

---

# **Linux Process Documentation**

**The kernel development community**

**Jul 14, 2020**



## **CONTENTS**



So you want to be a Linux kernel developer? Welcome! While there is a lot to be learned about the kernel in a technical sense, it is also important to learn about how our community works. Reading these documents will make it much easier for you to get your changes merged with a minimum of trouble.

Below are the essential guides that every developer should read.



---

**CHAPTER  
ONE**

---

## **LINUX KERNEL LICENSING RULES**

The Linux Kernel is provided under the terms of the GNU General Public License version 2 only (GPL-2.0), as provided in LICENSES/preferred/GPL-2.0, with an explicit syscall exception described in LICENSES/exceptions/Linux-syscall-note, as described in the COPYING file.

This documentation file provides a description of how each source file should be annotated to make its license clear and unambiguous. It doesn't replace the Kernel's license.

The license described in the COPYING file applies to the kernel source as a whole, though individual source files can have a different license which is required to be compatible with the GPL-2.0:

```
GPL-1.0+ : GNU General Public License v1.0 or later
GPL-2.0+ : GNU General Public License v2.0 or later
LGPL-2.0 : GNU Library General Public License v2 only
LGPL-2.0+ : GNU Library General Public License v2 or later
LGPL-2.1 : GNU Lesser General Public License v2.1 only
LGPL-2.1+ : GNU Lesser General Public License v2.1 or later
```

Aside from that, individual files can be provided under a dual license, e.g. one of the compatible GPL variants and alternatively under a permissive license like BSD, MIT etc.

The User-space API (UAPI) header files, which describe the interface of user-space programs to the kernel are a special case. According to the note in the kernel COPYING file, the syscall interface is a clear boundary, which does not extend the GPL requirements to any software which uses it to communicate with the kernel. Because the UAPI headers must be includable into any source files which create an executable running on the Linux kernel, the exception must be documented by a special license expression.

The common way of expressing the license of a source file is to add the matching boilerplate text into the top comment of the file. Due to formatting, typos etc. these "boilerplates" are hard to validate for tools which are used in the context of license compliance.

An alternative to boilerplate text is the use of Software Package Data Exchange (SPDX) license identifiers in each source file. SPDX license identifiers are machine parsable and precise shorthands for the license under which the content of the file is contributed. SPDX license identifiers are managed by the SPDX Workgroup at the Linux Foundation and have been agreed on by partners throughout the industry, tool vendors, and legal teams. For further information see <https://spdx.org/>

The Linux kernel requires the precise SPDX identifier in all source files. The valid identifiers used in the kernel are explained in the section License identifiers and have been retrieved from the official SPDX license list at <https://spdx.org/licenses/> along with the license texts.

### \* License identifier syntax

#### 1. Placement:

The SPDX license identifier in kernel files shall be added at the first possible line in a file which can contain a comment. For the majority of files this is the first line, except for scripts which require the '#!PATH\_TO\_INTERPRETER' in the first line. For those scripts the SPDX identifier goes into the second line.

#### 2. Style:

The SPDX license identifier is added in form of a comment. The comment style depends on the file type:

```
C source: // SPDX-License-Identifier: <SPDX License Expression>
C header: /* SPDX-License-Identifier: <SPDX License Expression> */
ASM:      /* SPDX-License-Identifier: <SPDX License Expression> */
scripts:  # SPDX-License-Identifier: <SPDX License Expression>
.rst:     .. SPDX-License-Identifier: <SPDX License Expression>
.dts{i}: // SPDX-License-Identifier: <SPDX License Expression>
```

If a specific tool cannot handle the standard comment style, then the appropriate comment mechanism which the tool accepts shall be used. This is the reason for having the “/\* \*/” style comment in C header files. There was build breakage observed with generated .lds files where ‘ld’ failed to parse the C++ comment. This has been fixed by now, but there are still older assembler tools which cannot handle C++ style comments.

#### 3. Syntax:

A <SPDX License Expression> is either an SPDX short form license identifier found on the SPDX License List, or the combination of two SPDX short form license identifiers separated by “WITH” when a license exception applies. When multiple licenses apply, an expression consists of keywords “AND”, “OR” separating sub-expressions and surrounded by “( “, “)” .

License identifiers for licenses like [L]GPL with the ‘or later’ option are constructed by using a “+” for indicating the ‘or later’ option..

```
// SPDX-License-Identifier: GPL-2.0+
// SPDX-License-Identifier: LGPL-2.1+
```

WITH should be used when there is a modifier to a license needed. For example, the linux kernel UAPI files use the expression:

```
// SPDX-License-Identifier: GPL-2.0 WITH Linux-syscall-note
// SPDX-License-Identifier: GPL-2.0+ WITH Linux-syscall-note
```

Other examples using WITH exceptions found in the kernel are:

```
// SPDX-License-Identifier: GPL-2.0 WITH mif-exception
// SPDX-License-Identifier: GPL-2.0+ WITH GCC-exception-2.0
```

Exceptions can only be used with particular License identifiers. The valid License identifiers are listed in the tags of the exception text file. For details see the point Exceptions in the chapter License identifiers.

OR should be used if the file is dual licensed and only one license is to be selected. For example, some dtsi files are available under dual licenses:

```
// SPDX-License-Identifier: GPL-2.0 OR BSD-3-Clause
```

Examples from the kernel for license expressions in dual licensed files:

```
// SPDX-License-Identifier: GPL-2.0 OR MIT
// SPDX-License-Identifier: GPL-2.0 OR BSD-2-Clause
// SPDX-License-Identifier: GPL-2.0 OR Apache-2.0
// SPDX-License-Identifier: GPL-2.0 OR MPL-1.1
// SPDX-License-Identifier: (GPL-2.0 WITH Linux-syscall-note) OR MIT
// SPDX-License-Identifier: GPL-1.0+ OR BSD-3-Clause OR OpenSSL
```

AND should be used if the file has multiple licenses whose terms all apply to use the file. For example, if code is inherited from another project and permission has been given to put it in the kernel, but the original license terms need to remain in effect:

```
// SPDX-License-Identifier: (GPL-2.0 WITH Linux-syscall-note) AND MIT
```

Another other example where both sets of license terms need to be adhered to is:

```
// SPDX-License-Identifier: GPL-1.0+ AND LGPL-2.1+
```

## \* **License identifiers**

The licenses currently used, as well as the licenses for code added to the kernel, can be broken down into:

### 1. Preferred licenses:

Whenever possible these licenses should be used as they are known to be fully compatible and widely used. These licenses are available from the directory:

LICENSES/pREFERRED/

in the kernel source tree.

The files in this directory contain the full license text and Metatags. The file names are identical to the SPDX license identifier which shall be used for the license in source files.

Examples:

LICENSES/pREFERRED/GPL-2.0

Contains the GPL version 2 license text and the required metatags:

LICENSES/pREFERRED/MIT

Contains the MIT license text and the required metatags

Metatags:

The following meta tags must be available in a license file:

- Valid-License-Identifier:

One or more lines which declare which License Identifiers are valid inside the project to reference this particular license text. Usually this is a single valid identifier, but e.g. for licenses with the ‘or later’ options two identifiers are valid.

- SPDX-URL:

The URL of the SPDX page which contains additional information related to the license.

- Usage-Guidance:

Freeform text for usage advice. The text must include correct examples for the SPDX license identifiers as they should be put into source files according to the License identifier syntax guidelines.

- License-Text:

All text after this tag is treated as the original license text

File format examples:

```
Valid-License-Identifier: GPL-2.0
Valid-License-Identifier: GPL-2.0+
SPDX-URL: https://spdx.org/licenses/GPL-2.0.html
Usage-Guide:
To use this license in source code, put one of the following SPDX
tag/value pairs into a comment according to the placement
guidelines in the licensing rules documentation.
For 'GNU General Public License (GPL) version 2 only' use:
    SPDX-License-Identifier: GPL-2.0
For 'GNU General Public License (GPL) version 2 or any later version
→' use:
    SPDX-License-Identifier: GPL-2.0+
```

(continues on next page)

(continued from previous page)

<b>License-Text:</b> Full license text
---

SPDX-License-Identifier: MIT SPDX-URL: <a href="https://spdx.org/licenses/MIT.html">https://spdx.org/licenses/MIT.html</a> <b>Usage-Guide:</b> To use this license in source code, put the following SPDX tag/value pair into a comment according to the placement guidelines in the licensing rules documentation. SPDX-License-Identifier: MIT <b>License-Text:</b> Full license text
---

## 2. Deprecated licenses:

These licenses should only be used for existing code or for importing code from a different project. These licenses are available from the directory:

LICENSES/deprecated/
----------------------

in the kernel source tree.

The files in this directory contain the full license text and Metatags. The file names are identical to the SPDX license identifier which shall be used for the license in source files.

Examples:

LICENSES/deprecated/ISC
-------------------------

Contains the Internet Systems Consortium license text and the required metatags:

LICENSES/deprecated/GPL-1.0
-----------------------------

Contains the GPL version 1 license text and the required metatags.

Metatags:

The metatag requirements for ‘other’ licenses are identical to the requirements of the Preferred licenses.

File format example:

Valid-License-Identifier: ISC SPDX-URL: <a href="https://spdx.org/licenses/ISC.html">https://spdx.org/licenses/ISC.html</a> <b>Usage-Guide:</b> Usage of this license in the kernel for new code is discouraged and it should solely be used for importing code from an already existing project. To use this license in source code, put the following SPDX
--

(continues on next page)

(continued from previous page)

```
tag/value pair into a comment according to the placement  
guidelines in the licensing rules documentation.
```

```
SPDX-License-Identifier: ISC  
License-Text:  
Full license text
```

### 3. Dual Licensing Only

These licenses should only be used to dual license code with another license in addition to a preferred license. These licenses are available from the directory:

```
LICENSES/dual/
```

in the kernel source tree.

The files in this directory contain the full license text and Metatags. The file names are identical to the SPDX license identifier which shall be used for the license in source files.

Examples:

```
LICENSES/dual/MPL-1.1
```

Contains the Mozilla Public License version 1.1 license text and the required metatags:

```
LICENSES/dual/Apache-2.0
```

Contains the Apache License version 2.0 license text and the required metatags.

Metatags:

The metatag requirements for ‘other’ licenses are identical to the requirements of the Preferred licenses.

File format example:

```
Valid-License-Identifier: MPL-1.1  
SPDX-URL: https://spdx.org/licenses/MPL-1.1.html  
Usage-Guide:  
Do NOT use. The MPL-1.1 is not GPL2 compatible. It may only be used  
for  
dual-licensed files where the other license is GPL2 compatible.  
If you end up using this it MUST be used together with a GPL2  
compatible  
license using "OR".  
To use the Mozilla Public License version 1.1 put the following SPDX  
tag/value pair into a comment according to the placement guidelines  
in  
the licensing rules documentation:
```

(continues on next page)

(continued from previous page)

SPDX-License-Identifier: MPL-1.1 License-Text: Full license text
--

#### 4. Exceptions:

Some licenses can be amended with exceptions which grant certain rights which the original license does not. These exceptions are available from the directory:

LICENSES/exceptions/
----------------------

in the kernel source tree. The files in this directory contain the full exception text and the required Exception Metatags.

Examples:

LICENSES/exceptions/Linux-syscall-note
--

Contains the Linux syscall exception as documented in the COPYING file of the Linux kernel, which is used for UAPI header files. e.g. /\* SPDX-License-Identifier: GPL-2.0 WITH Linux-syscall-note \*/:

LICENSES/exceptions/GCC-exception-2.0
---------------------------------------

Contains the GCC ‘linking exception’ which allows to link any binary independent of its license against the compiled version of a file marked with this exception. This is required for creating runnable executables from source code which is not compatible with the GPL.

Exception Metatags:

The following meta tags must be available in an exception file:

- SPDX-Exception-Identifier:  
One exception identifier which can be used with SPDX license identifiers.
- SPDX-URL:  
The URL of the SPDX page which contains additional information related to the exception.
- SPDX-Licenses:  
A comma separated list of SPDX license identifiers for which the exception can be used.
- Usage-Guidance:  
Freeform text for usage advice. The text must be followed by correct examples for the SPDX license identifiers as they should be put into source files according to the License identifier syntax guidelines.

- Exception-Text:

All text after this tag is treated as the original exception text

File format examples:

```
SPDX-Exception-Identifier: Linux-syscall-note
SPDX-URL: https://spdx.org/licenses/Linux-syscall-note.html
SPDX-Licenses: GPL-2.0, GPL-2.0+, GPL-1.0+, LGPL-2.0, LGPL-2.0+, LGPL-
                ↪2.1, LGPL-2.1+
Usage-Guidance:
This exception is used together with one of the above SPDX-Licenses
to mark user-space API (uapi) header files so they can be included
into non GPL compliant user-space application code.
To use this exception add it with the keyword WITH to one of the
identifiers in the SPDX-Licenses tag:
    SPDX-License-Identifier: <SPDX-License> WITH Linux-syscall-note
Exception-Text:
    Full exception text
```

```
SPDX-Exception-Identifier: GCC-exception-2.0
SPDX-URL: https://spdx.org/licenses/GCC-exception-2.0.html
SPDX-Licenses: GPL-2.0, GPL-2.0+
Usage-Guidance:
The "GCC Runtime Library exception 2.0" is used together with one
of the above SPDX-Licenses for code imported from the GCC runtime
library.
To use this exception add it with the keyword WITH to one of the
identifiers in the SPDX-Licenses tag:
    SPDX-License-Identifier: <SPDX-License> WITH GCC-exception-2.0
Exception-Text:
    Full exception text
```

All SPDX license identifiers and exceptions must have a corresponding file in the LICENSES subdirectories. This is required to allow tool verification (e.g. check-patch.pl) and to have the licenses ready to read and extract right from the source, which is recommended by various FOSS organizations, e.g. the [FSFE REUSE](#) initiative.

## \* MODULE\_LICENSE

Loadable kernel modules also require a MODULE\_LICENSE() tag. This tag is neither a replacement for proper source code license information (SPDX-License-Identifier) nor in any way relevant for expressing or determining the exact license under which the source code of the module is provided.

The sole purpose of this tag is to provide sufficient information whether the module is free software or proprietary for the kernel module loader and for user space tools.

The valid license strings for MODULE\_LICENSE() are:

“GPL”	Module is licensed under GPL version 2. This does not express any distinction between GPL-2.0-only or GPL-2.0-or-later. The exact license information can only be determined via the license information in the corresponding source files.
“GPL v2”	Same as “GPL”. It exists for historic reasons.
“GPL and additional rights”	Historical variant of expressing that the module source is dual licensed under a GPL v2 variant and MIT license. Please do not use in new code.
“Dual MIT/GPL”	The correct way of expressing that the module is dual licensed under a GPL v2 variant or MIT license choice.
“Dual BSD/GPL/BSD”	The module is dual licensed under a GPL v2 variant or BSD/BSD license choice. The exact variant of the BSD license can only be determined via the license information in the corresponding source files.
“Dual MPL/GPLv2”	The module is dual licensed under a GPL v2 variant or Mozilla Public License (MPL) choice. The exact variant of the MPL license can only be determined via the license information in the corresponding source files.
“Proprietary”	The module is under a proprietary license. This string is solely for proprietary third party modules and cannot be used for modules which have their source code in the kernel tree. Modules tagged that way are tainting the kernel with the ‘P’ flag when loaded and the kernel module loader refuses to link such modules against symbols which are exported with EXPORT_SYMBOL_GPL().



## HOWTO DO LINUX KERNEL DEVELOPMENT

This is the be-all, end-all document on this topic. It contains instructions on how to become a Linux kernel developer and how to learn to work with the Linux kernel development community. It tries to not contain anything related to the technical aspects of kernel programming, but will help point you in the right direction for that.

If anything in this document becomes out of date, please send in patches to the maintainer of this file, who is listed at the bottom of the document.

### \* **Introduction**

So, you want to learn how to become a Linux kernel developer? Or you have been told by your manager, “Go write a Linux driver for this device.” This document’s goal is to teach you everything you need to know to achieve this by describing the process you need to go through, and hints on how to work with the community. It will also try to explain some of the reasons why the community works like it does.

The kernel is written mostly in C, with some architecture-dependent parts written in assembly. A good understanding of C is required for kernel development. Assembly (any architecture) is not required unless you plan to do low-level development for that architecture. Though they are not a good substitute for a solid C education and/or years of experience, the following books are good for, if anything, reference:

- “The C Programming Language” by Kernighan and Ritchie [Prentice Hall]
- “Practical C Programming” by Steve Oualline [O’ Reilly]
- “C: A Reference Manual” by Harbison and Steele [Prentice Hall]

The kernel is written using GNU C and the GNU toolchain. While it adheres to the ISO C89 standard, it uses a number of extensions that are not featured in the standard. The kernel is a freestanding C environment, with no reliance on the standard C library, so some portions of the C standard are not supported. Arbitrary long long divisions and floating point are not allowed. It can sometimes be difficult to understand the assumptions the kernel has on the toolchain and the extensions that it uses, and unfortunately there is no definitive reference for them. Please check the gcc info pages (info gcc) for some information on them.

Please remember that you are trying to learn how to work with the existing development community. It is a diverse group of people, with high standards for coding,

style and procedure. These standards have been created over time based on what they have found to work best for such a large and geographically dispersed team. Try to learn as much as possible about these standards ahead of time, as they are well documented; do not expect people to adapt to you or your company's way of doing things.

### \* Legal Issues

The Linux kernel source code is released under the GPL. Please see the file COPYING in the main directory of the source tree. The Linux kernel licensing rules and how to use SPDX identifiers in source code are described in Documentation/process/license-rules.rst. If you have further questions about the license, please contact a lawyer, and do not ask on the Linux kernel mailing list. The people on the mailing lists are not lawyers, and you should not rely on their statements on legal matters.

For common questions and answers about the GPL, please see:

<https://www.gnu.org/licenses/gpl-faq.html>

### \* Documentation

The Linux kernel source tree has a large range of documents that are invaluable for learning how to interact with the kernel community. When new features are added to the kernel, it is recommended that new documentation files are also added which explain how to use the feature. When a kernel change causes the interface that the kernel exposes to userspace to change, it is recommended that you send the information or a patch to the manual pages explaining the change to the manual pages maintainer at [mtk.manpages@gmail.com](mailto:mtk.manpages@gmail.com), and CC the list [linux-api@vger.kernel.org](mailto:linux-api@vger.kernel.org).

Here is a list of files that are in the kernel source tree that are required reading:

**Documentation/admin-guide/README.rst** This file gives a short background on the Linux kernel and describes what is necessary to do to configure and build the kernel. People who are new to the kernel should start here.

**Documentation/process/changes.rst** This file gives a list of the minimum levels of various software packages that are necessary to build and run the kernel successfully.

**Documentation/process/coding-style.rst** This describes the Linux kernel coding style, and some of the rationale behind it. All new code is expected to follow the guidelines in this document. Most maintainers will only accept patches if these rules are followed, and many people will only review code if it is in the proper style.

**Documentation/process/submitting-patches.rst and Documentation/process/submitting-patches.rst** These files describe in explicit detail how to successfully create and send a patch, including (but not limited to):

- Email contents
- Email format
- Who to send it to

Following these rules will not guarantee success (as all patches are subject to scrutiny for content and style), but not following them will almost always prevent it.

Other excellent descriptions of how to create patches properly are:

**“The Perfect Patch”** <https://www.ozlabs.org/~akpm/stuff/tpp.txt>

**“Linux kernel patch submission format”** <https://web.archive.org/web/20180829112450/http://linux.yyz.us/patch-format.html>

**Documentation/process/stable-api-nonsense.rst** This file describes the rationale behind the conscious decision to not have a stable API within the kernel, including things like:

- Subsystem shim-layers (for compatibility?)
- Driver portability between Operating Systems.
- Mitigating rapid change within the kernel source tree (or preventing rapid change)

This document is crucial for understanding the Linux development philosophy and is very important for people moving to Linux from development on other Operating Systems.

**Documentation/admin-guide/security-bugs.rst** If you feel you have found a security problem in the Linux kernel, please follow the steps in this document to help notify the kernel developers, and help solve the issue.

**Documentation/process/management-style.rst** This document describes how Linux kernel maintainers operate and the shared ethos behind their methodologies. This is important reading for anyone new to kernel development (or anyone simply curious about it), as it resolves a lot of common misconceptions and confusion about the unique behavior of kernel maintainers.

**Documentation/process/stable-kernel-rules.rst** This file describes the rules on how the stable kernel releases happen, and what to do if you want to get a change into one of these releases.

**Documentation/process/kernel-docs.rst** A list of external documentation that pertains to kernel development. Please consult this list if you do not find what you are looking for within the in-kernel documentation.

**Documentation/process/applying-patches.rst** A good introduction describing exactly what a patch is and how to apply it to the different development branches of the kernel.

The kernel also has a large number of documents that can be automatically generated from the source code itself or from ReStructuredText markups (ReST), like this one. This includes a full description of the in-kernel API, and rules on how to handle locking properly.

All such documents can be generated as PDF or HTML by running:

```
make pdfdocs  
make htmldocs
```

respectively from the main kernel source directory.

The documents that uses ReST markup will be generated at Documentation/output. They can also be generated on LaTeX and ePub formats with:

```
make latexdocs  
make epubdocs
```

## \* **Becoming A Kernel Developer**

If you do not know anything about Linux kernel development, you should look at the Linux KernelNewbies project:

<https://kernelnewbies.org>

It consists of a helpful mailing list where you can ask almost any type of basic kernel development question (make sure to search the archives first, before asking something that has already been answered in the past.) It also has an IRC channel that you can use to ask questions in real-time, and a lot of helpful documentation that is useful for learning about Linux kernel development.

The website has basic information about code organization, subsystems, and current projects (both in-tree and out-of-tree). It also describes some basic logistical information, like how to compile a kernel and apply a patch.

If you do not know where you want to start, but you want to look for some task to start doing to join into the kernel development community, go to the Linux Kernel Janitor' s project:

<https://kernelnewbies.org/KernelJanitors>

It is a great place to start. It describes a list of relatively simple problems that need to be cleaned up and fixed within the Linux kernel source tree. Working with the developers in charge of this project, you will learn the basics of getting your patch into the Linux kernel tree, and possibly be pointed in the direction of what to go work on next, if you do not already have an idea.

Before making any actual modifications to the Linux kernel code, it is imperative to understand how the code in question works. For this purpose, nothing is better than reading through it directly (most tricky bits are commented well), perhaps even with the help of specialized tools. One such tool that is particularly recommended is the Linux Cross-Reference project, which is able to present source code in a self-referential, indexed webpage format. An excellent up-to-date repository of the kernel code may be found at:

<https://elixir.bootlin.com/>

## \* **The development process**

Linux kernel development process currently consists of a few different main kernel “branches” and lots of different subsystem-specific kernel branches. These different branches are:

- Linus’ s mainline tree
- Various stable trees with multiple major numbers
- Subsystem-specific trees
- linux-next integration testing tree

### \* **Mainline tree**

The mainline tree is maintained by Linus Torvalds, and can be found at <https://kernel.org> or in the repo. Its development process is as follows:

- As soon as a new kernel is released a two week window is open, during this period of time maintainers can submit big diffs to Linus, usually the patches that have already been included in the linux-next for a few weeks. The preferred way to submit big changes is using git (the kernel’s source management tool, more information can be found at <https://git-scm.com/>) but plain patches are also just fine.
- After two weeks a -rc1 kernel is released and the focus is on making the new kernel as rock solid as possible. Most of the patches at this point should fix a regression. Bugs that have always existed are not regressions, so only push these kinds of fixes if they are important. Please note that a whole new driver (or filesystem) might be accepted after -rc1 because there is no risk of causing regressions with such a change as long as the change is self-contained and does not affect areas outside of the code that is being added. git can be used to send patches to Linus after -rc1 is released, but the patches need to also be sent to a public mailing list for review.
- A new -rc is released whenever Linus deems the current git tree to be in a reasonably sane state adequate for testing. The goal is to release a new -rc kernel every week.
- Process continues until the kernel is considered “ready”, the process should last around 6 weeks.

It is worth mentioning what Andrew Morton wrote on the linux-kernel mailing list about kernel releases:

“Nobody knows when a kernel will be released, because it’s released according to perceived bug status, not according to a preconceived timeline.”

### \* **Various stable trees with multiple major numbers**

Kernels with 3-part versions are -stable kernels. They contain relatively small and critical fixes for security problems or significant regressions discovered in a given major mainline release. Each release in a major stable series increments the third part of the version number, keeping the first two parts the same.

This is the recommended branch for users who want the most recent stable kernel and are not interested in helping test development/experimental versions.

Stable trees are maintained by the “stable” team <[stable@vger.kernel.org](mailto:stable@vger.kernel.org)>, and are released as needs dictate. The normal release period is approximately two weeks, but it can be longer if there are no pressing problems. A security-related problem, instead, can cause a release to happen almost instantly.

The file Documentation/process/stable-kernel-rules.rst in the kernel tree documents what kinds of changes are acceptable for the -stable tree, and how the release process works.

### \* **Subsystem-specific trees**

The maintainers of the various kernel subsystems —and also many kernel subsystem developers—expose their current state of development in source repositories. That way, others can see what is happening in the different areas of the kernel. In areas where development is rapid, a developer may be asked to base his submissions onto such a subsystem kernel tree so that conflicts between the submission and other already ongoing work are avoided.

Most of these repositories are git trees, but there are also other SCMs in use, or patch queues being published as quilt series. Addresses of these subsystem repositories are listed in the MAINTAINERS file. Many of them can be browsed at <https://git.kernel.org/>.

Before a proposed patch is committed to such a subsystem tree, it is subject to review which primarily happens on mailing lists (see the respective section below). For several kernel subsystems, this review process is tracked with the tool patchwork. Patchwork offers a web interface which shows patch postings, any comments on a patch or revisions to it, and maintainers can mark patches as under review, accepted, or rejected. Most of these patchwork sites are listed at <https://patchwork.kernel.org/>.

### \* **linux-next integration testing tree**

Before updates from subsystem trees are merged into the mainline tree, they need to be integration-tested. For this purpose, a special testing repository exists into which virtually all subsystem trees are pulled on an almost daily basis:

<https://git.kernel.org/?p=linux/kernel/git/next/linux-next.git>

This way, the linux-next gives a summary outlook onto what will be expected to go into the mainline kernel at the next merge period. Adventurous testers are very welcome to runtime-test the linux-next.

## \* **Bug Reporting**

<https://bugzilla.kernel.org> is where the Linux kernel developers track kernel bugs. Users are encouraged to report all bugs that they find in this tool. For details on how to use the kernel bugzilla, please see:

<https://bugzilla.kernel.org/page.cgi?id=faq.html>

The file admin-guide/reporting-bugs.rst in the main kernel source directory has a good template for how to report a possible kernel bug, and details what kind of information is needed by the kernel developers to help track down the problem.

## \* **Managing bug reports**

One of the best ways to put into practice your hacking skills is by fixing bugs reported by other people. Not only you will help to make the kernel more stable, but you'll also learn to fix real world problems and you will improve your skills, and other developers will be aware of your presence. Fixing bugs is one of the best ways to get merits among other developers, because not many people like wasting time fixing other people's bugs.

To work in the already reported bug reports, go to <https://bugzilla.kernel.org>.

## \* **Mailing lists**

As some of the above documents describe, the majority of the core kernel developers participate on the Linux Kernel Mailing list. Details on how to subscribe and unsubscribe from the list can be found at:

<http://vger.kernel.org/vger-lists.html#linux-kernel>

There are archives of the mailing list on the web in many different places. Use a search engine to find these archives. For example:

<http://dir.gmane.org/gmane.linux.kernel>

It is highly recommended that you search the archives about the topic you want to bring up, before you post it to the list. A lot of things already discussed in detail are only recorded at the mailing list archives.

Most of the individual kernel subsystems also have their own separate mailing list where they do their development efforts. See the MAINTAINERS file for a list of what these lists are for the different groups.

Many of the lists are hosted on kernel.org. Information on them can be found at:

<http://vger.kernel.org/vger-lists.html>

Please remember to follow good behavioral habits when using the lists. Though a bit cheesy, the following URL has some simple guidelines for interacting with the list (or any list):

<http://www.albion.com/netiquette/>

If multiple people respond to your mail, the CC: list of recipients may get pretty large. Don't remove anybody from the CC: list without a good reason, or don't reply only to the list address. Get used to receiving the mail twice, one from the sender and the one from the list, and don't try to tune that by adding fancy mail-headers, people will not like it.

Remember to keep the context and the attribution of your replies intact, keep the "John Kernelhacker wrote …:" lines at the top of your reply, and add your statements between the individual quoted sections instead of writing at the top of the mail.

If you add patches to your mail, make sure they are plain readable text as stated in Documentation/process/submitting-patches.rst. Kernel developers don't want to deal with attachments or compressed patches; they may want to comment on individual lines of your patch, which works only that way. Make sure you use a mail program that does not mangle spaces and tab characters. A good first test is to send the mail to yourself and try to apply your own patch by yourself. If that doesn't work, get your mail program fixed or change it until it works.

Above all, please remember to show respect to other subscribers.

### \* Working with the community

The goal of the kernel community is to provide the best possible kernel there is. When you submit a patch for acceptance, it will be reviewed on its technical merits and those alone. So, what should you be expecting?

- criticism
- comments
- requests for change
- requests for justification
- silence

Remember, this is part of getting your patch into the kernel. You have to be able to take criticism and comments about your patches, evaluate them at a technical level and either rework your patches or provide clear and concise reasoning as to why those changes should not be made. If there are no responses to your posting, wait a few days and try again, sometimes things get lost in the huge volume.

What should you not do?

- expect your patch to be accepted without question
- become defensive
- ignore comments
- resubmit the patch without making any of the requested changes

In a community that is looking for the best technical solution possible, there will always be differing opinions on how beneficial a patch is. You have to be cooperative, and willing to adapt your idea to fit within the kernel. Or at least be willing to prove your idea is worth it. Remember, being wrong is acceptable as long as you are willing to work toward a solution that is right.

It is normal that the answers to your first patch might simply be a list of a dozen things you should correct. This does **not** imply that your patch will not be accepted, and it is **not** meant against you personally. Simply correct all issues raised against your patch and resend it.

## \* **Differences between the kernel community and corporate structures**

The kernel community works differently than most traditional corporate development environments. Here are a list of things that you can try to do to avoid problems:

Good things to say regarding your proposed changes:

- “This solves multiple problems.”
- “This deletes 2000 lines of code.”
- “Here is a patch that explains what I am trying to describe.”
- “I tested it on 5 different architectures…”
- “Here is a series of small patches that…”
- “This increases performance on typical machines…”

Bad things you should avoid saying:

- “We did it this way in AIX/ptx/Solaris, so therefore it must be good ...”
- “I’ve been doing this for 20 years, so…”
- “This is required for my company to make money”
- “This is for our Enterprise product line.”
- “Here is my 1000 page design document that describes my idea”
- “I’ve been working on this for 6 months…”
- “Here’s a 5000 line patch that…”
- “I rewrote all of the current mess, and here it is…”
- “I have a deadline, and this patch needs to be applied now.”

Another way the kernel community is different than most traditional software engineering work environments is the faceless nature of interaction. One benefit of using email and irc as the primary forms of communication is the lack of discrimination based on gender or race. The Linux kernel work environment is accepting of women and minorities because all you are is an email address. The international aspect also helps to level the playing field because you can’t guess gender based on a person’s name. A man may be named Andrea and a woman may be named Pat. Most women who have worked in the Linux kernel and have expressed an opinion have had positive experiences.

The language barrier can cause problems for some people who are not comfortable with English. A good grasp of the language can be needed in order to get ideas

across properly on mailing lists, so it is recommended that you check your emails to make sure they make sense in English before sending them.

### \* Break up your changes

The Linux kernel community does not gladly accept large chunks of code dropped on it all at once. The changes need to be properly introduced, discussed, and broken up into tiny, individual portions. This is almost the exact opposite of what companies are used to doing. Your proposal should also be introduced very early in the development process, so that you can receive feedback on what you are doing. It also lets the community feel that you are working with them, and not simply using them as a dumping ground for your feature. However, don't send 50 emails at one time to a mailing list, your patch series should be smaller than that almost all of the time.

The reasons for breaking things up are the following:

- 1) Small patches increase the likelihood that your patches will be applied, since they don't take much time or effort to verify for correctness. A 5 line patch can be applied by a maintainer with barely a second glance. However, a 500 line patch may take hours to review for correctness (the time it takes is exponentially proportional to the size of the patch, or something).

Small patches also make it very easy to debug when something goes wrong. It's much easier to back out patches one by one than it is to dissect a very large patch after it's been applied (and broken something).

- 2) It's important not only to send small patches, but also to rewrite and simplify (or simply re-order) patches before submitting them.

Here is an analogy from kernel developer Al Viro:

"Think of a teacher grading homework from a math student. The teacher does not want to see the student's trials and errors before they came up with the solution. They want to see the cleanest, most elegant answer. A good student knows this, and would never submit her intermediate work before the final solution."

The same is true of kernel development. The maintainers and reviewers do not want to see the thought process behind the solution to the problem one is solving. They want to see a simple and elegant solution."

It may be challenging to keep the balance between presenting an elegant solution and working together with the community and discussing your unfinished work. Therefore it is good to get early in the process to get feedback to improve your work, but also keep your changes in small chunks that they may get already accepted, even when your whole task is not ready for inclusion now.

Also realize that it is not acceptable to send patches for inclusion that are unfinished and will be "fixed up later."

## \* **Justify your change**

Along with breaking up your patches, it is very important for you to let the Linux community know why they should add this change. New features must be justified as being needed and useful.

## \* **Document your change**

When sending in your patches, pay special attention to what you say in the text in your email. This information will become the ChangeLog information for the patch, and will be preserved for everyone to see for all time. It should describe the patch completely, containing:

- why the change is necessary
- the overall design approach in the patch
- implementation details
- testing results

For more details on what this should all look like, please see the ChangeLog section of the document:

**“The Perfect Patch”** <http://www.ozlabs.org/~akpm/stuff/tpp.txt>

All of these things are sometimes very hard to do. It can take years to perfect these practices (if at all). It’s a continuous process of improvement that requires a lot of patience and determination. But don’t give up, it’s possible. Many have done it before, and each had to start exactly where you are now.

---

Thanks to Paolo Ciarrocchi who allowed the “Development Process” (<https://lwn.net/Articles/94386/>) section to be based on text he had written, and to Randy Dunlap and Gerrit Huizenga for some of the list of things you should and should not say. Also thanks to Pat Mochel, Hanna Linder, Randy Dunlap, Kay Sievers, Vojtech Pavlik, Jan Kara, Josh Boyer, Kees Cook, Andrew Morton, Andi Kleen, Vadim Lobanov, Jesper Juhl, Adrian Bunk, Keri Harris, Frans Pop, David A. Wheeler, Junio Hamano, Michael Kerrisk, and Alex Shepard for their review, comments, and contributions. Without their help, this document would not have been possible.

Maintainer: Greg Kroah-Hartman <[ggreg@kroah.com](mailto:ggreg@kroah.com)>



---

**CHAPTER  
THREE**

---

## **CONTRIBUTOR COVENANT CODE OF CONDUCT**

### **\* Our Pledge**

In the interest of fostering an open and welcoming environment, we as contributors and maintainers pledge to making participation in our project and our community a harassment-free experience for everyone, regardless of age, body size, disability, ethnicity, sex characteristics, gender identity and expression, level of experience, education, socio-economic status, nationality, personal appearance, race, religion, or sexual identity and orientation.

### **\* Our Standards**

Examples of behavior that contributes to creating a positive environment include:

- Using welcoming and inclusive language
- Being respectful of differing viewpoints and experiences
- Gracefully accepting constructive criticism
- Focusing on what is best for the community
- Showing empathy towards other community members

Examples of unacceptable behavior by participants include:

- The use of sexualized language or imagery and unwelcome sexual attention or advances
- Trolling, insulting/derogatory comments, and personal or political attacks
- Public or private harassment
- Publishing others' private information, such as a physical or electronic address, without explicit permission
- Other conduct which could reasonably be considered inappropriate in a professional setting

## \* **Our Responsibilities**

Maintainers are responsible for clarifying the standards of acceptable behavior and are expected to take appropriate and fair corrective action in response to any instances of unacceptable behavior.

Maintainers have the right and responsibility to remove, edit, or reject comments, commits, code, wiki edits, issues, and other contributions that are not aligned to this Code of Conduct, or to ban temporarily or permanently any contributor for other behaviors that they deem inappropriate, threatening, offensive, or harmful.

## \* **Scope**

This Code of Conduct applies both within project spaces and in public spaces when an individual is representing the project or its community. Examples of representing a project or community include using an official project e-mail address, posting via an official social media account, or acting as an appointed representative at an online or offline event. Representation of a project may be further defined and clarified by project maintainers.

## \* **Enforcement**

Instances of abusive, harassing, or otherwise unacceptable behavior may be reported by contacting the Code of Conduct Committee at <[conduct@kernel.org](mailto:conduct@kernel.org)>. All complaints will be reviewed and investigated and will result in a response that is deemed necessary and appropriate to the circumstances. The Code of Conduct Committee is obligated to maintain confidentiality with regard to the reporter of an incident. Further details of specific enforcement policies may be posted separately.

## \* **Attribution**

This Code of Conduct is adapted from the Contributor Covenant, version 1.4, available at <https://www.contributor-covenant.org/version/1/4/code-of-conduct.html>

## \* **Interpretation**

See the Linux Kernel Contributor Covenant Code of Conduct Interpretation document for how the Linux kernel community will be interpreting this document.

## **LINUX KERNEL CONTRIBUTOR COVENANT CODE OF CONDUCT INTERPRETATION**

The Contributor Covenant Code of Conduct is a general document meant to provide a set of rules for almost any open source community. Every open-source community is unique and the Linux kernel is no exception. Because of this, this document describes how we in the Linux kernel community will interpret it. We also do not expect this interpretation to be static over time, and will adjust it as needed.

The Linux kernel development effort is a very personal process compared to “traditional” ways of developing software. Your contributions and ideas behind them will be carefully reviewed, often resulting in critique and criticism. The review will almost always require improvements before the material can be included in the kernel. Know that this happens because everyone involved wants to see the best possible solution for the overall success of Linux. This development process has been proven to create the most robust operating system kernel ever, and we do not want to do anything to cause the quality of submission and eventual result to ever decrease.

### **\* Maintainers**

The Code of Conduct uses the term “maintainers” numerous times. In the kernel community, a “maintainer” is anyone who is responsible for a subsystem, driver, or file, and is listed in the MAINTAINERS file in the kernel source tree.

### **\* Responsibilities**

The Code of Conduct mentions rights and responsibilities for maintainers, and this needs some further clarifications.

First and foremost, it is a reasonable expectation to have maintainers lead by example.

That being said, our community is vast and broad, and there is no new requirement for maintainers to unilaterally handle how other people behave in the parts of the community where they are active. That responsibility is upon all of us, and ultimately the Code of Conduct documents final escalation paths in case of unresolved concerns regarding conduct issues.

Maintainers should be willing to help when problems occur, and work with others in the community when needed. Do not be afraid to reach out to the Technical Advisory Board (TAB) or other maintainers if you’re uncertain how to handle situations that come up. It will not be considered a violation report unless you want it to be. If you are uncertain about approaching the TAB or any other maintainers, please reach out to our conflict mediator, Mishi Choudhary <[mishi@linux.com](mailto:mishi@linux.com)>.

In the end, “be kind to each other” is really what the end goal is for everybody. We know everyone is human and we all fail at times, but the primary goal for all of us should be to work toward amicable resolutions of problems. Enforcement of the code of conduct will only be a last resort option.

Our goal of creating a robust and technically advanced operating system and the technical complexity involved naturally require expertise and decision-making.

The required expertise varies depending on the area of contribution. It is determined mainly by context and technical complexity and only secondary by the expectations of contributors and maintainers.

Both the expertise expectations and decision-making are subject to discussion, but at the very end there is a basic necessity to be able to make decisions in order to make progress. This prerogative is in the hands of maintainers and project’s leadership and is expected to be used in good faith.

As a consequence, setting expertise expectations, making decisions and rejecting unsuitable contributions are not viewed as a violation of the Code of Conduct.

While maintainers are in general welcoming to newcomers, their capacity of helping contributors overcome the entry hurdles is limited, so they have to set priorities. This, also, is not to be seen as a violation of the Code of Conduct. The kernel community is aware of that and provides entry level programs in various forms like [kernelnewbies.org](http://kernelnewbies.org).

## \* Scope

The Linux kernel community primarily interacts on a set of public email lists distributed around a number of different servers controlled by a number of different companies or individuals. All of these lists are defined in the MAINTAINERS file in the kernel source tree. Any emails sent to those mailing lists are considered covered by the Code of Conduct.

Developers who use the kernel.org bugzilla, and other subsystem bugzilla or bug tracking tools should follow the guidelines of the Code of Conduct. The Linux kernel community does not have an “official” project email address, or “official” social media address. Any activity performed using a kernel.org email account must follow the Code of Conduct as published for kernel.org, just as any individual using a corporate email account must follow the specific rules of that corporation.

The Code of Conduct does not prohibit continuing to include names, email addresses, and associated comments in mailing list messages, kernel change log messages, or code comments.

Interaction in other forums is covered by whatever rules apply to said forums and is in general not covered by the Code of Conduct. Exceptions may be considered

for extreme circumstances.

Contributions submitted for the kernel should use appropriate language. Content that already exists predating the Code of Conduct will not be addressed now as a violation. Inappropriate language can be seen as a bug, though; such bugs will be fixed more quickly if any interested parties submit patches to that effect. Expressions that are currently part of the user/kernel API, or reflect terminology used in published standards or specifications, are not considered bugs.

## \* **Enforcement**

The address listed in the Code of Conduct goes to the Code of Conduct Committee. The exact members receiving these emails at any given time are listed at <https://kernel.org/code-of-conduct.html>. Members can not access reports made before they joined or after they have left the committee.

The initial Code of Conduct Committee consists of volunteer members of the TAB, as well as a professional mediator acting as a neutral third party. The first task of the committee is to establish documented processes, which will be made public.

Any member of the committee, including the mediator, can be contacted directly if a reporter does not wish to include the full committee in a complaint or concern.

The Code of Conduct Committee reviews the cases according to the processes (see above) and consults with the TAB as needed and appropriate, for instance to request and receive information about the kernel community.

Any decisions by the committee will be brought to the TAB, for implementation of enforcement with the relevant maintainers if needed. A decision by the Code of Conduct Committee can be overturned by the TAB by a two-thirds vote.

At quarterly intervals, the Code of Conduct Committee and TAB will provide a report summarizing the anonymised reports that the Code of Conduct committee has received and their status, as well details of any overridden decisions including complete and identifiable voting details.

We expect to establish a different process for Code of Conduct Committee staffing beyond the bootstrap period. This document will be updated with that information when this occurs.



## A GUIDE TO THE KERNEL DEVELOPMENT PROCESS

Contents:

### \* **Introduction**

### \* **Executive summary**

The rest of this section covers the scope of the kernel development process and the kinds of frustrations that developers and their employers can encounter there. There are a great many reasons why kernel code should be merged into the official (“mainline”) kernel, including automatic availability to users, community support in many forms, and the ability to influence the direction of kernel development. Code contributed to the Linux kernel must be made available under a GPL-compatible license.

How the development process works introduces the development process, the kernel release cycle, and the mechanics of the merge window. The various phases in the patch development, review, and merging cycle are covered. There is some discussion of tools and mailing lists. Developers wanting to get started with kernel development are encouraged to track down and fix bugs as an initial exercise.

Early-stage planning covers early-stage project planning, with an emphasis on involving the development community as soon as possible.

Getting the code right is about the coding process; several pitfalls which have been encountered by other developers are discussed. Some requirements for patches are covered, and there is an introduction to some of the tools which can help to ensure that kernel patches are correct.

Posting patches talks about the process of posting patches for review. To be taken seriously by the development community, patches must be properly formatted and described, and they must be sent to the right place. Following the advice in this section should help to ensure the best possible reception for your work.

Followthrough covers what happens after posting patches; the job is far from done at that point. Working with reviewers is a crucial part of the development process; this section offers a number of tips on how to avoid problems at this important stage. Developers are cautioned against assuming that the job is done when a patch is merged into the mainline.

Advanced topics introduces a couple of “advanced” topics: managing patches with git and reviewing patches posted by others.

For more information concludes the document with pointers to sources for more information on kernel development.

### \* **What this document is about**

The Linux kernel, at over 8 million lines of code and well over 1000 contributors to each release, is one of the largest and most active free software projects in existence. Since its humble beginning in 1991, this kernel has evolved into a best-of-breed operating system component which runs on pocket-sized digital music players, desktop PCs, the largest supercomputers in existence, and all types of systems in between. It is a robust, efficient, and scalable solution for almost any situation.

With the growth of Linux has come an increase in the number of developers (and companies) wishing to participate in its development. Hardware vendors want to ensure that Linux supports their products well, making those products attractive to Linux users. Embedded systems vendors, who use Linux as a component in an integrated product, want Linux to be as capable and well-suited to the task at hand as possible. Distributors and other software vendors who base their products on Linux have a clear interest in the capabilities, performance, and reliability of the Linux kernel. And end users, too, will often wish to change Linux to make it better suit their needs.

One of the most compelling features of Linux is that it is accessible to these developers; anybody with the requisite skills can improve Linux and influence the direction of its development. Proprietary products cannot offer this kind of openness, which is a characteristic of the free software process. But, if anything, the kernel is even more open than most other free software projects. A typical three-month kernel development cycle can involve over 1000 developers working for more than 100 different companies (or for no company at all).

Working with the kernel development community is not especially hard. But, that notwithstanding, many potential contributors have experienced difficulties when trying to do kernel work. The kernel community has evolved its own distinct ways of operating which allow it to function smoothly (and produce a high-quality product) in an environment where thousands of lines of code are being changed every day. So it is not surprising that Linux kernel development process differs greatly from proprietary development methods.

The kernel's development process may come across as strange and intimidating to new developers, but there are good reasons and solid experience behind it. A developer who does not understand the kernel community's ways (or, worse, who tries to flout or circumvent them) will have a frustrating experience in store. The development community, while being helpful to those who are trying to learn, has little time for those who will not listen or who do not care about the development process.

It is hoped that those who read this document will be able to avoid that frustrating experience. There is a lot of material here, but the effort involved in reading it will be repaid in short order. The development community is always in need of developers who will help to make the kernel better; the following text should help you - or those who work for you - join our community.

## \* Credits

This document was written by Jonathan Corbet, [corbet@lwn.net](mailto:corbet@lwn.net). It has been improved by comments from Johannes Berg, James Berry, Alex Chiang, Roland Dreier, Randy Dunlap, Jake Edge, Jiri Kosina, Matt Mackall, Arthur Marsh, Amanda McPherson, Andrew Morton, Andrew Price, Tsugikazu Shibata, and Jochen Voß.

This work was supported by the Linux Foundation; thanks especially to Amanda McPherson, who saw the value of this effort and made it all happen.

## \* The importance of getting code into the mainline

Some companies and developers occasionally wonder why they should bother learning how to work with the kernel community and get their code into the mainline kernel (the “mainline” being the kernel maintained by Linus Torvalds and used as a base by Linux distributors). In the short term, contributing code can look like an avoidable expense; it seems easier to just keep the code separate and support users directly. The truth of the matter is that keeping code separate (“out of tree”) is a false economy.

As a way of illustrating the costs of out-of-tree code, here are a few relevant aspects of the kernel development process; most of these will be discussed in greater detail later in this document. Consider:

- Code which has been merged into the mainline kernel is available to all Linux users. It will automatically be present on all distributions which enable it. There is no need for driver disks, downloads, or the hassles of supporting multiple versions of multiple distributions; it all just works, for the developer and for the user. Incorporation into the mainline solves a large number of distribution and support problems.
- While kernel developers strive to maintain a stable interface to user space, the internal kernel API is in constant flux. The lack of a stable internal interface is a deliberate design decision; it allows fundamental improvements to be made at any time and results in higher-quality code. But one result of that policy is that any out-of-tree code requires constant upkeep if it is to work with new kernels. Maintaining out-of-tree code requires significant amounts of work just to keep that code working.

Code which is in the mainline, instead, does not require this work as the result of a simple rule requiring any developer who makes an API change to also fix any code that breaks as the result of that change. So code which has been merged into the mainline has significantly lower maintenance costs.

- Beyond that, code which is in the kernel will often be improved by other developers. Surprising results can come from empowering your user community and customers to improve your product.
- Kernel code is subjected to review, both before and after merging into the mainline. No matter how strong the original developer’s skills are, this review process invariably finds ways in which the code can be improved. Often review finds severe bugs and security problems. This is especially true for code which has been developed in a closed environment; such code benefits

strongly from review by outside developers. Out-of-tree code is lower-quality code.

- Participation in the development process is your way to influence the direction of kernel development. Users who complain from the sidelines are heard, but active developers have a stronger voice - and the ability to implement changes which make the kernel work better for their needs.
- When code is maintained separately, the possibility that a third party will contribute a different implementation of a similar feature always exists. Should that happen, getting your code merged will become much harder - to the point of impossibility. Then you will be faced with the unpleasant alternatives of either (1) maintaining a nonstandard feature out of tree indefinitely, or (2) abandoning your code and migrating your users over to the in-tree version.
- Contribution of code is the fundamental action which makes the whole process work. By contributing your code you can add new functionality to the kernel and provide capabilities and examples which are of use to other kernel developers. If you have developed code for Linux (or are thinking about doing so), you clearly have an interest in the continued success of this platform; contributing code is one of the best ways to help ensure that success.

All of the reasoning above applies to any out-of-tree kernel code, including code which is distributed in proprietary, binary-only form. There are, however, additional factors which should be taken into account before considering any sort of binary-only kernel code distribution. These include:

- The legal issues around the distribution of proprietary kernel modules are cloudy at best; quite a few kernel copyright holders believe that most binary-only modules are derived products of the kernel and that, as a result, their distribution is a violation of the GNU General Public license (about which more will be said below). Your author is not a lawyer, and nothing in this document can possibly be considered to be legal advice. The true legal status of closed-source modules can only be determined by the courts. But the uncertainty which haunts those modules is there regardless.
- Binary modules greatly increase the difficulty of debugging kernel problems, to the point that most kernel developers will not even try. So the distribution of binary-only modules will make it harder for your users to get support from the community.
- Support is also harder for distributors of binary-only modules, who must provide a version of the module for every distribution and every kernel version they wish to support. Dozens of builds of a single module can be required to provide reasonably comprehensive coverage, and your users will have to upgrade your module separately every time they upgrade their kernel.
- Everything that was said above about code review applies doubly to closed-source code. Since this code is not available at all, it cannot have been reviewed by the community and will, beyond doubt, have serious problems.

Makers of embedded systems, in particular, may be tempted to disregard much of what has been said in this section in the belief that they are shipping a self-contained product which uses a frozen kernel version and requires no more development after its release. This argument misses the value of widespread code review and the value of allowing your users to add capabilities to your product.

But these products, too, have a limited commercial life, after which a new version must be released. At that point, vendors whose code is in the mainline and well maintained will be much better positioned to get the new product ready for market quickly.

### \* **Licensing**

Code is contributed to the Linux kernel under a number of licenses, but all code must be compatible with version 2 of the GNU General Public License (GPLv2), which is the license covering the kernel distribution as a whole. In practice, that means that all code contributions are covered either by GPLv2 (with, optionally, language allowing distribution under later versions of the GPL) or the three-clause BSD license. Any contributions which are not covered by a compatible license will not be accepted into the kernel.

Copyright assignments are not required (or requested) for code contributed to the kernel. All code merged into the mainline kernel retains its original ownership; as a result, the kernel now has thousands of owners.

One implication of this ownership structure is that any attempt to change the licensing of the kernel is doomed to almost certain failure. There are few practical scenarios where the agreement of all copyright holders could be obtained (or their code removed from the kernel). So, in particular, there is no prospect of a migration to version 3 of the GPL in the foreseeable future.

It is imperative that all code contributed to the kernel be legitimately free software. For that reason, code from anonymous (or pseudonymous) contributors will not be accepted. All contributors are required to “sign off” on their code, stating that the code can be distributed with the kernel under the GPL. Code which has not been licensed as free software by its owner, or which risks creating copyright-related problems for the kernel (such as code which derives from reverse-engineering efforts lacking proper safeguards) cannot be contributed.

Questions about copyright-related issues are common on Linux development mailing lists. Such questions will normally receive no shortage of answers, but one should bear in mind that the people answering those questions are not lawyers and cannot provide legal advice. If you have legal questions relating to Linux source code, there is no substitute for talking with a lawyer who understands this field. Relying on answers obtained on technical mailing lists is a risky affair.

### \* **How the development process works**

Linux kernel development in the early 1990’s was a pretty loose affair, with relatively small numbers of users and developers involved. With a user base in the millions and with some 2,000 developers involved over the course of one year, the kernel has since had to evolve a number of processes to keep development happening smoothly. A solid understanding of how the process works is required in order to be an effective part of it.

### \* The big picture

The kernel developers use a loosely time-based release process, with a new major kernel release happening every two or three months. The recent release history looks like this:

5.0	March 3, 2019
5.1	May 5, 2019
5.2	July 7, 2019
5.3	September 15, 2019
5.4	November 24, 2019
5.5	January 6, 2020

Every 5.x release is a major kernel release with new features, internal API changes, and more. A typical release can contain about 13,000 changesets with changes to several hundred thousand lines of code. 5.x is the leading edge of Linux kernel development; the kernel uses a rolling development model which is continually integrating major changes.

A relatively straightforward discipline is followed with regard to the merging of patches for each release. At the beginning of each development cycle, the “merge window” is said to be open. At that time, code which is deemed to be sufficiently stable (and which is accepted by the development community) is merged into the mainline kernel. The bulk of changes for a new development cycle (and all of the major changes) will be merged during this time, at a rate approaching 1,000 changes (“patches,” or “changesets”) per day.

(As an aside, it is worth noting that the changes integrated during the merge window do not come out of thin air; they have been collected, tested, and staged ahead of time. How that process works will be described in detail later on).

The merge window lasts for approximately two weeks. At the end of this time, Linus Torvalds will declare that the window is closed and release the first of the “rc” kernels. For the kernel which is destined to be 5.6, for example, the release which happens at the end of the merge window will be called 5.6-rc1. The -rc1 release is the signal that the time to merge new features has passed, and that the time to stabilize the next kernel has begun.

Over the next six to ten weeks, only patches which fix problems should be submitted to the mainline. On occasion a more significant change will be allowed, but such occasions are rare; developers who try to merge new features outside of the merge window tend to get an unfriendly reception. As a general rule, if you miss the merge window for a given feature, the best thing to do is to wait for the next development cycle. (An occasional exception is made for drivers for previously-unsupported hardware; if they touch no in-tree code, they cannot cause regressions and should be safe to add at any time).

As fixes make their way into the mainline, the patch rate will slow over time. Linus releases new -rc kernels about once a week; a normal series will get up to somewhere between -rc6 and -rc9 before the kernel is considered to be sufficiently stable and the final release is made. At that point the whole process starts over again.

As an example, here is how the 5.4 development cycle went (all dates in 2019):

September 15	5.3 stable release
September 30	5.4-rc1, merge window closes
October 6	5.4-rc2
October 13	5.4-rc3
October 20	5.4-rc4
October 27	5.4-rc5
November 3	5.4-rc6
November 10	5.4-rc7
November 17	5.4-rc8
November 24	5.4 stable release

How do the developers decide when to close the development cycle and create the stable release? The most significant metric used is the list of regressions from previous releases. No bugs are welcome, but those which break systems which worked in the past are considered to be especially serious. For this reason, patches which cause regressions are looked upon unfavorably and are quite likely to be reverted during the stabilization period.

The developers' goal is to fix all known regressions before the stable release is made. In the real world, this kind of perfection is hard to achieve; there are just too many variables in a project of this size. There comes a point where delaying the final release just makes the problem worse; the pile of changes waiting for the next merge window will grow larger, creating even more regressions the next time around. So most 5.x kernels go out with a handful of known regressions though, hopefully, none of them are serious.

Once a stable release is made, its ongoing maintenance is passed off to the “stable team,” currently Greg Kroah-Hartman. The stable team will release occasional updates to the stable release using the 5.x.y numbering scheme. To be considered for an update release, a patch must (1) fix a significant bug, and (2) already be merged into the mainline for the next development kernel. Kernels will typically receive stable updates for a little more than one development cycle past their initial release. So, for example, the 5.2 kernel's history looked like this (all dates in 2019):

September 15	5.2 stable release
July 14	5.2.1
July 21	5.2.2
July 26	5.2.3
July 28	5.2.4
July 31	5.2.5
...	...
October 11	5.2.21

5.2.21 was the final stable update of the 5.2 release.

Some kernels are designated “long term” kernels; they will receive support for a longer period. As of this writing, the current long term kernels and their maintainers are:

3.16	Ben Hutchings	(very long-term kernel)
4.4	Greg Kroah-Hartman & Sasha Levin	(very long-term kernel)
4.9	Greg Kroah-Hartman & Sasha Levin	
4.14	Greg Kroah-Hartman & Sasha Levin	
4.19	Greg Kroah-Hartman & Sasha Levin	
5.4	Greg Kroah-Hartman & Sasha Levin	

The selection of a kernel for long-term support is purely a matter of a maintainer having the need and the time to maintain that release. There are no known plans for long-term support for any specific upcoming release.

### \* **The lifecycle of a patch**

Patches do not go directly from the developer's keyboard into the mainline kernel. There is, instead, a somewhat involved (if somewhat informal) process designed to ensure that each patch is reviewed for quality and that each patch implements a change which is desirable to have in the mainline. This process can happen quickly for minor fixes, or, in the case of large and controversial changes, go on for years. Much developer frustration comes from a lack of understanding of this process or from attempts to circumvent it.

In the hopes of reducing that frustration, this document will describe how a patch gets into the kernel. What follows below is an introduction which describes the process in a somewhat idealized way. A much more detailed treatment will come in later sections.

The stages that a patch goes through are, generally:

- Design. This is where the real requirements for the patch - and the way those requirements will be met - are laid out. Design work is often done without involving the community, but it is better to do this work in the open if at all possible; it can save a lot of time redesigning things later.
- Early review. Patches are posted to the relevant mailing list, and developers on that list reply with any comments they may have. This process should turn up any major problems with a patch if all goes well.
- Wider review. When the patch is getting close to ready for mainline inclusion, it should be accepted by a relevant subsystem maintainer - though this acceptance is not a guarantee that the patch will make it all the way to the mainline. The patch will show up in the maintainer's subsystem tree and into the -next trees (described below). When the process works, this step leads to more extensive review of the patch and the discovery of any problems resulting from the integration of this patch with work being done by others.
- Please note that most maintainers also have day jobs, so merging your patch may not be their highest priority. If your patch is getting feedback about changes that are needed, you should either make those changes or justify why they should not be made. If your patch has no review complaints but is not being merged by its appropriate subsystem or driver maintainer, you should be persistent in updating the patch to the current kernel so that it applies cleanly and keep sending it for review and merging.

- Merging into the mainline. Eventually, a successful patch will be merged into the mainline repository managed by Linus Torvalds. More comments and/or problems may surface at this time; it is important that the developer be responsive to these and fix any issues which arise.
- Stable release. The number of users potentially affected by the patch is now large, so, once again, new problems may arise.
- Long-term maintenance. While it is certainly possible for a developer to forget about code after merging it, that sort of behavior tends to leave a poor impression in the development community. Merging code eliminates some of the maintenance burden, in that others will fix problems caused by API changes. But the original developer should continue to take responsibility for the code if it is to remain useful in the longer term.

One of the largest mistakes made by kernel developers (or their employers) is to try to cut the process down to a single “merging into the mainline” step. This approach invariably leads to frustration for everybody involved.

### \* **How patches get into the Kernel**

There is exactly one person who can merge patches into the mainline kernel repository: Linus Torvalds. But, for example, of the over 9,500 patches which went into the 2.6.38 kernel, only 112 (around 1.3%) were directly chosen by Linus himself. The kernel project has long since grown to a size where no single developer could possibly inspect and select every patch unassisted. The way the kernel developers have addressed this growth is through the use of a lieutenant system built around a chain of trust.

The kernel code base is logically broken down into a set of subsystems: networking, specific architecture support, memory management, video devices, etc. Most subsystems have a designated maintainer, a developer who has overall responsibility for the code within that subsystem. These subsystem maintainers are the gatekeepers (in a loose way) for the portion of the kernel they manage; they are the ones who will (usually) accept a patch for inclusion into the mainline kernel.

Subsystem maintainers each manage their own version of the kernel source tree, usually (but certainly not always) using the git source management tool. Tools like git (and related tools like quilt or mercurial) allow maintainers to track a list of patches, including authorship information and other metadata. At any given time, the maintainer can identify which patches in his or her repository are not found in the mainline.

When the merge window opens, top-level maintainers will ask Linus to “pull” the patches they have selected for merging from their repositories. If Linus agrees, the stream of patches will flow up into his repository, becoming part of the mainline kernel. The amount of attention that Linus pays to specific patches received in a pull operation varies. It is clear that, sometimes, he looks quite closely. But, as a general rule, Linus trusts the subsystem maintainers to not send bad patches upstream.

Subsystem maintainers, in turn, can pull patches from other maintainers. For example, the networking tree is built from patches which accumulated first in trees dedicated to network device drivers, wireless networking, etc. This chain of

repositories can be arbitrarily long, though it rarely exceeds two or three links. Since each maintainer in the chain trusts those managing lower-level trees, this process is known as the “chain of trust.”

Clearly, in a system like this, getting patches into the kernel depends on finding the right maintainer. Sending patches directly to Linus is not normally the right way to go.

### \* **Next trees**

The chain of subsystem trees guides the flow of patches into the kernel, but it also raises an interesting question: what if somebody wants to look at all of the patches which are being prepared for the next merge window? Developers will be interested in what other changes are pending to see whether there are any conflicts to worry about; a patch which changes a core kernel function prototype, for example, will conflict with any other patches which use the older form of that function. Reviewers and testers want access to the changes in their integrated form before all of those changes land in the mainline kernel. One could pull changes from all of the interesting subsystem trees, but that would be a big and error-prone job.

The answer comes in the form of -next trees, where subsystem trees are collected for testing and review. The older of these trees, maintained by Andrew Morton, is called “-mm” (for memory management, which is how it got started). The -mm tree integrates patches from a long list of subsystem trees; it also has some patches aimed at helping with debugging.

Beyond that, -mm contains a significant collection of patches which have been selected by Andrew directly. These patches may have been posted on a mailing list, or they may apply to a part of the kernel for which there is no designated subsystem tree. As a result, -mm operates as a sort of subsystem tree of last resort; if there is no other obvious path for a patch into the mainline, it is likely to end up in -mm. Miscellaneous patches which accumulate in -mm will eventually either be forwarded on to an appropriate subsystem tree or be sent directly to Linus. In a typical development cycle, approximately 5-10% of the patches going into the mainline get there via -mm.

The current -mm patch is available in the “mmotm” (-mm of the moment) directory at:

<http://www.ozlabs.org/~akpm/mmotm/>

Use of the MMOTM tree is likely to be a frustrating experience, though; there is a definite chance that it will not even compile.

The primary tree for next-cycle patch merging is linux-next, maintained by Stephen Rothwell. The linux-next tree is, by design, a snapshot of what the mainline is expected to look like after the next merge window closes. Linux-next trees are announced on the linux-kernel and linux-next mailing lists when they are assembled; they can be downloaded from:

<http://www.kernel.org/pub/linux/kernel/next/>

Linux-next has become an integral part of the kernel development process; all patches merged during a given merge window should really have found their way into linux-next some time before the merge window opens.

## \* **Staging trees**

The kernel source tree contains the drivers/staging/ directory, where many sub-directories for drivers or filesystems that are on their way to being added to the kernel tree live. They remain in drivers/staging while they still need more work; once complete, they can be moved into the kernel proper. This is a way to keep track of drivers that aren't up to Linux kernel coding or quality standards, but people may want to use them and track development.

Greg Kroah-Hartman currently maintains the staging tree. Drivers that still need work are sent to him, with each driver having its own subdirectory in drivers/staging/. Along with the driver source files, a TODO file should be present in the directory as well. The TODO file lists the pending work that the driver needs for acceptance into the kernel proper, as well as a list of people that should be Cc'd for any patches to the driver. Current rules require that drivers contributed to staging must, at a minimum, compile properly.

Staging can be a relatively easy way to get new drivers into the mainline where, with luck, they will come to the attention of other developers and improve quickly. Entry into staging is not the end of the story, though; code in staging which is not seeing regular progress will eventually be removed. Distributors also tend to be relatively reluctant to enable staging drivers. So staging is, at best, a stop on the way toward becoming a proper mainline driver.

## \* **Tools**

As can be seen from the above text, the kernel development process depends heavily on the ability to herd collections of patches in various directions. The whole thing would not work anywhere near as well as it does without suitably powerful tools. Tutorials on how to use these tools are well beyond the scope of this document, but there is space for a few pointers.

By far the dominant source code management system used by the kernel community is git. Git is one of a number of distributed version control systems being developed in the free software community. It is well tuned for kernel development, in that it performs quite well when dealing with large repositories and large numbers of patches. It also has a reputation for being difficult to learn and use, though it has gotten better over time. Some sort of familiarity with git is almost a requirement for kernel developers; even if they do not use it for their own work, they'll need git to keep up with what other developers (and the mainline) are doing.

Git is now packaged by almost all Linux distributions. There is a home page at:

<http://git-scm.com/>

That page has pointers to documentation and tutorials.

Among the kernel developers who do not use git, the most popular choice is almost certainly Mercurial:

<http://www.selenic.com/mercurial/>

Mercurial shares many features with git, but it provides an interface which many find easier to use.

The other tool worth knowing about is Quilt:

<http://savannah.nongnu.org/projects/quilt/>

Quilt is a patch management system, rather than a source code management system. It does not track history over time; it is, instead, oriented toward tracking a specific set of changes against an evolving code base. Some major subsystem maintainers use quilt to manage patches intended to go upstream. For the management of certain kinds of trees (-mm, for example), quilt is the best tool for the job.

### \* Mailing lists

A great deal of Linux kernel development work is done by way of mailing lists. It is hard to be a fully-functioning member of the community without joining at least one list somewhere. But Linux mailing lists also represent a potential hazard to developers, who risk getting buried under a load of electronic mail, running afoul of the conventions used on the Linux lists, or both.

Most kernel mailing lists are run on vger.kernel.org; the master list can be found at:

<http://vger.kernel.org/vger-lists.html>

There are lists hosted elsewhere, though; a number of them are at lists.redhat.com.

The core mailing list for kernel development is, of course, linux-kernel. This list is an intimidating place to be; volume can reach 500 messages per day, the amount of noise is high, the conversation can be severely technical, and participants are not always concerned with showing a high degree of politeness. But there is no other place where the kernel development community comes together as a whole; developers who avoid this list will miss important information.

There are a few hints which can help with linux-kernel survival:

- Have the list delivered to a separate folder, rather than your main mailbox. One must be able to ignore the stream for sustained periods of time.
- Do not try to follow every conversation - nobody else does. It is important to filter on both the topic of interest (though note that long-running conversations can drift away from the original subject without changing the email subject line) and the people who are participating.
- Do not feed the trolls. If somebody is trying to stir up an angry response, ignore them.
- When responding to linux-kernel email (or that on other lists) preserve the Cc: header for all involved. In the absence of a strong reason (such as an explicit request), you should never remove recipients. Always make sure that the person you are responding to is in the Cc: list. This convention also makes it unnecessary to explicitly ask to be copied on replies to your postings.
- Search the list archives (and the net as a whole) before asking questions. Some developers can get impatient with people who clearly have not done their homework.

- Avoid top-posting (the practice of putting your answer above the quoted text you are responding to). It makes your response harder to read and makes a poor impression.
- Ask on the correct mailing list. Linux-kernel may be the general meeting point, but it is not the best place to find developers from all subsystems.

The last point - finding the correct mailing list - is a common place for beginning developers to go wrong. Somebody who asks a networking-related question on linux-kernel will almost certainly receive a polite suggestion to ask on the netdev list instead, as that is the list frequented by most networking developers. Other lists exist for the SCSI, video4linux, IDE, filesystem, etc. subsystems. The best place to look for mailing lists is in the MAINTAINERS file packaged with the kernel source.

### \* Getting started with Kernel development

Questions about how to get started with the kernel development process are common - from both individuals and companies. Equally common are missteps which make the beginning of the relationship harder than it has to be.

Companies often look to hire well-known developers to get a development group started. This can, in fact, be an effective technique. But it also tends to be expensive and does not do much to grow the pool of experienced kernel developers. It is possible to bring in-house developers up to speed on Linux kernel development, given the investment of a bit of time. Taking this time can endow an employer with a group of developers who understand the kernel and the company both, and who can help to train others as well. Over the medium term, this is often the more profitable approach.

Individual developers are often, understandably, at a loss for a place to start. Beginning with a large project can be intimidating; one often wants to test the waters with something smaller first. This is the point where some developers jump into the creation of patches fixing spelling errors or minor coding style issues. Unfortunately, such patches create a level of noise which is distracting for the development community as a whole, so, increasingly, they are looked down upon. New developers wishing to introduce themselves to the community will not get the sort of reception they wish for by these means.

Andrew Morton gives this advice for aspiring kernel developers

The #1 project for all kernel beginners should surely be "make sure that the kernel runs perfectly at all times on all machines which you can lay your hands on". Usually the way to do this is to work with others on getting things fixed up (this can require persistence!) but that's fine - it's a part of kernel development.

(<http://lwn.net/Articles/283982/>).

In the absence of obvious problems to fix, developers are advised to look at the current lists of regressions and open bugs in general. There is never any shortage of issues in need of fixing; by addressing these issues, developers will gain experience with the process while, at the same time, building respect with the rest of the development community.

## \* **Early-stage planning**

When contemplating a Linux kernel development project, it can be tempting to jump right in and start coding. As with any significant project, though, much of the groundwork for success is best laid before the first line of code is written. Some time spent in early planning and communication can save far more time later on.

### \* **Specifying the problem**

Like any engineering project, a successful kernel enhancement starts with a clear description of the problem to be solved. In some cases, this step is easy: when a driver is needed for a specific piece of hardware, for example. In others, though, it is tempting to confuse the real problem with the proposed solution, and that can lead to difficulties.

Consider an example: some years ago, developers working with Linux audio sought a way to run applications without dropouts or other artifacts caused by excessive latency in the system. The solution they arrived at was a kernel module intended to hook into the Linux Security Module (LSM) framework; this module could be configured to give specific applications access to the realtime scheduler. This module was implemented and sent to the linux-kernel mailing list, where it immediately ran into problems.

To the audio developers, this security module was sufficient to solve their immediate problem. To the wider kernel community, though, it was seen as a misuse of the LSM framework (which is not intended to confer privileges onto processes which they would not otherwise have) and a risk to system stability. Their preferred solutions involved realtime scheduling access via the rlimit mechanism for the short term, and ongoing latency reduction work in the long term.

The audio community, however, could not see past the particular solution they had implemented; they were unwilling to accept alternatives. The resulting disagreement left those developers feeling disillusioned with the entire kernel development process; one of them went back to an audio list and posted this:

There are a number of very good Linux kernel developers, but they tend to get outshouted by a large crowd of arrogant fools. Trying to communicate user requirements to these people is a waste of time. They are much too “intelligent” to listen to lesser mortals.

(<https://lwn.net/Articles/131776/>).

The reality of the situation was different; the kernel developers were far more concerned about system stability, long-term maintenance, and finding the right solution to the problem than they were with a specific module. The moral of the story is to focus on the problem - not a specific solution - and to discuss it with the development community before investing in the creation of a body of code.

So, when contemplating a kernel development project, one should obtain answers to a short set of questions:

- What, exactly, is the problem which needs to be solved?
- Who are the users affected by this problem? Which use cases should the solution address?

- How does the kernel fall short in addressing that problem now?

Only then does it make sense to start considering possible solutions.

### \* **Early discussion**

When planning a kernel development project, it makes great sense to hold discussions with the community before launching into implementation. Early communication can save time and trouble in a number of ways:

- It may well be that the problem is addressed by the kernel in ways which you have not understood. The Linux kernel is large and has a number of features and capabilities which are not immediately obvious. Not all kernel capabilities are documented as well as one might like, and it is easy to miss things. Your author has seen the posting of a complete driver which duplicated an existing driver that the new author had been unaware of. Code which reinvents existing wheels is not only wasteful; it will also not be accepted into the mainline kernel.
- There may be elements of the proposed solution which will not be acceptable for mainline merging. It is better to find out about problems like this before writing the code.
- It's entirely possible that other developers have thought about the problem; they may have ideas for a better solution, and may be willing to help in the creation of that solution.

Years of experience with the kernel development community have taught a clear lesson: kernel code which is designed and developed behind closed doors invariably has problems which are only revealed when the code is released into the community. Sometimes these problems are severe, requiring months or years of effort before the code can be brought up to the kernel community's standards. Some examples include:

- The Devicescape network stack was designed and implemented for single-processor systems. It could not be merged into the mainline until it was made suitable for multiprocessor systems. Retrofitting locking and such into code is a difficult task; as a result, the merging of this code (now called mac80211) was delayed for over a year.
- The Reiser4 filesystem included a number of capabilities which, in the core kernel developers' opinion, should have been implemented in the virtual filesystem layer instead. It also included features which could not easily be implemented without exposing the system to user-caused deadlocks. The late revelation of these problems - and refusal to address some of them - has caused Reiser4 to stay out of the mainline kernel.
- The AppArmor security module made use of internal virtual filesystem data structures in ways which were considered to be unsafe and unreliable. This concern (among others) kept AppArmor out of the mainline for years.

In each of these cases, a great deal of pain and extra work could have been avoided with some early discussion with the kernel developers.

### \* Who do you talk to?

When developers decide to take their plans public, the next question will be: where do we start? The answer is to find the right mailing list(s) and the right maintainer. For mailing lists, the best approach is to look in the MAINTAINERS file for a relevant place to post. If there is a suitable subsystem list, posting there is often preferable to posting on linux-kernel; you are more likely to reach developers with expertise in the relevant subsystem and the environment may be more supportive.

Finding maintainers can be a bit harder. Again, the MAINTAINERS file is the place to start. That file tends to not always be up to date, though, and not all subsystems are represented there. The person listed in the MAINTAINERS file may, in fact, not be the person who is actually acting in that role currently. So, when there is doubt about who to contact, a useful trick is to use git (and “git log” in particular) to see who is currently active within the subsystem of interest. Look at who is writing patches, and who, if anybody, is attaching Signed-off-by lines to those patches. Those are the people who will be best placed to help with a new development project.

The task of finding the right maintainer is sometimes challenging enough that the kernel developers have added a script to ease the process:

```
.../scripts/get_maintainer.pl
```

This script will return the current maintainer(s) for a given file or directory when given the “-f” option. If passed a patch on the command line, it will list the maintainers who should probably receive copies of the patch. There are a number of options regulating how hard get\_maintainer.pl will search for maintainers; please be careful about using the more aggressive options as you may end up including developers who have no real interest in the code you are modifying.

If all else fails, talking to Andrew Morton can be an effective way to track down a maintainer for a specific piece of code.

### \* When to post?

If possible, posting your plans during the early stages can only be helpful. Describe the problem being solved and any plans that have been made on how the implementation will be done. Any information you can provide can help the development community provide useful input on the project.

One discouraging thing which can happen at this stage is not a hostile reaction, but, instead, little or no reaction at all. The sad truth of the matter is (1) kernel developers tend to be busy, (2) there is no shortage of people with grand plans and little code (or even prospect of code) to back them up, and (3) nobody is obligated to review or comment on ideas posted by others. Beyond that, high-level designs often hide problems which are only revealed when somebody actually tries to implement those designs; for that reason, kernel developers would rather see the code.

If a request-for-comments posting yields little in the way of comments, do not assume that it means there is no interest in the project. Unfortunately, you also

cannot assume that there are no problems with your idea. The best thing to do in this situation is to proceed, keeping the community informed as you go.

### \* **Getting official buy-in**

If your work is being done in a corporate environment - as most Linux kernel work is - you must, obviously, have permission from suitably empowered managers before you can post your company's plans or code to a public mailing list. The posting of code which has not been cleared for release under a GPL-compatible license can be especially problematic; the sooner that a company's management and legal staff can agree on the posting of a kernel development project, the better off everybody involved will be.

Some readers may be thinking at this point that their kernel work is intended to support a product which does not yet have an officially acknowledged existence. Revealing their employer's plans on a public mailing list may not be a viable option. In cases like this, it is worth considering whether the secrecy is really necessary; there is often no real need to keep development plans behind closed doors.

That said, there are also cases where a company legitimately cannot disclose its plans early in the development process. Companies with experienced kernel developers may choose to proceed in an open-loop manner on the assumption that they will be able to avoid serious integration problems later. For companies without that sort of in-house expertise, the best option is often to hire an outside developer to review the plans under a non-disclosure agreement. The Linux Foundation operates an NDA program designed to help with this sort of situation; more information can be found at:

<https://www.linuxfoundation.org/nda/>

This kind of review is often enough to avoid serious problems later on without requiring public disclosure of the project.

### \* **Getting the code right**

While there is much to be said for a solid and community-oriented design process, the proof of any kernel development project is in the resulting code. It is the code which will be examined by other developers and merged (or not) into the mainline tree. So it is the quality of this code which will determine the ultimate success of the project.

This section will examine the coding process. We'll start with a look at a number of ways in which kernel developers can go wrong. Then the focus will shift toward doing things right and the tools which can help in that quest.

### \* Pitfalls

#### Coding style

The kernel has long had a standard coding style, described in Documentation/process/coding-style.rst. For much of that time, the policies described in that file were taken as being, at most, advisory. As a result, there is a substantial amount of code in the kernel which does not meet the coding style guidelines. The presence of that code leads to two independent hazards for kernel developers.

The first of these is to believe that the kernel coding standards do not matter and are not enforced. The truth of the matter is that adding new code to the kernel is very difficult if that code is not coded according to the standard; many developers will request that the code be reformatted before they will even review it. A code base as large as the kernel requires some uniformity of code to make it possible for developers to quickly understand any part of it. So there is no longer room for strangely-formatted code.

Occasionally, the kernel's coding style will run into conflict with an employer's mandated style. In such cases, the kernel's style will have to win before the code can be merged. Putting code into the kernel means giving up a degree of control in a number of ways - including control over how the code is formatted.

The other trap is to assume that code which is already in the kernel is urgently in need of coding style fixes. Developers may start to generate reformatting patches as a way of gaining familiarity with the process, or as a way of getting their name into the kernel changelogs - or both. But pure coding style fixes are seen as noise by the development community; they tend to get a chilly reception. So this type of patch is best avoided. It is natural to fix the style of a piece of code while working on it for other reasons, but coding style changes should not be made for their own sake.

The coding style document also should not be read as an absolute law which can never be transgressed. If there is a good reason to go against the style (a line which becomes far less readable if split to fit within the 80-column limit, for example), just do it.

Note that you can also use the `clang-format` tool to help you with these rules, to quickly re-format parts of your code automatically, and to review full files in order to spot coding style mistakes, typos and possible improvements. It is also handy for sorting `#includes`, for aligning variables/macros, for reflowing text and other similar tasks. See the file Documentation/process/clang-format.rst for more details.

## Abstraction layers

Computer Science professors teach students to make extensive use of abstraction layers in the name of flexibility and information hiding. Certainly the kernel makes extensive use of abstraction; no project involving several million lines of code could do otherwise and survive. But experience has shown that excessive or premature abstraction can be just as harmful as premature optimization. Abstraction should be used to the level required and no further.

At a simple level, consider a function which has an argument which is always passed as zero by all callers. One could retain that argument just in case somebody eventually needs to use the extra flexibility that it provides. By that time, though, chances are good that the code which implements this extra argument has been broken in some subtle way which was never noticed - because it has never been used. Or, when the need for extra flexibility arises, it does not do so in a way which matches the programmer's early expectation. Kernel developers will routinely submit patches to remove unused arguments; they should, in general, not be added in the first place.

Abstraction layers which hide access to hardware - often to allow the bulk of a driver to be used with multiple operating systems - are especially frowned upon. Such layers obscure the code and may impose a performance penalty; they do not belong in the Linux kernel.

On the other hand, if you find yourself copying significant amounts of code from another kernel subsystem, it is time to ask whether it would, in fact, make sense to pull out some of that code into a separate library or to implement that functionality at a higher level. There is no value in replicating the same code throughout the kernel.

## #ifdef and preprocessor use in general

The C preprocessor seems to present a powerful temptation to some C programmers, who see it as a way to efficiently encode a great deal of flexibility into a source file. But the preprocessor is not C, and heavy use of it results in code which is much harder for others to read and harder for the compiler to check for correctness. Heavy preprocessor use is almost always a sign of code which needs some cleanup work.

Conditional compilation with #ifdef is, indeed, a powerful feature, and it is used within the kernel. But there is little desire to see code which is sprinkled liberally with #ifdef blocks. As a general rule, #ifdef use should be confined to header files whenever possible. Conditionally-compiled code can be confined to functions which, if the code is not to be present, simply become empty. The compiler will then quietly optimize out the call to the empty function. The result is far cleaner code which is easier to follow.

C preprocessor macros present a number of hazards, including possible multiple evaluation of expressions with side effects and no type safety. If you are tempted to define a macro, consider creating an inline function instead. The code which results will be the same, but inline functions are easier to read, do not evaluate their arguments multiple times, and allow the compiler to perform type checking on the arguments and return value.

### Inline functions

Inline functions present a hazard of their own, though. Programmers can become enamored of the perceived efficiency inherent in avoiding a function call and fill a source file with inline functions. Those functions, however, can actually reduce performance. Since their code is replicated at each call site, they end up bloating the size of the compiled kernel. That, in turn, creates pressure on the processor's memory caches, which can slow execution dramatically. Inline functions, as a rule, should be quite small and relatively rare. The cost of a function call, after all, is not that high; the creation of large numbers of inline functions is a classic example of premature optimization.

In general, kernel programmers ignore cache effects at their peril. The classic time/space tradeoff taught in beginning data structures classes often does not apply to contemporary hardware. Space is time, in that a larger program will run slower than one which is more compact.

More recent compilers take an increasingly active role in deciding whether a given function should actually be inlined or not. So the liberal placement of "inline" keywords may not just be excessive; it could also be irrelevant.

### Locking

In May, 2006, the "Devicescape" networking stack was, with great fanfare, released under the GPL and made available for inclusion in the mainline kernel. This donation was welcome news; support for wireless networking in Linux was considered substandard at best, and the Devicescape stack offered the promise of fixing that situation. Yet, this code did not actually make it into the mainline until June, 2007 (2.6.22). What happened?

This code showed a number of signs of having been developed behind corporate doors. But one large problem in particular was that it was not designed to work on multiprocessor systems. Before this networking stack (now called mac80211) could be merged, a locking scheme needed to be retrofitted onto it.

Once upon a time, Linux kernel code could be developed without thinking about the concurrency issues presented by multiprocessor systems. Now, however, this document is being written on a dual-core laptop. Even on single-processor systems, work being done to improve responsiveness will raise the level of concurrency within the kernel. The days when kernel code could be written without thinking about locking are long past.

Any resource (data structures, hardware registers, etc.) which could be accessed concurrently by more than one thread must be protected by a lock. New code should be written with this requirement in mind; retrofitting locking after the fact is a rather more difficult task. Kernel developers should take the time to understand the available locking primitives well enough to pick the right tool for the job. Code which shows a lack of attention to concurrency will have a difficult path into the mainline.

## Regressions

One final hazard worth mentioning is this: it can be tempting to make a change (which may bring big improvements) which causes something to break for existing users. This kind of change is called a “regression,” and regressions have become most unwelcome in the mainline kernel. With few exceptions, changes which cause regressions will be backed out if the regression cannot be fixed in a timely manner. Far better to avoid the regression in the first place.

It is often argued that a regression can be justified if it causes things to work for more people than it creates problems for. Why not make a change if it brings new functionality to ten systems for each one it breaks? The best answer to this question was expressed by Linus in July, 2007:

So we don't fix bugs by introducing new problems. That way lies madness, and nobody ever knows if you actually make any real progress at all. Is it two steps forwards, one step back, or one step forward and two steps back?

(<http://lwn.net/Articles/243460/>).

An especially unwelcome type of regression is any sort of change to the user-space ABI. Once an interface has been exported to user space, it must be supported indefinitely. This fact makes the creation of user-space interfaces particularly challenging: since they cannot be changed in incompatible ways, they must be done right the first time. For this reason, a great deal of thought, clear documentation, and wide review for user-space interfaces is always required.

## \* Code checking tools

For now, at least, the writing of error-free code remains an ideal that few of us can reach. What we can hope to do, though, is to catch and fix as many of those errors as possible before our code goes into the mainline kernel. To that end, the kernel developers have put together an impressive array of tools which can catch a wide variety of obscure problems in an automated way. Any problem caught by the computer is a problem which will not afflict a user later on, so it stands to reason that the automated tools should be used whenever possible.

The first step is simply to heed the warnings produced by the compiler. Contemporary versions of gcc can detect (and warn about) a large number of potential errors. Quite often, these warnings point to real problems. Code submitted for review should, as a rule, not produce any compiler warnings. When silencing warnings, take care to understand the real cause and try to avoid “fixes” which make the warning go away without addressing its cause.

Note that not all compiler warnings are enabled by default. Build the kernel with “make EXTRA\_CFLAGS=-W” to get the full set.

The kernel provides several configuration options which turn on debugging features; most of these are found in the “kernel hacking” submenu. Several of these options should be turned on for any kernel used for development or testing purposes. In particular, you should turn on:

- `ENABLE_MUST_CHECK` and `FRAME_WARN` to get an extra set of warnings for problems like the use of deprecated interfaces or ignoring an important return value from a function. The output generated by these warnings can be verbose, but one need not worry about warnings from other parts of the kernel.
- `DEBUG_OBJECTS` will add code to track the lifetime of various objects created by the kernel and warn when things are done out of order. If you are adding a subsystem which creates (and exports) complex objects of its own, consider adding support for the object debugging infrastructure.
- `DEBUG_SLAB` can find a variety of memory allocation and use errors; it should be used on most development kernels.
- `DEBUG_SPINLOCK`, `DEBUG_ATOMIC_SLEEP`, and `DEBUG_MUTEXES` will find a number of common locking errors.

There are quite a few other debugging options, some of which will be discussed below. Some of them have a significant performance impact and should not be used all of the time. But some time spent learning the available options will likely be paid back many times over in short order.

One of the heavier debugging tools is the locking checker, or “lockdep.” This tool will track the acquisition and release of every lock (spinlock or mutex) in the system, the order in which locks are acquired relative to each other, the current interrupt environment, and more. It can then ensure that locks are always acquired in the same order, that the same interrupt assumptions apply in all situations, and so on. In other words, lockdep can find a number of scenarios in which the system could, on rare occasion, deadlock. This kind of problem can be painful (for both developers and users) in a deployed system; lockdep allows them to be found in an automated manner ahead of time. Code with any sort of non-trivial locking should be run with lockdep enabled before being submitted for inclusion.

As a diligent kernel programmer, you will, beyond doubt, check the return status of any operation (such as a memory allocation) which can fail. The fact of the matter, though, is that the resulting failure recovery paths are, probably, completely untested. Untested code tends to be broken code; you could be much more confident of your code if all those error-handling paths had been exercised a few times.

The kernel provides a fault injection framework which can do exactly that, especially where memory allocations are involved. With fault injection enabled, a configurable percentage of memory allocations will be made to fail; these failures can be restricted to a specific range of code. Running with fault injection enabled allows the programmer to see how the code responds when things go badly. See `Documentation/fault-injection/fault-injection.rst` for more information on how to use this facility.

Other kinds of errors can be found with the “sparse” static analysis tool. With sparse, the programmer can be warned about confusion between user-space and kernel-space addresses, mixture of big-endian and small-endian quantities, the passing of integer values where a set of bit flags is expected, and so on. Sparse must be installed separately (it can be found at [https://sparse.wiki.kernel.org/index.php/Main\\_Page](https://sparse.wiki.kernel.org/index.php/Main_Page) if your distributor does not package it); it can then be run on the code by adding “`C=1`” to your make command.

The “Coccinelle” tool (<http://coccinelle.lip6.fr/>) is able to find a wide variety of potential coding problems; it can also propose fixes for those problems. Quite a few “semantic patches” for the kernel have been packaged under the scripts/coccinelle directory; running “make coccicheck” will run through those semantic patches and report on any problems found. See Documentation/dev-tools/coccinelle.rst for more information.

Other kinds of portability errors are best found by compiling your code for other architectures. If you do not happen to have an S/390 system or a Blackfin development board handy, you can still perform the compilation step. A large set of cross compilers for x86 systems can be found at

<http://www.kernel.org/pub/tools/crosstool/>

Some time spent installing and using these compilers will help avoid embarrassment later.

### \* Documentation

Documentation has often been more the exception than the rule with kernel development. Even so, adequate documentation will help to ease the merging of new code into the kernel, make life easier for other developers, and will be helpful for your users. In many cases, the addition of documentation has become essentially mandatory.

The first piece of documentation for any patch is its associated changelog. Log entries should describe the problem being solved, the form of the solution, the people who worked on the patch, any relevant effects on performance, and anything else that might be needed to understand the patch. Be sure that the changelog says why the patch is worth applying; a surprising number of developers fail to provide that information.

Any code which adds a new user-space interface - including new sysfs or /proc files - should include documentation of that interface which enables user-space developers to know what they are working with. See Documentation/ABI/README for a description of how this documentation should be formatted and what information needs to be provided.

The file Documentation/admin-guide/kernel-parameters.rst describes all of the kernel’s boot-time parameters. Any patch which adds new parameters should add the appropriate entries to this file.

Any new configuration options must be accompanied by help text which clearly explains the options and when the user might want to select them.

Internal API information for many subsystems is documented by way of specially-formatted comments; these comments can be extracted and formatted in a number of ways by the “kernel-doc” script. If you are working within a subsystem which has kerneldoc comments, you should maintain them and add them, as appropriate, for externally-available functions. Even in areas which have not been so documented, there is no harm in adding kerneldoc comments for the future; indeed, this can be a useful activity for beginning kernel developers. The format of these comments, along with some information on how to create kerneldoc templates can be found at Documentation/doc-guide/.

Anybody who reads through a significant amount of existing kernel code will note that, often, comments are most notable by their absence. Once again, the expectations for new code are higher than they were in the past; merging uncommented code will be harder. That said, there is little desire for verbosely-commented code. The code should, itself, be readable, with comments explaining the more subtle aspects.

Certain things should always be commented. Uses of memory barriers should be accompanied by a line explaining why the barrier is necessary. The locking rules for data structures generally need to be explained somewhere. Major data structures need comprehensive documentation in general. Non-obvious dependencies between separate bits of code should be pointed out. Anything which might tempt a code janitor to make an incorrect “cleanup” needs a comment saying why it is done the way it is. And so on.

### \* Internal API changes

The binary interface provided by the kernel to user space cannot be broken except under the most severe circumstances. The kernel’s internal programming interfaces, instead, are highly fluid and can be changed when the need arises. If you find yourself having to work around a kernel API, or simply not using a specific functionality because it does not meet your needs, that may be a sign that the API needs to change. As a kernel developer, you are empowered to make such changes.

There are, of course, some catches. API changes can be made, but they need to be well justified. So any patch making an internal API change should be accompanied by a description of what the change is and why it is necessary. This kind of change should also be broken out into a separate patch, rather than buried within a larger patch.

The other catch is that a developer who changes an internal API is generally charged with the task of fixing any code within the kernel tree which is broken by the change. For a widely-used function, this duty can lead to literally hundreds or thousands of changes - many of which are likely to conflict with work being done by other developers. Needless to say, this can be a large job, so it is best to be sure that the justification is solid. Note that the Coccinelle tool can help with wide-ranging API changes.

When making an incompatible API change, one should, whenever possible, ensure that code which has not been updated is caught by the compiler. This will help you to be sure that you have found all in-tree uses of that interface. It will also alert developers of out-of-tree code that there is a change that they need to respond to. Supporting out-of-tree code is not something that kernel developers need to be worried about, but we also do not have to make life harder for out-of-tree developers than it needs to be.

## \* Posting patches

Sooner or later, the time comes when your work is ready to be presented to the community for review and, eventually, inclusion into the mainline kernel. Unsurprisingly, the kernel development community has evolved a set of conventions and procedures which are used in the posting of patches; following them will make life much easier for everybody involved. This document will attempt to cover these expectations in reasonable detail; more information can also be found in the files Documentation/process/submitting-patches.rst, Documentation/process/submitting-drivers.rst and Documentation/process/submit-checklist.rst.

### \* When to post

There is a constant temptation to avoid posting patches before they are completely “ready.” For simple patches, that is not a problem. If the work being done is complex, though, there is a lot to be gained by getting feedback from the community before the work is complete. So you should consider posting in-progress work, or even making a git tree available so that interested developers can catch up with your work at any time.

When posting code which is not yet considered ready for inclusion, it is a good idea to say so in the posting itself. Also mention any major work which remains to be done and any known problems. Fewer people will look at patches which are known to be half-baked, but those who do will come in with the idea that they can help you drive the work in the right direction.

### \* Before creating patches

There are a number of things which should be done before you consider sending patches to the development community. These include:

- Test the code to the extent that you can. Make use of the kernel’s debugging tools, ensure that the kernel will build with all reasonable combinations of configuration options, use cross-compilers to build for different architectures, etc.
- Make sure your code is compliant with the kernel coding style guidelines.
- Does your change have performance implications? If so, you should run benchmarks showing what the impact (or benefit) of your change is; a summary of the results should be included with the patch.
- Be sure that you have the right to post the code. If this work was done for an employer, the employer likely has a right to the work and must be agreeable with its release under the GPL.

As a general rule, putting in some extra thought before posting code almost always pays back the effort in short order.

## \* Patch preparation

The preparation of patches for posting can be a surprising amount of work, but, once again, attempting to save time here is not generally advisable even in the short term.

Patches must be prepared against a specific version of the kernel. As a general rule, a patch should be based on the current mainline as found in Linus' s git tree. When basing on mainline, start with a well-known release point - a stable or -rc release - rather than branching off the mainline at an arbitrary spot.

It may become necessary to make versions against -mm, linux-next, or a subsystem tree, though, to facilitate wider testing and review. Depending on the area of your patch and what is going on elsewhere, basing a patch against these other trees can require a significant amount of work resolving conflicts and dealing with API changes.

Only the most simple changes should be formatted as a single patch; everything else should be made as a logical series of changes. Splitting up patches is a bit of an art; some developers spend a long time figuring out how to do it in the way that the community expects. There are a few rules of thumb, however, which can help considerably:

- The patch series you post will almost certainly not be the series of changes found in your working revision control system. Instead, the changes you have made need to be considered in their final form, then split apart in ways which make sense. The developers are interested in discrete, self-contained changes, not the path you took to get to those changes.
- Each logically independent change should be formatted as a separate patch. These changes can be small ( “add a field to this structure” ) or large (adding a significant new driver, for example), but they should be conceptually small and amenable to a one-line description. Each patch should make a specific change which can be reviewed on its own and verified to do what it says it does.
- As a way of restating the guideline above: do not mix different types of changes in the same patch. If a single patch fixes a critical security bug, rearranges a few structures, and reformats the code, there is a good chance that it will be passed over and the important fix will be lost.
- Each patch should yield a kernel which builds and runs properly; if your patch series is interrupted in the middle, the result should still be a working kernel. Partial application of a patch series is a common scenario when the “git bisect” tool is used to find regressions; if the result is a broken kernel, you will make life harder for developers and users who are engaging in the noble work of tracking down problems.
- Do not overdo it, though. One developer once posted a set of edits to a single file as 500 separate patches - an act which did not make him the most popular person on the kernel mailing list. A single patch can be reasonably large as long as it still contains a single logical change.
- It can be tempting to add a whole new infrastructure with a series of patches, but to leave that infrastructure unused until the final patch in the series enables the whole thing. This temptation should be avoided if possible; if that

series adds regressions, bisection will finger the last patch as the one which caused the problem, even though the real bug is elsewhere. Whenever possible, a patch which adds new code should make that code active immediately.

Working to create the perfect patch series can be a frustrating process which takes quite a bit of time and thought after the “real work” has been done. When done properly, though, it is time well spent.

## \* Patch formatting and changelogs

So now you have a perfect series of patches for posting, but the work is not done quite yet. Each patch needs to be formatted into a message which quickly and clearly communicates its purpose to the rest of the world. To that end, each patch will be composed of the following:

- An optional “From” line naming the author of the patch. This line is only necessary if you are passing on somebody else’s patch via email, but it never hurts to add it when in doubt.
- A one-line description of what the patch does. This message should be enough for a reader who sees it with no other context to figure out the scope of the patch; it is the line that will show up in the “short form” changelogs. This message is usually formatted with the relevant subsystem name first, followed by the purpose of the patch. For example:

```
gpio: fix build on CONFIG_GPIO_SYSFS=n
```

- A blank line followed by a detailed description of the contents of the patch. This description can be as long as is required; it should say what the patch does and why it should be applied to the kernel.
- One or more tag lines, with, at a minimum, one Signed-off-by: line from the author of the patch. Tags will be described in more detail below.

The items above, together, form the changelog for the patch. Writing good changelogs is a crucial but often-neglected art; it’s worth spending another moment discussing this issue. When writing a changelog, you should bear in mind that a number of different people will be reading your words. These include subsystem maintainers and reviewers who need to decide whether the patch should be included, distributors and other maintainers trying to decide whether a patch should be backported to other kernels, bug hunters wondering whether the patch is responsible for a problem they are chasing, users who want to know how the kernel has changed, and more. A good changelog conveys the needed information to all of these people in the most direct and concise way possible.

To that end, the summary line should describe the effects of and motivation for the change as well as possible given the one-line constraint. The detailed description can then amplify on those topics and provide any needed additional information. If the patch fixes a bug, cite the commit which introduced the bug if possible (and please provide both the commit ID and the title when citing commits). If a problem is associated with specific log or compiler output, include that output to help others searching for a solution to the same problem. If the change is meant to support other changes coming in later patch, say so. If internal APIs are changed, detail those changes and how other developers should respond. In general, the more you

can put yourself into the shoes of everybody who will be reading your changelog, the better that changelog (and the kernel as a whole) will be.

Needless to say, the changelog should be the text used when committing the change to a revision control system. It will be followed by:

- The patch itself, in the unified ( “-u” ) patch format. Using the “-p” option to diff will associate function names with changes, making the resulting patch easier for others to read.

You should avoid including changes to irrelevant files (those generated by the build process, for example, or editor backup files) in the patch. The file “`dontdiff`” in the Documentation directory can help in this regard; pass it to diff with the “-X” option.

The tags mentioned above are used to describe how various developers have been associated with the development of this patch. They are described in detail in the Documentation/process/submitting-patches.rst document; what follows here is a brief summary. Each of these lines has the format:

```
tag: Full Name <email address> optional-other-stuff
```

The tags in common use are:

- Signed-off-by: this is a developer’ s certification that he or she has the right to submit the patch for inclusion into the kernel. It is an agreement to the Developer’ s Certificate of Origin, the full text of which can be found in Documentation/process/submitting-patches.rst Code without a proper signoff cannot be merged into the mainline.
- Co-developed-by: states that the patch was co-created by several developers; it is used to give attribution to co-authors (in addition to the author attributed by the From: tag) when multiple people work on a single patch. Every Co-developed-by: must be immediately followed by a Signed-off-by: of the associated co-author. Details and examples can be found in Documentation/process/submitting-patches.rst.
- Acked-by: indicates an agreement by another developer (often a maintainer of the relevant code) that the patch is appropriate for inclusion into the kernel.
- Tested-by: states that the named person has tested the patch and found it to work.
- Reviewed-by: the named developer has reviewed the patch for correctness; see the reviewer’ s statement in Documentation/process/submitting-patches.rst for more detail.
- Reported-by: names a user who reported a problem which is fixed by this patch; this tag is used to give credit to the (often underappreciated) people who test our code and let us know when things do not work correctly.
- Cc: the named person received a copy of the patch and had the opportunity to comment on it.

Be careful in the addition of tags to your patches: only Cc: is appropriate for addition without the explicit permission of the person named.

## \* **Sending the patch**

Before you mail your patches, there are a couple of other things you should take care of:

- Are you sure that your mailer will not corrupt the patches? Patches which have had gratuitous white-space changes or line wrapping performed by the mail client will not apply at the other end, and often will not be examined in any detail. If there is any doubt at all, mail the patch to yourself and convince yourself that it shows up intact.

Documentation/process/email-clients.rst has some helpful hints on making specific mail clients work for sending patches.

- Are you sure your patch is free of silly mistakes? You should always run patches through scripts/checkpatch.pl and address the complaints it comes up with. Please bear in mind that checkpatch.pl, while being the embodiment of a fair amount of thought about what kernel patches should look like, is not smarter than you. If fixing a checkpatch.pl complaint would make the code worse, don't do it.

Patches should always be sent as plain text. Please do not send them as attachments; that makes it much harder for reviewers to quote sections of the patch in their replies. Instead, just put the patch directly into your message.

When mailing patches, it is important to send copies to anybody who might be interested in it. Unlike some other projects, the kernel encourages people to err on the side of sending too many copies; don't assume that the relevant people will see your posting on the mailing lists. In particular, copies should go to:

- The maintainer(s) of the affected subsystem(s). As described earlier, the MAINTAINERS file is the first place to look for these people.
- Other developers who have been working in the same area - especially those who might be working there now. Using git to see who else has modified the files you are working on can be helpful.
- If you are responding to a bug report or a feature request, copy the original poster as well.
- Send a copy to the relevant mailing list, or, if nothing else applies, the linux-kernel list.
- If you are fixing a bug, think about whether the fix should go into the next stable update. If so, [stable@vger.kernel.org](mailto:stable@vger.kernel.org) should get a copy of the patch. Also add a "Cc: [stable@vger.kernel.org](mailto:stable@vger.kernel.org)" to the tags within the patch itself; that will cause the stable team to get a notification when your fix goes into the mainline.

When selecting recipients for a patch, it is good to have an idea of who you think will eventually accept the patch and get it merged. While it is possible to send patches directly to Linus Torvalds and have him merge them, things are not normally done that way. Linus is busy, and there are subsystem maintainers who watch over specific parts of the kernel. Usually you will be wanting that maintainer to merge your patches. If there is no obvious maintainer, Andrew Morton is often the patch target of last resort.

Patches need good subject lines. The canonical format for a patch line is something like:

```
[PATCH nn/mm] subsys: one-line description of the patch
```

where “nn” is the ordinal number of the patch, “mm” is the total number of patches in the series, and “subsys” is the name of the affected subsystem. Clearly, nn/mm can be omitted for a single, standalone patch.

If you have a significant series of patches, it is customary to send an introductory description as part zero. This convention is not universally followed though; if you use it, remember that information in the introduction does not make it into the kernel changelogs. So please ensure that the patches, themselves, have complete changelog information.

In general, the second and following parts of a multi-part patch should be sent as a reply to the first part so that they all thread together at the receiving end. Tools like git and quilt have commands to mail out a set of patches with the proper threading. If you have a long series, though, and are using git, please stay away from the -chain-reply-to option to avoid creating exceptionally deep nesting.

### \* **Followthrough**

At this point, you have followed the guidelines given so far and, with the addition of your own engineering skills, have posted a perfect series of patches. One of the biggest mistakes that even experienced kernel developers can make is to conclude that their work is now done. In truth, posting patches indicates a transition into the next stage of the process, with, possibly, quite a bit of work yet to be done.

It is a rare patch which is so good at its first posting that there is no room for improvement. The kernel development process recognizes this fact, and, as a result, is heavily oriented toward the improvement of posted code. You, as the author of that code, will be expected to work with the kernel community to ensure that your code is up to the kernel’s quality standards. A failure to participate in this process is quite likely to prevent the inclusion of your patches into the mainline.

### \* **Working with reviewers**

A patch of any significance will result in a number of comments from other developers as they review the code. Working with reviewers can be, for many developers, the most intimidating part of the kernel development process. Life can be made much easier, though, if you keep a few things in mind:

- If you have explained your patch well, reviewers will understand its value and why you went to the trouble of writing it. But that value will not keep them from asking a fundamental question: what will it be like to maintain a kernel with this code in it five or ten years later? Many of the changes you may be asked to make - from coding style tweaks to substantial rewrites - come from the understanding that Linux will still be around and under development a decade from now.

- Code review is hard work, and it is a relatively thankless occupation; people remember who wrote kernel code, but there is little lasting fame for those who reviewed it. So reviewers can get grumpy, especially when they see the same mistakes being made over and over again. If you get a review which seems angry, insulting, or outright offensive, resist the impulse to respond in kind. Code review is about the code, not about the people, and code reviewers are not attacking you personally.
- Similarly, code reviewers are not trying to promote their employers' agendas at the expense of your own. Kernel developers often expect to be working on the kernel years from now, but they understand that their employer could change. They truly are, almost without exception, working toward the creation of the best kernel they can; they are not trying to create discomfort for their employers' competitors.

What all of this comes down to is that, when reviewers send you comments, you need to pay attention to the technical observations that they are making. Do not let their form of expression or your own pride keep that from happening. When you get review comments on a patch, take the time to understand what the reviewer is trying to say. If possible, fix the things that the reviewer is asking you to fix. And respond back to the reviewer: thank them, and describe how you will answer their questions.

Note that you do not have to agree with every change suggested by reviewers. If you believe that the reviewer has misunderstood your code, explain what is really going on. If you have a technical objection to a suggested change, describe it and justify your solution to the problem. If your explanations make sense, the reviewer will accept them. Should your explanation not prove persuasive, though, especially if others start to agree with the reviewer, take some time to think things over again. It can be easy to become blinded by your own solution to a problem to the point that you don't realize that something is fundamentally wrong or, perhaps, you're not even solving the right problem.

Andrew Morton has suggested that every review comment which does not result in a code change should result in an additional code comment instead; that can help future reviewers avoid the questions which came up the first time around.

One fatal mistake is to ignore review comments in the hope that they will go away. They will not go away. If you repost code without having responded to the comments you got the time before, you're likely to find that your patches go nowhere.

Speaking of reposting code: please bear in mind that reviewers are not going to remember all the details of the code you posted the last time around. So it is always a good idea to remind reviewers of previously raised issues and how you dealt with them; the patch changelog is a good place for this kind of information. Reviewers should not have to search through list archives to familiarize themselves with what was said last time; if you help them get a running start, they will be in a better mood when they revisit your code.

What if you've tried to do everything right and things still aren't going anywhere? Most technical disagreements can be resolved through discussion, but there are times when somebody simply has to make a decision. If you honestly believe that this decision is going against you wrongly, you can always try appealing to a higher power. As of this writing, that higher power tends to be Andrew Morton. Andrew has a great deal of respect in the kernel development community; he can often

unjam a situation which seems to be hopelessly blocked. Appealing to Andrew should not be done lightly, though, and not before all other alternatives have been explored. And bear in mind, of course, that he may not agree with you either.

### \* **What happens next**

If a patch is considered to be a good thing to add to the kernel, and once most of the review issues have been resolved, the next step is usually entry into a subsystem maintainer's tree. How that works varies from one subsystem to the next; each maintainer has his or her own way of doing things. In particular, there may be more than one tree - one, perhaps, dedicated to patches planned for the next merge window, and another for longer-term work.

For patches applying to areas for which there is no obvious subsystem tree (memory management patches, for example), the default tree often ends up being -mm. Patches which affect multiple subsystems can also end up going through the -mm tree.

Inclusion into a subsystem tree can bring a higher level of visibility to a patch. Now other developers working with that tree will get the patch by default. Subsystem trees typically feed linux-next as well, making their contents visible to the development community as a whole. At this point, there's a good chance that you will get more comments from a new set of reviewers; these comments need to be answered as in the previous round.

What may also happen at this point, depending on the nature of your patch, is that conflicts with work being done by others turn up. In the worst case, heavy patch conflicts can result in some work being put on the back burner so that the remaining patches can be worked into shape and merged. Other times, conflict resolution will involve working with the other developers and, possibly, moving some patches between trees to ensure that everything applies cleanly. This work can be a pain, but count your blessings: before the advent of the linux-next tree, these conflicts often only turned up during the merge window and had to be addressed in a hurry. Now they can be resolved at leisure, before the merge window opens.

Some day, if all goes well, you'll log on and see that your patch has been merged into the mainline kernel. Congratulations! Once the celebration is complete (and you have added yourself to the MAINTAINERS file), though, it is worth remembering an important little fact: the job still is not done. Merging into the mainline brings its own challenges.

To begin with, the visibility of your patch has increased yet again. There may be a new round of comments from developers who had not been aware of the patch before. It may be tempting to ignore them, since there is no longer any question of your code being merged. Resist that temptation, though; you still need to be responsive to developers who have questions or suggestions.

More importantly, though: inclusion into the mainline puts your code into the hands of a much larger group of testers. Even if you have contributed a driver for hardware which is not yet available, you will be surprised by how many people will build your code into their kernels. And, of course, where there are testers, there will be bug reports.

The worst sort of bug reports are regressions. If your patch causes a regression, you'll find an uncomfortable number of eyes upon you; regressions need to be fixed as soon as possible. If you are unwilling or unable to fix the regression (and nobody else does it for you), your patch will almost certainly be removed during the stabilization period. Beyond negating all of the work you have done to get your patch into the mainline, having a patch pulled as the result of a failure to fix a regression could well make it harder for you to get work merged in the future.

After any regressions have been dealt with, there may be other, ordinary bugs to deal with. The stabilization period is your best opportunity to fix these bugs and ensure that your code's debut in a mainline kernel release is as solid as possible. So, please, answer bug reports, and fix the problems if at all possible. That's what the stabilization period is for; you can start creating cool new patches once any problems with the old ones have been taken care of.

And don't forget that there are other milestones which may also create bug reports: the next mainline stable release, when prominent distributors pick up a version of the kernel containing your patch, etc. Continuing to respond to these reports is a matter of basic pride in your work. If that is insufficient motivation, though, it's also worth considering that the development community remembers developers who lose interest in their code after it's merged. The next time you post a patch, they will be evaluating it with the assumption that you will not be around to maintain it afterward.

### \* **Other things that can happen**

One day, you may open your mail client and see that somebody has mailed you a patch to your code. That is one of the advantages of having your code out there in the open, after all. If you agree with the patch, you can either forward it on to the subsystem maintainer (be sure to include a proper From: line so that the attribution is correct, and add a signoff of your own), or send an Acked-by: response back and let the original poster send it upward.

If you disagree with the patch, send a polite response explaining why. If possible, tell the author what changes need to be made to make the patch acceptable to you. There is a certain resistance to merging patches which are opposed by the author and maintainer of the code, but it only goes so far. If you are seen as needlessly blocking good work, those patches will eventually flow around you and get into the mainline anyway. In the Linux kernel, nobody has absolute veto power over any code. Except maybe Linus.

On very rare occasion, you may see something completely different: another developer posts a different solution to your problem. At that point, chances are that one of the two patches will not be merged, and "mine was here first" is not considered to be a compelling technical argument. If somebody else's patch displaces yours and gets into the mainline, there is really only one way to respond: be pleased that your problem got solved and get on with your work. Having one's work shoved aside in this manner can be hurtful and discouraging, but the community will remember your reaction long after they have forgotten whose patch actually got merged.

## \* Advanced topics

At this point, hopefully, you have a handle on how the development process works. There is still more to learn, however! This section will cover a number of topics which can be helpful for developers wanting to become a regular part of the Linux kernel development process.

### \* Managing patches with git

The use of distributed version control for the kernel began in early 2002, when Linus first started playing with the proprietary BitKeeper application. While BitKeeper was controversial, the approach to software version management it embodied most certainly was not. Distributed version control enabled an immediate acceleration of the kernel development project. In current times, there are several free alternatives to BitKeeper. For better or for worse, the kernel project has settled on git as its tool of choice.

Managing patches with git can make life much easier for the developer, especially as the volume of those patches grows. Git also has its rough edges and poses certain hazards; it is a young and powerful tool which is still being civilized by its developers. This document will not attempt to teach the reader how to use git; that would be sufficient material for a long document in its own right. Instead, the focus here will be on how git fits into the kernel development process in particular. Developers who wish to come up to speed with git will find more information at:

<https://git-scm.com/>

<https://www.kernel.org/pub/software/scm/git/docs/user-manual.html>

and on various tutorials found on the web.

The first order of business is to read the above sites and get a solid understanding of how git works before trying to use it to make patches available to others. A git-using developer should be able to obtain a copy of the mainline repository, explore the revision history, commit changes to the tree, use branches, etc. An understanding of git's tools for the rewriting of history (such as rebase) is also useful. Git comes with its own terminology and concepts; a new user of git should know about refs, remote branches, the index, fast-forward merges, pushes and pulls, detached heads, etc. It can all be a little intimidating at the outset, but the concepts are not that hard to grasp with a bit of study.

Using git to generate patches for submission by email can be a good exercise while coming up to speed.

When you are ready to start putting up git trees for others to look at, you will, of course, need a server that can be pulled from. Setting up such a server with git-daemon is relatively straightforward if you have a system which is accessible to the Internet. Otherwise, free, public hosting sites (Github, for example) are starting to appear on the net. Established developers can get an account on kernel.org, but those are not easy to come by; see <https://kernel.org/faq/> for more information.

The normal git workflow involves the use of a lot of branches. Each line of development can be separated into a separate “topic branch” and maintained independently. Branches in git are cheap, there is no reason to not make free use of

them. And, in any case, you should not do your development in any branch which you intend to ask others to pull from. Publicly-available branches should be created with care; merge in patches from development branches when they are in complete form and ready to go - not before.

Git provides some powerful tools which can allow you to rewrite your development history. An inconvenient patch (one which breaks bisection, say, or which has some other sort of obvious bug) can be fixed in place or made to disappear from the history entirely. A patch series can be rewritten as if it had been written on top of today's mainline, even though you have been working on it for months. Changes can be transparently shifted from one branch to another. And so on. Judicious use of git's ability to revise history can help in the creation of clean patch sets with fewer problems.

Excessive use of this capability can lead to other problems, though, beyond a simple obsession for the creation of the perfect project history. Rewriting history will rewrite the changes contained in that history, turning a tested (hopefully) kernel tree into an untested one. But, beyond that, developers cannot easily collaborate if they do not have a shared view of the project history; if you rewrite history which other developers have pulled into their repositories, you will make life much more difficult for those developers. So a simple rule of thumb applies here: history which has been exported to others should generally be seen as immutable thereafter.

So, once you push a set of changes to your publicly-available server, those changes should not be rewritten. Git will attempt to enforce this rule if you try to push changes which do not result in a fast-forward merge (i.e. changes which do not share the same history). It is possible to override this check, and there may be times when it is necessary to rewrite an exported tree. Moving changesets between trees to avoid conflicts in linux-next is one example. But such actions should be rare. This is one of the reasons why development should be done in private branches (which can be rewritten if necessary) and only moved into public branches when it's in a reasonably advanced state.

As the mainline (or other tree upon which a set of changes is based) advances, it is tempting to merge with that tree to stay on the leading edge. For a private branch, rebasing can be an easy way to keep up with another tree, but rebasing is not an option once a tree is exported to the world. Once that happens, a full merge must be done. Merging occasionally makes good sense, but overly frequent merges can clutter the history needlessly. Suggested technique in this case is to merge infrequently, and generally only at specific release points (such as a mainline -rc release). If you are nervous about specific changes, you can always perform test merges in a private branch. The git "rerere" tool can be useful in such situations; it remembers how merge conflicts were resolved so that you don't have to do the same work twice.

One of the biggest recurring complaints about tools like git is this: the mass movement of patches from one repository to another makes it easy to slip in ill-advised changes which go into the mainline below the review radar. Kernel developers tend to get unhappy when they see that kind of thing happening; putting up a git tree with unreviewed or off-topic patches can affect your ability to get trees pulled in the future. Quoting Linus:

You can send me patches, but for me to pull a git patch from you, I need to know that you know what you're doing, and I need to be able to trust things \*without\* then having to go and check every individual change by hand.

(<https://lwn.net/Articles/224135/>).

To avoid this kind of situation, ensure that all patches within a given branch stick closely to the associated topic; a “driver fixes” branch should not be making changes to the core memory management code. And, most importantly, do not use a git tree to bypass the review process. Post an occasional summary of the tree to the relevant list, and, when the time is right, request that the tree be included in linux-next.

If and when others start to send patches for inclusion into your tree, don’t forget to review them. Also ensure that you maintain the correct authorship information; the git “am” tool does its best in this regard, but you may have to add a “From:” line to the patch if it has been relayed to you via a third party.

When requesting a pull, be sure to give all the relevant information: where your tree is, what branch to pull, and what changes will result from the pull. The git request-pull command can be helpful in this regard; it will format the request as other developers expect, and will also check to be sure that you have remembered to push those changes to the public server.

### \* **Reviewing patches**

Some readers will certainly object to putting this section with “advanced topics” on the grounds that even beginning kernel developers should be reviewing patches. It is certainly true that there is no better way to learn how to program in the kernel environment than by looking at code posted by others. In addition, reviewers are forever in short supply; by looking at code you can make a significant contribution to the process as a whole.

Reviewing code can be an intimidating prospect, especially for a new kernel developer who may well feel nervous about questioning code - in public - which has been posted by those with more experience. Even code written by the most experienced developers can be improved, though. Perhaps the best piece of advice for reviewers (all reviewers) is this: phrase review comments as questions rather than criticisms. Asking “how does the lock get released in this path?” will always work better than stating “the locking here is wrong.”

Different developers will review code from different points of view. Some are mostly concerned with coding style and whether code lines have trailing white space. Others will focus primarily on whether the change implemented by the patch as a whole is a good thing for the kernel or not. Yet others will check for problematic locking, excessive stack usage, possible security issues, duplication of code found elsewhere, adequate documentation, adverse effects on performance, user-space ABI changes, etc. All types of review, if they lead to better code going into the kernel, are welcome and worthwhile.

## \* For more information

There are numerous sources of information on Linux kernel development and related topics. First among those will always be the Documentation directory found in the kernel source distribution. The top-level process/howto.rst file is an important starting point; process/submitting-patches.rst and process/submitting-drivers.rst are also something which all kernel developers should read. Many internal kernel APIs are documented using the kerneldoc mechanism; “make html-docs” or “make pdfdocs” can be used to generate those documents in HTML or PDF format (though the version of TeX shipped by some distributions runs into internal limits and fails to process the documents properly).

Various web sites discuss kernel development at all levels of detail. Your author would like to humbly suggest <https://lwn.net/> as a source; information on many specific kernel topics can be found via the LWN kernel index at:

<https://lwn.net/Kernel/Index/>

Beyond that, a valuable resource for kernel developers is:

<https://kernelnewbies.org/>

And, of course, one should not forget <https://kernel.org/>, the definitive location for kernel release information.

There are a number of books on kernel development:

Linux Device Drivers, 3rd Edition (Jonathan Corbet, Alessandro Rubini, and Greg Kroah-Hartman). Online at <https://lwn.net/Kernel/LDD3/>.

Linux Kernel Development (Robert Love).

Understanding the Linux Kernel (Daniel Bovet and Marco Cesati).

All of these books suffer from a common fault, though: they tend to be somewhat obsolete by the time they hit the shelves, and they have been on the shelves for a while now. Still, there is quite a bit of good information to be found there.

Documentation for git can be found at:

<https://www.kernel.org/pub/software/scm/git/docs/>

<https://www.kernel.org/pub/software/scm/git/docs/user-manual.html>

## \* Conclusion

Congratulations to anybody who has made it through this long-winded document. Hopefully it has provided a helpful understanding of how the Linux kernel is developed and how you can participate in that process.

In the end, it’s the participation that matters. Any open source software project is no more than the sum of what its contributors put into it. The Linux kernel has progressed as quickly and as well as it has because it has been helped by an impressively large group of developers, all of whom are working to make it better. The kernel is a premier example of what can be done when thousands of people work together toward a common goal.

The kernel can always benefit from a larger developer base, though. There is always more work to do. But, just as importantly, most other participants in the Linux ecosystem can benefit through contributing to the kernel. Getting code into the mainline is the key to higher code quality, lower maintenance and distribution costs, a higher level of influence over the direction of kernel development, and more. It is a situation where everybody involved wins. Fire up your editor and come join us; you will be more than welcome.

The purpose of this document is to help developers (and their managers) work with the development community with a minimum of frustration. It is an attempt to document how this community works in a way which is accessible to those who are not intimately familiar with Linux kernel development (or, indeed, free software development in general). While there is some technical material here, this is very much a process-oriented discussion which does not require a deep knowledge of kernel programming to understand.

## SUBMITTING PATCHES: THE ESSENTIAL GUIDE TO GETTING YOUR CODE INTO THE KERNEL

For a person or company who wishes to submit a change to the Linux kernel, the process can sometimes be daunting if you’re not familiar with “the system.” This text is a collection of suggestions which can greatly increase the chances of your change being accepted.

This document contains a large number of suggestions in a relatively terse format. For detailed information on how the kernel development process works, see Documentation/process. Also, read Documentation/process/submit-checklist.rst for a list of items to check before submitting code. If you are submitting a driver, also read Documentation/process/submitting-drivers.rst; for device tree binding patches, read Documentation/devicetree/bindings/submitting-patches.rst.

Many of these steps describe the default behavior of the git version control system; if you use git to prepare your patches, you’ll find much of the mechanical work done for you, though you’ll still need to prepare and document a sensible set of patches. In general, use of git will make your life as a kernel developer easier.

### \* 0) Obtain a current source tree

If you do not have a repository with the current kernel source handy, use git to obtain one. You’ll want to start with the mainline repository, which can be grabbed with:

```
git clone git://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git
```

Note, however, that you may not want to develop against the mainline tree directly. Most subsystem maintainers run their own trees and want to see patches prepared against those trees. See the T: entry for the subsystem in the MAINTAINERS file to find that tree, or simply ask the maintainer if the tree is not listed there.

It is still possible to download kernel releases via tarballs (as described in the next section), but that is the hard way to do kernel development.

## \* 1) diff -up

If you must generate your patches by hand, use `diff -up` or `diff -uprN` to create patches. Git generates patches in this form by default; if you’re using git, you can skip this section entirely.

All changes to the Linux kernel occur in the form of patches, as generated by `diff(1)`. When creating your patch, make sure to create it in “unified diff” format, as supplied by the `-u` argument to `diff(1)`. Also, please use the `-p` argument which shows which C function each change is in – that makes the resultant `diff` a lot easier to read. Patches should be based in the root kernel source directory, not in any lower subdirectory.

To create a patch for a single file, it is often sufficient to do:

```
SRCTREE=linux
MYFILE=drivers/net/mydriver.c

cd $SRCTREE
cp $MYFILE $MYFILE.orig
vi $MYFILE      # make your change
cd ..
diff -up $SRCTREE/$MYFILE{.orig,} > /tmp/patch
```

To create a patch for multiple files, you should unpack a “vanilla”, or unmodified kernel source tree, and generate a `diff` against your own source tree. For example:

```
MYSRC=/devel/linux

tar xvfz linux-3.19.tar.gz
mv linux-3.19 linux-3.19-vanilla
diff -uprN -X linux-3.19-vanilla/Documentation/dontdiff \
      linux-3.19-vanilla $MYSRC > /tmp/patch
```

`dontdiff` is a list of files which are generated by the kernel during the build process, and should be ignored in any `diff(1)`-generated patch.

Make sure your patch does not include any extra files which do not belong in a patch submission. Make sure to review your patch *after* generating it with `diff(1)`, to ensure accuracy.

If your changes produce a lot of deltas, you need to split them into individual patches which modify things in logical stages; see 3) Separate your changes. This will facilitate review by other kernel developers, very important if you want your patch accepted.

If you’re using git, `git rebase -i` can help you with this process. If you’re not using git, `quilt` <<http://savannah.nongnu.org/projects/quilt>> is another popular alternative.

## \* 2) Describe your changes

Describe your problem. Whether your patch is a one-line bug fix or 5000 lines of a new feature, there must be an underlying problem that motivated you to do this work. Convince the reviewer that there is a problem worth fixing and that it makes sense for them to read past the first paragraph.

Describe user-visible impact. Straight up crashes and lockups are pretty convincing, but not all bugs are that blatant. Even if the problem was spotted during code review, describe the impact you think it can have on users. Keep in mind that the majority of Linux installations run kernels from secondary stable trees or vendor/product-specific trees that cherry-pick only specific patches from upstream, so include anything that could help route your change downstream: provoking circumstances, excerpts from dmesg, crash descriptions, performance regressions, latency spikes, lockups, etc.

Quantify optimizations and trade-offs. If you claim improvements in performance, memory consumption, stack footprint, or binary size, include numbers that back them up. But also describe non-obvious costs. Optimizations usually aren't free but trade-offs between CPU, memory, and readability; or, when it comes to heuristics, between different workloads. Describe the expected downsides of your optimization so that the reviewer can weigh costs against benefits.

Once the problem is established, describe what you are actually doing about it in technical detail. It's important to describe the change in plain English for the reviewer to verify that the code is behaving as you intend it to.

The maintainer will thank you if you write your patch description in a form which can be easily pulled into Linux's source code management system, git, as a "commit log". See 15) Explicit In-Reply-To headers.

Solve only one problem per patch. If your description starts to get long, that's a sign that you probably need to split up your patch. See 3) Separate your changes.

When you submit or resubmit a patch or patch series, include the complete patch description and justification for it. Don't just say that this is version N of the patch (series). Don't expect the subsystem maintainer to refer back to earlier patch versions or referenced URLs to find the patch description and put that into the patch. I.e., the patch (series) and its description should be self-contained. This benefits both the maintainers and reviewers. Some reviewers probably didn't even receive earlier versions of the patch.

Describe your changes in imperative mood, e.g. "make xyzzy do frotz" instead of "[This patch] makes xyzzy do frotz" or "[I] changed xyzzy to do frotz", as if you are giving orders to the codebase to change its behaviour.

If the patch fixes a logged bug entry, refer to that bug entry by number and URL. If the patch follows from a mailing list discussion, give a URL to the mailing list archive; use the <https://lkml.kernel.org/> redirector with a Message-Id, to ensure that the links cannot become stale.

However, try to make your explanation understandable without external resources. In addition to giving a URL to a mailing list archive or bug, summarize the relevant points of the discussion that led to the patch as submitted.

If you want to refer to a specific commit, don't just refer to the SHA-1 ID of the commit. Please also include the oneline summary of the commit, to make it easier for reviewers to know what it is about. Example:

```
Commit e21d2170f36602ae2708 ("video: remove unnecessary  
platform_set_drvdata()") removed the unnecessary  
platform_set_drvdata(), but left the variable "dev" unused,  
delete it.
```

You should also be sure to use at least the first twelve characters of the SHA-1 ID. The kernel repository holds a lot of objects, making collisions with shorter IDs a real possibility. Bear in mind that, even if there is no collision with your six-character ID now, that condition may change five years from now.

If your patch fixes a bug in a specific commit, e.g. you found an issue using git bisect, please use the ‘Fixes:’ tag with the first 12 characters of the SHA-1 ID, and the one line summary. Do not split the tag across multiple lines, tags are exempt from the “wrap at 75 columns” rule in order to simplify parsing scripts. For example:

```
Fixes: 54a4f0239f2e ("KVM: MMU: make kvm_mmu_zap_page() return the number  
of pages it actually freed")
```

The following git config settings can be used to add a pretty format for outputting the above style in the git log or git show commands:

```
[core]  
    abbrev = 12  
[pretty]  
    fixes = Fixes: %h (%s)
```

### \* 3) Separate your changes

Separate each **logical change** into a separate patch.

For example, if your changes include both bug fixes and performance enhancements for a single driver, separate those changes into two or more patches. If your changes include an API update, and a new driver which uses that new API, separate those into two patches.

On the other hand, if you make a single change to numerous files, group those changes into a single patch. Thus a single logical change is contained within a single patch.

The point to remember is that each patch should make an easily understood change that can be verified by reviewers. Each patch should be justifiable on its own merits.

If one patch depends on another patch in order for a change to be complete, that is OK. Simply note “**this patch depends on patch X**” in your patch description.

When dividing your change into a series of patches, take special care to ensure that the kernel builds and runs properly after each patch in the series. Developers

using `git bisect` to track down a problem can end up splitting your patch series at any point; they will not thank you if you introduce bugs in the middle.

If you cannot condense your patch set into a smaller set of patches, then only post say 15 or so at a time and wait for review and integration.

## \* 4) Style-check your changes

Check your patch for basic style violations, details of which can be found in `Documentation/process/coding-style.rst`. Failure to do so simply wastes the reviewers time and will get your patch rejected, probably without even being read.

One significant exception is when moving code from one file to another - in this case you should not modify the moved code at all in the same patch which moves it. This clearly delineates the act of moving the code and your changes. This greatly aids review of the actual differences and allows tools to better track the history of the code itself.

Check your patches with the patch style checker prior to submission (`scripts/checkpatch.pl`). Note, though, that the style checker should be viewed as a guide, not as a replacement for human judgment. If your code looks better with a violation then its probably best left alone.

**The checker reports at three levels:**

- ERROR: things that are very likely to be wrong
- WARNING: things requiring careful review
- CHECK: things requiring thought

You should be able to justify all violations that remain in your patch.

## \* 5) Select the recipients for your patch

You should always copy the appropriate subsystem maintainer(s) on any patch to code that they maintain; look through the `MAINTAINERS` file and the source code revision history to see who those maintainers are. The script `scripts/get_maintainer.pl` can be very useful at this step. If you cannot find a maintainer for the subsystem you are working on, Andrew Morton ([akpm@linux-foundation.org](mailto:akpm@linux-foundation.org)) serves as a maintainer of last resort.

You should also normally choose at least one mailing list to receive a copy of your patch set. [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org) functions as a list of last resort, but the volume on that list has caused a number of developers to tune it out. Look in the `MAINTAINERS` file for a subsystem-specific list; your patch will probably get more attention there. Please do not spam unrelated lists, though.

Many kernel-related lists are hosted on `vger.kernel.org`; you can find a list of them at <http://vger.kernel.org/vger-lists.html>. There are kernel-related lists hosted elsewhere as well, though.

Do not send more than 15 patches at once to the vger mailing lists!!!

Linus Torvalds is the final arbiter of all changes accepted into the Linux kernel. His e-mail address is <[torvalds@linux-foundation.org](mailto:torvalds@linux-foundation.org)>. He gets a lot of e-mail, and, at this point, very few patches go through Linus directly, so typically you should do your best to -avoid- sending him e-mail.

If you have a patch that fixes an exploitable security bug, send that patch to [security@kernel.org](mailto:security@kernel.org). For severe bugs, a short embargo may be considered to allow distributors to get the patch out to users; in such cases, obviously, the patch should not be sent to any public lists.

Patches that fix a severe bug in a released kernel should be directed toward the stable maintainers by putting a line like this:

Cc: [stable@vger.kernel.org](mailto:stable@vger.kernel.org)

into the sign-off area of your patch (note, NOT an email recipient). You should also read Documentation/process/stable-kernel-rules.rst in addition to this file.

Note, however, that some subsystem maintainers want to come to their own conclusions on which patches should go to the stable trees. The networking maintainer, in particular, would rather not see individual developers adding lines like the above to their patches.

If changes affect userland-kernel interfaces, please send the MAN-PAGES maintainer (as listed in the MAINTAINERS file) a man-pages patch, or at least a notification of the change, so that some information makes its way into the manual pages. User-space API changes should also be copied to [linux-api@vger.kernel.org](mailto:linux-api@vger.kernel.org).

For small patches you may want to CC the Trivial Patch Monkey [trivial@kernel.org](mailto:trivial@kernel.org) which collects “trivial” patches. Have a look into the MAINTAINERS file for its current manager.

Trivial patches must qualify for one of the following rules:

- Spelling fixes in documentation
- Spelling fixes for errors which could break grep(1)
- Warning fixes (cluttering with useless warnings is bad)
- Compilation fixes (only if they are actually correct)
- Runtime fixes (only if they actually fix things)
- Removing use of deprecated functions/macros
- Contact detail and documentation fixes
- Non-portable code replaced by portable code (even in arch-specific, since people copy, as long as it’s trivial)
- Any fix by the author/maintainer of the file (ie. patch monkey in re-transmission mode)

## \* 6) No MIME, no links, no compression, no attachments. Just plain text

Linus and other kernel developers need to be able to read and comment on the changes you are submitting. It is important for a kernel developer to be able to “quote” your changes, using standard e-mail tools, so that they may comment on specific portions of your code.

For this reason, all patches should be submitted by e-mail “inline” .

**Warning:** Be wary of your editor’ s word-wrap corrupting your patch, if you choose to cut-n-paste your patch.

Do not attach the patch as a MIME attachment, compressed or not. Many popular e-mail applications will not always transmit a MIME attachment as plain text, making it impossible to comment on your code. A MIME attachment also takes Linus a bit more time to process, decreasing the likelihood of your MIME-attached change being accepted.

Exception: If your mailer is mangling patches then someone may ask you to resend them using MIME.

See Documentation/process/email-clients.rst for hints about configuring your e-mail client so that it sends your patches untouched.

## \* 7) E-mail size

Large changes are not appropriate for mailing lists, and some maintainers. If your patch, uncompressed, exceeds 300 kB in size, it is preferred that you store your patch on an Internet-accessible server, and provide instead a URL (link) pointing to your patch. But note that if your patch exceeds 300 kB, it almost certainly needs to be broken up anyway.

## \* 8) Respond to review comments

Your patch will almost certainly get comments from reviewers on ways in which the patch can be improved. You must respond to those comments; ignoring reviewers is a good way to get ignored in return. Review comments or questions that do not lead to a code change should almost certainly bring about a comment or changelog entry so that the next reviewer better understands what is going on.

Be sure to tell the reviewers what changes you are making and to thank them for their time. Code review is a tiring and time-consuming process, and reviewers sometimes get grumpy. Even in that case, though, respond politely and address the problems they have pointed out.

## \* **9) Don't get discouraged - or impatient**

After you have submitted your change, be patient and wait. Reviewers are busy people and may not get to your patch right away.

Once upon a time, patches used to disappear into the void without comment, but the development process works more smoothly than that now. You should receive comments within a week or so; if that does not happen, make sure that you have sent your patches to the right place. Wait for a minimum of one week before resubmitting or pinging reviewers - possibly longer during busy times like merge windows.

## \* **10) Include PATCH in the subject**

Due to high e-mail traffic to Linus, and to linux-kernel, it is common convention to prefix your subject line with [PATCH]. This lets Linus and other kernel developers more easily distinguish patches from other e-mail discussions.

## \* **11) Sign your work - the Developer's Certificate of Origin**

To improve tracking of who did what, especially with patches that can percolate to their final resting place in the kernel through several layers of maintainers, we've introduced a "sign-off" procedure on patches that are being emailed around.

The sign-off is a simple line at the end of the explanation for the patch, which certifies that you wrote it or otherwise have the right to pass it on as an open-source patch. The rules are pretty simple: if you can certify the below:

### \* **Developer's Certificate of Origin 1.1**

By making a contribution to this project, I certify that:

- (a) The contribution was created in whole or in part by me and I have the right to submit it under the open source license indicated in the file; or
- (b) The contribution is based upon previous work that, to the best of my knowledge, is covered under an appropriate open source license and I have the right under that license to submit that work with modifications, whether created in whole or in part by me, under the same open source license (unless I am permitted to submit under a different license), as indicated in the file; or
- (c) The contribution was provided directly to me by some other person who certified (a), (b) or (c) and I have not modified it.
- (d) I understand and agree that this project and the contribution are public and that a record of the contribution (including all personal information I submit with it, including my sign-off) is maintained indefinitely and may be redistributed consistent with this project or the open source license(s) involved.

then you just add a line saying:

```
Signed-off-by: Random J Developer <random@developer.example.org>
```

using your real name (sorry, no pseudonyms or anonymous contributions.)

Some people also put extra tags at the end. They'll just be ignored for now, but you can do this to mark internal company procedures or just point out some special detail about the sign-off.

If you are a subsystem or branch maintainer, sometimes you need to slightly modify patches you receive in order to merge them, because the code is not exactly the same in your tree and the submitters'. If you stick strictly to rule (c), you should ask the submitter to rediff, but this is a totally counter-productive waste of time and energy. Rule (b) allows you to adjust the code, but then it is very impolite to change one submitter's code and make him endorse your bugs. To solve this problem, it is recommended that you add a line between the last Signed-off-by header and yours, indicating the nature of your changes. While there is nothing mandatory about this, it seems like prepending the description with your mail and/or name, all enclosed in square brackets, is noticeable enough to make it obvious that you are responsible for last-minute changes. Example:

```
Signed-off-by: Random J Developer <random@developer.example.org>
[lucky@maintainer.example.org: struct foo moved from foo.c to foo.h]
Signed-off-by: Lucky K Maintainer <lucky@maintainer.example.org>
```

This practice is particularly helpful if you maintain a stable branch and want at the same time to credit the author, track changes, merge the fix, and protect the submitter from complaints. Note that under no circumstances can you change the author's identity (the From header), as it is the one which appears in the changelog.

Special note to back-porters: It seems to be a common and useful practice to insert an indication of the origin of a patch at the top of the commit message (just after the subject line) to facilitate tracking. For instance, here's what we see in a 3.x-stable release:

```
Date: Tue Oct 7 07:26:38 2014 -0400

libata: Un-break ATA blacklist

commit 1c40279960bcd7d52dbdf1d466b20d24b99176c8 upstream.
```

And here's what might appear in an older kernel once a patch is backported:

```
Date: Tue May 13 22:12:27 2008 +0200

wireless, airo: waitbusy() won't delay

[backport of 2.6 commit b7acbd9bd1f277c1eb23f344f899cf4cd0bf36a]
```

Whatever the format, this information provides a valuable help to people tracking your trees, and to people trying to troubleshoot bugs in your tree.

## \* 12) When to use Acked-by:, Cc:, and Co-developed-by:

The Signed-off-by: tag indicates that the signer was involved in the development of the patch, or that he/she was in the patch's delivery path.

If a person was not directly involved in the preparation or handling of a patch but wishes to signify and record their approval of it then they can ask to have an Acked-by: line added to the patch's changelog.

Acked-by: is often used by the maintainer of the affected code when that maintainer neither contributed to nor forwarded the patch.

Acked-by: is not as formal as Signed-off-by:. It is a record that the acker has at least reviewed the patch and has indicated acceptance. Hence patch mergers will sometimes manually convert an acker's "yep, looks good to me" into an Acked-by: (but note that it is usually better to ask for an explicit ack).

Acked-by: does not necessarily indicate acknowledgement of the entire patch. For example, if a patch affects multiple subsystems and has an Acked-by: from one subsystem maintainer then this usually indicates acknowledgement of just the part which affects that maintainer's code. Judgement should be used here. When in doubt people should refer to the original discussion in the mailing list archives.

If a person has had the opportunity to comment on a patch, but has not provided such comments, you may optionally add a Cc: tag to the patch. This is the only tag which might be added without an explicit action by the person it names - but it should indicate that this person was copied on the patch. This tag documents that potentially interested parties have been included in the discussion.

Co-developed-by: states that the patch was co-created by multiple developers; it is used to give attribution to co-authors (in addition to the author attributed by the From: tag) when several people work on a single patch. Since Co-developed-by: denotes authorship, every Co-developed-by: must be immediately followed by a Signed-off-by: of the associated co-author. Standard sign-off procedure applies, i.e. the ordering of Signed-off-by: tags should reflect the chronological history of the patch insofar as possible, regardless of whether the author is attributed via From: or Co-developed-by:. Notably, the last Signed-off-by: must always be that of the developer submitting the patch.

Note, the From: tag is optional when the From: author is also the person (and email) listed in the From: line of the email header.

Example of a patch submitted by the From: author:

```
<changelog>
Co-developed-by: First Co-Author <first@coauthor.example.org>
Signed-off-by: First Co-Author <first@coauthor.example.org>
Co-developed-by: Second Co-Author <second@coauthor.example.org>
Signed-off-by: Second Co-Author <second@coauthor.example.org>
Signed-off-by: From Author <from@author.example.org>
```

Example of a patch submitted by a Co-developed-by: author:

```
From: From Author <from@author.example.org>  
<changelog>  
Co-developed-by: Random Co-Author <random@coauthor.example.org>  
Signed-off-by: Random Co-Author <random@coauthor.example.org>  
Signed-off-by: From Author <from@author.example.org>  
Co-developed-by: Submitting Co-Author <sub@coauthor.example.org>  
Signed-off-by: Submitting Co-Author <sub@coauthor.example.org>
```

## \* **13) Using Reported-by:, Tested-by:, Reviewed-by:, Suggested-by: and Fixes:**

The Reported-by tag gives credit to people who find bugs and report them and it hopefully inspires them to help us again in the future. Please note that if the bug was reported in private, then ask for permission first before using the Reported-by tag.

A Tested-by: tag indicates that the patch has been successfully tested (in some environment) by the person named. This tag informs maintainers that some testing has been performed, provides a means to locate testers for future patches, and ensures credit for the testers.

Reviewed-by:, instead, indicates that the patch has been reviewed and found acceptable according to the Reviewer's Statement:

### \* **Reviewer's statement of oversight**

By offering my Reviewed-by: tag, I state that:

- (a) I have carried out a technical review of this patch to evaluate its appropriateness and readiness for inclusion into the mainline kernel.
- (b) Any problems, concerns, or questions relating to the patch have been communicated back to the submitter. I am satisfied with the submitter's response to my comments.
- (c) While there may be things that could be improved with this submission, I believe that it is, at this time, (1) a worthwhile modification to the kernel, and (2) free of known issues which would argue against its inclusion.
- (d) While I have reviewed the patch and believe it to be sound, I do not (unless explicitly stated elsewhere) make any warranties or guarantees that it will achieve its stated purpose or function properly in any given situation.

A Reviewed-by tag is a statement of opinion that the patch is an appropriate modification of the kernel without any remaining serious technical issues. Any interested reviewer (who has done the work) can offer a Reviewed-by tag for a patch. This tag serves to give credit to reviewers and to inform maintainers of the degree of review which has been done on the patch. Reviewed-by: tags, when supplied by reviewers known to understand the subject area and to perform thorough reviews, will normally increase the likelihood of your patch getting into the kernel.

A Suggested-by: tag indicates that the patch idea is suggested by the person named and ensures credit to the person for the idea. Please note that this tag should not be added without the reporter's permission, especially if the idea was not posted in a public forum. That said, if we diligently credit our idea reporters, they will, hopefully, be inspired to help us again in the future.

A Fixes: tag indicates that the patch fixes an issue in a previous commit. It is used to make it easy to determine where a bug originated, which can help review a bug fix. This tag also assists the stable kernel team in determining which stable kernel versions should receive your fix. This is the preferred method for indicating a bug fixed by the patch. See 2) Describe your changes for more details.

## \* 14) The canonical patch format

This section describes how the patch itself should be formatted. Note that, if you have your patches stored in a git repository, proper patch formatting can be had with `git format-patch`. The tools cannot create the necessary text, though, so read the instructions below anyway.

The canonical patch subject line is:

```
Subject: [PATCH 001/123] subsystem: summary phrase
```

The canonical patch message body contains the following:

- A `from` line specifying the patch author, followed by an empty line (only needed if the person sending the patch is not the author).
- The body of the explanation, line wrapped at 75 columns, which will be copied to the permanent changelog to describe this patch.
- An empty line.
- The `Signed-off-by:` lines, described above, which will also go in the changelog.
- A marker line containing simply `---`.
- Any additional comments not suitable for the changelog.
- The actual patch (`diff` output).

The `Subject` line format makes it very easy to sort the emails alphabetically by subject line - pretty much any email reader will support that - since because the sequence number is zero-padded, the numerical and alphabetic sort is the same.

The `subsystem` in the email's `Subject` should identify which area or subsystem of the kernel is being patched.

The `summary phrase` in the email's `Subject` should concisely describe the patch which that email contains. The `summary phrase` should not be a filename. Do not use the same `summary phrase` for every patch in a whole patch series (where a patch series is an ordered sequence of multiple, related patches).

Bear in mind that the `summary phrase` of your email becomes a globally-unique identifier for that patch. It propagates all the way into the `git changelog`. The `summary phrase` may later be used in developer discussions which refer to the

patch. People will want to google for the `summary` phrase to read discussion regarding that patch. It will also be the only thing that people may quickly see when, two or three months later, they are going through perhaps thousands of patches using tools such as `gitk` or `git log --oneline`.

For these reasons, the `summary` must be no more than 70-75 characters, and it must describe both what the patch changes, as well as why the patch might be necessary. It is challenging to be both succinct and descriptive, but that is what a well-written summary should do.

The `summary` phrase may be prefixed by tags enclosed in square brackets: “`Subject: [PATCH <tag>…] <summary phrase>`”. The tags are not considered part of the summary phrase, but describe how the patch should be treated. Common tags might include a version descriptor if the multiple versions of the patch have been sent out in response to comments (i.e., “`v1, v2, v3`”), or “`RFC`” to indicate a request for comments. If there are four patches in a patch series the individual patches may be numbered like this: `1/4, 2/4, 3/4, 4/4`. This assures that developers understand the order in which the patches should be applied and that they have reviewed or applied all of the patches in the patch series.

A couple of example Subjects:

```
Subject: [PATCH 2/5] ext2: improve scalability of bitmap searching
Subject: [PATCH v2 01/27] x86: fix eflags tracking
```

The `from` line must be the very first line in the message body, and has the form:

`From: Patch Author <author@example.com>`

The `from` line specifies who will be credited as the author of the patch in the permanent changelog. If the `from` line is missing, then the `From:` line from the email header will be used to determine the patch author in the changelog.

The explanation body will be committed to the permanent source changelog, so should make sense to a competent reader who has long since forgotten the immediate details of the discussion that might have led to this patch. Including symptoms of the failure which the patch addresses (kernel log messages, oops messages, etc.) is especially useful for people who might be searching the commit logs looking for the applicable patch. If a patch fixes a compile failure, it may not be necessary to include `_all_` of the compile failures; just enough that it is likely that someone searching for the patch can find it. As in the `summary` phrase, it is important to be both succinct as well as descriptive.

The `---` marker line serves the essential purpose of marking for patch handling tools where the changelog message ends.

One good use for the additional comments after the `---` marker is for a `diffstat`, to show what files have changed, and the number of inserted and deleted lines per file. A `diffstat` is especially useful on bigger patches. Other comments relevant only to the moment or the maintainer, not suitable for the permanent changelog, should also go here. A good example of such comments might be patch changelogs which describe what has changed between the `v1` and `v2` version of the patch.

If you are going to include a `diffstat` after the `---` marker, please use `diffstat` options `-p 1 -w 70` so that filenames are listed from the top of the kernel source

tree and don't use too much horizontal space (easily fit in 80 columns, maybe with some indentation). (git generates appropriate diffstats by default.)

See more details on the proper patch format in the following references.

## \* 15) Explicit In-Reply-To headers

It can be helpful to manually add In-Reply-To: headers to a patch (e.g., when using `git send-email`) to associate the patch with previous relevant discussion, e.g. to link a bug fix to the email with the bug report. However, for a multi-patch series, it is generally best to avoid using In-Reply-To: to link to older versions of the series. This way multiple versions of the patch don't become an unmanageable forest of references in email clients. If a link is helpful, you can use the <https://lkml.kernel.org/> redirector (e.g., in the cover email text) to link to an earlier version of the patch series.

## \* 16) Providing base tree information

When other developers receive your patches and start the review process, it is often useful for them to know where in the tree history they should place your work. This is particularly useful for automated CI processes that attempt to run a series of tests in order to establish the quality of your submission before the maintainer starts the review.

If you are using `git format-patch` to generate your patches, you can automatically include the base tree information in your submission by using the `--base` flag. The easiest and most convenient way to use this option is with topical branches:

```
$ git checkout -t -b my-topical-branch master
Branch 'my-topical-branch' set up to track local branch 'master'.
Switched to a new branch 'my-topical-branch'

[perform your edits and commits]

$ git format-patch --base=auto --cover-letter -o outgoing/ master
outgoing/0000-cover-letter.patch
outgoing/0001-First-Commit.patch
outgoing/...
```

When you open `outgoing/0000-cover-letter.patch` for editing, you will notice that it will have the `base-commit:` trailer at the very bottom, which provides the reviewer and the CI tools enough information to properly perform `git am` without worrying about conflicts:

```
$ git checkout -b patch-review [base-commit-id]
Switched to a new branch 'patch-review'
$ git am patches.mbox
Applying: First Commit
Applying: ...
```

Please see `man git-format-patch` for more information about this option.

---

**Note:** The `--base` feature was introduced in git version 2.9.0.

---

If you are not using git to format your patches, you can still include the same `base-commit` trailer to indicate the commit hash of the tree on which your work is based. You should add it either in the cover letter or in the first patch of the series and it should be placed either below the `---` line or at the very bottom of all other content, right before your email signature.

## \* 17) Sending git pull requests

If you have a series of patches, it may be most convenient to have the maintainer pull them directly into the subsystem repository with a `git pull` operation. Note, however, that pulling patches from a developer requires a higher degree of trust than taking patches from a mailing list. As a result, many subsystem maintainers are reluctant to take pull requests, especially from new, unknown developers. If in doubt you can use the pull request as the cover letter for a normal posting of the patch series, giving the maintainer the option of using either.

A pull request should have [GIT PULL] in the subject line. The request itself should include the repository name and the branch of interest on a single line; it should look something like:

```
Please pull from  
git://jdelvare.pck.nerim.net/jdelvare-2.6 i2c-for-linus  
to get these changes:
```

A pull request should also include an overall message saying what will be included in the request, a `git shortlog` listing of the patches themselves, and a `diffstat` showing the overall effect of the patch series. The easiest way to get all this information together is, of course, to let git do it for you with the `git request-pull` command.

Some maintainers (including Linus) want to see pull requests from signed commits; that increases their confidence that the request actually came from you. Linus, in particular, will not pull from public hosting sites like GitHub in the absence of a signed tag.

The first step toward creating such tags is to make a GNUPG key and get it signed by one or more core kernel developers. This step can be hard for new developers, but there is no way around it. Attending conferences can be a good way to find developers who can sign your key.

Once you have prepared a patch series in git that you wish to have somebody pull, create a signed tag with `git tag -s`. This will create a new tag identifying the last commit in the series and containing a signature created with your private key. You will also have the opportunity to add a changelog-style message to the tag; this is an ideal place to describe the effects of the pull request as a whole.

If the tree the maintainer will be pulling from is not the repository you are working from, don't forget to push the signed tag explicitly to the public tree.

When generating your pull request, use the signed tag as the target. A command like this will do the trick:

```
git request-pull master git://my.public.tree/linux.git my-signed-tag
```

## \* References

**Andrew Morton, “The perfect patch” (tpp).** <<http://www.ozlabs.org/~akpm/stuff/tpp.txt>>

**Jeff Garzik, “Linux kernel patch submission format” .** <<https://web.archive.org/web/20180829112450/http://linux.yyz.us/patch-format.html>>

**Greg Kroah-Hartman, “How to piss off a kernel subsystem maintainer” .**  
<<http://www.kroah.com/log/linux/maintainer.html>>  
<<http://www.kroah.com/log/linux/maintainer-02.html>>  
<<http://www.kroah.com/log/linux/maintainer-03.html>>  
<<http://www.kroah.com/log/linux/maintainer-04.html>>  
<<http://www.kroah.com/log/linux/maintainer-05.html>>  
<<http://www.kroah.com/log/linux/maintainer-06.html>>

**NO!!!! No more huge patch bombs to linux-kernel@vger.kernel.org people!**  
<<https://lkml.org/lkml/2005/7/11/336>>

**Kernel Documentation/process/coding-style.rst:** Documentation/process/coding-style.rst

**Linus Torvalds’ s mail on the canonical patch format:** <<http://lkml.org/lkml/2005/4/7/183>>

**Andi Kleen, “On submitting kernel patches”** Some strategies to get difficult or controversial changes in.

<http://halobates.de/on-submitting-patches.pdf>

## PROGRAMMING LANGUAGE

The kernel is written in the C programming language [?]. More precisely, the kernel is typically compiled with `gcc` [?] under `-std=gnu89` [?]: the GNU dialect of ISO C90 (including some C99 features).

This dialect contains many extensions to the language [?], and many of them are used within the kernel as a matter of course.

There is some support for compiling the kernel with `clang` [?] and `icc` [?] for several of the architectures, although at the time of writing it is not completed, requiring third-party patches.

### \* Attributes

One of the common extensions used throughout the kernel are attributes [?]. Attributes allow to introduce implementation-defined semantics to language entities (like variables, functions or types) without having to make significant syntactic changes to the language (e.g. adding a new keyword) [?].

In some cases, attributes are optional (i.e. a compiler not supporting them should still produce proper code, even if it is slower or does not perform as many compile-time checks/diagnostics).

The kernel defines pseudo-keywords (e.g. `__pure`) instead of using directly the GNU attribute syntax (e.g. `__attribute__((__pure__))`) in order to feature detect which ones can be used and/or to shorten the code.

Please refer to `include/linux/compiler_attributes.h` for more information.



---

CHAPTER  
EIGHT

---

## LINUX KERNEL CODING STYLE

This is a short document describing the preferred coding style for the linux kernel. Coding style is very personal, and I won't **force** my views on anybody, but this is what goes for anything that I have to be able to maintain, and I'd prefer it for most other things too. Please at least consider the points made here.

First off, I'd suggest printing out a copy of the GNU coding standards, and NOT read it. Burn them, it's a great symbolic gesture.

Anyway, here goes:

### \* 1) Indentation

Tabs are 8 characters, and thus indentations are also 8 characters. There are heretic movements that try to make indentations 4 (or even 2!) characters deep, and that is akin to trying to define the value of PI to be 3.

Rationale: The whole idea behind indentation is to clearly define where a block of control starts and ends. Especially when you've been looking at your screen for 20 straight hours, you'll find it a lot easier to see how the indentation works if you have large indentations.

Now, some people will claim that having 8-character indentations makes the code move too far to the right, and makes it hard to read on a 80-character terminal screen. The answer to that is that if you need more than 3 levels of indentation, you're screwed anyway, and should fix your program.

In short, 8-char indents make things easier to read, and have the added benefit of warning you when you're nesting your functions too deep. Heed that warning.

The preferred way to ease multiple indentation levels in a switch statement is to align the `switch` and its subordinate `case` labels in the same column instead of double-indenting the `case` labels. E.g.:

```
switch (suffix) {  
    case 'G':  
    case 'g':  
        mem <= 30;  
        break;  
    case 'M':  
    case 'm':  
        mem <= 20;
```

(continues on next page)

(continued from previous page)

```
    break;
case 'K':
case 'k':
    mem <= 10;
    fallthrough;
default:
    break;
}
```

Don't put multiple statements on a single line unless you have something to hide:

```
if (condition) do_this;
do_something_evertime;
```

Don't put multiple assignments on a single line either. Kernel coding style is super simple. Avoid tricky expressions.

Outside of comments, documentation and except in Kconfig, spaces are never used for indentation, and the above example is deliberately broken.

Get a decent editor and don't leave whitespace at the end of lines.

## \* 2) Breaking long lines and strings

Coding style is all about readability and maintainability using commonly available tools.

The preferred limit on the length of a single line is 80 columns.

Statements longer than 80 columns should be broken into sensible chunks, unless exceeding 80 columns significantly increases readability and does not hide information.

Descendants are always substantially shorter than the parent and are placed substantially to the right. A very commonly used style is to align descendants to a function open parenthesis.

These same rules are applied to function headers with a long argument list.

However, never break user-visible strings such as printk messages because that breaks the ability to grep for them.

## \* 3) Placing Braces and Spaces

The other issue that always comes up in C styling is the placement of braces. Unlike the indent size, there are few technical reasons to choose one placement strategy over the other, but the preferred way, as shown to us by the prophets Kernighan and Ritchie, is to put the opening brace last on the line, and put the closing brace first, thusly:

```
if (x is true) {
    we do y
}
```

This applies to all non-function statement blocks (if, switch, for, while, do). E.g.:

```
switch (action) {
case KOBJ_ADD:
    return "add";
case KOBJ_REMOVE:
    return "remove";
case KOBJ_CHANGE:
    return "change";
default:
    return NULL;
}
```

However, there is one special case, namely functions: they have the opening brace at the beginning of the next line, thus:

```
int function(int x)
{
    body of function
}
```

Heretic people all over the world have claimed that this inconsistency is …well …inconsistent, but all right-thinking people know that (a) K&R are **right** and (b) K&R are right. Besides, functions are special anyway (you can't nest them in C).

Note that the closing brace is empty on a line of its own, **except** in the cases where it is followed by a continuation of the same statement, ie a **while** in a **do**-statement or an **else** in an if-statement, like this:

```
do {
    body of do-loop
} while (condition);
```

and

```
if (x == y) {
    ...
} else if (x > y) {
    ...
} else {
    ...
}
```

Rationale: K&R.

Also, note that this brace-placement also minimizes the number of empty (or almost empty) lines, without any loss of readability. Thus, as the supply of new-lines on your screen is not a renewable resource (think 25-line terminal screens here), you have more empty lines to put comments on.

Do not unnecessarily use braces where a single statement will do.

```
if (condition)
    action();
```

and

```
if (condition)
    do_this();
else
    do_that();
```

This does not apply if only one branch of a conditional statement is a single statement; in the latter case use braces in both branches:

```
if (condition) {
    do_this();
    do_that();
} else {
    otherwise();
}
```

Also, use braces when a loop contains more than a single simple statement:

```
while (condition) {
    if (test)
        do_something();
}
```

### \* 3.1) Spaces

Linux kernel style for use of spaces depends (mostly) on function-versus-keyword usage. Use a space after (most) keywords. The notable exceptions are `sizeof`, `typeof`, `alignof`, and `_attribute_`, which look somewhat like functions (and are usually used with parentheses in Linux, although they are not required in the language, as in: `sizeof info` after `struct fileinfo info;` is declared).

So use a space after these keywords:

```
if, switch, case, for, do, while
```

but not with `sizeof`, `typeof`, `alignof`, or `_attribute_`. E.g.,

```
s = sizeof(struct file);
```

Do not add spaces around (inside) parenthesized expressions. This example is **bad**:

```
s = sizeof( struct file );
```

When declaring pointer data or a function that returns a pointer type, the preferred use of `*` is adjacent to the data name or function name and not adjacent to the type name. Examples:

```
char *linux_banner;
unsigned long long memparse(char *ptr, char **retptr);
char *match_strdup(substring_t *s);
```

Use one space around (on each side of) most binary and ternary operators, such as any of these:

```
= + - < > * / % | & ^ <= >= == != ? :
```

but no space after unary operators:

```
& * + - ~ ! sizeof typeof alignof __attribute__ defined
```

no space before the postfix increment & decrement unary operators:

```
++ --
```

no space after the prefix increment & decrement unary operators:

```
++ --
```

and no space around the . and -> structure member operators.

Do not leave trailing whitespace at the ends of lines. Some editors with smart indentation will insert whitespace at the beginning of new lines as appropriate, so you can start typing the next line of code right away. However, some such editors do not remove the whitespace if you end up not putting a line of code there, such as if you leave a blank line. As a result, you end up with lines containing trailing whitespace.

Git will warn you about patches that introduce trailing whitespace, and can optionally strip the trailing whitespace for you; however, if applying a series of patches, this may make later patches in the series fail by changing their context lines.

## \* 4) Naming

C is a Spartan language, and your naming conventions should follow suit. Unlike Modula-2 and Pascal programmers, C programmers do not use cute names like ThisVariableIsATemporaryCounter. A C programmer would call that variable `tmp`, which is much easier to write, and not the least more difficult to understand.

HOWEVER, while mixed-case names are frowned upon, descriptive names for global variables are a must. To call a global function `foo` is a shooting offense.

GLOBAL variables (to be used only if you **really** need them) need to have descriptive names, as do global functions. If you have a function that counts the number of active users, you should call that `count_active_users()` or similar, you should **not** call it `cntusr()`.

Encoding the type of a function into the name (so-called Hungarian notation) is asinine - the compiler knows the types anyway and can check those, and it only confuses the programmer. No wonder Microsoft makes buggy programs.

LOCAL variable names should be short, and to the point. If you have some random integer loop counter, it should probably be called `i`. Calling it `loop_counter` is non-productive, if there is no chance of it being mis-understood. Similarly, `tmp` can be just about any type of variable that is used to hold a temporary value.

If you are afraid to mix up your local variable names, you have another problem, which is called the function-growth-hormone-imbalance syndrome. See chapter 6 (Functions).

For symbol names and documentation, avoid introducing new usage of ‘master / slave’ (or ‘slave’ independent of ‘master’) and ‘blacklist / whitelist’ .

**Recommended replacements for ‘master / slave’ are:** ‘{primary,main} / {secondary,replica,subordinate}’ ‘{initiator,requester} / {target,responder}’ ‘{controller,host} / {device,worker,proxy}’ ‘leader / follower’ ‘director / performer’

**Recommended replacements for ‘blacklist/whitelist’ are:** ‘denylist / allowlist’ ‘blocklist / passlist’

Exceptions for introducing new usage is to maintain a userspace ABI/API, or when updating code for an existing (as of 2020) hardware or protocol specification that mandates those terms. For new specifications translate specification usage of the terminology to the kernel coding standard where possible.

## \* 5) Typedefs

Please don’t use things like `vps_t`. It’s a **mistake** to use `typedef` for structures and pointers. When you see a

```
vps_t a;
```

in the source, what does it mean? In contrast, if it says

```
struct virtual_container *a;
```

you can actually tell what `a` is.

Lots of people think that `typedefs help readability`. Not so. They are useful only for:

- (a) totally opaque objects (where the `typedef` is actively used to **hide** what the object is).

Example: `pte_t` etc. opaque objects that you can only access using the proper accessor functions.

---

**Note:** Opaqueness and accessor functions are not good in themselves. The reason we have them for things like `pte_t` etc. is that there really is absolutely **zero** portably accessible information there.

---

- (b) Clear integer types, where the abstraction **helps** avoid confusion whether it is `int` or `long`.

`u8/u16/u32` are perfectly fine typedefs, although they fit into category (d) better than here.

---

**Note:** Again - there needs to be a **reason** for this. If something is `unsigned long`, then there's no reason to do

---

```
typedef unsigned long myflags_t;
```

---

but if there is a clear reason for why it under certain circumstances might be an `unsigned int` and under other configurations might be `unsigned long`, then by all means go ahead and use a typedef.

- (c) when you use sparse to literally create a **new** type for type-checking.
- (d) New types which are identical to standard C99 types, in certain exceptional circumstances.

Although it would only take a short amount of time for the eyes and brain to become accustomed to the standard types like `uint32_t`, some people object to their use anyway.

Therefore, the Linux-specific `u8/u16/u32/u64` types and their signed equivalents which are identical to standard types are permitted – although they are not mandatory in new code of your own.

When editing existing code which already uses one or the other set of types, you should conform to the existing choices in that code.

- (e) Types safe for use in userspace.

In certain structures which are visible to userspace, we cannot require C99 types and cannot use the `u32` form above. Thus, we use `_u32` and similar types in all structures which are shared with userspace.

Maybe there are other cases too, but the rule should basically be to NEVER EVER use a typedef unless you can clearly match one of those rules.

In general, a pointer, or a struct that has elements that can reasonably be directly accessed should **never** be a typedef.

## \* 6) Functions

Functions should be short and sweet, and do just one thing. They should fit on one or two screenfuls of text (the ISO/ANSI screen size is 80x24, as we all know), and do one thing and do that well.

The maximum length of a function is inversely proportional to the complexity and indentation level of that function. So, if you have a conceptually simple function that is just one long (but simple) case-statement, where you have to do lots of small things for a lot of different cases, it's OK to have a longer function.

However, if you have a complex function, and you suspect that a less-than-gifted first-year high-school student might not even understand what the function is all about, you should adhere to the maximum limits all the more closely. Use helper functions with descriptive names (you can ask the compiler to in-line them if you

think it's performance-critical, and it will probably do a better job of it than you would have done).

Another measure of the function is the number of local variables. They shouldn't exceed 5-10, or you're doing something wrong. Re-think the function, and split it into smaller pieces. A human brain can generally easily keep track of about 7 different things, anything more and it gets confused. You know you're brilliant, but maybe you'd like to understand what you did 2 weeks from now.

In source files, separate functions with one blank line. If the function is exported, the **EXPORT** macro for it should follow immediately after the closing function brace line. E.g.:

```
int system_is_up(void)
{
    return system_state == SYSTEM_RUNNING;
}
EXPORT_SYMBOL(system_is_up);
```

In function prototypes, include parameter names with their data types. Although this is not required by the C language, it is preferred in Linux because it is a simple way to add valuable information for the reader.

Do not use the `extern` keyword with function prototypes as this makes lines longer and isn't strictly necessary.

## \* 7) Centralized exiting of functions

Albeit deprecated by some people, the equivalent of the `goto` statement is used frequently by compilers in form of the unconditional jump instruction.

The `goto` statement comes in handy when a function exits from multiple locations and some common work such as cleanup has to be done. If there is no cleanup needed then just return directly.

Choose label names which say what the `goto` does or why the `goto` exists. An example of a good name could be `out_free_buffer`: if the `goto` frees buffer. Avoid using GW-BASIC names like `err1:` and `err2:`, as you would have to renumber them if you ever add or remove exit paths, and they make correctness difficult to verify anyway.

The rationale for using `gos` is:

- unconditional statements are easier to understand and follow
- nesting is reduced
- errors by not updating individual exit points when making modifications are prevented
- saves the compiler work to optimize redundant code away ;)

```
int fun(int a)
{
    int result = 0;
```

(continues on next page)

(continued from previous page)

```

char *buffer;

buffer = kmalloc(SIZE, GFP_KERNEL);
if (!buffer)
    return -ENOMEM;

if (condition1) {
    while (loop1) {
        ...
    }
    result = 1;
    goto out_free_buffer;
}
...
out_free_buffer:
    kfree(buffer);
    return result;
}

```

A common type of bug to be aware of is one `err` bugs which look like this:

```

err:
    kfree(foo->bar);
    kfree(foo);
    return ret;

```

The bug in this code is that on some exit paths `foo` is `NULL`. Normally the fix for this is to split it up into two error labels `err_free_bar:` and `err_free_foo::`

```

err_free_bar:
    kfree(foo->bar);
err_free_foo:
    kfree(foo);
    return ret;

```

Ideally you should simulate errors to test all exit paths.

## \* 8) Commenting

Comments are good, but there is also a danger of over-commenting. NEVER try to explain HOW your code works in a comment: it's much better to write the code so that the **working** is obvious, and it's a waste of time to explain badly written code.

Generally, you want your comments to tell WHAT your code does, not HOW. Also, try to avoid putting comments inside a function body: if the function is so complex that you need to separately comment parts of it, you should probably go back to chapter 6 for a while. You can make small comments to note or warn about something particularly clever (or ugly), but try to avoid excess. Instead, put the comments at the head of the function, telling people what it does, and possibly WHY it does it.

When commenting the kernel API functions, please use the kernel-doc format. See

the files at Documentation/doc-guide/ and scripts/kernel-doc for details.

The preferred style for long (multi-line) comments is:

```
/*
 * This is the preferred style for multi-line
 * comments in the Linux kernel source code.
 * Please use it consistently.
 *
 * Description: A column of asterisks on the left side,
 * with beginning and ending almost-blank lines.
 */
```

For files in net/ and drivers/net/ the preferred style for long (multi-line) comments is a little different.

```
/* The preferred comment style for files in net/ and drivers/net
 * looks like this.
 *
 * It is nearly the same as the generally preferred comment style,
 * but there is no initial almost-blank line.
 */
```

It's also important to comment data, whether they are basic types or derived types. To this end, use just one data declaration per line (no commas for multiple data declarations). This leaves you room for a small comment on each item, explaining its use.

## \* 9) You' ve made a mess of it

That's OK, we all do. You've probably been told by your long-time Unix user helper that GNU emacs automatically formats the C sources for you, and you've noticed that yes, it does do that, but the defaults it uses are less than desirable (in fact, they are worse than random typing - an infinite number of monkeys typing into GNU emacs would never make a good program).

So, you can either get rid of GNU emacs, or change it to use saner values. To do the latter, you can stick the following in your .emacs file:

```
(defun c-lineup-arglist-tabs-only (ignored)
  "Line up argument lists by tabs, not spaces"
  (let* ((anchor (c-langelem-pos c-syntactic-element))
         (column (c-langelem-2nd-pos c-syntactic-element))
         (offset (- (1+ column) anchor))
         (steps (floor offset c-basic-offset)))
    (* (max steps 1)
       c-basic-offset))

(dir-locals-set-class-variables
 'linux-kernel
 '((c-mode . (
      (c-basic-offset . 8)
      (c-label-minimum-indentation . 0)
      (c-offsets-alist . (
```

(continues on next page)

(continued from previous page)

```

(arglist-close          . c-lineup-arglist-tabs-only)
(arglist-cont-nonempty .
  (c-lineup-gcc-asm-reg c-lineup-arglist-tabs-only))
(arglist-intro         . +)
(brace-list-intro     . +)
(c                      . c-lineup-C-comments)
(case-label            . 0)
(comment-intro        . c-lineup-comment)
(cpp-define-intro    . +)
(cpp-macro             . -1000)
(cpp-macro-cont       . +)
(defun-block-intro    . +)
(else-clause           . 0)
(func-decl-cont       . +)
(inclass               . +)
(inher-cont            . c-lineup-multi-inher)
(knr-argdecl-intro   . 0)
(label                 . -1000)
(statement              . 0)
(statement-block-intro . +)
(statement-case-intro . +)
(statement-cont         . +)
(substatement          . +)
  ))
(indent-tabs-mode . t)
(show-trailing-whitespace . t)
)))))

(dir-locals-set-directory-class
 (expand-file-name "~/src/linux-trees")
 'linux-kernel)

```

This will make emacs go better with the kernel coding style for C files below `~/src/linux-trees`.

But even if you fail in getting emacs to do sane formatting, not everything is lost: use `indent`.

Now, again, GNU indent has the same brain-dead settings that GNU emacs has, which is why you need to give it a few command line options. However, that's not too bad, because even the makers of GNU indent recognize the authority of K&R (the GNU people aren't evil, they are just severely misguided in this matter), so you just give `indent` the options `-kr -i8` (stands for K&R, 8 character indents), or use `scripts/Lindent`, which indents in the latest style.

`indent` has a lot of options, and especially when it comes to comment re-formatting you may want to take a look at the man page. But remember: `indent` is not a fix for bad programming.

Note that you can also use the `clang-format` tool to help you with these rules, to quickly re-format parts of your code automatically, and to review full files in order to spot coding style mistakes, typos and possible improvements. It is also handy for sorting `#includes`, for aligning variables/macros, for reflowing text and other similar tasks. See the file `Documentation/process/clang-format.rst` for more details.

## \* 10) Kconfig configuration files

For all of the Kconfig\* configuration files throughout the source tree, the indentation is somewhat different. Lines under a config definition are indented with one tab, while help text is indented an additional two spaces. Example:

```
config AUDIT
    bool "Auditing support"
    depends on NET
    help
        Enable auditing infrastructure that can be used with another
        kernel subsystem, such as SELinux (which requires this for
        logging of avc messages output). Does not do system-call
        auditing without CONFIG_AUDITSYSCALL.
```

Seriously dangerous features (such as write support for certain filesystems) should advertise this prominently in their prompt string:

```
config ADFS_FS_RW
    bool "ADFS write support (DANGEROUS)"
    depends on ADFS_FS
    ...
```

For full documentation on the configuration files, see the file Documentation/kbuild/kconfig-language.rst.

## \* 11) Data structures

Data structures that have visibility outside the single-threaded environment they are created and destroyed in should always have reference counts. In the kernel, garbage collection doesn't exist (and outside the kernel garbage collection is slow and inefficient), which means that you absolutely **have** to reference count all your uses.

Reference counting means that you can avoid locking, and allows multiple users to have access to the data structure in parallel - and not having to worry about the structure suddenly going away from under them just because they slept or did something else for a while.

Note that locking is **not** a replacement for reference counting. Locking is used to keep data structures coherent, while reference counting is a memory management technique. Usually both are needed, and they are not to be confused with each other.

Many data structures can indeed have two levels of reference counting, when there are users of different classes. The subclass count counts the number of subclass users, and decrements the global count just once when the subclass count goes to zero.

Examples of this kind of multi-level-reference-counting can be found in memory management (`struct mm_struct: mm_users` and `mm_count`), and in filesystem code (`struct super_block: s_count` and `s_active`).

Remember: if another thread can find your data structure, and you don't have a reference count on it, you almost certainly have a bug.

## \* 12) Macros, Enums and RTL

Names of macros defining constants and labels in enums are capitalized.

```
#define CONSTANT 0x12345
```

Enums are preferred when defining several related constants.

CAPITALIZED macro names are appreciated but macros resembling functions may be named in lower case.

Generally, inline functions are preferable to macros resembling functions.

Macros with multiple statements should be enclosed in a do - while block:

```
#define macrofun(a, b, c)
    do {
        if (a == 5)
            do_this(b, c);
    } while (0)
```

Things to avoid when using macros:

1) macros that affect control flow:

```
#define FOO(x)
    do {
        if (blah(x) < 0)
            return -EBUGGERED;
    } while (0)
```

is a **very** bad idea. It looks like a function call but exits the calling function; don't break the internal parsers of those who will read the code.

2) macros that depend on having a local variable with a magic name:

```
#define FOO(val) bar(index, val)
```

might look like a good thing, but it's confusing as hell when one reads the code and it's prone to breakage from seemingly innocent changes.

3) macros with arguments that are used as l-values: FOO(x) = y; will bite you if somebody e.g. turns FOO into an inline function.

4) forgetting about precedence: macros defining constants using expressions must enclose the expression in parentheses. Beware of similar issues with macros using parameters.

```
#define CONSTANT 0x4000
#define CONSTEXP (CONSTANT | 3)
```

5) namespace collisions when defining local variables in macros resembling functions:

```
#define FOO(x) \
({ \
    typeof(x) ret; \
    ret = calc_ret(x); \
    (ret); \
})
```

ret is a common name for a local variable - \_\_foo\_ret is less likely to collide with an existing variable.

The cpp manual deals with macros exhaustively. The gcc internals manual also covers RTL which is used frequently with assembly language in the kernel.

## \* 13) Printing kernel messages

Kernel developers like to be seen as literate. Do mind the spelling of kernel messages to make a good impression. Do not use incorrect contractions like dont; use do not or don't instead. Make the messages concise, clear, and unambiguous.

Kernel messages do not have to be terminated with a period.

Printing numbers in parentheses (%d) adds no value and should be avoided.

There are a number of driver model diagnostic macros in <linux/device.h> which you should use to make sure messages are matched to the right device and driver, and are tagged with the right level: dev\_err(), dev\_warn(), dev\_info(), and so forth. For messages that aren't associated with a particular device, <linux/printk.h> defines pr\_notice(), pr\_info(), pr\_warn(), pr\_err(), etc.

Coming up with good debugging messages can be quite a challenge; and once you have them, they can be a huge help for remote troubleshooting. However debug message printing is handled differently than printing other non-debug messages. While the other pr\_XXX() functions print unconditionally, pr\_debug() does not; it is compiled out by default, unless either DEBUG is defined or CONFIG\_DYNAMIC\_DEBUG is set. That is true for dev\_dbg() also, and a related convention uses VERBOSE\_DEBUG to add dev\_vdbg() messages to the ones already enabled by DEBUG.

Many subsystems have Kconfig debug options to turn on -DDEBUG in the corresponding Makefile; in other cases specific files #define DEBUG. And when a debug message should be unconditionally printed, such as if it is already inside a debug-related #ifdef section, printk(KERN\_DEBUG ...) can be used.

## \* 14) Allocating memory

The kernel provides the following general purpose memory allocators: kmalloc(), kzalloc(), kcalloc(), kmalloc\_array(), kcalloc(), vmalloc(), and vzalloc(). Please refer to the API documentation for further information about them. Documentation/core-api/memory-allocation.rst

The preferred form for passing a size of a struct is the following:

```
p = kmalloc(sizeof(*p), ...);
```

The alternative form where struct name is spelled out hurts readability and introduces an opportunity for a bug when the pointer variable type is changed but the corresponding sizeof that is passed to a memory allocator is not.

Casting the return value which is a void pointer is redundant. The conversion from void pointer to any other pointer type is guaranteed by the C programming language.

The preferred form for allocating an array is the following:

```
p = kmalloc_array(n, sizeof(...), ...);
```

The preferred form for allocating a zeroed array is the following:

```
p = kcalloc(n, sizeof(...), ...);
```

Both forms check for overflow on the allocation size  $n * \text{sizeof}(\dots)$ , and return NULL if that occurred.

These generic allocation functions all emit a stack dump on failure when used without \_\_GFP\_NOWARN so there is no use in emitting an additional failure message when NULL is returned.

## \* 15) The inline disease

There appears to be a common misperception that gcc has a magic “make me faster” speedup option called `inline`. While the use of inlines can be appropriate (for example as a means of replacing macros, see Chapter 12), it very often is not. Abundant use of the `inline` keyword leads to a much bigger kernel, which in turn slows the system as a whole down, due to a bigger icache footprint for the CPU and simply because there is less memory available for the pagecache. Just think about it; a pagecache miss causes a disk seek, which easily takes 5 milliseconds. There are a LOT of cpu cycles that can go into these 5 milliseconds.

A reasonable rule of thumb is to not put `inline` at functions that have more than 3 lines of code in them. An exception to this rule are the cases where a parameter is known to be a compiletime constant, and as a result of this constantness you know the compiler will be able to optimize most of your function away at compile time. For a good example of this later case, see the `kmalloc()` inline function.

Often people argue that adding `inline` to functions that are static and used only once is always a win since there is no space tradeoff. While this is technically

correct, gcc is capable of inlining these automatically without help, and the maintenance issue of removing the inline when a second user appears outweighs the potential value of the hint that tells gcc to do something it would have done anyway.

## \* 16) Function return values and names

Functions can return values of many different kinds, and one of the most common is a value indicating whether the function succeeded or failed. Such a value can be represented as an error-code integer (-E<sub>xxx</sub> = failure, 0 = success) or a succeeded boolean (0 = failure, non-zero = success).

Mixing up these two sorts of representations is a fertile source of difficult-to-find bugs. If the C language included a strong distinction between integers and booleans then the compiler would find these mistakes for us...but it doesn't. To help prevent such bugs, always follow this convention:

If the name of a function is an action or an imperative command, the function should return an error-code integer. If the name is a predicate, the function should return a "succeeded" boolean.

For example, `add_work` is a command, and the `add_work()` function returns 0 for success or -EBUSY for failure. In the same way, `PCI device present` is a predicate, and the `pci_dev_present()` function returns 1 if it succeeds in finding a matching device or 0 if it doesn't.

All EXPORTed functions must respect this convention, and so should all public functions. Private (static) functions need not, but it is recommended that they do.

Functions whose return value is the actual result of a computation, rather than an indication of whether the computation succeeded, are not subject to this rule. Generally they indicate failure by returning some out-of-range result. Typical examples would be functions that return pointers; they use NULL or the ERR\_PTR mechanism to report failure.

## \* 17) Using bool

The Linux kernel `bool` type is an alias for the C99 `_Bool` type. `bool` values can only evaluate to 0 or 1, and implicit or explicit conversion to `bool` automatically converts the value to true or false. When using `bool` types the `!!` construction is not needed, which eliminates a class of bugs.

When working with `bool` values the `true` and `false` definitions should be used instead of 1 and 0.

`bool` function return types and stack variables are always fine to use whenever appropriate. Use of `bool` is encouraged to improve readability and is often a better option than '`int`' for storing boolean values.

Do not use `bool` if cache line layout or size of the value matters, as its size and alignment varies based on the compiled architecture. Structures that are optimized for alignment and size should not use `bool`.

If a structure has many true/false values, consider consolidating them into a bit-field with 1 bit members, or using an appropriate fixed width type, such as u8.

Similarly for function arguments, many true/false values can be consolidated into a single bitwise ‘flags’ argument and ‘flags’ can often be a more readable alternative if the call-sites have naked true/false constants.

Otherwise limited use of bool in structures and arguments can improve readability.

## \* 18) Don’t re-invent the kernel macros

The header file include/linux/kernel.h contains a number of macros that you should use, rather than explicitly coding some variant of them yourself. For example, if you need to calculate the length of an array, take advantage of the macro

```
#define ARRAY_SIZE(x) (sizeof(x) / sizeof((x)[0]))
```

Similarly, if you need to calculate the size of some structure member, use

```
#define sizeof_field(t, f) (sizeof(((t*)0)->f))
```

There are also min() and max() macros that do strict type checking if you need them. Feel free to peruse that header file to see what else is already defined that you shouldn’t reproduce in your code.

## \* 19) Editor modelines and other cruft

Some editors can interpret configuration information embedded in source files, indicated with special markers. For example, emacs interprets lines marked like this:

```
-*- mode: c -*-
```

Or like this:

```
/*
Local Variables:
compile-command: "gcc -DMAGIC_DEBUG_FLAG foo.c"
End:
*/
```

Vim interprets markers that look like this:

```
/* vim:set sw=8 noet */
```

Do not include any of these in source files. People have their own personal editor configurations, and your source files should not override them. This includes markers for indentation and mode configuration. People may use their own custom mode, or may have some other magic method for making indentation work correctly.

## \* 20) Inline assembly

In architecture-specific code, you may need to use inline assembly to interface with CPU or platform functionality. Don't hesitate to do so when necessary. However, don't use inline assembly gratuitously when C can do the job. You can and should poke hardware from C when possible.

Consider writing simple helper functions that wrap common bits of inline assembly, rather than repeatedly writing them with slight variations. Remember that inline assembly can use C parameters.

Large, non-trivial assembly functions should go in .S files, with corresponding C prototypes defined in C header files. The C prototypes for assembly functions should use `asmlinkage`.

You may need to mark your `asm` statement as `volatile`, to prevent GCC from removing it if GCC doesn't notice any side effects. You don't always need to do so, though, and doing so unnecessarily can limit optimization.

When writing a single inline assembly statement containing multiple instructions, put each instruction on a separate line in a separate quoted string, and end each string except the last with `\n\t` to properly indent the next instruction in the assembly output:

```
asm ("magic %reg1, #42\n\t"
     "more_magic %reg2, %reg3"
     : /* outputs */ : /* inputs */ : /* clobbers */);
```

## \* 21) Conditional Compilation

Wherever possible, don't use preprocessor conditionals (`#if`, `#ifdef`) in .c files; doing so makes code harder to read and logic harder to follow. Instead, use such conditionals in a header file defining functions for use in those .c files, providing no-op stub versions in the `#else` case, and then call those functions unconditionally from .c files. The compiler will avoid generating any code for the stub calls, producing identical results, but the logic will remain easy to follow.

Prefer to compile out entire functions, rather than portions of functions or portions of expressions. Rather than putting an `ifdef` in an expression, factor out part or all of the expression into a separate helper function and apply the conditional to that function.

If you have a function or variable which may potentially go unused in a particular configuration, and the compiler would warn about its definition going unused, mark the definition as `_maybe_unused` rather than wrapping it in a preprocessor conditional. (However, if a function or variable always goes unused, delete it.)

Within code, where possible, use the `IS_ENABLED` macro to convert a Kconfig symbol into a C boolean expression, and use it in a normal C conditional:

```
if (IS_ENABLED(CONFIG_SOMETHING)) {
    ...
}
```

The compiler will constant-fold the conditional away, and include or exclude the block of code just as with an `#ifdef`, so this will not add any runtime overhead. However, this approach still allows the C compiler to see the code inside the block, and check it for correctness (syntax, types, symbol references, etc). Thus, you still have to use an `#ifdef` if the code inside the block references symbols that will not exist if the condition is not met.

At the end of any non-trivial `#if` or `#ifdef` block (more than a few lines), place a comment after the `#endif` on the same line, noting the conditional expression used. For instance:

```
#ifdef CONFIG_SOMETHING
...
#endif /* CONFIG_SOMETHING */
```

## \* Appendix I) References

The C Programming Language, Second Edition by Brian W. Kernighan and Dennis M. Ritchie. Prentice Hall, Inc., 1988. ISBN 0-13-110362-8 (paperback), 0-13-110370-9 (hardback).

The Practice of Programming by Brian W. Kernighan and Rob Pike. Addison-Wesley, Inc., 1999. ISBN 0-201-61586-X.

GNU manuals - where in compliance with K&R and this text - for `cpp`, `gcc`, `gcc internals` and `indent`, all available from <http://www.gnu.org/manual/>

WG14 is the international standardization working group for the programming language C, URL: <http://www.open-std.org/JTC1/SC22/WG14/>

Kernel process/coding-style.rst, by [greg@kroah.com](mailto:greg@kroah.com) at OLS 2002: [http://www.kroah.com/linux/talks/ols\\_2002\\_kernel\\_codingstyle\\_talk/html/](http://www.kroah.com/linux/talks/ols_2002_kernel_codingstyle_talk/html/)



## KERNEL MAINTAINER PGP GUIDE

**Author** Konstantin Ryabitsev <[konstantin@linuxfoundation.org](mailto:konstantin@linuxfoundation.org)>

This document is aimed at Linux kernel developers, and especially at subsystem maintainers. It contains a subset of information discussed in the more general “[Protecting Code Integrity](#)” guide published by the Linux Foundation. Please read that document for more in-depth discussion on some of the topics mentioned in this guide.

### \* **The role of PGP in Linux Kernel development**

PGP helps ensure the integrity of the code that is produced by the Linux kernel development community and, to a lesser degree, establish trusted communication channels between developers via PGP-signed email exchange.

The Linux kernel source code is available in two main formats:

- Distributed source repositories (git)
- Periodic release snapshots (tarballs)

Both git repositories and tarballs carry PGP signatures of the kernel developers who create official kernel releases. These signatures offer a cryptographic guarantee that downloadable versions made available via [kernel.org](http://kernel.org) or any other mirrors are identical to what these developers have on their workstations. To this end:

- git repositories provide PGP signatures on all tags
- tarballs provide detached PGP signatures with all downloads

### \* **Trusting the developers, not infrastructure**

Ever since the 2011 compromise of core [kernel.org](http://kernel.org) systems, the main operating principle of the Kernel Archives project has been to assume that any part of the infrastructure can be compromised at any time. For this reason, the administrators have taken deliberate steps to emphasize that trust must always be placed with developers and never with the code hosting infrastructure, regardless of how good the security practices for the latter may be.

The above guiding principle is the reason why this guide is needed. We want to make sure that by placing trust into developers we do not simply shift the blame for potential future security incidents to someone else. The goal is to provide a

set of guidelines developers can use to create a secure working environment and safeguard the PGP keys used to establish the integrity of the Linux kernel itself.

### \* PGP tools

#### \* Use GnuPG v2

Your distro should already have GnuPG installed by default, you just need to verify that you are using version 2.x and not the legacy 1.4 release – many distributions still package both, with the default gpg command invoking GnuPG v.1. To check, run:

```
$ gpg --version | head -n1
```

If you see gpg (GnuPG) 1.4.x, then you are using GnuPG v.1. Try the gpg2 command (if you don't have it, you may need to install the gnupg2 package):

```
$ gpg2 --version | head -n1
```

If you see gpg (GnuPG) 2.x.x, then you are good to go. This guide will assume you have the version 2.2 of GnuPG (or later). If you are using version 2.0 of GnuPG, then some of the commands in this guide will not work, and you should consider installing the latest 2.2 version of GnuPG. Versions of gnupg-2.1.11 and later should be compatible for the purposes of this guide as well.

If you have both gpg and gpg2 commands, you should make sure you are always using GnuPG v2, not the legacy version. You can enforce this by setting the appropriate alias:

```
$ alias gpg=gpg2
```

You can put that in your .bashrc to make sure it's always the case.

### Configure gpg-agent options

The GnuPG agent is a helper tool that will start automatically whenever you use the gpg command and run in the background with the purpose of caching the private key passphrase. There are two options you should know in order to tweak when the passphrase should be expired from cache:

- **default-cache-ttl (seconds)**: If you use the same key again before the time-to-live expires, the countdown will reset for another period. The default is 600 (10 minutes).
- **max-cache-ttl (seconds)**: Regardless of how recently you've used the key since initial passphrase entry, if the maximum time-to-live countdown expires, you'll have to enter the passphrase again. The default is 30 minutes.

If you find either of these defaults too short (or too long), you can edit your ~/.gnupg/gpg-agent.conf file to set your own values:

```
# set to 30 minutes for regular ttl, and 2 hours for max ttl
default-cache-ttl 1800
max-cache-ttl 7200
```

---

**Note:** It is no longer necessary to start gpg-agent manually at the beginning of your shell session. You may want to check your rc files to remove anything you had in place for older versions of GnuPG, as it may not be doing the right thing any more.

---

## Set up a refresh cronjob

You will need to regularly refresh your keyring in order to get the latest changes on other people's public keys, which is best done with a daily cronjob:

```
@daily /usr/bin/gpg2 --refresh >/dev/null 2>&1
```

Check the full path to your gpg or gpg2 command and use the gpg2 command if regular gpg for you is the legacy GnuPG v.1.

## \* Protect your master PGP key

This guide assumes that you already have a PGP key that you use for Linux kernel development purposes. If you do not yet have one, please see the “[Protecting Code Integrity](#)” document mentioned earlier for guidance on how to create a new one.

You should also make a new key if your current one is weaker than 2048 bits (RSA).

### \* Master key vs. Subkeys

Subkeys are fully independent PGP keypairs that are tied to the “master” key using certifying key signatures (certificates). It is important to understand the following:

1. There are no technical differences between the “master key” and “subkeys.”
2. At creation time, we assign functional limitations to each key by giving it specific capabilities.
3. A PGP key can have 4 capabilities:
  - **[S]** key can be used for signing
  - **[E]** key can be used for encryption
  - **[A]** key can be used for authentication
  - **[C]** key can be used for certifying other keys
4. A single key may have multiple capabilities.

5. A subkey is fully independent from the master key. A message encrypted to a subkey cannot be decrypted with the master key. If you lose your private subkey, it cannot be recreated from the master key in any way.

The key carrying the **[C]** (certify) capability is considered the “master” key because it is the only key that can be used to indicate relationship with other keys. Only the **[C]** key can be used to:

- add or revoke other keys (subkeys) with S/E/A capabilities
- add, change or revoke identities (uids) associated with the key
- add or change the expiration date on itself or any subkey
- sign other people’ s keys for web of trust purposes

By default, GnuPG creates the following when generating new keys:

- A master key carrying both Certify and Sign capabilities (**[SC]**)
- A separate subkey with the Encryption capability (**[E]**)

If you used the default parameters when generating your key, then that is what you will have. You can verify by running `gpg --list-secret-keys`, for example:

```
sec    rsa2048 2018-01-23 [SC] [expires: 2020-01-23]
      00000000000000000000000000000000AAAABBBCCCCDDDD
uid          [ultimate] Alice Dev <audev@kernel.org>
ssb    rsa2048 2018-01-23 [E] [expires: 2020-01-23]
```

Any key carrying the **[C]** capability is your master key, regardless of any other capabilities it may have assigned to it.

The long line under the `sec` entry is your key fingerprint – whenever you see `[fpr]` in the examples below, that 40-character string is what it refers to.

### \* Ensure your passphrase is strong

GnuPG uses passphrases to encrypt your private keys before storing them on disk. This way, even if your `.gnupg` directory is leaked or stolen in its entirety, the attackers cannot use your private keys without first obtaining the passphrase to decrypt them.

It is absolutely essential that your private keys are protected by a strong passphrase. To set it or change it, use:

```
$ gpg --change-passphrase [fpr]
```

## \* Create a separate Signing subkey

Our goal is to protect your master key by moving it to offline media, so if you only have a combined **[SC]** key, then you should create a separate signing subkey:

```
$ gpg --quick-addkey [fpr] ed25519 sign
```

Remember to tell the keyservers about this change, so others can pull down your new subkey:

```
$ gpg --send-key [fpr]
```

---

### Note: ECC support in GnuPG

GnuPG 2.1 and later has full support for Elliptic Curve Cryptography, with ability to combine ECC subkeys with traditional RSA master keys. The main upside of ECC cryptography is that it is much faster computationally and creates much smaller signatures when compared byte for byte with 2048+ bit RSA keys. Unless you plan on using a smartcard device that does not support ECC operations, we recommend that you create an ECC signing subkey for your kernel work.

If for some reason you prefer to stay with RSA subkeys, just replace “ed25519” with “rsa2048” in the above command. Additionally, if you plan to use a hardware device that does not support ED25519 ECC keys, like Nitrokey Pro or a Yubikey, then you should use “nistp256” instead or “ed25519.”

---

## \* Back up your master key for disaster recovery

The more signatures you have on your PGP key from other developers, the more reasons you have to create a backup version that lives on something other than digital media, for disaster recovery reasons.

The best way to create a printable hardcopy of your private key is by using the paperkey software written for this very purpose. See `man paperkey` for more details on the output format and its benefits over other solutions. Paperkey should already be packaged for most distributions.

Run the following command to create a hardcopy backup of your private key:

```
$ gpg --export-secret-key [fpr] | paperkey -o /tmp/key-backup.txt
```

Print out that file (or pipe the output straight to lpr), then take a pen and write your passphrase on the margin of the paper. **This is strongly recommended** because the key printout is still encrypted with that passphrase, and if you ever change it you will not remember what it used to be when you had created the backup – guaranteed.

Put the resulting printout and the hand-written passphrase into an envelope and store in a secure and well-protected place, preferably away from your home, such as your bank vault.

---

**Note:** Your printer is probably no longer a simple dumb device connected to your parallel port, but since the output is still encrypted with your passphrase, printing out even to “cloud-integrated” modern printers should remain a relatively safe operation. One option is to change the passphrase on your master key immediately after you are done with paperkey.

---

### \* Back up your whole GnuPG directory

**Warning: !!!Do not skip this step!!!**

It is important to have a readily available backup of your PGP keys should you need to recover them. This is different from the disaster-level preparedness we did with paperkey. You will also rely on these external copies whenever you need to use your Certify key – such as when making changes to your own key or signing other people’s keys after conferences and summits.

Start by getting a small USB “thumb” drive (preferably two!) that you will use for backup purposes. You will need to encrypt them using LUKS – refer to your distro’s documentation on how to accomplish this.

For the encryption passphrase, you can use the same one as on your master key.

Once the encryption process is over, re-insert the USB drive and make sure it gets properly mounted. Copy your entire .gnupg directory over to the encrypted storage:

```
$ cp -a ~/.gnupg /media/disk/foo/gnupg-backup
```

You should now test to make sure everything still works:

```
$ gpg --homedir=/media/disk/foo/gnupg-backup --list-key [fpr]
```

If you don’t get any errors, then you should be good to go. Unmount the USB drive, distinctly label it so you don’t blow it away next time you need to use a random USB drive, and put in a safe place – but not too far away, because you’ll need to use it every now and again for things like editing identities, adding or revoking subkeys, or signing other people’s keys.

### \* Remove the master key from your homedir

The files in our home directory are not as well protected as we like to think. They can be leaked or stolen via many different means:

- by accident when making quick homedir copies to set up a new workstation
- by systems administrator negligence or malice
- via poorly secured backups
- via malware in desktop apps (browsers, pdf viewers, etc)

- via coercion when crossing international borders

Protecting your key with a good passphrase greatly helps reduce the risk of any of the above, but passphrases can be discovered via keyloggers, shoulder-surfing, or any number of other means. For this reason, the recommended setup is to remove your master key from your home directory and store it on offline storage.

**Warning:** Please see the previous section and make sure you have backed up your GnuPG directory in its entirety. What we are about to do will render your key useless if you do not have a usable backup!

First, identify the keygrip of your master key:

```
$ gpg --with-keygrip --list-key [fpr]
```

The output will be something like this:

Find the keygrip entry that is beneath the pub line (right under the master key fingerprint). This will correspond directly to a file in your `~/.gnupg` directory:

All you have to do is simply remove the .key file that corresponds to the master keygrip:

Now, if you issue the `--list-secret-keys` command, it will show that the master key is missing (the # indicates it is not available):

```
$ gpg --list-secret-keys
sec# rsa2048 2018-01-24 [SC] [expires: 2020-01-24]
          00000000000000000000000000AAAABBBBCCCCDDDD
uid          [ultimate] Alice Dev <adev@kernel.org>
ssb  rsa2048 2018-01-24 [E] [expires: 2020-01-24]
ssb  ed25519 2018-01-24 [S]
```

You should also remove any `secring.gpg` files in the `~/.gnupg` directory, which are left over from earlier versions of GnuPG.

### If you don't have the “private-keys-v1.d” directory

If you do not have a `~/.gnupg/private-keys-v1.d` directory, then your secret keys are still stored in the legacy `secring.gpg` file used by GnuPG v1. Making any changes to your key, such as changing the passphrase or adding a subkey, should automatically convert the old `secring.gpg` format to use `private-keys-v1.d` instead.

Once you get that done, make sure to delete the obsolete `secring.gpg` file, which still contains your private keys.

### \* Move the subkeys to a dedicated crypto device

Even though the master key is now safe from being leaked or stolen, the subkeys are still in your home directory. Anyone who manages to get their hands on those will be able to decrypt your communication or fake your signatures (if they know the passphrase). Furthermore, each time a GnuPG operation is performed, the keys are loaded into system memory and can be stolen from there by sufficiently advanced malware (think Meltdown and Spectre).

The best way to completely protect your keys is to move them to a specialized hardware device that is capable of smartcard operations.

#### \* The benefits of smartcards

A smartcard contains a cryptographic chip that is capable of storing private keys and performing crypto operations directly on the card itself. Because the key contents never leave the smartcard, the operating system of the computer into which you plug in the hardware device is not able to retrieve the private keys themselves. This is very different from the encrypted USB storage device we used earlier for backup purposes – while that USB device is plugged in and mounted, the operating system is able to access the private key contents.

Using external encrypted USB media is not a substitute to having a smartcard-capable device.

#### \* Available smartcard devices

Unless all your laptops and workstations have smartcard readers, the easiest is to get a specialized USB device that implements smartcard functionality. There are several options available:

- **Nitrokey Start**: Open hardware and Free Software, based on FSI Japan’s [Gnuk](#). One of the few available commercial devices that support ED25519 ECC keys, but offer fewest security features (such as resistance to tampering or some side-channel attacks).
- **Nitrokey Pro 2**: Similar to the Nitrokey Start, but more tamper-resistant and offers more security features. Pro 2 supports ECC cryptography (NISTP).

- [Yubikey 5](#): proprietary hardware and software, but cheaper than Nitrokey Pro and comes available in the USB-C form that is more useful with newer laptops. Offers additional security features such as FIDO U2F, among others, and now finally supports ECC keys (NISTP).

LWN has a good review of some of the above models, as well as several others. Your choice will depend on cost, shipping availability in your geographical region, and open/proprietary hardware considerations.

---

**Note:** If you are listed in MAINTAINERS or have an account at kernel.org, you qualify for a free Nitrokey Start courtesy of The Linux Foundation.

---

## \* Configure your smartcard device

Your smartcard device should Just Work (TM) the moment you plug it into any modern Linux workstation. You can verify it by running:

```
$ gpg --card-status
```

If you see full smartcard details, then you are good to go. Unfortunately, troubleshooting all possible reasons why things may not be working for you is way beyond the scope of this guide. If you are having trouble getting the card to work with GnuPG, please seek help via usual support channels.

To configure your smartcard, you will need to use the GnuPG menu system, as there are no convenient command-line switches:

```
$ gpg --card-edit
[...omitted...]
gpg/card> admin
Admin commands are allowed
gpg/card> passwd
```

You should set the user PIN (1), Admin PIN (3), and the Reset Code (4). Please make sure to record and store these in a safe place - especially the Admin PIN and the Reset Code (which allows you to completely wipe the smartcard). You so rarely need to use the Admin PIN, that you will inevitably forget what it is if you do not record it.

Getting back to the main card menu, you can also set other values (such as name, sex, login data, etc), but it's not necessary and will additionally leak information about your smartcard should you lose it.

---

**Note:** Despite having the name “PIN”, neither the user PIN nor the admin PIN on the card need to be numbers.

---

**Warning:** Some devices may require that you move the subkeys onto the device before you can change the passphrase. Please check the documentation provided by the device manufacturer.

### \* Move the subkeys to your smartcard

Exit the card menu (using “q”) and save all changes. Next, let’s move your subkeys onto the smartcard. You will need both your PGP key passphrase and the admin PIN of the card for most operations:

```
$ gpg --edit-key [fpr]  
  
Secret subkeys are available.  
  
pub rsa2048/AAAABBBBCCCCDDDD  
      created: 2018-01-23 expires: 2020-01-23 usage: SC  
      trust: ultimate validity: ultimate  
ssb  rsa2048/1111222233334444  
      created: 2018-01-23 expires: never usage: E  
ssb  ed25519/5555666677778888  
      created: 2017-12-07 expires: never usage: S  
[ultimate] (1). Alice Dev <audev@kernel.org>  
  
gpg>
```

Using `--edit-key` puts us into the menu mode again, and you will notice that the key listing is a little different. From here on, all commands are done from inside this menu mode, as indicated by `gpg>`.

First, let’s select the key we’ll be putting onto the card – you do this by typing `key 1` (it’s the first one in the listing, the **[E]** subkey):

```
gpg> key 1
```

In the output, you should now see `ssb*` on the **[E]** key. The \* indicates which key is currently “selected.” It works as a toggle, meaning that if you type `key 1` again, the \* will disappear and the key will not be selected any more.

Now, let’s move that key onto the smartcard:

```
gpg> keytocard  
Please select where to store the key:  
 (2) Encryption key  
Your selection? 2
```

Since it’s our **[E]** key, it makes sense to put it into the Encryption slot. When you submit your selection, you will be prompted first for your PGP key passphrase, and then for the admin PIN. If the command returns without an error, your key has been moved.

**Important:** Now type `key 1` again to unselect the first key, and `key 2` to select the **[S]** key:

```
gpg> key 1  
gpg> key 2  
gpg> keytocard  
Please select where to store the key:  
 (1) Signature key  
 (3) Authentication key  
Your selection? 1
```

You can use the **[S]** key both for Signature and Authentication, but we want to make sure it's in the Signature slot, so choose (1). Once again, if your command returns without an error, then the operation was successful:

```
gpg> q
Save changes? (y/N) y
```

Saving the changes will delete the keys you moved to the card from your home directory (but it's okay, because we have them in our backups should we need to do this again for a replacement smartcard).

### Verifying that the keys were moved

If you perform `--list-secret-keys` now, you will see a subtle difference in the output:

```
$ gpg --list-secret-keys
sec# rsa2048 2018-01-24 [SC] [expires: 2020-01-24]
    000000000000000000000000AAAABBBCCCCDDDD
uid          [ultimate] Alice Dev <audev@kernel.org>
ssb> rsa2048 2018-01-24 [E] [expires: 2020-01-24]
ssb> ed25519 2018-01-24 [S]
```

The `>` in the `ssb>` output indicates that the subkey is only available on the smartcard. If you go back into your secret keys directory and look at the contents there, you will notice that the `.key` files there have been replaced with stubs:

```
$ cd ~/.gnupg/private-keys-v1.d
$ strings *.key | grep 'private-key'
```

The output should contain `shadowed-private-key` to indicate that these files are only stubs and the actual content is on the smartcard.

### Verifying that the smartcard is functioning

To verify that the smartcard is working as intended, you can create a signature:

```
$ echo "Hello world" | gpg --clearsign > /tmp/test.asc
$ gpg --verify /tmp/test.asc
```

This should ask for your smartcard PIN on your first command, and then show "Good signature" after you run `gpg --verify`.

Congratulations, you have successfully made it extremely difficult to steal your digital developer identity!

### \* Other common GnuPG operations

Here is a quick reference for some common operations you'll need to do with your PGP key.

#### Mounting your master key offline storage

You will need your master key for any of the operations below, so you will first need to mount your backup offline storage and tell GnuPG to use it:

```
$ export GNUPGHOME=/media/disk/foo/gnupg-backup  
$ gpg --list-secret-keys
```

You want to make sure that you see sec and not sec# in the output (the # means the key is not available and you're still using your regular home directory location).

#### Extending key expiration date

The master key has the default expiration date of 2 years from the date of creation. This is done both for security reasons and to make obsolete keys eventually disappear from keyservers.

To extend the expiration on your key by a year from current date, just run:

```
$ gpg --quick-set-expire [fpr] 1y
```

You can also use a specific date if that is easier to remember (e.g. your birthday, January 1st, or Canada Day):

```
$ gpg --quick-set-expire [fpr] 2020-07-01
```

Remember to send the updated key back to keyservers:

```
$ gpg --send-key [fpr]
```

#### Updating your work directory after any changes

After you make any changes to your key using the offline storage, you will want to import these changes back into your regular working directory:

```
$ gpg --export | gpg --homedir ~/.gnupg --import  
$ unset GNUPGHOME
```

## Using gpg-agent over ssh

You can forward your gpg-agent over ssh if you need to sign tags or commits on a remote system. Please refer to the instructions provided on the GnuPG wiki:

- [Agent Forwarding over SSH](#)

It works more smoothly if you can modify the sshd server settings on the remote end.

## \* Using PGP with Git

One of the core features of Git is its decentralized nature – once a repository is cloned to your system, you have full history of the project, including all of its tags, commits and branches. However, with hundreds of cloned repositories floating around, how does anyone verify that their copy of linux.git has not been tampered with by a malicious third party?

Or what happens if a backdoor is discovered in the code and the “Author” line in the commit says it was done by you, while you’re pretty sure you had [nothing to do with it](#)?

To address both of these issues, Git introduced PGP integration. Signed tags prove the repository integrity by assuring that its contents are exactly the same as on the workstation of the developer who created the tag, while signed commits make it nearly impossible for someone to impersonate you without having access to your PGP keys.

### \* Configure git to use your PGP key

If you only have one secret key in your keyring, then you don’t really need to do anything extra, as it becomes your default key. However, if you happen to have multiple secret keys, you can tell git which key should be used ([fpr] is the fingerprint of your key):

```
$ git config --global user.signingKey [fpr]
```

**IMPORTANT:** If you have a distinct gpg2 command, then you should tell git to always use it instead of the legacy gpg from version 1:

```
$ git config --global gpg.program gpg2
$ git config --global gpgv.program gpgv2
```

### \* How to work with signed tags

To create a signed tag, simply pass the `-s` switch to the tag command:

```
$ git tag -s [tagname]
```

Our recommendation is to always sign git tags, as this allows other developers to ensure that the git repository they are pulling from has not been maliciously altered.

### How to verify signed tags

To verify a signed tag, simply use the `verify-tag` command:

```
$ git verify-tag [tagname]
```

If you are pulling a tag from another fork of the project repository, git should automatically verify the signature at the tip you're pulling and show you the results during the merge operation:

```
$ git pull [url] tags/sometag
```

The merge message will contain something like this:

```
Merge tag 'sometag' of [url]  
[Tag message]  
# gpg: Signature made [...]  
# gpg: Good signature from [...]
```

If you are verifying someone else's git tag, then you will need to import their PGP key. Please refer to the "How to verify kernel developer identities" section below.

---

**Note:** If you get "gpg: Can't check signature: unknown pubkey algorithm" error, you need to tell git to use gpgv2 for verification, so it properly processes signatures made by ECC keys. See instructions at the start of this section.

---

### Configure git to always sign annotated tags

Chances are, if you're creating an annotated tag, you'll want to sign it. To force git to always sign annotated tags, you can set a global configuration option:

```
$ git config --global tag.forceSignAnnotated true
```

## \* How to work with signed commits

It is easy to create signed commits, but it is much more difficult to use them in Linux kernel development, since it relies on patches sent to the mailing list, and this workflow does not preserve PGP commit signatures. Furthermore, when rebasing your repository to match upstream, even your own PGP commit signatures will end up discarded. For this reason, most kernel developers don't bother signing their commits and will ignore signed commits in any external repositories that they rely upon in their work.

However, if you have your working git tree publicly available at some git hosting service (kernel.org, infradead.org, ozlabs.org, or others), then the recommendation is that you sign all your git commits even if upstream developers do not directly benefit from this practice.

We recommend this for the following reasons:

1. Should there ever be a need to perform code forensics or track code provenance, even externally maintained trees carrying PGP commit signatures will be valuable for such purposes.
2. If you ever need to re-clone your local repository (for example, after a disk failure), this lets you easily verify the repository integrity before resuming your work.
3. If someone needs to cherry-pick your commits, this allows them to quickly verify their integrity before applying them.

## Creating signed commits

To create a signed commit, you just need to pass the `-S` flag to the `git commit` command (it's capital `-S` due to collision with another flag):

```
$ git commit -S
```

## Configure git to always sign commits

You can tell git to always sign commits:

```
git config --global commit.gpgSign true
```

---

**Note:** Make sure you configure gpg-agent before you turn this on.

---

## \* How to verify kernel developer identities

Signing tags and commits is easy, but how does one go about verifying that the key used to sign something belongs to the actual kernel developer and not to a malicious imposter?

### \* Configure auto-key-retrieval using WKD and DANE

If you are not already someone with an extensive collection of other developers' public keys, then you can jumpstart your keyring by relying on key auto-discovery and auto-retrieval. GnuPG can piggyback on other delegated trust technologies, namely DNSSEC and TLS, to get you going if the prospect of starting your own Web of Trust from scratch is too daunting.

Add the following to your `~/.gnupg/gpg.conf`:

```
auto-key-locate wkd,dane,local  
auto-key-retrieve
```

DNS-Based Authentication of Named Entities ("DANE") is a method for publishing public keys in DNS and securing them using DNSSEC signed zones. Web Key Directory ("WKD") is the alternative method that uses https lookups for the same purpose. When using either DANE or WKD for looking up public keys, GnuPG will validate DNSSEC or TLS certificates, respectively, before adding auto-retrieved public keys to your local keyring.

Kernel.org publishes the WKD for all developers who have kernel.org accounts. Once you have the above changes in your `gpg.conf`, you can auto-retrieve the keys for Linus Torvalds and Greg Kroah-Hartman (if you don't already have them):

```
$ gpg --locate-keys torvalds@kernel.org gregkh@kernel.org
```

If you have a kernel.org account, then you should [add the kernel.org UID to your key](#) to make WKD more useful to other kernel developers.

### \* Web of Trust (WOT) vs. Trust on First Use (TOFU)

PGP incorporates a trust delegation mechanism known as the "Web of Trust." At its core, this is an attempt to replace the need for centralized Certification Authorities of the HTTPS/TLS world. Instead of various software makers dictating who should be your trusted certifying entity, PGP leaves this responsibility to each user.

Unfortunately, very few people understand how the Web of Trust works. While it remains an important aspect of the OpenPGP specification, recent versions of GnuPG (2.2 and above) have implemented an alternative mechanism called "Trust on First Use" (TOFU). You can think of TOFU as "the SSH-like approach to trust." With SSH, the first time you connect to a remote system, its key fingerprint is recorded and remembered. If the key changes in the future, the SSH client will alert you and refuse to connect, forcing you to make a decision on whether you choose to trust the changed key or not. Similarly, the first time you import someone's PGP key, it is assumed to be valid. If at any point in the future GnuPG comes across another key with the same identity, both the previously imported key and

the new key will be marked as invalid and you will need to manually figure out which one to keep.

We recommend that you use the combined TOFU+PGP trust model (which is the new default in GnuPG v2). To set it, add (or modify) the `trust-model` setting in `~/.gnupg/gpg.conf`:

```
trust-model tofu+pgp
```

### \* How to use keyservers (more) safely

If you get a “No public key” error when trying to validate someone’s tag, then you should attempt to lookup that key using a keyserver. It is important to keep in mind that there is absolutely no guarantee that the key you retrieve from PGP keyservers belongs to the actual person – that much is by design. You are supposed to use the Web of Trust to establish key validity.

How to properly maintain the Web of Trust is beyond the scope of this document, simply because doing it properly requires both effort and dedication that tends to be beyond the caring threshold of most human beings. Here are some shortcuts that will help you reduce the risk of importing a malicious key.

First, let’s say you’ve tried to run `git verify-tag` but it returned an error saying the key is not found:

```
$ git verify-tag sunxi-fixes-for-4.15-2
gpg: Signature made Sun 07 Jan 2018 10:51:55 PM EST
gpg:                               using RSA key DA73759BF8619E484E5A3B47389A54219C0F2430
gpg:                               issuer "wens@...org"
gpg: Can't check signature: No public key
```

Let’s query the keyserver for more info about that key fingerprint (the fingerprint probably belongs to a subkey, so we can’t use it directly without finding out the ID of the master key it is associated with):

```
$ gpg --search DA73759BF8619E484E5A3B47389A54219C0F2430
gpg: data source: hkp://keys.gnupg.net
(1) Chen-Yu Tsai <wens@...org>
    4096 bit RSA key C94035C21B4F2AEB, created: 2017-03-14, expires: 2019-03-15
    Keys 1-1 of 1 for "DA73759BF8619E484E5A3B47389A54219C0F2430". Enter
    ↵number(s), N(ext), or Q(uit) > q
```

Locate the ID of the master key in the output, in our example `C94035C21B4F2AEB`. Now display the key of Linus Torvalds that you have on your keyring:

```
$ gpg --list-key torvalds@kernel.org
pub    rsa2048 2011-09-20 [SC]
      ABAF11C65A2970B130ABE3C479BE3E4300411886
uid          [ unknown] Linus Torvalds <torvalds@kernel.org>
sub    rsa2048 2011-09-20 [E]
```

Next, open the [PGP pathfinder](#). In the “From” field, paste the key fingerprint of Linus Torvalds from the output above. In the “To” field, paste the key-id you found via `gpg --search` of the unknown key, and check the results:

- **Finding paths to Linus**

If you get a few decent trust paths, then it's a pretty good indication that it is a valid key. You can add it to your keyring from the keyserver now:

```
$ gpg --recv-key C94035C21B4F2AEB
```

This process is not perfect, and you are obviously trusting the administrators of the PGP Pathfinder service to not be malicious (in fact, this goes against Trusting the developers, not infrastructure). However, if you do not carefully maintain your own web of trust, then it is a marked improvement over blindly trusting keyservers.

## EMAIL CLIENTS INFO FOR LINUX

### \* **Git**

These days most developers use `git send-email` instead of regular email clients. The man page for this is quite good. On the receiving end, maintainers use `git am` to apply the patches.

If you are new to `git` then send your first patch to yourself. Save it as raw text including all the headers. Run `git am raw_email.txt` and then review the changelog with `git log`. When that works then send the patch to the appropriate mailing list(s).

### \* **General Preferences**

Patches for the Linux kernel are submitted via email, preferably as inline text in the body of the email. Some maintainers accept attachments, but then the attachments should have content-type `text/plain`. However, attachments are generally frowned upon because it makes quoting portions of the patch more difficult in the patch review process.

Email clients that are used for Linux kernel patches should send the patch text untouched. For example, they should not modify or delete tabs or spaces, even at the beginning or end of lines.

Don't send patches with `format=flowed`. This can cause unexpected and unwanted line breaks.

Don't let your email client do automatic word wrapping for you. This can also corrupt your patch.

Email clients should not modify the character set encoding of the text. Emailed patches should be in ASCII or UTF-8 encoding only. If you configure your email client to send emails with UTF-8 encoding, you avoid some possible charset problems.

Email clients should generate and maintain "References:" or "In-Reply-To:" headers so that mail threading is not broken.

Copy-and-paste (or cut-and-paste) usually does not work for patches because tabs are converted to spaces. Using `xclipboard`, `xclip`, and/or `xcutsel` may work, but it's best to test this for yourself or just avoid copy-and-paste.

Don't use PGP/GPG signatures in mail that contains patches. This breaks many scripts that read and apply the patches. (This should be fixable.)

It's a good idea to send a patch to yourself, save the received message, and successfully apply it with 'patch' before sending patches to Linux mailing lists.

### \* Some email client (MUA) hints

Here are some specific MUA configuration hints for editing and sending patches for the Linux kernel. These are not meant to be complete software package configuration summaries.

Legend:

- TUI = text-based user interface
- GUI = graphical user interface

#### \* Alpine (TUI)

Config options:

In the Sending Preferences section:

- Do Not Send Flowed Text must be **enabled**
- Strip Whitespace Before Sending must be **disabled**

When composing the message, the cursor should be placed where the patch should appear, and then pressing CTRL-R let you specify the patch file to insert into the message.

#### \* Claws Mail (GUI)

Works. Some people use this successfully for patches.

To insert a patch use Message→Insert File (CTRL-I) or an external editor.

If the inserted patch has to be edited in the Claws composition window "Auto wrapping" in Configuration→Preferences→Compose→Wrapping should be disabled.

#### \* Evolution (GUI)

Some people use this successfully for patches.

**When composing mail select: Preformat** from Format→Paragraph  
Style→Preformatted (CTRL-7) or the toolbar

Then use: Insert→Text File… (ALT-N x) to insert the patch.

You can also `diff -Nru old.c new.c | xclip`, select Preformat, then paste with the middle button.

## \* Kmail (GUI)

Some people use Kmail successfully for patches.

The default setting of not composing in HTML is appropriate; do not enable it.

When composing an email, under options, uncheck “word wrap”. The only disadvantage is any text you type in the email will not be word-wrapped so you will have to manually word wrap text before the patch. The easiest way around this is to compose your email with word wrap enabled, then save it as a draft. Once you pull it up again from your drafts it is now hard word-wrapped and you can uncheck “word wrap” without losing the existing wrapping.

At the bottom of your email, put the commonly-used patch delimiter before inserting your patch: three hyphens (---).

Then from the Message menu item, select insert file and choose your patch. As an added bonus you can customise the message creation toolbar menu and put the insert file icon there.

Make the composer window wide enough so that no lines wrap. As of KMail 1.13.5 (KDE 4.5.4), KMail will apply word wrapping when sending the email if the lines wrap in the composer window. Having word wrapping disabled in the Options menu isn’t enough. Thus, if your patch has very long lines, you must make the composer window very wide before sending the email. See: [https://bugs.kde.org/show\\_bug.cgi?id=174034](https://bugs.kde.org/show_bug.cgi?id=174034)

You can safely GPG sign attachments, but inlined text is preferred for patches so do not GPG sign them. Signing patches that have been inserted as inlined text will make them tricky to extract from their 7-bit encoding.

If you absolutely must send patches as attachments instead of inlining them as text, right click on the attachment and select properties, and highlight Suggest automatic display to make the attachment inlined to make it more viewable.

When saving patches that are sent as inlined text, select the email that contains the patch from the message list pane, right click and select save as. You can use the whole email unmodified as a patch if it was properly composed. Emails are saved as read-write for user only so you will have to chmod them to make them group and world readable if you copy them elsewhere.

### \* **Lotus Notes (GUI)**

Run away from it.

### \* **IBM Verse (Web GUI)**

See Lotus Notes.

### \* **Mutt (TUI)**

Plenty of Linux developers use `mutt`, so it must work pretty well.

Mutt doesn't come with an editor, so whatever editor you use should be used in a way that there are no automatic linebreaks. Most editors have an insert file option that inserts the contents of a file unaltered.

To use `vim` with mutt:

```
set editor="vi"
```

If using `xclip`, type the command:

```
:set paste
```

before middle button or shift-insert or use:

```
:r filename
```

if you want to include the patch inline. `(a)ttach` works fine without `set paste`.

You can also generate patches with `git format-patch` and then use Mutt to send them:

```
$ mutt -H 0001-some-bug-fix.patch
```

Config options:

It should work with default settings. However, it's a good idea to set the `send_charset` to:

```
set send_charset="us-ascii:utf-8"
```

Mutt is highly customizable. Here is a minimum configuration to start using Mutt to send patches through Gmail:

```
# .muttrc
# ====== IMAP ======
set imap_user = 'yourusername@gmail.com'
set imap_pass = 'yourpassword'
set spoolfile = imaps://imap.gmail.com/INBOX
set folder = imaps://imap.gmail.com/
set record="imaps://imap.gmail.com/[Gmail]/Sent Mail"
set postponed="imaps://imap.gmail.com/[Gmail]/Drafts"
set mbox="imaps://imap.gmail.com/[Gmail]/All Mail"
```

(continues on next page)

(continued from previous page)

```
# ===== SMTP =====
set smtp_url = "smtp://username@smtp.gmail.com:587/"
set smtp_pass = $imap_pass
set ssl_force_tls = yes # Require encrypted connection

# ===== Composition =====
set editor = `echo \$EDITOR`
set edit_headers = yes # See the headers when editing
set charset = UTF-8 # value of $LANG; also fallback for send_charset
# Sender, email address, and sign-off line must match
unset use_domain # because joe@localhost is just embarrassing
set realname = "YOUR NAME"
set from = "username@gmail.com"
set use_from = yes
```

The Mutt docs have lots more information:

<https://gitlab.com/muttmua/mutt/-/wikis/UseCases/Gmail>

<http://www.mutt.org/doc/manual/>

## \* Pine (TUI)

Pine has had some whitespace truncation issues in the past, but these should all be fixed now.

Use alpine (pine's successor) if you can.

Config options:

- quell-flowed-text is needed for recent versions
- the no-strip-whitespace-before-send option is needed

## \* Sylpheed (GUI)

- Works well for inlining text (or using attachments).
- Allows use of an external editor.
- Is slow on large folders.
- Won't do TLS SMTP auth over a non-SSL connection.
- Has a helpful ruler bar in the compose window.
- Adding addresses to address book doesn't understand the display name properly.

### \* **Thunderbird (GUI)**

Thunderbird is an Outlook clone that likes to mangle text, but there are ways to coerce it into behaving.

- Allow use of an external editor: The easiest thing to do with Thunderbird and patches is to use an “external editor” extension and then just use your favorite \$EDITOR for reading/merging patches into the body text. To do this, download and install the extension, then add a button for it using View→Toolbars→Customize… and finally just click on it when in the Compose dialog.

Please note that “external editor” requires that your editor must not fork, or in other words, the editor must not return before closing. You may have to pass additional flags or change the settings of your editor. Most notably if you are using gvim then you must pass the -f option to gvim by putting /usr/bin/gvim -f (if the binary is in /usr/bin) to the text editor field in external editor settings. If you are using some other editor then please read its manual to find out how to do this.

To beat some sense out of the internal editor, do this:

- Edit your Thunderbird config settings so that it won’t use `format=flowed`. Go to edit→preferences→advanced→config editor to bring up the thunderbird’s registry editor.
- Set `mailnews.send_plaintext_flowed` to `false`
- Set `mailnews.wraplength` from 72 to 0
- View→Message Body As→Plain Text
- View→Character Encoding→Unicode (UTF-8)

### \* **TkRat (GUI)**

Works. Use “Insert file…” or external editor.

### \* **Gmail (Web GUI)**

Does not work for sending patches.

Gmail web client converts tabs to spaces automatically.

At the same time it wraps lines every 78 chars with CRLF style line breaks although tab2space problem can be solved with external editor.

Another problem is that Gmail will base64-encode any message that has a non-ASCII character. That includes things like European names.

---

**CHAPTER  
ELEVEN**

---

## **LINUX KERNEL ENFORCEMENT STATEMENT**

As developers of the Linux kernel, we have a keen interest in how our software is used and how the license for our software is enforced. Compliance with the reciprocal sharing obligations of GPL-2.0 is critical to the long-term sustainability of our software and community.

Although there is a right to enforce the separate copyright interests in the contributions made to our community, we share an interest in ensuring that individual enforcement actions are conducted in a manner that benefits our community and do not have an unintended negative impact on the health and growth of our software ecosystem. In order to deter unhelpful enforcement actions, we agree that it is in the best interests of our development community to undertake the following commitment to users of the Linux kernel on behalf of ourselves and any successors to our copyright interests:

Notwithstanding the termination provisions of the GPL-2.0, we agree that it is in the best interests of our development community to adopt the following provisions of GPL-3.0 as additional permissions under our license with respect to any non-defensive assertion of rights under the license.

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Our intent in providing these assurances is to encourage more use of the software. We want companies and individuals to use, modify and distribute this software. We want to work with users in an open and transparent way to eliminate any uncertainty about our expectations regarding compliance or enforcement that might limit adoption of our software. We view legal action as a last resort, to be initiated only when other community efforts have failed to resolve the problem.

Finally, once a non-compliance issue is resolved, we hope the user will feel welcome to join us in our efforts on this project. Working together, we will be stronger.

Except where noted below, we speak only for ourselves, and not for any company we might work for today, have in the past, or will in the future.

- Laura Abbott
- Bjorn Andersson (Linaro)
- Andrea Arcangeli
- Neil Armstrong
- Jens Axboe
- Pablo Neira Ayuso
- Khalid Aziz
- Ralf Baechle
- Felipe Balbi
- Arnd Bergmann
- Ard Biesheuvel
- Tim Bird
- Paolo Bonzini
- Christian Borntraeger
- Mark Brown (Linaro)
- Paul Burton
- Javier Martinez Canillas
- Rob Clark
- Kees Cook (Google)
- Jonathan Corbet
- Dennis Dalessandro
- Vivien Didelot (Savoir-faire Linux)
- Hans de Goede
- Mel Gorman (SUSE)
- Sven Eckelmann
- Alex Elder (Linaro)
- Fabio Estevam
- Larry Finger
- Bhumika Goyal
- Andy Gross
- Juergen Gross

- Shawn Guo
- Ulf Hansson
- Stephen Hemminger (Microsoft)
- Tejun Heo
- Rob Herring
- Masami Hiramatsu
- Michal Hocko
- Simon Horman
- Johan Hovold (Hovold Consulting AB)
- Christophe JAILLET
- Olof Johansson
- Lee Jones (Linaro)
- Heiner Kallweit
- Srinivas Kandagatla
- Jan Kara
- Shuah Khan (Samsung)
- David Kershner
- Jaegeuk Kim
- Namhyung Kim
- Colin Ian King
- Jeff Kirsher
- Greg Kroah-Hartman (Linux Foundation)
- Christian König
- Vinod Koul
- Krzysztof Kozlowski
- Viresh Kumar
- Aneesh Kumar K.V
- Julia Lawall
- Doug Ledford
- Chuck Lever (Oracle)
- Daniel Lezcano
- Shaohua Li
- Xin Long
- Tony Luck

- Catalin Marinas (Arm Ltd)
- Mike Marshall
- Chris Mason
- Paul E. McKenney
- Arnaldo Carvalho de Melo
- David S. Miller
- Ingo Molnar
- Kuninori Morimoto
- Trond Myklebust
- Martin K. Petersen (Oracle)
- Borislav Petkov
- Jiri Pirko
- Josh Poimboeuf
- Sebastian Reichel (Collabora)
- Guenter Roeck
- Joerg Roedel
- Leon Romanovsky
- Steven Rostedt (VMware)
- Frank Rowand
- Ivan Safonov
- Anna Schumaker
- Jes Sorensen
- K.Y. Srinivasan
- David Sterba (SUSE)
- Heiko Stuebner
- Jiri Kosina (SUSE)
- Willy Tarreau
- Dmitry Torokhov
- Linus Torvalds
- Thierry Reding
- Rik van Riel
- Luis R. Rodriguez
- Geert Uytterhoeven (Glider bvba)
- Eduardo Valentin (Amazon.com)

- Daniel Vetter
- Linus Walleij
- Richard Weinberger
- Dan Williams
- Rafael J. Wysocki
- Arvind Yadav
- Masahiro Yamada
- Wei Yongjun
- Lv Zheng
- Marc Zyngier (Arm Ltd)



## KERNEL DRIVER STATEMENT

### \* Position Statement on Linux Kernel Modules

We, the undersigned Linux kernel developers, consider any closed-source Linux kernel module or driver to be harmful and undesirable. We have repeatedly found them to be detrimental to Linux users, businesses, and the greater Linux ecosystem. Such modules negate the openness, stability, flexibility, and maintainability of the Linux development model and shut their users off from the expertise of the Linux community. Vendors that provide closed-source kernel modules force their customers to give up key Linux advantages or choose new vendors. Therefore, in order to take full advantage of the cost savings and shared support benefits open source has to offer, we urge vendors to adopt a policy of supporting their customers on Linux with open-source kernel code.

We speak only for ourselves, and not for any company we might work for today, have in the past, or will in the future.

- Dave Airlie
- Nick Andrew
- Jens Axboe
- Ralf Baechle
- Felipe Balbi
- Ohad Ben-Cohen
- Muli Ben-Yehuda
- Jiri Benc
- Arnd Bergmann
- Thomas Bogendoerfer
- Vitaly Bordug
- James Bottomley
- Josh Boyer
- Neil Brown
- Mark Brown
- David Brownell

- Michael Buesch
- Franck Bui-Huu
- Adrian Bunk
- François Cami
- Ralph Campbell
- Luiz Fernando N. Capitulino
- Mauro Carvalho Chehab
- Denis Cheng
- Jonathan Corbet
- Glauber Costa
- Alan Cox
- Magnus Damm
- Ahmed S. Darwish
- Robert P. J. Day
- Hans de Goede
- Arnaldo Carvalho de Melo
- Helge Deller
- Jean Delvare
- Mathieu Desnoyers
- Sven-Thorsten Dietrich
- Alexey Dobriyan
- Daniel Drake
- Alex Dubov
- Randy Dunlap
- Michael Ellerman
- Pekka Enberg
- Jan Engelhardt
- Mark Fasheh
- J. Bruce Fields
- Larry Finger
- Jeremy Fitzhardinge
- Mike Frysinger
- Kumar Gala
- Robin Getz

- Liam Girdwood
- Jan-Benedict Glaw
- Thomas Gleixner
- Brice Goglin
- Cyrill Gorcunov
- Andy Gospodarek
- Thomas Graf
- Krzysztof Halasa
- Harvey Harrison
- Stephen Hemminger
- Michael Hennerich
- Tejun Heo
- Benjamin Herrenschmidt
- Kristian Høgsberg
- Henrique de Moraes Holschuh
- Marcel Holtmann
- Mike Isely
- Takashi Iwai
- Olof Johansson
- Dave Jones
- Jesper Juhl
- Matthias Kaehlcke
- Kenji Kaneshige
- Jan Kara
- Jeremy Kerr
- Russell King
- Olaf Kirch
- Roel Kluin
- Hans-Jürgen Koch
- Auke Kok
- Peter Korsgaard
- Jiri Kosina
- Aaro Koskinen
- Mariusz Kozlowski

- Greg Kroah-Hartman
- Michael Krufky
- Aneesh Kumar
- Clemens Ladisch
- Christoph Lameter
- Gunnar Larisch
- Anders Larsen
- Grant Likely
- John W. Linville
- Yinghai Lu
- Tony Luck
- Pavel Machek
- Matt Mackall
- Paul Mackerras
- Roland McGrath
- Patrick McHardy
- Kyle McMartin
- Paul Menage
- Thierry Merle
- Eric Miao
- Akinobu Mita
- Ingo Molnar
- James Morris
- Andrew Morton
- Paul Mundt
- Oleg Nesterov
- Luca Olivetti
- S.Çağlar Onur
- Pierre Ossman
- Keith Owens
- Venkatesh Pallipadi
- Nick Piggin
- Nicolas Pitre
- Evgeniy Polyakov

- Richard Purdie
- Mike Rapoport
- Sam Ravnborg
- Gerrit Renker
- Stefan Richter
- David Rientjes
- Luis R. Rodriguez
- Stefan Roese
- Francois Romieu
- Rami Rosen
- Stephen Rothwell
- Maciej W. Rozycki
- Mark Salyzyn
- Yoshinori Sato
- Deepak Saxena
- Holger Schurig
- Amit Shah
- Yoshihiro Shimoda
- Sergei Shtylyov
- Kay Sievers
- Sebastian Siewior
- Rik Snel
- Jes Sorensen
- Alexey Starikovskiy
- Alan Stern
- Timur Tabi
- Hirokazu Takata
- Eliezer Tamir
- Eugene Teo
- Doug Thompson
- FUJITA Tomonori
- Dmitry Torokhov
- Marcelo Tosatti
- Steven Toth

- Theodore Tso
- Matthias Urlichs
- Geert Uytterhoeven
- Arjan van de Ven
- Ivo van Doorn
- Rik van Riel
- Wim Van Sebroeck
- Hans Verkuil
- Horst H. von Brand
- Dmitri Vorobiev
- Anton Vorontsov
- Daniel Walker
- Johannes Weiner
- Harald Welte
- Matthew Wilcox
- Dan J. Williams
- Darrick J. Wong
- David Woodhouse
- Chris Wright
- Bryan Wu
- Rafael J. Wysocki
- Herbert Xu
- Vlad Yasevich
- Peter Zijlstra
- Bartłomiej Zolnierkiewicz

Other guides to the community that are of interest to most developers are:

---

CHAPTER  
THIRTEEN

---

## MINIMAL REQUIREMENTS TO COMPILE THE KERNEL

### \* **Intro**

This document is designed to provide a list of the minimum levels of software necessary to run the 4.x kernels.

This document is originally based on my “Changes” file for 2.0.x kernels and therefore owes credit to the same people as that file (Jared Mauch, Axel Boldt, Alessandro Sigala, and countless other users all over the ‘net).

### \* **Current Minimal Requirements**

Upgrade to at **least** these software revisions before thinking you’ve encountered a bug! If you’re unsure what version you’re currently running, the suggested command should tell you.

Again, keep in mind that this list assumes you are already functionally running a Linux kernel. Also, not all tools are necessary on all systems; obviously, if you don’t have any PC Card hardware, for example, you probably needn’t concern yourself with pcmciautils.

Program	Minimal version	Command to check the version
GNU C	4.9	gcc -version
GNU make	3.81	make -version
binutils	2.23	ld -v
flex	2.5.35	flex -version
bison	2.0	bison -version
util-linux	2.10o	fdformat -version
kmod	13	depmod -V
e2fsprogs	1.41.4	e2fsck -V
jfsutils	1.1.3	fsck.jfs -V
reiserfsprogs	3.6.3	reiserfsck -V
xfsprogs	2.6.0	xfs_db -V
squashfs-tools	4.0	mksquashfs -version
btrfs-progs	0.18	btrfsck
pcmciautils	004	pccardctl -V
quota-tools	3.09	quota -V
PPP	2.4.0	pppd -version
nfs-utils	1.0.5	showmount -version
procps	3.2.0	ps -version
oprofile	0.9	oprofiled -version
udev	081	udevd -version
grub	0.93	grub -version    grub-install -version
mcelog	0.6	mcelog -version
iptables	1.4.2	iptables -V
openssl & libcrypto	1.0.0	openssl version
bc	1.06.95	bc -version
Sphinx <sup>1</sup>	1.3	sphinx-build -version

## \* Kernel compilation

### GCC

The gcc version requirements may vary depending on the type of CPU in your computer.

### Make

You will need GNU make 3.81 or later to build the kernel.

---

<sup>1</sup> Sphinx is needed only to build the Kernel documentation

## **Binutils**

Binutils 2.23 or newer is needed to build the kernel.

## **pkg-config**

The build system, as of 4.18, requires pkg-config to check for installed kconfig tools and to determine flags settings for use in ‘make {g,x}config’ . Previously pkg-config was being used but not verified or documented.

## **Flex**

Since Linux 4.16, the build system generates lexical analyzers during build. This requires flex 2.5.35 or later.

## **Bison**

Since Linux 4.16, the build system generates parsers during build. This requires bison 2.0 or later.

## **Perl**

You will need perl 5 and the following modules: Getopt::Long, Getopt::Std, File::Basename, and File::Find to build the kernel.

## **BC**

You will need bc to build kernels 3.10 and higher

## **OpenSSL**

Module signing and external certificate handling use the OpenSSL program and crypto library to do key creation and signature generation.

You will need openssl to build kernels 3.7 and higher if module signing is enabled. You will also need openssl development packages to build kernels 4.3 and higher.

## **\* System utilities**

### **Architectural changes**

DevFS has been obsoleted in favour of udev (<http://www.kernel.org/pub/linux/utils/kernel/hotplug/>)

32-bit UID support is now in place. Have fun!

Linux documentation for functions is transitioning to inline documentation via specially-formatted comments near their definitions in the source. These comments can be combined with ReST files the Documentation/ directory to make enriched documentation, which can then be converted to PostScript, HTML, La-Tex, ePUB and PDF files. In order to convert from ReST format to a format of your choice, you'll need Sphinx.

### Util-linux

New versions of util-linux provide `fdisk` support for larger disks, support new options to mount, recognize more supported partition types, have a `fdformat` which works with 2.4 kernels, and similar goodies. You'll probably want to upgrade.

### Ksymoops

If the unthinkable happens and your kernel oopses, you may need the `ksymoops` tool to decode it, but in most cases you don't. It is generally preferred to build the kernel with `CONFIG_KALLSYMS` so that it produces readable dumps that can be used as-is (this also produces better output than `ksymoops`). If for some reason your kernel is not built with `CONFIG_KALLSYMS` and you have no way to rebuild and reproduce the Oops with that option, then you can still decode that Oops with `ksymoops`.

### Mkinitrd

These changes to the `/lib/modules` file tree layout also require that `mkinitrd` be upgraded.

### E2fsprogs

The latest version of `e2fsprogs` fixes several bugs in `fsck` and `debugfs`. Obviously, it's a good idea to upgrade.

### JFSutils

The `jfsutils` package contains the utilities for the file system. The following utilities are available:

- `fsck.jfs` - initiate replay of the transaction log, and check and repair a JFS formatted partition.
- `mkfs.jfs` - create a JFS formatted partition.
- other file system utilities are also available in this package.

## Reiserfsprogs

The reiserfsprogs package should be used for reiserfs-3.6.x (Linux kernels 2.4.x). It is a combined package and contains working versions of `mkreiserfs`, `resize_reiserfs`, `debugreiserfs` and `reiserfsck`. These utils work on both i386 and alpha platforms.

## Xfsprogs

The latest version of xfsprogs contains `mkfs.xfs`, `xfs_db`, and the `xfs_repair` utilities, among others, for the XFS filesystem. It is architecture independent and any version from 2.0.0 onward should work correctly with this version of the XFS kernel code (2.6.0 or later is recommended, due to some significant improvements).

## PCMCIAutils

PCMCIAutils replaces `pcmcia-cs`. It properly sets up PCMCIA sockets at system startup and loads the appropriate modules for 16-bit PCMCIA devices if the kernel is modularized and the hotplug subsystem is used.

## Quota-tools

Support for 32 bit uid's and gid's is required if you want to use the newer version 2 quota format. Quota-tools version 3.07 and newer has this support. Use the recommended version or newer from the table above.

## Intel IA32 microcode

A driver has been added to allow updating of Intel IA32 microcode, accessible as a normal (misc) character device. If you are not using udev you may need to:

```
mkdir /dev/cpu
mknod /dev/cpu/microcode c 10 184
chmod 0644 /dev/cpu/microcode
```

as root before you can use this. You'll probably also want to get the user-space `microcode_ctl` utility to use with this.

## udev

`udev` is a userspace application for populating `/dev` dynamically with only entries for devices actually present. `udev` replaces the basic functionality of `devfs`, while allowing persistent device naming for devices.

### FUSE

Needs libfuse 2.4.0 or later. Absolute minimum is 2.3.0 but mount options `direct_io` and `kernel_cache` won't work.

### \* Networking

#### General changes

If you have advanced network configuration needs, you should probably consider using the network tools from ip-route2.

#### Packet Filter / NAT

The packet filtering and NAT code uses the same tools like the previous 2.4.x kernel series (`iptables`). It still includes backwards-compatibility modules for 2.2.x-style `ipchains` and 2.0.x-style `ipfwadm`.

### PPP

The PPP driver has been restructured to support multilink and to enable it to operate over diverse media layers. If you use PPP, upgrade `pppd` to at least 2.4.0.

If you are not using udev, you must have the device file `/dev/ppp` which can be made by:

```
mknod /dev/ppp c 108 0
```

as root.

### NFS-utils

In ancient (2.4 and earlier) kernels, the nfs server needed to know about any client that expected to be able to access files via NFS. This information would be given to the kernel by `mountd` when the client mounted the filesystem, or by `exportfs` at system startup. `exportfs` would take information about active clients from `/var/lib/nfs/rmtab`.

This approach is quite fragile as it depends on `rmtab` being correct which is not always easy, particularly when trying to implement fail-over. Even when the system is working well, `rmtab` suffers from getting lots of old entries that never get removed.

With modern kernels we have the option of having the kernel tell `mountd` when it gets a request from an unknown host, and `mountd` can give appropriate export information to the kernel. This removes the dependency on `rmtab` and means that the kernel only needs to know about currently active clients.

To enable this new functionality, you need to:

```
mount -t nfsd nfsd /proc/fs/nfsd
```

before running exportfs or mountd. It is recommended that all NFS services be protected from the internet-at-large by a firewall where that is possible.

## **mcelog**

On x86 kernels the mcelog utility is needed to process and log machine check events when CONFIG\_X86\_MCE is enabled. Machine check events are errors reported by the CPU. Processing them is strongly encouraged.

## **\* Kernel documentation**

### **Sphinx**

Please see sphinx\_install in Documentation/doc-guide/sphinx.rst for details about Sphinx requirements.

## **\* Getting updated software**

### **\* Kernel compilation**

#### **gcc**

- <<ftp://ftp.gnu.org/gnu/gcc/>>

#### **Make**

- <<ftp://ftp.gnu.org/gnu/make/>>

#### **Binutils**

- <<https://www.kernel.org/pub/linux/devel/binutils/>>

#### **Flex**

- <<https://github.com/westes/flex/releases>>

### Bison

- <<ftp://ftp.gnu.org/gnu/bison/>>

### OpenSSL

- <<https://www.openssl.org/>>

### \* System utilities

#### Util-linux

- <<https://www.kernel.org/pub/linux/utils/util-linux/>>

#### Kmod

- <<https://www.kernel.org/pub/linux/utils/kernel/kmod/>>
- <<https://git.kernel.org/pub/scm/utils/kernel/kmod/kmod.git>>

#### Ksymoops

- <<https://www.kernel.org/pub/linux/utils/kernel/ksymoops/v2.4/>>

#### Mkinitrd

- <<https://code.launchpad.net/initrd-tools/main>>

#### E2fsprogs

- <<https://www.kernel.org/pub/linux/kernel/people/ttyso/e2fsprogs/>>
- <<https://git.kernel.org/pub/scm/fs/ext2/e2fsprogs.git>>

#### JFSutils

- <<http://jfs.sourceforge.net/>>

### Reiserfsprogs

- <<https://git.kernel.org/pub/scm/linux/kernel/git/jeffm/reiserfsprogs.git/>>

### Xfsprogs

- <<https://git.kernel.org/pub/scm/fs/xfs/xfsprogs-dev.git>>
- <<https://www.kernel.org/pub/linux/utils/fs/xfs/xfsprogs/>>

### Pcmciautils

- <<https://www.kernel.org/pub/linux/utils/kernel pcmcia/>>

### Quota-tools

- <<http://sourceforge.net/projects/linuxquota/>>

### Intel P6 microcode

- <<https://downloadcenter.intel.com/>>

### udev

- <<http://www.freedesktop.org/software/systemd/man/udev.html>>

### FUSE

- <<https://github.com/libfuse/libfuse/releases>>

### mcelog

- <<http://www.mcelog.org/>>

### \* Networking

#### PPP

- <<https://download.samba.org/pub/ppp/>>
- <<https://git.ozlabs.org/?p=ppp.git>>
- <<https://github.com/paulusmack/ppp/>>

### NFS-utils

- <[http://sourceforge.net/project/showfiles.php?group\\_id=14](http://sourceforge.net/project/showfiles.php?group_id=14)>

### Iptables

- <<https://netfilter.org/projects/iptables/index.html>>

### Ip-route2

- <<https://www.kernel.org/pub/linux/utils/net/iproute2/>>

### OProfile

- <<http://oprofile.sf.net/download/>>

### NFS-Utils

- <<http://nfs.sourceforge.net/>>

### \* Kernel documentation

### Sphinx

- <<http://www.sphinx-doc.org/>>

---

## CHAPTER FOURTEEN

---

# SUBMITTING DRIVERS FOR THE LINUX KERNEL

This document is intended to explain how to submit device drivers to the various kernel trees. Note that if you are interested in video card drivers you should probably talk to XFree86 (<http://www.xfree86.org/>) and/or X.Org (<http://x.org/>) instead.

---

**Note:** This document is old and has seen little maintenance in recent years; it should probably be updated or, perhaps better, just deleted. Most of what is here can be found in the other development documents anyway.

Oh, and we don't really recommend submitting changes to XFree86 :)

---

Also read the Documentation/process/submitting-patches.rst document.

## \* Allocating Device Numbers

Major and minor numbers for block and character devices are allocated by the Linux assigned name and number authority (currently this is Torben Mathiasen). The site is <http://www.lanana.org/>. This also deals with allocating numbers for devices that are not going to be submitted to the mainstream kernel. See Documentation/admin-guide/devices.rst for more information on this.

If you don't use assigned numbers then when your device is submitted it will be given an assigned number even if that is different from values you may have shipped to customers before.

## \* Who To Submit Drivers To

**Linux 2.0:** No new drivers are accepted for this kernel tree.

**Linux 2.2:** No new drivers are accepted for this kernel tree.

**Linux 2.4:** If the code area has a general maintainer then please submit it to the maintainer listed in MAINTAINERS in the kernel file. If the maintainer does not respond or you cannot find the appropriate maintainer then please contact Willy Tarreau <[w@1wt.eu](mailto:w@1wt.eu)>.

**Linux 2.6 and upper:** The same rules apply as 2.4 except that you should follow linux-kernel to track changes in API's. The final contact point for Linux 2.6+ submissions is Andrew Morton.

## \* What Criteria Determine Acceptance

**Licensing:** The code must be released to us under the GNU General Public License. We don't insist on any kind of exclusive GPL licensing, and if you wish the driver to be useful to other communities such as BSD you may well wish to release under multiple licenses. See accepted licenses at include/linux/module.h

**Copyright:** The copyright owner must agree to use of GPL. It's best if the submitter and copyright owner are the same person/entity. If not, the name of the person/entity authorizing use of GPL should be listed in case it's necessary to verify the will of the copyright owner.

**Interfaces:** If your driver uses existing interfaces and behaves like other drivers in the same class it will be much more likely to be accepted than if it invents gratuitous new ones. If you need to implement a common API over Linux and NT drivers do it in userspace.

**Code:** Please use the Linux style of code formatting as documented in Documentation/process/coding-style.rst. If you have sections of code that need to be in other formats, for example because they are shared with a windows driver kit and you want to maintain them just once separate them out nicely and note this fact.

**Portability:** Pointers are not always 32bits, not all computers are little endian, people do not all have floating point and you shouldn't use inline x86 assembler in your driver without careful thought. Pure x86 drivers generally are not popular. If you only have x86 hardware it is hard to test portability but it is easy to make sure the code can easily be made portable.

**Clarity:** It helps if anyone can see how to fix the driver. It helps you because you get patches not bug reports. If you submit a driver that intentionally obfuscates how the hardware works it will go in the bitbucket.

**PM support:** Since Linux is used on many portable and desktop systems, your driver is likely to be used on such a system and therefore it should support basic power management by implementing, if necessary, the .suspend and .resume methods used during the system-wide suspend and resume transitions. You should verify that your driver correctly handles the suspend and resume, but if you are unable to ensure that, please at least define the .suspend method returning the -ENOSYS ("Function not implemented") error. You should also try to make sure that your driver uses as little power as possible when it's not doing anything. For the driver testing instructions see Documentation/power/drivers-testing.rst and for a relatively complete overview of the power management issues related to drivers see Documentation/driver-api/pm/devices.rst.

**Control:** In general if there is active maintenance of a driver by the author then patches will be redirected to them unless they are totally obvious and without need of checking. If you want to be the contact and update point for the driver it is a good idea to state this in the comments, and include an entry in MAINTAINERS for your driver.

## \* What Criteria Do Not Determine Acceptance

**Vendor:** Being the hardware vendor and maintaining the driver is often a good thing. If there is a stable working driver from other people already in the tree don't expect 'we are the vendor' to get your driver chosen. Ideally work with the existing driver author to build a single perfect driver.

**Author:** It doesn't matter if a large Linux company wrote the driver, or you did. Nobody has any special access to the kernel tree. Anyone who tells you otherwise isn't telling the whole story.

## \* Resources

**Linux kernel master tree:** [ftp.country\\_code.kernel.org:/pub/linux/kernel/…](ftp://country_code.kernel.org:/pub/linux/kernel/)

where country\_code == your country code, such as **us**, **uk**, **fr**, etc.

<http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git>

**Linux kernel mailing list:** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org) [mail] [major-domo@vger.kernel.org](mailto:major-domo@vger.kernel.org) to subscribe]

**Linux Device Drivers, Third Edition (covers 2.6.10):** <http://lwn.net/Kernel/LDD3/> (free version)

**LWN.net:** Weekly summary of kernel development activity - <http://lwn.net/2.6 API changes>:

<http://lwn.net/Articles/2.6-kernel-api/>

Porting drivers from prior kernels to 2.6:

<http://lwn.net/Articles/driver-porting/>

**KernelNewbies:** Documentation and assistance for new kernel programmers

<http://kernelnewbies.org/>

**Linux USB project:** <http://www.linux-usb.org/>

**How to NOT write kernel driver by Arjan van de Ven:** <http://www.fenrus.org/how-to-not-write-a-device-driver-paper.pdf>

**Kernel Janitor:** <http://kernelnewbies.org/KernelJanitors>

**GIT, Fast Version Control System:** <http://git-scm.com/>



## THE LINUX KERNEL DRIVER INTERFACE

(all of your questions answered and then some)

Greg Kroah-Hartman <[greg@kroah.com](mailto:greg@kroah.com)>

This is being written to try to explain why Linux **does not have a binary kernel interface, nor does it have a stable kernel interface.**

---

**Note:** Please realize that this article describes the **in kernel** interfaces, not the kernel to userspace interfaces.

The kernel to userspace interface is the one that application programs use, the syscall interface. That interface is **very** stable over time, and will not break. I have old programs that were built on a pre 0.9something kernel that still work just fine on the latest 2.6 kernel release. That interface is the one that users and application programmers can count on being stable.

---

### \* Executive Summary

You think you want a stable kernel interface, but you really do not, and you don't even know it. What you want is a stable running driver, and you get that only if your driver is in the main kernel tree. You also get lots of other good benefits if your driver is in the main kernel tree, all of which has made Linux into such a strong, stable, and mature operating system which is the reason you are using it in the first place.

### \* Intro

It's only the odd person who wants to write a kernel driver that needs to worry about the in-kernel interfaces changing. For the majority of the world, they neither see this interface, nor do they care about it at all.

First off, I'm not going to address **any** legal issues about closed source, hidden source, binary blobs, source wrappers, or any other term that describes kernel drivers that do not have their source code released under the GPL. Please consult a lawyer if you have any legal questions, I'm a programmer and hence, I'm just going to be describing the technical issues here (not to make light of the legal issues, they are real, and you do need to be aware of them at all times.)

So, there are two main topics here, binary kernel interfaces and stable kernel source interfaces. They both depend on each other, but we will discuss the binary stuff first to get it out of the way.

### \* **Binary Kernel Interface**

Assuming that we had a stable kernel source interface for the kernel, a binary interface would naturally happen too, right? Wrong. Please consider the following facts about the Linux kernel:

- Depending on the version of the C compiler you use, different kernel data structures will contain different alignment of structures, and possibly include different functions in different ways (putting functions inline or not.) The individual function organization isn't that important, but the different data structure padding is very important.
- Depending on what kernel build options you select, a wide range of different things can be assumed by the kernel:
  - different structures can contain different fields
  - Some functions may not be implemented at all, (i.e. some locks compile away to nothing for non-SMP builds.)
  - Memory within the kernel can be aligned in different ways, depending on the build options.
- Linux runs on a wide range of different processor architectures. There is no way that binary drivers from one architecture will run on another architecture properly.

Now a number of these issues can be addressed by simply compiling your module for the exact specific kernel configuration, using the same exact C compiler that the kernel was built with. This is sufficient if you want to provide a module for a specific release version of a specific Linux distribution. But multiply that single build by the number of different Linux distributions and the number of different supported releases of the Linux distribution and you quickly have a nightmare of different build options on different releases. Also realize that each Linux distribution release contains a number of different kernels, all tuned to different hardware types (different processor types and different options), so for even a single release you will need to create multiple versions of your module.

Trust me, you will go insane over time if you try to support this kind of release, I learned this the hard way a long time ago...

## \* Stable Kernel Source Interfaces

This is a much more “volatile” topic if you talk to people who try to keep a Linux kernel driver that is not in the main kernel tree up to date over time.

Linux kernel development is continuous and at a rapid pace, never stopping to slow down. As such, the kernel developers find bugs in current interfaces, or figure out a better way to do things. If they do that, they then fix the current interfaces to work better. When they do so, function names may change, structures may grow or shrink, and function parameters may be reworked. If this happens, all of the instances of where this interface is used within the kernel are fixed up at the same time, ensuring that everything continues to work properly.

As a specific examples of this, the in-kernel USB interfaces have undergone at least three different reworks over the lifetime of this subsystem. These reworks were done to address a number of different issues:

- A change from a synchronous model of data streams to an asynchronous one. This reduced the complexity of a number of drivers and increased the throughput of all USB drivers such that we are now running almost all USB devices at their maximum speed possible.
- A change was made in the way data packets were allocated from the USB core by USB drivers so that all drivers now needed to provide more information to the USB core to fix a number of documented deadlocks.

This is in stark contrast to a number of closed source operating systems which have had to maintain their older USB interfaces over time. This provides the ability for new developers to accidentally use the old interfaces and do things in improper ways, causing the stability of the operating system to suffer.

In both of these instances, all developers agreed that these were important changes that needed to be made, and they were made, with relatively little pain. If Linux had to ensure that it will preserve a stable source interface, a new interface would have been created, and the older, broken one would have had to be maintained over time, leading to extra work for the USB developers. Since all Linux USB developers do their work on their own time, asking programmers to do extra work for no gain, for free, is not a possibility.

Security issues are also very important for Linux. When a security issue is found, it is fixed in a very short amount of time. A number of times this has caused internal kernel interfaces to be reworked to prevent the security problem from occurring. When this happens, all drivers that use the interfaces were also fixed at the same time, ensuring that the security problem was fixed and could not come back at some future time accidentally. If the internal interfaces were not allowed to change, fixing this kind of security problem and insuring that it could not happen again would not be possible.

Kernel interfaces are cleaned up over time. If there is no one using a current interface, it is deleted. This ensures that the kernel remains as small as possible, and that all potential interfaces are tested as well as they can be (unused interfaces are pretty much impossible to test for validity.)

## \* **What to do**

So, if you have a Linux kernel driver that is not in the main kernel tree, what are you, a developer, supposed to do? Releasing a binary driver for every different kernel version for every distribution is a nightmare, and trying to keep up with an ever changing kernel interface is also a rough job.

Simple, get your kernel driver into the main kernel tree (remember we are talking about drivers released under a GPL-compatible license here, if your code doesn't fall under this category, good luck, you are on your own here, you leech). If your driver is in the tree, and a kernel interface changes, it will be fixed up by the person who did the kernel change in the first place. This ensures that your driver is always buildable, and works over time, with very little effort on your part.

The very good side effects of having your driver in the main kernel tree are:

- The quality of the driver will rise as the maintenance costs (to the original developer) will decrease.
- Other developers will add features to your driver.
- Other people will find and fix bugs in your driver.
- Other people will find tuning opportunities in your driver.
- Other people will update the driver for you when external interface changes require it.
- The driver automatically gets shipped in all Linux distributions without having to ask the distros to add it.

As Linux supports a larger number of different devices “out of the box” than any other operating system, and it supports these devices on more different processor architectures than any other operating system, this proven type of development model must be doing something right :)

---

Thanks to Randy Dunlap, Andrew Morton, David Brownell, Hanna Linder, Robert Love, and Nishanth Aravamudan for their review and comments on early drafts of this paper.

---

## CHAPTER SIXTEEN

---

### LINUX KERNEL MANAGEMENT STYLE

This is a short document describing the preferred (or made up, depending on who you ask) management style for the linux kernel. It's meant to mirror the process/coding-style.rst document to some degree, and mainly written to avoid answering<sup>1</sup> the same (or similar) questions over and over again.

Management style is very personal and much harder to quantify than simple coding style rules, so this document may or may not have anything to do with reality. It started as a lark, but that doesn't mean that it might not actually be true. You'll have to decide for yourself.

Btw, when talking about "kernel manager" , it's all about the technical lead persons, not the people who do traditional management inside companies. If you sign purchase orders or you have any clue about the budget of your group, you're almost certainly not a kernel manager. These suggestions may or may not apply to you.

First off, I'd suggest buying "Seven Habits of Highly Effective People" , and NOT read it. Burn it, it's a great symbolic gesture.

Anyway, here goes:

#### \* 1) Decisions

Everybody thinks managers make decisions, and that decision-making is important. The bigger and more painful the decision, the bigger the manager must be to make it. That's very deep and obvious, but it's not actually true.

The name of the game is to **avoid** having to make a decision. In particular, if somebody tells you "choose (a) or (b), we really need you to decide on this" , you're in trouble as a manager. The people you manage had better know the details better than you, so if they come to you for a technical decision, you're screwed. You're clearly not competent to make that decision for them.

(Corollary:if the people you manage don't know the details better than you, you're also screwed, although for a totally different reason. Namely that you are in the wrong job, and that **they** should be managing your brilliance instead).

So the name of the game is to **avoid** decisions, at least the big and painful ones. Making small and non-consequential decisions is fine, and makes you look like you

---

<sup>1</sup> This document does so not so much by answering the question, but by making it painfully obvious to the questioner that we don't have a clue to what the answer is.

know what you’re doing, so what a kernel manager needs to do is to turn the big and painful ones into small things where nobody really cares.

It helps to realize that the key difference between a big decision and a small one is whether you can fix your decision afterwards. Any decision can be made small by just always making sure that if you were wrong (and you **will** be wrong), you can always undo the damage later by backtracking. Suddenly, you get to be doubly managerial for making **two** inconsequential decisions - the wrong one **and** the right one.

And people will even see that as true leadership (cough bullshit cough).

Thus the key to avoiding big decisions becomes to just avoiding to do things that can’t be undone. Don’t get ushered into a corner from which you cannot escape. A cornered rat may be dangerous - a cornered manager is just pitiful.

It turns out that since nobody would be stupid enough to ever really let a kernel manager have huge fiscal responsibility **anyway**, it’s usually fairly easy to backtrack. Since you’re not going to be able to waste huge amounts of money that you might not be able to repay, the only thing you can backtrack on is a technical decision, and there back-tracking is very easy: just tell everybody that you were an incompetent nincompoop, say you’re sorry, and undo all the worthless work you had people work on for the last year. Suddenly the decision you made a year ago wasn’t a big decision after all, since it could be easily undone.

It turns out that some people have trouble with this approach, for two reasons:

- admitting you were an idiot is harder than it looks. We all like to maintain appearances, and coming out in public to say that you were wrong is sometimes very hard indeed.
- having somebody tell you that what you worked on for the last year wasn’t worthwhile after all can be hard on the poor lowly engineers too, and while the actual **work** was easy enough to undo by just deleting it, you may have irrevocably lost the trust of that engineer. And remember: “irrevocable” was what we tried to avoid in the first place, and your decision ended up being a big one after all.

Happily, both of these reasons can be mitigated effectively by just admitting up-front that you don’t have a friggin’ clue, and telling people ahead of the fact that your decision is purely preliminary, and might be the wrong thing. You should always reserve the right to change your mind, and make people very **aware** of that. And it’s much easier to admit that you are stupid when you haven’t **yet** done the really stupid thing.

Then, when it really does turn out to be stupid, people just roll their eyes and say “Oops, not again” .

This preemptive admission of incompetence might also make the people who actually do the work also think twice about whether it’s worth doing or not. After all, if **they** aren’t certain whether it’s a good idea, you sure as hell shouldn’t encourage them by promising them that what they work on will be included. Make them at least think twice before they embark on a big endeavor.

Remember: they’d better know more about the details than you do, and they usually already think they have the answer to everything. The best thing you can

do as a manager is not to instill confidence, but rather a healthy dose of critical thinking on what they do.

Btw, another way to avoid a decision is to plaintively just whine “can’t we just do both?” and look pitiful. Trust me, it works. If it’s not clear which approach is better, they’ll eventually figure it out. The answer may end up being that both teams get so frustrated by the situation that they just give up.

That may sound like a failure, but it’s usually a sign that there was something wrong with both projects, and the reason the people involved couldn’t decide was that they were both wrong. You end up coming up smelling like roses, and you avoided yet another decision that you could have screwed up on.

## \* 2) People

Most people are idiots, and being a manager means you’ll have to deal with it, and perhaps more importantly, that **they** have to deal with **you**.

It turns out that while it’s easy to undo technical mistakes, it’s not as easy to undo personality disorders. You just have to live with theirs - and yours.

However, in order to prepare yourself as a kernel manager, it’s best to remember not to burn any bridges, bomb any innocent villagers, or alienate too many kernel developers. It turns out that alienating people is fairly easy, and un-alienating them is hard. Thus “alienating” immediately falls under the heading of “not reversible”, and becomes a no-no according to 1) Decisions.

There’s just a few simple rules here:

- (1) don’t call people d\*ckheads (at least not in public)
- (2) learn how to apologize when you forgot rule (1)

The problem with #1 is that it’s very easy to do, since you can say “you’re a d\*ckhead” in millions of different ways<sup>2</sup>, sometimes without even realizing it, and almost always with a white-hot conviction that you are right.

And the more convinced you are that you are right (and let’s face it, you can call just about **anybody** a d\*ckhead, and you often **will** be right), the harder it ends up being to apologize afterwards.

To solve this problem, you really only have two options:

- get really good at apologies
- spread the “love” out so evenly that nobody really ends up feeling like they get unfairly targeted. Make it inventive enough, and they might even be amused.

The option of being unfailingly polite really doesn’t exist. Nobody will trust somebody who is so clearly hiding their true character.

---

<sup>2</sup> Paul Simon sang “Fifty Ways to Leave Your Lover”, because quite frankly, “A Million Ways to Tell a Developer They’re a D\*ckhead” doesn’t scan nearly as well. But I’m sure he thought about it.

## \* 3) People II - the Good Kind

While it turns out that most people are idiots, the corollary to that is sadly that you are one too, and that while we can all bask in the secure knowledge that we're better than the average person (let's face it, nobody ever believes that they're average or below-average), we should also admit that we're not the sharpest knife around, and there will be other people that are less of an idiot than you are.

Some people react badly to smart people. Others take advantage of them.

Make sure that you, as a kernel maintainer, are in the second group. Suck up to them, because they are the people who will make your job easier. In particular, they'll be able to make your decisions for you, which is what the game is all about.

So when you find somebody smarter than you are, just coast along. Your management responsibilities largely become ones of saying "Sounds like a good idea - go wild", or "That sounds good, but what about xxx?". The second version in particular is a great way to either learn something new about "xxx" or seem **extra** managerial by pointing out something the smarter person hadn't thought about. In either case, you win.

One thing to look out for is to realize that greatness in one area does not necessarily translate to other areas. So you might prod people in specific directions, but let's face it, they might be good at what they do, and suck at everything else. The good news is that people tend to naturally gravitate back to what they are good at, so it's not like you are doing something irreversible when you **do** prod them in some direction, just don't push too hard.

## \* 4) Placing blame

Things will go wrong, and people want somebody to blame. Tag, you're it.

It's not actually that hard to accept the blame, especially if people kind of realize that it wasn't **all** your fault. Which brings us to the best way of taking the blame: do it for someone else. You'll feel good for taking the fall, they'll feel good about not getting blamed, and the person who lost their whole 36GB porn-collection because of your incompetence will grudgingly admit that you at least didn't try to weasel out of it.

Then make the developer who really screwed up (if you can find them) know **in private** that they screwed up. Not just so they can avoid it in the future, but so that they know they owe you one. And, perhaps even more importantly, they're also likely the person who can fix it. Because, let's face it, it sure ain't you.

Taking the blame is also why you get to be manager in the first place. It's part of what makes people trust you, and allow you the potential glory, because you're the one who gets to say "I screwed up". And if you've followed the previous rules, you'll be pretty good at saying that by now.

## \* 5) Things to avoid

There's one thing people hate even more than being called "d\*ckhead", and that is being called a "d\*ckhead" in a sanctimonious voice. The first you can apologize for, the second one you won't really get the chance. They likely will no longer be listening even if you otherwise do a good job.

We all think we're better than anybody else, which means that when somebody else puts on airs, it **really** rubs us the wrong way. You may be morally and intellectually superior to everybody around you, but don't try to make it too obvious unless you really **intend** to irritate somebody<sup>3</sup>.

Similarly, don't be too polite or subtle about things. Politeness easily ends up going overboard and hiding the problem, and as they say, "On the internet, nobody can hear you being subtle". Use a big blunt object to hammer the point in, because you can't really depend on people getting your point otherwise.

Some humor can help pad both the bluntness and the moralizing. Going overboard to the point of being ridiculous can drive a point home without making it painful to the recipient, who just thinks you're being silly. It can thus help get through the personal mental block we all have about criticism.

## \* 6) Why me?

Since your main responsibility seems to be to take the blame for other peoples mistakes, and make it painfully obvious to everybody else that you're incompetent, the obvious question becomes one of why do it in the first place?

First off, while you may or may not get screaming teenage girls (or boys, let's not be judgmental or sexist here) knocking on your dressing room door, you **will** get an immense feeling of personal accomplishment for being "in charge". Never mind the fact that you're really leading by trying to keep up with everybody else and running after them as fast as you can. Everybody will still think you're the person in charge.

It's a great job if you can hack it.

---

<sup>3</sup> Hint: internet newsgroups that are not directly related to your work are great ways to take out your frustrations at other people. Write insulting posts with a sneer just to get into a good flame every once in a while, and you'll feel cleansed. Just don't crap too close to home.



---

CHAPTER  
**SEVENTEEN**

---

## **EVERYTHING YOU EVER WANTED TO KNOW ABOUT LINUX -STABLE RELEASES**

Rules on what kind of patches are accepted, and which ones are not, into the “-stable” tree:

- It must be obviously correct and tested.
- It cannot be bigger than 100 lines, with context.
- It must fix only one thing.
- It must fix a real bug that bothers people (not a, “This could be a problem…” type thing).
- It must fix a problem that causes a build error (but not for things marked CONFIG\_BROKEN), an oops, a hang, data corruption, a real security issue, or some “oh, that’s not good” issue. In short, something critical.
- Serious issues as reported by a user of a distribution kernel may also be considered if they fix a notable performance or interactivity issue. As these fixes are not as obvious and have a higher risk of a subtle regression they should only be submitted by a distribution kernel maintainer and include an addendum linking to a bugzilla entry if it exists and additional information on the user-visible impact.
- New device IDs and quirks are also accepted.
- No “theoretical race condition” issues, unless an explanation of how the race can be exploited is also provided.
- It cannot contain any “trivial” fixes in it (spelling changes, whitespace cleanups, etc).
- It must follow the Documentation/process/submitting-patches.rst rules.
- It or an equivalent fix must already exist in Linus’ tree (upstream).

## \* Procedure for submitting patches to the -stable tree

- If the patch covers files in net/ or drivers/net please follow netdev stable submission guidelines as described in Documentation/networking/netdev-FAQ.rst after first checking the stable networking queue at <https://patchwork.ozlabs.org/bundle/davem/stable/?series=&submitter=&state=&q=&archive=> to ensure the requested patch is not already queued up.
- Security patches should not be handled (solely) by the -stable review process but should follow the procedures in Documentation/admin-guide/security-bugs.rst.

## \* For all other submissions, choose one of the following procedures

### \* Option 1

To have the patch automatically included in the stable tree, add the tag

Cc: [stable@vger.kernel.org](mailto:stable@vger.kernel.org)

in the sign-off area. Once the patch is merged it will be applied to the stable tree without anything else needing to be done by the author or subsystem maintainer.

### \* Option 2

After the patch has been merged to Linus' tree, send an email to [stable@vger.kernel.org](mailto:stable@vger.kernel.org) containing the subject of the patch, the commit ID, why you think it should be applied, and what kernel version you wish it to be applied to.

### \* Option 3

Send the patch, after verifying that it follows the above rules, to [stable@vger.kernel.org](mailto:stable@vger.kernel.org). You must note the upstream commit ID in the changelog of your submission, as well as the kernel version you wish it to be applied to.

Option 1 is **strongly** preferred, is the easiest and most common. Option 2 and Option 3 are more useful if the patch isn't deemed worthy at the time it is applied to a public git tree (for instance, because it deserves more regression testing first). Option 3 is especially useful if the patch needs some special handling to apply to an older kernel (e.g., if API's have changed in the meantime).

Note that for Option 3, if the patch deviates from the original upstream patch (for example because it had to be backported) this must be very clearly documented and justified in the patch description.

The upstream commit ID must be specified with a separate line above the commit text, like this:

```
commit <sha1> upstream.
```

Additionally, some patches submitted via Option 1 may have additional patch prerequisites which can be cherry-picked. This can be specified in the following format in the sign-off area:

```
Cc: <stable@vger.kernel.org> # 3.3.x: a1f84a3: sched: Check for idle
Cc: <stable@vger.kernel.org> # 3.3.x: 1b9508f: sched: Rate-limit newidle
Cc: <stable@vger.kernel.org> # 3.3.x: fd21073: sched: Fix affinity logic
Cc: <stable@vger.kernel.org> # 3.3.x
Signed-off-by: Ingo Molnar <mingo@elte.hu>
```

The tag sequence has the meaning of:

```
git cherry-pick a1f84a3
git cherry-pick 1b9508f
git cherry-pick fd21073
git cherry-pick <this commit>
```

Also, some patches may have kernel version prerequisites. This can be specified in the following format in the sign-off area:

```
Cc: <stable@vger.kernel.org> # 3.3.x
```

The tag has the meaning of:

```
git cherry-pick <this commit>
```

For each “-stable” tree starting with the specified version.

Following the submission:

- The sender will receive an ACK when the patch has been accepted into the queue, or a NAK if the patch is rejected. This response might take a few days, according to the developer’s schedules.
- If accepted, the patch will be added to the -stable queue, for review by other developers and by the relevant subsystem maintainer.

## \* Review cycle

- When the -stable maintainers decide for a review cycle, the patches will be sent to the review committee, and the maintainer of the affected area of the patch (unless the submitter is the maintainer of the area) and CC: to the linux-kernel mailing list.
- The review committee has 48 hours in which to ACK or NAK the patch.
- If the patch is rejected by a member of the committee, or linux-kernel members object to the patch, bringing up issues that the maintainers and members did not realize, the patch will be dropped from the queue.
- At the end of the review cycle, the ACKed patches will be added to the latest -stable release, and a new -stable release will happen.

- Security patches will be accepted into the -stable tree directly from the security kernel team, and not go through the normal review cycle. Contact the kernel security team for more details on this procedure.

### \* **Trees**

- The queues of patches, for both completed versions and in progress versions can be found at:

[https://git.kernel.org/pub/scm/linux/kernel/git/stable/stable-queue.  
git](https://git.kernel.org/pub/scm/linux/kernel/git/stable/stable-queue.git)

- The finalized and tagged releases of all stable kernels can be found in separate branches per version at:

[https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux-stable.  
git](https://git.kernel.org/pub/scm/linux/kernel/git/stable/linux-stable.git)

### \* **Review committee**

- This is made up of a number of kernel developers who have volunteered for this task, and a few that haven't.

---

**CHAPTER  
EIGHTEEN**

---

## **LINUX KERNEL PATCH SUBMISSION CHECKLIST**

Here are some basic things that developers should do if they want to see their kernel patch submissions accepted more quickly.

These are all above and beyond the documentation that is provided in Documentation/process/submitting-patches.rst and elsewhere regarding submitting Linux kernel patches.

- 1) If you use a facility then #include the file that defines/declares that facility.  
Don't depend on other header files pulling in ones that you use.
- 2) Builds cleanly:
  - a) with applicable or modified CONFIG options =y, =m, and =n. No gcc warnings/errors, no linker warnings/errors.
  - b) Passes `allnoconfig`, `allmodconfig`
  - c) Builds successfully when using `O=builddir`
- 3) Builds on multiple CPU architectures by using local cross-compile tools or some other build farm.
- 4) ppc64 is a good architecture for cross-compilation checking because it tends to use `unsigned long` for 64-bit quantities.
- 5) Check your patch for general style as detailed in Documentation/process/coding-style.rst. Check for trivial violations with the patch style checker prior to submission (`scripts/checkpatch.pl`). You should be able to justify all violations that remain in your patch.
- 6) Any new or modified CONFIG options do not muck up the config menu and default to off unless they meet the exception criteria documented in Documentation/kbuild/kconfig-language.rst Menu attributes: default value.
- 7) All new Kconfig options have help text.
- 8) Has been carefully reviewed with respect to relevant Kconfig combinations.  
This is very hard to get right with testing – brainpower pays off here.
- 9) Check cleanly with sparse.
- 10) Use `make checkstack` and `make namespacecheck` and fix any problems that they find.

---

**Note:** checkstack does not point out problems explicitly, but any one function that uses more than 512 bytes on the stack is a candidate for change.

---

- 11) Include kernel-doc to document global kernel APIs. (Not required for static functions, but OK there also.) Use `make htmldocs` or `make pdfdocs` to check the kernel-doc and fix any issues.
- 12) Has been tested with `CONFIG_PREEMPT`, `CONFIG_DEBUG_PREEMPT`, `CONFIG_DEBUG_SLAB`, `CONFIG_DEBUG_PAGEALLOC`, `CONFIG_DEBUG_MUTEXES`, `CONFIG_DEBUG_SPINLOCK`, `CONFIG_DEBUG_ATOMIC_SLEEP`, `CONFIG_PROVE_RCU` and `CONFIG_DEBUG_OBJECTS_RCU_HEAD` all simultaneously enabled.
- 13) Has been build- and runtime tested with and without `CONFIG_SMP` and `CONFIG_PREEMPT`.
- 16) All codepaths have been exercised with all lockdep features enabled.
- 17) All new `/proc` entries are documented under `Documentation/`
- 18) All new kernel boot parameters are documented in `Documentation/admin-guide/kernel-parameters.rst`.
- 19) All new module parameters are documented with `MODULE_PARM_DESC()`
- 20) All new userspace interfaces are documented in `Documentation/ABI/`. See `Documentation/ABI/README` for more information. Patches that change userspace interfaces should be CCed to [linux-api@vger.kernel.org](mailto:linux-api@vger.kernel.org).
- 21) Check that it all passes `make headers_check`.
- 22) Has been checked with injection of at least slab and page-allocation failures. See `Documentation/fault-injection/`.  
If the new code is substantial, addition of subsystem-specific fault injection might be appropriate.
- 23) Newly-added code has been compiled with `gcc -W` (use `make EXTRA_CFLAGS=-W`). This will generate lots of noise, but is good for finding bugs like “warning: comparison between signed and unsigned” .
- 24) Tested after it has been merged into the `-mm` patchset to make sure that it still works with all of the other queued patches and various changes in the VM, VFS, and other subsystems.
- 25) All memory barriers {e.g., `barrier()`, `rmb()`, `wmb()`} need a comment in the source code that explains the logic of what they are doing and why.
- 26) If any ioctl's are added by the patch, then also update `Documentation/userspace-api/ioctl/ioctl-number.rst`.
- 27) If your modified source code depends on or uses any of the kernel APIs or features that are related to the following Kconfig symbols, then test multiple builds with the related Kconfig symbols disabled and/or `=m` (if that option is available) [not all of these at the same time, just various/random combinations of them]:  
`CONFIG_SMP`, `CONFIG_SYSFS`, `CONFIG_PROC_FS`, `CONFIG_INPUT`, `CONFIG_PCI`,  
`CONFIG_BLOCK`,      `CONFIG_PM`,      `CONFIG_MAGIC_SYSRQ`,      `CONFIG_NET`,

CONFIG\_INET=n (but latter with CONFIG\_NET=y).



---

**CHAPTER  
NINETEEN**

---

## **INDEX OF DOCUMENTATION FOR PEOPLE INTERESTED IN WRITING AND/OR UNDERSTANDING THE LINUX KERNEL**

Juan-Mariano de Goyeneche <[jmseyas@dit.upm.es](mailto:jmseyas@dit.upm.es)>

The need for a document like this one became apparent in the linux-kernel mailing list as the same questions, asking for pointers to information, appeared again and again.

Fortunately, as more and more people get to GNU/Linux, more and more get interested in the Kernel. But reading the sources is not always enough. It is easy to understand the code, but miss the concepts, the philosophy and design decisions behind this code.

Unfortunately, not many documents are available for beginners to start. And, even if they exist, there was no “well-known” place which kept track of them. These lines try to cover this lack. All documents available on line known by the author are listed, while some reference books are also mentioned.

PLEASE, if you know any paper not listed here or write a new document, send me an e-mail, and I’ ll include a reference to it here. Any corrections, ideas or comments are also welcomed.

The papers that follow are listed in no particular order. All are cataloged with the following fields: the document’ s “Title”, the “Author” /s, the “URL” where they can be found, some “Keywords” helpful when searching for specific topics, and a brief “Description” of the Document.

Enjoy!

---

**Note:** The documents on each section of this document are ordered by its published date, from the newest to the oldest.

---

### \* Docs at the Linux Kernel tree

The Sphinx books should be built with make {htmldocs | pdfdocs | epubdocs}.

- Name: **linux/Documentation**

**Author** Many.

**Location** Documentation/

**Keywords** text files, Sphinx.

**Description** Documentation that comes with the kernel sources, inside the Documentation directory. Some pages from this document (including this document itself) have been moved there, and might be more up to date than the web version.

### \* On-line docs

- Title: **Linux Kernel Mailing List Glossary**

**Author** various

**URL** <https://kernelnewbies.org/KernelGlossary>

**Date** rolling version

**Keywords** glossary, terms, linux-kernel.

**Description** From the introduction: “This glossary is intended as a brief description of some of the acronyms and terms you may hear during discussion of the Linux kernel” .

- Title: **Tracing the Way of Data in a TCP Connection through the Linux Kernel**

**Author** Richard Sailer

**URL** [https://archive.org/details/linux\\_kernel\\_data\\_flow\\_short\\_paper](https://archive.org/details/linux_kernel_data_flow_short_paper)

**Date** 2016

**Keywords** Linux Kernel Networking, TCP, tracing, ftrace

**Description** A seminar paper explaining ftrace and how to use it for understanding linux kernel internals, illustrated at tracing the way of a TCP packet through the kernel.

**Abstract** This short paper outlines the usage of ftrace a tracing framework as a tool to understand a running Linux system. Having obtained a trace-log a kernel hacker can read and understand source code more determined and with context. In a detailed example this approach is demonstrated in tracing and the way of data in a TCP Connection through the kernel. Finally this trace-log is used as base for more a exact conceptual exploration and description of the Linux TCP/IP implementation.

- Title: **On submitting kernel Patches**

**Author** Andi Kleen

**URL** <http://halobates.de/on-submitting-kernel-patches.pdf>

**Date** 2008

**Keywords** patches, review process, types of submissions, basic rules, case studies

**Description** This paper gives several experience values on what types of patches there are and how likely they get merged.

**Abstract** [⋯]. This paper examines some common problems for submitting larger changes and some strategies to avoid problems.

- Title: **Linux Device Drivers, Third Edition**

**Author** Jonathan Corbet, Alessandro Rubini, Greg Kroah-Hartman

**URL** <http://lwn.net/Kernel/LDD3/>

**Date** 2005

**Description** A 600-page book covering the (2.6.10) driver programming API and kernel hacking in general. Available under the Creative Commons Attribution-ShareAlike 2.0 license.

**note** You can also purchase a copy from O’ Reilly or elsewhere.

- Title: **Writing an ALSA Driver**

**Author** Takashi Iwai <[tiwai@suse.de](mailto:tiwai@suse.de)>

**URL** <http://www.alsa-project.org/~iwai/writing-an-alsa-driver/index.html>

**Date** 2005

**Keywords** ALSA, sound, soundcard, driver, lowlevel, hardware.

**Description** Advanced Linux Sound Architecture for developers, both at kernel and user-level sides. ALSA is the Linux kernel sound architecture in the 2.6 kernel version.

- Title: **Linux PCMCIA Programmer’ s Guide**

**Author** David Hinds.

**URL** <http://pcmcia-cs.sourceforge.net/ftp/doc/PCMCIA-PROG.html>

**Date** 2003

**Keywords** PCMCIA.

**Description** “This document describes how to write kernel device drivers for the Linux PCMCIA Card Services interface. It also describes how to write user-mode utilities for communicating with Card Services.

- Title: **Linux Kernel Module Programming Guide**

**Author** Ori Pomerantz.

**URL** <http://tldp.org/LDP/lkmpg/2.6/html/index.html>

**Date** 2001

**Keywords** modules, GPL book, /proc, ioctl, system calls, interrupt handlers .

**Description** Very nice 92 pages GPL book on the topic of modules programming. Lots of examples.

- Title: **Global spinlock list and usage**

**Author** Rick Lindsley.

**URL** <http://lse.sourceforge.net/lockhier/global-spin-lock>

**Date** 2001

**Keywords** spinlock.

**Description** This is an attempt to document both the existence and usage of the spinlocks in the Linux 2.4.5 kernel. Comprehensive list of spinlocks showing when they are used, which functions access them, how each lock is acquired, under what conditions it is held, whether interrupts can occur or not while it is held…

- Title: **A Linux vm README**

**Author** Kanoj Sarcar.

**URL** <http://kos.enix.org/pub/linux-vmm.html>

**Date** 2001

**Keywords** virtual memory, mm, pgd, vma, page, page flags, page cache, swap cache, kswapd.

**Description** Telegraphic, short descriptions and definitions relating the Linux virtual memory implementation.

- Title: **Video4linux Drivers, Part 1: Video-Capture Device**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/406>

**Date** 2000

**Keywords** video4linux, driver, video capture, capture devices, camera driver.

**Description** The title says it all.

- Title: **Video4linux Drivers, Part 2: Video-capture Devices**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/429>

**Date** 2000

**Keywords** video4linux, driver, video capture, capture devices, camera driver, control, query capabilities, capability, facility.

**Description** The title says it all.

- Title: **Linux IP Networking. A Guide to the Implementation and Modification of the Linux Protocol Stack.**

**Author** Glenn Herrin.

**URL** <http://www.cs.unh.edu/cnrg/gherrin>

**Date** 2000

**Keywords** network, networking, protocol, IP, UDP, TCP, connection, socket, receiving, transmitting, forwarding, routing, packets, modules, /proc, sk\_buff, FIB, tags.

**Description** Excellent paper devoted to the Linux IP Networking, explaining anything from the kernel's to the user space configuration tools' code. Very good to get a general overview of the kernel networking implementation and understand all steps packets follow from the time they are received at the network device till they are delivered to applications. The studied kernel code is from 2.2.14 version. Provides code for a working packet dropper example.

- Title: **How To Make Sure Your Driver Will Work On The Power Macintosh**

**Author** Paul Mackerras.

**URL** <http://www.linux-mag.com/id/261>

**Date** 1999

**Keywords** Mac, Power Macintosh, porting, drivers, compatibility.

**Description** The title says it all.

- Title: **An Introduction to SCSI Drivers**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/284>

**Date** 1999

**Keywords** SCSI, device, driver.

**Description** The title says it all.

- Title: **Advanced SCSI Drivers And Other Tales**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/307>

**Date** 1999

**Keywords** SCSI, device, driver, advanced.

**Description** The title says it all.

- Title: **Writing Linux Mouse Drivers**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/330>

**Date** 1999

**Keywords** mouse, driver, gpm.

**Description** The title says it all.

- Title: **More on Mouse Drivers**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/356>

**Date** 1999

**Keywords** mouse, driver, gpm, races, asynchronous I/O.

**Description** The title still says it all.

- Title: **Writing Video4linux Radio Driver**

**Author** Alan Cox.

**URL** <http://www.linux-mag.com/id/381>

**Date** 1999

**Keywords** video4linux, driver, radio, radio devices.

**Description** The title says it all.

- Title: **I/O Event Handling Under Linux**

**Author** Richard Gooch.

**URL** <http://web.mit.edu/~yandros/doc/io-events.html>

**Date** 1999

**Keywords** IO, I/O, select(2), poll(2), FDs, aio\_read(2), readiness event queues.

**Description** From the Introduction: “I/O Event handling is about how your Operating System allows you to manage a large number of open files (file descriptors in UNIX/POSIX, or FDs) in your application. You want the OS to notify you when FDs become active (have data ready to be read or are ready for writing). Ideally you want a mechanism that is scalable. This means a large number of inactive FDs cost very little in memory and CPU time to manage” .

- Title: **(nearly) Complete Linux Loadable Kernel Modules. The definitive guide for hackers, virus coders and system administrators.**

**Author** pragmatic/THC.

**URL** [http://packetstormsecurity.org/docs/hack/LKM\\_HACKING.html](http://packetstormsecurity.org/docs/hack/LKM_HACKING.html)

**Date** 1999

**Keywords** syscalls, intercept, hide, abuse, symbol table.

**Description** Interesting paper on how to abuse the Linux kernel in order to intercept and modify syscalls, make

files/directories/processes invisible, become root, hijack ttys, write kernel modules based virus...and solutions for admins to avoid all those abuses.

**Notes** For 2.0.x kernels. Gives guidances to port it to 2.2.x kernels.

- Name: **Linux Virtual File System**

**Author** Peter J. Braam.

**URL** <http://www.coda.cs.cmu.edu/doc/talks/linuxvfs/>

**Date** 1998

**Keywords** slides, VFS, inode, superblock, dentry, dcache.

**Description** Set of slides, presumably from a presentation on the Linux VFS layer. Covers version 2.1.x, with dentries and the dcache.

- Title: **The Venus kernel interface**

**Author** Peter J. Braam.

**URL** <http://www.coda.cs.cmu.edu/doc/html/kernel-venus-protocol.html>

**Date** 1998

**Keywords** coda, filesystem, venus, cache manager.

**Description** “This document describes the communication between Venus and kernel level file system code needed for the operation of the Coda filesystem. This version document is meant to describe the current interface (version 1.0) as well as improvements we envisage” .

- Title: **Design and Implementation of the Second Extended Filesystem**

**Author** Rémy Card, Theodore Ts’o, Stephen Tweedie.

**URL** <http://web.mit.edu/tytso/www/linux/ext2intro.html>

**Date** 1998

**Keywords** ext2, linux fs history, inode, directory, link, devices, VFS, physical structure, performance, benchmarks, ext2fs library, ext2fs tools, e2fsck.

**Description** Paper written by three of the top ext2 hackers. Covers Linux filesystems history, ext2 motivation, ext2 features, design, physical structure on disk, performance, benchmarks, e2fsck’s passes description...A must read!

**Notes** This paper was first published in the Proceedings of the First Dutch International Symposium on Linux, ISBN 90-367-0385-9.

- Title: **The Linux RAID-1, 4, 5 Code**

**Author** Ingo Molnar, Gadi Oxman and Miguel de Icaza.

**URL** <http://www.linuxjournal.com/article.php?sid=2391>

**Date** 1997

**Keywords** RAID, MD driver.

**Description** Linux Journal Kernel Korner article.

**Abstract** A description of the implementation of the RAID-1, RAID-4 and RAID-5 personalities of the MD device driver in the Linux kernel, providing users with high performance and reliable, secondary-storage capability using software.

- Title: **Linux Kernel Hackers' Guide**

**Author** Michael K. Johnson.

**URL** <http://www.tldp.org/LDP/khg/HyperNews/get/khg.html>

**Date** 1997

**Keywords** device drivers, files, VFS, kernel interface, character vs block devices, hardware interrupts, scsi, DMA, access to user memory, memory allocation, timers.

**Description** A guide designed to help you get up to speed on the concepts that are not intuitively obvious, and to document the internal structures of Linux.

- Title: **Dynamic Kernels: Modularized Device Drivers**

**Author** Alessandro Rubini.

**URL** <http://www.linuxjournal.com/article.php?sid=1219>

**Date** 1996

**Keywords** device driver, module, loading/unloading modules, allocating resources.

**Description** Linux Journal Kernel Korner article.

**Abstract** This is the first of a series of four articles co-authored by Alessandro Rubini and Georg Zezchwitz which present a practical approach to writing Linux device drivers as kernel loadable modules. This installment presents an introduction to the topic, preparing the reader to understand next month's installment.

- Title: **Dynamic Kernels: Discovery**

**Author** Alessandro Rubini.

**URL** <http://www.linuxjournal.com/article.php?sid=1220>

**Date** 1996

**Keywords** character driver, init\_module, clean\_up module, autodetection, major number, minor number, file operations, open(), close().

**Description** Linux Journal Kernel Korner article.

**Abstract** This article, the second of four, introduces part of the actual code to create custom module implementing a character device driver. It describes the code for module initialization and cleanup, as well as the open() and close() system calls.

- Title: **The Devil' s in the Details**

**Author** Georg v. Zezschwitz and Alessandro Rubini.

**URL** <http://www.linuxjournal.com/article.php?sid=1221>

**Date** 1996

**Keywords** read(), write(), select(), ioctl(), blocking/non blocking mode, interrupt handler.

**Description** Linux Journal Kernel Korner article.

**Abstract** This article, the third of four on writing character device drivers, introduces concepts of reading, writing, and using ioctl-calls.

- Title: **Dissecting Interrupts and Browsing DMA**

**Author** Alessandro Rubini and Georg v. Zezschwitz.

**URL** <http://www.linuxjournal.com/article.php?sid=1222>

**Date** 1996

**Keywords** interrupts, irqs, DMA, bottom halves, task queues.

**Description** Linux Journal Kernel Korner article.

**Abstract** This is the fourth in a series of articles about writing character device drivers as loadable kernel modules. This month, we further investigate the field of interrupt handling. Though it is conceptually simple, practical limitations and constraints make this an "interesting" part of device driver writing, and several different facilities have been provided for different situations. We also investigate the complex topic of DMA.

- Title: **Device Drivers Concluded**

**Author** Georg v. Zezschwitz.

**URL** <http://www.linuxjournal.com/article.php?sid=1287>

**Date** 1996

**Keywords** address spaces, pages, pagination, page management, demand loading, swapping, memory protection, memory mapping, mmap, virtual memory areas (VMAs), vremap, PCI.

**Description** Finally, the above turned out into a five articles series. This latest one' s introduction reads: "This is the last of five articles about character device drivers. In this final section, Georg deals with memory mapping devices, beginning with an overall description of the Linux memory management concepts".

- Title: **Network Buffers And Memory Management**

**Author** Alan Cox.

**URL** <http://www.linuxjournal.com/article.php?sid=1312>

**Date** 1996

**Keywords** sk\_buffs, network devices, protocol/link layer variables, network devices flags, transmit, receive, configuration, multi-cast.

**Description** Linux Journal Kernel Korner.

**Abstract** Writing a network device driver for Linux is fundamentally simple—most of the complexity (other than talking to the hardware) involves managing network packets in memory.

- Title: **Analysis of the Ext2fs structure**

**Author** Louis-Dominique Dubeau.

**URL** <http://teaching.csse.uwa.edu.au/units/CITS2002/fs-ext2/>

**Date** 1994

**Keywords** ext2, filesystem, ext2fs.

**Description** Description of ext2's blocks, directories, inodes, bitmaps, invariants...

## \* Published books

- Title: **Linux Treiber entwickeln**

**Author** Jürgen Quade, Eva-Katharina Kunst

**Publisher** dpunkt.verlag

**Date** Oct 2015 (4th edition)

**Pages** 688

**ISBN** 978-3-86490-288-8

**Note** German. The third edition from 2011 is much cheaper and still quite up-to-date.

- Title: **Linux Kernel Networking: Implementation and Theory**

**Author** Rami Rosen

**Publisher** Apress

**Date** December 22, 2013

**Pages** 648

**ISBN** 978-1430261964

- Title: **Embedded Linux Primer: A practical Real-World Approach, 2nd Edition**

**Author** Christopher Hallinan

- Publisher** Pearson
- Date** November, 2010
- Pages** 656
- ISBN** 978-0137017836
- Title: **Linux Kernel Development, 3rd Edition**

**Author** Robert Love

**Publisher** Addison-Wesley

**Date** July, 2010

**Pages** 440

**ISBN** 978-0672329463
  - Title: **Essential Linux Device Drivers**

**Author** Sreekrishnan Venkateswaran

**Published** Prentice Hall

**Date** April, 2008

**Pages** 744

**ISBN** 978-0132396554
  - Title: **Linux Device Drivers, 3rd Edition**

**Authors** Jonathan Corbet, Alessandro Rubini, and Greg Kroah-Hartman

**Publisher** O' Reilly & Associates

**Date** 2005

**Pages** 636

**ISBN** 0-596-00590-3

**Notes** Further information in <http://www.oreilly.com/catalog/linuxdrive3/> PDF format, URL: <http://lwn.net/Kernel/LDD3/>
  - Title: **Linux Kernel Internals**

**Author** Michael Beck

**Publisher** Addison-Wesley

**Date** 1997

**ISBN** 0-201-33143-8 (second edition)
  - Title: **Programmation Linux 2.0 API système et fonctionnement du noyau**

**Author** Remy Card, Eric Dumas, Franck Mevel

**Publisher** Eyrolles

**Date** 1997

**Pages** 520

**ISBN** 2-212-08932-5

**Notes** French

- Title: **The Design and Implementation of the 4.4 BSD UNIX Operating System**

**Author** Marshall Kirk McKusick, Keith Bostic, Michael J. Karels,  
John S. Quarterman

**Publisher** Addison-Wesley

**Date** 1996

**ISBN** 0-201-54979-4

- Title: **Unix internals - the new frontiers**

**Author** Uresh Vahalia

**Publisher** Prentice Hall

**Date** 1996

**Pages** 600

**ISBN** 0-13-101908-2

- Title: **Programming for the real world - POSIX.4**

**Author** Bill O. Gallmeister

**Publisher** O' Reilly & Associates, Inc

**Date** 1995

**Pages** 552

**ISBN** I-56592-074-0

**Notes** Though not being directly about Linux, Linux aims to be  
POSIX. Good reference.

- Title: **UNIX Systems for Modern Architectures: Symmetric Multiprocessing and Caching for Kernel Programmers**

**Author** Curt Schimmel

**Publisher** Addison Wesley

**Date** June, 1994

**Pages** 432

**ISBN** 0-201-63338-8

- Title: **The Design and Implementation of the 4.3 BSD UNIX Operating System**

**Author** Samuel J. Leffler, Marshall Kirk McKusick, Michael J Karels,  
John S. Quarterman

**Publisher** Addison-Wesley

**Date** 1989 (reprinted with corrections on October, 1990)

**ISBN** 0-201-06196-1

- Title: **The Design of the UNIX Operating System**

**Author** Maurice J. Bach

**Publisher** Prentice Hall

**Date** 1986

**Pages** 471

**ISBN** 0-13-201757-1

## \* Miscellaneous

- Name: **Cross-Referencing Linux**

**URL** <https://elixir.bootlin.com/>

**Keywords** Browsing source code.

**Description** Another web-based Linux kernel source code browser.

Lots of cross references to variables and functions. You can see where they are defined and where they are used.

- Name: **Linux Weekly News**

**URL** <http://lwn.net>

**Keywords** latest kernel news.

**Description** The title says it all. There's a fixed kernel section summarizing developers' work, bug fixes, new features and versions produced during the week. Published every Thursday.

- Name: **The home page of Linux-MM**

**Author** The Linux-MM team.

**URL** <http://linux-mm.org/>

**Keywords** memory management, Linux-MM, mm patches, TODO, docs, mailing list.

**Description** Site devoted to Linux Memory Management development. Memory related patches, HOWTOs, links, mm developers ...Don't miss it if you are interested in memory management development!

- Name: **Kernel Newbies IRC Channel and Website**

**URL** <http://www.kernelnewbies.org>

**Keywords** IRC, newbies, channel, asking doubts.

**Description** #kernelnewbies on irc.oftc.net. #kernelnewbies is an IRC network dedicated to the 'newbie' kernel hacker. The audience mostly consists of people who are learning about the kernel,

working on kernel projects or professional kernel hackers that want to help less seasoned kernel people. #kernelnewbies is on the OFTC IRC Network. Try irc.oftc.net as your server and then /join #kernelnewbies. The kernelnewbies website also hosts articles, documents, FAQs…

- Name: **linux-kernel mailing list archives and search engines**

**URL** <http://vger.kernel.org/vger-lists.html>

**URL** <http://www.uwsg.indiana.edu/hypermail/linux/kernel/index.html>

**URL** <http://groups.google.com/group/mlist.linux.kernel>

**Keywords** linux-kernel, archives, search.

**Description** Some of the linux-kernel mailing list archivers. If you have a better/another one, please let me know.

---

Document last updated on Tue 2016-Sep-20

**This document is based on:** <http://www.dit.upm.es/~jmseyas/linux/kernel/hackers-docs.html>

## DEPRECATED INTERFACES, LANGUAGE FEATURES, ATTRIBUTES, AND CONVENTIONS

In a perfect world, it would be possible to convert all instances of some deprecated API into the new API and entirely remove the old API in a single development cycle. However, due to the size of the kernel, the maintainership hierarchy, and timing, it's not always feasible to do these kinds of conversions at once. This means that new instances may sneak into the kernel while old ones are being removed, only making the amount of work to remove the API grow. In order to educate developers about what has been deprecated and why, this list has been created as a place to point when uses of deprecated things are proposed for inclusion in the kernel.

### \* **deprecated**

While this attribute does visually mark an interface as deprecated, it [does not produce warnings during builds any more](#) because one of the standing goals of the kernel is to build without warnings and no one was actually doing anything to remove these deprecated interfaces. While using `_deprecated` is nice to note an old API in a header file, it isn't the full solution. Such interfaces must either be fully removed from the kernel, or added to this file to discourage others from using them in the future.

### \* **BUG() and BUG\_ON()**

Use `WARN()` and `WARN_ON()` instead, and handle the “impossible” error condition as gracefully as possible. While the `BUG()`-family of APIs were originally designed to act as an “impossible situation” assert and to kill a kernel thread “safely”, they turn out to just be too risky. (e.g. “In what order do locks need to be released? Have various states been restored?”) Very commonly, using `BUG()` will destabilize a system or entirely break it, which makes it impossible to debug or even get viable crash reports. Linus has [very strong feelings about this](#).

Note that the `WARN()`-family should only be used for “expected to be unreachable” situations. If you want to warn about “reachable but undesirable” situations, please use the `pr_warn()`-family of functions. System owners may have set the `panic_on_warn` sysctl, to make sure their systems do not continue running in the face of “unreachable” conditions. (For example, see commits like [this one](#).)

## \* open-coded arithmetic in allocator arguments

Dynamic size calculations (especially multiplication) should not be performed in memory allocator (or similar) function arguments due to the risk of them overflowing. This could lead to values wrapping around and a smaller allocation being made than the caller was expecting. Using those allocations could lead to linear overflows of heap memory and other misbehaviors. (One exception to this is literal values where the compiler can warn if they might overflow. Though using literals for arguments as suggested below is also harmless.)

For example, do not use `count * size` as an argument, as in:

```
foo = kmalloc(count * size, GFP_KERNEL);
```

Instead, the 2-factor form of the allocator should be used:

```
foo = kmalloc_array(count, size, GFP_KERNEL);
```

If no 2-factor form is available, the saturate-on-overflow helpers should be used:

```
bar = vmalloc(array_size(count, size));
```

Another common case to avoid is calculating the size of a structure with a trailing array of others structures, as in:

```
header = kzalloc(sizeof(*header) + count * sizeof(*header->item),  
                 GFP_KERNEL);
```

Instead, use the helper:

```
header = kzalloc(struct_size(header, item, count), GFP_KERNEL);
```

See `array_size()`, `array3_size()`, and `struct_size()`, for more details as well as the related `check_add_overflow()` and `check_mul_overflow()` family of functions.

## \* simple\_strtol(), simple strtoll(), simple strtoul(), simple strtoull()

The `simple_strtol()`, `simple strtoll()`, `simple strtoul()`, and `simple strtoull()` functions explicitly ignore overflows, which may lead to unexpected results in callers. The respective `kstrtol()`, `kstrtoll()`, `kstrtoul()`, and `kstrtoull()` functions tend to be the correct replacements, though note that those require the string to be NUL or newline terminated.

## \* **strncpy()**

strncpy() performs no bounds checking on the destination buffer. This could result in linear overflows beyond the end of the buffer, leading to all kinds of misbehaviors. While CONFIG\_FORTIFY\_SOURCE=y and various compiler flags help reduce the risk of using this function, there is no good reason to add new uses of this function. The safe replacement is strscpy().

## \* **strncpy() on NUL-terminated strings**

Use of strncpy() does not guarantee that the destination buffer will be NUL terminated. This can lead to various linear read overflows and other misbehavior due to the missing termination. It also NUL-pads the destination buffer if the source contents are shorter than the destination buffer size, which may be a needless performance penalty for callers using only NUL-terminated strings. The safe replacement is strscpy(). (Users of strncpy() still needing NUL-padding should instead use strscpy\_pad().)

If a caller is using non-NUL-terminated strings, strncpy() can still be used, but destinations should be marked with the `_nonstring` attribute to avoid future compiler warnings.

## \* **strlcpy()**

strlcpy() reads the entire source buffer first, possibly exceeding the given limit of bytes to copy. This is inefficient and can lead to linear read overflows if a source string is not NUL-terminated. The safe replacement is strscpy().

## \* **%p format specifier**

Traditionally, using “%p” in format strings would lead to regular address exposure flaws in dmesg, proc, sysfs, etc. Instead of leaving these to be exploitable, all “%p” uses in the kernel are being printed as a hashed value, rendering them unusable for addressing. New uses of “%p” should not be added to the kernel. For text addresses, using “%pS” is likely better, as it produces the more useful symbol name instead. For nearly everything else, just do not add “%p” at all.

Paraphrasing Linus’ s current [guidance](#):

- If the hashed “%p” value is pointless, ask yourself whether the pointer itself is important. Maybe it should be removed entirely?
- If you really think the true pointer value is important, why is some system state or user privilege level considered “special”? If you think you can justify it (in comments and commit log) well enough to stand up to Linus’ s scrutiny, maybe you can use “%px”, along with making sure you have sensible permissions.

And finally, know that a toggle for “%p” hashing will [not be accepted](#).

## \* Variable Length Arrays (VLAs)

Using stack VLAs produces much worse machine code than statically sized stack arrays. While these non-trivial [performance issues](#) are reason enough to eliminate VLAs, they are also a security risk. Dynamic growth of a stack array may exceed the remaining memory in the stack segment. This could lead to a crash, possible overwriting sensitive contents at the end of the stack (when built without CONFIG\_THREAD\_INFO\_IN\_TASK=y), or overwriting memory adjacent to the stack (when built without CONFIG\_VMAP\_STACK=y)

## \* Implicit switch case fall-through

The C language allows switch cases to fall through to the next case when a “break” statement is missing at the end of a case. This, however, introduces ambiguity in the code, as it’s not always clear if the missing break is intentional or a bug. For example, it’s not obvious just from looking at the code if STATE\_ONE is intentionally designed to fall through into STATE\_TWO:

```
switch (value) {
case STATE_ONE:
    do_something();
case STATE_TWO:
    do_other();
    break;
default:
    WARN("unknown state");
}
```

As there have been a long list of flaws [due to missing “break” statements](#), we no longer allow implicit fall-through. In order to identify intentional fall-through cases, we have adopted a pseudo-keyword macro “fallthrough” which expands to gcc’s extension [\\_attribute\\_\(\\_\\_fallthrough\\_\\_\)](#). (When the C17/C18 [[fallthrough]] syntax is more commonly supported by C compilers, static analyzers, and IDEs, we can switch to using that syntax for the macro pseudo-keyword.)

All switch/case blocks must end in one of:

- break;
- fallthrough;
- continue;
- goto <label>;
- return [expression];

---

CHAPTER  
**TWENTYONE**

---

## **EMBARGOED HARDWARE ISSUES**

### **\* Scope**

Hardware issues which result in security problems are a different category of security bugs than pure software bugs which only affect the Linux kernel.

Hardware issues like Meltdown, Spectre, L1TF etc. must be treated differently because they usually affect all Operating Systems ( “OS” ) and therefore need coordination across different OS vendors, distributions, hardware vendors and other parties. For some of the issues, software mitigations can depend on microcode or firmware updates, which need further coordination.

### **\* Contact**

The Linux kernel hardware security team is separate from the regular Linux kernel security team.

The team only handles the coordination of embargoed hardware security issues. Reports of pure software security bugs in the Linux kernel are not handled by this team and the reporter will be guided to contact the regular Linux kernel security team (Documentation/admin-guide/) instead.

The team can be contacted by email at <[hardware-security@kernel.org](mailto:hardware-security@kernel.org)>. This is a private list of security officers who will help you to coordinate an issue according to our documented process.

The list is encrypted and email to the list can be sent by either PGP or S/MIME encrypted and must be signed with the reporter’ s PGP key or S/MIME certificate. The list’ s PGP key and S/MIME certificate are available from the following URLs:

- PGP: <https://www.kernel.org/static/files/hardware-security.asc>
- S/MIME: <https://www.kernel.org/static/files/hardware-security.crt>

While hardware security issues are often handled by the affected hardware vendor, we welcome contact from researchers or individuals who have identified a potential hardware flaw.

### \* **Hardware security officers**

The current team of hardware security officers:

- Linus Torvalds (Linux Foundation Fellow)
- Greg Kroah-Hartman (Linux Foundation Fellow)
- Thomas Gleixner (Linux Foundation Fellow)

### \* **Operation of mailing-lists**

The encrypted mailing-lists which are used in our process are hosted on Linux Foundation's IT infrastructure. By providing this service, members of Linux Foundation's IT operations personnel technically have the ability to access the embargoed information, but are obliged to confidentiality by their employment contract. Linux Foundation IT personnel are also responsible for operating and managing the rest of kernel.org infrastructure.

The Linux Foundation's current director of IT Project infrastructure is Konstantin Ryabitsev.

### \* **Non-disclosure agreements**

The Linux kernel hardware security team is not a formal body and therefore unable to enter into any non-disclosure agreements. The kernel community is aware of the sensitive nature of such issues and offers a Memorandum of Understanding instead.

### \* **Memorandum of Understanding**

The Linux kernel community has a deep understanding of the requirement to keep hardware security issues under embargo for coordination between different OS vendors, distributors, hardware vendors and other parties.

The Linux kernel community has successfully handled hardware security issues in the past and has the necessary mechanisms in place to allow community compliant development under embargo restrictions.

The Linux kernel community has a dedicated hardware security team for initial contact, which oversees the process of handling such issues under embargo rules.

The hardware security team identifies the developers (domain experts) who will form the initial response team for a particular issue. The initial response team can bring in further developers (domain experts) to address the issue in the best technical way.

All involved developers pledge to adhere to the embargo rules and to keep the received information confidential. Violation of the pledge will lead to immediate exclusion from the current issue and removal from all related mailing-lists. In addition, the hardware security team will also exclude the offender from future issues. The impact of this consequence is a highly effective deterrent in our community. In

case a violation happens the hardware security team will inform the involved parties immediately. If you or anyone becomes aware of a potential violation, please report it immediately to the Hardware security officers.

## \* **Process**

Due to the globally distributed nature of Linux kernel development, face-to-face meetings are almost impossible to address hardware security issues. Phone conferences are hard to coordinate due to time zones and other factors and should be only used when absolutely necessary. Encrypted email has been proven to be the most effective and secure communication method for these types of issues.

### **Start of Disclosure**

Disclosure starts by contacting the Linux kernel hardware security team by email. This initial contact should contain a description of the problem and a list of any known affected hardware. If your organization builds or distributes the affected hardware, we encourage you to also consider what other hardware could be affected.

The hardware security team will provide an incident-specific encrypted mailing-list which will be used for initial discussion with the reporter, further disclosure and coordination.

The hardware security team will provide the disclosing party a list of developers (domain experts) who should be informed initially about the issue after confirming with the developers that they will adhere to this Memorandum of Understanding and the documented process. These developers form the initial response team and will be responsible for handling the issue after initial contact. The hardware security team is supporting the response team, but is not necessarily involved in the mitigation development process.

While individual developers might be covered by a non-disclosure agreement via their employer, they cannot enter individual non-disclosure agreements in their role as Linux kernel developers. They will, however, agree to adhere to this documented process and the Memorandum of Understanding.

The disclosing party should provide a list of contacts for all other entities who have already been, or should be, informed about the issue. This serves several purposes:

- The list of disclosed entities allows communication across the industry, e.g. other OS vendors, HW vendors, etc.
- The disclosed entities can be contacted to name experts who should participate in the mitigation development.
- If an expert which is required to handle an issue is employed by an listed entity or member of an listed entity, then the response teams can request the disclosure of that expert from that entity. This ensures that the expert is also part of the entity's response team.

### Disclosure

The disclosing party provides detailed information to the initial response team via the specific encrypted mailing-list.

From our experience the technical documentation of these issues is usually a sufficient starting point and further technical clarification is best done via email.

### Mitigation development

The initial response team sets up an encrypted mailing-list or repurposes an existing one if appropriate.

Using a mailing-list is close to the normal Linux development process and has been successfully used in developing mitigations for various hardware security issues in the past.

The mailing-list operates in the same way as normal Linux development. Patches are posted, discussed and reviewed and if agreed on applied to a non-public git repository which is only accessible to the participating developers via a secure connection. The repository contains the main development branch against the mainline kernel and backport branches for stable kernel versions as necessary.

The initial response team will identify further experts from the Linux kernel developer community as needed. Bringing in experts can happen at any time of the development process and needs to be handled in a timely manner.

If an expert is employed by or member of an entity on the disclosure list provided by the disclosing party, then participation will be requested from the relevant entity.

If not, then the disclosing party will be informed about the experts participation. The experts are covered by the Memorandum of Understanding and the disclosing party is requested to acknowledge the participation. In case that the disclosing party has a compelling reason to object, then this objection has to be raised within five work days and resolved with the incident team immediately. If the disclosing party does not react within five work days this is taken as silent acknowledgement.

After acknowledgement or resolution of an objection the expert is disclosed by the incident team and brought into the development process.

### Coordinated release

The involved parties will negotiate the date and time where the embargo ends. At that point the prepared mitigations are integrated into the relevant kernel trees and published.

While we understand that hardware security issues need coordinated embargo time, the embargo time should be constrained to the minimum time which is required for all involved parties to develop, test and prepare the mitigations. Extending embargo time artificially to meet conference talk dates or other non-technical reasons is creating more work and burden for the involved developers and response teams as the patches need to be kept up to date in order to follow the ongoing upstream kernel development, which might create conflicting changes.

## CVE assignment

Neither the hardware security team nor the initial response team assign CVEs, nor are CVEs required for the development process. If CVEs are provided by the disclosing party they can be used for documentation purposes.

## \* Process ambassadors

For assistance with this process we have established ambassadors in various organizations, who can answer questions about or provide guidance on the reporting process and further handling. Ambassadors are not involved in the disclosure of a particular issue, unless requested by a response team or by an involved disclosed party. The current ambassadors list:

ARM	Grant Likely < <a href="mailto:grant.likely@arm.com">grant.likely@arm.com</a> >
AMD	Tom Lendacky < <a href="mailto:tom.lendacky@amd.com">tom.lendacky@amd.com</a> >
IBM Z	Christian Borntraeger < <a href="mailto:borntraeger@de.ibm.com">borntraeger@de.ibm.com</a> >
IBM Power	Anton Blanchard < <a href="mailto:anton@linux.ibm.com">anton@linux.ibm.com</a> >
Intel	Tony Luck < <a href="mailto:tony.luck@intel.com">tony.luck@intel.com</a> >
Qualcomm	Trilok Soni < <a href="mailto:tsoni@codeaurora.org">tsoni@codeaurora.org</a> >
Microsoft	James Morris < <a href="mailto:jamorris@linux.microsoft.com">jamorris@linux.microsoft.com</a> >
VMware	
Xen	Andrew Cooper < <a href="mailto:andrew.cooper3@citrix.com">andrew.cooper3@citrix.com</a> >
Canonical	John Johansen < <a href="mailto:john.johansen@canonical.com">john.johansen@canonical.com</a> >
Debian	Ben Hutchings < <a href="mailto:ben@decadent.org.uk">ben@decadent.org.uk</a> >
Oracle	Konrad Rzeszutek Wilk < <a href="mailto:konrad.wilk@oracle.com">konrad.wilk@oracle.com</a> >
Red Hat	Josh Poimboeuf < <a href="mailto:jpoimboe@redhat.com">jpoimboe@redhat.com</a> >
SUSE	Jiri Kosina < <a href="mailto:jkosina@suse.cz">jkosina@suse.cz</a> >
Amazon	
Google	Kees Cook < <a href="mailto:keescook@chromium.org">keescook@chromium.org</a> >

If you want your organization to be added to the ambassadors list, please contact the hardware security team. The nominated ambassador has to understand and support our process fully and is ideally well connected in the Linux kernel community.

## \* Encrypted mailing-lists

We use encrypted mailing-lists for communication. The operating principle of these lists is that email sent to the list is encrypted either with the list's PGP key or with the list's S/MIME certificate. The mailing-list software decrypts the email and re-encrypts it individually for each subscriber with the subscriber's PGP key or S/MIME certificate. Details about the mailing-list software and the setup which is used to ensure the security of the lists and protection of the data can be found here: <https://korg.wiki.kernel.org/userdoc/remail>.

### \* **List keys**

For initial contact see Contact. For incident specific mailing-lists the key and S/MIME certificate are conveyed to the subscribers by email sent from the specific list.

### \* **Subscription to incident specific lists**

Subscription is handled by the response teams. Disclosed parties who want to participate in the communication send a list of potential subscribers to the response team so the response team can validate subscription requests.

Each subscriber needs to send a subscription request to the response team by email. The email must be signed with the subscriber's PGP key or S/MIME certificate. If a PGP key is used, it must be available from a public key server and is ideally connected to the Linux kernel's PGP web of trust. See also: <https://www.kernel.org/signature.html>.

The response team verifies that the subscriber request is valid and adds the subscriber to the list. After subscription the subscriber will receive email from the mailing-list which is signed either with the list's PGP key or the list's S/MIME certificate. The subscriber's email client can extract the PGP key or the S/MIME certificate from the signature so the subscriber can send encrypted email to the list.

## **LIST OF MAINTAINERS AND HOW TO SUBMIT KERNEL CHANGES**

Please try to follow the guidelines below. This will make things easier on the maintainers. Not all of these guidelines matter for every trivial patch so apply some common sense.

### **\* Tips for patch submitters**

1. Always test your changes, however small, on at least 4 or 5 people, preferably many more.
2. Try to release a few ALPHA test versions to the net. Announce them onto the kernel channel and await results. This is especially important for device drivers, because often that's the only way you will find things like the fact version 3 firmware needs a magic fix you didn't know about, or some clown changed the chips on a board and not its name. (Don't laugh! Look at the SMC etherpower for that.)
3. Make sure your changes compile correctly in multiple configurations. In particular check that changes work both as a module and built into the kernel.
4. When you are happy with a change make it generally available for testing and await feedback.
5. Make a patch available to the relevant maintainer in the list. Use `diff -u` to make the patch easy to merge. Be prepared to get your changes sent back with seemingly silly requests about formatting and variable names. These aren't as silly as they seem. One job the maintainers (and especially Linus) do is to keep things looking the same. Sometimes this means that the clever hack in your driver to get around a problem actually needs to become a generalized kernel feature ready for next time.

PLEASE check your patch with the automated style checker (`scripts/checkpatch.pl`) to catch trivial style violations. See `process/coding-style` for guidance here.

PLEASE CC: the maintainers and mailing lists that are generated by `scripts/get_maintainer.pl`. The results returned by the script will be best if you have git installed and are making your changes in a branch derived from Linus' latest git tree. See `process/submitting-patches` for details.

PLEASE try to include any credit lines you want added with the patch. It avoids people being missed off by mistake and makes it easier to know who wants adding and who doesn't.

PLEASE document known bugs. If it doesn't work for everything or does something very odd once a month document it.

PLEASE remember that submissions must be made under the terms of the Linux Foundation certificate of contribution and should include a Signed-off-by: line. The current version of this "Developer's Certificate of Origin" (DCO) is listed in the file process/submitting-patches.

6. Make sure you have the right to send any changes you make. If you do changes at work you may find your employer owns the patch not you.
7. When sending security related changes or reports to a maintainer please Cc: [security@kernel.org](mailto:security@kernel.org), especially if the maintainer does not respond. Please keep in mind that the security team is a small set of people who can be efficient only when working on verified bugs. Please only Cc: this list when you have identified that the bug would present a short-term risk to other users if it were publicly disclosed. For example, reports of address leaks do not represent an immediate threat and are better handled publicly, and ideally, should come with a patch proposal. Please do not send automated reports to this list either. Such bugs will be handled better and faster in the usual public places. See admin-guide/security-bugs for details.
8. Happy hacking.

### \* Descriptions of section entries and preferred order

M: Mail patches to: FullName <[address@domain](mailto:address@domain)>

R: Designated Reviewer: FullName <[address@domain](mailto:address@domain)>

These reviewers should be CCed on patches.

L: Mailing list that is relevant to this area

S: Status, one of the following:

Supported: Someone is actually paid to look after this.

Maintained: Someone actually looks after it.

Odd Fixes: It has a maintainer but they don't have time to do much other than throw the odd patch in. See below..

Orphan: No current maintainer [but maybe you could take the role as you write your new code].

Obsolete: Old code. Something tagged obsolete generally means it has been replaced by a better system and you should be using that.

W: Web-page with status/info

Q: Patchwork web based patch tracking system site

B: URI for where to file bugs. A web-page with detailed bug filing info, a direct bug tracker link, or a mailto: URI.

C: URI for chat protocol, server and channel where developers

usually hang out, for example irc://server/channel.

P: Subsystem Profile document for more details submitting patches to the given subsystem. This is either an in-tree file, or a URI. See maintainer/maintainer-entry-profile for details.

T: SCM tree type and location.

Type is one of: git, hg, quilt, stgit, topgit

F: Files and directories wildcard patterns.

A trailing slash includes all files and subdirectory files.

F: drivers/net/ all files in and below drivers/net

F: drivers/net/\* all files in drivers/net, but not below

F: /net/ all files in “any top level directory” /net

One pattern per line. Multiple F: lines acceptable.

X: Excluded files and directories that are NOT maintained, same rules as F:. Files exclusions are tested before file matches.

Can be useful for excluding a specific subdirectory, for instance:

F: net/

X: net/ipv6/

matches all files in and below net excluding net/ipv6/

N: Files and directories Regex patterns.

N: [^a-z]tegra all files whose path contains tegra  
(not including files like integrator)

One pattern per line. Multiple N: lines acceptable.

scripts/get\_maintainer.pl has different behavior for files that match F: pattern and matches of N: patterns. By default, get\_maintainer will not look at git log history when an F: pattern match occurs. When an N: match occurs, git log history is used to also notify the people that have git commit signatures.

K: Content regex (perl extended) pattern match in a patch or file.

For instance:

K: of\_get\_profile

matches patches or files that contain “of\_get\_profile”

K: \b printk|pr\_(info|err)\b

matches patches or files that contain one or more of the words printk, pr\_info or pr\_err

One regex pattern per line. Multiple K: lines acceptable.

## \* **Maintainers List**

---

**Note:** When reading this list, please look for the most precise areas first. When adding to this list, please keep the entries in alphabetical order.

---

### \* **3C59X NETWORK DRIVER**

**Mail** Steffen Klassert <[klassert@kernel.org](mailto:klassert@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Odd Fixes

**Files** networking/device\_drivers/3com/vortex drivers/net/ethernet/  
3com/3c59x.c

### \* **3CR990 NETWORK DRIVER**

**Mail** David Dillow <[dave@thedillows.org](mailto:dave@thedillows.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/3com/typhoon\*

### \* **3WARE SAS/SATA-RAID SCSI DRIVERS (3W-XXXX, 3W-9XXX, 3W-SAS)**

**Mail** Adam Radford <[aradford@gmail.com](mailto:aradford@gmail.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.lsi.com>

**Files** drivers/scsi/3w-\*

### \* **53C700 AND 53C700-66 SCSI DRIVER**

**Mail** “James E.J. Bottomley”<[James.Bottomley@HansenPartnership.com](mailto:James.Bottomley@HansenPartnership.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** drivers/scsi/53c700\*

### \* **6LOWPAN GENERIC (BTLE/IEEE 802.15.4)**

**Mail** Alexander Aring <alex.aring@gmail.com>, Jukka Rissanen <jukka.rissanen@linux.intel.com>

**Mailing list** linux-bluetooth@vger.kernel.org, linux-wpan@vger.kernel.org

**Status** Maintained

**Files** networking/6lowpan include/net/6lowpan.h net/6lowpan/

### \* **6PACK NETWORK DRIVER FOR AX.25**

**Mail** Andreas Koensgen <ajk@comnets.uni-bremen.de>

**Mailing list** linux-hams@vger.kernel.org

**Status** Maintained

**Files** drivers/net/hamradio/6pack.c

### \* **802.11 (including CFG80211/NL80211)**

**Mail** Johannes Berg <johannes@sipsolutions.net>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/>

**SCM** git://git.kernel.org/pub/scm/linux/kernel/git/jberg/mac80211.git  
git://git.kernel.org/pub/scm/linux/kernel/git/jberg/mac80211-next.git

**Files** driver-api/80211/cfg80211 networking/regulatory include/linux/ieee80211.h include/net/cfg80211.h include/net/ieee80211\_radiotap.h include/net/iw\_handler.h include/net/wext.h include/uapi/linux/nl80211.h net/wireless/

### \* **8169 10/100/1000 GIGABIT ETHERNET DRIVER**

**Mail** Realtek linux nic maintainers <nic\_swsd@realtek.com>, Heiner Kallweit <hkallweit1@gmail.com>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/realtek/r8169\*

### \* 8250/16550 (AND CLONE UARTS) SERIAL DRIVER

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [linux-serial@vger.kernel.org](mailto:linux-serial@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/tty.git>

**Files** drivers/tty/serial/8250\* include/linux/serial\_8250.h

### \* 8390 NETWORK DRIVERS [WD80x3/SMC-ELITE, SMC-ULTRA, NE2000, 3C503, etc.]

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Orphan / Obsolete

**Files** drivers/net/ethernet/8390/

### \* 9P FILE SYSTEM

**Mail** Eric Van Hensbergen <[ericvh@gmail.com](mailto:ericvh@gmail.com)>, Latchesar Ionkov <[luchonkov.net](mailto:luchonkov.net)>, Dominique Martinet <[asmadeus@codewreck.org](mailto:asmadeus@codewreck.org)>

**Mailing list** [v9fs-developer@lists.sourceforge.net](mailto:v9fs-developer@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://swik.net/v9fs>

**Patchwork** <http://patchwork.kernel.org/project/v9fs-devel/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/ericvh/v9fs.git> git [git://github.com/martinod/linux.git](https://github.com/martinod/linux.git)

**Files** filesystems/9p fs/9p/ include/net/9p/ include/trace/events/9p.h include/uapi/linux/virtio\_9p.h net/9p/

### \* A8293 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/a8293\*

### \* AACRAID SCSI RAID DRIVER

**Mail** Adaptec OEM Raid Solutions <[aacraid@microsemi.com](mailto:aacraid@microsemi.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.adaptec.com/>

**Files** scsi/aacraid drivers/scsi/aacraid/

### \* ABI/API

**Mailing list** [linux-api@vger.kernel.org](mailto:linux-api@vger.kernel.org)

**Files** include/linux/syscalls.h kernel/sys\_ni.c

### \* ABIT UGURU 1,2 HARDWARE MONITOR DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/abituguru.c

### \* ABIT UGURU 3 HARDWARE MONITOR DRIVER

**Mail** Alistair John Strachan <[alistair@devzero.co.uk](mailto:alistair@devzero.co.uk)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/abituguru3.c

### \* ACCES 104-DIO-48E GPIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-104-dio-48e.c

## \* ACCES 104-IDI-48 GPIO DRIVER

**Mail** “William Breathitt Gray” <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-104-idi-48.c

## \* ACCES 104-IDIO-16 GPIO DRIVER

**Mail** “William Breathitt Gray” <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-104-idio-16.c

## \* ACCES 104-QUAD-8 DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>, Syed Nayyar Waris <[syednwaris@gmail.com](mailto:syednwaris@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-counter-104-quad-8  
Documentation/ABI/testing/sysfs-bus-iio-counter-104-quad-8  
drivers/counter/104-quad-8.c

## \* ACCES PCI-IDIO-16 GPIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-pci-idio-16.c

## \* ACCES PCIe-IDIO-24 GPIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-pcie-idio-24.c

### \* ACENIC DRIVER

**Mail** Jes Sorensen <[jes@trained-monkey.org](mailto:jes@trained-monkey.org)>

**Mailing list** [linux-acenic@sunsite.dk](mailto:linux-acenic@sunsite.dk)

**Status** Maintained

**Files** drivers/net/ethernet/alteon/acenic\*

### \* ACER ASPIRE ONE TEMPERATURE AND FAN DRIVER

**Mail** Peter Kaestle <[peter@piie.net](mailto:peter@piie.net)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Web-page** <http://piie.net/?section=acerhdf>

**Files** drivers/platform/x86/acerhdf.c

### \* ACER WMI LAPTOP EXTRAS

**Mail** “Lee, Chun-Yi” <[jlee@suse.com](mailto:jlee@suse.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/acer-wmi.c

### \* ACPI

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Len Brown <[lenb@kernel.org](mailto:lenb@kernel.org)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Status** Supported

**Web-page** <https://01.org/linux-acpi>

**Patchwork** <https://patchwork.kernel.org/project/linux-acpi/list/>

**bugs** <https://bugzilla.kernel.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm>

**Files** Documentation/ABI/testing/configfs-acpi Documentation/  
ABI/testing/sysfs-bus-acpi Documentation/firmware-guide/  
acpi/ drivers/acpi/ drivers/pci/\*/\*acpi\* drivers/pci/  
\*acpi\* drivers/pnp/pnppacpi/ include/acpi/ include/linux/  
acpi.h include/linux/fwnode.h tools/power/acpi/

### \* ACPI APEI

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Len Brown <[lenb@kernel.org](mailto:lenb@kernel.org)>

**Reviewer** James Morse <[james.morse@arm.com](mailto:james.morse@arm.com)>, Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>, Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Files** drivers/acpi/apei/

### \* ACPI COMPONENT ARCHITECTURE (ACPICA)

**Mail** Robert Moore <[robert.moore@intel.com](mailto:robert.moore@intel.com)>, Erik Kaneda <[erik.kaneda@intel.com](mailto:erik.kaneda@intel.com)>, “Rafael J. Wysocki” <[rafael.j.wysocki@intel.com](mailto:rafael.j.wysocki@intel.com)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org), [devel@acpica.org](mailto:devel@acpica.org)

**Status** Supported

**Web-page** <https://acpica.org/> <https://github.com/acpica/acpica/>

**Patchwork** <https://patchwork.kernel.org/project/linux-acpi/list/>

**bugs** <https://bugzilla.kernel.org> <https://bugs.acpica.org>

**SCM** git [git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm](https://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm)

**Files** drivers/acpi/acpica/ include/acpi/ tools/power/acpi/

### \* ACPI FAN DRIVER

**Mail** Zhang Rui <[rui.zhang@intel.com](mailto:rui.zhang@intel.com)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Status** Supported

**Web-page** <https://01.org/linux-acpi>

**bugs** <https://bugzilla.kernel.org>

**Files** drivers/acpi/fan.c

### \* ACPI FOR ARM64 (ACPI/arm64)

**Mail** Lorenzo Pieralisi <[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>, Hanjun Guo <[guohanjun@huawei.com](mailto:guohanjun@huawei.com)>, Sudeep Holla <[sudeep.holla@arm.com](mailto:sudeep.holla@arm.com)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/acpi/arm64

## \* ACPI I2C MULTI INstantiate DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/i2c-multi-instantiate.c

## \* ACPI PMIC DRIVERS

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Len Brown <[lenb@kernel.org](mailto:lenb@kernel.org)>

**Reviewer** Andy Shevchenko <[andriy.shevchenko@linux.intel.com](mailto:andriy.shevchenko@linux.intel.com)>, Mika Westerberg <[mika.westerberg@linux.intel.com](mailto:mika.westerberg@linux.intel.com)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-acpi/list/>

**bugs** <https://bugzilla.kernel.org>

**SCM** git [git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm](https://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm)

**Files** drivers/acpi/pmic/

## \* ACPI THERMAL DRIVER

**Mail** Zhang Rui <[rui.zhang@intel.com](mailto:rui.zhang@intel.com)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Status** Supported

**Web-page** <https://01.org/linux-acpi>

**bugs** <https://bugzilla.kernel.org>

**Files** drivers/acpi/\*thermal\*

## \* ACPI VIDEO DRIVER

**Mail** Zhang Rui <[rui.zhang@intel.com](mailto:rui.zhang@intel.com)>

**Mailing list** [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Status** Supported

**Web-page** <https://01.org/linux-acpi>

**bugs** <https://bugzilla.kernel.org>

**Files** drivers/acpi/acpi\_video.c

### \* ACPI WMI DRIVER

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Orphan

**Files** drivers/platform/x86/wmi.c include/uapi/linux/wmi.h

### \* AD1889 ALSA SOUND DRIVER

**Mailing list** [linux-parisc@vger.kernel.org](mailto:linux-parisc@vger.kernel.org)

**Status** Maintained

**Web-page** <https://parisc.wiki.kernel.org/index.php/AD1889>

**Files** sound/pci/ad1889.\*

### \* AD525X ANALOG DEVICES DIGITAL POTENTIOMETERS DRIVER

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/AD5254> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/misc/ad525x\_dpot.c

### \* AD5398 CURRENT REGULATOR DRIVER (AD5398/AD5821)

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/AD5398> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/regulator/ad5398.c

### \* AD714X CAPACITANCE TOUCH SENSOR DRIVER (AD7142/3/7/8/7A)

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/AD7142> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/input/misc/ad714x.c

### \* AD7877 TOUCHSCREEN DRIVER

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/AD7877> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/input/touchscreen/ad7877.c

### \* AD7879 TOUCHSCREEN DRIVER (AD7879/AD7889)

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/AD7879> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/input/touchscreen/ad7879.c

### \* ADDRESS SPACE LAYOUT RANDOMIZATION (ASLR)

**Mail** Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>

**Status** Maintained

### \* ADF7242 IEEE 802.15.4 RADIO DRIVER

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Supported

**Web-page** <https://wiki.analog.com/ADF7242> <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/net/ieee802154/adf7242.txt drivers/net/ieee802154/adf7242.c

### \* ADM1025 HARDWARE MONITOR DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/adm1025 drivers/hwmon/adm1025.c

## \* ADM1029 HARDWARE MONITOR DRIVER

**Mail** Corentin Labbe <[clabbe.montjoie@gmail.com](mailto:clabbe.montjoie@gmail.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/adm1029.c

## \* ADM8211 WIRELESS DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Orphan

**Web-page** <https://wireless.wiki.kernel.org/>

**Files** drivers/net/wireless/admtek/adm8211.\*

## \* ADP1653 FLASH CONTROLLER DRIVER

**Mail** Sakari Ailus <[sakari.ailus@iki.fi](mailto:sakari.ailus@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/adp1653.c include/media/i2c/adp1653.h

## \* ADP5520 BACKLIGHT DRIVER WITH IO EXPANDER (ADP5520/ADP5501)

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/ADP5520> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/gpio/gpio-adp5520.c drivers/input/keyboard/adp5520-keys.c drivers/leds/leds-adp5520.c drivers/mfd/adp5520.c drivers/video/backlight/adp5520\_bl.c

## \* ADP5588 QWERTY KEYPAD AND IO EXPANDER DRIVER (ADP5588/ADP5587)

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/ADP5588> <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/gpio/gpio-adp5588.c drivers/input/keyboard/adp5588-keys.c

\* **ADP8860 BACKLIGHT DRIVER (ADP8860/ADP8861/ADP8863)**

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/ADP8860>      <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/video/backlight/adp8860\_bl.c

\* **ADT746X FAN DRIVER**

**Mail** Colin Leroy <[colin@colino.net](mailto:colin@colino.net)>

**Status** Maintained

**Files** drivers/macintosh/therm\_adt746x.c

\* **ADT7475 HARDWARE MONITOR DRIVER**

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/adt7475 drivers/hwmon/adt7475.c

\* **ADVANSYS SCSI DRIVER**

**Mail** Matthew Wilcox <[willy@infradead.org](mailto:willy@infradead.org)>, Hannes Reinecke <[hare@suse.com](mailto:hare@suse.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** scsi/advansys drivers/scsi/advansys.c

\* **ADXL34X THREE-AXIS DIGITAL ACCELEROMETER DRIVER (ADXL345/ADXL346)**

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://wiki.analog.com/ADXL345>      <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/accel/adi,  
adxl345.yaml drivers/input/misc/adxl34x.c

### \* ADXL372 THREE-AXIS DIGITAL ACCELEROMETER DRIVER

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/accel/adi,  
adxl372.yaml drivers/iio/accel/adxl372.c drivers/iio/  
accel/adxl372\_i2c.c drivers/iio/accel/adxl372\_spi.c

### \* AF9013 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/af9013\*

### \* AF9033 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/af9033\*

### \* AFFS FILE SYSTEM

**Mail** David Sterba <[dsterba@suse.com](mailto:dsterba@suse.com)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Odd Fixes

**Files** filesystems/affs fs/affs/

### \* AFS FILESYSTEM

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>

**Mailing list** [linux-afs@lists.infradead.org](mailto:linux-afs@lists.infradead.org)

**Status** Supported

**Web-page** <https://www.infradead.org/~dhowells/kafs/>

**Files** filesystems/afs fs/afs/ include/trace/events/afs.h

### \* AGPGART DRIVER

**Mail** David Airlie <[airlied@linux.ie](mailto:airlied@linux.ie)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm>

**Files** drivers/char/agp/ include/linux/agp\* include/uapi/linux/agp\*

### \* AHA152X SCSI DRIVER

**Mail** “Juergen E. Fischer” <[fischer@norbit.de](mailto:fischer@norbit.de)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** drivers/scsi/aha152x\* drivers/scsi/pcmcia/aha152x\*

### \* AIC7XXX / AIC79XX SCSI DRIVER

**Mail** Hannes Reinecke <[hare@suse.com](mailto:hare@suse.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** drivers/scsi/aic7xxx/

### \* AIMSLAB FM RADIO RECEIVER DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-aimslab\*

### \* AIO

**Mail** Benjamin LaHaise <[bcrl@kvack.org](mailto:bcrl@kvack.org)>

**Mailing list** [linux-aio@kvack.org](mailto:linux-aio@kvack.org)

**Status** Supported

**Files** `fs/aio.c` `include/linux/*aio*.h`

### \* AIRSPY MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** `git` `git://linuxtv.org/anttip/media_tree.git`

**Files** `drivers/media/usb/airspy/`

### \* ALACRITECH GIGABIT ETHERNET DRIVER

**Mail** Lino Sanfilippo <[LinoSanfilippo@gmx.de](mailto:LinoSanfilippo@gmx.de)>

**Status** Maintained

**Files** `drivers/net/ethernet/alacritech/*`

### \* ALCATEL SPEEDTOUCH USB DRIVER

**Mail** Duncan Sands <[duncan.sands@free.fr](mailto:duncan.sands@free.fr)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-usb.org/SpeedTouch/>

**Files** `drivers/usb/atm/speedtch.c` `drivers/usb/atm/usbatm.c`

### \* ALCHEMY AU1XX0 MMC DRIVER

**Mail** Manuel Lauss <[manuel.lauss@gmail.com](mailto:manuel.lauss@gmail.com)>

**Status** Maintained

**Files** `drivers/mmc/host/au1xmmc.c`

### \* ALI1563 I2C DRIVER

**Mail** Rudolf Marek <[r.marek@assembler.cz](mailto:r.marek@assembler.cz)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** i2c/busses/i2c-ali1563 drivers/i2c/busses/i2c-ali1563.c

### \* ALL SENSORS DLH SERIES PRESSURE SENSORS DRIVER

**Mail** Tomislav Denis <[tomislav.denis@avl.com](mailto:tomislav.denis@avl.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.allsensors.com/>

**Files** Documentation/devicetree/bindings/iio/pressure/asc,  
dlhl60d.yaml drivers/iio/pressure/dlhl60d.c

### \* ALLEGRO DVT VIDEO IP CORE DRIVER

**Mail** Michael Tretter <[m.tretter@pengutronix.de](mailto:m.tretter@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/media/allegro-dvt/

### \* ALLWINNER A10 CSI DRIVER

**Mail** Maxime Ripard <[mripard@kernel.org](mailto:mripard@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/allwinner,  
sun4i-a10-csi.yaml drivers/media/platform/sunxi/  
sun4i-csi/

### \* ALLWINNER CPUFREQ DRIVER

**Mail** Yangtao Li <[tiny.windzz@gmail.com](mailto:tiny.windzz@gmail.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/opp/allwinner,  
sun50i-h6-operating-points.yaml drivers/cpufreq/  
sun50i-cpufreq-nvmem.c

### \* ALLWINNER CRYPTO DRIVERS

**Mail** Corentin Labbe <[clabbe.montjoie@gmail.com](mailto:clabbe.montjoie@gmail.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** drivers/crypto/allwinner/

### \* ALLWINNER THERMAL DRIVER

**Mail** Vasily Khoruzhick <[anarsoul@gmail.com](mailto:anarsoul@gmail.com)>, Yangtao Li  
<[tiny.windzz@gmail.com](mailto:tiny.windzz@gmail.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/thermal/allwinner,  
sun8i-a83t-ths.yaml drivers/thermal/sun8i\_thermal.c

### \* ALLWINNER VPU DRIVER

**Mail** Maxime Ripard <[mripard@kernel.org](mailto:mripard@kernel.org)>, Paul Kocialkowski  
<[paul.kocialkowski@bootlin.com](mailto:paul.kocialkowski@bootlin.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/media/sunxi/cedrus/

### \* ALPHA PORT

**Mail** Richard Henderson <[rth@twiddle.net](mailto:rth@twiddle.net)>, Ivan Kokshaysky  
<[ink@jurassic.park.msu.ru](mailto:ink@jurassic.park.msu.ru)>, Matt Turner <[mattst88@gmail.com](mailto:mattst88@gmail.com)>

**Mailing list** [linux-alpha@vger.kernel.org](mailto:linux-alpha@vger.kernel.org)

**Status** Odd Fixes

**Files** arch/alpha/

## \* ALPS PS/2 TOUCHPAD DRIVER

**Reviewer** Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Files** drivers/input/mouse/alps.\*

## \* ALTERA I2C CONTROLLER DRIVER

**Mail** Thor Thayer <[thor.thayer@linux.intel.com](mailto:thor.thayer@linux.intel.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-altera.txt  
drivers/i2c/busses/i2c-altera.c

## \* ALTERA MAILBOX DRIVER

**Mail** Ley Foon Tan <[ley.foon.tan@intel.com](mailto:ley.foon.tan@intel.com)>

**Status** Maintained

**Files** drivers/mailbox/mailbox-altera.c

## \* ALTERA PIO DRIVER

**Mail** Joyce Ooi <[joyce.ooi@intel.com](mailto:joyce.ooi@intel.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-altera.c

## \* ALTERA SYSTEM MANAGER DRIVER

**Mail** Thor Thayer <[thor.thayer@linux.intel.com](mailto:thor.thayer@linux.intel.com)>

**Status** Maintained

**Files** drivers/mfd/altera-sysmgr.c include/linux/mfd/  
altera-sysmgr.h

## \* ALTERA SYSTEM RESOURCE DRIVER FOR ARRIA10 DEVKIT

**Mail** Thor Thayer <[thor.thayer@linux.intel.com](mailto:thor.thayer@linux.intel.com)>

**Status** Maintained

**Files** drivers/gpio/gpio-altera-a10sr.c drivers/mfd/  
altera-a10sr.c drivers/reset/reset-a10sr.c include/  
dt-bindings/reset/altr,rst-mgr-a10sr.h include/linux/  
mfd/altera-a10sr.h

## \* ALTERA TRIPLE SPEED ETHERNET DRIVER

**Mail** Thor Thayer <thor.thayer@linux.intel.com>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/altera/

## \* ALTERA UART/JTAG UART SERIAL DRIVERS

**Mail** Tobias Klauser <tklauser@distanz.ch>

**Mailing list** linux-serial@vger.kernel.org

**Status** Maintained

**Files** drivers/tty/serial/altera\_jtaguart.c        drivers/tty/  
      serial/altera\_uart.c        include/linux/altera\_jtaguart.h  
      include/linux/altera\_uart.h

## \* AMAZON ANNAPURNA LABS FIC DRIVER

**Mail** Talel Shenhār <talel@amazon.com>

**Status** Maintained

**Files** Documentation/devicetree/bindings/interrupt-controller/  
      amazon,al-fic.txt drivers/irqchip/irq-al-fic.c

## \* AMAZON ANNAPURNA LABS THERMAL MMIO DRIVER

**Mail** Talel Shenhār <talel@amazon.com>

**Status** Maintained

**Files** Documentation/devicetree/bindings/thermal/amazon,  
      al-thermal.txt drivers/thermal/thermal\_mmio.c

## \* AMAZON ETHERNET DRIVERS

**Mail** Netanel Belgazal <netanel@amazon.com>, Arthur Kiyanovski  
      <akiyano@amazon.com>

**Reviewer** Guy Tzalik <gtzalik@amazon.com>, Saeed Bishara  
      <saeedb@amazon.com>, Zorik Machulsky <zorik@amazon.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** networking/device\_drivers/amazon/ena    drivers/net/ethernet/  
      amazon/

### \* AMAZON RDMA EFA DRIVER

**Mail** Gal Pressman <galpress@amazon.com>

**Reviewer** Yossi Leybovich <sleybo@amazon.com>

**Mailing list** linux-rdma@vger.kernel.org

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-rdma/list/>

**Files** drivers/infiniband/hw/efa/ include/uapi/rdma/efa-abi.h

### \* AMD CRYPTOGRAPHIC COPROCESSOR (CCP) DRIVER

**Mail** Tom Lendacky <thomas.lendacky@amd.com>

**Mailing list** linux-crypto@vger.kernel.org

**Status** Supported

**Files** drivers/crypto/ccp/ include/linux/ccp.h

### \* AMD DISPLAY CORE

**Mail** Harry Wentland <harry.wentland@amd.com>, Leo Li <sunpeng.li@amd.com>

**Mailing list** amd-gfx@lists.freedesktop.org

**Status** Supported

**SCM** git git://people.freedesktop.org/~agd5f/linux

**Files** drivers/gpu/drm/amd/display/

### \* AMD ENERGY DRIVER

**Mail** Naveen Krishna Chatradhi <nchatrad@amd.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/amd\_energy drivers/hwmon/amd\_energy.c

## \* AMD FAM15H PROCESSOR POWER MONITORING DRIVER

**Mail** Huang Rui <ray.huang@amd.com>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

## Status Supported

**Files** hwmon/fam15h\_power drivers/hwmon/fam15h\_power.c

\* AMD FCH GPIO DRIVER

**Mail** Enrico Weigelt, metux IT consult <[info@metux.net](mailto:info@metux.net)>

**Mailing list** linux-gpio@vger.kernel.org

## Status Maintained

**Files** drivers/gpio/gpio-amd-fch.c include/linux/  
platform\_data/gpio/gpio-amd-fch.h

#### \* AMD GEODE CS5536 USB DEVICE CONTROLLER DRIVER

**Mailing list** [linux-geode@lists.infradead.org](mailto:linux-geode@lists.infradead.org) (moderated for non-subscribers)

## Status Orphan

**Files** drivers/usb/gadget/udc/amd5536udc.\*

#### \* AMD GEODE PROCESSOR/CHIPSET SUPPORT

**Mail** Andres Salomon <dilinger@queued.net>

**Mailing list** [linux-geode@lists.infradead.org](mailto:linux-geode@lists.infradead.org) (moderated for non-subscribers)

## Status Supported

**Web-page** [http://www.amd.com/us-en/ConnectivitySolutions/  
TechnicalResources/0,,50\\_2334\\_2452\\_11363,00.html](http://www.amd.com/us-en/ConnectivitySolutions/TechnicalResources/0,,50_2334_2452_11363,00.html)

**Files** arch/x86/include/asm/geode.h drivers/char/hw\_random/  
geode-rng.c drivers/crypto/geode\* drivers/video/fbdev/  
geode/

## \* AMD IOMMU (AMD-VI)

**Mail** Joerg Roedel <joro@8bytes.org>

**Mailing list** iommu@lists.linux-foundation.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/joro/iommu.git

**Files** drivers/iommu/amd/ include/linux/amd-iommu.h

## \* AMD KFD

**Mail** Felix Kuehling <Felix.Kuehling@amd.com>

**Mailing list** amd-gfx@lists.freedesktop.org

**Status** Supported

**SCM** git git://people.freedesktop.org/~agd5f/linux

**Files** drivers/gpu/drm/amd/amdgpu/amdgpu\_amdkfd\*. [ch]  
drivers/gpu/drm/amd/amdkfd/ drivers/gpu/drm/amd/  
include/cik\_structs.h drivers/gpu/drm/amd/include/  
kgd\_kfd\_interface.h drivers/gpu/drm/amd/include/  
v9\_structs.h drivers/gpu/drm/amd/include/vi\_structs.h  
include/uapi/linux/kfd\_ioctl.h

## \* AMD SPI DRIVER

**Mail** Sanjay R Mehta <sanju.mehta@amd.com>

**Status** Maintained

**Files** drivers/spi/spi-amd.c

## \* AMD MP2 I2C DRIVER

**Mail** Elie Morisse <syniurge@gmail.com>, Nehal Shah <nehal-bakulchandra.shah@amd.com>, Shyam Sundar S K <shyam-sundar.s-k@amd.com>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Maintained

**Files** drivers/i2c/busses/i2c-amd-mp2\*

### \* AMD POWERPLAY

**Mail** Evan Quan <evan.quan@amd.com>

**Mailing list** amd-gfx@lists.freedesktop.org

**Status** Supported

**SCM** git git://people.freedesktop.org/~agd5f/linux

**Files** drivers/gpu/drm/amd/powerplay/

### \* AMD SEATTLE DEVICE TREE SUPPORT

**Mail** Brijesh Singh <brijeshkumar.singh@amd.com>, Suravee Suthikulpanit <suravee.suthikulpanit@amd.com>, Tom Lendacky <thomas.lendacky@amd.com>

**Status** Supported

**Files** arch/arm64/boot/dts/amd/

### \* AMD XGBE DRIVER

**Mail** Tom Lendacky <thomas.lendacky@amd.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** arch/arm64/boot/dts/amd/amd-seattle-xgbe\*.dtsi drivers/net/ethernet/amd/xgbe/

### \* ANALOG DEVICES INC AD5686 DRIVER

**Mail** Michael Hennerich <Michael.Hennerich@analog.com>

**Mailing list** linux-pm@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/iio/dac/ad5686\* drivers/iio/dac/ad5696\*

### \* ANALOG DEVICES INC AD5758 DRIVER

**Mail** Michael Hennerich <Michael.Hennerich@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/dac/ad5758.txt  
drivers/iio/dac/ad5758.c

## \* ANALOG DEVICES INC AD7091R5 DRIVER

**Mail** Benjamin Bia <benjamin.bia@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7091r5.yaml  
drivers/iio/adc/ad7091r5.c

## \* ANALOG DEVICES INC AD7124 DRIVER

**Mail** Michael Hennerich <Michael.Hennerich@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7124.yaml  
drivers/iio/adc/ad7124.c

## \* ANALOG DEVICES INC AD7192 DRIVER

**Mail** Alexandru Tachici <alexandru.tachici@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7192.yaml  
drivers/iio/adc/ad7192.c

## \* ANALOG DEVICES INC AD7292 DRIVER

**Mail** Marcelo Schmitt <marcelo.schmitt1@gmail.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7292.yaml  
drivers/iio/adc/ad7292.c

## \* ANALOG DEVICES INC AD7606 DRIVER

**Mail** Michael Hennerich <Michael.Hennerich@analog.com>, Benjamin Bia <beniamin.bia@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7606.yaml  
drivers/iio/adc/ad7606.c

## \* ANALOG DEVICES INC AD7768-1 DRIVER

**Mail** Michael Hennerich <Michael.Hennerich@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7768-1.txt  
drivers/iio/adc/ad7768-1.c

## \* ANALOG DEVICES INC AD7780 DRIVER

**Mail** Michael Hennerich <Michael.Hennerich@analog.com>, Renato Lui Geh <renatogeh@gmail.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7780.yaml  
drivers/iio/adc/ad7780.c

## \* ANALOG DEVICES INC AD9389B DRIVER

**Mail** Hans Verkuil <hverkuil-cisco@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Files** drivers/media/i2c/ad9389b\*

## \* ANALOG DEVICES INC ADGS1408 DRIVER

**Mail** Mircea Caprioru <[mircea.caprioru@analog.com](mailto:mircea.caprioru@analog.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/mux/adi,adgs1408.txt  
drivers/mux/adgs1408.c

## \* ANALOG DEVICES INC ADIN DRIVER

**Mail** Alexandru Ardelean <[alexaundru.ardelean@analog.com](mailto:alexaundru.ardelean@analog.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/net/adi,adin.yaml  
drivers/net/phy/adin.c

## \* ANALOG DEVICES INC ADIS DRIVER LIBRARY

**Mail** Alexandru Ardelean <[alexandru.ardelean@analog.com](mailto:alexandru.ardelean@analog.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Files** drivers/iio imu/adis.c include/linux/iio imu/adis.h

## \* ANALOG DEVICES INC ADIS16460 DRIVER

**Mail** Dragos Bogdan <[dragos.bogdan@analog.com](mailto:dragos.bogdan@analog.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio imu/adi,  
adis16460.yaml drivers/iio imu/adis16460.c

## \* ANALOG DEVICES INC ADIS16475 DRIVER

**Mail** Nuno Sa <[nuno.sa@analog.com](mailto:nuno.sa@analog.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Status** Supported

**Files** drivers/iio imu/adis16475.c Documentation/devicetree/  
bindings/iio imu/adi,adis16475.yaml

## \* ANALOG DEVICES INC ADM1177 DRIVER

**Mail** Benjamin Bia <[benjamin.bia@analog.com](mailto:benjamin.bia@analog.com)>, Michael Hennerich <[Michael.Hennerich@analog.com](mailto:Michael.Hennerich@analog.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/hwmon/adi,adm1177.yaml  
drivers/hwmon/adm1177.c

## \* ANALOG DEVICES INC ADP5061 DRIVER

**Mail** Michael Hennerich <[Michael.Hennerich@analog.com](mailto:Michael.Hennerich@analog.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/power/supply/adp5061.c

## \* ANALOG DEVICES INC ADV7180 DRIVER

**Mail** Lars-Peter Clausen <[lars@metafoo.de](mailto:lars@metafoo.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/media/i2c/adv7180.c

## \* ANALOG DEVICES INC ADV748X DRIVER

**Mail** Kieran Bingham <[kieran.bingham@ideasonboard.com](mailto:kieran.bingham@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/adv748x/\*

### \* ANALOG DEVICES INC ADV7511 DRIVER

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/adv7511\*

### \* ANALOG DEVICES INC ADV7604 DRIVER

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/adv7604\*

### \* ANALOG DEVICES INC ADV7842 DRIVER

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/adv7842\*

### \* ANALOG DEVICES INC ASOC CODEC DRIVERS

**Mail** Lars-Peter Clausen <[lars@metafoo.de](mailto:lars@metafoo.de)>, Nuno Sá <[nuno.sa@analog.com](mailto:nuno.sa@analog.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://wiki.analog.com/> <http://ez.analog.com/community/linux-device-drivers>

**Files** sound/soc/codecs/ad1\* sound/soc/codecs/ad7\* sound/soc/codecs/adau\* sound/soc/codecs/adav\* sound/soc/codecs/sigmadsp.\* sound/soc/codecs/ssm\*

### \* ANALOG DEVICES INC DMA DRIVERS

**Mail** Lars-Peter Clausen <lars@metafoo.de>

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** drivers/dma/dma-axi-dmac.c

### \* ANALOG DEVICES INC HMC425A DRIVER

**Mail** Benjamin Bia <benjamin.bia@analog.com>, Michael Hennerich <michael.hennerich@analog.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/amplifiers/adi,  
hmc425a.yaml drivers/iio/amplifiers/hmc425a.c

### \* ANALOG DEVICES INC IIO DRIVERS

**Mail** Lars-Peter Clausen <lars@metafoo.de>, Michael Hennerich <Michael.Hennerich@analog.com>

**Status** Supported

**Web-page** <http://wiki.analog.com/> <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/ABI/testing/sysfs-bus-iio-frequency-ad9523  
Documentation/ABI/testing/sysfs-bus-iio-frequency-adf4350  
drivers/iio/\*/\*ad\* drivers/iio/adc/ltc249\* drivers/staging/  
iio/\*/\*ad\*

**Excluded** drivers/iio/\*/\*adjd\*

### \* ANALOGBITS PLL LIBRARIES

**Mail** Paul Walmsley <paul.walmsley@sifive.com>

**Status** Supported

**Files** drivers/clk/analogbits/\* include/linux/clk/analogbits\*

## \* ANDES ARCHITECTURE

**Mail** Nick Hu <[nickhu@andestech.com](mailto:nickhu@andestech.com)>, Greentime Hu <[green.hu@gmail.com](mailto:green.hu@gmail.com)>, Vincent Chen <[deanbo422@gmail.com](mailto:deanbo422@gmail.com)>

**Status** Supported

**SCM** git <https://git.kernel.org/pub/scm/linux/kernel/git/greentime/linux.git>

**Files** Documentation/devicetree/bindings/interrupt-controller/andestech,ativc32.txt Documentation/devicetree/bindings/nds32/arch/nds32/

**Regex** nds32

**Content regex** nds32

## \* ANDROID CONFIG FRAGMENTS

**Mail** Rob Herring <[rohb@kernel.org](mailto:rohb@kernel.org)>

**Status** Supported

**Files** kernel/configs/android\*

## \* ANDROID DRIVERS

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>, Arve Hjønnevåg <[arve@android.com](mailto:arve@android.com)>, Todd Kjos <[tkjos@android.com](mailto:tkjos@android.com)>, Martijn Coenen <[maco@android.com](mailto:maco@android.com)>, Joel Fernandes <[joel@joelfernandes.org](mailto:joel@joelfernandes.org)>, Christian Brauner <[christian@brauner.io](mailto:christian@brauner.io)>

**Mailing list** [devel@driverdev.osuosl.org](mailto:devel@driverdev.osuosl.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/staging.git>

**Files** drivers/android/ drivers/staging/android/

## \* ANDROID GOLDFISH PIC DRIVER

**Mail** Miodrag Dinic <[miodrag.dinic@mips.com](mailto:miodrag.dinic@mips.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/interrupt-controller/google,goldfish-pic.txt drivers/irqchip/irq-goldfish-pic.c

## \* ANDROID GOLDFISH RTC DRIVER

**Mail** Miodrag Dinic <[miodrag.dinic@mips.com](mailto:miodrag.dinic@mips.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/rtc/google,  
goldfish-rtc.txt drivers/rtc/rtc-goldfish.c

## \* ANDROID ION DRIVER

**Mail** Laura Abbott <[labbott@redhat.com](mailto:labbott@redhat.com)>, Sumit Semwal  
<[sumit.semwal@linaro.org](mailto:sumit.semwal@linaro.org)>

**Mailing list** [devel@driverdev.osuosl.org](mailto:devel@driverdev.osuosl.org), [devel@lists.freedesktop.org](mailto:devel@lists.freedesktop.org), [linaro-mm-sig@lists.linaro.org](mailto:linaro-mm-sig@lists.linaro.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/staging/android/ion drivers/staging/android/  
uapi/ion.h

## \* AOA (Apple Onboard Audio) ALSA DRIVER

**Mail** Johannes Berg <[johannes@sipsolutions.net](mailto:johannes@sipsolutions.net)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org), [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** sound/aoa/

## \* APEX EMBEDDED SYSTEMS STX104 IIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** drivers/iio/adc/stx104.c

## \* APM DRIVER

**Mail** Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>

**Status** Odd fixes

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/jikos/apm.git>

**Files** arch/x86/kernel/apm\_32.c drivers/char/apm-emulation.c  
include/linux/apm\_bios.h include/uapi/linux/apm\_bios.h

### \* APPARMOR SECURITY MODULE

**Mail** John Johansen <john.johansen@canonical.com>

**Mailing list** apparmor@lists.ubuntu.com (subscribers-only, general discussion)

**Status** Supported

**Web-page** [wiki.apparmor.net](http://wiki.apparmor.net)

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/jj/linux-apparmor](https://git.kernel.org/pub/scm/linux/kernel/git/jj/linux-apparmor)

**Files** admin-guide/LSM/apparmor security/apparmor/

### \* APPLE BCM5974 MULTITOUCH DRIVER

**Mail** Henrik Rydberg <rydberg@bitmath.org>

**Mailing list** linux-input@vger.kernel.org

**Status** Odd fixes

**Files** drivers/input/mouse/bcm5974.c

### \* APPLE SMC DRIVER

**Mail** Henrik Rydberg <rydberg@bitmath.org>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Odd fixes

**Files** drivers/hwmon/applesmc.c

### \* APPLETALK NETWORK LAYER

**Mailing list** netdev@vger.kernel.org

**Status** Odd fixes

**Files** drivers/net/appletalk/ include/linux/atalk.h include/uapi/linux/atalk.h net/appletalk/

### \* APPLIED MICRO (APM) X-GENE DEVICE TREE SUPPORT

**Mail** Khuong Dinh <khuong@os.amperecomputing.com>

**Status** Supported

**Files** arch/arm64/boot/dts/apm/

## \* APPLIED MICRO (APM) X-GENE SOC EDAC

**Mail** Khuong Dinh <[khuong@os.amperecomputing.com](mailto:khuong@os.amperecomputing.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/edac/apm-xgene-edac.txt  
drivers/edac/xgene\_edac.c

## \* APPLIED MICRO (APM) X-GENE SOC ETHERNET (V2) DRIVER

**Mail** Iyappan Subramanian <[iyappan@os.amperecomputing.com](mailto:iyappan@os.amperecomputing.com)>,  
Keyur Chudgar <[keyur@os.amperecomputing.com](mailto:keyur@os.amperecomputing.com)>

**Status** Supported

**Files** drivers/net/ethernet/apm/xgene-v2/

## \* APPLIED MICRO (APM) X-GENE SOC ETHERNET DRIVER

**Mail** Iyappan Subramanian <[iyappan@os.amperecomputing.com](mailto:iyappan@os.amperecomputing.com)>,  
Keyur Chudgar <[keyur@os.amperecomputing.com](mailto:keyur@os.amperecomputing.com)>, Quan Nguyen  
<[quan@os.amperecomputing.com](mailto:quan@os.amperecomputing.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/net/apm-xgene-enet.txt  
Documentation/devicetree/bindings/net/apm-xgene-mdio.txt  
drivers/net/ethernet/apm/xgene/ drivers/net/phy/mdio-xgene.c

## \* APPLIED MICRO (APM) X-GENE SOC PMU

**Mail** Khuong Dinh <[khuong@os.amperecomputing.com](mailto:khuong@os.amperecomputing.com)>

**Status** Supported

**Files** admin-guide/perf/xgene-pmu Documentation/devicetree/  
bindings/perf/apm-xgene-pmu.txt drivers/perf/xgene\_pmu.c

## \* APTINA CAMERA SENSOR PLL

**Mail** Laurent Pinchart <[Laurent.pinchart@ideasonboard.com](mailto:Laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/aptina-pll.\*

## \* AQUANTIA ETHERNET DRIVER (atlantic)

**Mail** Igor Russkikh <[irusskikh@marvell.com](mailto:irusskikh@marvell.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <https://www.marvell.com/>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** networking/device\_drivers/aquantia/atlantic        drivers/net/  
          ethernet/aquantia/atlantic/

## \* AQUANTIA ETHERNET DRIVER PTP SUBSYSTEM

**Mail** Egor Pomozov <[epomozov@marvell.com](mailto:epomozov@marvell.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.aquantia.com>

**Files** drivers/net/ethernet/aquantia/atlantic/aq\_ptp\*

## \* ARASAN NAND CONTROLLER DRIVER

**Mail** Naga Sureshkumar Relli <[nagasure@xilinx.com](mailto:nagasure@xilinx.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/mtd/arasan,  
  drivers/mtd/nand/raw/  
          hand-controller.yaml  arasan-nand-controller.c

## \* ARC FRAMEBUFFER DRIVER

**Mail** Jaya Kumar <[jayalk@intworks.biz](mailto:jayalk@intworks.biz)>

**Status** Maintained

**Files** drivers/video/fbdev/arcfb.c    drivers/video/fbdev/core/  
  fb\_defio.c

### \* ARC PGU DRM DRIVER

**Mail** Alexey Brodkin <[abrodkin@synopsys.com](mailto:abrodkin@synopsys.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/display/snps,arcpgu.txt  
drivers/gpu/drm/arc/

### \* ARCNET NETWORK LAYER

**Mail** Michael Grzeschik <[m.grzeschik@pengutronix.de](mailto:m.grzeschik@pengutronix.de)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/arcnet/ include/uapi/linux/if\_arcnet.h

### \* ARM ARCHITECTED TIMER DRIVER

**Mail** Mark Rutland <[mark.rutland@arm.com](mailto:mark.rutland@arm.com)>, Marc Zyngier <[maz@kernel.org](mailto:maz@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/include/asm/arch\_timer.h arch/arm64/include/asm/arch\_timer.h  
drivers/clocksource/arm\_arch\_timer.c

### \* ARM HDLCD DRM DRIVER

**Mail** Liviu Dudau <[liviu.dudau@arm.com](mailto:liviu.dudau@arm.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/display/arm,hlcd.txt  
drivers/gpu/drm/arm/hlcd\_\*

### \* ARM INTEGRATOR, VERSATILE AND REALVIEW SUPPORT

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/arm,integrator.yaml  
Documentation/devicetree/bindings/arm/arm,realview.yaml  
Documentation/devicetree/bindings/arm/arm,versatile.yaml  
Documentation/devicetree/bindings/arm/arm,vexpress-juno.yaml  
Documentation/devicetree/

```

bindings/auxdisplay/arm-charlcd.txt      Documentation/
devicetree/bindings/clock/arm,syscon-icst.yaml
Documentation/devicetree/bindings/i2c/i2c-versatile.txt
Documentation/devicetree/bindings/interrupt-controller/
arm,versatile-fpga-irq.txt      Documentation/devicetree/
bindings/mtd/arm-versatile.txt      arch/arm/boot/dts/
arm-realview-*      arch/arm/boot/dts/integrator*      arch/arm/
boot/dts/versatile*      arch/arm/mach-integrator/      arch/
arm/mach-realview/      arch/arm/mach-versatile/      arch/
arm/plat-versatile/      drivers/bus/arm-integrator-lm.c
drivers/clk/versatile/      drivers/i2c/busses/i2c-versatile.
c      drivers/irqchip/irq-versatile-fpga.c      drivers/
mtd/maps/physmap-versatile.*      drivers/power/reset/
arm-versatile-reboot.c      drivers/soc/versatile/

```

## \* ARM KOMEDA DRM-KMS DRIVER

**Mail** James (Qian) Wang <james.qian.wang@arm.com>,  
 Liviu Dudau <liviu.dudau@arm.com>, Mihail Atanassov  
<mihail.atanassov@arm.com>

**Mailing list** Mali DP Maintainers <malidp@foss.arm.com>

**Status** Supported

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/arm,komeda.
txt gpu/komeda-kms drivers/gpu/drm/arm/display/include/
drivers/gpu/drm/arm/display/komeda/

## \* ARM MALI PANFROST DRM DRIVER

**Mail** Rob Herring <robh@kernel.org>, Tomeu Vizoso  
<tomeu.vizoso@collabora.com>

**Reviewer** Steven Price <steven.price@arm.com>, Alyssa Rosenzweig  
<alyssa.rosenzweig@collabora.com>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Supported

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** drivers/gpu/drm/panfrost/ include/uapi/drm/
panfrost\_drm.h

### \* ARM Mali-DP DRM DRIVER

**Mail** Liviu Dudau <[liviu.dudau@arm.com](mailto:liviu.dudau@arm.com)>, Brian Starkey <[brian.starkey@arm.com](mailto:brian.starkey@arm.com)>

**Mailing list** Mali DP Maintainers <[malidp@foss.arm.com](mailto:malidp@foss.arm.com)>

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/arm,malidp.txt  
gpu/afbc drivers/gpu/drm/arm/

### \* ARM MFM AND FLOPPY DRIVERS

**Mail** Ian Molton <[spyro@f2s.com](mailto:spyro@f2s.com)>

**Status** Maintained

**Files** arch/arm/include/asm/floppy.h  
arch/arm/mach-rpc/  
floppydma.S

### \* ARM PMU PROFILING AND DEBUGGING

**Mail** Will Deacon <[will@kernel.org](mailto:will@kernel.org)>, Mark Rutland <[mark.rutland@arm.com](mailto:mark.rutland@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/pmu.yaml  
Documentation/devicetree/bindings/perf/\*  
include/asm/hw\_breakpoint.h  
perf\_event.h  
arch/arm\*/kernel/hw\_breakpoint.c  
arch/arm\*/kernel/perf\_\*  
arch/arm/oprofile/common.c  
drivers/perf/\*  
include/linux/perf/arm\_pmu.h

### \* ARM PORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Odd Fixes

**Web-page** <http://www.armlinux.org.uk/>

**SCM** git <git://git.armlinux.org.uk/~rmk/linux-arm.git>

**Files** arch/arm/

**Excluded** arch/arm/boot/dts/

## \* ARM PRIMECELL AACI PL041 DRIVER

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Odd Fixes

**Files** sound/arm/aaci.\*

## \* ARM PRIMECELL BUS SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Odd Fixes

**Files** drivers/amba/include/linux/amba/bus.h

## \* ARM PRIMECELL CLCD PL110 DRIVER

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Odd Fixes

**Files** drivers/video/fbdev/amba-clcd.\*

## \* ARM PRIMECELL KMI PL050 DRIVER

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Odd Fixes

**Files** drivers/input/serio/ambakmi.\* include/linux/amba/kmi.h

## \* ARM PRIMECELL MMCI PL180/1 DRIVER

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Odd Fixes

**Files** drivers/mmc/host/mmci.\* include/linux/amba/mmci.h

## \* ARM PRIMECELL SSP PL022 SPI DRIVER

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/spi/spi-pl022.yaml  
drivers/spi/spi-pl022.c

## \* ARM PRIMECELL UART PL010 AND PL011 DRIVERS

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Odd Fixes

**Files** drivers/tty/serial/amba-pl01\*.c      include/linux/amba/  
serial.h

## \* ARM PRIMECELL VIC PL190/PL192 DRIVER

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/interrupt-controller/arm,vic.txt  
drivers/irqchip/irq-vic.c

## \* ARM SMC WATCHDOG DRIVER

**Mail** Julius Werner <[jwerner@chromium.org](mailto:jwerner@chromium.org)>

**Reviewer** Evan Benn <[evanbenn@chromium.org](mailto:evanbenn@chromium.org)>

**Status** Maintained

**Files** devicetree/bindings/watchdog/arm-smc-wdt.yaml    drivers/  
watchdog/arm\_smci\_wdt.c

## \* ARM SMMU DRIVERS

**Mail** Will Deacon <[will@kernel.org](mailto:will@kernel.org)>

**Reviewer** Robin Murphy <[robin.murphy@arm.com](mailto:robin.murphy@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iommu/arm\_smmu\*  
drivers/iommu/arm-smmu\* drivers/iommu/io-pgtble-arm-v7s.  
c drivers/iommu/io-pgtble-arm.c

## \* ARM SUB-ARCHITECTURES

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** <git://git.kernel.org/pub/scm/linux/kernel/git/arm/arm-soc.git>

**Files** arch/arm/mach-\*/ arch/arm/plat-\*/

## \* ARM/ACTIONS SEMI ARCHITECTURE

**Mail** Andreas Färber <[afaerber@suse.de](mailto:afaerber@suse.de)>, Manivannan Sadhasivam <[manivannan.sadhasivam@linaro.org](mailto:manivannan.sadhasivam@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/actions.yaml  
Documentation/devicetree/bindings/clock/actions,owl-cmu.txt  
Documentation/devicetree/bindings/dma/owl-dma.txt  
Documentation/devicetree/bindings/i2c/i2c-owl.txt  
Documentation/devicetree/bindings/mmc/owl-mmc.yaml  
Documentation/devicetree/bindings/pinctrl/actions,s900-pinctrl.txt  
Documentation/devicetree/bindings/power/actions,owl-sps.txt  
Documentation/devicetree/bindings/timer/actions,owl-timer.txt  
arch/arm/boot/dts/owl-\* arch/arm/mach-actions/  
arch/arm64/boot/dts/actions/ drivers/clk/actions/  
drivers/clocksource/timer-owl\* drivers/dma/owl-dma.c  
drivers/i2c/busses/i2c-owl.c drivers/mmc/host/owl-mmc.c  
drivers/pinctrl/actions/\* drivers/soc/actions/  
include/dt-bindings/power/owl-\* include/linux/soc/actions/

**Regex** owl

## \* ARM/ADS SPHERE MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/AFEB9260 MACHINE SUPPORT

**Mail** Sergey Lapin <[slapin@ossfans.org](mailto:slapin@ossfans.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/AJECO 1ARM MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/Allwinner SoC Clock Support

**Mail** Emilio López <[emilio@elopez.com.ar](mailto:emilio@elopez.com.ar)>

**Status** Maintained

**Files** drivers/clk/sunxi/

### \* ARM/Allwinner sunXi SoC support

**Mail** Maxime Ripard <[mripar@kernel.org](mailto:mripar@kernel.org)>, Chen-Yu Tsai <[wens@csie.org](mailto:wens@csie.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/sunxi/linux.git>

**Files** arch/arm/mach-sunxi/ arch/arm64/boot/dts/allwinner/ drivers/clk/sunxi-ng/ drivers/pinctrl/sunxi/ drivers/soc/sunxi/

**Regex** sun[x456789]i sun50i

### \* ARM/Amlogic Meson SoC CLOCK FRAMEWORK

**Mail** Neil Armstrong <[narmstrong@baylibre.com](mailto:narmstrong@baylibre.com)>, Jerome Brunet <[jbrunet@baylibre.com](mailto:jbrunet@baylibre.com)>

**Mailing list** [linux-amlogic@lists.infradead.org](mailto:linux-amlogic@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/clock/amlogic\*  
drivers/clk/meson/ include/dt-bindings/clock/gxbb\*  
include/dt-bindings/clock/meson\*

## \* ARM/Amlogic Meson SoC Crypto Drivers

**Mail** Corentin Labbe <[clabbe@baylibre.com](mailto:clabbe@baylibre.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org), [amlogic@lists.infradead.org](mailto:amlogic@lists.infradead.org) linux-

**Status** Maintained

**Files** Documentation/devicetree/bindings/crypto/amlogic\*  
drivers/crypto/amlogic/

## \* ARM/Amlogic Meson SoC Sound Drivers

**Mail** Jerome Brunet <[jbrunet@baylibre.com](mailto:jbrunet@baylibre.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/amlogic\* sound/  
soc/meson/

## \* ARM/Amlogic Meson SoC support

**Mail** Kevin Hilman <[khilman@baylibre.com](mailto:khilman@baylibre.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-amlogic@lists.infradead.org](mailto:linux-amlogic@lists.infradead.org)

**Status** Maintained

**Web-page** <http://linux-meson.com/>

**Files** arch/arm/boot/dts/meson\* arch/arm/mach-meson/ arch/  
arm64/boot/dts/amlogic/ drivers/mmc/host/meson\* drivers/  
pinctrl/meson/ drivers/rtc/rtc-meson\* drivers/soc/amlogic/

**Regex** meson

## \* ARM/Annapurna Labs ALPINE ARCHITECTURE

**Mail** Tsahee Zidenberg <[tsahee@annapurnalabs.com](mailto:tsahee@annapurnalabs.com)>, Antoine Tenart  
<[antoine.tenart@bootlin.com](mailto:antoine.tenart@bootlin.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/alpine\* arch/arm/mach-alpine/ arch/  
arm64/boot/dts/al/ drivers/\*/\*alpine\*

### \* ARM/ARTPEC MACHINE SUPPORT

**Mail** Jesper Nilsson <[jesper.nilsson@axis.com](mailto:jesper.nilsson@axis.com)>, Lars Persson <[lars.persson@axis.com](mailto:lars.persson@axis.com)>

**Mailing list** [linux-arm-kernel@axis.com](mailto:linux-arm-kernel@axis.com)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pinctrl/axis,  
artpec6-pinctrl.txt arch/arm/boot/dts/artpec6\* arch/arm/  
mach-artpec drivers/clk/axis drivers/crypto/axis drivers/  
mmc/host/usdhi6rol0.c drivers/pinctrl/pinctrl-artpec\*

### \* ARM/ASPEED I2C DRIVER

**Mail** Brendan Higgins <[brendanhiggins@google.com](mailto:brendanhiggins@google.com)>

**Reviewer** Benjamin Herrenschmidt <[benh@kernel.crashing.org](mailto:benh@kernel.crashing.org)>, Joel Stanley <[joel@jms.id.au](mailto:joel@jms.id.au)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org), [openbmc@lists.ozlabs.org](mailto:openbmc@lists.ozlabs.org)  
(moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-aspeed.txt  
Documentation/devicetree/bindings/interrupt-controller/  
aspeed,ast2400-i2c-ic.txt drivers/i2c/busses/i2c-aspeed.c  
drivers/irqchip/irq-aspeed-i2c-ic.c

### \* ARM/ASPEED MACHINE SUPPORT

**Mail** Joel Stanley <[joel@jms.id.au](mailto:joel@jms.id.au)>

**Reviewer** Andrew Jeffery <[andrew@aj.id.au](mailto:andrew@aj.id.au)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-aspeed@lists.ozlabs.org](mailto:linux-aspeed@lists.ozlabs.org) (moderated for non-subscribers)

**Status** Supported

**Patchwork** <https://patchwork.ozlabs.org/project/linux-aspeed/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/joel/aspeed.git>

**Files** arch/arm/boot/dts/aspeed-\* arch/arm/mach-aspeed/

**Regex** aspeed

### \* ARM/BITMAIN ARCHITECTURE

**Mail** Manivannan Sadhasivam <[manivannan.sadhasivam@linaro.org](mailto:manivannan.sadhasivam@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/bitmain.yaml  
Documentation/devicetree/bindings/clock/bitmain,  
bm1880-clk.yaml Documentation/devicetree/bindings/  
pinctrl/bitmain,bm1880-pinctrl.txt arch/arm64/boot/  
dts/bitmain/ drivers/clk/clk-bm1880.c drivers/pinctrl/  
pinctrl-bm1880.c

### \* ARM/CALXEDA Highbank ARCHITECTURE

**Mail** Andre Przywara <[andre.przywara@arm.com](mailto:andre.przywara@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/ecx-\*.dts\* arch/arm/boot/dts/  
highbank.dts arch/arm/mach-highbank/

### \* ARM/CAVIUM NETWORKS CNS3XXX MACHINE SUPPORT

**Mail** Krzysztof Halasa <[khalasa@piap.pl](mailto:khalasa@piap.pl)>

**Status** Maintained

**Files** arch/arm/mach-cns3xxx/

### \* ARM/CAVIUM THUNDER NETWORK DRIVER

**Mail** Sunil Goutham <[sgoutham@marvell.com](mailto:sgoutham@marvell.com)>, Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/net/ethernet/cavium/thunder/

## \* ARM/CIRRUS LOGIC BK3 MACHINE SUPPORT

**Mail** Lukasz Majewski <[lukma@denx.de](mailto:lukma@denx.de)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-ep93xx/ts72xx.c

## \* ARM/CIRRUS LOGIC CLPS711X ARM ARCHITECTURE

**Mail** Alexander Shiyan <[shc\\_work@mail.ru](mailto:shc_work@mail.ru)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Odd Fixes

**Regex** clps711x

## \* ARM/CIRRUS LOGIC EDB9315A MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/CIRRUS LOGIC EP93XX ARM ARCHITECTURE

**Mail** Hartley Sweeten <[hsweeten@visionengravers.com](mailto:hsweeten@visionengravers.com)>, Alexander Sverdlin <[alexander.sverdlin@gmail.com](mailto:alexander.sverdlin@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-ep93xx/                  arch/arm/mach-ep93xx/include/  
    mach/

## \* ARM/CLKDEV SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.armlinux.org.uk/~rmk/linux-arm.git> clkdev

**Files** drivers/clk/clkdev.c

## \* ARM/CONEXANT DIGICOLOR MACHINE SUPPORT

**Mail** Baruch Siach <[baruch@tkos.co.il](mailto:baruch@tkos.co.il)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/cx92755\*

**Regex** digicolor

## \* ARM/CONTEC MICRO9 MACHINE SUPPORT

**Mail** Hubert Feurstein <[hubert.feurstein@contec.at](mailto:hubert.feurstein@contec.at)>

**Status** Maintained

**Files** arch/arm/mach-ep93xx/micro9.c

## \* ARM/CORESIGHT FRAMEWORK AND DRIVERS

**Mail** Mathieu Poirier <[mathieu.poirier@linaro.org](mailto:mathieu.poirier@linaro.org)>

**Reviewer** Suzuki K Poulose <[suzuki.poulose@arm.com](mailto:suzuki.poulose@arm.com)>, Mike Leach <[mike.leach@linaro.org](mailto:mike.leach@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-coresight-devices-\*  
Documentation/devicetree/bindings/arm/  
coresight-cpu-debug.txt Documentation/devicetree/  
bindings/arm/coresight-cti.yaml Documentation/devicetree/  
bindings/arm/coresight.txt Documentation/trace/coresight/  
\* drivers/hwtracing/coresight/\* include/dt-bindings/arm/  
coresight-cti-dt.h tools/perf/arch/arm/util/auxtrace.c  
tools/perf/arch/arm/util/cs-etm.c tools/perf/arch/arm/  
util/cs-etm.h tools/perf/arch/arm/util/pmu.c tools/perf/  
util/cs-etm-decoder/\* tools/perf/util/cs-etm.\*

## \* ARM/CORGI MACHINE SUPPORT

**Mail** Richard Purdie <[rpurdie@rpsys.net](mailto:rpurdie@rpsys.net)>

**Status** Maintained

### \* ARM/CORTINA SYSTEMS GEMINI ARM ARCHITECTURE

**Mail** Hans Ulli Kroll <ulli.kroll@googlemail.com>, Linus Walleij <linus.walleij@linaro.org>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://github.com/ulli-kroll/linux.git

**Files** Documentation/devicetree/bindings/arm/gemini.  
txt Documentation/devicetree/bindings/net/cortina,  
gemini-ethernet.txt Documentation/devicetree/bindings/  
pinctrl/cortina,gemini-pinctrl.txt Documentation/  
devicetree/bindings/rtc/faraday,ftrtc010.txt arch/arm/  
mach-gemini/ drivers/net/ethernet/cortina/ drivers/  
pinctrl/pinctrl-gemini.c drivers/rtc/rtc-ftrtc010.c

### \* ARM/CSR SIRFPRIMA2 MACHINE SUPPORT

**Mail** Barry Song <baohua@kernel.org>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/baohua/linux.git

**Files** arch/arm/boot/dts/prima2\* arch/arm/mach-prima2/ drivers/  
clk/sirf/ drivers/clocksource/timer-atlas7.c drivers/  
clocksource/timer-prima2.c

**Excluded** drivers/gnss

**Regex** [^a-z]sirf

### \* ARM/CZ.NIC TURRIS MOX SUPPORT

**Mail** Marek Behun <marek.behun@nic.cz>

**Status** Maintained

**Web-page** <http://mox.turris.cz>

**Files** Documentation/ABI/testing/debugfs-moxtet Documentation/  
ABI/testing/sysfs-bus-moxtet-devices Documentation/ABI/  
testing/sysfs-firmware-turris-mox-rwtm Documentation/  
devicetree/bindings/bus/moxtet.txt Documentation/  
devicetree/bindings/firmware/cznic,turris-mox-rwtm.txt  
Documentation/devicetree/bindings/gpio/gpio-moxtet.txt  
drivers/bus/moxtet.c drivers/firmware/turris-mox-rwtm.c  
drivers/gpio/gpio-moxtet.c include/linux/moxtet.h

### \* ARM/EBSA110 MACHINE SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.armlinux.org.uk/>

**Files** arch/arm/mach-ebsa110/ drivers/net/ethernet/amd/am79c961a.\*

### \* ARM/ENERGY MICRO (SILICON LABS) EFM32 SUPPORT

**Mail** Uwe Kleine-König <[u.kleine-koenig@pengutronix.de](mailto:u.kleine-koenig@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Regex** efm32

### \* ARM/EZX SMARTPHONES (A780, A910, A1200, E680, ROKR E2 and ROKR E6)

**Mail** Robert Jarzmik <[robert.jarzmik@free.fr](mailto:robert.jarzmik@free.fr)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/ezx.c

### \* ARM/FARADAY FA526 PORT

**Mail** Hans Ulli Kroll <[ulli.kroll@googlemail.com](mailto:ulli.kroll@googlemail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.berlios.de/gemini-board>

**Files** arch/arm/mm/\*-fa\*

## \* ARM/FOOTBRIDGE ARCHITECTURE

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.armlinux.org.uk/>

**Files** arch/arm/include/asm/hardware/dec21285.h        arch/arm/mach-footbridge/

## \* ARM/FREESCALE IMX / MXC ARM ARCHITECTURE

**Mail** Shawn Guo <[shawnguo@kernel.org](mailto:shawnguo@kernel.org)>, Sascha Hauer <[s.hauer@pengutronix.de](mailto:s.hauer@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>, Fabio Estevam <[festevam@gmail.com](mailto:festevam@gmail.com)>, NXP Linux Team <[linux-imx@nxp.com](mailto:linux-imx@nxp.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/shawnguo/linux.git>

**Excluded** drivers/media/i2c/

**Regex** imx mxs

## \* ARM/FREESCALE LAYERSCAPE ARM ARCHITECTURE

**Mail** Shawn Guo <[shawnguo@kernel.org](mailto:shawnguo@kernel.org)>, Li Yang <[leoyang.li@nxp.com](mailto:leoyang.li@nxp.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/shawnguo/linux.git>

**Files** arch/arm/boot/dts/ls1021a\*        arch/arm64/boot/dts/freescale/fsl-\* arch/arm64/boot/dts/freescale/qoriq-\*

## \* ARM/FREESCALE VYBRID ARM ARCHITECTURE

**Mail** Shawn Guo <[shawnguo@kernel.org](mailto:shawnguo@kernel.org)>, Sascha Hauer <[s.hauer@pengutronix.de](mailto:s.hauer@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>, Stefan Agner <[stefan@agner.ch](mailto:stefan@agner.ch)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/shawnguo/linux.git>

**Files** arch/arm/boot/dts/vf\* arch/arm/mach-imx/\*vf610\*

## \* ARM/GLOMATION GESBC9312SX MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/GUMSTIX MACHINE SUPPORT

**Mail** Steve Sakoman <[sakoman@gmail.com](mailto:sakoman@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/H4700 (HP IPAQ HX4700) MACHINE SUPPORT

**Mail** Philipp Zabel <[philipp.zabel@gmail.com](mailto:philipp.zabel@gmail.com)>, Paul Parsons <[lost.distance@yahoo.com](mailto:lost.distance@yahoo.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/hx4700.c arch/arm/mach-pxa/include/mach/hx4700.h sound/soc/pxa/hx4700.c

### \* ARM/HISILICON SOC SUPPORT

**Mail** Wei Xu <xuwei5@hisilicon.com>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://www.hisilicon.com>

**SCM** git [git://github.com/hisilicon/linux-hisi.git](https://github.com/hisilicon/linux-hisi.git)

**Files** arch/arm/boot/dts/hi3\* arch/arm/boot/dts/hip\* arch/arm/boot/dts/hisi\* arch/arm/mach-hisi/ arch/arm64/boot/dts/hisilicon/

### \* ARM/HP JORNADA 7XX MACHINE SUPPORT

**Mail** Kristoffer Ericson <kristoffer.ericson@gmail.com>

**Status** Maintained

**Web-page** [www.jlime.com](http://www.jlime.com)

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/kristoffer/linux-hpc.git](https://git.kernel.org/pub/scm/linux/kernel/git/kristoffer/linux-hpc.git)

**Files** arch/arm/mach-sa1100/include/mach/jornada720.h arch/arm/mach-sa1100/jornada720.c

### \* ARM/IGEP MACHINE SUPPORT

**Mail** Enric Balletbo i Serra <[eballetbo@gmail.com](mailto:eballetbo@gmail.com)>, Javier Martinez Canillas <[javier@dowhile0.org](mailto:javier@dowhile0.org)>

**Mailing list** linux-omap@vger.kernel.org, linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/omap3-igep\*

### \* ARM/INCOME PXA270 SUPPORT

**Mail** Marek Vasut <[marek.vasut@gmail.com](mailto:marek.vasut@gmail.com)>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/colibri-pxa270-income.c

## \* ARM/INTEL IOP32X ARM ARCHITECTURE

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/INTEL IQ81342EX MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/INTEL IXDP2850 MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/INTEL IXP4XX ARM ARCHITECTURE

**Mail** Linus Walleij <[linusw@kernel.org](mailto:linusw@kernel.org)>, Imre Kaloz <[kaloz@openwrt.org](mailto:kaloz@openwrt.org)>, Krzysztof Halasa <[khalasa@piap.pl](mailto:khalasa@piap.pl)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/intel-ixp4xx.yaml  
Documentation/devicetree/bindings/gpio/intel,  
ixp4xx-gpio.txt Documentation/devicetree/bindings/  
interrupt-controller/intel,ixp4xx-interrupt.yaml  
Documentation/devicetree/bindings/timer/intel,  
ixp4xx-timer.yaml arch/arm/mach-ixp4xx/ drivers/  
clocksource/timer-ixp4xx.c drivers/gpio/gpio-ixp4xx.  
c drivers/irqchip/irq-ixp4xx.c include/linux/irqchip/  
irq-ixp4xx.h include/linux/platform\_data/timer-ixp4xx.h

## \* ARM/INTEL RESEARCH IMOTE/STARGATE 2 MACHINE SUPPORT

**Mail** Jonathan Cameron <jic23@cam.ac.uk>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/stargate2.c drivers/pcmcia/pxa2xx\_stargate2.c

## \* ARM/INTEL XSC3 (MANZANO) ARM CORE

**Mail** Lennert Buytenhek <kernel@wantstofly.org>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/IP FABRICS DOUBLE ESPRESSO MACHINE SUPPORT

**Mail** Lennert Buytenhek <kernel@wantstofly.org>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

## \* ARM/LG1K ARCHITECTURE

**Mail** Chanho Min <chanho.min@lge.com>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm64/boot/dts/lg/

## \* ARM/LOGICPD PXA270 MACHINE SUPPORT

**Mail** Lennert Buytenhek <kernel@wantstofly.org>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/LPC18XX ARCHITECTURE

**Mail** Vladimir Zapskiy <[vz@mleia.com](mailto:vz@mleia.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-lpc2k.txt  
arch/arm/boot/dts/lpc43\* drivers/i2c/busses/i2c-lpc2k.c  
drivers/memory/pl172.c drivers/mtd/spi-nor/controllers/  
nxp-spifi.c drivers/rtc/rtc-lpc24xx.c

**Regex** lpc18xx

### \* ARM/LPC32XX SOC SUPPORT

**Mail** Vladimir Zapskiy <[vz@mleia.com](mailto:vz@mleia.com)>, Sylvain Lemieux <[slemieux.tyco@gmail.com](mailto:slemieux.tyco@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://github.com/vzapolskiy/linux-lpc32xx.git>

**Files** Documentation/devicetree/bindings/i2c/i2c-pnx.txt  
arch/arm/boot/dts/lpc32\* arch/arm/mach-lpc32xx/ drivers/  
i2c/busses/i2c-pnx.c drivers/net/ethernet/nxp/lpc\_eth.c  
drivers/usb/host/ohci-nxp.c drivers/watchdog/pnx4008\_wdt.c

**Regex** lpc32xx

### \* ARM/MAGICIAN MACHINE SUPPORT

**Mail** Philipp Zabel <[philipp.zabel@gmail.com](mailto:philipp.zabel@gmail.com)>

**Status** Maintained

### \* ARM/Marvell Dove/MV78xx0/Orion SOC support

**Mail** Jason Cooper <[jason@lakedaemon.net](mailto:jason@lakedaemon.net)>, Andrew Lunn <[andrew@lunn.ch](mailto:andrew@lunn.ch)>, Sebastian Hesselbarth <[sebastian.hesselbarth@gmail.com](mailto:sebastian.hesselbarth@gmail.com)>, Gregory Clement <[gregory.clement@bootlin.com](mailto:gregory.clement@bootlin.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.infradead.org/linux-mvebu.git>

**Files** Documentation/devicetree/bindings/soc/dove/ arch/arm/  
boot/dts/dove\* arch/arm/boot/dts/orion5x\* arch/arm/  
mach-dove/ arch/arm/mach-mv78xx0/ arch/arm/mach-orion5x/  
arch/arm/plat-orion/ drivers/soc/dove/

### \* ARM/Marvell Kirkwood and Armada 370, 375, 38x, 39x, XP, 3700, 7K/8K, CN9130 SOC support

**Mail** Jason Cooper <jason@lakedaemon.net>, Andrew Lunn <andrew@lunn.ch>, Gregory Clement <gregory.clement@bootlin.com>, Sebastian Hesselbarth <sebastian.hesselbarth@gmail.com>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://git.infradead.org/linux-mvebu.git

**Files** arch/arm/boot/dts/armada\* arch/arm/boot/dts/kirkwood\*  
arch/arm/configs/mvebu\_\*\_defconfig arch/arm/mach-mvebu/  
arch/arm64/boot/dts/marvell/armada\* arch/arm64/boot/  
dts/marvell/cn913\* drivers/cpufreq/armada-37xx-cpufreq.c  
drivers/cpufreq/armada-8k-cpufreq.c drivers/cpufreq/  
mvebu-cpufreq.c drivers/irqchip/irq-armada-370-xp.  
c drivers/irqchip/irq-mvebu-\* drivers/pinctrl/mvebu/  
drivers/rtc/rtc-armada38x.c

### \* ARM/Mediatek RTC DRIVER

**Mail** Eddie Huang <eddie.huang@mediatek.com>, Sean Wang <sean.wang@mediatek.com>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers), linux-mediatek@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/rtc/rtc-mt2712.txt  
Documentation/devicetree/bindings/rtc/rtc-mt7622.txt  
drivers/rtc/rtc-mt2712.c drivers/rtc/rtc-mt6397.c drivers/  
rtc/rtc-mt7622.c

## \* ARM/Mediatek SoC support

**Mail** Matthias Brugger <[matthias.bgg@gmail.com](mailto:matthias.bgg@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-mediatek@lists.infradead.org](mailto:linux-mediatek@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <https://mtk.bcnfs.org/>

**chat** <irc://chat.freenode.net/linux-mEDIATEK>

**Files** arch/arm/boot/dts/mt6\* arch/arm/boot/dts/mt7\* arch/arm/boot/dts/mt8\* arch/arm/mach-mEDIATEK/ arch/arm64/boot/dts/mediatek/ drivers/soc/mediatek/

**Regex** mtk mt[678]

**Content regex** mediatek

## \* ARM/Mediatek USB3 PHY DRIVER

**Mail** Chunfeng Yun <[chunfeng.yun@mediatek.com](mailto:chunfeng.yun@mediatek.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-mediatek@lists.infradead.org](mailto:linux-mediatek@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/phy/phy-mtk-\*  
drivers/phy/mediatek/

## \* ARM/Microchip (AT91) SoC support

**Mail** Nicolas Ferre <[nicolas.ferre@microchip.com](mailto:nicolas.ferre@microchip.com)>, Alexandre Belloni <[alexandre.belloni@bootlin.com](mailto:alexandre.belloni@bootlin.com)>, Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://www.linux4sam.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/at91/linux.git>

**Files** arch/arm/boot/dts/at91\*.dts arch/arm/boot/dts/at91\*.dtsi arch/arm/boot/dts/sama\*.dts arch/arm/boot/dts/sama\*.dtsi arch/arm/include/debug/at91.S arch/arm/mach-at91/drivers/memory/atmel\* drivers/watchdog/sama5d4\_wdt.c include/soc/at91/

**Excluded** drivers/input/touchscreen/atmel\_mxt\_ts.c drivers/net/wireless/atmel/

**Regex** at91 atmel

### \* ARM/MIOA701 MACHINE SUPPORT

**Mail** Robert Jarzmik <[robert.jarzmik@free.fr](mailto:robert.jarzmik@free.fr)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/mioa701.c

### \* ARM/NEC MOBILEPRO 900/c MACHINE SUPPORT

**Mail** Michael Petchkovsky <[mkpetch@internode.on.net](mailto:mkpetch@internode.on.net)>

**Status** Maintained

### \* ARM/NOMADIK/U300/Ux500 ARCHITECTURES

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/linusw/linux-nomadik.git>

**Files** Documentation/devicetree/bindings/arm/ste-\*  
Documentation/devicetree/bindings/arm/ux500.  
yaml Documentation/devicetree/bindings/arm/ux500/  
Documentation/devicetree/bindings/i2c/i2c-nomadik.  
txt Documentation/devicetree/bindings/i2c/i2c-stu300.  
txt arch/arm/boot/dts/ste-\* arch/arm/mach-nomadik/  
arch/arm/mach-u300/ arch/arm/mach-ux500/ drivers/clk/  
clk-nomadik.c drivers/clk/clk-u300.c drivers/clocksource/  
clksrc-dbx500-prcmu.c drivers/clocksource/timer-u300.c  
drivers/dma/coh901318\* drivers/dma/ste\_dma40\* drivers/  
hwspinlock/u8500\_hsem.c drivers/i2c/busses/i2c-nomadik.  
c drivers/i2c/busses/i2c-stu300.c drivers/iio/adc/  
ab8500-gpadc.c drivers/mfd/ab3100\* drivers/mfd/ab8500\*  
drivers/mfd/abx500\* drivers/mfd/db8500\* drivers/mfd/  
dbx500\* drivers/pinctrl/nomadik/ drivers/pinctrl/  
pinctrl-coh901\* drivers/pinctrl/pinctrl-u300.c drivers/  
rtc/rtc-ab3100.c drivers/rtc/rtc-ab8500.c drivers/rtc/  
rtc-coh901331.c drivers/rtc/rtc-pl031.c drivers/soc/ux500/  
drivers/watchdog/coh901327\_wdt.c

### \* ARM/NUVOTON NPCM ARCHITECTURE

**Mail** Avi Fishman <[avifishman70@gmail.com](mailto:avifishman70@gmail.com)>, Tomer Maimon <[tmaimon77@gmail.com](mailto:tmaimon77@gmail.com)>, Tali Perry <[tali.perry1@gmail.com](mailto:tali.perry1@gmail.com)>

**Reviewer** Patrick Venture <[venture@google.com](mailto:venture@google.com)>, Nancy Yuen <[yuenn@google.com](mailto:yuenn@google.com)>, Benjamin Fair <[benjaminfair@google.com](mailto:benjaminfair@google.com)>

**Mailing list** [openbmc@lists.ozlabs.org](mailto:openbmc@lists.ozlabs.org) (moderated for non-subscribers)

**Status** Supported

**Files** Documentation/devicetree/bindings/\*/\*/\*npcm\*  
Documentation/devicetree/bindings/\*/\*npcm\* arch/arm/boot/  
dts/nuvoton-npcm\* arch/arm/mach-npcm/ drivers/\*/\*npcm\*  
drivers/\*/\*/\*npcm\* include/dt-bindings/clock/nuvoton,  
nPCM7xx-clock.h

### \* ARM/OPENMOKO NEO FREERUNNER (GTA02) MACHINE SUPPORT

**Mailing list** [openmoko-kernel@lists.openmoko.org](mailto:openmoko-kernel@lists.openmoko.org) (subscribers-only)

**Status** Orphan

**Web-page** [http://wiki.openmoko.org/wiki/Neo\\_FreeRunner](http://wiki.openmoko.org/wiki/Neo_FreeRunner)

**Files** arch/arm/mach-s3c24xx/gta02.h arch/arm/mach-s3c24xx/  
mach-gta02.c

### \* ARM/Orion SoC/Technologic Systems TS-78xx platform support

**Mail** Alexander Clouter <[alex@digriz.org.uk](mailto:alex@digriz.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.digriz.org.uk/ts78xx/kernel>

**Files** arch/arm/mach-orion5x/ts78xx-\*

### \* ARM/OXNAS platform support

**Mail** Neil Armstrong <[narmstrong@baylibre.com](mailto:narmstrong@baylibre.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-oxnas@groups.io](mailto:linux-oxnas@groups.io) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/ox8\*.dts\* arch/arm/mach-oxnas/  
drivers/power/reset/oxnas-restart.c

### Regex oxnas

#### \* ARM/PALM TREO SUPPORT

**Mail** Tomas Cech <[sleep\\_walker@suse.com](mailto:sleep_walker@suse.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Web-page** <http://hackndev.com>

**Files** arch/arm/mach-pxa/palmtreo.\*

#### \* ARM/PALMTX,PALMT5,PALMLD,PALMTE2,PALMTC SUPPORT

**Mail** Marek Vasut <[marek.vasut@gmail.com](mailto:marek.vasut@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Web-page** <http://hackndev.com>

**Files** arch/arm/mach-pxa/include/mach/palmld.h        arch/arm/  
      mach-pxa/include/mach/palmtc.h arch/arm/mach-pxa/include/  
      mach/palmtx.h        arch/arm/mach-pxa/palmld.c        arch/arm/  
      mach-pxa/palmt5.\* arch/arm/mach-pxa/palmtc.c        arch/arm/  
      mach-pxa/palmte2.\* arch/arm/mach-pxa/palmtx.c

#### \* ARM/PALMZ72 SUPPORT

**Mail** Sergey Lapin <[slapin@ossfans.org](mailto:slapin@ossfans.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Web-page** <http://hackndev.com>

**Files** arch/arm/mach-pxa/palmz72.\*

#### \* ARM/PLEB SUPPORT

**Mail** Peter Chubb <[pleb@gelato.unsw.edu.au](mailto:pleb@gelato.unsw.edu.au)>

**Status** Maintained

**Web-page** <http://www.disy.cse.unsw.edu.au/Hardware/PLEB>

## \* ARM/PT DIGITAL BOARD PORT

**Mail** Stefan Eletzhofer <[stefan.eletzhofer@eletztrick.de](mailto:stefan.eletzhofer@eletztrick.de)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.armlinux.org.uk/>

## \* ARM/QUALCOMM SUPPORT

**Mail** Andy Gross <[agross@kernel.org](mailto:agross@kernel.org)>, Bjorn Andersson <[bjorn.andersson@linaro.org](mailto:bjorn.andersson@linaro.org)>

**Mailing list** [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/qcom/linux.git>

**Files** Documentation/devicetree/bindings/\*/\*qcom\*  
Documentation/devicetree/bindings/soc/qcom/ arch/arm/  
boot/dts/qcom-\*.dts arch/arm/boot/dts/qcom-\*.dtsi arch/  
arm/mach-qcom/ arch/arm64/boot/dts/qcom/ drivers/\*/\*/  
qcom\* drivers/\*/\*qcom/ drivers/\*/\*pm8??-\* drivers/  
\*/qcom\* drivers/\*/\*qcom/ drivers/bluetooth/btqcomsmd.  
c drivers/clocksource/timer-qcom.c drivers/cpuidle/  
cpuidle-qcom-spm.c drivers/extcon/extcon-qcom\* drivers/  
i2c/busses/i2c-qcom-geni.c drivers/i2c/busses/i2c-qup.  
c drivers/iommu/msm\* drivers/mfd/ssbi.c drivers/mmc/  
host/mmci\_qcom\* drivers/mmc/host/sdhci-msm.c drivers/  
pci/controller/dwc/pcie-qcom.c drivers/phy/qualcomm/  
drivers/power/\*/\*msm\* drivers/reset/reset-qcom-\* drivers/  
scsi/ufs/ufs-qcom.\* drivers/spi/spi-geni-qcom.c drivers/  
spi/spi-qcom-qspi.c drivers/spi/spi-qup.c drivers/tty/  
serial/msm\_serial.c drivers/usb/dwc3/dwc3-qcom.c include/  
dt-bindings/\*/\*qcom\* include/linux/\*/\*qcom\*

## \* ARM/RADISYS ENP2611 MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/RDA MICRO ARCHITECTURE

**Mail** Manivannan Sadhasivam <[manivannan.sadhasivam@linaro.org](mailto:manivannan.sadhasivam@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-unisoc@lists.infradead.org](mailto:linux-unisoc@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/rda.yaml  
Documentation/devicetree/bindings/gpio/gpio-rda.yaml  
Documentation/devicetree/bindings/interrupt-controller/  
rda,8810pl-intc.txt Documentation/devicetree/bindings/  
serial/rda,8810pl-uart.txt Documentation/devicetree/  
bindings/timer/rda,8810pl-timer.txt arch/arm/boot/dts/  
rda8810pl-\* drivers/clocksource/timer-rda.c drivers/gpio/  
gpio-rda.c drivers/irqchip/irq-rda-intc.c drivers/tty/  
serial/rda-uart.c

### \* ARM/REALTEK ARCHITECTURE

**Mail** Andreas Färber <[afaerber@suse.de](mailto:afaerber@suse.de)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-realtek-soc@lists.infradead.org](mailto:linux-realtek-soc@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/realtek.yaml  
arch/arm/boot/dts/rtd\* arch/arm/mach-realtek/ arch/arm64/  
boot/dts/realtek/

### \* ARM/RENESAS ARM64 ARCHITECTURE

**Mail** Geert Uytterhoeven <[geert+renesas@glider.be](mailto:geert+renesas@glider.be)>, Magnus Damm <[magnus.damm@gmail.com](mailto:magnus.damm@gmail.com)>

**Mailing list** [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**Patchwork** <http://patchwork.kernel.org/project/linux-renesas-soc/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git> next

**Files** Documentation/devicetree/bindings/arm/renesas.yaml  
arch/arm64/boot/dts/renesas/drivers/soc/renesas/include/  
linux/soc/renesas/

## \* ARM/RISCPC ARCHITECTURE

**Mail** Russell King <linux@armlinux.org.uk>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.armlinux.org.uk/>

**Files** arch/arm/include/asm/hardware/entry-macro-iomd.S arch/arm/include/asm/hardware/ioc.h arch/arm/include/asm/hardware/iomd.h arch/arm/include/asm/hardware/memc.h arch/arm/mach-rpc/ drivers/net/ethernet/8390/etherh.c drivers/net/ethernet/i825xx/ether1\* drivers/net/ethernet/seeq/ether3\* drivers/scsi/arm/

## \* ARM/Rockchip SoC support

**Mail** Heiko Stuebner <heiko@sntech.de>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers), linux-rockchip@lists.infradead.org

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mmind/linux-rockchip.git>

**Files** Documentation/devicetree/bindings/i2c/i2c-rk3x.yaml Documentation/devicetree/bindings/mmc/rockchip-dw-mshc.yaml Documentation/devicetree/bindings/spi/spi-rockchip.yaml arch/arm/boot/dts/rk3\* arch/arm/boot/dts/rv1108\* arch/arm/mach-rockchip/ drivers/\*/\*/\*rockchip\* drivers/\*/\*rockchip\* drivers/clk/rockchip/ drivers/i2c/busses/i2c-rk3x.c sound/soc/rockchip/

**Regex** rockchip

## \* ARM/SAMSUNG EXYNOS ARM ARCHITECTURES

**Mail** Kukjin Kim <kgene@kernel.org>, Krzysztof Kozlowski <krzk@kernel.org>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers), linux-samsung-soc@vger.kernel.org (moderated for non-subscribers)

**Status** Maintained

**Patchwork** <https://patchwork.kernel.org/project/linux-samsung-soc/list/>

**Files** Documentation/arm/samsung/ Documentation/devicetree/  
bindings/arm/samsung/ Documentation/devicetree/bindings/  
power/pd-samsung.yaml arch/arm/boot/dts/exynos\* arch/  
arm/boot/dts/s3c\* arch/arm/boot/dts/s5p\* arch/arm/  
mach-exynos\*/ arch/arm/mach-s3c24\*/ arch/arm/mach-s3c64xx/  
arch/arm/mach-s5p\*/ arch/arm/plat-samsung/ arch/arm64/  
boot/dts/exynos/ drivers/\*/\*/\*s3c24\* drivers/\*/\*s3c24\*  
drivers/\*/\*s3c64xx\* drivers/\*/\*s5pv210\* drivers/memory/  
samsung/ drivers/soc/samsung/ drivers/tty/serial/samsung\*  
include/linux/soc/samsung/

**Regex** exynos

### \* ARM/SAMSUNG MOBILE MACHINE SUPPORT

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-s5pv210/

### \* ARM/SAMSUNG S5P SERIES 2D GRAPHICS ACCELERATION (G2D) SUPPORT

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>, Kamil Debski <[kamil@wypas.org](mailto:kamil@wypas.org)>, Andrzej Hajda <[a.hajda@samsung.com](mailto:a.hajda@samsung.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/platform/s5p-g2d/

### \* ARM/SAMSUNG S5P SERIES HDMI CEC SUBSYSTEM SUPPORT

**Mail** Marek Szyprowski <[m.szyprowski@samsung.com](mailto:m.szyprowski@samsung.com)>

**Mailing list** [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org) (moderated for non-subscribers), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/s5p-cec.txt  
drivers/media/platform/s5p-cec/

## \* ARM/SAMSUNG S5P SERIES JPEG CODEC SUPPORT

**Mail** Andrzej Pietrasiewicz <[andrzejtp2010@gmail.com](mailto:andrzejtp2010@gmail.com)>, Jacek Anaszewski <[jacek.anaszewski@gmail.com](mailto:jacek.anaszewski@gmail.com)>, Sylwester Nawrocki <[s.nawrocki@samsung.com](mailto:s.nawrocki@samsung.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** [drivers/media/platform/s5p-jpeg/](https://git.kernel.org/pub/scm/linux/kernel/git/andrzej/s5p-jpeg/)

## \* ARM/SAMSUNG S5P SERIES Multi Format Codec (MFC) SUPPORT

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>, Kamil Debiski <[kamil@wypas.org](mailto:kamil@wypas.org)>, Jeongtae Park <[jtp.park@samsung.com](mailto:jtp.park@samsung.com)>, Andrzej Hajda <[a.hajda@samsung.com](mailto:a.hajda@samsung.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** [drivers/media/platform/s5p-mfc/](https://git.kernel.org/pub/scm/linux/kernel/git/andrzej/s5p-mfc/)

## \* ARM/SHMOBILE ARM ARCHITECTURE

**Mail** Geert Uytterhoeven <[geert+renesas@glider.be](mailto:geert+renesas@glider.be)>, Magnus Damm <[magnus.damm@gmail.com](mailto:magnus.damm@gmail.com)>

**Mailing list** [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**Patchwork** <http://patchwork.kernel.org/project/linux-renesas-soc/list/>

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) next

**Files** [Documentation/devicetree/bindings/arm/renesas.yaml](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git)  
[arch/arm/boot/dts/emev2\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/boot/dts/gr-peach\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git)  
[arch/arm/boot/dts/iwg20d-q7\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/boot/dts/r7s\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/boot/dts/r8a\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/boot/dts/r9a\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/boot/dts/sh\\*](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/configs/shmobile\\_defconfig](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/include/debug/renesas-scif.S](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git) [arch/arm/mach-shmobile/drivers/soc/renesas/include/linux/soc/renesas/](https://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-devel.git)

## \* ARM/SOCFPGA ARCHITECTURE

**Mail** Dinh Nguyen <dinguyen@kernel.org>

## Status Maintained

**Web-page** <http://www.rocketboards.org>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/dinguyen/linux.git

**Files** arch/arm/boot/dts/socfpga\* arch/arm/configs/  
socfpga\_defconfig arch/arm/mach-socfpga/ arch/arm64/boot/  
dts/altera/ arch/arm64/boot/dts/intel/

\* ARM/SOCFPGA CLOCK FRAMEWORK SUPPORT

**Mail** Dinh Nquyen <[dinquiry@kernel.org](mailto:dinquiry@kernel.org)>

**Status** Maintained

**Files** drivers/clk/socfpqa/

\* ARM/SOCFPGA EDAC SUPPORT

**Mail** Thor Thayer <thor.thayer@linux.intel.com>

## Status Maintained

## Files drivers/edac/altera\_edac.

\* ARM/SPREADTRUM SoC SUPPORT

**Mail** Orson Zhai <[orsonzhai@gmail.com](mailto:orsonzhai@gmail.com)>, Baolin Wang <[baolin.wang7@gmail.com](mailto:baolin.wang7@gmail.com)>, Chunyan Zhang <[zhang.lyra@gmail.com](mailto:zhang.lyra@gmail.com)>

**Status** Maintained

**Files** arch/arm64/boot/dts/sprd

**Regex** sprd sc27xx sc2731

## \* ARM/STI ARCHITECTURE

**Mail** Patrice Chotard <patrice.chotard@st.com>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.stlinux.com>

**Files** Documentation/devicetree/bindings/i2c/i2c-st.txt arch/arm/boot/dts/sti\* arch/arm/mach-sti/ drivers/ata/ahci\_st.c drivers/char/hw\_random/st-rng.c drivers/clocksource/arm\_global\_timer.c drivers/clocksource/clksrc\_st\_lpc.c drivers/cpufreq/sti-cpufreq.c drivers/dma/st\_fdma\* drivers/i2c/busses/i2c-st.c drivers/media/platform/sti/c8sectpfe/ drivers/media/rc/st\_rc.c drivers/mmc/host/sdhci-st.c drivers/phy/st/phy-miphy28lp.c drivers/phy/st/phy-stih407-usb.c drivers/pinctrl/pinctrl-st.c drivers/remoteproc/st\_remoteproc.c drivers/remoteproc/st\_slim\_rproc.c drivers/reset/sti/drivers/rtc/rtc-st-lpc.c drivers/tty/serial/st-asc.c drivers/usb/dwc3/dwc3-st.c drivers/usb/host/ehci-st.c drivers/usb/host/ohci-st.c drivers/watchdog/st\_lpc\_wdt.c include/linux/remoteproc/st\_slim\_rproc.h

## \* ARM/STM32 ARCHITECTURE

**Mail** Maxime Coquelin <[mcoquelin.stm32@gmail.com](mailto:mcoquelin.stm32@gmail.com)>, Alexandre Torgue <[alexandre.torgue@st.com](mailto:alexandre.torgue@st.com)>

**Mailing list** [linux-stm32@st-md-mailman.stormreply.com](mailto:linux-stm32@st-md-mailman.stormreply.com) (moderated for non-subscribers), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/atorgue/stm32.git> stm32-next

**Files** arch/arm/boot/dts/stm32\* arch/arm/mach-stm32/ drivers/clocksource/armv7m\_systick.c

**Regex** stm32 stm

## \* ARM/Synaptics SoC support

**Mail** Jisheng Zhang <[Jisheng.Zhang@synaptics.com](mailto:Jisheng.Zhang@synaptics.com)>, Sebastian Hesselbarth <[sebastian.hesselbarth@gmail.com](mailto:sebastian.hesselbarth@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/berlin\* arch/arm/mach-berlin/ arch/arm64/boot/dts/synaptics/

### \* ARM/TANGO ARCHITECTURE

**Mail** Marc Gonzalez <[marc.w.gonzalez@free.fr](mailto:marc.w.gonzalez@free.fr)>, Mans Rullgard <[mans@mansr.com](mailto:mans@mansr.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Odd Fixes

**Regex** tango

### \* ARM/TECHNOLOGIC SYSTEMS TS7250 MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/TEGRA HDMI CEC SUBSYSTEM SUPPORT

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/tegra-cec.txt  
drivers/media/platform/tegra-cec/

### \* ARM/TETON BGA MACHINE SUPPORT

**Mail** “Mark F. Brown” <[mark.brown314@gmail.com](mailto:mark.brown314@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/TEXAS INSTRUMENT AEMIF/EMIF DRIVERS

**Mail** Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/memory/\*emif\*

## \* ARM/TEXAS INSTRUMENT KEYSTONE ARCHITECTURE

**Mail** Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/ssantosh/linux-keystone.git>

**Files** arch/arm/boot/dts/keystone-\* arch/arm/mach-keystone/

## \* ARM/TEXAS INSTRUMENT KEYSTONE CLOCK FRAMEWORK

**Mail** Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/clk/keystone/

## \* ARM/TEXAS INSTRUMENT KEYSTONE CIOCKSOURCE

**Mail** Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/clocksource/timer-keystone.c

## \* ARM/TEXAS INSTRUMENT KEYSTONE RESET DRIVER

**Mail** Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/power/reset/keystone-reset.c

## \* ARM/TEXAS INSTRUMENTS K3 ARCHITECTURE

**Mail** Tero Kristo <[t-kristo@ti.com](mailto:t-kristo@ti.com)>, Nishanth Menon <[nm@ti.com](mailto:nm@ti.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Files** Documentation/devicetree/bindings/arm/ti/k3.txt arch/arm64/boot/dts/ti/Makefile arch/arm64/boot/dts/ti/k3-\* include/dt-bindings/pinctrl/k3.h

### \* ARM/THECUS N2100 MACHINE SUPPORT

**Mail** Lennert Buytenhek <[kernel@wantstofly.org](mailto:kernel@wantstofly.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

### \* ARM/TOSA MACHINE SUPPORT

**Mail** Dmitry Eremin-Solenikov <[dbaryshkov@gmail.com](mailto:dbaryshkov@gmail.com)>, Dirk Opfer <[dirk@opfer-online.de](mailto:dirk@opfer-online.de)>

**Status** Maintained

### \* ARM/UNIPHIER ARCHITECTURE

**Mail** Masahiro Yamada <[yamada.masahiro@socionext.com](mailto:yamada.masahiro@socionext.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/masahiroy/linux-uniphier.git>

**Files** Documentation/devicetree/bindings/arm/socionext/uniphier.yaml Documentation/devicetree/bindings/gpio/socionext\_uniphier-gpio.yaml Documentation/devicetree/bindings/pinctrl/socionext\_uniphier-pinctrl.yaml arch/arm/boot/dts/uniphier\* arch/arm/include/asm/hardware/cache-uniphier.h arch/arm/mach-uniphier/ arch/arm/mm/cache-uniphier.c arch/arm64/boot/dts/socionext/uniphier\* drivers/bus/uniphier-system-bus.c drivers/clk/uniphier/drivers/dma/uniphier-mdmac.c drivers/gpio/gpio-uniphier.c drivers/i2c/busses/i2c-uniphier\* drivers/irqchip/irq-uniphier-aidet.c drivers/mmc/host/uniphier-sd.c drivers/pinctrl/uniphier/ drivers/reset/reset-uniphier.c drivers/tty/serial/8250/8250\_uniphier.c

**Regex** uniphier

## \* ARM/VERSATILE EXPRESS PLATFORM

**Mail** Liviu Dudau <[liviu.dudau@arm.com](mailto:liviu.dudau@arm.com)>, Sudeep Holla <[sudeep.holla@arm.com](mailto:sudeep.holla@arm.com)>, Lorenzo Pieralisi <[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** \*/\*\*/\*vexpress\* \*/\*\*/vexpress\* arch/arm/boot/dts/vexpress\* arch/arm/mach-vexpress/ arch/arm64/boot/dts/arm/drivers/clk/versatile/clk-vexpress-osc.c drivers/clocksource/timer-versatile.c

**Regex** mps2

## \* ARM/VFP SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.armlinux.org.uk/>

**Files** arch/arm/vfp/

## \* ARM/VOIPAC PXA270 SUPPORT

**Mail** Marek Vasut <[marek.vasut@gmail.com](mailto:marek.vasut@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/include/mach/vpac270.h arch/arm/mach-pxa/vpac270.c

## \* ARM/VT8500 ARM ARCHITECTURE

**Mail** Tony Prisk <[linux@prisktech.co.nz](mailto:linux@prisktech.co.nz)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-wmt.txt arch/arm/mach-vt8500/ drivers/clocksource/timer-vt8500.c drivers/i2c/busses/i2c-wmt.c drivers/mmc/host/wmt-sdmmc.c drivers/pwm/pwm-vt8500.c drivers/rtc/rtc-vt8500.c

```
drivers/tty/serial/vt8500_serial.c      drivers/usb/host/  
ehci-platform.c drivers/usb/host/uhci-platform.c drivers/  
video/fbdev/vt8500lcdfb.*   drivers/video/fbdev/wm8505fb*  
drivers/video/fbdev/wmt_ge_rops.*
```

### \* ARM/ZIPIT Z2 SUPPORT

**Mail** Marek Vasut <[marek.vasut@gmail.com](mailto:marek.vasut@gmail.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/mach-pxa/include/mach/z2.h arch/arm/mach-pxa/z2.c

### \* ARM/ZTE ARCHITECTURE

**Mail** Jun Nie <[jun.nie@linaro.org](mailto:jun.nie@linaro.org)>, Shawn Guo <[shawnguo@kernel.org](mailto:shawnguo@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/zte.yaml  
Documentation/devicetree/bindings/clock/zx2967\*.txt  
Documentation/devicetree/bindings/dma/zxdma.txt  
Documentation/devicetree/bindings/gpio/zx296702-gpio.txt  
Documentation/devicetree/bindings/i2c/i2c-zx2967.txt  
Documentation/devicetree/bindings/mmc/zx-dw-mshc.txt  
Documentation/devicetree/bindings/pinctrl/pinctrl-zx.txt  
Documentation/devicetree/bindings/reset/zte,zx2967-reset.txt  
Documentation/devicetree/bindings/soc/zte/\*.txt  
Documentation/devicetree/bindings/sound/zte,\*.txt  
Documentation/devicetree/bindings/thermal/zx2967-thermal.txt  
Documentation/devicetree/bindings/watchdog/zte,zx2967-wdt.txt  
arch/arm/boot/dts/zx2967\*  
arch/arm/mach-zx/ arch/arm64/boot/dts/zte/ drivers/clk/zte/  
drivers/dma/zx\_dma.c drivers/gpio/gpio-zx.c drivers/  
i2c/busses/i2c-zx2967.c drivers/mmc/host/dw\_mmc-zx.\*  
drivers/pinctrl/zte/ drivers/soc/zte/ drivers/thermal/zx2967\_thermal.c  
drivers/watchdog/zx2967\_wdt.c include/dt-bindings/clock/zx2967\*.h  
include/dt-bindings/soc/zte,\*.h sound/soc/codecs/zx\_aud96p22.c sound/soc/zte/

## \* ARM/ZYNQ ARCHITECTURE

**Mail** Michal Simek <[michal.simek@xilinx.com](mailto:michal.simek@xilinx.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://wiki.xilinx.com>

**SCM** git <https://github.com/Xilinx/linux-xlnx.git>

**Files** Documentation/devicetree/bindings/i2c/cdns,i2c-r1p10.yaml  
Documentation/devicetree/bindings/i2c/xlnx,xps-iic-2.00.a.yaml  
arch/arm/mach-zynq/drivers/block/xsysace.c  
drivers/clocksource/timer-cadence-ttc.c  
drivers/cpuidle/cpuidle-zynq.c  
drivers/edac/synopsys\_edac.c  
drivers/i2c/busses/i2c-cadence.c  
drivers/i2c/busses/i2c-xiic.c  
drivers/mmc/host/sdhci-of-arasan.c

**Regex** zynq xilinx

## \* ARM64 PORT (AARCH64 ARCHITECTURE)

**Mail** Catalin Marinas <[catalin.marinas@arm.com](mailto:catalin.marinas@arm.com)>, Will Deacon <[will@kernel.org](mailto:will@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/arm64/linux.git>

**Files** Documentation/arm64/  
arch/arm64/  
tools/testing/  
selftests/arm64/

**Excluded** arch/arm64/boot/dts/

## \* AS3645A LED FLASH CONTROLLER DRIVER

**Mail** Sakari Ailus <[sakari.ailus@iki.fi](mailto:sakari.ailus@iki.fi)>

**Mailing list** [linux-leds@vger.kernel.org](mailto:linux-leds@vger.kernel.org)

**Status** Maintained

**Files** drivers/leds/leds-as3645a.c

## \* ASAHI KASEI AK7375 LENS VOICE COIL DRIVER

**Mail** Tianshu Qiu <tian.shu.qiu@intel.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/i2c/ak7375.txt  
drivers/media/i2c/ak7375.c

## \* ASAHI KASEI AK8974 DRIVER

**Mail** Linus Walleij <linus.walleij@linaro.org>

**Mailing list** linux-iio@vger.kernel.org

**Status** Supported

**Web-page** <http://www.akm.com/>

**Files** drivers/iio/magnetometer/ak8974.c

## \* ASC7621 HARDWARE MONITOR DRIVER

**Mail** George Joseph <george.joseph@fairview5.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/asc7621 drivers/hwmon/asc7621.c

## \* ASPEED PINCTRL DRIVERS

**Mail** Andrew Jeffery <[andrew@aj.id.au](mailto:andrew@aj.id.au)>

**Mailing list** [linux-aspeed@lists.ozlabs.org](mailto:linux-aspeed@lists.ozlabs.org) (moderated for non-subscribers), [openbmc@lists.ozlabs.org](mailto:openbmc@lists.ozlabs.org) (moderated for non-subscribers), [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pinctrl/aspeed,\*  
drivers/pinctrl/aspeed/

## \* ASPEED SCU INTERRUPT CONTROLLER DRIVER

**Mail** Eddie James <eajames@linux.ibm.com>

**Mailing list** linux-aspeed@lists.ozlabs.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/interrupt-controller/aspeed,ast2xxx-scu-ic.txt  
drivers/irqchip/irq-aspeed-scu-ic.c  
include/dt-bindings/interrupt-controller/aspeed-scu-ic.h

## \* ASPEED VIDEO ENGINE DRIVER

**Mail** Eddie James <eajames@linux.ibm.com>

**Mailing list** linux-media@vger.kernel.org, openbmc@lists.ozlabs.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/aspeed-video.txt  
drivers/media/platform/aspeed-video.c

## \* ASUS NOTEBOOKS AND EEEPC ACPI/WMI EXTRAS DRIVERS

**Mail** Corentin Chary <corentin.chary@gmail.com>

**Mailing list** acpi4asus-user@lists.sourceforge.net, platform-driver-x86@vger.kernel.org

**Status** Maintained

**Web-page** <http://acpi4asus.sf.net>

**Files** drivers/platform/x86/asus\*.c  
drivers/platform/x86/eeepc\*.c

## \* ASUS WIRELESS RADIO CONTROL DRIVER

**Mail** João Paulo Rechi Vita <jprvita@gmail.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/asus-wireless.c

### \* ASYMMETRIC KEYS

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>

**Mailing list** [keyrings@vger.kernel.org](mailto:keyrings@vger.kernel.org)

**Status** Maintained

**Files** Documentation/crypto/asymmetric-keys.txt        crypto/  
          asymmetric\_keys/  include/crypto/pkcs7.h  include/crypto/  
          public\_key.h  include/linux/verification.h

### \* ASYNCHRONOUS TRANSFERS/TRANSFORMS (IOAT) API

**Reviewer** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>

**Status** Odd fixes

**Web-page** <http://sourceforge.net/projects/xscaleiop>

**Files** Documentation/crypto/async-tx-api.txt  crypto/async\_tx/  
          drivers/dma/    include/linux/async\_tx.h    include/linux/  
          dmaengine.h

### \* AT24 EEPROM DRIVER

**Mail** Bartosz Golaszewski <[bgolaszewski@baylibre.com](mailto:bgolaszewski@baylibre.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/brcf/linux.git

**Files** Documentation/devicetree/bindings/eeprom/at24.yaml  
          drivers/misc/eeprom/at24.c

### \* ATA OVER ETHERNET (AOE) DRIVER

**Mail** “Justin Sanders” <[justin@coraid.com](mailto:justin@coraid.com)>

**Status** Supported

**Web-page** <http://www.openaoe.org/>

**Files** Documentation/admin-guide/aoe/drivers/block/aoe/

## \* **ATHEROS 71XX/9XXX GPIO DRIVER**

**Mail** Alban Bedel <[albeu@free.fr](mailto:albeu@free.fr)>

**Status** Maintained

**Web-page** <https://github.com/AlbanBedel/linux>

**SCM** git <git://github.com/AlbanBedel/linux>

**Files** Documentation/devicetree/bindings/gpio/gpio-ath79.txt  
drivers/gpio/gpio-ath79.c

## \* **ATHEROS 71XX/9XXX USB PHY DRIVER**

**Mail** Alban Bedel <[albeu@free.fr](mailto:albeu@free.fr)>

**Status** Maintained

**Web-page** <https://github.com/AlbanBedel/linux>

**SCM** git <git://github.com/AlbanBedel/linux>

**Files** Documentation/devicetree/bindings/phy/phy-ath79-usb.txt  
drivers/phy/qualcomm/phy-ath79-usb.c

## \* **ATHEROS ATH GENERIC UTILITIES**

**Mail** Kalle Valo <[kvalo@codeaurora.org](mailto:kvalo@codeaurora.org)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Supported

**Files** drivers/net/wireless/ath/\*

## \* **ATHEROS ATH5K WIRELESS DRIVER**

**Mail** Jiri Slaby <[jirislaby@gmail.com](mailto:jirislaby@gmail.com)>, Nick Kossi-fidis <[mickflemm@gmail.com](mailto:mickflemm@gmail.com)>, Luis Chamberlain <[mcgrof@kernel.org](mailto:mcgrof@kernel.org)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/ath5k>

**Files** drivers/net/wireless/ath/ath5k/

### \* **ATHEROS ATH6KL WIRELESS DRIVER**

**Mail** Kalle Valo <[kvalo@codeaurora.org](mailto:kvalo@codeaurora.org)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Supported

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/ath6kl>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kvalo/ath.git>

**Files** drivers/net/wireless/ath/ath6kl/

### \* **ATI\_REMOTE2 DRIVER**

**Mail** Ville Syrjala <[syrjala@sci.fi](mailto:syrjala@sci.fi)>

**Status** Maintained

**Files** drivers/input/misc/ati\_remote2.c

### \* **ATK0110 HWMON DRIVER**

**Mail** Luca Tettamanti <[kronos.it@gmail.com](mailto:kronos.it@gmail.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/asus\_atk0110.c

### \* **ATLX ETHERNET DRIVERS**

**Mail** Jay Cliburn <[jcliburn@gmail.com](mailto:jcliburn@gmail.com)>, Chris Snook <[chris.snook@gmail.com](mailto:chris.snook@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://sourceforge.net/projects/atl1> <http://atl1.sourceforge.net>

**Files** drivers/net/ethernet/atheros/

### \* **ATM**

**Mail** Chas Williams <[3chas3@gmail.com](mailto:3chas3@gmail.com)>

**Mailing list** [linux-atm-general@lists.sourceforge.net](mailto:linux-atm-general@lists.sourceforge.net) (moderated for non-subscribers), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://linux-atm.sourceforge.net>

**Files** drivers/atm/ include/linux/atm\* include/uapi/linux/atm\*

## \* ATMEL MACB ETHERNET DRIVER

**Mail** Nicolas Ferre <[nicolas.ferre@microchip.com](mailto:nicolas.ferre@microchip.com)>, Claudiu Beznea <[claudiu.beznea@microchip.com](mailto:claudiu.beznea@microchip.com)>

**Status** Supported

**Files** drivers/net/ethernet/cadence/

## \* ATMEL MAXTOUCH DRIVER

**Mail** Nick Dyer <[nick@shmanahar.org](mailto:nick@shmanahar.org)>

**Status** Maintained

**SCM** git <git://github.com/ndyer/linux.git>

**Files** Documentation/devicetree/bindings/input/atmel,maxtouch.txt  
drivers/input/touchscreen/atmel\_mxt\_ts.c

## \* ATMEL WIRELESS DRIVER

**Mail** Simon Kelley <[simon@thekelleys.org.uk](mailto:simon@thekelleys.org.uk)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.thekelleys.org.uk/atmel> <http://atmelwlandriver.sourceforge.net/>

**Files** drivers/net/wireless/atmel/atmel\*

## \* ATOMIC INFRASTRUCTURE

**Mail** Will Deacon <[will@kernel.org](mailto:will@kernel.org)>, Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>

**Reviewer** Boqun Feng <[boqun.feng@gmail.com](mailto:boqun.feng@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** arch/\*/include/asm/atomic\*.h include/\*/atomic\*.h  
scripts/atomic/

### \* ATTO EXPRESSSAS SAS/SATA RAID SCSI DRIVER

**Mail** Bradley Grove <[linuxdrivers@attotech.com](mailto:linuxdrivers@attotech.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.attotech.com>

**Files** drivers/scsi/esas2r

### \* ATUSB IEEE 802.15.4 RADIO DRIVER

**Mail** Stefan Schmidt <[stefan@datenfreihafen.org](mailto:stefan@datenfreihafen.org)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ieee802154/at86rf230.h                    drivers/net/  
      ieee802154/atusb.c    drivers/net/ieee802154/atusb.h

### \* AUDIT SUBSYSTEM

**Mail** Paul Moore <[paul@paul-moore.com](mailto:paul@paul-moore.com)>, Eric Paris  
<[eparis@redhat.com](mailto:eparis@redhat.com)>

**Mailing list** [linux-audit@redhat.com](mailto:linux-audit@redhat.com) (moderated for non-subscribers)

**Status** Supported

**Web-page** <https://github.com/linux-audit>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pcmoore/audit.git>

**Files** include/linux/audit.h include/uapi/linux/audit.h kernel/  
      audit\*

### \* AUXILIARY DISPLAY DRIVERS

**Mail** Miguel Ojeda Sandonis <[miguel.ojeda.sandonis@gmail.com](mailto:miguel.ojeda.sandonis@gmail.com)>

**Status** Maintained

**Files** drivers/auxdisplay/ include/linux/cfag12864b.h

## \* AVIA HX711 ANALOG DIGITAL CONVERTER IIO DRIVER

**Mail** Andreas Klinger <[ak@it-klinger.de](mailto:ak@it-klinger.de)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/adc/avia-hx711.yaml  
drivers/iio/adc/hx711.c

## \* AX.25 NETWORK LAYER

**Mail** Ralf Baechle <[ralf@linux-mips.org](mailto:ralf@linux-mips.org)>

**Mailing list** [linux-hams@vger.kernel.org](mailto:linux-hams@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-ax25.org/>

**Files** include/net/ax25.h include/uapi/linux/ax25.h net/ax25/

## \* AXENTIA ARM DEVICES

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/boot/dts/at91-linea.dtsci arch/arm/boot/dts/at91-natte.dtsci arch/arm/boot/dts/at91-nattis-2-natte-2.dtsci arch/arm/boot/dts/at91-tse850-3.dts

## \* AXENTIA ASOC DRIVERS

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/axentia,\*  
sound/soc/atmel/tse850-pcm5142.c

### \* AXI-FAN-CONTROL HARDWARE MONITOR DRIVER

**Mail** Nuno Sá <[nuno.sa@analog.com](mailto:nuno.sa@analog.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/hwmon/adi,  
axi-fan-control.yaml drivers/hwmon/axi-fan-control.c

### \* AXXIA I2C CONTROLLER

**Mail** Krzysztof Adamski <[krzysztof.adamski@nokia.com](mailto:krzysztof.adamski@nokia.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-axxia.txt  
drivers/i2c/busses/i2c-axxia.c

### \* AZ6007 DVB DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/az6007.c

### \* AZTECH FM RADIO RECEIVER DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-aztech\*

## \* B43 WIRELESS DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org),  
**dev@lists.infradead.org** b43-

**Status** Odd Fixes

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/b43>

**Files** [drivers/net/wireless/broadcom/b43/](https://git.kernel.org/pub/scm/linux/kernel/git/broadcom/b43/)

## \* B43LEGACY WIRELESS DRIVER

**Mail** Larry Finger <[Larry.Finger@lwfinger.net](mailto:Larry.Finger@lwfinger.net)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org),  
**dev@lists.infradead.org** b43-

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/b43>

**Files** [drivers/net/wireless/broadcom/b43legacy/](https://git.kernel.org/pub/scm/linux/kernel/git/broadcom/b43legacy/)

## \* BACKLIGHT CLASS/SUBSYSTEM

**Mail** Lee Jones <[lee.jones@linaro.org](mailto:lee.jones@linaro.org)>, Daniel Thompson <[daniel.thompson@linaro.org](mailto:daniel.thompson@linaro.org)>, Jingoo Han <[jingoohan1@gmail.com](mailto:jingoohan1@gmail.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** [git git://git.kernel.org/pub/scm/linux/kernel/git/lee/backlight.git](https://git.kernel.org/pub/scm/linux/kernel/git/lee/backlight.git)

**Files** Documentation/ABI/stable/sysfs-class-backlight  
Documentation/ABI/testing/sysfs-class-backlight  
Documentation/devicetree/bindings/leds/backlight drivers/  
video/backlight/ include/linux/backlight.h include/linux/  
pwm\_backlight.h

## \* BATMAN ADVANCED

**Mail** Marek Lindner <[mareklindner@neomailbox.ch](mailto:mareklindner@neomailbox.ch)>, Simon Wunderlich <[sw@simonwunderlich.de](mailto:sw@simonwunderlich.de)>, Antonio Quartulli <[a@unstable.cc](mailto:a@unstable.cc)>, Sven Eckelmann <[sven@narfation.org](mailto:sven@narfation.org)>

**Mailing list** [b.a.t.m.a.n@lists.open-mesh.org](mailto:b.a.t.m.a.n@lists.open-mesh.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <https://www.open-mesh.org/>

**Patchwork** <https://patchwork.open-mesh.org/project/batman/list/>

**bugs** <https://www.open-mesh.org/projects/batman-adv/issues>

**chat** irc://chat.freenode.net/batman

**SCM** git <https://git.open-mesh.org/linux-merge.git>

**Files** Documentation/ABI/obsolete/sysfs-class-net-batman-adv  
Documentation/ABI/obsolete/sysfs-class-net-mesh  
networking/batman-adv include/uapi/linux/batadv\_packet.  
h include/uapi/linux/batman\_adv.h net/batman-adv/

### \* BAYCOM/HDLCDRV DRIVERS FOR AX.25

**Mail** Thomas Sailer <[t.sailer@alumni.ethz.ch](mailto:t.sailer@alumni.ethz.ch)>

**Mailing list** [linux-hams@vger.kernel.org](mailto:linux-hams@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.baycom.org/~tom/ham/ham.html>

**Files** drivers/net/hamradio/baycom\*

### \* BCACHE (BLOCK LAYER CACHE)

**Mail** Coly Li <[colyli@suse.de](mailto:colyli@suse.de)>, Kent Overstreet  
<[kent.overstreet@gmail.com](mailto:kent.overstreet@gmail.com)>

**Mailing list** [linux-bcache@vger.kernel.org](mailto:linux-bcache@vger.kernel.org)

**Status** Maintained

**Web-page** <http://bcache.evilpiepirate.org>

**chat** irc://irc.oftc.net/bcache

**Files** drivers/md/bcache/

### \* BDISP ST MEDIA DRIVER

**Mail** Fabien Dessenne <[fabien.dessenne@st.com](mailto:fabien.dessenne@st.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/platform/sti/bdisp

## \* BECKHOFF CX5020 ETHERCAT MASTER DRIVER

**Mail** Dariusz Marcinkiewicz <[reksio@newterm.pl](mailto:reksio@newterm.pl)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/ec\_bhf.c

## \* BEFS FILE SYSTEM

**Mail** Luis de Bethencourt <[luisbg@kernel.org](mailto:luisbg@kernel.org)>, Salah Triki <[salah.triki@gmail.com](mailto:salah.triki@gmail.com)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/luisbg/linux-befs.git>

**Files** filesystems/befs fs/befs/

## \* BFQ I/O SCHEDULER

**Mail** Paolo Valente <[paolo.valente@linaro.org](mailto:paolo.valente@linaro.org)>, Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Maintained

**Files** block/bfq-iosched block/bfq-\*

## \* BFS FILE SYSTEM

**Mail** “Tigran A. Aivazian” <[aivazian.tigran@gmail.com](mailto:aivazian.tigran@gmail.com)>

**Status** Maintained

**Files** filesystems/bfs fs/bfs/ include/uapi/linux/bfs\_fs.h

## \* BLINKM RGB LED DRIVER

**Mail** Jan-Simon Moeller <[jansimon.moeller@gmx.de](mailto:jansimon.moeller@gmx.de)>

**Status** Maintained

**Files** drivers/leds/leds-blinkm.c

### \* BLOCK LAYER

**Mail** Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** block/ drivers/block/ kernel/trace/blktrace.c lib/ sbitmap.c

### \* BLOCK2MTD DRIVER

**Mail** Joern Engel <[joern@lazybastard.org](mailto:joern@lazybastard.org)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** drivers/mtd/devices/block2mtd.c

### \* BLUETOOTH DRIVERS

**Mail** Marcel Holtmann <[marcel@holtmann.org](mailto:marcel@holtmann.org)>, Johan Hedberg <[johan.hedberg@gmail.com](mailto:johan.hedberg@gmail.com)>

**Mailing list** [linux-bluetooth@vger.kernel.org](mailto:linux-bluetooth@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.bluez.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/bluetooth/bluetooth.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/bluetooth/bluetooth-next.git>

**Files** drivers/bluetooth/

### \* BLUETOOTH SUBSYSTEM

**Mail** Marcel Holtmann <[marcel@holtmann.org](mailto:marcel@holtmann.org)>, Johan Hedberg <[johan.hedberg@gmail.com](mailto:johan.hedberg@gmail.com)>

**Mailing list** [linux-bluetooth@vger.kernel.org](mailto:linux-bluetooth@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.bluez.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/bluetooth/bluetooth.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/bluetooth/bluetooth-next.git>

**Files** include/net/bluetooth/ net/bluetooth/

## \* BONDING DRIVER

**Mail** Jay Vosburgh <[j.vosburgh@gmail.com](mailto:j.vosburgh@gmail.com)>, Veaceslav Falico <[vfalico@gmail.com](mailto:vfalico@gmail.com)>, Andy Gospodarek <[andy@greyhouse.net](mailto:andy@greyhouse.net)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://sourceforge.net/projects/bonding/>

**Files** drivers/net/bonding/ include/uapi/linux/if\_bonding.h

## \* BOSCH SENSORTEC BMA400 ACCELEROMETER IIO DRIVER

**Mail** Dan Robertson <[dan@dlrobertson.com](mailto:dan@dlrobertson.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/accel/bosch,  
bma400.yaml drivers/iio/accel/bma400\*

## \* BPF (Safe dynamic programs and tools)

**Mail** Alexei Starovoitov <[ast@kernel.org](mailto:ast@kernel.org)>, Daniel Borkmann <[daniel@iogearbox.net](mailto:daniel@iogearbox.net)>

**Reviewer** Martin KaFai Lau <[kafai@fb.com](mailto:kafai@fb.com)>, Song Liu <[songliubraving@fb.com](mailto:songliubraving@fb.com)>, Yonghong Song <[yhs@fb.com](mailto:yhs@fb.com)>, Andrii Nakryiko <[andriin@fb.com](mailto:andriin@fb.com)>, John Fastabend <[john.fastabend@gmail.com](mailto:john.fastabend@gmail.com)>, KP Singh <[kpsingh@chromium.org](mailto:kpsingh@chromium.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Supported

**Patchwork** <https://patchwork.ozlabs.org/project/netdev/list/?delegate=77147>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/bpf/bpf.git> git  
<git://git.kernel.org/pub/scm/linux/kernel/git/bpf/bpf-next.git>

**Files** Documentation/bpf/ networking/filter arch/\*/\* include/  
linux/bpf\* include/linux/filter.h include/trace/events/  
xdp.h include/uapi/linux/bpf\* include/uapi/linux/filter.  
h kernel/bpf/ kernel/trace/bpf\_trace.c lib/test\_bpf.c  
net/bpf/ net/core/filter.c net/sched/act\_bpf.c net/sched/  
cls\_bpf.c samples/bpf/ tools/bpf/ tools/lib/bpf/ tools/  
testing/selftests/bpf/

**Regex** bpf

**Content regex** bpf

### \* BPF JIT for ARM

**Mail** Shubham Bansal <[illusionist.neo@gmail.com](mailto:illusionist.neo@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/net/

### \* BPF JIT for ARM64

**Mail** Daniel Borkmann <[daniel@ioinbox.net](mailto:daniel@ioinbox.net)>, Alexei Starovoitov <[ast@kernel.org](mailto:ast@kernel.org)>, Zi Shen Lim <[zlim.lnx@gmail.com](mailto:zlim.lnx@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Supported

**Files** arch/arm64/net/

### \* BPF JIT for MIPS (32-BIT AND 64-BIT)

**Mail** Paul Burton <[paulburton@kernel.org](mailto:paulburton@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/mips/net/

### \* BPF JIT for NFP NICs

**Mail** Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/netronome/nfp/bpf/

### \* BPF JIT for POWERPC (32-BIT AND 64-BIT)

**Mail** Naveen N. Rao <[naveen.n.rao@linux.ibm.com](mailto:naveen.n.rao@linux.ibm.com)>, Sandipan Das <[sandipan@linux.ibm.com](mailto:sandipan@linux.ibm.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/powerpc/net/

### \* BPF JIT for RISC-V (32-bit)

**Mail** Luke Nelson <[luke.r.nels@gmail.com](mailto:luke.r.nels@gmail.com)>, Xi Wang <[xi.wang@gmail.com](mailto:xi.wang@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/riscv/net/

**Excluded** arch/riscv/net/bpf\_jit\_comp64.c

### \* BPF JIT for RISC-V (64-bit)

**Mail** Björn Töpel <[bjorn.topel@gmail.com](mailto:bjorn.topel@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/riscv/net/

**Excluded** arch/riscv/net/bpf\_jit\_comp32.c

### \* BPF JIT for S390

**Mail** Ilya Leoshkevich <[iii@linux.ibm.com](mailto:iii@linux.ibm.com)>, Heiko Carstens <[hca@linux.ibm.com](mailto:hca@linux.ibm.com)>, Vasily Gorbik <[gor@linux.ibm.com](mailto:gor@linux.ibm.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/s390/net/

**Excluded** arch/s390/net/pnet.c

### \* BPF JIT for SPARC (32-BIT AND 64-BIT)

**Mail** David S. Miller <[davem@davemloft.net](mailto:davem@davemloft.net)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** arch/sparc/net/

### \* BPF JIT for X86 32-BIT

**Mail** Wang YanQing <udknight@gmail.com>

**Mailing list** netdev@vger.kernel.org, bpf@vger.kernel.org

**Status** Maintained

**Files** arch/x86/net/bpf\_jit\_comp32.c

### \* BPF JIT for X86 64-BIT

**Mail** Alexei Starovoitov <ast@kernel.org>, Daniel Borkmann <daniel@io gearbox.net>

**Mailing list** netdev@vger.kernel.org, bpf@vger.kernel.org

**Status** Supported

**Files** arch/x86/net/

**Excluded** arch/x86/net/bpf\_jit\_comp32.c

### \* BROADCOM B44 10/100 ETHERNET DRIVER

**Mail** Michael Chan <michael.chan@broadcom.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/broadcom/b44.\*

### \* BROADCOM B53 ETHERNET SWITCH DRIVER

**Mail** Florian Fainelli <f.fainelli@gmail.com>

**Mailing list** netdev@vger.kernel.org, openwrt-devel@lists.openwrt.org (subscribers-only)

**Status** Supported

**Files** drivers/net/dsa/b53/\* include/linux/platform\_data/b53.h

### \* BROADCOM BCM2711/BCM2835 ARM ARCHITECTURE

**Mail** Nicolas Saenz Julianne <nsaenzjulienne@suse.de>

**Mailing list** bcm-kernel-feedback-list@broadcom.com, linux-rpi-kernel@lists.infradead.org (moderated for non-subscribers), linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/nsaenz/linux-rpi.git

**Files** Documentation/devicetree/bindings/pci/brcm\_stb-pcie.yaml  
 drivers/pci/controller/pcie-brcmstb.c  
 drivers/staging/vc04\_services

**Regex** bcm2711 bcm2835

## \* BROADCOM BCM281XX/BCM11XXX/BCM216XX ARM ARCHITECTURE

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>, Ray Jui <[rjui@broadcom.com](mailto:rjui@broadcom.com)>, Scott Branden <[sbranden@broadcom.com](mailto:sbranden@broadcom.com)>, [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com)

**Status** Maintained

**SCM** git [git://github.com/broadcom/mach-bcm](https://github.com/broadcom/mach-bcm)

**Files** arch/arm/mach-bcm/

**Regex** bcm281\* bcm113\* bcm216\* kona

## \* BROADCOM BCM47XX MIPS ARCHITECTURE

**Mail** Hauke Mehrtens <[hauke@hauke-m.de](mailto:hauke@hauke-m.de)>, Rafał Miłecki <[zajec5@gmail.com](mailto:zajec5@gmail.com)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/mips/brcm/ arch/mips/bcm47xx/\* arch/mips/include/asm/mach-bcm47xx/\*

## \* BROADCOM BCM5301X ARM ARCHITECTURE

**Mail** Hauke Mehrtens <[hauke@hauke-m.de](mailto:hauke@hauke-m.de)>, Rafał Miłecki <[zajec5@gmail.com](mailto:zajec5@gmail.com)>, [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com)

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** arch/arm/boot/dts/bcm470\* arch/arm/boot/dts/bcm5301x\*.dtsi arch/arm/boot/dts/bcm953012\* arch/arm/mach-bcm/bcm\_5301x.c

## \* BROADCOM BCM53573 ARM ARCHITECTURE

**Mail** Rafał Miłecki <[rafal@milecki.pl](mailto:rafal@milecki.pl)>

**Mailing list** [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** arch/arm/boot/dts/bcm47189\* arch/arm/boot/dts/bcm53573\*

## \* BROADCOM BCM63XX ARM ARCHITECTURE

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>, [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com)

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git [git://github.com/broadcom/stblinux.git](https://github.com/broadcom/stblinux.git)

**Regex** bcm63xx

## \* BROADCOM BCM63XX/BCM33XX UDC DRIVER

**Mail** Kevin Cernekee <[cernekee@gmail.com](mailto:cernekee@gmail.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/gadget/udc/bcm63xx\_udc.\*

## \* BROADCOM BCM7XXX ARM ARCHITECTURE

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>, [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com)

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git [git://github.com/broadcom/stblinux.git](https://github.com/broadcom/stblinux.git)

**Files** Documentation/devicetree/bindings/pci/brcm,stb-pcie.yaml  
arch/arm/boot/dts/bcm7\*.dts\* arch/arm/include/asm/hardware/cache-b15-rac.h arch/arm/mach-bcm/\*brcmstb\*  
arch/arm/mm/cache-b15-rac.c drivers/bus/brcmstb\_gisb.c  
drivers/pci/controller/pcie-brcmstb.c

**Regex** brcmstb

## \* BROADCOM BMIPS CPUFREQ DRIVER

**Mail** Markus Mayer <mmayer@broadcom.com>, bcm-kernel-feedback-list@broadcom.com

**Mailing list** linux-pm@vger.kernel.org

**Status** Maintained

**Files** drivers/cpufreq/bmips-cpufreq.c

## \* BROADCOM BMIPS MIPS ARCHITECTURE

**Mail** Florian Fainelli <f.fainelli@gmail.com>

**Mailing list** bcm-kernel-feedback-list@broadcom.com, linux-mips@vger.kernel.org

**Status** Maintained

**SCM** git git://github.com/broadcom/stblinux.git

**Files** arch/mips/bmips/\* arch/mips/boot/dts/brcm/bcm\*.dts\*  
arch/mips/include/asm/mach-bmips/\* arch/mips/kernel/\*bmips\*  
drivers/irqchip/irq-bcm63\* drivers/irqchip/irq-bcm7\*  
drivers/irqchip/irq-brcmstb\* include/linux/bcm963xx\_nvram.h  
include/linux/bcm963xx\_tag.h

## \* BROADCOM BNX2 GIGABIT ETHERNET DRIVER

**Mail** Rasesh Mody <rmody@marvell.com>, GR-Linux-NIC-Dev@marvell.com

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/broadcom/bnx2.\* drivers/net/ethernet/broadcom/bnx2\_\*

## \* BROADCOM BNX2FC 10 GIGABIT FCOE DRIVER

**Mail** QLogic-Storage-Upstream@qlogic.com

**Mailing list** linux-scsi@vger.kernel.org

**Status** Supported

**Files** drivers/scsi/bnx2fc/

## \* **BROADCOM BNX2I 1/10 GIGABIT iSCSI DRIVER**

**Mail** QLogic-Storage-Upstream@qlogic.com

**Mailing list** linux-scsi@vger.kernel.org

**Status** Supported

**Files** drivers/scsi/bnx2i/

## \* **BROADCOM BNX2X 10 GIGABIT ETHERNET DRIVER**

**Mail** Ariel Elior <aelior@marvell.com>, Sudarsana Kalluru <skalluru@marvell.com>, GR-everest-linux-l2@marvell.com

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/broadcom/bnx2x/

## \* **BROADCOM BNXT\_EN 50 GIGABIT ETHERNET DRIVER**

**Mail** Michael Chan <michael.chan@broadcom.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/broadcom/bnxt/

## \* **BROADCOM BRCM80211 IEEE802.11n WIRELESS DRIVER**

**Mail** Arend van Spriel <arend.vanspriel@broadcom.com>, Franky Lin <franky.lin@broadcom.com>, Hante Meuleman <hante.meuleman@broadcom.com>, Chi-Hsien Lin <chi-hsien.lin@cypress.com>, Wright Feng <wright.feng@cypress.com>

**Mailing list** linux-wireless@vger.kernel.org, brcm80211-dev-list.pdl@broadcom.com, brcm80211-dev-list@cypress.com

**Status** Supported

**Files** drivers/net/wireless/broadcom/brcm80211/

## \* **BROADCOM BRCMSTB GPIO DRIVER**

**Mail** Gregory Fong <gregory.0xf0@gmail.com>

**Mailing list** bcm-kernel-feedback-list@broadcom.com

**Status** Supported

**Files** Documentation/devicetree/bindings/gpio/brcm,  
brcmstb-gpio.txt drivers/gpio/gpio-brcmstb.c

## \* **BROADCOM BRCMSTB I2C DRIVER**

**Mail** Kamal Dasu <kdasu.kdev@gmail.com>

**Mailing list** linux-i2c@vger.kernel.org, bcm-kernel-feedback-list@broadcom.com

**Status** Supported

**Files** Documentation/devicetree/bindings/i2c/brcm,brcmstb-i2c.yaml  
drivers/i2c/busses/i2c-brcmstb.c

## \* **BROADCOM BRCMSTB USB EHCI DRIVER**

**Mail** Al Cooper <alcooperx@gmail.com>

**Mailing list** linux-usb@vger.kernel.org, bcm-kernel-feedback-list@broadcom.com

**Status** Maintained

**Files** Documentation/devicetree/bindings/usb/brcm,  
bcm7445-ehci.yaml drivers/usb/host/ehci-brcm.\*

## \* **BROADCOM BRCMSTB USB2 and USB3 PHY DRIVER**

**Mail** Al Cooper <alcooperx@gmail.com>

**Mailing list** linux-kernel@vger.kernel.org, bcm-kernel-feedback-list@broadcom.com

**Status** Maintained

**Files** drivers/phy/broadcom/phy-brcm-usb\*

### \* BROADCOM GENET ETHERNET DRIVER

**Mail** Doug Berger <[opendmb@gmail.com](mailto:opendmb@gmail.com)>, Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>

**Mailing list** [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com), [net-dev@vger.kernel.org](mailto:net-dev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/broadcom/genet/

### \* BROADCOM IPROC ARM ARCHITECTURE

**Mail** Ray Jui <[rjui@broadcom.com](mailto:rjui@broadcom.com)>, Scott Branden <[sbranden@broadcom.com](mailto:sbranden@broadcom.com)>, [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com)

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://github.com/broadcom/cygnus-linux.git>

**Files** arch/arm64/boot/dts/broadcom/northstar2/\* arch/arm64/boot/dts/broadcom/stingray/\* drivers/clk/bcm/clk-ns\* drivers/clk/bcm/clk-sr\* drivers/pinctrl/bcm/pinctrl-ns\* include/dt-bindings/clock/bcm-sr\*

**Regex** iproc cygnus bcm[-\_]nsp bcm9113\* bcm9583\* bcm9585\* bcm9586\* bcm988312 bcm113\* bcm583\* bcm585\* bcm586\* bcm88312 hr2 stingray

### \* BROADCOM KONA GPIO DRIVER

**Mail** Ray Jui <[rjui@broadcom.com](mailto:rjui@broadcom.com)>

**Mailing list** [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com)

**Status** Supported

**Files** Documentation/devicetree/bindings/gpio/brcm,kona-gpio.txt drivers/gpio/gpio-bcm-kona.c

### \* BROADCOM NETXTREME-E ROCE DRIVER

**Mail** Selvin Xavier <[selvin.xavier@broadcom.com](mailto:selvin.xavier@broadcom.com)>, Devesh Sharma <[devesh.sharma@broadcom.com](mailto:devesh.sharma@broadcom.com)>, Somnath Kotur <[somnath.kotur@broadcom.com](mailto:somnath.kotur@broadcom.com)>, Sriharsha Basavapatna <[sriharsha.basavapatna@broadcom.com](mailto:sriharsha.basavapatna@broadcom.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.broadcom.com>

**Files** drivers/infiniband/hw/bnxt\_re/ include/uapi/rdma/  
bnxt\_re-abi.h

#### \* BROADCOM NVRAM DRIVER

**Mail** Rafał Miłecki <zajec5@gmail.com>

**Mailing list** linux-mips@vger.kernel.org

**Status** Maintained

**Files** drivers/firmware/broadcom/\*

#### \* BROADCOM SPECIFIC AMBA DRIVER (BCMA)

**Mail** Rafał Miłecki <zajec5@gmail.com>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Files** drivers/bcma/ include/linux/bcma/

#### \* BROADCOM SPI DRIVER

**Mail** Kamal Dasu <kdasu.kdev@gmail.com>, bcm-kernel-feedback-list@broadcom.com

**Status** Maintained

**Files** Documentation/devicetree/bindings/spi/brcm,  
spi-bcm-qspi.txt drivers/spi/spi-bcm-qspi.\* drivers/spi/  
spi-brcmstb-qspi.c drivers/spi/spi-iproc-qspi.c

#### \* BROADCOM STB AVS CPUFREQ DRIVER

**Mail** Markus Mayer <mmayer@broadcom.com>, bcm-kernel-feedback-list@broadcom.com

**Mailing list** linux-pm@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/cpufreq/brcm,  
stb-avs-cpu-freq.txt drivers/cpufreq/brcmstb\*

## \* BROADCOM STB AVS TMON DRIVER

**Mail** Markus Mayer <[mmayer@broadcom.com](mailto:mmayer@broadcom.com)>, bcm-kernel-feedback-list@broadcom.com

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/thermal/brcm, avs-tmon.txt drivers/thermal/broadcom/brcmstb\*

## \* BROADCOM STB DPFE DRIVER

**Mail** Markus Mayer <[mmayer@broadcom.com](mailto:mmayer@broadcom.com)>, bcm-kernel-feedback-list@broadcom.com

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/memory-controllers/brcm, dpfe-cpu.txt drivers/memory/brcmstb\_dpfe.c

## \* BROADCOM STB NAND FLASH DRIVER

**Mail** Brian Norris <[computersforpeace@gmail.com](mailto:computersforpeace@gmail.com)>, Kamal Dasu <[kdasu.kdev@gmail.com](mailto:kdasu.kdev@gmail.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org), bcm-kernel-feedback-list@broadcom.com

**Status** Maintained

**Files** drivers/mtd/nand/raw/brcmnand/

## \* BROADCOM SYSTEMPORT ETHERNET DRIVER

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>

**Mailing list** [bcm-kernel-feedback-list@broadcom.com](mailto:bcm-kernel-feedback-list@broadcom.com), net-dev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/broadcom/bcmsysport.\*

## \* **BROADCOM TG3 GIGABIT ETHERNET DRIVER**

**Mail** Siva Reddy Kallam <[siva.kallam@broadcom.com](mailto:siva.kallam@broadcom.com)>, Prashant Sreedharan <[prashant@broadcom.com](mailto:prashant@broadcom.com)>, Michael Chan <[mchan@broadcom.com](mailto:mchan@broadcom.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/broadcom/tg3.\*

## \* **BROCADE BFA FC SCSI DRIVER**

**Mail** Anil Gurumurthy <[anil.gurumurthy@qlogic.com](mailto:anil.gurumurthy@qlogic.com)>, Sudarsana Kalluru <[sudarsana.kalluru@qlogic.com](mailto:sudarsana.kalluru@qlogic.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/bfa/

## \* **BROCADE BNA 10 GIGABIT ETHERNET DRIVER**

**Mail** Rasesh Mody <[rmody@marvell.com](mailto:rmody@marvell.com)>, Sudarsana Kalluru <[skalluru@marvell.com](mailto:skalluru@marvell.com)>, GR-Linux-NIC-Dev@marvell.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/brocade/bna/

## \* **BSG (block layer generic sg v4 driver)**

**Mail** FUJITA Tomonori <[fujita.tomonori@lab.ntt.co.jp](mailto:fujita.tomonori@lab.ntt.co.jp)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** block/bsg.c include/linux/bsg.h include/uapi/linux/bsg.h

## \* **BT87X AUDIO DRIVER**

**Mail** Clemens Ladisch <[clemens@ladisch.de](mailto:clemens@ladisch.de)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git>

**Files** sound/cards/bt87x sound/pci/bt87x.c

### \* BT8XXGPIO DRIVER

**Mail** Michael Buesch <[m@bues.ch](mailto:m@bues.ch)>

**Status** Maintained

**Web-page** <http://bu3sch.de/btgpio.php>

**Files** drivers/gpio/gpio-bt8xx.c

### \* BTRFS FILE SYSTEM

**Mail** Chris Mason <[clm@fb.com](mailto:clm@fb.com)>, Josef Bacik <[josef@toxicpanda.com](mailto:josef@toxicpanda.com)>, David Sterba <[dsterba@suse.com](mailto:dsterba@suse.com)>

**Mailing list** [linux-btrfs@vger.kernel.org](mailto:linux-btrfs@vger.kernel.org)

**Status** Maintained

**Web-page** <http://btrfs.wiki.kernel.org/>

**Patchwork** <http://patchwork.kernel.org/project/linux-btrfs/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kdave/linux.git>

**Files** filesystems/btrfs fs/btrfs/ include/linux/btrfs\* include/uapi/linux/btrfs\*

### \* BTTV VIDEO4LINUX DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/driver-api/media/drivers/bttv\* drivers/media/pci/bt8xx/bttv\*

### \* BUS FREQUENCY DRIVER FOR SAMSUNG EXYNOS

**Mail** Chanwoo Choi <[cw00.choi@samsung.com](mailto:cw00.choi@samsung.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org), [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/chanwoo/linux.git>

**Files** Documentation/devicetree/bindings/devfreq/exynos-bus.txt drivers/devfreq/exynos-bus.c

## \* BUSLOGIC SCSI DRIVER

**Mail** Khalid Aziz <khalid@gonehiking.org>

**Mailing list** linux-scsi@vger.kernel.org

**Status** Maintained

**Files** drivers/scsi/BusLogic.\* drivers/scsi/FlashPoint.\*

## \* C-MEDIA CMI8788 DRIVER

**Mail** Clemens Ladisch <clemens@ladisch.de>

**Mailing list** alsa-devel@alsa-project.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git

**Files** sound/pci/oxygen/

## \* C-SKY ARCHITECTURE

**Mail** Guo Ren <guoren@kernel.org>

**Mailing list** linux-csky@vger.kernel.org

**Status** Supported

**SCM** git <https://github.com/c-sky/csky-linux.git>

**Files** Documentation/devicetree/bindings/csky/ Documentation/devicetree/bindings/interrupt-controller/csky,\* Documentation/devicetree/bindings/timer/csky,\* arch/csky/drivers/clocksource/timer-gx6605s.c drivers/clocksource/timer-mp-csky.c drivers/irqchip/irq-csky-\*

**Regex** csky

**Content regex** csky

## \* C6X ARCHITECTURE

**Mail** Mark Salter <msalter@redhat.com>, Aurelien Jacquot <jacquot.aurelien@gmail.com>

**Mailing list** linux-c6x-dev@linux-c6x.org

**Status** Maintained

**Web-page** [http://www.linux-c6x.org/wiki/index.php/Main\\_Page](http://www.linux-c6x.org/wiki/index.php/Main_Page)

**Files** arch/c6x/

\* **CA8210 IEEE-802.15.4 RADIO DRIVER**

**Mail** Harry Morris <[h.morris@cascola.com](mailto:h.morris@cascola.com)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Maintained

**Web-page** <https://github.com/Cascoda/ca8210-linux.git>

**Files** Documentation/devicetree/bindings/net/ieee802154/  
ca8210.txt drivers/net/ieee802154/ca8210.c

\* **CACHEFILES: FS-CACHE BACKEND FOR CACHING ON MOUNTED FILESYSTEMS**

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>

**Mailing list** [linux-cachefs@redhat.com](mailto:linux-cachefs@redhat.com) (moderated for non-subscribers)

**Status** Supported

**Files** filesystems/caching/cachefiles fs/cachefiles/

\* **CADENCE MIPI-CSI2 BRIDGES**

**Mail** Maxime Ripard <[mripard@kernel.org](mailto:mripard@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/cdns,\*.txt  
drivers/media/platform/cadence/cdns-csi2\*

\* **CADENCE NAND DRIVER**

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Orphan

**Files** Documentation/devicetree/bindings/mtd/  
cadence-nand-controller.txt drivers/mtd/nand/raw/  
cadence-nand-controller.c

## \* CADET FM/AM RADIO RECEIVER DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

## Status Maintained

**Web-page** <https://linuxtv.org>

**SCM** qit qit://linuxtv.org/media tree.qit

**Files** drivers/media/radio/radio-caDET\*

#### \* CAFE CMOS INTEGRATED CAMERA CONTROLLER DRIVER

**Mail** Jonathan Corbet <[corbet@lwn.net](mailto:corbet@lwn.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

## Status Maintained

**SCM** qit qit://linuxtv.org/media tree.qit

**Files** Documentation/admin-guide/media/cafe\_ccic\* drivers/  
media/platform/marvell-ccic/

## \* CAIF NETWORK LAYER

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

## Status Orphan

**Files** Documentation/networking/caif/ drivers/net/caif/  
include/net/caif/ include/uapi/linux/caif/ net/caif/

\* CAKE ODISC

**Mail** Toke Høiland-Jørgensen <[toke@toke.dk](mailto:toke@toke.dk)>

**Mailing list** [cake@lists.bufferbloat.net](mailto:cake@lists.bufferbloat.net) (moderated for non-subscribers)

**Status** Maintained

**Files** net/sched/sch\_cake.c

### \* CAN NETWORK DRIVERS

**Mail** Wolfgang Grandegger <[wg@grandegger.com](mailto:wg@grandegger.com)>, Marc Kleine-Budde <[mkl@pengutronix.de](mailto:mkl@pengutronix.de)>

**Mailing list** [linux-can@vger.kernel.org](mailto:linux-can@vger.kernel.org)

**Status** Maintained

**Web-page** <https://github.com/linux-can>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mkl/linux-can.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/mkl/linux-can-next.git>

**Files** Documentation/devicetree/bindings/net/can/ drivers/  
net/can/ include/linux/can/dev.h include/linux/can/led.h  
include/linux/can/platform/ include/linux/can/rx-offload.h  
include/uapi/linux/can/error.h include/uapi/linux/can/netlink.h include/uapi/linux/can/vxcan.h

### \* CAN NETWORK LAYER

**Mail** Oliver Hartkopp <[socketcan@hartkopp.net](mailto:socketcan@hartkopp.net)>, Marc Kleine-Budde <[mkl@pengutronix.de](mailto:mkl@pengutronix.de)>

**Mailing list** [linux-can@vger.kernel.org](mailto:linux-can@vger.kernel.org)

**Status** Maintained

**Web-page** <https://github.com/linux-can>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mkl/linux-can.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/mkl/linux-can-next.git>

**Files** networking/can include/linux/can/core.h include/linux/can/skb.h include/net/netns/can.h include/uapi/linux/can.h include/uapi/linux/can/bcm.h include/uapi/linux/can/gw.h include/uapi/linux/can/raw.h net/can/

### \* CAN-J1939 NETWORK LAYER

**Mail** Robin van der Gracht <[robin@protonic.nl](mailto:robin@protonic.nl)>, Oleksij Rempel <[o.rempel@pengutronix.de](mailto:o.rempel@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>

**Mailing list** [linux-can@vger.kernel.org](mailto:linux-can@vger.kernel.org)

**Status** Maintained

**Files** networking/j1939 include/uapi/linux/can/j1939.h net/can/j1939/

## \* CAPABILITIES

**Mail** Serge Hallyn <[serge@hallyn.com](mailto:serge@hallyn.com)>

**Mailing list** [linux-security-module@vger.kernel.org](mailto:linux-security-module@vger.kernel.org)

**Status** Supported

**Files** `include/linux/capability.h` `include/uapi/linux/capability.h` `kernel/capability.c` `security/commoncap.c`

## \* CAPELLA MICROSYSTEMS LIGHT SENSOR DRIVER

**Mail** Kevin Tsai <[ktsai@capellamicro.com](mailto:ktsai@capellamicro.com)>

**Status** Maintained

**Files** `drivers/iio/light/cm*`

## \* CARL9170 LINUX COMMUNITY WIRELESS DRIVER

**Mail** Christian Lamparter <[chunkeey@googlemail.com](mailto:chunkeey@googlemail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/carl9170>

**Files** `drivers/net/wireless/ath/carl9170/`

## \* CAVIUM I2C DRIVER

**Mail** Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Status** Supported

**Web-page** <http://www.marvell.com>

**Files** `drivers/i2c/busses/i2c-octeon*` `drivers/i2c/busses/i2c-thunderx*`

## \* CAVIUM LIQUIDIO NETWORK DRIVER

**Mail** Derek Chickles <[dchickles@marvell.com](mailto:dchickles@marvell.com)>, Santanand Burla <[sburla@marvell.com](mailto:sburla@marvell.com)>, Felix Manlunas <[fmanlunas@marvell.com](mailto:fmanlunas@marvell.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.marvell.com>

**Files** `drivers/net/ethernet/cavium/liquidio/`

## \* CAVIUM MMC DRIVER

**Mail** Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Status** Supported

**Web-page** <http://www.marvell.com>

**Files** drivers/mmc/host/cavium\*

## \* CAVIUM OCTEON-TX CRYPTO DRIVER

**Mail** George Cherian <[gcherian@marvell.com](mailto:gcherian@marvell.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.marvell.com>

**Files** drivers/crypto/cavium/cpt/

## \* CAVIUM THUNDERX2 ARM64 SOC

**Mail** Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/cavium-thunder2.txt  
arch/arm64/boot/dts/cavium/thunder2-99xx\*

## \* CC2520 IEEE-802.15.4 RADIO DRIVER

**Mail** Varka Bhadram <[varkabhadram@gmail.com](mailto:varkabhadram@gmail.com)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/ieee802154/cc2520.txt  
drivers/net/ieee802154/cc2520.c  
include/linux/spi/cc2520.h

## \* CCREE ARM TRUSTZONE CRYPTOCELL REE DRIVER

**Mail** Gilad Ben-Yossef <[gilad@benyossef.com](mailto:gilad@benyossef.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Supported

**Web-page** <https://developer.arm.com/products/system-ip/trustzone-cryptocell/cryptocell-700-family>

**Files** drivers/crypto/ccree/

## \* CCTRNG ARM TRUSTZONE CRYPTOCELL TRUE RANDOM NUMBER GENERATOR (TRNG) DRIVER

**Mail** Hadar Gat <[hadar.gat@arm.com](mailto:hadar.gat@arm.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Supported

**Files** drivers/char/hw\_random/cctrng.c drivers/char/hw\_random/cctrng.h Documentation/devicetree/bindings/rng/arm-cctrng.yaml

**Web-page** <https://developer.arm.com/products/system-ip/trustzone-cryptocell/cryptocell-700-family>

## \* CEC FRAMEWORK

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <http://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/ABI/testing/debugfs-cec-error-inj  
Documentation/devicetree/bindings/media/cec.txt driver-api/media/cec-core Documentation/userspace-api/media/cec  
drivers/media/cec/ drivers/media/rc/keymaps/rc-cec.c  
include/media/cec-notifier.h include/media/cec.h include/uapi/linux/cec-funcs.h include/uapi/cec.h

### \* CEC GPIO DRIVER

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <http://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/cec-gpio.txt  
drivers/media/platform/cec-gpio/

### \* CELL BROADBAND ENGINE ARCHITECTURE

**Mail** Arnd Bergmann <[arnd@arndb.de](mailto:arnd@arndb.de)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/power/cell/>

**Files** arch/powerpc/include/asm/cell\*.h arch/powerpc/include/  
asm/spu\*.h arch/powerpc/include/uapi/asm/spu\*.h arch/  
powerpc/oprofile/\*cell\* arch/powerpc/platforms/cell/

### \* CELLWISE CW2015 BATTERY DRIVER

**Mail** Tobias Schramm <[t.schramm@manjaro.org](mailto:t.schramm@manjaro.org)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/power/supply/  
cw2015\_battery.yaml drivers/power/supply/cw2015\_battery.c

### \* CEPH COMMON CODE (LIBCEPH)

**Mail** Ilya Dryomov <[idryomov@gmail.com](mailto:idryomov@gmail.com)>, Jeff Layton  
<[jlayton@kernel.org](mailto:jlayton@kernel.org)>

**Mailing list** [ceph-devel@vger.kernel.org](mailto:ceph-devel@vger.kernel.org)

**Status** Supported

**Web-page** <http://ceph.com/>

**SCM** git <git://github.com/ceph/ceph-client.git>

**Files** include/linux/ceph/ include/linux/crush/ net/ceph/

## \* CEPH DISTRIBUTED FILE SYSTEM CLIENT (CEPH)

**Mail** Jeff Layton <[jlayton@kernel.org](mailto:jlayton@kernel.org)>, Ilya Dryomov <[idryomov@gmail.com](mailto:idryomov@gmail.com)>

**Mailing list** [ceph-devel@vger.kernel.org](mailto:ceph-devel@vger.kernel.org)

**Status** Supported

**Web-page** <http://ceph.com/>

**SCM** git <git://github.com/ceph/ceph-client.git>

**Files** filesystems/ceph fs/ceph/

## \* CERTIFICATE HANDLING

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>, David Woodhouse <[dwmw2@infradead.org](mailto:dwmw2@infradead.org)>

**Mailing list** [keyrings@vger.kernel.org](mailto:keyrings@vger.kernel.org)

**Status** Maintained

**Files** admin-guide/module-signing certs/ scripts/extract-cert.c  
scripts/sign-file.c

## \* CFAG12864B LCD DRIVER

**Mail** Miguel Ojeda Sandonis <[miguel.ojeda.sandonis@gmail.com](mailto:miguel.ojeda.sandonis@gmail.com)>

**Status** Maintained

**Files** drivers/auxdisplay/cfag12864b.c include/linux/  
cfag12864b.h

## \* CFAG12864BFB LCD FRAMEBUFFER DRIVER

**Mail** Miguel Ojeda Sandonis <[miguel.ojeda.sandonis@gmail.com](mailto:miguel.ojeda.sandonis@gmail.com)>

**Status** Maintained

**Files** drivers/auxdisplay/cfag12864bfb.c include/linux/  
cfag12864b.h

## \* CHAR and MISC DRIVERS

**Mail** Arnd Bergmann <[arnd@arndb.de](mailto:arnd@arndb.de)>, Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/char-misc.git>

**Files** drivers/char/ drivers/misc/ include/linux/miscdevice.h

### \* CHECKPATCH

**Mail** Andy Whitcroft <[apw@canonical.com](mailto:apw@canonical.com)>, Joe Perches <[joe@perches.com](mailto:joe@perches.com)>

**Status** Maintained

**Files** scripts/checkpatch.pl

### \* CHINESE DOCUMENTATION

**Mail** Harry Wei <[harryxiyou@gmail.com](mailto:harryxiyou@gmail.com)>, Alex Shi <[alex.shi@linux.alibaba.com](mailto:alex.shi@linux.alibaba.com)>

**Mailing list** [xiyoulinuxkernelgroup@googlegroups.com](mailto:xiyoulinuxkernelgroup@googlegroups.com) (subscribers-only)

**Status** Maintained

**Files** Documentation/translations/zh\_CN/

### \* CHIPIDEA USB HIGH SPEED DUAL ROLE CONTROLLER

**Mail** Peter Chen <[Peter.Chen@nxp.com](mailto:Peter.Chen@nxp.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/peter.chen/usb.git>

**Files** drivers/usb/chipidea/

### \* CHIPONE ICN8318 I2C TOUCHSCREEN DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/input/touchscreen/  
chipone\_icn8318.txt    drivers/input/touchscreen/  
chipone\_icn8318.c

### \* CHIPONE ICN8505 I2C TOUCHSCREEN DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/touchscreen/chipone\_icn8505.c

### \* CHROME HARDWARE PLATFORM SUPPORT

**Mail** Benson Leung <[bleung@chromium.org](mailto:bleung@chromium.org)>, Enric Balletbo i Serra <[enric.balletbo@collabora.com](mailto:enric.balletbo@collabora.com)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/chrome-platform/linux.git>

**Files** drivers/platform/chrome/

### \* CHOMEOS EC CODEC DRIVER

**Mail** Cheng-Yi Chiang <[cychiang@chromium.org](mailto:cychiang@chromium.org)>

**Reviewer** Enric Balletbo i Serra <[enric.balletbo@collabora.com](mailto:enric.balletbo@collabora.com)>, Guenter Roeck <[groeck@chromium.org](mailto:groeck@chromium.org)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/google,  
cros-ec-codec.yaml sound/soc/codecs/cros\_ec\_codec.\*

### \* CHOMEOS EC SUBDRIVERS

**Mail** Benson Leung <[bleung@chromium.org](mailto:bleung@chromium.org)>, Enric Balletbo i Serra <[enric.balletbo@collabora.com](mailto:enric.balletbo@collabora.com)>

**Reviewer** Guenter Roeck <[groeck@chromium.org](mailto:groeck@chromium.org)>

**Status** Maintained

**Files** drivers/power/supply/cros\_usbpd-charger.c

**Regex** cros\_ec cros-ec

### \* CIRRUS LOGIC AUDIO CODEC DRIVERS

**Mail** James Schulman <[james.schulman@cirrus.com](mailto:james.schulman@cirrus.com)>, David Rhodes <[david.rhodes@cirrus.com](mailto:david.rhodes@cirrus.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** sound/soc/codecs/cs\*

### \* CIRRUS LOGIC EP93XX ETHERNET DRIVER

**Mail** Hartley Sweeten <[hsweeten@visionengravers.com](mailto:hsweeten@visionengravers.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/cirrus/ep93xx\_eth.c

### \* CIRRUS LOGIC LOCHNAGAR DRIVER

**Mail** Charles Keepax <[ckeepax@opensource.cirrus.com](mailto:ckeepax@opensource.cirrus.com)>, Richard Fitzgerald <[rf@opensource.cirrus.com](mailto:rf@opensource.cirrus.com)>

**Mailing list** [patches@opensource.cirrus.com](mailto:patches@opensource.cirrus.com)

**Status** Supported

**Files** Documentation/devicetree/bindings/clock/cirrus,  
lochnagar.yaml Documentation/devicetree/bindings/hwmon/  
cirrus\_lochnagar.yaml Documentation/devicetree/bindings/  
mfd/cirrus\_lochnagar.yaml Documentation/devicetree/  
bindings/pinctrl/cirrus\_lochnagar.yaml Documentation/  
devicetree/bindings/sound/cirrus\_lochnagar.yaml hw-  
mon/lochnagar drivers/clk/clk-lochnagar.c drivers/hwmon/  
lochnagar-hwmon.c drivers/mfd/lochnagar-i2c.c drivers/  
pinctrl/cirrus\_pinctrl-lochnagar.c drivers/regulator/  
lochnagar-regulator.c include/dt-bindings/clk/lochnagar.h  
include/dt-bindings/pinctrl/lochnagar.h include/linux/  
mfd/lochnagar\* sound/soc/codecs/lochnagar-sc.c

### \* CIRRUS LOGIC MADERA CODEC DRIVERS

**Mail** Charles Keepax <[ckeepax@opensource.cirrus.com](mailto:ckeepax@opensource.cirrus.com)>, Richard Fitzgerald <[rf@opensource.cirrus.com](mailto:rf@opensource.cirrus.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-  
subscribers), [patches@opensource.cirrus.com](mailto:patches@opensource.cirrus.com)

**Status** Supported

**Web-page** <https://github.com/CirrusLogic/linux-drivers/wiki>

**SCM** git <https://github.com/CirrusLogic/linux-drivers.git>

**Files** Documentation/devicetree/bindings/mfd/cirrus\_madera.  
yaml Documentation/devicetree/bindings/pinctrl/cirrus\_  
madera.yaml Documentation/devicetree/bindings/sound/  
cirrus\_madera.yaml drivers/gpio/gpio-madera\* drivers/  
irqchip/irq-madera\* drivers/mfd/cs47l\* drivers/mfd/madera\*  
drivers/pinctrl/cirrus/\* include/dt-bindings/sound/  
madera\* include/linux/irqchip/irq-madera\* include/linux/  
mfd/madera/\* include/sound/madera\* sound/soc/codecs/cs47l\*  
sound/soc/codecs/madera\*

### \* CISCO FCOE HBA DRIVER

**Mail** Satish Kharat <[satishkh@cisco.com](mailto:satishkh@cisco.com)>, Sesidhar Baddela <[sebaddel@cisco.com](mailto:sebaddel@cisco.com)>, Karan Tilak Kumar <[kartilak@cisco.com](mailto:kartilak@cisco.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/fnic/

### \* CISCO SCSI HBA DRIVER

**Mail** Karan Tilak Kumar <[kartilak@cisco.com](mailto:kartilak@cisco.com)>, Sesidhar Baddela <[sebaddel@cisco.com](mailto:sebaddel@cisco.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/snsc/

### \* CISCO VIC ETHERNET NIC DRIVER

**Mail** Christian Benvenuti <[benve@cisco.com](mailto:benve@cisco.com)>, Govindarajulu Varadarajan <[\\_govind@gmx.com](mailto:_govind@gmx.com)>

**Status** Supported

**Files** drivers/net/ethernet/cisco/enic/

### \* CISCO VIC LOW LATENCY NIC DRIVER

**Mail** Christian Benvenuti <[benve@cisco.com](mailto:benve@cisco.com)>, Nelson Escobar <[neescoba@cisco.com](mailto:neescoba@cisco.com)>, Parvi Kaustubhi <[pkaustub@cisco.com](mailto:pkaustub@cisco.com)>

**Status** Supported

**Files** drivers/infiniband/hw/usnic/

### \* CLANG-FORMAT FILE

**Mail** Miguel Ojeda <[miguel.ojeda.sandonis@gmail.com](mailto:miguel.ojeda.sandonis@gmail.com)>

**Status** Maintained

**Files** .clang-format

### \* CLANG/LLVM BUILD SUPPORT

**Mailing list** [clang-built-linux@googlegroups.com](mailto:clang-built-linux@googlegroups.com)

**Status** Supported

**Web-page** <https://clangbuiltlinux.github.io/>

**bugs** <https://github.com/ClangBuiltLinux/linux/issues>

**chat** <irc://chat.freenode.net/clangbuiltlinux>

**Files** kbuild/llvm

**Content regex** \b(?i:clang|llvm)\b

### \* CLEANCACHE API

**Mail** Konrad Rzeszutek Wilk <[konrad.wilk@oracle.com](mailto:konrad.wilk@oracle.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** include/linux/cleancache.h mm/cleancache.c

### \* CLK API

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-clk@vger.kernel.org](mailto:linux-clk@vger.kernel.org)

**Status** Maintained

**Files** include/linux/clk.h

### \* CLOCKSOURCE, CLOCKEVENT DRIVERS

**Mail** Daniel Lezcano <[daniel.lezcano@linaro.org](mailto:daniel.lezcano@linaro.org)>, Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
timers/core

**Files** Documentation/devicetree/bindings/timer/ drivers/  
clocksource/

## \* CMPC ACPI DRIVER

**Mail** Thadeu Lima de Souza Cascardo <[cascardo@holoscopio.com](mailto:cascardo@holoscopio.com)>, Daniel Oliveira Nascimento <[don@syst.com.br](mailto:don@syst.com.br)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Supported

**Files** drivers/platform/x86/classmate-laptop.c

## \* COBALT MEDIA DRIVER

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/cobalt/

## \* COCCINELLE/Semantic Patches (SmPL)

**Mail** Julia Lawall <[Julia.Lawall@lip6.fr](mailto:Julia.Lawall@lip6.fr)>, Gilles Muller <[Gilles.Muller@lip6.fr](mailto:Gilles.Muller@lip6.fr)>, Nicolas Palix <[nicolas.palix@imag.fr](mailto:nicolas.palix@imag.fr)>, Michal Marek <[michal.lkml@markovi.net](mailto:michal.lkml@markovi.net)>

**Mailing list** cocci@systeme.lip6.fr (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://coccinelle.lip6.fr/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mmarek/kbuild.git>  
misc

**Files** dev-tools/coccinelle scripts/coccicheck scripts/coccinelle/

## \* CODA FILE SYSTEM

**Mail** Jan Harkes <[jaharkes@cs.cmu.edu](mailto:jaharkes@cs.cmu.edu)>, coda@cs.cmu.edu

**Mailing list** [codalist@codalists.cs.cmu.edu](mailto:codalist@codalists.cs.cmu.edu)

**Status** Maintained

**Web-page** <http://www.codalists.cs.cmu.edu/>

**Files** filesystems/coda/fs/coda/ include/linux/coda\*.h include/uapi/linux/coda\*.h

### \* CODA V4L2 MEM2MEM DRIVER

**Mail** Philipp Zabel <[p.zabel@pengutronix.de](mailto:p.zabel@pengutronix.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/coda.txt  
drivers/media/platform/coda/

### \* CODE OF CONDUCT

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Status** Supported

**Files** process/code-of-conduct-interpretation process/code-of-conduct

### \* COMMON CLK FRAMEWORK

**Mail** Michael Turquette <[mturquette@baylibre.com](mailto:mturquette@baylibre.com)>, Stephen Boyd <[sboyd@kernel.org](mailto:sboyd@kernel.org)>

**Mailing list** [linux-clk@vger.kernel.org](mailto:linux-clk@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/linux-clk/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/clk/linux.git>

**Files** Documentation/devicetree/bindings/clock/ drivers/clk/  
include/linux/clk-pr\* include/linux/clk/ include/linux/  
of\_clk.h

**Excluded** drivers/clk/clkdev.c

### \* COMMON INTERNET FILE SYSTEM (CIFS)

**Mail** Steve French <[sfrench@samba.org](mailto:sfrench@samba.org)>

**Mailing list** [linux-cifs@vger.kernel.org](mailto:linux-cifs@vger.kernel.org), [technical@lists.samba.org](mailto:technical@lists.samba.org) (moderated for non-subscribers) samba-

**Status** Supported

**Web-page** <http://linux-cifs.samba.org/>

**SCM** git <git://git.samba.org/sfrench/cifs-2.6.git>

**Files** Documentation/admin-guide/cifs/ fs/cifs/

## \* COMPACTPCI HOTPLUG CORE

**Mail** Scott Murray <[scott@spiteful.org](mailto:scott@spiteful.org)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** drivers/pci/hotplug/cpcihp\_hotplug\*

## \* COMPACTPCI HOTPLUG GENERIC DRIVER

**Mail** Scott Murray <[scott@spiteful.org](mailto:scott@spiteful.org)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** drivers/pci/hotplug/cpcihp\_generic.c

## \* COMPACTPCI HOTPLUG ZIATECH ZT5550 DRIVER

**Mail** Scott Murray <[scott@spiteful.org](mailto:scott@spiteful.org)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** drivers/pci/hotplug/cpcihp\_zt5550.\*

## \* COMPAL LAPTOP SUPPORT

**Mail** Cezary Jackiewicz <[cezary.jackiewicz@gmail.com](mailto:cezary.jackiewicz@gmail.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/compal-laptop.c

## \* COMPILER ATTRIBUTES

**Mail** Miguel Ojeda <[miguel.ojeda.sandonis@gmail.com](mailto:miguel.ojeda.sandonis@gmail.com)>

**Status** Maintained

**Files** include/linux/compiler\_attributes.h

### \* CONEXANT ACCESSRUNNER USB DRIVER

**Mailing list** [accessrunner-general@lists.sourceforge.net](mailto:accessrunner-general@lists.sourceforge.net)

**Status** Orphan

**Web-page** <http://accessrunner.sourceforge.net/>

**Files** drivers/usb/atm/cxacru.c

### \* CONFIGFS

**Mail** Joel Becker <[jlbec@evilplan.org](mailto:jlbec@evilplan.org)>, Christoph Hellwig <[hch@lst.de](mailto:hch@lst.de)>

**Status** Supported

**SCM** git <git://git.infradead.org/users/hch/configfs.git>

**Files** fs/configfs/ include/linux/configfs.h

### \* CONNECTOR

**Mail** Evgeniy Polyakov <[zbr@ioremap.net](mailto:zbr@ioremap.net)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/connector/

### \* CONTROL GROUP (CGROUP)

**Mail** Tejun Heo <[tj@kernel.org](mailto:tj@kernel.org)>, Li Zefan <[lizefan@huawei.com](mailto:lizefan@huawei.com)>, Johannes Weiner <[hannes@cmpxchg.org](mailto:hannes@cmpxchg.org)>

**Mailing list** [cgroups@vger.kernel.org](mailto:cgroups@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tj/cgroup.git>

**Files** Documentation/admin-guide/cgroup-v1/ admin-guide/cgroup-v2 include/linux/cgroup\* kernel/cgroup/

### \* CONTROL GROUP - BLOCK IO CONTROLLER (BLKIO)

**Mail** Tejun Heo <[tj@kernel.org](mailto:tj@kernel.org)>, Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [cgroups@vger.kernel.org](mailto:cgroups@vger.kernel.org), [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**SCM** git <git://git.kernel.dk/linux-block>

**Files** admin-guide/cgroup-v1/blkio-controller block/bfq-cgroup.c block/blk-cgroup.c block/blk-iolatency.c block/blk-throttle.c include/linux/blk-cgroup.h

## \* CONTROL GROUP - CPUSET

**Mail** Li Zefan <lizefan@huawei.com>

**Mailing list** cgroups@vger.kernel.org

**Status** Maintained

**Web-page** <http://www.bullopensource.org/cpuset/> <http://oss.sgi.com/projects/cpusets/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tj/cgroup.git>

**Files** admin-guide/cgroup-v1/cpusets include/linux/cpuset.h  
kernel/cgroup/cpuset.c

## \* CONTROL GROUP - MEMORY RESOURCE CONTROLLER (MEMCG)

**Mail** Johannes Weiner <[hannes@cmpxchg.org](mailto:hannes@cmpxchg.org)>, Michal Hocko <[mhocko@kernel.org](mailto:mhocko@kernel.org)>, Vladimir Davydov <[vdavydov.dev@gmail.com](mailto:vdavydov.dev@gmail.com)>

**Mailing list** cgroups@vger.kernel.org, linux-mm@kvack.org

**Status** Maintained

**Files** mm/memcontrol.c mm/swap\_cgroup.c

## \* CORETEMP HARDWARE MONITORING DRIVER

**Mail** Fenghua Yu <[fenghua.yu@intel.com](mailto:fenghua.yu@intel.com)>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/coretemp drivers/hwmon/coretemp.c

## \* COSA/SRP SYNC SERIAL DRIVER

**Mail** Jan “Yenya” Kasprzak <[kas@fi.muni.cz](mailto:kas@fi.muni.cz)>

**Status** Maintained

**Web-page** <http://www.fi.muni.cz/~kas/cosa/>

**Files** drivers/net/wan/cosa\*

### \* COUNTER SUBSYSTEM

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-counter\*      driver-api/generic-counter drivers/counter/ include/linux/counter.h  
include/linux/counter\_enum.h

### \* CPMAC ETHERNET DRIVER

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/ti/cpmac.c

### \* CPU FREQUENCY DRIVERS - VEXPRESS SPC ARM BIG LITTLE

**Mail** Viresh Kumar <[viresh.kumar@linaro.org](mailto:viresh.kumar@linaro.org)>, Sudeep Holla <[sudeep.holla@arm.com](mailto:sudeep.holla@arm.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.arm.com/products/processors/technologies/biglittleprocessing.php>

**Files** drivers/cpufreq/vexpress-spc-cpufreq.c

### \* CPU FREQUENCY SCALING FRAMEWORK

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Viresh Kumar <[viresh.kumar@linaro.org](mailto:viresh.kumar@linaro.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**bugs** <https://bugzilla.kernel.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm.git> git <git://git.kernel.org/pub/scm/linux/kernel/git/vireshk/pm.git>  
(For ARM Updates)

**Files** admin-guide/pm/cpufreq      admin-guide/pm/intel\_pstate  
Documentation/cpu-freq/      Documentation/devicetree/  
bindings/cpufreq/      drivers/cpufreq/ include/linux/cpufreq.h  
include/linux/sched/cpufreq.h      kernel/sched/cpufreq\*.c  
tools/testing/selftests/cpufreq/

## \* CPU IDLE TIME MANAGEMENT FRAMEWORK

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Daniel Lezcano <[daniel.lezcano@linaro.org](mailto:daniel.lezcano@linaro.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**bugs** <https://bugzilla.kernel.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm.git>

**Files** admin-guide/pm/cpuidle driver-api/pm/cpuidle drivers/cpuidle/\* include/linux/cpuidle.h

## \* CPU POWER MONITORING SUBSYSTEM

**Mail** Thomas Renninger <[trenn@suse.com](mailto:trenn@suse.com)>, Shuah Khan <[shuah@kernel.org](mailto:shuah@kernel.org)>, Shuah Khan <[skhan@linuxfoundation.org](mailto:skhan@linuxfoundation.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** tools/power/cpupower/

## \* CPUD/MSR DRIVER

**Mail** “H. Peter Anvin” <[hpa@zytor.com](mailto:hpa@zytor.com)>

**Status** Maintained

**Files** arch/x86/kernel/cpuid.c arch/x86/kernel/msr.c

## \* CPUIDLE DRIVER - ARM BIG LITTLE

**Mail** Lorenzo Pieralisi <[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>, Daniel Lezcano <[daniel.lezcano@linaro.org](mailto:daniel.lezcano@linaro.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org) [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm.git>

**Files** drivers/cpuidle/cpuidle-big\_little.c

### \* CPUIDLE DRIVER - ARM EXYNOS

**Mail** Bartlomiej Zolnierkiewicz <[b.zolnierkie@samsung.com](mailto:b.zolnierkie@samsung.com)>, Daniel Lezcano <[daniel.lezcano@linaro.org](mailto:daniel.lezcano@linaro.org)>, Kukjin Kim <[kgene@kernel.org](mailto:kgene@kernel.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org), [soc@vger.kernel.org](mailto:soc@vger.kernel.org) [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org)

**Status** Supported

**Files** [arch/arm/mach-exynos/pm.c](#) [drivers/cpuidle/cpuidle-exynos.c](#)

### \* CPUIDLE DRIVER - ARM PSCI

**Mail** Lorenzo Pieralisi <[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>, Sudeep Holla <[sudeep.holla@arm.com](mailto:sudeep.holla@arm.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org), [kernel@lists.infradead.org](mailto:kernel@lists.infradead.org) [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Supported

**Files** [drivers/cpuidle/cpuidle-psci.c](#)

### \* CRAMFS FILESYSTEM

**Mail** Nicolas Pitre <[nico@fluxnic.net](mailto:nico@fluxnic.net)>

**Status** Maintained

**Files** [filesystems/cramfs/fs/cramfs/](#)

### \* CREATIVE SB0540

**Mail** Bastien Nocera <[hadess@hadess.net](mailto:hadess@hadess.net)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** [drivers/hid/hid-creative-sb0540.c](#)

### \* CRYPTO API

**Mail** Herbert Xu <[herbert@gondor.apana.org.au](mailto:herbert@gondor.apana.org.au)>, “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**SCM** <git://git.kernel.org/pub/scm/linux/kernel/git/herbert/cryptodev-2.6.git> <git://git.kernel.org/pub/scm/linux/kernel/git/herbert/crypto-2.6.git>

**Files** Documentation/crypto/  
bindings/crypto/ arch/\*/crypto/ crypto/ drivers/crypto/  
include/crypto/ include/linux/crypto\* lib/crypto/

## \* CRYPTOGRAPHIC RANDOM NUMBER GENERATOR

**Mail** Neil Horman <nhorman@tuxdriver.com>

**Mailing list** linux-crypto@vger.kernel.org

**Status** Maintained

**Files** crypto/ansi\_cprng.c crypto/rng.c

## \* CS3308 MEDIA DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Odd Fixes

**Web-page** <http://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/i2c/cs3308.c

## \* CS5535 Audio ALSA driver

**Mail** Jaya Kumar <jayakumar.alsa@gmail.com>

**Status** Maintained

**Files** sound/pci/cs5535audio/

## \* CSI DRIVERS FOR ALLWINNER V3s

**Mail** Yong Deng <yong.deng@magentech.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/allwinner,  
sun6i-a31-csi.yaml drivers/media/platform/sunxi/  
sun6i-csi/

### \* CW1200 WLAN driver

**Mail** Solomon Peachy <[pizza@shaftnet.org](mailto:pizza@shaftnet.org)>

**Status** Maintained

**Files** drivers/net/wireless/st/cw1200/

### \* CX18 VIDEO4LINUX DRIVER

**Mail** Andy Walls <[awalls@md.metrocast.net](mailto:awalls@md.metrocast.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/cx18/ include/uapi/linux/ivtv\*

### \* CX2341X MPEG ENCODER HELPER MODULE

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/common/cx2341x\* include/media/drv-intf/  
cx2341x.h

### \* CX24120 MEDIA DRIVER

**Mail** Jemma Denson <[jdenson@gmail.com](mailto:jdenson@gmail.com)>, Patrick Boettcher <[patrick.boettcher@posteo.de](mailto:patrick.boettcher@posteo.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/cx24120\*

### \* CX88 VIDEO4LINUX DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/driver-api/media/drivers/cx88\* drivers/  
media/pci/cx88/

### \* CXD2820R MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/cxd2820r\*

### \* CXGB3 ETHERNET DRIVER (CXGB3)

**Mail** Vishal Kulkarni <[vishal@chelsio.com](mailto:vishal@chelsio.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.chelsio.com>

**Files** drivers/net/ethernet/chelsio/cxgb3/

### \* CXGB3 ISCSI DRIVER (CXGB3I)

**Mail** Karen Xie <[kxie@chelsio.com](mailto:kxie@chelsio.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.chelsio.com>

**Files** drivers/scsi/cxgb3i/cxgb3i

### \* CXGB4 CRYPTO DRIVER (chcr)

**Mail** Ayush Sawal <[ayush.sawal@chelsio.com](mailto:ayush.sawal@chelsio.com)>, Vinay Ku-  
mar Yadav <[vinay.yadav@chelsio.com](mailto:vinay.yadav@chelsio.com)>, Rohit Maheshwari  
<[rohitm@chelsio.com](mailto:rohitm@chelsio.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.chelsio.com>

**Files** drivers/crypto/chelsio

### \* CXGB4 ETHERNET DRIVER (CXGB4)

**Mail** Vishal Kulkarni <[vishal@chelsio.com](mailto:vishal@chelsio.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.chelsio.com>

**Files** drivers/net/ethernet/chelsio/cxgb4/

### \* CXGB4 iSCSI DRIVER (CXGB4I)

**Mail** Karen Xie <[kxie@chelsio.com](mailto:kxie@chelsio.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.chelsio.com>

**Files** drivers/scsi/cxgb4i/cxgb4i

### \* CXGB4 IWARP RNIC DRIVER (IW\_CXGB4)

**Mail** Potnuri Bharat Teja <[bharat@chelsio.com](mailto:bharat@chelsio.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.openfabrics.org>

**Files** drivers/infiniband/hw/cxgb4/ include/uapi/rdma/  
cxgb4-abi.h

### \* **CXGB4VF ETHERNET DRIVER (CXGB4VF)**

**Mail** Vishal Kulkarni <[vishal@gmail.com](mailto:vishal@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.chelsio.com>

**Files** drivers/net/ethernet/chelsio/cxgb4vf/

### \* **CXL (IBM Coherent Accelerator Processor Interface CAPI) DRIVER**

**Mail** Frederic Barrat <[fbarrat@linux.ibm.com](mailto:fbarrat@linux.ibm.com)>, Andrew Donnellan <[ajd@linux.ibm.com](mailto:ajd@linux.ibm.com)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Files** Documentation/ABI/testing/sysfs-class-cxl powerpc/cxl  
arch/powerpc/platforms/powernv/pci-cxl.c drivers/misc/  
cxl/include/misc/cxl\* include/uapi/misc/cxl.h

### \* **CXLFLASH (IBM Coherent Accelerator Processor Interface CAPI Flash) SCSI DRIVER**

**Mail** Manoj N. Kumar <[manoj@linux.ibm.com](mailto:manoj@linux.ibm.com)>, Matthew Krishnan R. Ochs <[mrochs@linux.ibm.com](mailto:mrochs@linux.ibm.com)>, Uma Krishnan <[ukrishn@linux.ibm.com](mailto:ukrishn@linux.ibm.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** powerpc/cxlflash drivers/scsi/cxlflash/ include/uapi/scsi/  
cxlflash\_ioctl.h

### \* **CYBERPRO FB DRIVER**

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.armlinux.org.uk/>

**Files** drivers/video/fbdev/cyber2000fb.\*

### \* CYCLADES ASYNC MUX DRIVER

**Status** Orphan

**Web-page** <http://www.cyclades.com/>

**Files** drivers/tty/cyclades.c include/linux/cyclades.h include/uapi/linux/cyclades.h

### \* CYCLADES PC300 DRIVER

**Status** Orphan

**Web-page** <http://www.cyclades.com/>

**Files** drivers/net/wan/pc300\*

### \* CYPRESS\_FIRMWARE MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/common/cypress\_firmware\*

### \* CYPRESS CY8CTMA140 TOUCHSCREEN DRIVER

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/touchscreen/cy8ctma140.c

### \* CYTTSP TOUCHSCREEN DRIVER

**Mail** Ferruh Yigit <[fery@cypress.com](mailto:fery@cypress.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Supported

**Files** drivers/input/touchscreen/cyttsp\* include/linux/input/cyttsp.h

\* **D-LINK DIR-685 TOUCHKEYS DRIVER**

**Mail** Linus Walleij <linus.walleij@linaro.org>

**Mailing list** linux-input@vger.kernel.org

**Status** Supported

**Files** drivers/input/keyboard/dlink-dir685-touchkeys.c

\* **DALLAS/MAXIM DS1685-FAMILY REAL TIME CLOCK**

**Mail** Joshua Kinard <kumba@gentoo.org>

**Status** Maintained

**Files** drivers/rtc/rtc-ds1685.c include/linux/rtc/ds1685.h

\* **DAMA SLAVE for AX.25**

**Mail** Joerg Reuter <jreuter@yaina.de>

**Mailing list** linux-hams@vger.kernel.org

**Status** Maintained

**Web-page** <http://yaina.de/jreuter/> <http://www.qsl.net/dl1bke/>

**Files** net/ax25/af\_ax25.c net/ax25/ax25\_dev.c net/ax25/  
ax25\_ds\_\* net/ax25/ax25\_in.c net/ax25/ax25\_out.c net/  
ax25/ax25\_timer.c net/ax25/sysctl\_net\_ax25.c

\* **DAVICOM FAST ETHERNET (DMFE) NETWORK DRIVER**

**Mailing list** netdev@vger.kernel.org

**Status** Orphan

**Files** networking/device\_drivers/dec/dmfe drivers/net/ethernet/  
dec/tulip/dmfe.c

\* **DC390/AM53C974 SCSI driver**

**Mail** Hannes Reinecke <hare@suse.com>

**Mailing list** linux-scsi@vger.kernel.org

**Status** Maintained

**Files** drivers/scsi/am53c974.c

### \* DC395x SCSI driver

**Mail** Oliver Neukum <[oliver@neukum.org](mailto:oliver@neukum.org)>, Ali Akcaagac <[aliakc@web.de](mailto:aliakc@web.de)>, Jamie Lenehan <[lenehan@twibble.org](mailto:lenehan@twibble.org)>

**Mailing list** [dc395x@twibble.org](mailto:dc395x@twibble.org)

**Status** Maintained

**Web-page** <http://twibble.org/dist/dc395x/> <http://lists.twibble.org/mailman/listinfo/dc395x/>

**Files** scsi/dc395x drivers/scsi/dc395x.\*

### \* DCCP PROTOCOL

**Mail** Gerrit Renker <[gerrit@erg.abdn.ac.uk](mailto:gerrit@erg.abdn.ac.uk)>

**Mailing list** [dccp@vger.kernel.org](mailto:dccp@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linuxfoundation.org/collaborate/workgroups/networking/dccp>

**Files** include/linux/dccp.h include/linux/tfrc.h include/uapi/linux/dccp.h net/dccp/

### \* DECnet NETWORK LAYER

**Mailing list** [linux-decnet-user@lists.sourceforge.net](mailto:linux-decnet-user@lists.sourceforge.net)

**Status** Orphan

**Web-page** <http://linux-decnet.sourceforge.net>

**Files** networking/decnet net/decnet/

### \* DECSTATION PLATFORM SUPPORT

**Mail** “Maciej W. Rozycki” <[macro@linux-mips.org](mailto:macro@linux-mips.org)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-mips.org/wiki/DECstation>

**Files** arch/mips/dec/ arch/mips/include/asm/dec/ arch/mips/include/asm/mach-dec/

### \* DEFXX FDDI NETWORK DRIVER

**Mail** “Maciej W. Rozycki” <[macro@linux-mips.org](mailto:macro@linux-mips.org)>

**Status** Maintained

**Files** drivers/net/fddi/defxx.\*

### \* DEFZA FDDI NETWORK DRIVER

**Mail** “Maciej W. Rozycki” <[macro@linux-mips.org](mailto:macro@linux-mips.org)>

**Status** Maintained

**Files** drivers/net/fddi/defza.\*

### \* DEINTERLACE DRIVERS FOR ALLWINNER H3

**Mail** Jernej Skrabec <[jernej.skrabec@siol.net](mailto:jernej.skrabec@siol.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/allwinner,  
sun8i-h3-deinterlace.yaml    drivers/media/platform/sunxi/  
sun8i-di/

### \* DELL LAPTOP DRIVER

**Mail** Matthew Garrett <[mjg59@srcf.ucam.org](mailto:mjg59@srcf.ucam.org)>, Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/dell-laptop.c

### \* DELL LAPTOP FREEFALL DRIVER

**Mail** Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Status** Maintained

**Files** drivers/platform/x86/dell-smo8800.c

## \* DELL LAPTOP RBTN DRIVER

**Mail** Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Status** Maintained

**Files** drivers/platform/x86/dell-rbtn.\*

## \* DELL LAPTOP SMM DRIVER

**Mail** Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Status** Maintained

**Files** drivers/hwmon/dell-smm-hwmon.c include/uapi/linux/i8k.h

## \* DELL REMOTE BIOS UPDATE DRIVER

**Mail** Stuart Hayes <[stuart.w.hayes@gmail.com](mailto:stuart.w.hayes@gmail.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/dell\_rbu.c

## \* DELL SMBIOS DRIVER

**Mail** Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>, Mario Limonciello <[mario.limonciello@dell.com](mailto:mario.limonciello@dell.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/dell-smbios.\*

## \* DELL SMBIOS SMM DRIVER

**Mail** Mario Limonciello <[mario.limonciello@dell.com](mailto:mario.limonciello@dell.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/dell-smbios-smm.c

### \* DELL SMBIOS WMI DRIVER

**Mail** Mario Limonciello <[mario.limonciello@dell.com](mailto:mario.limonciello@dell.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/dell-smbios-wmi.c                    tools/wmi/  
dell-smbios-example.c

### \* DELL SYSTEMS MANAGEMENT BASE DRIVER (dcdbas)

**Mail** Stuart Hayes <[stuart.w.hayes@gmail.com](mailto:stuart.w.hayes@gmail.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** driver-api/dcdbas drivers/platform/x86/dcdbas.\*

### \* DELL WMI DESCRIPTOR DRIVER

**Mail** Mario Limonciello <[mario.limonciello@dell.com](mailto:mario.limonciello@dell.com)>

**Status** Maintained

**Files** drivers/platform/x86/dell-wmi-descriptor.c

### \* DELL WMI NOTIFICATIONS DRIVER

**Mail** Matthew Garrett <[mjg59@srcf.ucam.org](mailto:mjg59@srcf.ucam.org)>, Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Status** Maintained

**Files** drivers/platform/x86/dell-wmi.c

### \* DELTA ST MEDIA DRIVER

**Mail** Hugues Fruchet <[hugues.fruchet@st.com](mailto:hugues.fruchet@st.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/platform/sti/delta

### \* DENALI NAND DRIVER

**Mail** Masahiro Yamada <yamada.masahiro@socionext.com>

**Mailing list** linux-mtd@lists.infradead.org

**Status** Supported

**Files** drivers/mtd/nand/raw/denali\*

### \* DESIGNWARE EDMA CORE IP DRIVER

**Mail** Gustavo Pimentel <gustavo.pimentel@synopsys.com>

**Mailing list** dmaengine@vger.kernel.org

**Status** Maintained

**Files** drivers/dma/dw-edma/ include/linux/dma/edma.h

### \* DESIGNWARE USB2 DRD IP DRIVER

**Mail** Minas Harutyunyan <hminas@synopsys.com>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/balbi/usb.git

**Files** drivers/usb/dwc2/

### \* DESIGNWARE USB3 DRD IP DRIVER

**Mail** Felipe Balbi <balbi@kernel.org>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/balbi/usb.git

**Files** drivers/usb/dwc3/

### \* DEVANTECH SRF ULTRASONIC RANGER IIO DRIVER

**Mail** Andreas Klinger <ak@it-klinger.de>

**Mailing list** linux-iio@vger.kernel.org

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-iio-distance-srf08  
drivers/iio/proximity/srf\*.c

## \* DEVICE COREDUMP (DEV\_COREDUMP)

**Mail** Johannes Berg <johannes@sipsolutions.net>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Maintained

**Files** drivers/base/devcoredump.c include/linux/devcoredump.h

## \* DEVICE DIRECT ACCESS (DAX)

**Mail** Dan Williams <dan.j.williams@intel.com>, Vishal Verma <vishal.l.verma@intel.com>, Dave Jiang <dave.jiang@intel.com>

**Mailing list** linux-nvdimm@lists.01.org

**Status** Supported

**Files** drivers/dax/

## \* DEVICE FREQUENCY (DEVFREQ)

**Mail** MyungJoo Ham <myungjoo.ham@samsung.com>, Kyungmin Park <kyungmin.park@samsung.com>, Chanwoo Choi <cw00.choi@samsung.com>

**Mailing list** linux-pm@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/chanwoo/linux.git

**Files** Documentation/devicetree/bindings/devfreq/ drivers/devfreq/ include/linux/devfreq.h include/trace/events/devfreq.h

## \* DEVICE FREQUENCY EVENT (DEVFREQ-EVENT)

**Mail** Chanwoo Choi <cw00.choi@samsung.com>

**Mailing list** linux-pm@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/chanwoo/linux.git

**Files** Documentation/devicetree/bindings/devfreq/event/ drivers/devfreq/devfreq-event.c drivers/devfreq/event/include/dt-bindings/pmu/exynos\_ppmu.h include/linux/devfreq-event.h

### \* DEVICE NUMBER REGISTRY

**Mail** Torben Mathiasen <[device@lanana.org](mailto:device@lanana.org)>

**Status** Maintained

**Web-page** <http://lanana.org/docs/device-list/index.html>

### \* DEVICE-MAPPER (LVM)

**Mail** Alasdair Kergon <[agk@redhat.com](mailto:agk@redhat.com)>, <[snitzer@redhat.com](mailto:snitzer@redhat.com)>, [dm-devel@redhat.com](mailto:dm-devel@redhat.com) Mike Snitzer

**Mailing list** [dm-devel@redhat.com](mailto:dm-devel@redhat.com)

**Status** Maintained

**Web-page** <http://sources.redhat.com/dm>

**Patchwork** <http://patchwork.kernel.org/project/dm-devel/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/device-mapper/linux-dm.git> quilt <http://people.redhat.com/agk/patches/linux/editing/>

**Files** Documentation/admin-guide/device-mapper/ drivers/md/Kconfig drivers/md/Makefile drivers/md/dm\* drivers/md/persistent-data/ include/linux/device-mapper.h include/linux/dm-\* .h include/uapi/linux/dm-\* .h

### \* DEVLINK

**Mail** Jiri Pirko <[jiri@mellanox.com](mailto:jiri@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** Documentation/networking/devlink include/net/devlink.h include/uapi/linux/devlink.h net/core/devlink.c

### \* DIALOG SEMICONDUCTOR DRIVERS

**Mail** Support Opensource <[support.opensource@diasemi.com](mailto:support.opensource@diasemi.com)>

**Status** Supported

**Web-page** <http://www.dialog-semiconductor.com/products>

**Files** Documentation/devicetree/bindings/input/da90??-onkey.txt Documentation/devicetree/bindings/mfd/da90\*.txt Documentation/devicetree/bindings/regulator/da92\*.txt Documentation/devicetree/bindings/regulator/slg51000.txt Documentation/devicetree/bindings/sound/da[79]\*.txt Documentation/devicetree/bindings/thermal/da90??-thermal.txt Documentation/devicetree/bindings/watchdog/da90??-wdt.txt Documentation/hwmon/da90???.rst drivers/

```
gpio/gpio-da90???.c drivers/hwmon/da90??-hwmon.c drivers/
iio/adc/da91??-* .c drivers/input/misc/da90??_onkey.c
drivers/input/touchscreen/da9052_tsi.c drivers/leds/
leds-da90?? .c drivers/mfd/da903x.c drivers/mfd/da90??-* .c
drivers/mfd/da91??-* .c drivers/pinctrl/pinctrl-da90?? .c
drivers/power/supply/da9052-battery.c drivers/power/
supply/da91??-* .c drivers/regulator/da903x.c drivers/
regulator/da9???-regulator.[ch] drivers/regulator/
slg51000-regulator.[ch] drivers/rtc/rtc-da90?? .c drivers/
thermal/da90??-thermal.c drivers/video/backlight/da90?
?_bl.c drivers/watchdog/da90??_wdt.c include/linux/mfd/
da903x.h include/linux/mfd/da9052/ include/linux/mfd/
da9055/ include/linux/mfd/da9062/ include/linux/mfd/
da9063/ include/linux/mfd/da9150/ include/linux/regulator/
da9211.h include/sound/da[79]* .h sound/soc/codecs/da[79]* .
[ch]
```

## \* DIAMOND SYSTEMS GPIO-MM GPIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-gpio-mm.c

## \* DIOLAN U2C-12 I2C DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** drivers/i2c/busses/i2c-diolan-u2c.c

## \* DIRECTORY NOTIFICATION (DNOTIFY)

**Mail** Jan Kara <[jack@suse.cz](mailto:jack@suse.cz)>

**Reviewer** Amir Goldstein <[amir73il@gmail.com](mailto:amir73il@gmail.com)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Maintained

**Files** filesystems/dnotify fs/notify/dnotify/ include/linux/
dnotify.h

## \* DISK GEOMETRY AND PARTITION HANDLING

**Mail** Andries Brouwer <[aeb@cwi.nl](mailto:aeb@cwi.nl)>

**Status** Maintained

**Web-page** <http://www.win.tue.nl/~aeb/linux/Large-Disk.html>

<http://www.win.tue.nl/~aeb/linux/zip/zip-1.html> [http://www.win.tue.nl/~aeb/partitions/partition\\_types-1.html](http://www.win.tue.nl/~aeb/partitions/partition_types-1.html)

## \* DISKQUOTA

**Mail** Jan Kara <[jack@suse.com](mailto:jack@suse.com)>

**Status** Maintained

**Files** filesystems/quota fs/quota/ include/linux/quota\*.h include/uapi/linux/quota\*.h

## \* DISPLAYLINK USB 2.0 FRAMEBUFFER DRIVER (UDLFB)

**Mail** Bernie Thompson <[bernie@plugable.com](mailto:bernie@plugable.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://plugable.com/category/projects/udlfb/>

**Files** fb/udlfb drivers/video/fbdev/udlfb.c include/video/udlfb.h

## \* DISTRIBUTED LOCK MANAGER (DLM)

**Mail** Christine Caulfield <[ccaulfie@redhat.com](mailto:ccaulfie@redhat.com)>, David Teigland <[teigland@redhat.com](mailto:teigland@redhat.com)>

**Mailing list** [cluster-devel@redhat.com](mailto:cluster-devel@redhat.com)

**Status** Supported

**Web-page** <http://sources.redhat.com/cluster/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/teigland/linux-dlm.git>

**Files** fs/dlm/

## \* DMA BUFFER SHARING FRAMEWORK

**Mail** Sumit Semwal <sumit.semwal@linaro.org>

**Mailing list** linux-media@vger.kernel.org, dri-devel@lists.freedesktop.org, linaro-mm-sig@lists.linaro.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** driver-api/dma-buf drivers/dma-buf/ include/linux/\*fence.h  
include/linux/dma-buf\* include/linux/dma-resv.h

**Content regex** \bdma\_(?:buf|fence|resv)\b

## \* DMA GENERIC OFFLOAD ENGINE SUBSYSTEM

**Mail** Vinod Koul <vkoul@kernel.org>

**Mailing list** dmaengine@vger.kernel.org

**Status** Maintained

**Patchwork** <https://patchwork.kernel.org/project/linux-dmaengine/list/>

**SCM** git git://git.infradead.org/users/vkoul/slave-dma.git

**Files** Documentation/devicetree/bindings/dma/ Documentation/  
driver-api/dmaengine/ drivers/dma/ include/linux/  
dmaengine.h include/linux/of\_dma.h

## \* DMA MAPPING HELPERS

**Mail** Christoph Hellwig <hch@lst.de>, Marek Szyprowski <m.szyprowski@samsung.com>

**Reviewer** Robin Murphy <robin.murphy@arm.com>

**Mailing list** iommu@lists.linux-foundation.org

**Status** Supported

**Web-page** <http://git.infradead.org/users/hch/dma-mapping.git>

**SCM** git git://git.infradead.org/users/hch/dma-mapping.git

**Files** include/asm-generic/dma-mapping.h include/linux/  
dma-direct.h include/linux/dma-mapping.h include/linux/  
dma-noncoherent.h kernel/dma/

### \* DMA-BUF HEAPS FRAMEWORK

**Mail** Sumit Semwal <[sumit.semwal@linaro.org](mailto:sumit.semwal@linaro.org)>

**Reviewer** Andrew F. Davis <[afd@ti.com](mailto:afd@ti.com)>, Benjamin Gaignard <[benjamin.gaignard@linaro.org](mailto:benjamin.gaignard@linaro.org)>, Liam Mark <[lmark@codeaurora.org](mailto:lmark@codeaurora.org)>, Laura Abbott <[labbott@redhat.com](mailto:labbott@redhat.com)>, Brian Starkey <[Brian.Starkey@arm.com](mailto:Brian.Starkey@arm.com)>, John Stultz <[john.stultz@linaro.org](mailto:john.stultz@linaro.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [devel@lists.freedesktop.org](mailto:devel@lists.freedesktop.org), [linaro-mm-sig@lists.linaro.org](mailto:linaro-mm-sig@lists.linaro.org) (moderated for non-subscribers) dri-

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/dma-buf/dma-heap.c drivers/dma-buf/heaps/\*  
include/linux/dma-heap.h include/uapi/linux/dma-heap.h

### \* DMC FREQUENCY DRIVER FOR SAMSUNG EXYNOS5422

**Mail** Lukasz Luba <[lukasz.luba@arm.com](mailto:lukasz.luba@arm.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org), [soc@vger.kernel.org](mailto:soc@vger.kernel.org) linux-samsung-

**Status** Maintained

**Files** Documentation/devicetree/bindings/memory-controllers/exynos5422-dmc.txt drivers/memory/samsung/exynos5422-dmc.c

### \* DME1737 HARDWARE MONITOR DRIVER

**Mail** Juerg Haefliger <[juergh@gmail.com](mailto:juergh@gmail.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/dme1737 drivers/hwmon/dme1737.c

### \* DMI/SMBIOS SUPPORT

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Status** Maintained

**SCM** quilt <http://jdelvare.nerim.net-devel/linux/jdelvare-dmi/>

**Files** Documentation/ABI/testing/sysfs-firmware-dmi-tables  
drivers/firmware/dmi-id.c drivers/firmware/dmi\_scan.c  
include/linux/dmi.h

### \* DOCUMENTATION

**Mail** Jonathan Corbet <[corbet@lwn.net](mailto:corbet@lwn.net)>

**Mailing list** [linux-doc@vger.kernel.org](mailto:linux-doc@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.lwn.net/linux.git docs-next

**Files** Documentation/ scripts/documentation-file-ref-check  
scripts/kernel-doc scripts/sphinx-pre-install

**Excluded** Documentation/ABI/ Documentation/admin-guide/media/  
Documentation/devicetree/ Documentation/driver-api/media/  
Documentation/firmware-guide/acpi/ Documentation/i2c/  
Documentation/power/ Documentation/spi/ Documentation/  
userspace-api/media/

### \* DOCUMENTATION SCRIPTS

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-doc@vger.kernel.org](mailto:linux-doc@vger.kernel.org)

**Status** Maintained

**Files** Documentation/sphinx/parse-headers.pl scripts/  
documentation-file-ref-check scripts/sphinx-pre-install

### \* DOCUMENTATION/ITALIAN

**Mail** Federico Vaga <[federico.vaga@vaga.pv.it](mailto:federico.vaga@vaga.pv.it)>

**Mailing list** [linux-doc@vger.kernel.org](mailto:linux-doc@vger.kernel.org)

**Status** Maintained

**Files** Documentation/translations/it\_IT

### \* DONGWOON DW9714 LENS VOICE COIL DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/i2c/dongwoon,  
dw9714.txt drivers/media/i2c/dw9714.c

## \* DONGWOON DW9807 LENS VOICE COIL DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/dongwoon,  
dw9807-vcm.txt drivers/media/i2c/dw9807-vcm.c

## \* DOUBLETALK DRIVER

**Mail** “James R. Van Zandt” <[jrv@vanzandt.mv.com](mailto:jrv@vanzandt.mv.com)>

**Mailing list** [blinux-list@redhat.com](mailto:blinux-list@redhat.com)

**Status** Maintained

**Files** drivers/char/dtlk.c include/linux/dtlk.h

## \* DPAA2 DATAPATH I/O (DPIO) DRIVER

**Mail** Roy Pledge <[Roy.Pledge@nxp.com](mailto:Roy.Pledge@nxp.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/soc/fsl/dpio

## \* DPAA2 ETHERNET DRIVER

**Mail** Ioana Ciornei <[ioana.ciornei@nxp.com](mailto:ioana.ciornei@nxp.com)>, Ioana Radulescu <[ruxandra.radulescu@nxp.com](mailto:ruxandra.radulescu@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** networking/device\_drivers/freescale/dpaa2/ethernet-driver  
networking/device\_drivers/freescale/dpaa2/mac-phy-support  
drivers/net/ethernet/freescale/dpaa2/Kconfig drivers/  
drivers/net/ethernet/freescale/dpaa2/Makefile drivers/net/  
drivers/net/ethernet/freescale/dpaa2/dpaa2-eth\* drivers/net/  
drivers/net/ethernet/freescale/dpaa2/dpaa2-mac\* drivers/net/ethernet/  
freescale/dpaa2/dpkg.h drivers/net/ethernet/freescale/  
dpaa2/dpmac\* drivers/net/ethernet/freescale/dpaa2/dpni\*

## \* DPAA2 ETHERNET SWITCH DRIVER

**Mail** Ioana Radulescu <[ruxandra.radulescu@nxp.com](mailto:ruxandra.radulescu@nxp.com)>, Ioana Ciornei <[ioana.ciornei@nxp.com](mailto:ioana.ciornei@nxp.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/fsl-dpaa2/ethsw

## \* DPT\_I2O SCSI RAID DRIVER

**Mail** Adaptec OEM Raid Solutions <[aacraid@microsemi.com](mailto:aacraid@microsemi.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.adaptec.com/>

**Files** drivers/scsi/dpt\* drivers/scsi/dpt/

## \* DRBD DRIVER

**Mail** Philipp Reisner <[philipp.reisner@linbit.com](mailto:philipp.reisner@linbit.com)>, Lars Ellenberg <[lars.ellenberg@linbit.com](mailto:lars.ellenberg@linbit.com)>

**Mailing list** [drbd-dev@lists.linbit.com](mailto:drbd-dev@lists.linbit.com)

**Status** Supported

**Web-page** <http://www.drbd.org>

**SCM** git <git://git.linbit.com/linux-drbd.git> git <git://git.linbit.com/drbd-8.4.git>

**Files** Documentation/admin-guide/blockdev/ drivers/block/drbd/lib/lru\_cache.c

## \* DRIVER CORE, KOBJECTS, DEBUGFS AND SYSFS

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Reviewer** “Rafael J. Wysocki” <[rafael@kernel.org](mailto:rafael@kernel.org)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/driver-core.git>

**Files** core-api/kobject drivers/base/ fs/debugfs/ fs/sysfs/ include/linux/debugfs.h include/linux/kobj\* lib/kobj\*

## \* DRIVERS FOR ADAPTIVE VOLTAGE SCALING (AVS)

**Mail** Kevin Hilman <[khilman@kernel.org](mailto:khilman@kernel.org)>, Nishanth Menon <[nm@ti.com](mailto:nm@ti.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** drivers/power/avs/ include/linux/power/smартreflex.h

## \* DRM DRIVER FOR ALLWINNER DE2 AND DE3 ENGINE

**Mail** Maxime Ripard <[mripard@kernel.org](mailto:mripard@kernel.org)>, Chen-Yu Tsai <[wens@csie.org](mailto:wens@csie.org)>

**Reviewer** Jernej Skrabec <[jernej.skrabec@siol.net](mailto:jernej.skrabec@siol.net)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/sun4i/sun8i\*

## \* DRM DRIVER FOR ARM PL111 CLCD

**Mail** Eric Anholt <[eric@anholt.net](mailto:eric@anholt.net)>

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/pl111/

## \* DRM DRIVER FOR ARM VERSATILE TFT PANELS

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/panel/arm,versatile-tft-panel.yaml      drivers/gpu/drm/panel/panel-arm-versatile.c

## \* DRM DRIVER FOR ASPEED BMC GFX

**Mail** Joel Stanley <[joel@jms.id.au](mailto:joel@jms.id.au)>

**Mailing list** [linux-aspeed@lists.ozlabs.org](mailto:linux-aspeed@lists.ozlabs.org)

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/gpu/aspeed-gfx.txt  
drivers/gpu/drm/aspeed/

## \* DRM DRIVER FOR AST SERVER GRAPHICS CHIPS

**Mail** Dave Airlie <[airlied@redhat.com](mailto:airlied@redhat.com)>

**Status** Odd Fixes

**Files** drivers/gpu/drm/ast/

## \* DRM DRIVER FOR BOCHS VIRTUAL GPU

**Mail** Gerd Hoffmann <[kraxel@redhat.com](mailto:kraxel@redhat.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/bochs/

## \* DRM DRIVER FOR BOE HIMAX8279D PANELS

**Mail** Jerry Han <[hanxu5@huaqin.corp-partner.google.com](mailto:hanxu5@huaqin.corp-partner.google.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/  
panel/boe,himax8279d.yaml                        drivers/gpu/drm/panel/  
panel-boe-himax8279d.c

## \* DRM DRIVER FOR FARADAY TVE200 TV ENCODER

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/tve200/

## \* DRM DRIVER FOR FEIXIN K101 IM2BA02 MIPI-DSI LCD PANELS

**Mail** Icenowy Zheng <[icenowy@aosc.io](mailto:icenowy@aosc.io)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/panel/  
feixin,k101-im2ba02.yaml drivers/gpu/drm/panel/  
panel-feixin-k101-im2ba02.c

## \* DRM DRIVER FOR FEIYANG FY07024DI26A30-D MIPI-DSI LCD PANELS

**Mail** Jagan Teki <[jagan@amarulasolutions.com](mailto:jagan@amarulasolutions.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/panel/  
feiyang,fy07024di26a30d.yaml drivers/gpu/drm/panel/  
panel-feiyang-fy07024di26a30d.c

## \* DRM DRIVER FOR GRAIN MEDIA GM12U320 PROJECTORS

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/tiny/gm12u320.c

## \* DRM DRIVER FOR HX8357D PANELS

**Mail** Eric Anholt <[eric@anholt.net](mailto:eric@anholt.net)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/himax,  
hx8357d.txt drivers/gpu/drm/tiny/hx8357d.c

## \* DRM DRIVER FOR ILITEK ILI9225 PANELS

**Mail** David Lechner <[david@lechnology.com](mailto:david@lechnology.com)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/ilitek,  
ili9225.txt drivers/gpu/drm/tiny/ili9225.c

## \* DRM DRIVER FOR ILITEK ILI9486 PANELS

**Mail** Kamlesh Gurudasani <[kamlesh.gurudasani@gmail.com](mailto:kamlesh.gurudasani@gmail.com)>

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/ilitek,  
ili9486.yaml drivers/gpu/drm/tiny/ili9486.c

## \* DRM DRIVER FOR INTEL I810 VIDEO CARDS

**Status** Orphan / Obsolete

**Files** drivers/gpu/drm/i810/ include/uapi/drm/i810\_drm.h

## \* DRM DRIVER FOR LVDS PANELS

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Status** Maintained

**Files** drivers/gpu/drm/panel/panel\_lvds.c Documentation/  
devicetree/bindings/display/panel/lvds.yaml

## \* DRM DRIVER FOR MATROX G200/G400 GRAPHICS CARDS

**Status** Orphan / Obsolete

**Files** drivers/gpu/drm/mga/ include/uapi/drm/mga\_drm.h

## \* DRM DRIVER FOR MGA G200 SERVER GRAPHICS CHIPS

**Mail** Dave Airlie <[airlied@redhat.com](mailto:airlied@redhat.com)>

**Status** Odd Fixes

**Files** drivers/gpu/drm/mgag200/

## \* DRM DRIVER FOR MI0283QT

**Mail** Noralf Trønnes <[noralf@tronnes.org](mailto:noralf@tronnes.org)>

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/multi-inno,  
mi0283qt.txt drivers/gpu/drm/tiny/mi0283qt.c

### \* DRM DRIVER FOR MSM ADRENO GPU

**Mail** Rob Clark <[robdclark@gmail.com](mailto:robdclark@gmail.com)>, Sean Paul <[sean@poorly.run](mailto:sean@poorly.run)>

**Mailing list** [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org), [devel@lists.freedesktop.org](mailto:devel@lists.freedesktop.org), [freedreno@lists.freedesktop.org](mailto:freedreno@lists.freedesktop.org) dri-

**Status** Maintained

**SCM** git <https://gitlab.freedesktop.org/drm/msm.git>

**Files** Documentation/devicetree/bindings/display/msm/ drivers/gpu/drm/msm/include/uapi/drm/msm\_drm.h

### \* DRM DRIVER FOR NOVATEK NT35510 PANELS

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/panel/novatek\_nt35510.yaml drivers/gpu/drm/panel/panel-novatek-nt35510.c

### \* DRM DRIVER FOR NVIDIA GEFORCE/QUADRO GPUS

**Mail** Ben Skeggs <[bskeggs@redhat.com](mailto:bskeggs@redhat.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), nouveau@lists.freedesktop.org nou-

**Status** Supported

**SCM** git <git://github.com/skeggsb/linux>

**Files** drivers/gpu/drm/nouveau/include/uapi/drm/nouveau\_drm.h

### \* DRM DRIVER FOR OLIMEX LCD-OLINUXINO PANELS

**Mail** Stefan Mavrodiev <[stefan@olimex.com](mailto:stefan@olimex.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/panel/olimex\_lcd-olinuxino.yaml drivers/gpu/drm/panel/panel-olimex-lcd-olinuxino.c

## \* DRM DRIVER FOR PERVERSIVE DISPLAYS REPAPER PANELS

**Mail** Noralf Trønnes <[noralf@tronnes.org](mailto:noralf@tronnes.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/repaper.txt  
drivers/gpu/drm/tiny/repaper.c

## \* DRM DRIVER FOR QEMU' S CIRRUS DEVICE

**Mail** Dave Airlie <[airlied@redhat.com](mailto:airlied@redhat.com)>, Gerd Hoffmann <[kraxel@redhat.com](mailto:kraxel@redhat.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Obsolete

**Web-page** <https://www.kraxel.org/blog/2014/10/qemu-using-cirrus-considered-harmful/>

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/tiny/cirrus.c

## \* DRM DRIVER FOR QXL VIRTUAL GPU

**Mail** Dave Airlie <[airlied@redhat.com](mailto:airlied@redhat.com)>, Gerd Hoffmann <[kraxel@redhat.com](mailto:kraxel@redhat.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org), spice-devel@lists.freedesktop.org

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/qxl/include/uapi/drm/qxl\_drm.h

## \* DRM DRIVER FOR RAGE 128 VIDEO CARDS

**Status** Orphan / Obsolete

**Files** drivers/gpu/drm/r128/include/uapi/drm/r128\_drm.h

## \* DRM DRIVER FOR RAYDIUM RM67191 PANELS

**Mail** Robert Chiras <[robert.chiras@nxp.com](mailto:robert.chiras@nxp.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/  
panel/raydium\_rm67191.yaml                    drivers/gpu/drm/panel/  
panel-raydium-rm67191.c

## \* DRM DRIVER FOR ROCKTECH JH057N00900 PANELS

**Mail** Guido Günther <[agx@sigxcpu.org](mailto:agx@sigxcpu.org)>

**Reviewer** Purism Kernel Team <[kernel@puri.sm](mailto:kernel@puri.sm)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/panel/  
rocktech\_jh057n00900.txt                    drivers/gpu/drm/panel/  
panel-rocktech-jh057n00900.c

## \* DRM DRIVER FOR SAVAGE VIDEO CARDS

**Status** Orphan / Obsolete

**Files** drivers/gpu/drm/savage/ include/uapi/drm/savage\_drm.h

## \* DRM DRIVER FOR SIS VIDEO CARDS

**Status** Orphan / Obsolete

**Files** drivers/gpu/drm/sis/ include/uapi/drm/sis\_drm.h

## \* DRM DRIVER FOR SITRONIX ST7586 PANELS

**Mail** David Lechner <[david@lechnology.com](mailto:david@lechnology.com)>

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/sitronix,  
st7586.txt drivers/gpu/drm/tiny/st7586.c

## \* DRM DRIVER FOR SITRONIX ST7701 PANELS

**Mail** Jagan Teki <[jagan@amarulasolutions.com](mailto:jagan@amarulasolutions.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/  
panel/sitronix,st7701.yaml                        drivers/gpu/drm/panel/  
panel-sitronix-st7701.c

## \* DRM DRIVER FOR SITRONIX ST7735R PANELS

**Mail** David Lechner <[david@lechnology.com](mailto:david@lechnology.com)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/sitronix,  
st7735r.yaml drivers/gpu/drm/tiny/st7735r.c

## \* DRM DRIVER FOR SONY ACX424AKP PANELS

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/panel/panel-sony-acx424akp.c

## \* DRM DRIVER FOR ST-ERICSSON MCDE

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/ste,mcde.txt  
drivers/gpu/drm/mcde/

## \* DRM DRIVER FOR TDFX VIDEO CARDS

**Status** Orphan / Obsolete

**Files** drivers/gpu/drm/tdfx/

## \* DRM DRIVER FOR TPO TPG110 PANELS

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/panel/tpo,  
tpg110.yaml drivers/gpu/drm/panel/panel-tpo-tpg110.c

## \* DRM DRIVER FOR USB DISPLAYLINK VIDEO ADAPTERS

**Mail** Dave Airlie <[airlied@redhat.com](mailto:airlied@redhat.com)>

**Reviewer** Sean Paul <[sean@poorly.run](mailto:sean@poorly.run)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Odd Fixes

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/udl/

## \* DRM DRIVER FOR VIRTUAL KERNEL MODESETTING (VKMS)

**Mail** Rodrigo Siqueira <[rodrigosiqueiramelo@gmail.com](mailto:rodrigosiqueiramelo@gmail.com)>

**Reviewer** Haneen Mohammed <[hamohammed.sa@gmail.com](mailto:hamohammed.sa@gmail.com)>, Daniel Vetter <[daniel@ffwll.ch](mailto:daniel@ffwll.ch)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** gpu/vkms drivers/gpu/drm/vkms/

## \* DRM DRIVER FOR VIRTUALBOX VIRTUAL GPU

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/vboxvideo/

## \* DRM DRIVER FOR VMWARE VIRTUAL GPU

**Mail** “VMware Graphics” <[linux-graphics-maintainer@vmware.com](mailto:linux-graphics-maintainer@vmware.com)>, Roland Scheidegger <[sroland@vmware.com](mailto:sroland@vmware.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Supported

**SCM** git <git://people.freedesktop.org/~sroland/linux>

**Files** drivers/gpu/drm/vmwgfx/ include/uapi/drm/vmwgfx\_drm.h

## \* DRM DRIVERS

**Mail** David Airlie <[airlied@linux.ie](mailto:airlied@linux.ie)>, Daniel Vetter <[daniel@ffwll.ch](mailto:daniel@ffwll.ch)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**bugs** <https://bugs.freedesktop.org/>

**chat** <irc://chat.freenode.net/dri-devel>

**SCM** git <git://anongit.freedesktop.org/drm/drm>

**Files** Documentation/devicetree/bindings/display/  
Documentation/devicetree/bindings/gpu/ Documentation/gpu/  
drivers/gpu/drm/ drivers/gpu/vga/ include/drm/ include/  
linux/vga\* include/uapi/drm/

## \* DRM DRIVERS AND MISC GPU PATCHES

**Mail** Maarten Lankhorst <[maarten.lankhorst@linux.intel.com](mailto:maarten.lankhorst@linux.intel.com)>, Maxime Ripard <[mripard@kernel.org](mailto:mripard@kernel.org)>, Thomas Zimmermann <[tzimmermann@suse.de](mailto:tzimmermann@suse.de)>

**Status** Maintained

**Web-page** <https://01.org/linuxgraphics/gfx-docs/maintainer-tools/drm-misc.html>

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/gpu/ drivers/gpu/drm/\* drivers/gpu/vga/  
include/drm/drm\* include/linux/vga\* include/uapi/drm/drm\*

### \* DRM DRIVERS FOR ALLWINNER A10

**Mail** Maxime Ripard <[mripard@kernel.org](mailto:mripard@kernel.org)>, Chen-Yu Tsai <[wens@csie.org](mailto:wens@csie.org)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/allwinner\*  
drivers/gpu/drm/sun4i/

### \* DRM DRIVERS FOR AMLOGIC SOCS

**Mail** Neil Armstrong <[narmstrong@baylibre.com](mailto:narmstrong@baylibre.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), [linux-amlogic@lists.infradead.org](mailto:linux-amlogic@lists.infradead.org)

**Status** Supported

**Web-page** <http://linux-meson.com/>

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/amlogic,  
meson-dw-hdmi.yaml Documentation/devicetree/bindings/  
display/amlogic,meson-vpu.yaml gpu/meson drivers/gpu/drm/  
meson/

### \* DRM DRIVERS FOR ATMEL HLCDC

**Mail** Sam Ravnborg <[sam@ravnborg.org](mailto:sam@ravnborg.org)>, Boris Brezillon <[bbrezillon@kernel.org](mailto:bbrezillon@kernel.org)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/atmel/  
drivers/gpu/drm/atmel-hlcdc/

### \* DRM DRIVERS FOR BRIDGE CHIPS

**Mail** Andrzej Hajda <[a.hajda@samsung.com](mailto:a.hajda@samsung.com)>, Neil Armstrong <[narmstrong@baylibre.com](mailto:narmstrong@baylibre.com)>

**Reviewer** Laurent Pinchart <[Laurent.pinchart@ideasonboard.com](mailto:Laurent.pinchart@ideasonboard.com)>, Jonas Karlman <[jonas@kwiboo.se](mailto:jonas@kwiboo.se)>, Jernej Skrabec <[jernej.skrabec@siol.net](mailto:jernej.skrabec@siol.net)>

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** drivers/gpu/drm/bridge/

## \* DRM DRIVERS FOR EXYNOS

**Mail** Inki Dae <inki.dae@samsung.com>, Joonyoung  
Shim <jy0922.shim@samsung.com>, Seung-Woo  
Kim <sw0312.kim@samsung.com>, Kyungmin Park  
<kyungmin.park@samsung.com>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/daeinki/drm-exynos.git

**Files** Documentation/devicetree/bindings/display/exynos/  
drivers/gpu/drm/exynos/ include/uapi/drm/exynos\_drm.h

## \* DRM DRIVERS FOR FREESCALE DCU

**Mail** Stefan Agner <stefan@agner.ch>, Alison Wang  
<alison.wang@nxp.com>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Supported

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/fsl,dcu.txt  
Documentation/devicetree/bindings/display/fsl,tcon.txt  
drivers/gpu/drm/fsl-dcu/

## \* DRM DRIVERS FOR FREESCALE IMX

**Mail** Philipp Zabel <p.zabel@pengutronix.de>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/imx/ drivers/  
gpu/drm/imx/ drivers/gpu/ipu-v3/

### \* DRM DRIVERS FOR GMA500 (Poulsbo, Moorestown and derivative chipsets)

**Mail** Patrik Jakobsson <[patrik.r.jakobsson@gmail.com](mailto:patrik.r.jakobsson@gmail.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://github.com/patjak/drm-gma500>

**Files** drivers/gpu/drm/gma500/

### \* DRM DRIVERS FOR HISILICON

**Mail** Xinliang Liu <[xinliang.liu@linaro.org](mailto:xinliang.liu@linaro.org)>, Rongrong Zou <[zourongrong@gmail.com](mailto:zourongrong@gmail.com)>

**Reviewer** John Stultz <[john.stultz@linaro.org](mailto:john.stultz@linaro.org)>, Xinwei Kong <[kong.kongxinwei@hisilicon.com](mailto:kong.kongxinwei@hisilicon.com)>, Chen Feng <[puck.chen@hisilicon.com](mailto:puck.chen@hisilicon.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/hisilicon/  
drivers/gpu/drm/hisilicon/

### \* DRM DRIVERS FOR LIMA

**Mail** Qiang Yu <[yuq825@gmail.com](mailto:yuq825@gmail.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), [lima@lists.freedesktop.org](mailto:lima@lists.freedesktop.org)  
(moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/lima/ include/uapi/drm/lima\_drm.h

### \* DRM DRIVERS FOR MEDIATEK

**Mail** Chun-Kuang Hu <[chunkuang.hu@kernel.org](mailto:chunkuang.hu@kernel.org)>, Philipp Zabel <[p.zabel@pengutronix.de](mailto:p.zabel@pengutronix.de)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/display MEDIATEK/  
drivers/gpu/drm MEDIATEK/

## \* DRM DRIVERS FOR NVIDIA TEGRA

**Mail** Thierry Reding <[thierry.reding@gmail.com](mailto:thierry.reding@gmail.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org)

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/tegra/linux.git>

**Files** Documentation/devicetree/bindings/display/tegra/nvidia,  
tegra20-host1x.txt drivers/gpu/drm/tegra/ drivers/gpu/  
host1x/ include/linux/host1x.h include/uapi/drm/tegra\_drm.  
h

## \* DRM DRIVERS FOR RENESAS

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>, Kieran  
Bingham <[kieran.bingham+renesas@ideasonboard.com](mailto:kieran.bingham+renesas@ideasonboard.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**SCM** git [git://linuxtv.org/pinchartl/media\\_drm/du/next](git://linuxtv.org/pinchartl/media_drm/du/next)

**Files** Documentation/devicetree/bindings/display/bridge/  
renesas,dw-hdmi.txt Documentation/devicetree/bindings/  
display/bridge/renesas,lvds.txt Documentation/devicetree/  
bindings/display/renesas,du.txt drivers/gpu/drm/rcar-du/  
drivers/gpu/drm/shmobile/ include/linux/platform\_data/  
shmob\_drm.h

## \* DRM DRIVERS FOR ROCKCHIP

**Mail** Sandy Huang <[hjc@rock-chips.com](mailto:hjc@rock-chips.com)>, Heiko Stübner  
<[heiko@sntech.de](mailto:heiko@sntech.de)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/rockchip/  
drivers/gpu/drm/rockchip/

## \* DRM DRIVERS FOR STI

**Mail** Benjamin Gaignard <[benjamin.gaignard@linaro.org](mailto:benjamin.gaignard@linaro.org)>, Vincent Abriou <[vincent.abriou@st.com](mailto:vincent.abriou@st.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/st,stih4xx.txt  
drivers/gpu/drm/sti

## \* DRM DRIVERS FOR STM

**Mail** Yannick Fertre <[yannick.fertre@st.com](mailto:yannick.fertre@st.com)>, Philippe Cornu <[philippe.cornu@st.com](mailto:philippe.cornu@st.com)>, Benjamin Gaignard <[benjamin.gaignard@linaro.org](mailto:benjamin.gaignard@linaro.org)>, Vincent Abriou <[vincent.abriou@st.com](mailto:vincent.abriou@st.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/st,  
stm32-ltdc.yaml  
drivers/gpu/drm/stm

## \* DRM DRIVERS FOR TI KEYSTONE

**Mail** Jyri Sarha <[jsarha@ti.com](mailto:jsarha@ti.com)>, Tomi Valkeinen <[tomi.valkeinen@ti.com](mailto:tomi.valkeinen@ti.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/ti/ti,  
am65x-dss.yaml  
Documentation/devicetree/bindings/display/  
ti/ti,j721e-dss.yaml  
Documentation/devicetree/bindings/  
display/ti/ti,k2g-dss.yaml  
drivers/gpu/drm/tidss/

## \* DRM DRIVERS FOR TI LCDC

**Mail** Jyri Sarha <[jsarha@ti.com](mailto:jsarha@ti.com)>

**Reviewer** Tomi Valkeinen <[tomi.valkeinen@ti.com](mailto:tomi.valkeinen@ti.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/tilcdc/  
drivers/gpu/drm/tilcdc/

## \* DRM DRIVERS FOR TI OMAP

**Mail** Tomi Valkeinen <[tomi.valkeinen@ti.com](mailto:tomi.valkeinen@ti.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/ti/ drivers/  
gpu/drm/omapdrm/

## \* DRM DRIVERS FOR V3D

**Mail** Eric Anholt <[eric@anholt.net](mailto:eric@anholt.net)>

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/gpu/brcm,bcm-v3d.txt  
drivers/gpu/drm/v3d/ include/uapi/drm/v3d\_drm.h

## \* DRM DRIVERS FOR VC4

**Mail** Eric Anholt <[eric@anholt.net](mailto:eric@anholt.net)>

**Status** Supported

**SCM** git <git://github.com/anholt/linux> git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/brcm,bcm-vc4.txt  
drivers/gpu/drm/vc4/ include/uapi/drm/vc4\_drm.h

### \* DRM DRIVERS FOR VIVANTE GPU IP

**Mail** Lucas Stach <l.stach@pengutronix.de>

**Reviewer** Russell King <linux+etnaviv@armlinux.org.uk>, Christian Gmeiner <christian.gmeiner@gmail.com>

**Mailing list** etnaviv@lists.freedesktop.org (moderated for non-subscribers), dri-devel@lists.freedesktop.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/gpu/vivante,gc.yaml  
drivers/gpu/drm/etnaviv/ include/uapi/drm/etnaviv\_drm.h

### \* DRM DRIVERS FOR XEN

**Mail** Oleksandr Andrushchenko <oleksandr\_andrushchenko@epam.com>

**Mailing list** dri-devel@lists.freedesktop.org, xen-devel@lists.xenproject.org (moderated for non-subscribers)

**Status** Supported

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** gpu/xen-front drivers/gpu/drm/xen/

### \* DRM DRIVERS FOR ZTE ZX

**Mail** Shawn Guo <shawnguo@kernel.org>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/zte,vou.txt  
drivers/gpu/drm/zte/

### \* DRM PANEL DRIVERS

**Mail** Thierry Reding <thierry.reding@gmail.com>

**Reviewer** Sam Ravnborg <sam@ravnborg.org>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Maintained

**SCM** git git://anongit.freedesktop.org/drm/drm-misc

**Files** Documentation/devicetree/bindings/display/panel/  
drivers/gpu/drm/drm\_panel.c drivers/gpu/drm/panel/  
include/drm/drm\_panel.h

### \* **DRM TTM SUBSYSTEM**

**Mail** Christian Koenig <[christian.koenig@amd.com](mailto:christian.koenig@amd.com)>, Huang Rui <[ray.huang@amd.com](mailto:ray.huang@amd.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git <git://people.freedesktop.org/~agd5f/linux>

**Files** drivers/gpu/drm/ttm/ include/drm/ttm/

### \* **DSBR100 USB FM RADIO DRIVER**

**Mail** Alexey Klimov <[klimov.linux@gmail.com](mailto:klimov.linux@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/dsbr100.c

### \* **DT3155 MEDIA DRIVER**

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/dt3155/

### \* **DVB\_USB\_AF9015 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/af9015\*

### \* **DVB\_USB\_AF9035 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/af9035\*

### \* **DVB\_USB\_ANYSEE MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/anysee\*

### \* **DVB\_USB\_AU6610 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/au6610\*

### \* **DVB\_USB\_CE6230 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/ce6230\*

### \* **DVB\_USB\_CXUSB MEDIA DRIVER**

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/dvb-usb/cxusb\*

### \* **DVB\_USB\_EC168 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/ec168\*

### \* **DVB\_USB\_GL861 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/gl861\*

## \* **DVB\_USB\_MXL111SF MEDIA DRIVER**

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/mxl111sf.git>

**Files** drivers/media/usb/dvb-usb-v2/mxl111sf\*

## \* **DVB\_USB\_RTL28XXU MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/rtl28xxu\*

## \* **DVB\_USB\_V2 MEDIA DRIVER**

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/dvb-usb-v2/dvb\_usb\*      drivers/media/usb/dvb-usb-v2/usb\_urb.c

## \* DYNAMIC DEBUG

**Mail** Jason Baron <jbaron@akamai.com>

**Status** Maintained

**Files** include/linux/dynamic\_debug.h lib/dynamic\_debug.c

## \* DYNAMIC INTERRUPT MODERATION

**Mail** Tal Gilboa <talgi@mellanox.com>

**Status** Maintained

**Files** networking/net\_dim include/linux/dim.h lib/dim/

## \* DZ DECSTATION DZ11 SERIAL DRIVER

**Mail** “Maciej W. Rozycki” <macro@linux-mips.org>

**Status** Maintained

**Files** drivers/tty/serial/dz.\*

## \* E3X0 POWER BUTTON DRIVER

**Mail** Moritz Fischer <moritz.fischer@ettus.com>

**Mailing list** usrp-users@lists.ettus.com

**Status** Supported

**Web-page** <http://www.ettus.com>

**Files** Documentation/devicetree/bindings/input/e3x0-button.txt  
drivers/input/misc/e3x0-button.c

## \* E4000 MEDIA DRIVER

**Mail** Antti Palosaari <crope@iki.fi>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/e4000\*

### \* EARTH\_PT1 MEDIA DRIVER

**Mail** Akihiro Tsukada <[tskd08@gmail.com](mailto:tskd08@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/media/pci/pt1/

### \* EARTH\_PT3 MEDIA DRIVER

**Mail** Akihiro Tsukada <[tskd08@gmail.com](mailto:tskd08@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/media/pci/pt3/

### \* EC100 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/ec100\*

### \* ECRYPT FILE SYSTEM

**Mail** Tyler Hicks <[code@tyhicks.com](mailto:code@tyhicks.com)>

**Mailing list** [ecryptfs@vger.kernel.org](mailto:ecryptfs@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <http://ecryptfs.org> <https://launchpad.net/ecryptfs>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tyhicks/ecryptfs.git>

**Files** filesystems/ecryptfs fs/ecryptfs/

### \* EDAC-AMD64

**Mail** Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/amd64\_edac\*

### \* EDAC-ARMADA

**Mail** Jan Luebbe <[jlu@pengutronix.de](mailto:jlu@pengutronix.de)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/armada\_xp\_\*

### \* EDAC-AST2500

**Mail** Stefan Schaeckeler <[sschaeck@cisco.com](mailto:sschaeck@cisco.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/edac/  
aspeed-sdram-edac.txt drivers/edac/aspeed\_edac.c

### \* EDAC-BLUEFIELD

**Mail** Shravan Kumar Ramani <[sramani@mellanox.com](mailto:sramani@mellanox.com)>

**Status** Supported

**Files** drivers/edac/bluefield\_edac.c

### \* EDAC-CALXEDA

**Mail** Robert Richter <[rric@kernel.org](mailto:rric@kernel.org)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/highbank\*

### \* EDAC-CAVIUM OCTEON

**Mail** Ralf Baechle <[ralf@linux-mips.org](mailto:ralf@linux-mips.org)>, Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org), [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Supported

**Files** drivers/edac/octeon\_edac\*

### \* EDAC-CAVIUM THUNDERX

**Mail** Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Supported

**Files** drivers/edac/thunderx\_edac\*

### \* EDAC-CORE

**Mail** Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>, Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>, Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>

**Reviewer** James Morse <[james.morse@arm.com](mailto:james.morse@arm.com)>, Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/ras/ras.git> edac-for-next

**Files** admin-guide/ras driver-api/edac drivers/edac/ include/linux/edac.h

### \* EDAC-DMC520

**Mail** Lei Wang <[lewan@microsoft.com](mailto:lewan@microsoft.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Supported

**Files** drivers/edac/dmc520\_edac.c

### \* EDAC-E752X

**Mail** Mark Gross <mark.gross@intel.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/e752x\_edac.c

### \* EDAC-E7XXX

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/e7xxx\_edac.c

### \* EDAC-FSL\_DDR

**Mail** York Sun <york.sun@nxp.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/fsl\_ddr\_edac.\*

### \* EDAC-GHES

**Mail** Mauro Carvalho Chehab <mchehab@kernel.org>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/ghes\_edac.c

### \* EDAC-I10NM

**Mail** Tony Luck <tony.luck@intel.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/i10nm\_base.c

\* **EDAC-I3000**

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Orphan

**Files** drivers/edac/i3000\_edac.c

\* **EDAC-I5000**

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/i5000\_edac.c

\* **EDAC-I5400**

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/i5400\_edac.c

\* **EDAC-I7300**

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/i7300\_edac.c

\* **EDAC-I7CORE**

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/i7core\_edac.c

\* **EDAC-I82443BXGX**

**Mail** Tim Small <tim@buttersideup.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/i82443bxgx\_edac.c

\* **EDAC-I82975X**

**Mail** “Arvind R.” <arvino55@gmail.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/i82975x\_edac.c

\* **EDAC-IE31200**

**Mail** Jason Baron <jbaron@akamai.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/ie31200\_edac.c

\* **EDAC-MPC85XX**

**Mail** Johannes Thumshirn <morbidrsa@gmail.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/mpc85xx\_edac.[ch]

\* **EDAC-PASEMI**

**Mail** Egor Martovetsky <egor@pasemi.com>

**Mailing list** linux-edac@vger.kernel.org

**Status** Maintained

**Files** drivers/edac/pasemi\_edac.c

### \* EDAC-PND2

**Mail** Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/pnd2\_edac.[ch]

### \* EDAC-QCOM

**Mail** Channagoud Kadabi <[ckadabi@codeaurora.org](mailto:ckadabi@codeaurora.org)>, Venkata Narendra Kumar Gutta <[vnkgutta@codeaurora.org](mailto:vnkgutta@codeaurora.org)>

**Mailing list** [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org), [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/qcom\_edac.c

### \* EDAC-R82600

**Mail** Tim Small <[tim@buttersideup.com](mailto:tim@buttersideup.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/r82600\_edac.c

### \* EDAC-SBRIDGE

**Mail** Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>

**Reviewer** Qiuxu Zhuo <[qiuxu.zhuo@intel.com](mailto:qiuxu.zhuo@intel.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/sb\_edac.c

### \* EDAC-SIFIVE

**Mail** Yash Shah <[yash.shah@sifive.com](mailto:yash.shah@sifive.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Supported

**Files** drivers/edac/sifive\_edac.c

### \* EDAC-SKYLAKE

**Mail** Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/skx\_\*.c

### \* EDAC-TI

**Mail** Tero Kristo <[t-kristo@ti.com](mailto:t-kristo@ti.com)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** drivers/edac/ti\_edac.c

### \* EDIROL UA-101/UA-1000 DRIVER

**Mail** Clemens Ladisch <[clemens@ladisch.de](mailto:clemens@ladisch.de)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git>

**Files** sound/usb/misc/ua101.c

### \* EFI TEST DRIVER

**Mail** Ivan Hu <[ivan.hu@canonical.com](mailto:ivan.hu@canonical.com)>, Ard Biesheuvel <[ardb@kernel.org](mailto:ardb@kernel.org)>

**Mailing list** [linux-efi@vger.kernel.org](mailto:linux-efi@vger.kernel.org)

**Status** Maintained

**Files** drivers/firmware/efi/test/

### \* EFI VARIABLE FILESYSTEM

**Mail** Matthew Garrett <[matthew.garrett@nebula.com](mailto:matthew.garrett@nebula.com)>, Jeremy Kerr <[jk@ozlabs.org](mailto:jk@ozlabs.org)>, Ard Biesheuvel <[ardb@kernel.org](mailto:ardb@kernel.org)>

**Mailing list** [linux-efi@vger.kernel.org](mailto:linux-efi@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/efi/efi.git>

**Files** fs/efivarfs/

### \* EFIFB FRAMEBUFFER DRIVER

**Mail** Peter Jones <[pjones@redhat.com](mailto:pjones@redhat.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/efifb.c

### \* EFS FILESYSTEM

**Status** Orphan

**Web-page** <http://aeschi.ch.eu.org/efs/>

**Files** fs/efs/

### \* EHEA (IBM pSeries eHEA 10Gb ethernet adapter) DRIVER

**Mail** Douglas Miller <[dougmill@linux.ibm.com](mailto:dougmill@linux.ibm.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/ibm/ehea/

### \* EM28XX VIDEO4LINUX DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/admin-guide/media/em28xx\* drivers/media/usb/em28xx/

### \* EMBEDDED LINUX

**Mail** Paul Gortmaker <[paul.gortmaker@windriver.com](mailto:paul.gortmaker@windriver.com)>, Matt Mackall <[mpm@selenic.com](mailto:mpm@selenic.com)>, David Woodhouse <[dwmw2@infradead.org](mailto:dwmw2@infradead.org)>

**Mailing list** [linux-embedded@vger.kernel.org](mailto:linux-embedded@vger.kernel.org)

**Status** Maintained

## \* EMMC CMDQ HOST CONTROLLER INTERFACE (CQHCI) DRIVER

**Mail** Adrian Hunter <[adrian.hunter@intel.com](mailto:adrian.hunter@intel.com)>, Ritesh Harjani <[riteshh@codeaurora.org](mailto:riteshh@codeaurora.org)>, Asutosh Das <[asutoshd@codeaurora.org](mailto:asutoshd@codeaurora.org)>

**Mailing list** [linux-mmc@vger.kernel.org](mailto:linux-mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/cqhci\*

## \* EMULEX 10Gbps iSCSI - OneConnect DRIVER

**Mail** Subbu Seetharaman <[subbu.seetharaman@broadcom.com](mailto:subbu.seetharaman@broadcom.com)>, Ketan Mukadam <[ketan.mukadam@broadcom.com](mailto:ketan.mukadam@broadcom.com)>, Jitendra Bhivare <[jitendra.bhivare@broadcom.com](mailto:jitendra.bhivare@broadcom.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.broadcom.com>

**Files** drivers/scsi/be2iscsi/

## \* EMULEX 10Gbps NIC BE2, BE3-R, Lancer, Skyhawk-R DRIVER (be2net)

**Mail** Ajit Khaparde <[ajit.khaparde@broadcom.com](mailto:ajit.khaparde@broadcom.com)>, Sriharsha Basavapatna <[sriharsha.basavapatna@broadcom.com](mailto:sriharsha.basavapatna@broadcom.com)>, Somnath Kotur <[somnath.kotur@broadcom.com](mailto:somnath.kotur@broadcom.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.emulex.com>

**Files** drivers/net/ethernet/emulex/benet/

## \* EMULEX ONECONNECT ROCE DRIVER

**Mail** Selvin Xavier <[selvin.xavier@broadcom.com](mailto:selvin.xavier@broadcom.com)>, Devesh Sharma <[devesh.sharma@broadcom.com](mailto:devesh.sharma@broadcom.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <http://www.broadcom.com>

**Files** drivers/infiniband/hw/ocrdma/ include/uapi/rdma/ocrdma-abi.h

## \* EMULEX/BROADCOM LPFC FC/FCOE SCSI DRIVER

**Mail** James Smart <[james.smart@broadcom.com](mailto:james.smart@broadcom.com)>, Dick Kennedy <[dick.kennedy@broadcom.com](mailto:dick.kennedy@broadcom.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.broadcom.com>

**Files** drivers/scsi/lpfc/

## \* ENE CB710 FLASH CARD READER DRIVER

**Mail** Michał Mirosław <[mirq-linux@rere.qmqm.pl](mailto:mirq-linux@rere.qmqm.pl)>

**Status** Maintained

**Files** drivers/misc/cb710/ drivers/mmc/host/cb710-mmc.\*  
include/linux/cb710.h

## \* ENE KB2426 (ENE0100/ENE020XX) INFRARED RECEIVER

**Mail** Maxim Levitsky <[maximlevitsky@gmail.com](mailto:maximlevitsky@gmail.com)>

**Status** Maintained

**Files** drivers/media/rc/ene\_ir.\*

## \* EPAPR HYPERVISOR BYTE CHANNEL DEVICE DRIVER

**Mail** Laurentiu Tudor <[laurentiu.tudor@nxp.com](mailto:laurentiu.tudor@nxp.com)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/tty/ehv\_bytechan.c

## \* EPSON S1D13XXX FRAMEBUFFER DRIVER

**Mail** Kristoffer Ericson <[kristoffer.ericson@gmail.com](mailto:kristoffer.ericson@gmail.com)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kristoffer/linux-hpc.git>

**Files** drivers/video/fbdev/s1d13xxfb.c include/video/s1d13xxfb.h

## \* EROFS FILE SYSTEM

**Mail** Gao Xiang <[xiang@kernel.org](mailto:xiang@kernel.org)>, Chao Yu <[yuchao0@huawei.com](mailto:yuchao0@huawei.com)>

**Mailing list** [linux-erofs@lists.ozlabs.org](mailto:linux-erofs@lists.ozlabs.org)

**Status** Maintained

**SCM** [git git://git.kernel.org/pub/scm/linux/kernel/git/xiang/erofs.git](git://git.kernel.org/pub/scm/linux/kernel/git/xiang/erofs.git)

**Files** `filesystems/erofs fs/erofs/ include/trace/events/erofs.h`

## \* ERRSEQ ERROR TRACKING INFRASTRUCTURE

**Mail** Jeff Layton <[jlayton@kernel.org](mailto:jlayton@kernel.org)>

**Status** Maintained

**Files** `include/linux/errseq.h lib/errseq.c`

## \* ET131X NETWORK DRIVER

**Mail** Mark Einon <[mark.einon@gmail.com](mailto:mark.einon@gmail.com)>

**Status** Odd Fixes

**Files** `drivers/net/ethernet/agere/`

## \* ETHERNET BRIDGE

**Mail** Roopa Prabhu <[roopa@cumulusnetworks.com](mailto:roopa@cumulusnetworks.com)>, Nikolay Aleksandrov <[nikolay@cumulusnetworks.com](mailto:nikolay@cumulusnetworks.com)>

**Mailing list** [bridge@lists.linux-foundation.org](mailto:bridge@lists.linux-foundation.org) (moderated for non-subscribers), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linuxfoundation.org/en/Net:Bridge>

**Files** `include/linux/netfilter_bridge/ net/bridge/`

## \* ETHERNET PHY LIBRARY

**Mail** Andrew Lunn <[andrew@lunn.ch](mailto:andrew@lunn.ch)>, Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>, Heiner Kallweit <[hkallweitz1@gmail.com](mailto:hkallweitz1@gmail.com)>

**Reviewer** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-class-net-phydev  
Documentation/devicetree/bindings/net/ethernet-phy.  
yaml Documentation/devicetree/bindings/net/mdio\*  
Documentation/devicetree/bindings/net/qca\_ar803x.yaml net-  
working/phy drivers/net/phy/ drivers/of/of\_mdio.c drivers/  
of/of\_net.c include/dt-bindings/net/qca\_ar803x.h include/  
linux/\*mdio\*.h include/linux/of\_net.h include/linux/phy.h  
include/linux/phy\_fixed.h include/linux/platform\_data/  
mdio-bcm-unimac.h include/linux/platform\_data/mdio-gpio.h  
include/trace/events/mdio.h include/uapi/linux/mdio.h  
include/uapi/linux/mii.h

### \* EXFAT FILE SYSTEM

**Mail** Namjae Jeon <[namjae.jeon@samsung.com](mailto:namjae.jeon@samsung.com)>, Sungjong Seo  
<[sj1557.seo@samsung.com](mailto:sj1557.seo@samsung.com)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Maintained

**Files** fs/exfat/

### \* EXT2 FILE SYSTEM

**Mail** Jan Kara <[jack@suse.com](mailto:jack@suse.com)>

**Mailing list** [linux-ext4@vger.kernel.org](mailto:linux-ext4@vger.kernel.org)

**Status** Maintained

**Files** filesystems/ext2 fs/ext2/ include/linux/ext2\*

### \* EXT4 FILE SYSTEM

**Mail** “Theodore Ts’o” <[tytso@mit.edu](mailto:tytso@mit.edu)>, Andreas Dilger  
<[adilger.kernel@dilger.ca](mailto:adilger.kernel@dilger.ca)>

**Mailing list** [linux-ext4@vger.kernel.org](mailto:linux-ext4@vger.kernel.org)

**Status** Maintained

**Web-page** <http://ext4.wiki.kernel.org>

**Patchwork** <http://patchwork.ozlabs.org/project/linux-ext4/list/>

**SCM** git [git.kernel.org/pub/scm/linux/kernel/git/tytso/ext4.git](http://git.kernel.org/pub/scm/linux/kernel/git/tytso/ext4.git)

**Files** Documentation/filesystems/ext4/ fs/ext4/

## \* Extended Verification Module (EVM)

**Mail** Mimi Zohar <zohar@linux.ibm.com>

**Mailing list** linux-integrity@vger.kernel.org

**Status** Supported

**Files** security/integrity/evm/

## \* EXTENSIBLE FIRMWARE INTERFACE (EFI)

**Mail** Ard Biesheuvel <ardb@kernel.org>

**Mailing list** linux-efi@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/efi/efi.git

**Files** admin-guide/efi-stub arch/\*/include/asm/efi.h arch/\*/  
kernel/efi.c arch/arm/boot/compressed/efi-header.S arch/  
arm64/kernel/efi-entry.S arch/x86/platform/efi/ drivers/  
firmware/efi/ include/linux/efi\*.h

## \* EXTERNAL CONNECTOR SUBSYSTEM (EXTCON)

**Mail** MyungJoo Ham <myungjoo.ham@samsung.com>, Chanwoo Choi  
<cw00.choi@samsung.com>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/chanwoo/extcon.git

**Files** Documentation/devicetree/bindings/extcon/ firmware-  
guide/acpi/extcon-intel-int3496 drivers/extcon/ include/linux/  
extcon.h include/linux/extcon/

## \* EXTRA BOOT CONFIG

**Mail** Masami Hiramatsu <mhiramat@kernel.org>

**Status** Maintained

**Files** admin-guide/bootconfig fs/proc/bootconfig.c include/linux/  
bootconfig.h lib/bootconfig.c tools/bootconfig/\*

### \* EXYNOS DP DRIVER

**Mail** Jingoo Han <jingoohan1@gmail.com>

**Mailing list** dri-devel@lists.freedesktop.org

**Status** Maintained

**Files** drivers/gpu/drm/exynos/exynos\_dp\*

### \* EXYNOS SYSMMU (IOMMU) driver

**Mail** Marek Szyprowski <m.szyprowski@samsung.com>

**Mailing list** iommu@lists.linux-foundation.org

**Status** Maintained

**Files** drivers/iommu/exynos-iommu.c

### \* EZchip NPS platform support

**Mail** Vineet Gupta <vgupta@synopsys.com>, Ofer Levi <oferle@mellanox.com>

**Status** Supported

**Files** arch/arc/boot/dts/eznps.dts arch/arc/plat-eznp

### \* F2FS FILE SYSTEM

**Mail** Jaegeuk Kim <jaegeuk@kernel.org>, Chao Yu <yuchao0@huawei.com>

**Mailing list** linux-f2fs-devel@lists.sourceforge.net

**Status** Maintained

**Web-page** <https://f2fs.wiki.kernel.org/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jaegeuk/f2fs.git

**Files** Documentation/ABI/testing/sysfs-fs-f2fs fileystems/f2fs-fs/f2fs/ include/linux/f2fs\_fs.h include/trace/events/f2fs.h

## \* F71805F HARDWARE MONITORING DRIVER

**Mail** Jean Delvare <jdelvare@suse.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/f71805f drivers/hwmon/f71805f.c

## \* FADDR2LINE

**Mail** Josh Poimboeuf <jpoimboe@redhat.com>

**Status** Maintained

**Files** scripts/faddr2line

## \* FAILOVER MODULE

**Mail** Sridhar Samudrala <sridhar.samudrala@intel.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** networking/failover include/net/failover.h net/core/failover.c

## \* FANOTIFY

**Mail** Jan Kara <jack@suse.cz>

**Reviewer** Amir Goldstein <amir73il@gmail.com>

**Mailing list** linux-fsdevel@vger.kernel.org

**Status** Maintained

**Files** fs/notify/fanotify/ include/linux/fanotify.h include/uapi/linux/fanotify.h

## \* FARSYNC SYNCHRONOUS DRIVER

**Mail** Kevin Curtis <kevin.curtis@farsite.co.uk>

**Status** Supported

**Web-page** <http://www.farsite.co.uk/>

**Files** drivers/net/wan/farsync.\*

### \* FAULT INJECTION SUPPORT

**Mail** Akinobu Mita <[akinobu.mita@gmail.com](mailto:akinobu.mita@gmail.com)>

**Status** Supported

**Files** Documentation/fault-injection/ lib/fault-inject.c

### \* FBTFT Framebuffer drivers

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org),  
[fbdev@vger.kernel.org](mailto:fbdev@vger.kernel.org)

linux-

**Status** Orphan

**Files** drivers/staging/fbtft/

### \* FC0011 TUNER DRIVER

**Mail** Michael Buesch <[m@bues.ch](mailto:m@bues.ch)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/tuners/fc0011.c      drivers/media/tuners/  
fc0011.h

### \* FC2580 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/fc2580\*

### \* FCOE SUBSYSTEM (libfc, libfcoe, fcoe)

**Mail** Hannes Reinecke <[hare@suse.de](mailto:hare@suse.de)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** [www.Open-FCoE.org](http://www.Open-FCoE.org)

**Files** drivers/scsi/fcoe/ drivers/scsi/libfc/ include/scsi/fc/  
include/scsi/libfc.h include/scsi/libfcoe.h include/uapi/  
scsi/fc/

\* **FILE LOCKING (flock() and fcntl()/lockf())**

**Mail** Jeff Layton <[jlayton@kernel.org](mailto:jlayton@kernel.org)>, “J. Bruce Fields”  
<[bfields@fieldses.org](mailto:bfields@fieldses.org)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Maintained

**Files** `fs/fcntl.c` `fs/locks.c` `include/linux/fcntl.h` `include/uapi/linux/fcntl.h`

\* **FILESYSTEM DIRECT ACCESS (DAX)**

**Mail** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>

**Reviewer** Matthew Wilcox <[willy@infradead.org](mailto:willy@infradead.org)>, Jan Kara  
<[jack@suse.cz](mailto:jack@suse.cz)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org), [linux-nvdimm@lists.01.org](mailto:linux-nvdimm@lists.01.org)

**Status** Supported

**Files** `fs/dax.c` `include/linux/dax.h` `include/trace/events/fs_dax.h`

\* **FILESYSTEMS (VFS and infrastructure)**

**Mail** Alexander Viro <[viro@zeniv.linux.org.uk](mailto:viro@zeniv.linux.org.uk)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Maintained

**Files** `fs/*` `include/linux/fs.h` `include/linux/fs_types.h` `include/uapi/linux/fs.h` `include/uapi/linux/openat2.h`

\* **FINTEK F75375S HARDWARE MONITOR AND FAN CONTROLLER DRIVER**

**Mail** Riku Voipio <[riku.voipio@iki.fi](mailto:riku.voipio@iki.fi)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** `drivers/hwmon/f75375s.c` `include/linux/f75375s.h`

### \* FIREWIRE AUDIO DRIVERS and IEC 61883-1/6 PACKET STREAMING ENGINE

**Mail** Clemens Ladisch <[clemens@ladisch.de](mailto:clemens@ladisch.de)>, Takashi Sakamoto <[o-takashi@sakamocchi.jp](mailto:o-takashi@sakamocchi.jp)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git>

**Files** `include/uapi/sound/firewire.h` `sound/firewire/`

### \* FIREWIRE MEDIA DRIVERS (firedtv)

**Mail** Stefan Richter <[stefanr@s5r6.in-berlin.de](mailto:stefanr@s5r6.in-berlin.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [linux1394-devel@lists.sourceforge.net](mailto:linux1394-devel@lists.sourceforge.net)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mchehab/linux-media.git>

**Files** `drivers/media/firewire/`

### \* FIREWIRE SBP-2 TARGET

**Mail** Chris Boot <[bootc@bootc.net](mailto:bootc@bootc.net)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org), [target-devel@vger.kernel.org](mailto:target-devel@vger.kernel.org), [linux1394-devel@lists.sourceforge.net](mailto:linux1394-devel@lists.sourceforge.net)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/nab/lio-core-2.6.git> master

**Files** `drivers/target/sbp/`

### \* FIREWIRE SUBSYSTEM

**Mail** Stefan Richter <[stefanr@s5r6.in-berlin.de](mailto:stefanr@s5r6.in-berlin.de)>

**Mailing list** [linux1394-devel@lists.sourceforge.net](mailto:linux1394-devel@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://ieee1394.wiki.kernel.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/ieee1394/linux1394.git>

**Files** `drivers/firewire/` `include/linux/firewire.h` `include/uapi/linux/firewire*.h` `tools/firewire/`

\* **FIRMWARE LOADER (request\_firmware)**

**Mail** Luis Chamberlain <[mcgrof@kernel.org](mailto:mcgrof@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** Documentation/firmware\_class/  
firmware\_loader/ include/linux/firmware.h      drivers/base/

\* **FLASH ADAPTER DRIVER (IBM Flash Adapter 900GB Full Height PCI Flash Card)**

**Mail** Joshua Morris <[josh.h.morris@us.ibm.com](mailto:josh.h.morris@us.ibm.com)>, Philip Kelleher  
<[pjk1939@linux.ibm.com](mailto:pjk1939@linux.ibm.com)>

**Status** Maintained

**Files** drivers/block/rsxx/

\* **FLEXTIMER FTM-QUADDEC DRIVER**

**Mail** Patrick Havelange <[patrick.havelange@essensium.com](mailto:patrick.havelange@essensium.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-counter-ftm-quaddec  
Documentation/devicetree/bindings/counter/ftm-quaddec.  
txt drivers/counter/ftm-quaddec.c

\* **FLOPPY DRIVER**

**Mail** Denis Efremov <[efremov@linux.com](mailto:efremov@linux.com)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/block/floppy.c

\* **FLYSKY FSIA6B RC RECEIVER**

**Mail** Markus Koch <[markus@notsyncing.net](mailto:markus@notsyncing.net)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/joystick/fsia6b.c

### \* FORCEDETH GIGABIT ETHERNET DRIVER

**Mail** Rain River <[rain.1986.08.12@gmail.com](mailto:rain.1986.08.12@gmail.com)>, Zhu Yanjun  
<[zyjzyj2000@gmail.com](mailto:zyjzyj2000@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/nvidia/\*

### \* FPGA DFL DRIVERS

**Mail** Wu Hao <[hao.wu@intel.com](mailto:hao.wu@intel.com)>

**Mailing list** [linux-fpga@vger.kernel.org](mailto:linux-fpga@vger.kernel.org)

**Status** Maintained

**Files** fpga/dfl drivers/fpga/dfl\* include/uapi/linux/fpga-dfl.h

### \* FPGA MANAGER FRAMEWORK

**Mail** Moritz Fischer <[mdf@kernel.org](mailto:mdf@kernel.org)>

**Mailing list** [linux-fpga@vger.kernel.org](mailto:linux-fpga@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.rocketboards.org>

**Patchwork** <http://patchwork.kernel.org/project/linux-fpga/list/>

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/mdf/linux-fpga.git](http://git.kernel.org/pub/scm/linux/kernel/git/mdf/linux-fpga.git)

**Files** Documentation/devicetree/bindings/fpga/ Documentation/  
driver-api/fpga/ Documentation/fpga/ drivers/fpga/  
include/linux/fpga/

### \* FPU EMULATOR

**Mail** Bill Metzenthin <[billm@melbpc.org.au](mailto:billm@melbpc.org.au)>

**Status** Maintained

**Web-page** <http://floatingpoint.sourceforge.net/emulator/index.html>

**Files** arch/x86/math-emu/

## \* FRAME RELAY DLCI/FRAD (Sangoma drivers too)

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Orphan

**Files** drivers/net/wan/dlc1.c drivers/net/wan/sdla.c

## \* FRAMEBUFFER LAYER

**Mail** Bartłomiej Zolnierkiewicz <[b.zolnierkie@samsung.com](mailto:b.zolnierkie@samsung.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), [fbdev@vger.kernel.org](mailto:fbdev@vger.kernel.org) linux-

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/linux-fbdev/list/>

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/fb/ drivers/video/ include/linux/fb.h  
include/uapi/linux/fb.h include/uapi/video/ include/video/

## \* FREESCALE CAAM (Cryptographic Acceleration and Assurance Module) DRIVER

**Mail** Horia Geantă <[horia.geanta@nxp.com](mailto:horia.geanta@nxp.com)>, Aymen Sghaier <[aymen.sghaier@nxp.com](mailto:aymen.sghaier@nxp.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/crypto/fsl-sec4.txt  
drivers/crypto/caam/

## \* FREESCALE COLDFIRE M5441X MMC DRIVER

**Mail** Angelo Dureghello <[angelo.dureghello@timesys.com](mailto:angelo.dureghello@timesys.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/sdhci-esdhc-mcf.c include/linux/  
platform\_data/mmc-esdhc-mcf.h

## \* FREESCALE DIU FRAMEBUFFER DRIVER

**Mail** Timur Tabi <[timur@kernel.org](mailto:timur@kernel.org)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/fsl-diu-fb.\*

## \* FREESCALE DMA DRIVER

**Mail** Li Yang <[leoyang.li@nxp.com](mailto:leoyang.li@nxp.com)>, Zhang Wei <[zw@zh-kernel.org](mailto:zw@zh-kernel.org)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/dma/fsldma.\*

## \* FREESCALE ENETC ETHERNET DRIVERS

**Mail** Claudiu Manoil <[claudiu.manoil@nxp.com](mailto:claudiu.manoil@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/freescale/enetc/

## \* FREESCALE eTSEC ETHERNET DRIVER (GIANFAR)

**Mail** Claudiu Manoil <[claudiu.manoil@nxp.com](mailto:claudiu.manoil@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/fsl-tsec-phy.txt  
drivers/net/ethernet/freescale/gianfar\*

## \* FREESCALE GPMI NAND DRIVER

**Mail** Han Xu <[han.xu@nxp.com](mailto:han.xu@nxp.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** drivers/mtd/nand/raw/gpmi-nand/\*

## \* FREESCALE I2C CPM DRIVER

**Mail** Jochen Friedrich <jochen@scram.de>

**Mailing list** linuxppc-dev@lists.ozlabs.org, linux-i2c@vger.kernel.org

**Status** Maintained

**Files** drivers/i2c/busses/i2c-cpm.c

## \* FREESCALE IMX / MXC FEC DRIVER

**Mail** Fugang Duan <fugang.duan@nxp.com>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/fsl-fec.txt  
drivers/net/ethernet/freescale/fec.h                drivers/net/  
ethernet/freescale/fec\_main.c                drivers/net/ethernet/  
freescale/fec\_ptp.c

## \* FREESCALE IMX / MXC FRAMEBUFFER DRIVER

**Mail** Sascha Hauer <s.hauer@pengutronix.de>

**Reviewer** Pengutronix Kernel Team <kernel@pengutronix.de>

**Mailing list** linux-fbdev@vger.kernel.org,                linux-arm-  
kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/video/fbdev/imxfb.c                include/linux/  
platform\_data/video-imxfb.h

## \* FREESCALE IMX DDR PMU DRIVER

**Mail** Frank Li <Frank.li@nxp.com>

**Mailing list** linux-arm-kernel@lists.infradead.org

**Status** Maintained

**Files** admin-guide/perf/imx-ddr                Documentation/devicetree/  
bindings/perf/fsl-imx-ddr.txt                drivers/perf/  
fsl\_imx8\_ddr\_perf.c

## \* FREESCALE IMX I2C DRIVER

**Mail** Oleksij Rempel <[o.rempel@pengutronix.de](mailto:o.rempel@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-imx.txt  
drivers/i2c/busses/i2c-imx.c

## \* FREESCALE IMX LPI2C DRIVER

**Mail** Dong Aisheng <[aisheng.dong@nxp.com](mailto:aisheng.dong@nxp.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org), [linux-imx@nxp.com](mailto:linux-imx@nxp.com)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-imx-lpi2c.txt  
drivers/i2c/busses/i2c-imx-lpi2c.c

## \* FREESCALE QORIQ DPAA ETHERNET DRIVER

**Mail** Madalin Bucur <[madalin.bucur@nxp.com](mailto:madalin.bucur@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/freescale/dpaa

## \* FREESCALE QORIQ DPAA FMAN DRIVER

**Mail** Madalin Bucur <[madalin.bucur@nxp.com](mailto:madalin.bucur@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/fsl-fman.txt  
drivers/net/ethernet/freescale/fman

## \* FREESCALE QORIQ PTP CLOCK DRIVER

**Mail** Yangbo Lu <[yangbo.lu@nxp.com](mailto:yangbo.lu@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/ptp/ptp-qorirq.txt  
drivers/net/ethernet/freescale/dpaa2/dpaa2-ptp\* drivers/  
net/ethernet/freescale/dpaa2/dprtc\* drivers/net/ethernet/  
freescale/enetc/enetc\_ptp.c drivers/ptp/ptp\_qorirq.c

drivers/ptp/ptp\_qoriq\_debugfs.c                    include/linux/fsl/  
ptp\_qoriq.h

## \* FREESCALE QUAD SPI DRIVER

**Mail** Han Xu <[han.xu@nxp.com](mailto:han.xu@nxp.com)>

**Mailing list** [linux-spi@vger.kernel.org](mailto:linux-spi@vger.kernel.org)

**Status** Maintained

**Files** drivers/spi/spi-fsl-qspi.c

## \* FREESCALE QUICC ENGINE LIBRARY

**Mail** Qiang Zhao <[qiang.zhao@nxp.com](mailto:qiang.zhao@nxp.com)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/soc/fsl/qe/ include/soc/fsl/\*qe\*.h include/soc/  
fsl/\*ucc\*.h

## \* FREESCALE QUICC ENGINE UCC ETHERNET DRIVER

**Mail** Li Yang <[leoyang.li@nxp.com](mailto:leoyang.li@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/net/ethernet/freescale/ucc\_geth\*

## \* FREESCALE QUICC ENGINE UCC HDLC DRIVER

**Mail** Zhao Qiang <[qiang.zhao@nxp.com](mailto:qiang.zhao@nxp.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/net/wan/fsl\_ucc\_hdlc\*

## \* FREESCALE QUICC ENGINE UCC UART DRIVER

**Mail** Timur Tabi <[timur@kernel.org](mailto:timur@kernel.org)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/tty/serial/ucc\_uart.c

## \* FREESCALE SOC DRIVERS

**Mail** Li Yang <leoyang.li@nxp.com>

**Mailing list** linuxppc-dev@lists.ozlabs.org,  
kernel@lists.infradead.org

linux-arm-

**Status** Maintained

**Files** Documentation/devicetree/bindings/misc/fsl,  
dpaa2-console.txt Documentation/devicetree/bindings/soc/  
fsl/ drivers/soc/fsl/ include/linux/fsl/

## \* FREESCALE SOC FS\_ENET DRIVER

**Mail** Pantelis Antoniou <pantelis.antoniou@gmail.com>

**Mailing list** linuxppc-dev@lists.ozlabs.org, netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/freescale/fs\_enet/ include/linux/  
fs\_enet\_pd.h

## \* FREESCALE SOC SOUND DRIVERS

**Mail** Timur Tabi <timur@kernel.org>, Nicolin Chen  
<nicoleotsuka@gmail.com>, Xiubo Li <Xiubo.Lee@gmail.com>

**Reviewer** Fabio Estevam <festevam@gmail.com>

**Mailing list** alsa-devel@alsa-project.org (moderated for non-  
subscribers), linuxppc-dev@lists.ozlabs.org

**Status** Maintained

**Files** sound/soc/fsl/fsl\* sound/soc/fsl/imx\* sound/soc/fsl/  
mpc8610\_hpcd.c

## \* FREESCALE USB PERIPHERAL DRIVERS

**Mail** Li Yang <leoyang.li@nxp.com>

**Mailing list** linux-usb@vger.kernel.org, linuxppc-dev@lists.ozlabs.org

**Status** Maintained

**Files** drivers/usb/gadget/udc/fsl\*

## \* FREEVXFS FILESYSTEM

**Mail** Christoph Hellwig <[hch@infradead.org](mailto:hch@infradead.org)>

**Status** Maintained

**Web-page** <ftp://ftp.openlinux.org/pub/people/hch/vxfs>

**Files** fs/freevxfs/

## \* FREEZER

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Pavel Machek <[pavel@ucw.cz](mailto:pavel@ucw.cz)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**Files** power/freezing-of-tasks include/linux/freezer.h kernel/freezer.c

## \* FRONTSWAP API

**Mail** Konrad Rzeszutek Wilk <[konrad.wilk@oracle.com](mailto:konrad.wilk@oracle.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** include/linux/frontswap.h mm/frontswap.c

## \* FS-CACHE: LOCAL CACHING FOR NETWORK FILESYSTEMS

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>

**Mailing list** [linux-cachefs@redhat.com](mailto:linux-cachefs@redhat.com) (moderated for non-subscribers)

**Status** Supported

**Files** Documentation/filesystems/caching/ fs/fscache/ include/linux/fscache\*.h

## \* FSCRYPT: FILE SYSTEM LEVEL ENCRYPTION SUPPORT

**Mail** Theodore Y. Ts’o <[tytso@mit.edu](mailto:tytso@mit.edu)>, Jaegeuk Kim <[jaegeuk@kernel.org](mailto:jaegeuk@kernel.org)>, Eric Biggers <[ebiggers@kernel.org](mailto:ebiggers@kernel.org)>

**Mailing list** [linux-fscrypt@vger.kernel.org](mailto:linux-fscrypt@vger.kernel.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-fscrypt/list/>

**SCM** git <git://git.kernel.org/pub/scm/fs/fscrypt/fscrypt.git>

**Files** filesystems/fscrypt fs/crypto/ include/linux/fscrypt\*.h  
include/uapi/linux/fscrypt.h

### \* FSI SUBSYSTEM

**Mail** Jeremy Kerr <jk@ozlabs.org>, Joel Stanley <joel@jms.id.au>  
**Reviewer** Alistair Popple <alistair@popple.id.au>, Eddie James  
<eajames@linux.ibm.com>

**Mailing list** linux-fsi@lists.ozlabs.org

**Status** Supported

**Patchwork** <http://patchwork.ozlabs.org/project/linux-fsi/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/joel/fsi.git

**Files** drivers/fsi/ include/linux/fsi\*.h include/trace/events/  
fsi\*.h

### \* FSI-ATTACHED I2C DRIVER

**Mail** Eddie James <eajames@linux.ibm.com>  
**Mailing list** linux-i2c@vger.kernel.org openbmc@lists.ozlabs.org  
(moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-fsi.txt  
drivers/i2c/busses/i2c-fsi.c

### \* FSI-ATTACHED SPI DRIVER

**Mail** Eddie James <eajames@linux.ibm.com>  
**Mailing list** linux-spi@vger.kernel.org  
**Status** Maintained  
**Files** Documentation/devicetree/bindings/fsi/ibm,fsi2spi.yaml  
drivers/spi/spi-fsi.c

### \* FSNOTIFY: FILESYSTEM NOTIFICATION INFRASTRUCTURE

**Mail** Jan Kara <jack@suse.cz>  
**Reviewer** Amir Goldstein <amir73il@gmail.com>  
**Mailing list** linux-fsdevel@vger.kernel.org  
**Status** Maintained  
**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jack/linux-fs.git fs-  
notify

**Files** fs/notify/ include/linux/fsnotify\*.h

### \* FSVERITY: READ-ONLY FILE-BASED AUTHENTICITY PROTECTION

**Mail** Eric Biggers <[ebiggers@kernel.org](mailto:ebiggers@kernel.org)>, Theodore Y. Ts'o <[tytso@mit.edu](mailto:tytso@mit.edu)>

**Mailing list** [linux-fscrypt@vger.kernel.org](mailto:linux-fscrypt@vger.kernel.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-fscrypt/list/>

**SCM** git <git://git.kernel.org/pub/scm/fs/fscrypt/fscrypt.git> fsverity

**Files** filesystems/fsverity fs/verity/ include/linux/fsverity.h  
include/uapi/linux/fsverity.h

### \* FUJITSU LAPTOP EXTRAS

**Mail** Jonathan Woithe <[jwoithe@just42.net](mailto:jwoithe@just42.net)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/fujitsu-laptop.c

### \* FUJITSU M-5MO LS CAMERA ISP DRIVER

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>, Heungjun Kim <[riverful.kim@samsung.com](mailto:riverful.kim@samsung.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/m5mols/ include/media/i2c/m5mols.h

### \* FUJITSU TABLET EXTRAS

**Mail** Robert Gerlach <[khnz@gmx.de](mailto:khnz@gmx.de)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/fujitsu-tablet.c

### \* FUSE: FILESYSTEM IN USERSPACE

**Mail** Miklos Szeredi <miklos@szeredi.hu>

**Mailing list** linux-fsdevel@vger.kernel.org

**Status** Maintained

**Web-page** <http://fuse.sourceforge.net/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/mszeredi/fuse.git

**Files** filesystems/fuse fs/fuse/ include/uapi/linux/fuse.h

### \* FUTEX SUBSYSTEM

**Mail** Thomas Gleixner <tglx@linutronix.de>, Ingo Molnar <mingo@redhat.com>

**Reviewer** Peter Zijlstra <peterz@infradead.org>, Darren Hart <dvhart@infradead.org>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git locking/core

**Files** Documentation/locking/\*futex\* include/asm-generic/futex.h include/linux/futex.h include/uapi/linux/futex.h kernel/futex.c tools/perf/bench/futex\* Documentation/locking/\*futex\*

### \* GATEWORKS SYSTEM CONTROLLER (GSC) DRIVER

**Mail** Tim Harvey <tharvey@gateworks.com>, Robert Jones <rjones@gateworks.com>

**Status** Maintained

**Files** Documentation/devicetree/bindings/mfd/gateworks-gsc.yaml drivers/mfd/gateworks-gsc.c include/linux/mfd/gsc.h hwmon/gsc-hwmon drivers/hwmon/gsc-hwmon.c include/linux/platform\_data/gsc\_hwmon.h

## \* GASKET DRIVER FRAMEWORK

**Mail** Rob Springer <[rspenger@google.com](mailto:rspenger@google.com)>, Todd  
Poynor <[toddpoynor@google.com](mailto:toddpoynor@google.com)>, Ben Chan  
<[benchan@chromium.org](mailto:benchan@chromium.org)>, Richard Yeh <[rcy@google.com](mailto:rcy@google.com)>

**Status** Maintained

**Files** drivers/staging/gasket/

## \* GCC PLUGINS

**Mail** Kees Cook <[keescook@chromium.org](mailto:keescook@chromium.org)>

**Reviewer** Emese Revfy <[re.emese@gmail.com](mailto:re.emese@gmail.com)>

**Mailing list** [kernel-hardening@lists.openwall.com](mailto:kernel-hardening@lists.openwall.com)

**Status** Maintained

**Files** kbuild/gcc-plugins scripts/Makefile.gcc-plugins scripts/  
gcc-plugin.sh scripts/gcc-plugins/

## \* GCOV BASED KERNEL PROFILING

**Mail** Peter Oberparleiter <[oberpar@linux.ibm.com](mailto:oberpar@linux.ibm.com)>

**Status** Maintained

**Files** dev-tools/gcov kernel/gcov/

## \* GDB KERNEL DEBUGGING HELPER SCRIPTS

**Mail** Jan Kiszka <[jan.kiszka@siemens.com](mailto:jan.kiszka@siemens.com)>, Kieran Bingham  
<[kbingham@kernel.org](mailto:kbingham@kernel.org)>

**Status** Supported

**Files** scripts/gdb/

## \* GDT SCSI DISK ARRAY CONTROLLER DRIVER

**Mail** Achim Leubner <[achim\\_leubner@adaptec.com](mailto:achim_leubner@adaptec.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.icp-vortex.com/>

**Files** drivers/scsi/gdt\*

## \* GEMTEK FM RADIO RECEIVER DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/radio/radio-gemtek\*

## \* GENERIC ARCHITECTURE TOPOLOGY

**Mail** Sudeep Holla <sudeep.holla@arm.com>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Maintained

**Files** drivers/base/arch\_topology.c include/linux/  
arch\_topology.h

## \* GENERIC GPIO I2C DRIVER

**Mail** Wolfram Sang <wsa+renesas@sang-engineering.com>

**Status** Supported

**Files** drivers/i2c/busses/i2c-gpio.c include/linux/  
platform\_data/i2c-gpio.h

## \* GENERIC GPIO I2C MULTIPLEXER DRIVER

**Mail** Peter Korsgaard <peter.korsgaard@barco.com>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Supported

**Files** i2c/muxes/i2c-mux-gpio drivers/i2c/muxes/i2c-mux-gpio.c  
include/linux/platform\_data/i2c-mux-gpio.h

## \* GENERIC HDLC (WAN) DRIVERS

**Mail** Krzysztof Halasa <khc@pm.waw.pl>

**Status** Maintained

**Web-page** <http://www.kernel.org/pub/linux/utils/net/hdrc/>

**Files** drivers/net/wan/c101.c drivers/net/wan/hd6457\* drivers/  
net/wan/hdlc\* drivers/net/wan/n2.c drivers/net/wan/  
pc300too.c drivers/net/wan/pci200syn.c drivers/net/wan/  
wanxl\*

## \* GENERIC INCLUDE/ASM HEADER FILES

**Mail** Arnd Bergmann <[arnd@arndb.de](mailto:arnd@arndb.de)>

**Mailing list** [linux-arch@vger.kernel.org](mailto:linux-arch@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/arnd/asm-generic.git>

**Files** include/asm-generic/ include/uapi/asm-generic/

## \* GENERIC PHY FRAMEWORK

**Mail** Kishon Vijay Abraham I <[kishon@ti.com](mailto:kishon@ti.com)>, Vinod Koul <[vkoul@kernel.org](mailto:vkoul@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/phy/linux-phy.git>

**Files** Documentation/devicetree/bindings/phy/ drivers/phy/ include/linux/phy/

## \* GENERIC PINCTRL I2C DEMULTIPLEXER DRIVER

**Mail** Wolfram Sang <[wsa+renesas@sang-engineering.com](mailto:wsa+renesas@sang-engineering.com)>

**Status** Supported

**Files** drivers/i2c/muxes/i2c-demux-pinctrl.c

## \* GENERIC PM DOMAINS

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Kevin Hilman <[khilman@kernel.org](mailto:khilman@kernel.org)>, Ulf Hansson <[ulf.hansson@linaro.org](mailto:ulf.hansson@linaro.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/power/power?domain\* drivers/base/power/domain\*.c include/linux/pm\_domain.h

### \* GENERIC RESISTIVE TOUCHSCREEN ADC DRIVER

**Mail** Eugen Hristev <[eugen.hristev@microchip.com](mailto:eugen.hristev@microchip.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/touchscreen/resistive-adc-touch.c

### \* GENERIC UIO DRIVER FOR PCI DEVICES

**Mail** “Michael S. Tsirkin” <[mst@redhat.com](mailto:mst@redhat.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Files** drivers/uio/uio\_pci\_generic.c

### \* GENERIC VDSO LIBRARY

**Mail** Andy Lutomirski <[luto@kernel.org](mailto:luto@kernel.org)>, Thomas Frascino  
Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>, Vincenzo Frascino  
<[vincenzo.frascino@arm.com](mailto:vincenzo.frascino@arm.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git  
timers/vdso

**Files** include/asm-generic/vdso/vsyscall.h include/vdso/  
kernel/time/vsyscall.c lib/vdso/

### \* GENWQE (IBM Generic Workqueue Card)

**Mail** Frank Haverkamp <[haver@linux.ibm.com](mailto:haver@linux.ibm.com)>

**Status** Supported

**Files** drivers/misc/genwqe/

### \* GET\_MAINTAINER SCRIPT

**Mail** Joe Perches <[joe@perches.com](mailto:joe@perches.com)>

**Status** Maintained

**Files** scripts/get\_maintainer.pl

### \* GFS2 FILE SYSTEM

**Mail** Bob Peterson <[rpeterso@redhat.com](mailto:rpeterso@redhat.com)>, Andreas Gruenbacher <[agruenba@redhat.com](mailto:agruenba@redhat.com)>

**Mailing list** [cluster-devel@redhat.com](mailto:cluster-devel@redhat.com)

**Status** Supported

**Web-page** <http://sources.redhat.com/cluster/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gfs2/linux-gfs2.git>

**Files** Documentation/filesystems/gfs2\* fs/gfs2/ include/uapi/linux/gfs2\_ondisk.h

### \* GNSS SUBSYSTEM

**Mail** Johan Hovold <[johan@kernel.org](mailto:johan@kernel.org)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/johan/gnss.git>

**Files** Documentation/ABI/testing/sysfs-class-gnss  
Documentation/devicetree/bindings/gnss/ drivers/gnss/  
include/linux/gnss.h

### \* GO7007 MPEG CODEC

**Mail** Hans Verkuil <[hverkuil-cisco@xs4all.nl](mailto:hverkuil-cisco@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/usb/go7007/

### \* GOODIX TOUCHSCREEN

**Mail** Bastien Nocera <[hadess@hadess.net](mailto:hadess@hadess.net)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/touchscreen/goodix.c

### \* GOOGLE ETHERNET DRIVERS

**Mail** Catherine Sullivan <[csully@google.com](mailto:csully@google.com)>

**Reviewer** Sagi Shahar <[sagis@google.com](mailto:sagis@google.com)>, Jon Olson <[jonolson@google.com](mailto:jonolson@google.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** networking/device\_drivers/google/gve drivers/net/ethernet/google

### \* GPD POCKET FAN DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/gpd-pocket-fan.c

### \* GPIO ACPI SUPPORT

**Mail** Mika Westerberg <[mika.westerberg@linux.intel.com](mailto:mika.westerberg@linux.intel.com)>, Andy Shevchenko <[andriy.shevchenko@linux.intel.com](mailto:andriy.shevchenko@linux.intel.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org), [linux-acpi@vger.kernel.org](mailto:linux-acpi@vger.kernel.org)

**Status** Maintained

**Files** firmware-guide/acpi/gpio-properties drivers/gpio/gpiolib-acpi.c drivers/gpio/gpiolib-acpi.h

### \* GPIO AGGREGATOR

**Mail** Geert Uytterhoeven <[geert+renesas@glider.be](mailto:geert+renesas@glider.be)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Supported

**Files** admin-guide/gpio/gpio-aggregator drivers/gpio/gpio-aggregator.c

## \* **GPIO IR Transmitter**

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/gpio-ir-tx.c

## \* **GPIO MOCKUP DRIVER**

**Mail** Bamvor Jian Zhang <[bamv2005@gmail.com](mailto:bamv2005@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-mockup.c tools/testing/selftests/gpio/

## \* **GPIO REGMAP**

**Reviewer** Michael Walle <[michael@walle.cc](mailto:michael@walle.cc)>

**Status** Maintained

**Files** drivers/gpio/gpio-regmap.c include/linux/gpio/regmap.h

## \* **GPIO SUBSYSTEM**

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>, Bartosz Golaszewski <[bgolaszewski@baylibre.com](mailto:bgolaszewski@baylibre.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/linusw/linux-gpio.git

**Files** Documentation/ABI/obsolete/sysfs-gpio Documentation/ABI/testing/gpio-cdev Documentation/admin-guide/gpio/Documentation/devicetree/bindings/gpio/ Documentation/driver-api/gpio/ drivers/gpio/ include/asm-generic/gpio.h include/linux/gpio.h include/linux/gpio/ include/linux/of\_gpio.h include/uapi/linux/gpio.h tools/gpio/

## \* GRE DEMULTIPLEXER DRIVER

**Mail** Dmitry Kozlov <[xeb@mail.ru](mailto:xeb@mail.ru)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** include/net/gre.h net/ipv4/gre\_demux.c net/ipv4/gre\_offload.c

## \* GRETHER 10/100/1G Ethernet MAC device driver

**Mail** Andreas Larsson <[andreas@gaisler.com](mailto:andreas@gaisler.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/aeroflex/

## \* GREYBUS AUDIO PROTOCOLS DRIVERS

**Mail** Vaibhav Agarwal <[vaibhav.sr@gmail.com](mailto:vaibhav.sr@gmail.com)>, Mark Greer <[mgreer@animalcreek.com](mailto:mgreer@animalcreek.com)>

**Status** Maintained

**Files** drivers/staging/greybus/audio\_apbridgea.c drivers/staging/greybus/audio\_apbridgea.h drivers/staging/greybus/audio\_codec.c drivers/staging/greybus/audio\_codec.h drivers/staging/greybus/audio\_manager.c drivers/staging/greybus/audio\_manager.h drivers/staging/greybus/audio\_manager\_module.c drivers/staging/greybus/audio\_manager\_private.h drivers/staging/greybus/audio\_manager\_sysfs.c drivers/staging/greybus/audio\_module.c drivers/staging/greybus/audio\_topology.c

## \* GREYBUS FW/HID/SPI PROTOCOLS DRIVERS

**Mail** Viresh Kumar <[vireshk@kernel.org](mailto:vireshk@kernel.org)>

**Status** Maintained

**Files** drivers/staging/greybus/authentication.c drivers/staging/greybus/bootrom.c drivers/staging/greybus/firmware.h drivers/staging/greybus/fw-core.c drivers/staging/greybus/fw-download.c drivers/staging/greybus/fw-management.c drivers/staging/greybus/greybus\_authentication.h drivers/staging/greybus/greybus\_firmware.h drivers/staging/greybus/hid.c drivers/staging/greybus/i2c.c drivers/staging/greybus/spi.c

drivers/staging/greybus/spilib.c drivers/staging/greybus/  
spilib.h

## \* GREYBUS LOOPBACK DRIVER

**Mail** Bryan O' Donoghue <[pure.logic@nexus-software.ie](mailto:pure.logic@nexus-software.ie)>

**Status** Maintained

**Files** drivers/staging/greybus/loopback.c

## \* GREYBUS PLATFORM DRIVERS

**Mail** Vaibhav Hiremath <[hvaibhav.linux@gmail.com](mailto:hvaibhav.linux@gmail.com)>

**Status** Maintained

**Files** drivers/staging/greybus/arche-apb-ctrl.c      drivers/  
staging/greybus/arche-platform.c drivers/staging/greybus/  
arche\_platform.h

## \* GREYBUS SDIO/GPIO/SPI PROTOCOLS DRIVERS

**Mail** Rui Miguel Silva <[rmfrfs@gmail.com](mailto:rmfrfs@gmail.com)>

**Status** Maintained

**Files** drivers/staging/greybus/gpio.c drivers/staging/greybus/  
light.c    drivers/staging/greybus/power\_supply.c    drivers/  
staging/greybus/sdio.c    drivers/staging/greybus/spi.c  
drivers/staging/greybus/spilib.c

## \* GREYBUS SUBSYSTEM

**Mail** Johan Hovold <[johan@kernel.org](mailto:johan@kernel.org)>,       Alex El-  
der <[elder@kernel.org](mailto:elder@kernel.org)>,       Greg Kroah-Hartman  
<[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [greybus-dev@lists.linaro.org](mailto:greybus-dev@lists.linaro.org)    (moderated for non-  
subscribers)

**Status** Maintained

**Files** drivers/greybus/    drivers/staging/greybus/    include/linux/  
greybus.h    include/linux/greybus/

### \* GREYBUS UART PROTOCOLS DRIVERS

**Mail** David Lin <[dtwlin@gmail.com](mailto:dtwlin@gmail.com)>

**Status** Maintained

**Files** drivers/staging/greybus/log.c    drivers/staging/greybus/  
uart.c

### \* GS1662 VIDEO SERIALIZER

**Mail** Charles-Antoine Couret <[charles-antoine.couret@nexvision.fr](mailto:charles-antoine.couret@nexvision.fr)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/spi/gs1662.c

### \* GSPCA FINEPIX SUBDRIVER

**Mail** Frank Zago <[frank@zago.net](mailto:frank@zago.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/gspca/finepix.c

### \* GSPCA GL860 SUBDRIVER

**Mail** Olivier Lorin <[o.lorin@laposte.net](mailto:o.lorin@laposte.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/gspca/gl860/

### \* GSPCA M5602 SUBDRIVER

**Mail** Erik Andren <[erik.andren@gmail.com](mailto:erik.andren@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/gspca/m5602/

\* **GSPCA PAC207 SONIXB SUBDRIVER**

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Odd Fixes

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/usb/gspca/pac207.c

\* **GSPCA SN9C20X SUBDRIVER**

**Mail** Brian Johnson <brijohn@gmail.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/usb/gspca/sn9c20x.c

\* **GSPCA T613 SUBDRIVER**

**Mail** Leandro Costantino <lcostantino@gmail.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/usb/gspca/t613.c

\* **GSPCA USB WEBCAM DRIVER**

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Odd Fixes

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/usb/gspca/

### \* GTP (GPRS Tunneling Protocol)

**Mail** Pablo Neira Ayuso <[pablo@netfilter.org](mailto:pablo@netfilter.org)>, Harald Welte <[laforge@gnumonks.org](mailto:laforge@gnumonks.org)>

**Mailing list** [osmocom-net-gprs@lists.osmocom.org](mailto:osmocom-net-gprs@lists.osmocom.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pablo/gtp.git>

**Files** drivers/net/gtp.c

### \* GUID PARTITION TABLE (GPT)

**Mail** Davidlohr Bueso <[dave@stgolabs.net](mailto:dave@stgolabs.net)>

**Mailing list** [linux-efi@vger.kernel.org](mailto:linux-efi@vger.kernel.org)

**Status** Maintained

**Files** block/partitions/efi.\*

### \* H8/300 ARCHITECTURE

**Mail** Yoshinori Sato <[ysato@users.sourceforge.jp](mailto:ysato@users.sourceforge.jp)>

**Mailing list** [uclinux-h8-devel@lists.sourceforge.jp](mailto:uclinux-h8-devel@lists.sourceforge.jp) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://uclinux-h8.sourceforge.jp>

**SCM** git <git://git.sourceforge.jp/gitroot/uclinux-h8/linux.git>

**Files** arch/h8300/ drivers/clk/h8300/ drivers/clocksource/ h8300\_\*.c drivers/irqchip/irq-renesas-h8\*.c

### \* HABANALABS PCI DRIVER

**Mail** Oded Gabbay <[oded.gabbay@gmail.com](mailto:oded.gabbay@gmail.com)>

**Status** Supported

**SCM** git <https://github.com/HabanaAI/linux.git>

**Files** Documentation/ABI/testing/debugfs-driver-habanalabs  
Documentation/ABI/testing/sysfs-driver-habanalabs  
drivers/misc/habanalabs/ include/uapi/misc/habanalabs.h

## \* HACKRF MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/hackrf/

## \* HANTRO VPU CODEC DRIVER

**Mail** Ezequiel Garcia <[ezequiel@collabora.com](mailto:ezequiel@collabora.com)>, Philipp Zabel <[p.zabel@pengutronix.de](mailto:p.zabel@pengutronix.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [rockchip@lists.infradead.org](mailto:rockchip@lists.infradead.org) linux-

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/nxp,  
imx8mq-vpu.yaml Documentation/devicetree/bindings/media/  
rockchip-vpu.yaml drivers/staging/media/hantro/

## \* HARD DRIVE ACTIVE PROTECTION SYSTEM (HDAPS) DRIVER

**Mail** Frank Seidel <[frank@f-seidel.de](mailto:frank@f-seidel.de)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.kernel.org/pub/linux/kernel/people/fseidel/>  
[hdaps](#)

**Files** drivers/platform/x86/hdaps.c

## \* HARDWARE MONITORING

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>, Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Web-page** <http://hwmon.wiki.kernel.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/groeck/linux-staging.git>

**Files** Documentation/devicetree/bindings/hwmon/ Documentation/hwmon/ drivers/hwmon/ include/linux/hwmon\*.h include/trace/events/hwmon\*.h

### \* HARDWARE RANDOM NUMBER GENERATOR CORE

**Mail** Matt Mackall <[mpm@selenic.com](mailto:mpm@selenic.com)>, Herbert Xu <[herbert@gondor.apana.org.au](mailto:herbert@gondor.apana.org.au)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Odd fixes

**Files** admin-guide/hw\_random Documentation/devicetree/bindings/rng/ drivers/char/hw\_random/ include/linux/hw\_random.h

### \* HARDWARE SPINLOCK CORE

**Mail** Ohad Ben-Cohen <[ohad@wizery.com](mailto:ohad@wizery.com)>, Bjorn Andersson <[bjorn.andersson@linaro.org](mailto:bjorn.andersson@linaro.org)>

**Reviewer** Baolin Wang <[baolin.wang7@gmail.com](mailto:baolin.wang7@gmail.com)>

**Mailing list** [linux-remoteproc@vger.kernel.org](mailto:linux-remoteproc@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/andersson/remoteproc.git  
hwspinlock-next

**Files** Documentation/devicetree/bindings/hwlock/ lock-ing/hwspinlock drivers/hwspinlock/ include/linux/hwspinlock.h

### \* HARDWARE TRACING FACILITIES

**Mail** Alexander Shishkin <[alexander.shishkin@linux.intel.com](mailto:alexander.shishkin@linux.intel.com)>

**Status** Maintained

**Files** drivers/hwtracing/

### \* HARMONY SOUND DRIVER

**Mailing list** [linux-parisc@vger.kernel.org](mailto:linux-parisc@vger.kernel.org)

**Status** Maintained

**Files** sound/parisc/harmony.\*

## \* HDPVR USB VIDEO ENCODER DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/usb/hdpvr/

## \* HEWLETT PACKARD ENTERPRISE ILO NMI WATCHDOG DRIVER

**Mail** Jerry Hoemann <jerry.hoemann@hpe.com>

**Status** Supported

**Files** watchdog/hpwdt drivers/watchdog/hpwdt.c

## \* HEWLETT-PACKARD SMART ARRAY RAID DRIVER (hpsa)

**Mail** Don Brace <don.brace@microsemi.com>

**Mailing list** esc.storagedev@microsemi.com, scsi@vger.kernel.org

linux-

**Status** Supported

**Files** scsi/hpsa drivers/scsi/hpsa\*. [ch] include/linux/cciss\*.h  
include/uapi/linux/cciss\*.h

## \* HFI1 DRIVER

**Mail** Mike Marciniszyn <mike.marciniszyn@intel.com>, Dennis Dalessandro <dennis.dalessandro@intel.com>

**Mailing list** linux-rdma@vger.kernel.org

**Status** Supported

**Files** drivers/infiniband/hw/hfil

## \* HFS FILESYSTEM

**Mailing list** linux-fsdevel@vger.kernel.org

**Status** Orphan

**Files** filesystems/hfs fs/hfs/

### \* HFSPLUS FILESYSTEM

**Mail** Mailing list [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Orphan

**Files** filesystems/hfsplus fs/hfsplus/

### \* HGA FRAMEBUFFER DRIVER

**Mail** Ferenc Bakonyi <[fero@drama.obuda.kando.hu](mailto:fero@drama.obuda.kando.hu)>

**Mailing list** [linux-nvidia@lists.surfsouth.com](mailto:linux-nvidia@lists.surfsouth.com)

**Status** Maintained

**Web-page** <http://drama.obuda.kando.hu/~fero/cgi-bin/hgafb.shtml>

**Files** drivers/video/fbdev/hgafb.c

### \* HIBERNATION (aka Software Suspend, aka swsusp)

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Pavel Machek <[pavel@ucw.cz](mailto:pavel@ucw.cz)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**bugs** <https://bugzilla.kernel.org>

**Files** arch/\*/include/asm/suspend\*.h arch/x86/power/ drivers/ base/power/ include/linux/freezer.h include/linux/pm.h include/linux/suspend.h kernel/power/

### \* HID CORE LAYER

**Mail** Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>, Benjamin Tissoires <[benjamin.tissoires@redhat.com](mailto:benjamin.tissoires@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/hid/hid.git>

**Files** drivers/hid/ include/linux/hid\* include/uapi/linux/hid\*

## \* HID SENSOR HUB DRIVERS

**Mail** Jiri Kosina <jikos@kernel.org>, Jonathan  
Cameron <jic23@kernel.org>, Srinivas Pandruvada  
<srinivas.pandruvada@linux.intel.com>

**Mailing list** linux-input@vger.kernel.org, linux-iio@vger.kernel.org

**Status** Maintained

**Files** Documentation/hid/hid-sensor\* drivers/hid/hid-sensor-\*  
drivers/iio/\*/hid-\* include/linux/hid-sensor-\*

## \* HIGH-RESOLUTION TIMERS, CLOCKEVENTS

**Mail** Thomas Gleixner <tglx@linutronix.de>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git  
timers/core

**Files** Documentation/timers/ include/linux/clockchips.h  
include/linux/hrtimer.h kernel/time/clockevents.c kernel/  
time/hrtimer.c kernel/time/timer\_\*.c

## \* HIGH-SPEED SCC DRIVER FOR AX.25

**Mailing list** linux-hams@vger.kernel.org

**Status** Orphan

**Files** drivers/net/hamradio/dmascc.c drivers/net/hamradio/scc.  
c

## \* HIGHPOINT ROCKETRAID 3xxx RAID DRIVER

**Mail** HighPoint Linux Team <linux@highpoint-tech.com>

**Status** Supported

**Web-page** <http://www.highpoint-tech.com>

**Files** scsi/hptiop drivers/scsi/hptiop.c

### \* **HIPPI**

**Mail** Jes Sorensen <[jes@trained-monkey.org](mailto:jes@trained-monkey.org)>

**Mailing list** [linux-hippi@sunsite.dk](mailto:linux-hippi@sunsite.dk)

**Status** Maintained

**Files** drivers/net/hippi/ include/linux/hippidevice.h include/uapi/linux/if\_hippi.h net/802/hippi.c

### \* **HISILICON DMA DRIVER**

**Mail** Zhou Wang <[wangzhou1@hisilicon.com](mailto:wangzhou1@hisilicon.com)>

**Mailing list** [dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org)

**Status** Maintained

**Files** drivers/dma/hisi\_dma.c

### \* **HISILICON HIGH PERFORMANCE RSA ENGINE DRIVER (HPRE)**

**Mail** Zaibo Xu <[xuzaibo@huawei.com](mailto:xuzaibo@huawei.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/debugfs-hisi-hpre drivers/crypto/hisilicon/hpre/hpre.h drivers/crypto/hisilicon/hpre/hpre\_crypto.c drivers/crypto/hisilicon/hpre/hpre\_main.c

### \* **HISILICON LPC BUS DRIVER**

**Mail** john.garry@huawei.com

**Status** Maintained

**Web-page** <http://www.hisilicon.com>

**Files** Documentation/devicetree/bindings/arm/hisilicon/hisilicon-low-pin-count.txt drivers/bus/hisi\_lpc.c

### \* **HISILICON NETWORK SUBSYSTEM 3 DRIVER (HNS3)**

**Mail** Yisen Zhuang <[yisen.zhuang@huawei.com](mailto:yisen.zhuang@huawei.com)>, Salil Mehta <[salil.mehta@huawei.com](mailto:salil.mehta@huawei.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.hisilicon.com>

**Files** drivers/net/ethernet/hisilicon/hns3/

## \* HISILICON NETWORK SUBSYSTEM DRIVER

**Mail** Yisen Zhuang <[yisen.zhuang@huawei.com](mailto:yisen.zhuang@huawei.com)>, Salil Mehta <[salil.mehta@huawei.com](mailto:salil.mehta@huawei.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.hisilicon.com>

**Files** Documentation/devicetree/bindings/net/hisilicon\*.txt  
drivers/net/ethernet/hisilicon/

## \* HISILICON PMU DRIVER

**Mail** Shaokun Zhang <[zhangshaokun@hisilicon.com](mailto:zhangshaokun@hisilicon.com)>

**Status** Supported

**Web-page** <http://www.hisilicon.com>

**Files** admin-guide/perf/hisi-pmu drivers/perf/hisilicon

## \* HISILICON QM AND ZIP Controller DRIVER

**Mail** Zhou Wang <[wangzhou1@hisilicon.com](mailto:wangzhou1@hisilicon.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/debugfs-hisi-zip drivers/  
crypto/hisilicon/qm.c drivers/crypto/hisilicon/qm.h  
drivers/crypto/hisilicon/sgl.c drivers/crypto/hisilicon/  
zip/

## \* HISILICON ROCE DRIVER

**Mail** Lijun Ou <[ouljun@huawei.com](mailto:ouljun@huawei.com)>, Wei Hu(Xavier) <[huwei87@hisilicon.com](mailto:huwei87@hisilicon.com)>, Weihang Li <[liweihang@huawei.com](mailto:liweihang@huawei.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/infiniband/  
hisilicon-hns-roce.txt drivers/infiniband/hw/hns/

## \* HISILICON SAS Controller

**Mail** John Garry <[john.garry@huawei.com](mailto:john.garry@huawei.com)>

**Status** Supported

**Web-page** <http://www.hisilicon.com>

**Files** Documentation/devicetree/bindings/scsi/hisilicon-sas.txt  
drivers/scsi/hisi\_sas/

## \* HISILICON SECURITY ENGINE V2 DRIVER (SEC2)

**Mail** Zaibo Xu <[xuzaibo@huawei.com](mailto:xuzaibo@huawei.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/debugfs-hisi-sec drivers/  
crypto/hisilicon/sec2/sec.h drivers/crypto/hisilicon/  
sec2/sec\_crypto.c drivers/crypto/hisilicon/sec2/  
sec\_crypto.h drivers/crypto/hisilicon/sec2/sec\_main.c

## \* HISILICON TRUE RANDOM NUMBER GENERATOR V2 SUPPORT

**Mail** Zaibo Xu <[xuzaibo@huawei.com](mailto:xuzaibo@huawei.com)>

**Status** Maintained

**Files** drivers/char/hw\_random/hisi-trng-v2.c

## \* HISILICON V3XX SPI NOR FLASH Controller Driver

**Mail** John Garry <[john.garry@huawei.com](mailto:john.garry@huawei.com)>

**Status** Maintained

**Web-page** <http://www.hisilicon.com>

**Files** drivers/spi/spi-hisi-sfc-v3xx.c

## \* HMM - Heterogeneous Memory Management

**Mail** Jérôme Glisse <[jglisse@redhat.com](mailto:jglisse@redhat.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** vm/hmm include/linux/hmm\* lib/test\_hmm\* mm/hmm\* tools/  
testing/selftests/vm/\*hmm\*

**\* HOST AP DRIVER**

**Mail** Jouni Malinen <j@w1.fi>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Obsolete

**Web-page** <http://w1.fi/hostap-driver.html>

**Files** drivers/net/wireless/intersil/hostap/

**\* HP COMPAQ TC1100 TABLET WMI EXTRAS DRIVER**

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Orphan

**Files** drivers/platform/x86/tc1100-wmi.c

**\* HPET: High Precision Event Timers driver**

**Mail** Clemens Ladisch <clemens@ladisch.de>

**Status** Maintained

**Files** timers/hpet    drivers/char/hpet.c    include/linux/hpet.h  
                      include/uapi/linux/hpet.h

**\* HPET: x86**

**Status** Orphan

**Files** arch/x86/include/asm/hpet.h arch/x86/kernel/hpet.c

**\* HPFS FILESYSTEM**

**Mail** Mikulas Patocka <mikulas@artax.karlin.mff.cuni.cz>

**Status** Maintained

**Web-page** <http://artax.karlin.mff.cuni.cz/~mikulas/vyplody/hpfs/index-e.cgi>

**Files** fs/hpfs/

### \* HSI SUBSYSTEM

**Mail** Sebastian Reichel <[sre@kernel.org](mailto:sre@kernel.org)>

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/sre/linux-hsi.git

**Files** Documentation/ABI/testing/sysfs-bus-hsi      driver-api/hsi  
drivers/hsi/ include/linux/hsi/ include/uapi/linux/hsi/

### \* HSO 3G MODEM DRIVER

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Orphan

**Files** drivers/net/usb/hso.c

### \* HSR NETWORK PROTOCOL

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Orphan

**Files** net/hsr/

### \* HT16K33 LED CONTROLLER DRIVER

**Mail** Robin van der Gracht <[robin@protonic.nl](mailto:robin@protonic.nl)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/ht16k33.txt  
drivers/auxdisplay/ht16k33.c

### \* HTCPEN TOUCHSCREEN DRIVER

**Mail** Pau Oliva Fora <[pof@eslack.org](mailto:pof@eslack.org)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/touchscreen/htcpen.c

## \* HTS221 TEMPERATURE-HUMIDITY IIO DRIVER

**Mail** Lorenzo Bianconi <[lorenzo.bianconi83@gmail.com](mailto:lorenzo.bianconi83@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.st.com/>

**Files** Documentation/devicetree/bindings/iio/humidity/hts221.txt  
drivers/iio/humidity/hts221\*

## \* HUAWEI ETHERNET DRIVER

**Mail** Bin Luo <[luobin9@huawei.com](mailto:luobin9@huawei.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** networking/hinic drivers/net/ethernet/huawei/hinic/

## \* HUGETLB FILESYSTEM

**Mail** Mike Kravetz <[mike.kravetz@oracle.com](mailto:mike.kravetz@oracle.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-kernel-mm-hugepages  
admin-guide/mm/hugetlbpage vm/hugetlbfs\_reserv fs/hugetlbfs/  
include/linux/hugetlb.h mm/hugetlb.c

## \* HVA ST MEDIA DRIVER

**Mail** Jean-Christophe Trotin <[jean-christophe.trotin@st.com](mailto:jean-christophe.trotin@st.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/platform/sti/hva

### \* HWPOISON MEMORY FAILURE HANDLING

**Mail** Naoya Horiguchi <[naoya.horiguchi@nec.com](mailto:naoya.horiguchi@nec.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** mm/hwpoison-inject.c mm/memory-failure.c

### \* HYGON PROCESSOR SUPPORT

**Mail** Pu Wen <[puwen@hygon.cn](mailto:puwen@hygon.cn)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** arch/x86/kernel/cpu/hygon.c

### \* HYNIX HI556 SENSOR DRIVER

**Mail** Shawn Tu <[shawnx.tu@intel.com](mailto:shawnx.tu@intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/hi556.c

### \* Hyper-V CORE AND DRIVERS

**Mail** “K. Y. Srinivasan” <[kys@microsoft.com](mailto:kys@microsoft.com)>, Haiyang Zhang <[haiyangz@microsoft.com](mailto:haiyangz@microsoft.com)>, Stephen Hemminger <[sthemmin@microsoft.com](mailto:sthemmin@microsoft.com)>, Wei Liu <[wei.liu@kernel.org](mailto:wei.liu@kernel.org)>

**Mailing list** [linux-hyperv@vger.kernel.org](mailto:linux-hyperv@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/hyperv/linux.git>

**Files** Documentation/ABI/stable/sysfs-bus-vmbus

Documentation/ABI/testing/debugfs-hyperv  
networking/device\_drivers/microsoft/netvsc  
arch/x86/hyperv  
arch/x86/include/asm/hyperv-tlfs.h  
arch/x86/include/asm/mshyperv.h  
arch/x86/include/asm/trace/hyperv.h  
arch/x86/kernel/cpu/mshyperv.c  
drivers/clocksource/hyperv\_timer.c  
drivers/hid/hid-hyperv.c  
drivers/hv/  
drivers/input/serio/hyperv-keyboard.c  
drivers/iommu/hyperv-iommu.c  
drivers/net/hyperv/  
drivers/pci/controller/pci-hyperv-intf.c  
drivers/pci/controller/pci-hyperv.c  
drivers/scsi/storvsc\_drv.c  
drivers/uio/uio\_hv\_generic.c  
drivers/video/fbdev/hyperv\_fb.c  
include/asm-generic/hyperv-tlfs.

```
h   include/asm-generic/mshyperv.h   include/clocksource/
hyperv_timer.h include/linux/hyperv.h include/uapi/linux/
hyperv.h net/vmw_vsock/hyperv_transport.c tools/hv/
```

## \* HYPERBUS SUPPORT

**Mail** Vignesh Raghavendra <vigneshr@ti.com>

**Mailing list** linux-mtd@lists.infradead.org

**Status** Supported

**Patchwork** <http://patchwork.ozlabs.org/project/linux-mtd/list/>

**chat** irc://irc.oftc.net/mtd

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/mtd/linux.git  
cfi/next

**Files** Documentation/devicetree/bindings/mtd/cypress,  
hyperflash.txt Documentation/devicetree/bindings/mtd/  
ti,am654-hbmc.txt drivers/mtd/hyperbus/ include/linux/  
mtd/hyperbus.h

## \* HYPERVISOR VIRTUAL CONSOLE DRIVER

**Mailing list** linuxppc-dev@lists.ozlabs.org

**Status** Odd Fixes

**Files** drivers/tty/hvc/

## \* I2C ACPI SUPPORT

**Mail** Mika Westerberg <mika.westerberg@linux.intel.com>

**Mailing list** linux-i2c@vger.kernel.org, linux-acpi@vger.kernel.org

**Status** Maintained

**Files** drivers/i2c/i2c-core-acpi.c

## \* I2C CONTROLLER DRIVER FOR NVIDIA GPU

**Mail** Ajay Gupta <ajayg@nvidia.com>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Maintained

**Files** i2c/busses/i2c-nvidia-gpu  
i2c-nvidia-gpu.c drivers/i2c/busses/

### \* I2C MUXES

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-arb\*  
Documentation/devicetree/bindings/i2c/i2c-gate\*  
Documentation/devicetree/bindings/i2c/i2c-mux\* i2c/i2c-topology Documentation/i2c/muxes/ drivers/i2c/i2c-mux.c  
drivers/i2c/muxes/ include/linux/i2c-mux.h

### \* I2C MV64XXX MARVELL AND ALLWINNER DRIVER

**Mail** Gregory CLEMENT <[gregory.clement@bootlin.com](mailto:gregory.clement@bootlin.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/marvell,  
mv64xxx-i2c.yaml drivers/i2c/busses/i2c-mv64xxx.c

### \* I2C OVER PARALLEL PORT

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** i2c/busses/i2c-parport drivers/i2c/busses/i2c-parport.c

### \* I2C SUBSYSTEM

**Mail** Wolfram Sang <[wsa@kernel.org](mailto:wsa@kernel.org)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Web-page** <https://i2c.wiki.kernel.org/>

**Patchwork** <https://patchwork.ozlabs.org/project/linux-i2c/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/wsa/linux.git

**Files** Documentation/devicetree/bindings/i2c/i2c.txt  
Documentation/i2c/ drivers/i2c/\* include/linux/i2c-dev.h  
include/linux/i2c-smbus.h include/linux/i2c.h include/uapi/linux/i2c-\*.h include/uapi/linux/i2c.h

## \* I2C SUBSYSTEM HOST DRIVERS

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://i2c.wiki.kernel.org/>

**Patchwork** <https://patchwork.ozlabs.org/project/linux-i2c/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/wsa/linux.git>

**Files** Documentation/devicetree/bindings/i2c/ drivers/i2c/  
algos/ drivers/i2c/busses/

## \* I2C-TAOS-EVM DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** i2c/busses/i2c-taos-evm drivers/i2c/busses/i2c-taos-evm.c

## \* I2C-TINY-USB DRIVER

**Mail** Till Harbaum <[till@harbaum.org](mailto:till@harbaum.org)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Web-page** [http://www.harbaum.org/till/i2c\\_tiny\\_usb](http://www.harbaum.org/till/i2c_tiny_usb)

**Files** drivers/i2c/busses/i2c-tiny-usb.c

## \* I2C/SMBUS CONTROLLER DRIVERS FOR PC

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** i2c/busses/i2c-ali1535 i2c/busses/i2c-ali1563 i2c/busses/i2c-  
ali15x3 i2c/busses/i2c-amd756 i2c/busses/i2c-amd8111  
i2c/busses/i2c-i801 i2c/busses/i2c-nforce2 i2c/busses/i2c-piix4  
i2c/busses/i2c-sis5595 i2c/busses/i2c-sis630 i2c/busses/i2c-  
sis96x i2c/busses/i2c-via i2c/busses/i2c-viapro drivers/i2c/  
busses/i2c-ali1535.c drivers/i2c/busses/i2c-ali1563.c  
drivers/i2c/busses/i2c-ali15x3.c drivers/i2c/busses/  
i2c-amd756-s4882.c drivers/i2c/busses/i2c-amd756.c

```
drivers/i2c/busses/i2c-amd8111.c      drivers/i2c/busses/
i2c-i801.c    drivers/i2c/busses/i2c-isch.c   drivers/
i2c/busses/i2c-nforce2-s4985.c       drivers/i2c/busses/
i2c-nforce2.c   drivers/i2c/busses/i2c-piix4.c   drivers/
i2c/busses/i2c-sis5595.c       drivers/i2c/busses/i2c-sis630.
c   drivers/i2c/busses/i2c-sis96x.c   drivers/i2c/busses/
i2c-via.c drivers/i2c/busses/i2c-viapro.c
```

### \* I2C/SMBUS INTEL CHT WHISKEY COVE PMIC DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** drivers/i2c/busses/i2c-cht-wc.c

### \* I2C/SMBUS ISMT DRIVER

**Mail** Seth Heasley <[seth.heasley@intel.com](mailto:seth.heasley@intel.com)>, Neil Horman <[nhorman@tuxdriver.com](mailto:nhorman@tuxdriver.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Files** i2c/busses/i2c-ismt drivers/i2c/busses/i2c-ismt.c

### \* I2C/SMBUS STUB DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** drivers/i2c/i2c-stub.c

### \* I3C DRIVER FOR CADENCE I3C MASTER IP

**Mail** Przemysław Gaj <[pgaj@cadence.com](mailto:pgaj@cadence.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/i3c/cdns,i3c-master.txt  
drivers/i3c/master/i3c-master-cdns.c

## \* I3C DRIVER FOR SYNOPSYS DESIGNWARE

**Mail** Vitor Soares <[vitor.soares@synopsys.com](mailto:vitor.soares@synopsys.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/i3c/snps,  
dw-i3c-master.txt drivers/i3c/master/dw\*

## \* I3C SUBSYSTEM

**Mail** Boris Brezillon <[bbrezillon@kernel.org](mailto:bbrezillon@kernel.org)>

**Mailing list** [linux-i3c@lists.infradead.org](mailto:linux-i3c@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**chat** <irc://chat.freenode.net/linux-i3c>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/i3c/linux.git>

**Files** Documentation/ABI/testing/sysfs-bus-i3c Documentation/  
devicetree/bindings/i3c/ Documentation/driver-api/i3c  
drivers/i3c/ include/linux/i3c/

## \* IA64 (Itanium) PLATFORM

**Mail** Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>, Fenghua Yu <[fenghua.yu@intel.com](mailto:fenghua.yu@intel.com)>

**Mailing list** [linux-ia64@vger.kernel.org](mailto:linux-ia64@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/aegl/linux.git>

**Files** Documentation/ia64/ arch/ia64/

## \* IBM Power 842 compression accelerator

**Mail** Haren Myneni <[haren@us.ibm.com](mailto:haren@us.ibm.com)>

**Status** Supported

**Files** crypto/842.c drivers/crypto/nx/Kconfig drivers/crypto/  
nx/Makefile drivers/crypto/nx/nx-842\* include/linux/sw842.  
h lib/842/

### \* IBM Power in-Nest Crypto Acceleration

**Mail** Breno Leitão <[leitao@debian.org](mailto:leitao@debian.org)>, Nayna Jain <[nayna@linux.ibm.com](mailto:nayna@linux.ibm.com)>, Paulo Flabiano Smorigo <[p fsmorigo@gmail.com](mailto:p fsmorigo@gmail.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Supported

**Files** drivers/crypto/nx/Kconfig      drivers/crypto/nx/Makefile  
drivers/crypto/nx/nx-aes\*      drivers/crypto/nx/nx-sha\*  
drivers/crypto/nx/nx.\*      drivers/crypto/nx/nx\_csbcpb.h  
drivers/crypto/nx/nx\_debugfs.c

### \* IBM Power IO DLPAR Driver for RPA-compliant PPC64 platform

**Mail** Tyrel Datwyler <[tyreld@linux.ibm.com](mailto:tyreld@linux.ibm.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Files** drivers/pci/hotplug/rpadlpar\*

### \* IBM Power Linux RAID adapter

**Mail** Brian King <[brking@us.ibm.com](mailto:brking@us.ibm.com)>

**Status** Supported

**Files** drivers/scsi/iopr.\*

### \* IBM Power PCI Hotplug Driver for RPA-compliant PPC64 platform

**Mail** Tyrel Datwyler <[tyreld@linux.ibm.com](mailto:tyreld@linux.ibm.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Files** drivers/pci/hotplug/rpaphp\*

### \* IBM Power SRIOV Virtual NIC Device Driver

**Mail** Thomas Falcon <[tlfalcon@linux.ibm.com](mailto:tlfalcon@linux.ibm.com)>, John Allen <[jallen@linux.ibm.com](mailto:jallen@linux.ibm.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/ibm/ibmvnic.\*

\* **IBM Power Virtual Accelerator Switchboard**

**Mail** Sukadev Bhattiprolu <[sukadev@linux.ibm.com](mailto:sukadev@linux.ibm.com)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Files** arch/powerpc/include/asm/vas.h arch/powerpc/platforms/powernv/copy-paste.h arch/powerpc/platforms/powernv/vas\*

\* **IBM Power Virtual Ethernet Device Driver**

**Mail** Thomas Falcon <[tlfalcon@linux.ibm.com](mailto:tlfalcon@linux.ibm.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/ibm/ibmveth.\*

\* **IBM Power Virtual FC Device Drivers**

**Mail** Tyrel Datwyler <[tyreld@linux.ibm.com](mailto:tyreld@linux.ibm.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/ibmvscsi/ibmvfc\*

\* **IBM Power Virtual Management Channel Driver**

**Mail** Steven Royer <[seroyer@linux.ibm.com](mailto:seroyer@linux.ibm.com)>

**Status** Supported

**Files** drivers/misc/ibmvmc.\*

\* **IBM Power Virtual SCSI Device Drivers**

**Mail** Tyrel Datwyler <[tyreld@linux.ibm.com](mailto:tyreld@linux.ibm.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/ibmvscsi/ibmvscsi\* include/scsi/viosrp.h

## \* IBM Power Virtual SCSI Device Target Driver

**Mail** Michael Cyr <mikecyr@linux.ibm.com>

**Mailing list** linux-scsi@vger.kernel.org, target-devel@vger.kernel.org

**Status** Supported

**Files** drivers/scsi/ibmvscsi\_tgt/

## \* IBM Power VMX Cryptographic instructions

**Mail** Breno Leitão <leitao@debian.org>, Nayna Jain <nayna@linux.ibm.com>, Paulo Flabiano Smorigo <pfsmorigo@gmail.com>

**Mailing list** linux-crypto@vger.kernel.org

**Status** Supported

**Files** drivers/crypto/vmx/Kconfig drivers/crypto/vmx/Makefile  
drivers/crypto/vmx/aes\* drivers/crypto/vmx/ghash\* drivers/  
crypto/vmx/ppc-xlate.pl drivers/crypto/vmx/vmx.c

## \* IBM ServeRAID RAID DRIVER

**Status** Orphan

**Files** drivers/scsi/ips.\*

## \* ICH LPC AND GPIO DRIVER

**Mail** Peter Tyser <ptyser@xes-inc.com>

**Status** Maintained

**Files** drivers/gpio/gpio-ich.c drivers/mfd/lpc\_ich.c

## \* ICY I2C DRIVER

**Mail** Max Staudt <max@enpas.org>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Maintained

**Files** drivers/i2c/busses/i2c-icy.c

### \* IDE SUBSYSTEM

**Mail** “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.ozlabs.org/project/linux-ide/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/davem/ide.git>

**Files** Documentation/ide/ drivers/ide/ include/linux/ide.h

### \* IDE/ATAPI DRIVERS

**Mail** Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**Files** cdrom/ide-cd drivers/ide/ide-cd\*

### \* IDEAPAD LAPTOP EXTRAS DRIVER

**Mail** Ike Panhc <[ike.pan@canonical.com](mailto:ike.pan@canonical.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Web-page** <http://launchpad.net/ideapad-laptop>

**Files** drivers/platform/x86/ideapad-laptop.c

### \* IDEAPAD LAPTOP SLIDE BAR DRIVER

**Mail** Andrey Moiseev <[o2g.org.ru@gmail.com](mailto:o2g.org.ru@gmail.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Web-page** <https://github.com/o2genum/ideapad-slidebar>

**Files** drivers/input/misc/ideapad\_slidebar.c

### \* IDT VersaClock 5 CLOCK DRIVER

**Mail** Marek Vasut <[marek.vasut@gmail.com](mailto:marek.vasut@gmail.com)>

**Status** Maintained

**Files** drivers/clk/clk-versaclock5.c

### \* IEEE 802.15.4 SUBSYSTEM

**Mail** Alexander Aring <[alex.aring@gmail.com](mailto:alex.aring@gmail.com)>, Stefan Schmidt <[stefan@datenfreihafen.org](mailto:stefan@datenfreihafen.org)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linux-wpan.org/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/sschmidt/wpan.git  
git git://git.kernel.org/pub/scm/linux/kernel/git/sschmidt/wpan-next.git

**Files** networking/ieee802154 drivers/net/ieee802154/ include/linux/ieee802154.h include/linux/nl802154.h include/net/af\_ieee802154.h include/net/cfg802154.h include/net/ieee802154\_netdev.h include/net/mac802154.h include/net/nl802154.h net/ieee802154/ net/mac802154/

### \* IFE PROTOCOL

**Mail** Yotam Gigi <[yotam.gi@gmail.com](mailto:yotam.gi@gmail.com)>, Jamal Hadi Salim <[jhs@mojatatu.com](mailto:jhs@mojatatu.com)>

**Files** include/net/ife.h include/uapi/linux/ife.h net/ife

### \* IGORPLUG-USB IR RECEIVER

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/igorplugusb.c

## \* IGUANAWORKS USB IR TRANSCEIVER

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/iguanair.c

## \* IIO DIGITAL POTENTIOMETER DAC

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-iio-dac-dpot-dac  
Documentation/devicetree/bindings/iio/dac/dpot-dac.txt  
drivers/iio/dac/dpot-dac.c

## \* IIO ENVELOPE DETECTOR

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-iio-adc-envelope-detector  
Documentation/devicetree/bindings/iioadc/  
envelope-detector.txt drivers/iioadc/envelope-detector.c

## \* IIO MULTIPLEXER

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/multiplexer/  
io-channel-mux.txt drivers/iio/multiplexer/iio-mux.c

## \* IIO SUBSYSTEM AND DRIVERS

**Mail** Jonathan Cameron <[jic23@kernel.org](mailto:jic23@kernel.org)>

**Reviewer** Hartmut Knaack <[knaack.h@gmx.de](mailto:knaack.h@gmx.de)>, Lars-Peter Clausen <[lars@metafoo.de](mailto:lars@metafoo.de)>, Peter Meerwald-Stadler <[pmeerw@pmeerw.net](mailto:pmeerw@pmeerw.net)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jic23/iio.git

**Files** Documentation/ABI/testing/configfs-iio\* Documentation/  
ABI/testing/sysfs-bus-iio\* Documentation/devicetree/  
bindings/iio/ drivers/iio/ drivers/staging/iio/ include/  
linux/iio/ tools/iio/

### \* IIO UNIT CONVERTER

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/afe/  
current-sense-amplifier.txt Documentation/devicetree/  
bindings/iio/afe/current-sense-shunt.txt Documentation/  
devicetree/bindings/iio/afe/voltage-divider.txt drivers/  
iio/afe/iio-rescale.c

### \* IKANOS/ADI EAGLE ADSL USB DRIVER

**Mail** Matthieu Castet <[castet.matthieu@free.fr](mailto:castet.matthieu@free.fr)>, Stanislaw Gruszka  
<[stf\\_xl@wp.pl](mailto:stf_xl@wp.pl)>

**Status** Maintained

**Files** drivers/usb/atm/ueagle-atm.c

### \* IMGTEC ASCII LCD DRIVER

**Mail** Paul Burton <[paulburton@kernel.org](mailto:paulburton@kernel.org)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/auxdisplay/  
img-ascii-lcd.txt drivers/auxdisplay/img-ascii-lcd.c

### \* IMGTEC IR DECODER DRIVER

**Status** Orphan

**Files** drivers/media/rc/img-ir/

### \* IMON SOUNDGRAPH USB IR RECEIVER

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/imon.c drivers/media/rc/imon\_raw.c

### \* IMS TWINTURBO FRAMEBUFFER DRIVER

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Orphan

**Files** drivers/video/fbdev/imsttfb.c

### \* INA209 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/hwmon/ina2xx.txt hwmon/ina209 drivers/hwmon/ina209.c

### \* INA2XX HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/ina2xx drivers/hwmon/ina2xx.c include/linux/platform\_data/ina2xx.h

### \* INDUSTRY PACK SUBSYSTEM (IPACK)

**Mail** Samuel Iglesias Gonsalvez <[siglesias@igalia.com](mailto:siglesias@igalia.com)>, Jens Taprogge <[jens.taprogge@taprogge.org](mailto:jens.taprogge@taprogge.org)>, Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [industry pack-devel@lists.sourceforge.net](mailto:industry pack-devel@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://industry pack.sourceforge.net>

**Files** drivers/ipack/

### \* INFINEON DPS310 Driver

**Mail** Eddie James <eajames@linux.ibm.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Maintained

**Files** drivers/iio/pressure/dps310.c

### \* INFINIBAND SUBSYSTEM

**Mail** Doug Ledford <dledford@redhat.com>, Jason Gunthorpe <jgg@mellanox.com>

**Mailing list** linux-rdma@vger.kernel.org

**Status** Supported

**Web-page** <https://github.com/linux-rdma/rdma-core>

**Patchwork** <http://patchwork.kernel.org/project/linux-rdma/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/rdma/rdma.git

**Files** Documentation/devicetree/bindings/infiniband/  
Documentation/infiniband/ drivers/infiniband/ include/  
rdma/ include/trace/events/ib\_mad.h include/trace/events/  
ib\_umad.h include/uapi/linux/if\_infiniband.h include/uapi/  
rdma/ samples/bpf/ibumad\_kern.c samples/bpf/ibumad\_user.c

### \* INGENIC JZ4780 DMA Driver

**Mail** Zubair Lutfullah Kakakhel <Zubair.Kakakhel@imgtec.com>

**Status** Maintained

**Files** drivers/dma/dma-jz4780.c

### \* INGENIC JZ4780 NAND DRIVER

**Mail** Harvey Hunt <harveyhuntnexus@gmail.com>

**Mailing list** linux-mtd@lists.infradead.org

**Status** Maintained

**Files** drivers/mtd/nand/raw/ingenic/

## \* INGENIC JZ47xx SoCs

**Mail** Paul Cercueil <paul@crapouillou.net>

**Status** Maintained

**Files** arch/mips/boot/dts/ingenic/      arch/mips/include/asm/  
mach-jz4740/      arch/mips/jz4740/      drivers/clk/ingenic/  
drivers/dma/dma-jz4780.c      drivers/gpu/drm/ingenic/      drivers/  
i2c/busses/i2c-jz4780.c      drivers/iio/adc/ingenic-adc.c  
drivers/irqchip/irq-ingenic.c      drivers/memory/jz4780-nemc.  
c      drivers/mmc/host/jz4740\_mmc.c      drivers/mtd/nand/raw/  
ingenic/      drivers/pinctrl/pinctrl-ingenic.c      drivers/power/  
supply/ingenic-battery.c      drivers/pwm/pwm-jz4740.c      drivers/  
remoteproc/ingenic\_rproc.c      drivers/rtc/rtc-jz4740.c  
drivers/tty/serial/8250/8250\_ingenic.c      drivers/usb/  
musb/jz4740.c      drivers/watchdog/jz4740\_wdt.c      include/  
dt-bindings/iio/adc/ingenic\_adc.h      include/linux/mfd/  
ingenic-tcu.h      sound/soc/codecs/jz47\*      sound/soc/jz4740/

## \* INOTIFY

**Mail** Jan Kara <jack@suse.cz>

**Reviewer** Amir Goldstein <amir73il@gmail.com>

**Mailing list** linux-fsdevel@vger.kernel.org

**Status** Maintained

**Files** filesystems/inotify      fs/notify/inotify/      include/linux/  
inotify.h      include/uapi/linux/inotify.h

## \* INPUT (KEYBOARD, MOUSE, JOYSTICK, TOUCHSCREEN) DRIVERS

**Mail** Dmitry Torokhov <dmitry.torokhov@gmail.com>

**Mailing list** linux-input@vger.kernel.org

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/linux-input/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/dtor/input.git

**Files** Documentation/devicetree/bindings/input/      Documentation/  
devicetree/bindings/serio/      Documentation/input/      drivers/  
input/      include/linux/input.h      include/linux/input/      include/  
uapi/linux/input-event-codes.h      include/uapi/linux/input.h

### \* INPUT MULTITOUCH (MT) PROTOCOL

**Mail** Henrik Rydberg <[rydberg@bitmath.org](mailto:rydberg@bitmath.org)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Odd fixes

**Files** input/multi-touch-protocol drivers/input/input-mt.c

**Content regex** \b(ABS|SYN)\_MT\_

### \* INSIDE SECURE CRYPTO DRIVER

**Mail** Antoine Tenart <[antoine.tenart@bootlin.com](mailto:antoine.tenart@bootlin.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** drivers/crypto/inside-secure/

### \* INTEGRITY MEASUREMENT ARCHITECTURE (IMA)

**Mail** Mimi Zohar <[zohar@linux.ibm.com](mailto:zohar@linux.ibm.com)>, Dmitry Kasatkin <[dmitry.kasatkin@gmail.com](mailto:dmitry.kasatkin@gmail.com)>

**Mailing list** [linux-integrity@vger.kernel.org](mailto:linux-integrity@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/zohar/linux-integrity.git>

**Files** security/integrity/ima/

### \* INTEL 810/815 FRAMEBUFFER DRIVER

**Mail** Antonino Daplas <[adaplas@gmail.com](mailto:adaplas@gmail.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/i810/

### \* INTEL ASoC DRIVERS

**Mail** Cezary Rojewski <[cezary.rojewski@intel.com](mailto:cezary.rojewski@intel.com)>, Pierre-Louis Bossart <[pierre-louis.bossart@linux.intel.com](mailto:pierre-louis.bossart@linux.intel.com)>, Liam Girdwood <[liam.r.girdwood@linux.intel.com](mailto:liam.r.girdwood@linux.intel.com)>, Jie Yang <[yang.jie@linux.intel.com](mailto:yang.jie@linux.intel.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

## Files sound/soc/intel/

#### \* INTEL ATOMISP2 DUMMY / POWER-MANAGEMENT DRIVER

**Mail** Hans de Goede <hdegoede@redhat.com>

**Mailing list** platform-driver-x86@vger.kernel.org

## Status Maintained

**Files** drivers/platform/x86/intel\_atomisp2\_pm.c

#### \* INTEL BROXTON PMC DRIVER

**Mail** Mika Westerberg <mika.westerberg@linux.intel.com>, Zha Qipeng <qipeng.zha@intel.com>

## Status Maintained

**Files** drivers/mfd/intel\_pmc\_bxt.c include/linux/mfd/intel\_pmc\_bxt.h

\* INTEL C600 SERIES SAS CONTROLLER DRIVER

**Mail** Intel SCU Linux support <[intel-linux-scu@intel.com](mailto:intel-linux-scu@intel.com)>, Artur Paszkiewicz <[artur.paszkiewicz@intel.com](mailto:artur.paszkiewicz@intel.com)>

**Mailing list** linux-scsi@vger.kernel.org

## Status Supported

**SCM** git git://git.code.sf.net/p/intel-sas/isci

## Files drivers/scsi/isci/

\* INTEL CPU family model numbers

**Mail** Tony Luck <tony.luck@intel.com>, x86@kernel.org

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** arch/x86/include/asm/intel-family.h

### \* INTEL DRM DRIVERS (excluding Poulsbo, Moorestown and derivative chipsets)

**Mail** Jani Nikula <[jani.nikula@linux.intel.com](mailto:jani.nikula@linux.intel.com)>, Joonas Lahtinen <[joonas.lahtinen@linux.intel.com](mailto:joonas.lahtinen@linux.intel.com)>, Rodrigo Vivi <[rodrigo.vivi@intel.com](mailto:rodrigo.vivi@intel.com)>

**Mailing list** [intel-gfx@lists.freedesktop.org](mailto:intel-gfx@lists.freedesktop.org)

**Status** Supported

**Web-page** <https://01.org/linuxgraphics/>

**Patchwork** <http://patchwork.freedesktop.org/project/intel-gfx/>

**bugs** <https://gitlab.freedesktop.org/drm/intel/-/wikis/How-to-file-i915-bugs>

**chat** <irc://chat.freenode.net/intel-gfx>

**SCM** git <git://anongit.freedesktop.org/drm-intel>

**Files** gpu/i915 drivers/gpu/drm/i915/ include/drm/i915\* include/uapi/drm/i915\_drm.h

### \* INTEL ETHERNET DRIVERS

**Mail** Jeff Kirsher <[jeffrey.t.kirsher@intel.com](mailto:jeffrey.t.kirsher@intel.com)>

**Mailing list** [intel-wired-lan@lists.osuosl.org](mailto:intel-wired-lan@lists.osuosl.org) (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://www.intel.com/support/feedback.htm> <http://e1000.sourceforge.net/>

**Patchwork** <http://patchwork.ozlabs.org/project/intel-wired-lan/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/jkirsher/net-queue.git> <git://git.kernel.org/pub/scm/linux/kernel/git/jkirsher/next-queue.git>

**Files** networking/device\_drivers/intel/e100  
networking/device\_drivers/intel/e1000  
networking/device\_drivers/intel/e1000e  
networking/device\_drivers/intel/fm10k  
networking/device\_drivers/intel/iavf  
networking/device\_drivers/intel/ice  
networking/device\_drivers/intel/igb  
networking/device\_drivers/intel/igbvf  
networking/device\_drivers/intel/ixgb  
networking/device\_drivers/intel/ixgbe  
networking/device\_drivers/intel/ixgbefv  
drivers/net/ethernet/intel/drivers/net/ethernet/intel/\*/  
include/linux/avf/virtchnl.h

## \* INTEL FRAMEBUFFER DRIVER (excluding 810 and 815)

**Mail** Maik Broemme <[mbroemme@libmpq.org](mailto:mbroemme@libmpq.org)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** fb/intelfb drivers/video/fbdev/intelfb/

## \* INTEL GPIO DRIVERS

**Mail** Andy Shevchenko <[andy@kernel.org](mailto:andy@kernel.org)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/andy/linux-gpio-intel.git>

**Files** drivers/gpio/gpio-ich.c drivers/gpio/gpio-intel-mid.c  
drivers/gpio/gpio-merrifield.c drivers/gpio/gpio-ml-ioh.c  
drivers/gpio/gpio-pch.c drivers/gpio/gpio-sch.c drivers/  
gpio/gpio-sodaville.c

## \* INTEL GVT-g DRIVERS (Intel GPU Virtualization)

**Mail** Zhenyu Wang <[zhenyuw@linux.intel.com](mailto:zhenyuw@linux.intel.com)>, Zhi Wang <[zhi.a.wang@intel.com](mailto:zhi.a.wang@intel.com)>

**Mailing list** [intel-gvt-dev@lists.freedesktop.org](mailto:intel-gvt-dev@lists.freedesktop.org), [intel-gfx@lists.freedesktop.org](mailto:intel-gfx@lists.freedesktop.org)

**Status** Supported

**Web-page** <https://01.org/igvt-g>

**SCM** git <https://github.com/intel/gvt-linux.git>

**Files** drivers/gpu/drm/i915/gvt/

## \* INTEL HID EVENT DRIVER

**Mail** Alex Hung <[alex.hung@canonical.com](mailto:alex.hung@canonical.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/intel-hid.c

### \* INTEL I/OAT DMA DRIVER

**Mail** Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>

**Reviewer** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>

**Mailing list** [dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-dmaengine/list/>

**Files** drivers/dma/ioat\*

### \* INTEL IADX DRIVER

**Mail** Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>

**Mailing list** [dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org)

**Status** Supported

**Files** drivers/dma/idxd/\* include/uapi/linux/idxd.h

### \* INTEL IDLE DRIVER

**Mail** Jacob Pan <[jacob.jun.pan@linux.intel.com](mailto:jacob.jun.pan@linux.intel.com)>, Len Brown <[lenb@kernel.org](mailto:lenb@kernel.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**bugs** <https://bugzilla.kernel.org>

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/lenb/linux.git](https://git.kernel.org/pub/scm/linux/kernel/git/lenb/linux.git)

**Files** drivers/idle/intel\_idle.c

### \* INTEL INTEGRATED SENSOR HUB DRIVER

**Mail** Srinivas Pandruvada <[srinivas.pandruvada@linux.intel.com](mailto:srinivas.pandruvada@linux.intel.com)>, Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/hid/intel-ish-hid/

## \* INTEL IOMMU (VT-d)

**Mail** David Woodhouse <[dwmw2@infradead.org](mailto:dwmw2@infradead.org)>, Lu Baolu <[baolu.lu@linux.intel.com](mailto:baolu.lu@linux.intel.com)>

**Mailing list** [iommu@lists.linux-foundation.org](mailto:iommu@lists.linux-foundation.org)

**Status** Supported

**SCM** [git git://git.kernel.org/pub/scm/linux/kernel/git/joro/iommu.git](git://git.kernel.org/pub/scm/linux/kernel/git/joro/iommu.git)

**Files** drivers/iommu/intel/ include/linux/intel-iommu.h  
include/linux/intel-svm.h

## \* INTEL IOP-ADMA DMA DRIVER

**Reviewer** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>

**Status** Odd fixes

**Files** drivers/dma/iop-adma.c

## \* INTEL IPU3 CSI-2 CIO2 DRIVER

**Mail** Yong Zhi <[yong.zhi@intel.com](mailto:yong.zhi@intel.com)>, Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>, Bingbu Cao <[bingbu.cao@intel.com](mailto:bingbu.cao@intel.com)>

**Reviewer** Tian Shu Qiu <[tian.shu.qiu@intel.com](mailto:tian.shu.qiu@intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** userspace-api/media/v4l/pixfmt-srggb10-ipu3 drivers/media/pci/intel/ipu3/

## \* INTEL IPU3 CSI-2 IMGU DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Reviewer** Bingbu Cao <[bingbu.cao@intel.com](mailto:bingbu.cao@intel.com)>, Tian Shu Qiu <[tian.shu.qiu@intel.com](mailto:tian.shu.qiu@intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** admin-guide/media/ipu3 Documentation/admin-guide/media/ipu3\_rcb.svg userspace-api/media/v4l/pixfmt-meta-intel-ipu3 drivers/staging/media/ipu3/

### \* INTEL IXP4XX QMGR, NPE, ETHERNET and HSS SUPPORT

**Mail** Krzysztof Halasa <[khalasa@piap.pl](mailto:khalasa@piap.pl)>

**Status** Maintained

**Files** drivers/net/ethernet/xscale/ixp4xx\_eth.c    drivers/net/wan/ixp4xx\_hss.c    drivers/soc/ixp4xx/ixp4xx-npe.c    drivers/soc/ixp4xx/ixp4xx-qmgr.c    include/linux/soc/ixp4xx/npe.h    include/linux/soc/ixp4xx/qmgr.h

### \* INTEL IXP4XX RANDOM NUMBER GENERATOR SUPPORT

**Mail** Deepak Saxena <[dsaxena@plexity.net](mailto:dsaxena@plexity.net)>

**Status** Maintained

**Files** drivers/char/hw\_random/ixp4xx-rng.c

### \* INTEL MANAGEMENT ENGINE (mei)

**Mail** Tomas Winkler <[tomas.winkler@intel.com](mailto:tomas.winkler@intel.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** Documentation/driver-api/mei/\*    drivers/misc/mei/\*  
drivers/watchdog/mei\_wdt.c    include/linux/mei\_cl\_bus.h  
include/uapi/linux/mei.h samples/mei/\*

### \* INTEL MENLOW THERMAL DRIVER

**Mail** Sujith Thomas <[sujith.thomas@intel.com](mailto:sujith.thomas@intel.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Supported

**Web-page** <https://01.org/linux-acpi>

**Files** drivers/platform/x86/intel\_menlow.c

### \* INTEL MIC DRIVERS (mic)

**Mail** Sudeep Dutt <[sudeep.dutt@intel.com](mailto:sudeep.dutt@intel.com)>, Ashutosh Dixit <[ashutosh.dixit@intel.com](mailto:ashutosh.dixit@intel.com)>

**Status** Supported

**Web-page** <https://github.com/sudeepdutt/mic>    <http://software.intel.com/en-us/mic-developer>

**Files** Documentation/misc-devices/mic/ drivers/dma/  
mic\_x100\_dma.c drivers/dma/mic\_x100\_dma.h drivers/misc/  
mic/include/linux/mic\_bus.h include/linux/scif.h include/  
uapi/linux/mic\_common.h include/uapi/linux/mic\_ioctl.h  
include/uapi/linux/scif\_ioctl.h

## \* INTEL P-Unit IPC DRIVER

**Mail** Zha Qipeng <qipeng.zha@intel.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** arch/x86/include/asm/intel\_punit\_ipc.h drivers/  
platform/x86/intel\_punit\_ipc.c

## \* INTEL PMC CORE DRIVER

**Mail** Rajneesh Bhardwaj <rajneesh.bhardwaj@intel.com>, Vishwanath Somayaji <vishwanath.somayaji@intel.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/intel\_pmc\_core\*

## \* INTEL PMIC GPIO DRIVERS

**Mail** Andy Shevchenko <andy@kernel.org>

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/andy/linux-gpio-intel.git

**Files** drivers/gpio/gpio-\*cove.c drivers/gpio/gpio-msic.c

## \* INTEL PMIC MULTIFUNCTION DEVICE DRIVERS

**Reviewer** Andy Shevchenko <andriy.shevchenko@linux.intel.com>

**Status** Maintained

**Files** drivers/mfd/intel\_msic.c drivers/mfd/intel\_soc\_pmic\*  
include/linux/mfd/intel\_msic.h include/linux/mfd/  
intel\_soc\_pmic\*

### \* INTEL PRO/WIRELESS 2100, 2200BG, 2915ABG NETWORK CONNECTION SUPPORT

**Mail** Stanislav Yakovlev <[stas.yakovlev@gmail.com](mailto:stas.yakovlev@gmail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** networking/device\_drivers/intel/ipw2100  
networking/device\_drivers/intel/ipw2200 drivers/net/wireless/intel/  
ipw2x00/

### \* INTEL PSTATE DRIVER

**Mail** Srinivas Pandruvada <[srinivas.pandruvada@linux.intel.com](mailto:srinivas.pandruvada@linux.intel.com)>,  
Len Brown <[lenb@kernel.org](mailto:lenb@kernel.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**Files** drivers/cpufreq/intel\_pstate.c

### \* INTEL RDMA RNIC DRIVER

**Mail** Faisal Latif <[faisal.latif@intel.com](mailto:faisal.latif@intel.com)>, Shiraz Saleem  
<[shiraz.saleem@intel.com](mailto:shiraz.saleem@intel.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/hw/i40iw/ include/uapi/rdma/  
i40iw-abi.h

### \* INTEL SCU DRIVERS

**Mail** Mika Westerberg <[mika.westerberg@linux.intel.com](mailto:mika.westerberg@linux.intel.com)>

**Status** Maintained

**Files** arch/x86/include/asm/intel\_scu\_ipc.h drivers/platform/  
x86/intel\_scu\_\*

### \* INTEL SPEED SELECT TECHNOLOGY

**Mail** Srinivas Pandruvada <[srinivas.pandruvada@linux.intel.com](mailto:srinivas.pandruvada@linux.intel.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/intel\_speed\_select\_if/ include/  
uapi/linux/isst\_if.h tools/power/x86/intel-speed-select/

### \* INTEL STRATIX10 FIRMWARE DRIVERS

**Mail** Richard Gong <[richard.gong@linux.intel.com](mailto:richard.gong@linux.intel.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-devices-platform-stratix10-rsu  
Documentation/devicetree/bindings/firmware/intel,  
stratix10-svc.txt drivers/firmware/stratix10-rsu.c  
drivers/firmware/stratix10-svc.c include/linux/firmware/  
intel/stratix10-smc.h include/linux/firmware/intel/  
stratix10-svc-client.h

### \* INTEL TELEMETRY DRIVER

**Mail** Rajneesh Bhardwaj <[rajneesh.bhardwaj@linux.intel.com](mailto:rajneesh.bhardwaj@linux.intel.com)>,  
“David E. Box” <[david.e.box@linux.intel.com](mailto:david.e.box@linux.intel.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** arch/x86/include/asm/intel\_telemetry.h drivers/  
platform/x86/intel\_telemetry\*

### \* INTEL UNCORE FREQUENCY CONTROL

**Mail** Srinivas Pandruvada <[srinivas.pandruvada@linux.intel.com](mailto:srinivas.pandruvada@linux.intel.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/intel-uncore-frequency.c

### \* INTEL VIRTUAL BUTTON DRIVER

**Mail** AceLan Kao <acelan.kao@canonical.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/intel-vbtn.c

### \* INTEL WIRELESS 3945ABG/BG, 4965AGN (iwlegacy)

**Mail** Stanislaw Gruszka <stf\_xl@wp.pl>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Supported

**Files** drivers/net/wireless/intel/iwlegacy/

### \* INTEL WIRELESS WIFI LINK (iwlwifi)

**Mail** Johannes Berg <johannes.berg@intel.com>, Emmanuel Grumbach <emmanuel.grumbach@intel.com>, Luca Coelho <luciano.coelho@intel.com>, Intel Linux Wireless <linuxwifi@intel.com>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Supported

**Web-page** <https://wireless.wiki.kernel.org/en/users/drivers/iwlwifi>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/iwlwifi/iwlwifi.git

**Files** drivers/net/wireless/intel/iwlwifi/

### \* INTEL WIRELESS WIMAX CONNECTION 2400

**Mail** Inaky Perez-Gonzalez <inaky.perez-gonzalez@intel.com>, linux-wimax@intel.com

**Mailing list** wimax@linuxwimax.org (subscribers-only)

**Status** Supported

**Web-page** <http://linuxwimax.org>

**Files** admin-guide/wimax/i2400m drivers/net/wimax/i2400m/include/uapi/linux/wimax/i2400m.h

## \* INTEL WMI SLIM BOOTLOADER (SBL) FIRMWARE UPDATE DRIVER

**Mail** Jithu Joseph <jithu.joseph@intel.com>

**Reviewer** Maurice Ma <maurice.ma@intel.com>

**Status** Maintained

**Web-page** <https://slimbootloader.github.io/security/firmware-update.html>

**Files** drivers/platform/x86/intel-wmi-sbl-fw-update.c

## \* INTEL WMI THUNDERBOLT FORCE POWER DRIVER

**Mail** Mario Limonciello <mario.limonciello@dell.com>

**Status** Maintained

**Files** drivers/platform/x86/intel-wmi-thunderbolt.c

## \* INTEL(R) TRACE HUB

**Mail** Alexander Shishkin <alexander.shishkin@linux.intel.com>

**Status** Supported

**Files** trace/intel\_th drivers/hwtracing/intel\_th/ include/linux/intel\_th.h

## \* INTEL(R) TRUSTED EXECUTION TECHNOLOGY (TXT)

**Mail** Ning Sun <ning.sun@intel.com>

**Mailing list** tboot-devel@lists.sourceforge.net

**Status** Supported

**Web-page** <http://tboot.sourceforge.net>

**SCM** hg <http://tboot.hg.sourceforge.net:8000/hgroot/tboot/tboot>

**Files** x86/intel\_txt arch/x86/kernel/tboot.c include/linux/tboot.h

## \* INTERCONNECT API

**Mail** Georgi Djakov <georgi.djakov@linaro.org>

**Mailing list** linux-pm@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/interconnect/ driver-api/interconnect drivers/interconnect/ include/dt-bindings/ interconnect/ include/linux/interconnect-provider.h include/linux/interconnect.h

### \* INVENSENSE MPU-3050 GYROSCOPE DRIVER

**Mail** Linus Walleij <linus.walleij@linaro.org>

**Mailing list** linux-iio@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/gyroscope/  
invensense,mpu3050.txt drivers/iio/gyro/mpu3050\*

### \* IOC3 ETHERNET DRIVER

**Mail** Ralf Baechle <ralf@linux-mips.org>

**Mailing list** linux-mips@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/sgi/ioc3-eth.c

### \* IOMAP FILESYSTEM LIBRARY

**Mail** Christoph Hellwig <hch@infradead.org>, Darrick J. Wong  
<darrick.wong@oracle.com>, linux-xfs@vger.kernel.org, linux-  
fsdevel@vger.kernel.org

**Mailing list** linux-xfs@vger.kernel.org, linux-fsdevel@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/fs/xfs/xfs-linux.git

**Files** fs/iomap/ include/linux/iomap.h

### \* IOMMU DRIVERS

**Mail** Joerg Roedel <joro@8bytes.org>

**Mailing list** iommu@lists.linux-foundation.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/joro/iommu.git

**Files** Documentation/devicetree/bindings/iommu/ drivers/iommu/  
include/linux/iommu.h include/linux/iovva.h include/linux/  
of\_iommu.h

## \* **IO\_URING**

**Mail** Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [io-uring@vger.kernel.org](mailto:io-uring@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.dk/linux-block> git <git://git.kernel.dk/liburing>

**Files** fs/io-wq.c fs/io-wq.h fs/io\_uring.c include/uapi/linux/  
io\_uring.h

## \* **IPMI SUBSYSTEM**

**Mail** Corey Minyard <[minyard@acm.org](mailto:minyard@acm.org)>

**Mailing list** [openipmi-developer@lists.sourceforge.net](mailto:openipmi-developer@lists.sourceforge.net) (moderated for  
non-subscribers)

**Status** Supported

**Web-page** <http://openipmi.sourceforge.net/>

**Files** driver-api/ipmi Documentation/devicetree/bindings/ipmi/  
drivers/char/ipmi/ include/linux/ipmi\* include/uapi/linux/  
ipmi\*

## \* **IPS SCSI RAID DRIVER**

**Mail** Adaptec OEM Raid Solutions <[aacraid@microsemi.com](mailto:aacraid@microsemi.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.adaptec.com/>

**Files** drivers/scsi/ips\*

## \* **IPVS**

**Mail** Wensong Zhang <[wensong@linux-vs.org](mailto:wensong@linux-vs.org)>, Simon Hormann  
<[horms@verge.net.au](mailto:horms@verge.net.au)>, Julian Anastasov <[ja@ssi.bg](mailto:ja@ssi.bg)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [lvs-devel@vger.kernel.org](mailto:lvs-devel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/horms/ipvsnex.git> git <git://git.kernel.org/pub/scm/linux/kernel/git/horms/ipvs.git>

**Files** networking/ipvs-sysctl include/net/ip\_vs.h include/uapi/  
linux/ip\_vs.h net/netfilter/ipvs/

### \* IPWIRELESS DRIVER

**Mail** Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>, David Sterba <[dsterba@suse.com](mailto:dsterba@suse.com)>

**Status** Odd Fixes

**Files** drivers/tty/ipwireless/

### \* IPX NETWORK LAYER

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Obsolete

**Files** include/uapi/linux/ipx.h

### \* IRQ DOMAINS (IRQ NUMBER MAPPING LIBRARY)

**Mail** Marc Zyngier <[maz@kernel.org](mailto:maz@kernel.org)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> irq/core

**Files** core-api/irq/irq-domain include/linux/irqdomain.h kernel/irq/irqdomain.c kernel/irq/msi.c

### \* IRQ SUBSYSTEM

**Mail** Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> irq/core

**Files** kernel/irq/

### \* IRQCHIP DRIVERS

**Mail** Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>, Jason Cooper <[jason@lakedaemon.net](mailto:jason@lakedaemon.net)>, Marc Zyngier <[maz@kernel.org](mailto:maz@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> irq/core

**Files** Documentation/devicetree/bindings/interrupt-controller/drivers/irqchip/

### \* ISA

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Status** Maintained

**Files** driver-api/isa drivers/base/isa.c include/linux/isa.h

### \* ISA RADIO MODULE

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-isa\*

### \* ISAPNP

**Mail** Jaroslav Kysela <[perex@perex.cz](mailto:perex@perex.cz)>

**Status** Maintained

**Files** driver-api/isapnp drivers/pnp/isapnp/include/linux/isapnp.h

### \* iSCSI

**Mail** Lee Duncan <[lduncan@suse.com](mailto:lduncan@suse.com)>, Chris Leech <[cleech@redhat.com](mailto:cleech@redhat.com)>

**Mailing list** [open-iscsi@googlegroups.com](mailto:open-iscsi@googlegroups.com), [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Web-page** [www.open-iscsi.com](http://www.open-iscsi.com)

**Files** drivers/scsi/\*iscsi\* include/scsi/\*iscsi\*

### \* iSCSI BOOT FIRMWARE TABLE (iBFT) DRIVER

**Mail** Peter Jones <[pjones@redhat.com](mailto:pjones@redhat.com)>, Konrad Rzeszutek Wilk <[konrad@kernel.org](mailto:konrad@kernel.org)>

**Status** Maintained

**Files** drivers/firmware/iscsi\_ibft\*

### \* ISCSI EXTENSIONS FOR RDMA (ISER) INITIATOR

**Mail** Sagi Grimberg <[sagi@grimberg.me](mailto:sagi@grimberg.me)>, Max Gurtovoy <[maxg@mellanox.com](mailto:maxg@mellanox.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.openfabrics.org> [www.open-iscsi.org](http://www.open-iscsi.org)

**Patchwork** <http://patchwork.kernel.org/project/linux-rdma/list/>

**Files** drivers/infiniband/ulp/iser/

### \* ISCSI EXTENSIONS FOR RDMA (ISER) TARGET

**Mail** Sagi Grimberg <[sagi@grimberg.me](mailto:sagi@grimberg.me)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org), target-devel@vger.kernel.org

**Status** Supported

**Web-page** <http://www.linux-iscsi.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/nab/target-pending.git> master

**Files** drivers/infiniband/ulp/isert

### \* ISDN/CMTP OVER BLUETOOTH

**Mail** Karsten Keil <[isdn@linux-pingi.de](mailto:isdn@linux-pingi.de)>

**Mailing list** [isdn4linux@listserv.isdn4linux.de](mailto:isdn4linux@listserv.isdn4linux.de) (subscribers-only), [net-dev@vger.kernel.org](mailto:net-dev@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <http://www.isdn4linux.de>

**Files** Documentation/isdn/ drivers/isdn/capi/ include/linux/isdn/ include/uapi/linux/isdn/net/bluetooth/cmtp/

### \* ISDN/mISDN SUBSYSTEM

**Mail** Karsten Keil <[isdn@linux-pingi.de](mailto:isdn@linux-pingi.de)>

**Mailing list** [isdn4linux@listserv.isdn4linux.de](mailto:isdn4linux@listserv.isdn4linux.de) (subscribers-only), [net-dev@vger.kernel.org](mailto:net-dev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.isdn4linux.de>

**Files** drivers/isdn/Kconfig drivers/isdn/Makefile drivers/isdn/hardware/ drivers/isdn/mISDN/

## \* IT87 HARDWARE MONITORING DRIVER

**Mail** Jean Delvare <jdelvare@suse.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/it87 drivers/hwmon/it87.c

## \* IT913X MEDIA DRIVER

**Mail** Antti Palosaari <crope@iki.fi>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/it913x\*

## \* IVTV VIDEO4LINUX DRIVER

**Mail** Andy Walls <[awalls@md.metrocast.net](mailto:awalls@md.metrocast.net)>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/admin-guide/media/ivtv\*      drivers/media/pci/ivtv/ include/uapi/linux/ivtv\*

## \* IX2505V MEDIA DRIVER

**Mail** Malcolm Priestley <[tvboxspy@gmail.com](mailto:tvboxspy@gmail.com)>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/ix2505v\*

## \* JAILHOUSE HYPERVISOR INTERFACE

**Mail** Jan Kiszka <[jan.kiszka@siemens.com](mailto:jan.kiszka@siemens.com)>

**Mailing list** [jailhouse-dev@googlegroups.com](mailto:jailhouse-dev@googlegroups.com)

**Status** Maintained

**Files** arch/x86/include/asm/jailhouse\_para.h    arch/x86/kernel/  
jailhouse.c

## \* JC42.4 TEMPERATURE SENSOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/jc42 drivers/hwmon/jc42.c

## \* JFS FILESYSTEM

**Mail** Dave Kleikamp <[shaggy@kernel.org](mailto:shaggy@kernel.org)>

**Mailing list** [jfs-discussion@lists.sourceforge.net](mailto:jfs-discussion@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://jfs.sourceforge.net/>

**SCM** git git://github.com/kleikamp/linux-shaggy.git

**Files** admin-guide/fs/jfs/

## \* JME NETWORK DRIVER

**Mail** Guo-Fu Tseng <[cooldavid@cooldavid.org](mailto:cooldavid@cooldavid.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/jme.\*

## \* JOURNALLING FLASH FILE SYSTEM V2 (JFFS2)

**Mail** David Woodhouse <[dwmw2@infradead.org](mailto:dwmw2@infradead.org)>, Richard Weinberger  
<[richard@nod.at](mailto:richard@nod.at)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Odd Fixes

**Web-page** <http://www.linux-mtd.infradead.org/doc/jffs2.html>

**SCM** git git://git.infradead.org/ubifs-2.6.git

**Files** fs/jffs2/include/uapi/linux/jffs2.h

### \* JOURNALLING LAYER FOR BLOCK DEVICES (JBD2)

**Mail** “Theodore Ts’o” <[tytso@mit.edu](mailto:tytso@mit.edu)>, Jan Kara <[jack@suse.com](mailto:jack@suse.com)>

**Mailing list** [linux-ext4@vger.kernel.org](mailto:linux-ext4@vger.kernel.org)

**Status** Maintained

**Files** fs/jbd2/include/linux/jbd2.h

### \* JPU V4L2 MEM2MEM DRIVER FOR RENESAS

**Mail** Mikhail Ulyanov <[mikhail.ulyanov@cogentembedded.com](mailto:mikhail.ulyanov@cogentembedded.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/platform/rcar\_jpu.c

### \* JSM Neo PCI based serial card

**Mailing list** [linux-serial@vger.kernel.org](mailto:linux-serial@vger.kernel.org)

**Status** Orphan

**Files** drivers/tty/serial/jsm/

### \* K10TEMP HARDWARE MONITORING DRIVER

**Mail** Clemens Ladisch <[clemens@ladisch.de](mailto:clemens@ladisch.de)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/k10temp drivers/hwmon/k10temp.c

### \* K8TEMP HARDWARE MONITORING DRIVER

**Mail** Rudolf Marek <[r.marek@assembler.cz](mailto:r.marek@assembler.cz)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/k8temp drivers/hwmon/k8temp.c

### \* KASAN

**Mail** Andrey Ryabinin <[aryabinin@virtuozzo.com](mailto:aryabinin@virtuozzo.com)>

**Reviewer** Alexander Potapenko <[glider@google.com](mailto:glider@google.com)>, Dmitry Vyukov <[dvyukov@google.com](mailto:dvyukov@google.com)>

**Mailing list** [kasan-dev@googlegroups.com](mailto:kasan-dev@googlegroups.com)

**Status** Maintained

**Files** dev-tools/kasan arch/\*/include/asm/kasan.h arch/\*/mm/kasan\_init\* include/linux/kasan\*.h lib/test\_kasan.c mm/kasan/ scripts/Makefile.kasan

### \* KCONFIG

**Mail** Masahiro Yamada <[masahiro.yamada@linaro.org](mailto:masahiro.yamada@linaro.org)>

**Mailing list** [linux-kbuild@vger.kernel.org](mailto:linux-kbuild@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/masahiroy/linux-kbuild.git> kconfig

**Files** Documentation/kbuild/kconfig\* scripts/Kconfig.include scripts/kconfig/

### \* KCSAN

**Mail** Marco Elver <[elver@google.com](mailto:elver@google.com)>

**Reviewer** Dmitry Vyukov <[dvyukov@google.com](mailto:dvyukov@google.com)>

**Mailing list** [kasan-dev@googlegroups.com](mailto:kasan-dev@googlegroups.com)

**Status** Maintained

**Files** dev-tools/kcsan include/linux/kcsan\*.h kernel/kcsan/ lib/Kconfig.kcsan scripts/Makefile.kcsan

### \* KDUMP

**Mail** Dave Young <[dyoung@redhat.com](mailto:dyoung@redhat.com)>, Baoquan He <[bhe@redhat.com](mailto:bhe@redhat.com)>

**Reviewer** Vivek Goyal <[vrgoyal@redhat.com](mailto:vrgoyal@redhat.com)>

**Mailing list** [kexec@lists.infradead.org](mailto:kexec@lists.infradead.org)

**Status** Maintained

**Web-page** <http://lse.sourceforge.net/kdump/>

**Files** Documentation/admin-guide/kdump/ fs/proc/vmcore.c include/linux/crash\_core.h include/linux/crash\_dump.h include/uapi/linux/vmcore.h kernel/crash\_\*.c

## \* KEENE FM RADIO TRANSMITTER DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/radio/radio-keene\*

## \* KERNEL AUTOMOUNTER

**Mail** Ian Kent <raven@themaw.net>

**Mailing list** autofs@vger.kernel.org

**Status** Maintained

**Files** fs/autofs/

## \* KERNEL BUILD + files below scripts/ (unless maintained elsewhere)

**Mail** Masahiro Yamada <masahiro@kernel.org>, Michal Marek <michal.lkml@markovi.net>

**Mailing list** linux-kbuild@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/masahiro/linux-kbuild.git

**Files** Documentation/kbuild/Makefile scripts/\*vmlinux\* scripts/Kbuild\* scripts/Makefile\* scripts/basic/ scripts/mk\* scripts/mod/ scripts/package/

## \* KERNEL JANITORS

**Mailing list** kernel-janitors@vger.kernel.org

**Status** Odd Fixes

**Web-page** <http://kernelnewbies.org/KernelJanitors>

### \* KERNEL NFSD, SUNRPC, AND LOCKD SERVERS

**Mail** “J. Bruce Fields” <[bfields@fieldses.org](mailto:bfields@fieldses.org)>, Chuck Lever <[chuck.lever@oracle.com](mailto:chuck.lever@oracle.com)>

**Mailing list** [linux-nfs@vger.kernel.org](mailto:linux-nfs@vger.kernel.org)

**Status** Supported

**Web-page** <http://nfs.sourceforge.net/>

**SCM** git <git://linux-nfs.org/~bfields/linux.git>

**Files** fs/lockd/ fs/nfs\_common/ fs/nfssd/ include/linux/lockd/ include/linux/sunrpc/ include/uapi/linux/nfssd/ include/uapi/linux/sunrpc/ net/sunrpc/

### \* KERNEL SELFTEST FRAMEWORK

**Mail** Shuah Khan <[shuah@kernel.org](mailto:shuah@kernel.org)>, Shuah Khan <[skhan@linuxfoundation.org](mailto:skhan@linuxfoundation.org)>

**Mailing list** [linux-kselftest@vger.kernel.org](mailto:linux-kselftest@vger.kernel.org)

**Status** Maintained

**Patchwork** <https://patchwork.kernel.org/project/linux-kselftest/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/shuah/linux-kselftest.git>

**Files** Documentation/dev-tools/kselftest\* tools/testing/ selftests/

### \* KERNEL UNIT TESTING FRAMEWORK (KUnit)

**Mail** Brendan Higgins <[brendanhiggins@google.com](mailto:brendanhiggins@google.com)>

**Mailing list** [linux-kselftest@vger.kernel.org](mailto:linux-kselftest@vger.kernel.org), kunit-dev@googlegroups.com

**Status** Maintained

**Web-page** [https://google.github.io/kunit-docs/third\\_party/kernel/docs/](https://google.github.io/kunit-docs/third_party/kernel/docs/)

**Files** Documentation/dev-tools/kunit/ include/kunit/ lib/kunit/ tools/testing/kunit/

## \* KERNEL USERMODE HELPER

**Mail** Luis Chamberlain <[mcgrof@kernel.org](mailto:mcgrof@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** `include/linux/umh.h` `kernel/umh.c`

## \* KERNEL VIRTUAL MACHINE (KVM)

**Mail** Paolo Bonzini <[pbonzini@redhat.com](mailto:pbonzini@redhat.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.linux-kvm.org>

**SCM** git `git://git.kernel.org/pub/scm/virt/kvm/kvm.git`

**Files** `Documentation/virt/kvm/`      `include/asm-generic/kvm*`  
`include/kvm/iodev.h`    `include/linux/kvm*`    `include/trace/`  
`events/kvm.h`    `include/uapi/asm-generic/kvm*`    `include/uapi/`  
`linux/kvm*`    `tools/kvm/`    `tools/testing/selftests/kvm/`    `virt/`  
`kvm/*`

## \* KERNEL VIRTUAL MACHINE FOR ARM64 (KVM/arm64)

**Mail** Marc Zyngier <[maz@kernel.org](mailto:maz@kernel.org)>

**Reviewer** James Morse <[james.morse@arm.com](mailto:james.morse@arm.com)>, Julien Thierry <[julien.thierry.kdev@gmail.com](mailto:julien.thierry.kdev@gmail.com)>, Suzuki K Poulose <[suzuki.poulose@arm.com](mailto:suzuki.poulose@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [kvmarm@lists.cs.columbia.edu](mailto:kvmarm@lists.cs.columbia.edu)

**Status** Maintained

**SCM** git `git://git.kernel.org/pub/scm/linux/kernel/git/kvmarm/kvmarm.git`

**Files** `arch/arm64/include/asm/kvm*`    `arch/arm64/include/uapi/`  
`asm/kvm*`    `arch/arm64/kvm/`    `include/kvm/arm_*`

## \* KERNEL VIRTUAL MACHINE FOR MIPS (KVM/mips)

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org), [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Orphan

**Files** `arch/mips/include/asm/kvm*`    `arch/mips/include/uapi/asm/`  
`kvm*`    `arch/mips/kvm/`

### \* KERNEL VIRTUAL MACHINE FOR POWERPC (KVM/powerpc)

**Mail** Paul Mackerras <[paulus@ozlabs.org](mailto:paulus@ozlabs.org)>

**Mailing list** [kvm-ppc@vger.kernel.org](mailto:kvm-ppc@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.linux-kvm.org/>

**SCM** git <git://github.com/agraf/linux-2.6.git>

**Files** arch/powerpc/include/asm/kvm\* arch/powerpc/include/uapi/asm/kvm\* arch/powerpc/kernel/kvm\* arch/powerpc/kvm/

### \* KERNEL VIRTUAL MACHINE for s390 (KVM/s390)

**Mail** Christian Borntraeger <[borntraeger@de.ibm.com](mailto:borntraeger@de.ibm.com)>, Janosch Frank <[frankja@linux.ibm.com](mailto:frankja@linux.ibm.com)>

**Reviewer** David Hildenbrand <[david@redhat.com](mailto:david@redhat.com)>, CorNELIA Huck <[cohuck@redhat.com](mailto:cohuck@redhat.com)>, Claudio Imbrenda <[imbrenda@linux.ibm.com](mailto:imbrenda@linux.ibm.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kvms390/linux.git>

**Files** Documentation/virt/kvm/s390\* arch/s390/include/asm/gmap.h arch/s390/include/asm/kvm\* arch/s390/include/uapi/asm/kvm\* arch/s390/kvm/ arch/s390/mm/gmap.c tools/testing/selftests/kvm/\*s390x/ tools/testing/selftests/kvm/s390x/

### \* KERNEL VIRTUAL MACHINE FOR X86 (KVM/x86)

**Mail** Paolo Bonzini <[pbonzini@redhat.com](mailto:pbonzini@redhat.com)>

**Reviewer** Sean Christopherson <[sean.j.christopherson@intel.com](mailto:sean.j.christopherson@intel.com)>, Vitaly Kuznetsov <[vkuznets@redhat.com](mailto:vkuznets@redhat.com)>, Wanpeng Li <[wanpengli@tencent.com](mailto:wanpengli@tencent.com)>, Jim Mattson <[jmattson@google.com](mailto:jmattson@google.com)>, Joerg Roedel <[joro@8bytes.org](mailto:joro@8bytes.org)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.linux-kvm.org/>

**SCM** git <git://git.kernel.org/pub/scm/virt/kvm/kvm.git>

**Files** arch/x86/include/asm/kvm\* arch/x86/include/asm/pvclock-abi.h arch/x86/include/asm/svm.h arch/x86/include/asm/vmx\*.h arch/x86/include/uapi/asm/kvm\* arch/x86/include/uapi/asm/svm.h arch/x86/include/uapi/asm/vmx.h

arch/x86/kernel/kvm.c arch/x86/kernel/kvmclock.c arch/  
x86/kvm/ arch/x86/kvm/\*/

## \* KERNFS

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>, Tejun Heo  
<[tj@kernel.org](mailto:tj@kernel.org)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/driver-core.git>

**Files** fs/kernfs/ include/linux/kernfs.h

## \* KEXEC

**Mail** Eric Biederman <[ebiederm@xmission.com](mailto:ebiederm@xmission.com)>

**Mailing list** [kexec@lists.infradead.org](mailto:kexec@lists.infradead.org)

**Status** Maintained

**Web-page** <http://kernel.org/pub/linux/utils/kernel/kexec/>

**Files** include/linux/kexec.h include/uapi/linux/kexec.h kernel/  
kexec\*

## \* KEYS-ENCRYPTED

**Mail** Mimi Zohar <[zohar@linux.ibm.com](mailto:zohar@linux.ibm.com)>

**Mailing list** [linux-integrity@vger.kernel.org](mailto:linux-integrity@vger.kernel.org), [keyrings@vger.kernel.org](mailto:keyrings@vger.kernel.org)

**Status** Supported

**Files** security/keys/trusted-encrypted include/keys/  
encrypted-type.h security/keys/encrypted-keys/

## \* KEYS-TRUSTED

**Mail** James Bottomley <[jejb@linux.ibm.com](mailto:jejb@linux.ibm.com)>, Jarkko Sakkinen <[jarkko.sakkinen@linux.intel.com](mailto:jarkko.sakkinen@linux.intel.com)>, Mimi Zohar <[zohar@linux.ibm.com](mailto:zohar@linux.ibm.com)>

**Mailing list** [linux-integrity@vger.kernel.org](mailto:linux-integrity@vger.kernel.org), [keyrings@vger.kernel.org](mailto:keyrings@vger.kernel.org)

**Status** Supported

**Files** security/keys/trusted-encrypted include/keys/trusted-type.h  
include/keys/trusted\_tpm.h security/keys/trusted-keys/

### \* **KEYS/KEYRINGS**

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>, Jarkko Sakkinen <[jarkko.sakkinen@linux.intel.com](mailto:jarkko.sakkinen@linux.intel.com)>

**Mailing list** [keyrings@vger.kernel.org](mailto:keyrings@vger.kernel.org)

**Status** Maintained

**Files** security/keys/core include/keys/ include/linux/key-type.h  
include/linux/key.h include/linux/keyctl.h include/uapi/  
linux/keyctl.h security/keys/

### \* **KFIFO**

**Mail** Stefani Seibold <[stefani@seibold.net](mailto:stefani@seibold.net)>

**Status** Maintained

**Files** include/linux/kfifo.h lib/kfifo.c samples/kfifo/

### \* **KGDB / KDB /debug\_core**

**Mail** Jason Wessel <[jason.wessel@windriver.com](mailto:jason.wessel@windriver.com)>, Daniel Thompson <[daniel.thompson@linaro.org](mailto:daniel.thompson@linaro.org)>

**Reviewer** Douglas Anderson <[dianders@chromium.org](mailto:dianders@chromium.org)>

**Mailing list** [kgdb-bugreport@lists.sourceforge.net](mailto:kgdb-bugreport@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://kgdb.wiki.kernel.org/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jwessel/kgdb.git

**Files** dev-tools/kgdb drivers/misc/kgdbts.c drivers/tty/serial/  
kgdboc.c include/linux/kdb.h include/linux/kgdb.h kernel/  
debug/

### \* **KMEMLEAK**

**Mail** Catalin Marinas <[catalin.marinas@arm.com](mailto:catalin.marinas@arm.com)>

**Status** Maintained

**Files** dev-tools/kmemleak include/linux/kmemleak.h mm/  
kmemleak-test.c mm/kmemleak.c

## \* KMOD KERNEL MODULE LOADER - USERMODE HELPER

**Mail** Luis Chamberlain <[mcgrof@kernel.org](mailto:mcgrof@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** `include/linux/kmod.h` `kernel/kmod.c` `lib/test_kmod.c` `tools/testing/selftests/kmod/`

## \* KPROBES

**Mail** Naveen N. Rao <[naveen.n.rao@linux.ibm.com](mailto:naveen.n.rao@linux.ibm.com)>, Anil S Ke-shavamurthy <[anil.s.keshavamurthy@intel.com](mailto:anil.s.keshavamurthy@intel.com)>, “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>, Masami Hiramatsu <[mhiramat@kernel.org](mailto:mhiramat@kernel.org)>

**Status** Maintained

**Files** `Documentation/kprobes.txt` `include/asm-generic/kprobes.h` `include/linux/kprobes.h` `kernel/kprobes.c`

## \* KS0108 LCD CONTROLLER DRIVER

**Mail** Miguel Ojeda Sandonis <[miguel.ojeda.sandonis@gmail.com](mailto:miguel.ojeda.sandonis@gmail.com)>

**Status** Maintained

**Files** `admin-guide/auxdisplay/ks0108` `drivers/auxdisplay/ks0108.c` `include/linux/ks0108.h`

## \* L3MDEV

**Mail** David Ahern <[dsahern@kernel.org](mailto:dsahern@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** `include/net/l3mdev.h` `net/l3mdev`

## \* L7 BPF FRAMEWORK

**Mail** John Fastabend <[john.fastabend@gmail.com](mailto:john.fastabend@gmail.com)>, Daniel Borkmann <[daniel@iogearbox.net](mailto:daniel@iogearbox.net)>, Jakub Sitnicki <[jakub@cloudflare.com](mailto:jakub@cloudflare.com)>, Lorenz Bauer <[lmb@cloudflare.com](mailto:lmb@cloudflare.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** `include/linux/skmsg.h` `net/core/skmsg.c` `net/core/sock_map.c` `net/ipv4/tcp_bpf.c` `net/ipv4/udp_bpf.c`

## \* LANTIQ / INTEL Ethernet drivers

**Mail** Hauke Mehrtens <[hauke@hauke-m.de](mailto:hauke@hauke-m.de)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/dsa/lantiq\_gswip.c drivers/net/dsa/  
lantiq\_pce.h drivers/net/ethernet/lantiq\_xrx200.c net/  
dsa/tag\_gswip.c

## \* LANTIQ MIPS ARCHITECTURE

**Mail** John Crispin <[john@phrozen.org](mailto:john@phrozen.org)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Files** arch/mips/lantiq drivers/soc/lantiq

## \* LAPB module

**Mailing list** [linux-x25@vger.kernel.org](mailto:linux-x25@vger.kernel.org)

**Status** Orphan

**Files** networking/lapb-module include/\*/lapb.h net/lapb/

## \* LASI 53c700 driver for PARISC

**Mail** “James E.J. Bottomley”<[James.Bottomley@HansenPartnership.com](mailto:James.Bottomley@HansenPartnership.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** scsi/53c700 drivers/scsi/53c700\*

## \* LEAKING\_ADDRESSES

**Mail** Tobin C. Harding <[me@tobin.cc](mailto:me@tobin.cc)>, Tycho Andersen  
<[tycho@tycho.ws](mailto:tycho@tycho.ws)>

**Mailing list** [kernel-hardening@lists.openwall.com](mailto:kernel-hardening@lists.openwall.com)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tobin/leaks.git

**Files** scripts/leaking\_addresses.pl

### \* LED SUBSYSTEM

**Mail** Jacek Anaszewski <[jacek.anaszewski@gmail.com](mailto:jacek.anaszewski@gmail.com)>, Pavel Machek <[pavel@ucw.cz](mailto:pavel@ucw.cz)>

**Reviewer** Dan Murphy <[dmurphy@ti.com](mailto:dmurphy@ti.com)>

**Mailing list** [linux-leds@vger.kernel.org](mailto:linux-leds@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/j.anaszewski/linux-leds.git> git <git://git.kernel.org/pub/scm/linux/kernel/git/pavel/linux-leds.git>

**Files** Documentation/devicetree/bindings/leds/ drivers/leds/include/linux/leds.h

### \* LEGACY EEPROM DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Status** Maintained

**Files** misc-devices/eeprom drivers/misc/eeprom/eeprom.c

### \* LEGO MINDSTORMS EV3

**Reviewer** David Lechner <[david@technology.com](mailto:david@technology.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/power/supply/lego\_ev3\_battery.txt arch/arm/boot/dts/da850-lego-ev3.dts drivers/power/supply/lego\_ev3\_battery.c

### \* LEGO USB Tower driver

**Mail** Juergen Stuber <[starblue@users.sourceforge.net](mailto:starblue@users.sourceforge.net)>

**Mailing list** [legousb-devel@lists.sourceforge.net](mailto:legousb-devel@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://legousb.sourceforge.net/>

**Files** drivers/usb/misc/legousbtower.c

### \* LG LAPTOP EXTRAS

**Mail** Matan Ziv-Av <[matan@svgalib.org](mailto:matan@svgalib.org)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-platform-lg-laptop  
admin-guide/laptops/lg-laptop drivers/platform/x86/lg-laptop.  
c

### \* LG2160 MEDIA DRIVER

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/tuners.git>

**Files** drivers/media/dvb-frontends/lg2160.\*

### \* LGDT3305 MEDIA DRIVER

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/tuners.git>

**Files** drivers/media/dvb-frontends/lgdt3305.\*

### \* LIBATA PATA ARASAN COMPACT FLASH CONTROLLER

**Mail** Viresh Kumar <[vireshk@kernel.org](mailto:vireshk@kernel.org)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** drivers/ata/pata\_arasan\_cf.c include/linux/  
pata\_arasan\_cf\_data.h

## \* LIBATA PATA DRIVERS

**Mail** Bartlomiej Zolnierkiewicz <[b.zolnierkie@samsung.com](mailto:b.zolnierkie@samsung.com)>, Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** drivers/ata/ata\_generic.c drivers/ata/pata\_\*.c

## \* LIBATA PATA FARADAY FTIDE010 AND GEMINI SATA BRIDGE DRIVERS

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** drivers/ata/pata\_ftide010.c drivers/ata/sata\_gemini.c  
drivers/ata/sata\_gemini.h

## \* LIBATA SATA AHCI PLATFORM devices support

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>, Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** drivers/ata/ahci\_platform.c drivers/ata/  
libahci\_platform.c include/linux/ahci\_platform.h

## \* LIBATA SATA PROMISE TX2/TX4 CONTROLLER DRIVER

**Mail** Mikael Pettersson <[mikpelinux@gmail.com](mailto:mikpelinux@gmail.com)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** drivers/ata/sata.promise.\*

## \* LIBATA SUBSYSTEM (Serial and Parallel ATA drivers)

**Mail** Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [linux-ide@vger.kernel.org](mailto:linux-ide@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/axboe/linux-block.git>

**Files** Documentation/devicetree/bindings/ata/ drivers/ata/include/linux/ata.h include/linux/libata.h

## \* LIBLOCKDEP

**Mail** Sasha Levin <[alexander.levin@microsoft.com](mailto:alexander.levin@microsoft.com)>

**Status** Maintained

**Files** tools/lib/lockdep/

## \* LIBNVDIMM BLK: MMIO-APERTURE DRIVER

**Mail** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>, Vishal Verma <[vishal.l.verma@intel.com](mailto:vishal.l.verma@intel.com)>, Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>

**Mailing list** [linux-nvdimm@lists.01.org](mailto:linux-nvdimm@lists.01.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-nvdimm/list/>

**P** nvdimm/maintainer-entry-profile

**Files** drivers/nvdimm/blk.c drivers/nvdimm/region\_devs.c

## \* LIBNVDIMM BTT: BLOCK TRANSLATION TABLE

**Mail** Vishal Verma <[vishal.l.verma@intel.com](mailto:vishal.l.verma@intel.com)>, Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>, Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>

**Mailing list** [linux-nvdimm@lists.01.org](mailto:linux-nvdimm@lists.01.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-nvdimm/list/>

**P** nvdimm/maintainer-entry-profile

**Files** drivers/nvdimm/btt\*

## \* LIBNVDIMM PMEM: PERSISTENT MEMORY DRIVER

**Mail** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>, Vishal Verma <[vishal.l.verma@intel.com](mailto:vishal.l.verma@intel.com)>, Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>

**Mailing list** [linux-nvdimm@lists.01.org](mailto:linux-nvdimm@lists.01.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-nvdimm/list/>

**P** nvdimm/maintainer-entry-profile

**Files** drivers/nvdimm/pmem\*

## \* LIBNVDIMM: DEVICETREE BINDINGS

**Mail** Oliver O' Halloran <[oohall@gmail.com](mailto:oohall@gmail.com)>

**Mailing list** [linux-nvdimm@lists.01.org](mailto:linux-nvdimm@lists.01.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-nvdimm/list/>

**Files** Documentation/devicetree/bindings/pmem/pmem-region.txt  
drivers/nvdimm/of\_pmem.c

## \* LIBNVDIMM: NON-VOLATILE MEMORY DEVICE SUBSYSTEM

**Mail** Dan Williams <[dan.j.williams@intel.com](mailto:dan.j.williams@intel.com)>, Vishal Verma <[vishal.l.verma@intel.com](mailto:vishal.l.verma@intel.com)>, Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>, Ira Weiny <[ira.weiny@intel.com](mailto:ira.weiny@intel.com)>

**Mailing list** [linux-nvdimm@lists.01.org](mailto:linux-nvdimm@lists.01.org)

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-nvdimm/list/>

**P** nvdimm/maintainer-entry-profile

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/nvdimm/nvdimm.git>

**Files** drivers/acpi/nfit/\* drivers/nvdimm/\* include/linux/libnvdimm.h include/linux/nd.h include/uapi/linux/ndctl.h  
tools/testing/nvdimm/

### \* LICENSES and SPDX stuff

**Mail** Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>, Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [linux-spdx@vger.kernel.org](mailto:linux-spdx@vger.kernel.org)

**Status** Maintained

**SCM** [git git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/spdx.git](git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/spdx.git)

**Files** COPYING process/license-rules LICENSES/ scripts/ spdxcheck-test.sh scripts/spdxcheck.py

### \* LIGHTNVM PLATFORM SUPPORT

**Mail** Matias Bjorling <[mb@lightnvm.io](mailto:mb@lightnvm.io)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Maintained

**Web-page** <http://github/OpenChannelSSD>

**Files** drivers/lightnvm/ include/linux/lightnvm.h include/uapi/linux/lightnvm.h

### \* LINEAR RANGES HELPERS

**Mail** Mark Brown <[broonie@kernel.org](mailto:broonie@kernel.org)>

**Reviewer** Matti Vaittinen <[matti.vaittinen@fi.rohmeurope.com](mailto:matti.vaittinen@fi.rohmeurope.com)>

**Files** lib/linear\_ranges.c lib/test\_linear\_ranges.c include/linux/linear\_range.h

### \* LINUX FOR POWER MACINTOSH

**Mail** Benjamin Herrenschmidt <[benh@kernel.crashing.org](mailto:benh@kernel.crashing.org)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Odd Fixes

**Files** arch/powerpc/platforms/powermac/ drivers/macintosh/

## \* LINUX FOR POWERPC (32-BIT AND 64-BIT)

**Mail** Michael Ellerman <[mpe@ellerman.id.au](mailto:mpe@ellerman.id.au)>

**Reviewer** Benjamin Herrenschmidt <[benh@kernel.crashing.org](mailto:benh@kernel.crashing.org)>,  
Paul Mackerras <[paulus@samba.org](mailto:paulus@samba.org)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Web-page** <https://github.com/linuxppc/wiki/wiki>

**Patchwork** <http://patchwork.ozlabs.org/project/linuxppc-dev/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/powerpc/linux.git>

**Files** Documentation/ABI/stable/sysfs-firmware-opal-\*  
Documentation/devicetree/bindings/i2c/i2c-opal.txt  
Documentation/devicetree/bindings/powerpc/ Documentation/  
devicetree/bindings/rtc/rtc-opal.txt Documentation/  
powerpc/ arch/powerpc/ drivers/\*/\*/\*pasemi\* drivers/\*/\*  
\*pasemi\* drivers/char/tpm/tpm\_ibmvtpm\* drivers/crypto/  
nx/ drivers/crypto/vmx/ drivers/i2c/busses/i2c-opal.c  
drivers/net/ethernet/ibm/ibmveth.\* drivers/net/ethernet/  
ibm/ibmvnic.\* drivers/pci/hotplug/pnv\_php.c drivers/pci/  
hotplug/rpa\* drivers/rtc/rtc-opal.c drivers/scsi/ibmvscsi/  
drivers/tty/hvc/hvc\_opal.c drivers/watchdog/wdrtas.c  
tools/testing/selftests/powerpc

**Regex** /pmac powermac powernv [^a-z0-9]ps3 pseries

## \* LINUX FOR POWERPC EMBEDDED MPC5XXX

**Mail** Anatolij Gustschin <[agust@denx.de](mailto:agust@denx.de)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Odd Fixes

**Files** arch/powerpc/platforms/512x/ arch/powerpc/platforms/  
52xx/

## \* LINUX FOR POWERPC EMBEDDED PPC4XX

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Orphan

**Files** arch/powerpc/platforms/40x/ arch/powerpc/platforms/44x/

## \* LINUX FOR POWERPC EMBEDDED PPC83XX AND PPC85XX

**Mail** Scott Wood <oss@buserror.net>

**Mailing list** linuxppc-dev@lists.ozlabs.org

**Status** Odd fixes

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/scottwood/linux.git

**Files** Documentation/devicetree/bindings/powerpc/fsl/ arch/ powerpc/platforms/83xx/ arch/powerpc/platforms/85xx/

## \* LINUX FOR POWERPC EMBEDDED PPC8XX

**Mail** Christophe Leroy <christophe.leroy@csgroup.eu>

**Mailing list** linuxppc-dev@lists.ozlabs.org

**Status** Maintained

**Files** arch/powerpc/platforms/8xx/

## \* LINUX KERNEL DUMP TEST MODULE (LKDTM)

**Mail** Kees Cook <keescook@chromium.org>

**Status** Maintained

**Files** drivers/misc/lkdtm/\* tools/testing/selftests/lkdtm/\*

## \* LINUX KERNEL MEMORY CONSISTENCY MODEL (LKMM)

**Mail** Alan Stern <stern@rowland.harvard.edu>, Andrea Parri <parri.andrea@gmail.com>, Will Deacon <will@kernel.org>, Peter Zijlstra <peterz@infradead.org>, Boqun Feng <boqun.feng@gmail.com>, Nicholas Piggin <npiggin@gmail.com>, David Howells <dhowells@redhat.com>, Jade Alglave <j.alglave@ucl.ac.uk>, Luc Maranget <luc.maranget@inria.fr>, “Paul E. McKenney” <paulmck@kernel.org>

**Reviewer** Akira Yokosawa <akiyks@gmail.com>, Daniel Lustig <dlustig@nvidia.com>

**Mailing list** linux-kernel@vger.kernel.org, linux-arch@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/paulmck/linux-rcu.git dev

**Files** Documentation/atomic\_bitops.txt Documentation/atomic\_t.txt core-api/atomic\_ops core-api/refcount-vs-atomic Documentation/memory-barriers.txt tools/memory-model/

## \* LIS3LV02D ACCELEROMETER DRIVER

**Mail** Eric Piel <[eric.piel@tremplin-utc.net](mailto:eric.piel@tremplin-utc.net)>

**Status** Maintained

**Files** misc-devices/lis3lv02d drivers/misc/lis3lv02d/ drivers/platform/x86/hp\_accel.c

## \* LIST KUNIT TEST

**Mail** David Gow <[davidgow@google.com](mailto:davidgow@google.com)>

**Mailing list** [linux-kselftest@vger.kernel.org](mailto:linux-kselftest@vger.kernel.org), [kunit-dev@googlegroups.com](mailto:kunit-dev@googlegroups.com)

**Status** Maintained

**Files** lib/list-test.c

## \* LIVE PATCHING

**Mail** Josh Poimboeuf <[jpoimboe@redhat.com](mailto:jpoimboe@redhat.com)>, Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>, Miroslav Benes <[mbenes@suse.cz](mailto:mbenes@suse.cz)>, Petr Mladek <[pmladek@suse.com](mailto:pmladek@suse.com)>

**Reviewer** Joe Lawrence <[joe.lawrence@redhat.com](mailto:joe.lawrence@redhat.com)>

**Mailing list** [live-patching@vger.kernel.org](mailto:live-patching@vger.kernel.org)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/livepatching/livepatching.git

**Files** Documentation/ABI/testing/sysfs-kernel-livepatch  
Documentation/livepatch/ arch/powerpc/include/asm/  
livepatch.h arch/s390/include/asm/livepatch.h arch/  
x86/include/asm/livepatch.h include/linux/livepatch.h  
kernel/livepatch/ lib/livepatch/ samples/livepatch/ tools/  
testing/selftests/livepatch/

## \* LLC (802.2)

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Odd fixes

**Files** include/linux/llc.h include/net/llc\* include/uapi/linux/llc.h net/llc/

## \* LM73 HARDWARE MONITOR DRIVER

**Mail** Guillaume Ligneul <[guillaume.ligneul@gmail.com](mailto:guillaume.ligneul@gmail.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/lm73.c

## \* LM78 HARDWARE MONITOR DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/lm78 drivers/hwmon/lm78.c

## \* LM83 HARDWARE MONITOR DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/lm83 drivers/hwmon/lm83.c

## \* LM90 HARDWARE MONITOR DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/hwmon/lm90.txt    hwmon/lm90    drivers/hwmon/lm90.c    include/dt-bindings/thermal/lm90.h

## \* LM95234 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/lm95234 drivers/hwmon/lm95234.c

### \* LME2510 MEDIA DRIVER

**Mail** Malcolm Priestley <[tvboxspy@gmail.com](mailto:tvboxspy@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/usb/dvb-usb-v2/lmedm04\*

### \* LOADPIN SECURITY MODULE

**Mail** Kees Cook <[keescook@chromium.org](mailto:keescook@chromium.org)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kees/linux.git>  
lsm/loadpin

**Files** admin-guide/LSM/LoadPin security/loadpin/

### \* LOCKING PRIMITIVES

**Mail** Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>, Ingo Molnar <[mingo@redhat.com](mailto:mingo@redhat.com)>, Will Deacon <[will@kernel.org](mailto:will@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> locking/core

**Files** Documentation/locking/ arch/\*/include/asm/spinlock\*.h  
include/linux/lockdep.h include/linux/mutex\*.h include/  
linux/rwlock\*.h include/linux/rwsem\*.h include/linux/  
seqlock.h include/linux/spinlock\*.h kernel/locking/ lib/  
locking\*[ch]

**Excluded** kernel/locking/locktorture.c

### \* LOGICAL DISK MANAGER SUPPORT (LDM, Windows 2000/XP/Vista Dynamic Disks)

**Mail** “Richard Russon (FlatCap)” <[ldm@flatcap.org](mailto:ldm@flatcap.org)>

**Mailing list** [linux-ntfs-dev@lists.sourceforge.net](mailto:linux-ntfs-dev@lists.sourceforge.net)

**Status** Maintained

**Web-page** <http://www.linux-ntfs.org/content/view/19/37/>

**Files** admin-guide/ldm block/partitions/ldm.\*

### \* LOGITECH HID GAMING KEYBOARDS

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/hid/hid.git>

**Files** drivers/hid/hid-lg-g15.c

### \* LSILOGIC MPT FUSION DRIVERS (FC/SAS/SPI)

**Mail** Sathya Prakash <[sathya.prakash@broadcom.com](mailto:sathya.prakash@broadcom.com)>, Sreekanth Reddy <[sreekanth.reddy@broadcom.com](mailto:sreekanth.reddy@broadcom.com)>, Suganath Prabu Subramani <[suganath-prabu.subramani@broadcom.com](mailto:suganath-prabu.subramani@broadcom.com)>

**Mailing list** [MPT-FusionLinux.pdl@broadcom.com](mailto:MPT-FusionLinux.pdl@broadcom.com), [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.avagotech.com/support/>

**Files** drivers/message/fusion/ drivers/scsi/mpt3sas/

### \* LSILOGIC/SYMBIOS/NCR 53C8XX and 53C1010 PCI-SCSI drivers

**Mail** Matthew Wilcox <[willy@infradead.org](mailto:willy@infradead.org)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** drivers/scsi/sym53c8xx\_2/

### \* LTC1660 DAC DRIVER

**Mail** Marcus Folkesson <[marcus.folkesson@gmail.com](mailto:marcus.folkesson@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/dac/lltc,ltc1660.yaml  
drivers/iio/dac/ltc1660.c

## \* LTC2947 HARDWARE MONITOR DRIVER

**Mail** Nuno Sá <[nuno.sa@analog.com](mailto:nuno.sa@analog.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/hwmon/adi, ltc2947.  
yaml drivers/hwmon/ltc2947-core.c drivers/hwmon/  
ltc2947-i2c.c drivers/hwmon/ltc2947-spi.c drivers/hwmon/  
ltc2947.h

## \* LTC2983 IIO TEMPERATURE DRIVER

**Mail** Nuno Sá <[nuno.sa@analog.com](mailto:nuno.sa@analog.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/iio/temperature/adi,  
ltc2983.yaml drivers/iio/temperature/ltc2983.c

## \* LTC4261 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/ltc4261 drivers/hwmon/ltc4261.c

## \* LTC4306 I2C MULTIPLEXER DRIVER

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Supported

**Web-page** <http://ez.analog.com/community/linux-device-drivers>

**Files** Documentation/devicetree/bindings/i2c/i2c-mux-ltc4306.  
txt drivers/i2c/muxes/i2c-mux-ltc4306.c

### \* LTP (Linux Test Project)

**Mail** Mike Frysinger <[vapier@gentoo.org](mailto:vapier@gentoo.org)>, Cyril Hrubis <[chrubis@suse.cz](mailto:chrubis@suse.cz)>, Wanlong Gao <[wanlong.gao@gmail.com](mailto:wanlong.gao@gmail.com)>, Jan Stancek <[jstancek@redhat.com](mailto:jstancek@redhat.com)>, Stanislav Kholmanskih <[stanislav.kholmanskih@oracle.com](mailto:stanislav.kholmanskih@oracle.com)>, Alexey Kodanев <[alexey.kodanev@oracle.com](mailto:alexey.kodanev@oracle.com)>

**Mailing list** [ltp@lists.linux.it](mailto:ltp@lists.linux.it) (subscribers-only)

**Status** Maintained

**Web-page** <http://linux-test-project.github.io/>

**SCM** git [git://github.com/linux-test-project/ltp.git](https://github.com/linux-test-project/ltp.git)

### \* M68K ARCHITECTURE

**Mail** Geert Uytterhoeven <[geert@linux-m68k.org](mailto:geert@linux-m68k.org)>

**Mailing list** [linux-m68k@lists.linux-m68k.org](mailto:linux-m68k@lists.linux-m68k.org)

**Status** Maintained

**Web-page** <http://www.linux-m68k.org/>

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/geert/linux-m68k.git](https://git.kernel.org/pub/scm/linux/kernel/git/geert/linux-m68k.git)

**Files** arch/m68k/ drivers/zorro/

### \* M68K ON APPLE MACINTOSH

**Mail** Joshua Thompson <[funaho@jurai.org](mailto:funaho@jurai.org)>

**Mailing list** [linux-m68k@lists.linux-m68k.org](mailto:linux-m68k@lists.linux-m68k.org)

**Status** Maintained

**Web-page** <http://www.mac.linux-m68k.org/>

**Files** arch/m68k/mac/

### \* M68K ON HP9000/300

**Mail** Philip Blundell <[philb@gnu.org](mailto:philb@gnu.org)>

**Status** Maintained

**Web-page** <http://www.tazenda.demon.co.uk/phil/linux-hp>

**Files** arch/m68k/hp300/

### \* M88DS3103 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/m88ds3103\*

### \* M88RS2000 MEDIA DRIVER

**Mail** Malcolm Priestley <[tvboxspy@gmail.com](mailto:tvboxspy@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/m88rs2000\*

### \* MA901 MASTERKIT USB FM RADIO DRIVER

**Mail** Alexey Klimov <[klimov.linux@gmail.com](mailto:klimov.linux@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-ma901.c

### \* MAC80211

**Mail** Johannes Berg <[johannes@sipsolutions.net](mailto:johannes@sipsolutions.net)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/jberg/mac80211.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/jberg/mac80211-next.git>

**Files** networking/mac80211-injection network-  
ing/mac80211\_hwsim/mac80211\_hwsim drivers/net/wireless/  
mac80211\_hwsim.[ch] include/net/mac80211.h net/mac80211/

### \* MAILBOX API

**Mail** Jassi Brar <[jassisinghbrar@gmail.com](mailto:jassisinghbrar@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/mailbox/ include/linux/mailbox\_client.h include/linux/mailbox\_controller.h

### \* MAN-PAGES: MANUAL PAGES FOR LINUX - Sections 2, 3, 4, 5, and 7

**Mail** Michael Kerrisk <[mtk.manpages@gmail.com](mailto:mtk.manpages@gmail.com)>

**Mailing list** [linux-man@vger.kernel.org](mailto:linux-man@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.kernel.org/doc/man-pages>

### \* MARDUK (CREATOR CI40) DEVICE TREE SUPPORT

**Mail** Rahul Bedarkar <[rahulbedarkar89@gmail.com](mailto:rahulbedarkar89@gmail.com)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Files** arch/mips/boot/dts/img/pistachio\_marduk.dts

### \* MARVELL 88E6XXX ETHERNET SWITCH FABRIC DRIVER

**Mail** Andrew Lunn <[andrew@lunn.ch](mailto:andrew@lunn.ch)>, Vivien Didelot <[vivien.didelot@gmail.com](mailto:vivien.didelot@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/dsa/marvell.txt  
networking/devlink/mv88e6xxx drivers/net/dsa/mv88e6xxx/  
include/linux/platform\_data/mv88e6xxx.h

### \* MARVELL ARMADA 3700 PHY DRIVERS

**Mail** Miquel Raynal <[miquel.raynal@bootlin.com](mailto:miquel.raynal@bootlin.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/phy/phy-mvebu-comphy.txt  
Documentation/devicetree/bindings/phy/phy-mvebu-utmi.txt  
drivers/phy/marvell/phy-mvebu-a3700-comphy.c drivers/phy/marvell/phy-mvebu-a3700-utmi.c

## \* MARVELL ARMADA DRM SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Status** Maintained

**SCM** git <git://git.armlinux.org.uk/~rmk/linux-arm.git> drm-armada-devel git <git://git.armlinux.org.uk/~rmk/linux-arm.git> drm-armada-fixes

**Files** Documentation/devicetree/bindings/display/armada/drivers/gpu/drm/armada/include/uapi/drm/armada\_drm.h

## \* MARVELL CRYPTO DRIVER

**Mail** Boris Brezillon <[bbrezillon@kernel.org](mailto:bbrezillon@kernel.org)>, Arnaud Ebalard <[arno@natisbad.org](mailto:arno@natisbad.org)>, Srujana Challa <[schalla@marvell.com](mailto:schalla@marvell.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** drivers/crypto/marvell/

## \* MARVELL GIGABIT ETHERNET DRIVERS (skge/sky2)

**Mail** Mirko Lindner <[mlindner@marvell.com](mailto:mlindner@marvell.com)>, Stephen Hemminger <[stephen@networkplumber.org](mailto:stephen@networkplumber.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/marvell/sk\*

## \* MARVELL LIBERTAS WIRELESS DRIVER

**Mailing list** [libertas-dev@lists.infradead.org](mailto:libertas-dev@lists.infradead.org)

**Status** Orphan

**Files** drivers/net/wireless/marvell/libertas/

## \* MARVELL MACCHIATOBIN SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** arch/arm64/boot/dts/marvell/armada-8040-mcbin.dts

## \* MARVELL MV643XX ETHERNET DRIVER

**Mail** Sebastian Hesselbarth <[sebastian.hesselbarth@gmail.com](mailto:sebastian.hesselbarth@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/marvell/mv643xx\_eth.\* include/  
linux/mv643xx.h

## \* MARVELL MV88X3310 PHY DRIVER

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/phy/marvell10g.c

## \* MARVELL MVEBU THERMAL DRIVER

**Mail** Miquel Raynal <[miquel.raynal@bootlin.com](mailto:miquel.raynal@bootlin.com)>

**Status** Maintained

**Files** drivers/thermal/armada\_thermal.c

## \* MARVELL MVNETA ETHERNET DRIVER

**Mail** Thomas Petazzoni <[thomas.petazzoni@bootlin.com](mailto:thomas.petazzoni@bootlin.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/marvell/mvneta.\*

## \* MARVELL MWIFIEX WIRELESS DRIVER

**Mail** Amitkumar Karwar <[amitkarwar@gmail.com](mailto:amitkarwar@gmail.com)>, Ganapathi Bhat <[ganapathi.bhat@nxp.com](mailto:ganapathi.bhat@nxp.com)>, Xinming Hu <[huxinming820@gmail.com](mailto:huxinming820@gmail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireless/marvell/mwifiex/

## \* MARVELL MWL8K WIRELESS DRIVER

**Mail** Lennert Buytenhek <buytenh@wantstofly.org>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Odd Fixes

**Files** drivers/net/wireless/marvell/mwl8k.c

## \* MARVELL NAND CONTROLLER DRIVER

**Mail** Miquel Raynal <miquel.raynal@bootlin.com>

**Mailing list** linux-mtd@lists.infradead.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/mtd/marvell-nand.txt  
drivers/mtd/nand/raw/marvell\_nand.c

## \* MARVELL OCTEONTX2 PHYSICAL FUNCTION DRIVER

**Mail** Sunil Goutham <sgoutham@marvell.com>, Geetha sowjanya <gakula@marvell.com>, Subbaraya Sundeep <sbhatta@marvell.com>, hariprasad <hkelam@marvell.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/marvell/octeontx2/nic/

## \* MARVELL OCTEONTX2 RVU ADMIN FUNCTION DRIVER

**Mail** Sunil Goutham <sgoutham@marvell.com>, Linu Cherian <lcherian@marvell.com>, Geetha sowjanya <gakula@marvell.com>, Jerin Jacob <jerinj@marvell.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** networking/device\_drivers/marvell/octeontx2 drivers/net/ethernet/marvell/octeontx2/af/

## \* MARVELL SOC MMC/SD/SDIO CONTROLLER DRIVER

**Mail** Nicolas Pitre <[nico@fluxnic.net](mailto:nico@fluxnic.net)>

**Status** Odd Fixes

**Files** drivers/mmc/host/mvsdio.\*

## \* MARVELL USB MDIO CONTROLLER DRIVER

**Mail** Tobias Waldekranz <[tobias@waldekranz.com](mailto:tobias@waldekranz.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/marvell\_mvusb.yaml  
drivers/net/phy/mdio-mvusb.c

## \* MARVELL XENON MMC/SD/SDIO HOST CONTROLLER DRIVER

**Mail** Hu Ziji <[huziji@marvell.com](mailto:huziji@marvell.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mmc/marvell\_xenon-sdhci.txt  
drivers/mmc/host/sdhci-xenon\*

## \* MATROX FRAMEBUFFER DRIVER

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Orphan

**Files** drivers/video/fbdev/matrox/matroxfb\_\* include/uapi/linux/matroxfb.h

## \* MAX16065 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/max16065 drivers/hwmon/max16065.c

## \* MAX2175 SDR TUNER DRIVER

**Mail** Ramesh Shanmugasundaram <rashanmu@gmail.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/i2c/max2175.txt  
userspace-api/media/drivers/max2175 drivers/media/i2c/  
max2175\* include/uapi/linux/max2175.h

## \* MAX6650 HARDWARE MONITOR AND FAN CONTROLLER DRIVER

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Orphan

**Files** hwmon/max6650 drivers/hwmon/max6650.c

## \* MAX6697 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <linux@roeck-us.net>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/hwmon/max6697.txt  
hwmon/max6697 drivers/hwmon/max6697.c include/linux/  
platform\_data/max6697.h

## \* MAX9860 MONO AUDIO VOICE CODEC DRIVER

**Mail** Peter Rosin <peda@axentia.se>

**Mailing list** alsa-devel@alsa-project.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/max9860.txt  
sound/soc/codecs/max9860.\*

## \* MAXBOTIX ULTRASONIC RANGER IIO DRIVER

**Mail** Andreas Klinger <[ak@it-klinger.de](mailto:ak@it-klinger.de)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/proximity/  
maxbotix\_mb1232.yaml drivers/iio/proximity/mb1232.c

## \* MAXIM MAX77650 PMIC MFD DRIVER

**Mail** Bartosz Golaszewski <[bgolaszewski@baylibre.com](mailto:bgolaszewski@baylibre.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/\*/\*max77650.yaml  
Documentation/devicetree/bindings/\*/\*max77650\*.yaml  
drivers/gpio/gpio-max77650.c drivers/input/misc/  
max77650-onkey.c drivers/leds/leds-max77650.c drivers/  
mfd/max77650.c drivers/power/supply/max77650-charger.c  
drivers/regulator/max77650-regulator.c include/linux/mfd/  
max77650.h

## \* MAXIM MAX77802 PMIC REGULATOR DEVICE DRIVER

**Mail** Javier Martinez Canillas <[javier@dowhile0.org](mailto:javier@dowhile0.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/\*/\*max77802.  
txt drivers/regulator/max77802-regulator.c include/  
dt-bindings/\*/\*max77802.h

## \* MAXIM MUIC CHARGER DRIVERS FOR EXYNOS BASED BOARDS

**Mail** Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>, Bartłomiej Zolnierkiewicz <[b.zolnierkie@samsung.com](mailto:b.zolnierkie@samsung.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**Files** drivers/power/supply/max14577\_charger.c drivers/power/  
supply/max77693\_charger.c

## \* MAXIM PMIC AND MUIC DRIVERS FOR EXYNOS BASED BOARDS

**Mail** Chanwoo Choi <[cw00.choi@samsung.com](mailto:cw00.choi@samsung.com)>, Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>, Bartłomiej Zolnierkiewicz <[b.zolnierkie@samsung.com](mailto:b.zolnierkie@samsung.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/\*/max77686.txt  
Documentation/devicetree/bindings/clock/maxim,max77686.txt  
Documentation/devicetree/bindings/mfd/max14577.txt  
Documentation/devicetree/bindings/mfd/max77693.txt  
drivers/\*/max14577\*.c drivers/\*/max77686\*.c drivers/\*/  
max77693\*.c drivers/clk/clk-max77686.c drivers/extcon/  
extcon-max14577.c drivers/extcon/extcon-max77693.c  
drivers/rtc/rtc-max77686.c include/linux/mfd/max14577\*.  
h include/linux/mfd/max77686\*.h include/linux/mfd/  
max77693\*.h

## \* MAXIRADIO FM RADIO RECEIVER DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-maxiradio\*

## \* MCAN MMIO DEVICE DRIVER

**Mail** Dan Murphy <[dmurphy@ti.com](mailto:dmurphy@ti.com)>, Sriram Dash <[sriram.dash@samsung.com](mailto:sriram.dash@samsung.com)>

**Mailing list** [linux-can@vger.kernel.org](mailto:linux-can@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/can/bosch,m\_can.  
yaml drivers/net/can/m\_can/m\_can.c drivers/net/can/m\_can/  
m\_can.h drivers/net/can/m\_can/m\_can\_platform.c

### \* MCP2221A MICROCHIP USB-HID TO I2C BRIDGE DRIVER

**Mail** Rishi Gupta <[gupt21@gmail.com](mailto:gupt21@gmail.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org), [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/hid/hid-mcp2221.c

### \* MCP4018 AND MCP4531 MICROCHIP DIGITAL POTENTIOMETER DRIVERS

**Mail** Peter Rosin <[peda@axentia.se](mailto:peda@axentia.se)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-iio-potentiometer-mcp4531  
drivers/iio/potentiometer/mcp4018.c                            drivers/iio/  
potentiometer/mcp4531.c

### \* MCR20A IEEE-802.15.4 RADIO DRIVER

**Mail** Xue Liu <[liuxuenetmail@gmail.com](mailto:liuxuenetmail@gmail.com)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Maintained

**Web-page** <https://github.com/xueliu/mcr20a-linux>

**Files** Documentation/devicetree/bindings/net/ieee802154/  
mcr20a.txt    drivers/net/ieee802154/mcr20a.c    drivers/net/  
ieee802154/mcr20a.h

### \* MEASUREMENT COMPUTING CIO-DAC IIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** drivers/iio/dac/cio-dac.c

## \* MEDIA CONTROLLER FRAMEWORK

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>, Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://www.linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/mc/ include/media/media-\*.h include/uapi/linux/media.h

## \* MEDIA DRIVER FOR FREESCALE IMX PXP

**Mail** Philipp Zabel <[p.zabel@pengutronix.de](mailto:p.zabel@pengutronix.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/platform/imx-pxp.[ch]

## \* MEDIA DRIVERS FOR ASCOT2E

**Mail** Sergey Kozlov <[serjk@netup.ru](mailto:serjk@netup.ru)>, Abylay Ospan <[aospan@netup.ru](mailto:aospan@netup.ru)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org> <http://netup.tv/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/ascot2e\*

## \* MEDIA DRIVERS FOR CXD2099AR CI CONTROLLERS

**Mail** Jasmin Jessich <[jasmin@anw.at](mailto:jasmin@anw.at)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/cxd2099\*

### \* MEDIA DRIVERS FOR CXD2841ER

**Mail** Sergey Kozlov <[serjk@netup.ru](mailto:serjk@netup.ru)>, Abylay Ospan <[aospan@netup.ru](mailto:aospan@netup.ru)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org> <http://netup.tv/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/cxd2841er\*

### \* MEDIA DRIVERS FOR CXD2880

**Mail** Yasunari Takiguchi <[Yasunari.Takiguchi@sony.com](mailto:Yasunari.Takiguchi@sony.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <http://linuxtv.org/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/cxd2880/\* drivers/media/spi/cxd2880\*

### \* MEDIA DRIVERS FOR DIGITAL DEVICES PCIE DEVICES

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Orphan

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/ddbridge/\*

### \* MEDIA DRIVERS FOR FREESCALE IMX

**Mail** Steve Longerbeam <[slongerbeam@gmail.com](mailto:slongerbeam@gmail.com)>, Philipp Zabel <[p.zabel@pengutronix.de](mailto:p.zabel@pengutronix.de)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** admin-guide/media/imx Documentation/devicetree/bindings/media/imx.txt drivers/staging/media/imx/ include/linux/imx-media.h include/media/imx.h

## \* MEDIA DRIVERS FOR FREESCALE IMX7

**Mail** Rui Miguel Silva <[rmfrfs@gmail.com](mailto:rmfrfs@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** admin-guide/media/imx7 Documentation/devicetree/  
bindings/media/imx7-csi.txt Documentation/devicetree/  
bindings/media/imx7-mipi-csi2.txt drivers/staging/  
media/imx/imx7-media-csi.c drivers/staging/media/imx/  
imx7-mipi-csis.c

## \* MEDIA DRIVERS FOR HELENE

**Mail** Abylay Ospan <[aospan@netup.ru](mailto:aospan@netup.ru)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org http://netup.tv/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/helene\*

## \* MEDIA DRIVERS FOR HORUS3A

**Mail** Sergey Kozlov <[serjk@netup.ru](mailto:serjk@netup.ru)>, Abylay Ospan <[aospan@netup.ru](mailto:aospan@netup.ru)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org http://netup.tv/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/horus3a\*

## \* MEDIA DRIVERS FOR LNBH25

**Mail** Sergey Kozlov <[serjk@netup.ru](mailto:serjk@netup.ru)>, Abylay Ospan <[aospan@netup.ru](mailto:aospan@netup.ru)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org http://netup.tv/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/lnbh25\*

### \* MEDIA DRIVERS FOR MXL5XX TUNER DEMODULATORS

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Orphan

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/mxl5xx\*

### \* MEDIA DRIVERS FOR NETUP PCI UNIVERSAL DVB devices

**Mail** Sergey Kozlov <[serjk@netup.ru](mailto:serjk@netup.ru)>, Abylay Ospan <[aospan@netup.ru](mailto:aospan@netup.ru)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Web-page** <https://linuxtv.org> <http://netup.tv/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/netup\_unidvb/\*

### \* MEDIA DRIVERS FOR NVIDIA TEGRA - VDE

**Mail** Dmitry Osipenko <[digetx@gmail.com](mailto:digetx@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [tegra@vger.kernel.org](mailto:tegra@vger.kernel.org) linux-

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/nvidia,  
tegra-vde.txt drivers/staging/media/tegra-vde/

### \* MEDIA DRIVERS FOR RENESAS - CEU

**Mail** Jacopo Mondi <[jacopo@jmondi.org](mailto:jacopo@jmondi.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [soc@vger.kernel.org](mailto:soc@vger.kernel.org) linux-renesas-

**Status** Supported

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/renesas\_ceu.  
yaml drivers/media/platform/renesas-ceu.c include/media/  
drv-intf/renesas-ceu.h

## \* MEDIA DRIVERS FOR RENESAS - DRIF

**Mail** Ramesh Shanmugasundaram <rashanmu@gmail.com>

**Mailing list** linux-media@vger.kernel.org, linux-renesas-soc@vger.kernel.org

**Status** Supported

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/renesas,drif.txt  
drivers/media/platform/rcar\_drif.c

## \* MEDIA DRIVERS FOR RENESAS - FCP

**Mail** Laurent Pinchart <laurent.pinchart@ideasonboard.com>

**Mailing list** linux-media@vger.kernel.org, linux-renesas-soc@vger.kernel.org

**Status** Supported

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/renesas,fcp.txt  
drivers/media/platform/rcar-fcp.c include/media/rcar-fcp.h

## \* MEDIA DRIVERS FOR RENESAS - FDP1

**Mail** Kieran Bingham <kieran.bingham+renesas@ideasonboard.com>

**Mailing list** linux-media@vger.kernel.org, linux-renesas-soc@vger.kernel.org

**Status** Supported

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/renesas,fdp1.txt  
drivers/media/platform/rcar\_fdp1.c

## \* MEDIA DRIVERS FOR RENESAS - VIN

**Mail** Niklas Söderlund <niklas.soderlund@agnatech.se>

**Mailing list** linux-media@vger.kernel.org, linux-renesas-soc@vger.kernel.org

**Status** Supported

**SCM** git git://linuxtv.org/media\_tree.git

**Files** Documentation/devicetree/bindings/media/renesas,csi2.yaml  
Documentation/devicetree/bindings/media/renesas,vin.yaml  
drivers/media/platform/rcar-vin/

### \* MEDIA DRIVERS FOR RENESAS - VSP1

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>, Kieran Bingham <[kieran.bingham+renesas@ideasonboard.com](mailto:kieran.bingham+renesas@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/renesas,vsp1.txt  
drivers/media/platform/vsp1/

### \* MEDIA DRIVERS FOR ST STV0910 DEMODULATOR ICs

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Orphan

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/stv0910\*

### \* MEDIA DRIVERS FOR ST STV6111 TUNER ICs

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Orphan

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/dvb-frontends/stv6111\*

### \* MEDIA DRIVERS FOR STM32 - DCMI

**Mail** Hugues Fruchet <[hugues.fruchet@st.com](mailto:hugues.fruchet@st.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/st\_stm32-dcmi.yaml  
drivers/media/platform/stm32/stm32-dcmi.c

## \* MEDIA INPUT INFRASTRUCTURE (V4L/DVB)

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.kernel.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/admin-guide/media/ Documentation/  
devicetree/bindings/media/ Documentation/driver-api/  
media/ Documentation/userspace-api/media/ drivers/media/  
drivers/staging/media/ include/linux/platform\_data/media/  
include/media/ include/uapi/linux/dvb/ include/uapi/linux/  
ivtv\* include/uapi/linux/media.h include/uapi/linux/meye.h  
include/uapi/linux/uvcvideo.h include/uapi/linux/v4l2-\*  
include/uapi/linux/videodev2.h

## \* MEDIATEK BLUETOOTH DRIVER

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Mailing list** [linux-bluetooth@vger.kernel.org](mailto:linux-bluetooth@vger.kernel.org), [linux-mEDIATEK@lists.infradead.org](mailto:linux-mEDIATEK@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/  
mediatek-bluetooth.txt drivers/bluetooth/btmtkuart.c

## \* MEDIATEK BOARD LEVEL SHUTDOWN DRIVERS

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/power/reset/  
mt6323-poweroff.txt drivers/power/reset/mt6323-poweroff.c

### \* MEDIATEK CIR DRIVER

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Status** Maintained

**Files** drivers/media/rc/mtk-cir.c

### \* MEDIATEK DMA DRIVER

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Mailing list** [dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-mediatek@lists.infradead.org](mailto:linux-mediatek@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/dma/mtk-\* drivers/dma/mediatek/

### \* MEDIATEK ETHERNET DRIVER

**Mail** Felix Fietkau <[nbd@nbd.name](mailto:nbd@nbd.name)>, John Crispin <[john@phrozen.org](mailto:john@phrozen.org)>, Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>, Mark Lee <[Mark-MC.Lee@mediatek.com](mailto:Mark-MC.Lee@mediatek.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/mediatek/

### \* MEDIATEK I2C CONTROLLER DRIVER

**Mail** Qii Wang <[qii.wang@mediatek.com](mailto:qii.wang@mediatek.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-mt65xx.txt  
drivers/i2c/busses/i2c-mt65xx.c

### \* MEDIATEK JPEG DRIVER

**Mail** Rick Chang <[rick.chang@mediatek.com](mailto:rick.chang@mediatek.com)>, Bin Liu <[bin.liu@mediatek.com](mailto:bin.liu@mediatek.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/media/  
mediatek-jpeg-decoder.txt drivers/media/platform/  
mtk-jpeg/

## \* MEDIATEK MDP DRIVER

**Mail** Minghsiu Tsai <[minghsiu.tsai@mediatek.com](mailto:minghsiu.tsai@mediatek.com)>, Houlong Wei <[houlong.wei@mediatek.com](mailto:houlong.wei@mediatek.com)>, Andrew-CT Chen <[andrew-ct.chen@mediatek.com](mailto:andrew-ct.chen@mediatek.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/media/mediatek-mdp.txt  
drivers/media/platform/mtk-mdp/ drivers/media/platform/mtk-vpu/

## \* MEDIATEK MEDIA DRIVER

**Mail** Tiffany Lin <[tiffany.lin@mediatek.com](mailto:tiffany.lin@mediatek.com)>, Andrew-CT Chen <[andrew-ct.chen@mediatek.com](mailto:andrew-ct.chen@mediatek.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/media/mediatek-vcodec.txt  
Documentation/devicetree/bindings/media/mediatek-vpu.txt  
drivers/media/platform/mtk-vcodec/  
drivers/media/platform/mtk-vpu/

## \* MEDIATEK MMC/SD/SDIO DRIVER

**Mail** Chaotian Jing <[chaotian.jing@mediatek.com](mailto:chaotian.jing@mediatek.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/mmc/mtk-sd.txt  
drivers/mmc/host/mtk-sd.c

## \* MEDIATEK MT76 WIRELESS LAN DRIVER

**Mail** Felix Fietkau <[nbd@nbd.name](mailto:nbd@nbd.name)>, Lorenzo Bianconi <[lorenzo.bianconi83@gmail.com](mailto:lorenzo.bianconi83@gmail.com)>

**Reviewer** Ryder Lee <[ryder.lee@mediatek.com](mailto:ryder.lee@mediatek.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireless/mediatek/mt76/

## \* MEDIATEK MT7601U WIRELESS LAN DRIVER

**Mail** Jakub Kicinski <[kubakici@wp.pl](mailto:kubakici@wp.pl)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireless MEDIATEK/mt7601u/

## \* MEDIATEK MT7621/28/88 I2C DRIVER

**Mail** Stefan Roese <[sr@denx.de](mailto:sr@denx.de)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-mt7621.txt  
drivers/i2c/busses/i2c-mt7621.c

## \* MEDIATEK NAND CONTROLLER DRIVER

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Orphan

**Files** Documentation/devicetree/bindings/mtd/mtk-nand.txt  
drivers/mtd/nand/raw/mtk\_\*

## \* MEDIATEK PMIC LED DRIVER

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/leds/leds-mt6323.txt  
drivers/leds/leds-mt6323.c

## \* MEDIATEK RANDOM NUMBER GENERATOR SUPPORT

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Status** Maintained

**Files** drivers/char/hw\_random/mtk-rng.c

## \* MEDIATEK SWITCH DRIVER

**Mail** Sean Wang <[sean.wang@mediatek.com](mailto:sean.wang@mediatek.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/dsa/mt7530.\* net/dsa/tag\_mtk.c

## \* MEDIATEK USB3 DRD IP DRIVER

**Mail** Chunfeng Yun <[chunfeng.yun@mediatek.com](mailto:chunfeng.yun@mediatek.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org) (moderated for non-subscribers), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-mediatek@lists.infradead.org](mailto:linux-mediatek@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/usb/mtu3/

## \* MEGACHIPS STDPXXXX-GE-B850V3-FW LVDS/DP++ BRIDGES

**Mail** Peter Senna Tschudin <[peter.senna@gmail.com](mailto:peter.senna@gmail.com)>, Martin Donnelly <[martin.donnelly@ge.com](mailto:martin.donnelly@ge.com)>, Martyn Welch <[martyn.welch@collabora.co.uk](mailto:martyn.welch@collabora.co.uk)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/bridge/megachips-stdpXXXX-ge-b850v3-fw.txt drivers/gpu/drm/bridge/megachips-stdpXXXX-ge-b850v3-fw.c

## \* MEGARAID SCSI/SAS DRIVERS

**Mail** Kashyap Desai <[kashyap.desai@broadcom.com](mailto:kashyap.desai@broadcom.com)>, Sumit Saxena <[sumit.saxena@broadcom.com](mailto:sumit.saxena@broadcom.com)>, Shivasharan S <[shivasharan.srikanteshwara@broadcom.com](mailto:shivasharan.srikanteshwara@broadcom.com)>

**Mailing list** [megaraidlinux.pdl@broadcom.com](mailto:megaraidlinux.pdl@broadcom.com), [scsi@vger.kernel.org](mailto:scsi@vger.kernel.org) linux-

**Status** Maintained

**Web-page** <http://www.avagotech.com/support/>

**Files** scsi/megaraid drivers/scsi/megaraid.\* drivers/scsi/megaraid/

### \* MELEXIS MLX90614 DRIVER

**Mail** Crt Mori <[cmo@melexis.com](mailto:cmo@melexis.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.melexis.com>

**Files** drivers/iio/temperature/mlx90614.c

### \* MELEXIS MLX90632 DRIVER

**Mail** Crt Mori <[cmo@melexis.com](mailto:cmo@melexis.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.melexis.com>

**Files** drivers/iio/temperature/mlx90632.c

### \* MELFAS MIP4 TOUCHSCREEN DRIVER

**Mail** Sangwon Jee <[jeesw@melfas.com](mailto:jeesw@melfas.com)>

**Status** Supported

**Web-page** <http://www.melfas.com>

**Files** Documentation/devicetree/bindings/input/touchscreen/  
melfas\_mip4.txt drivers/input/touchscreen/melfas\_mip4.c

### \* MELLANOX ETHERNET DRIVER (mlx4\_en)

**Mail** Tariq Toukan <[tariqt@mellanox.com](mailto:tariqt@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** drivers/net/ethernet/mellanox/mlx4/en\_\*

### \* MELLANOX ETHERNET DRIVER (mlx5e)

**Mail** Saeed Mahameed <[saeedm@mellanox.com](mailto:saeedm@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** drivers/net/ethernet/mellanox/mlx5/core/en\_\*

### \* MELLANOX ETHERNET INNOVA DRIVERS

**Reviewer** Boris Pismenny <[borisp@mellanox.com](mailto:borisp@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** drivers/net/ethernet/mellanox/mlx5/core/accel/\*  
drivers/net/ethernet/mellanox/mlx5/core/en\_accel/\*  
drivers/net/ethernet/mellanox/mlx5/core/fpga/\* include/  
linux/mlx5/mlx5\_ifc\_fpga.h

### \* MELLANOX ETHERNET SWITCH DRIVERS

**Mail** Jiri Pirko <[jiri@mellanox.com](mailto:jiri@mellanox.com)>, Ido Schimmel  
<[idosch@mellanox.com](mailto:idosch@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** drivers/net/ethernet/mellanox/mlxsw/ tools/testing/  
selftests/drivers/net/mlxsw/

### \* MELLANOX FIRMWARE FLASH LIBRARY (mlxfw)

**Mail** mlxsw@mellanox.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** drivers/net/ethernet/mellanox/mlxfw/

### \* MELLANOX HARDWARE PLATFORM SUPPORT

**Mail** Andy Shevchenko <[andy@infradead.org](mailto:andy@infradead.org)>, Darren Hart <[dvhart@infradead.org](mailto:dvhart@infradead.org)>, Vadim Pasternak <[vadimp@mellanox.com](mailto:vadimp@mellanox.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Supported

**Files** Documentation/ABI/testing/sysfs-platform-mellanox-bootctl  
drivers/platform/mellanox/ include/linux/platform\_data/  
mlxreg.h

### \* MELLANOX MLX4 core VPI driver

**Mail** Tariq Toukan <[tariqt@mellanox.com](mailto:tariqt@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** drivers/net/ethernet/mellanox/mlx4/ include/linux/mlx4/

### \* MELLANOX MLX4 IB driver

**Mail** Yishai Hadas <[yishaih@mellanox.com](mailto:yishaih@mellanox.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.kernel.org/project/linux-rdma/list/>

**Files** drivers/infiniband/hw/mlx4/ include/linux/mlx4/ include/  
uapi/rdma/mlx4-abi.h

### \* MELLANOX MLX5 core VPI driver

**Mail** Saeed Mahameed <[saeedm@mellanox.com](mailto:saeedm@mellanox.com)>, Leon Romanovsky <[leonro@mellanox.com](mailto:leonro@mellanox.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**Files** Documentation/networking/device\_drivers/mellanox/  
drivers/net/ethernet/mellanox/mlx5/core/ include/linux/  
mlx5/

#### \* MELLANOX MLX5 IB DRIVER

**Mail** Leon Romanovsky <leonro@mellanox.com>

**Mailing list** linux-rdma@vger.kernel.org

**Status** Supported

**Web-page** <http://www.mellanox.com>

**Patchwork** <http://patchwork.kernel.org/project/linux-rdma/list/>

**Files** drivers/infiniband/hw/mlx5/ include/linux/mlx5/ include/  
uapi/rdma/mlx5-abi.h

#### \* MELLANOX MLXCPLD I2C AND MUX DRIVER

**Mail** Vadim Pasternak <[vadimp@mellanox.com](mailto:vadimp@mellanox.com)>, Michael Shych  
<[michaelsh@mellanox.com](mailto:michaelsh@mellanox.com)>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Supported

**Files** i2c/busses/i2c-mlxcpld drivers/i2c/busses/i2c-mlxcpld.c  
drivers/i2c/muxes/i2c-mux-mlxcpld.c

#### \* MELLANOX MLXCPLD LED DRIVER

**Mail** Vadim Pasternak <[vadimp@mellanox.com](mailto:vadimp@mellanox.com)>

**Mailing list** linux-leds@vger.kernel.org

**Status** Supported

**Files** leds/leds-mlxcpld drivers/leds/leds-mlxcpld.c drivers/  
leds/leds-mlxreg.c

#### \* MELLANOX PLATFORM DRIVER

**Mail** Vadim Pasternak <[vadimp@mellanox.com](mailto:vadimp@mellanox.com)>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Supported

**Files** drivers/platform/x86/mlx-platform.c

### \* MEMBARRIER SUPPORT

**Mail** Mathieu Desnoyers <[mathieu.desnoyers@efficios.com](mailto:mathieu.desnoyers@efficios.com)>, “Paul E. McKenney” <[paulmck@kernel.org](mailto:paulmck@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** arch/powerpc/include/asm/membarrier.h include/uapi/linux/membarrier.h kernel/sched/membarrier.c

### \* MEMBLOCK

**Mail** Mike Rapoport <[rppt@linux.ibm.com](mailto:rppt@linux.ibm.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** core-api/boot-time-mm include/linux/memblock.h mm/mmblock.c

### \* MEMORY MANAGEMENT

**Mail** Andrew Morton <[akpm@linux-foundation.org](mailto:akpm@linux-foundation.org)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Web-page** <http://www.linux-mm.org>

**SCM** quilt <https://ozlabs.org/~akpm/mmotm/> quilt <https://ozlabs.org/~akpm/mmots/> git [git https://github.com/hnaz/linux-mm.git](https://github.com/hnaz/linux-mm.git)

**Files** include/linux/gfp.h include/linux/memory\_hotplug.h include/linux/mm.h include/linux/mmzone.h include/linux/vmalloc.h mm/

### \* MEMORY TECHNOLOGY DEVICES (MTD)

**Mail** Miquel Raynal <[miquel.raynal@bootlin.com](mailto:miquel.raynal@bootlin.com)>, Richard Weinberger <[richard@nod.at](mailto:richard@nod.at)>, Vignesh Raghavendra <[vigneshr@ti.com](mailto:vigneshr@ti.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Web-page** <http://www.linux-mtd.infradead.org/>

**Patchwork** <http://patchwork.ozlabs.org/project/linux-mtd/list/>

**chat** irc://irc.oftc.net/mtd

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/mtd/linux.git  
mtd/fixes git git://git.kernel.org/pub/scm/linux/kernel/git/mtd/linux.git  
mtd/next

**Files** Documentation/devicetree/bindings/mtd/ drivers/mtd/  
include/linux/mtd/ include/uapi/mtd/

### \* MEN A21 WATCHDOG DRIVER

**Mail** Johannes Thumshirn <[morbidrsa@gmail.com](mailto:morbidrsa@gmail.com)>

**Mailing list** [linux-watchdog@vger.kernel.org](mailto:linux-watchdog@vger.kernel.org)

**Status** Maintained

**Files** drivers/watchdog/mena21\_wdt.c

### \* MEN CHAMELEON BUS (mcb)

**Mail** Johannes Thumshirn <[morbidrsa@gmail.com](mailto:morbidrsa@gmail.com)>

**Status** Maintained

**Files** driver-api/men-chameleon-bus drivers/mcb/ include/linux/  
mcb.h

### \* MEN F21BMC (Board Management Controller)

**Mail** Andreas Werner <[andreas.werner@men.de](mailto:andreas.werner@men.de)>

**Status** Supported

**Files** hwmon/menf21bmc drivers/hwmon/menf21bmc\_hwmon.c  
drivers/leds/leds-menf21bmc.c drivers/mfd/menf21bmc.c  
drivers/watchdog/menf21bmc\_wdt.c

### \* MEN Z069 WATCHDOG DRIVER

**Mail** Johannes Thumshirn <[jth@kernel.org](mailto:jth@kernel.org)>

**Mailing list** [linux-watchdog@vger.kernel.org](mailto:linux-watchdog@vger.kernel.org)

**Status** Maintained

**Files** drivers/watchdog/menz69\_wdt.c

## \* MESON AO CEC DRIVER FOR AMLOGIC SOCS

**Mail** Neil Armstrong <[narmstrong@baylibre.com](mailto:narmstrong@baylibre.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [amlogic@lists.infradead.org](mailto:amlogic@lists.infradead.org) linux-

**Status** Supported

**Web-page** <http://linux-meson.com/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/amlogic,  
meson-gx-ao-cec.yaml drivers/media/platform/meson/  
ao-cec-g12a.c drivers/media/platform/meson/ao-cec.c

## \* MESON NAND CONTROLLER DRIVER FOR AMLOGIC SOCS

**Mail** Liang Yang <[liang.yang@amlogic.com](mailto:liang.yang@amlogic.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/mtd/amlogic,  
meson-nand.txt drivers/mtd/nand/raw/meson\_\*

## \* MESON VIDEO DECODER DRIVER FOR AMLOGIC SOCS

**Mail** Maxime Jourdan <[mjourdan@baylibre.com](mailto:mjourdan@baylibre.com)>, Neil Armstrong  
<[narmstrong@baylibre.com](mailto:narmstrong@baylibre.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [amlogic@lists.infradead.org](mailto:amlogic@lists.infradead.org) linux-

**Status** Supported

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/amlogic,  
gx-vdec.yaml drivers/staging/media/meson/vdec/

## \* METHODE UDPU SUPPORT

**Mail** Vladimir Vid <[vladimir.vid@sartura.hr](mailto:vladimir.vid@sartura.hr)>

**Status** Maintained

**Files** arch/arm64/boot/dts/marvell/armada-3720-uDPU.dts

### \* MHI BUS

**Mail** Manivannan Sadhasivam <[manivannan.sadhasivam@linaro.org](mailto:manivannan.sadhasivam@linaro.org)>,  
Hemant Kumar <[hemantk@codeaurora.org](mailto:hemantk@codeaurora.org)>

**Mailing list** [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mani/mhi.git>

**Files** Documentation/mhi/ drivers/bus/mhi/ include/linux/mhi.h

### \* MICROBLAZE ARCHITECTURE

**Mail** Michal Simek <[monstr@monstr.eu](mailto:monstr@monstr.eu)>

**Status** Supported

**Web-page** <http://www.monstr.eu/fdt/>

**SCM** git <git://git.monstr.eu/linux-2.6-microblaze.git>

**Files** arch/microblaze/

### \* MICROCHIP AT91 SERIAL DRIVER

**Mail** Richard Genoud <[richard.genoud@gmail.com](mailto:richard.genoud@gmail.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/mfd/atmel-usart.txt  
drivers/tty/serial/atmel\_serial.c      drivers/tty/serial/  
atmel\_serial.h

### \* MICROCHIP AT91 USART MFD DRIVER

**Mail** Radu Pirea <[radu\\_nicolae.pirea@upb.ro](mailto:radu_nicolae.pirea@upb.ro)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mfd/atmel-usart.  
txt      drivers/mfd/at91-usart.c      include/dt-bindings/mfd/  
at91-usart.h

## \* MICROCHIP AT91 USART SPI DRIVER

**Mail** Radu Pirea <[radu\\_nicolae.pirea@upb.ro](mailto:radu_nicolae.pirea@upb.ro)>

**Mailing list** [linux-spi@vger.kernel.org](mailto:linux-spi@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mfd/atmel-usart.txt  
drivers/spi/spi-at91-usart.c

## \* MICROCHIP AUDIO ASOC DRIVERS

**Mail** Codrin Ciubotariu <[codrin.ciubotariu@microchip.com](mailto:codrin.ciubotariu@microchip.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**Files** sound/soc/atmel

## \* MICROCHIP DMA DRIVER

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/dma/atmel-dma.txt  
drivers/dma/at\_hdmac.c drivers/dma/at\_hdmac\_regs.h  
include/dt-bindings/dma/at91.h include/linux/platform\_data/dma-atmel.h

## \* MICROCHIP ECC DRIVER

**Mail** Tudor Ambarus <[tudor.ambarus@microchip.com](mailto:tudor.ambarus@microchip.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** drivers/crypto/atmel-ecc.\*

## \* MICROCHIP I2C DRIVER

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Supported

**Files** drivers/i2c/busses/i2c-at91-\*.\* drivers/i2c/busses/i2c-at91.h

## \* MICROCHIP ISC DRIVER

**Mail** Eugen Hristev <[eugen.hristev@microchip.com](mailto:eugen.hristev@microchip.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/media/atmel-isc.txt  
drivers/media/platform/atmel/atmel-isc-base.c drivers/  
media/platform/atmel/atmel-isc-reg.h drivers/media/  
platform/atmel/atmel-isc.h drivers/media/platform/atmel/  
atmel-sama5d2-isc.c include/linux/atmel-isc-media.h

## \* MICROCHIP ISI DRIVER

**Mail** Eugen Hristev <[eugen.hristev@microchip.com](mailto:eugen.hristev@microchip.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Files** drivers/media/platform/atmel/atmel-isi.c drivers/media/  
platform/atmel/atmel-isi.h

## \* MICROCHIP KSZ SERIES ETHERNET SWITCH DRIVER

**Mail** Woojung Huh <[woojung.huh@microchip.com](mailto:woojung.huh@microchip.com)>, Microchip Linux  
Driver Support <[UNGLinuxDriver@microchip.com](mailto:UNGLinuxDriver@microchip.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/dsa/ksz.txt  
drivers/net/dsa/microchip/\* include/linux/platform\_data/  
microchip-ksz.h net/dsa/tag\_ksz.c

## \* MICROCHIP LAN743X ETHERNET DRIVER

**Mail** Bryan Whitehead <[bryan.whitehead@microchip.com](mailto:bryan.whitehead@microchip.com)>, Microchip  
Linux Driver Support <[UNGLinuxDriver@microchip.com](mailto:UNGLinuxDriver@microchip.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** `drivers/net/ethernet/microchip/lan743x_*`

## \* MICROCHIP LCDFB DRIVER

**Mail** Nicolas Ferre <[nicolas.ferre@microchip.com](mailto:nicolas.ferre@microchip.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** `drivers/video/fbdev/atmel_lcdfb.c`                    `include/video/atmel_lcdc.h`

## \* MICROCHIP MCP16502 PMIC DRIVER

**Mail** Andrei Stefanescu <[andrei.stefanescu@microchip.com](mailto:andrei.stefanescu@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** `Documentation/devicetree/bindings/regulator/mcp16502-regulator.txt` `drivers/regulator/mcp16502.c`

## \* MICROCHIP MCP3911 ADC DRIVER

**Mail** Marcus Folkesson <[marcus.folkesson@gmail.com](mailto:marcus.folkesson@gmail.com)>, Kent Gustavsson <[kent@minoris.se](mailto:kent@minoris.se)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Files** `Documentation/devicetree/bindings/iio/adc/microchip,mcp3911.yaml` `drivers/iio/adc/mcp3911.c`

## \* MICROCHIP MMC/SD/SDIO MCI DRIVER

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Status** Maintained

**Files** drivers/mmc/host/atmel-mci.c

## \* MICROCHIP NAND DRIVER

**Mail** Tudor Ambarus <[tudor.ambarus@microchip.com](mailto:tudor.ambarus@microchip.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mtd/atmel-nand.txt  
drivers/mtd/nand/raw/atmel/\*

## \* MICROCHIP PWM DRIVER

**Mail** Claudiu Beznea <[claudiu.beznea@microchip.com](mailto:claudiu.beznea@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-pwm@vger.kernel.org](mailto:linux-pwm@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/pwm/atmel-pwm.txt  
drivers/pwm/pwm-atmel.c

## \* MICROCHIP SAMA5D2-COMPATIBLE ADC DRIVER

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>, Eugen Hristev <[eugen.hristev@microchip.com](mailto:eugen.hristev@microchip.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/iio/adc/  
at91-sama5d2\_adc.txt    drivers/iio/adc/at91-sama5d2\_adc.c  
include/dt-bindings/iio/adc/at91-sama5d2\_adc.h

## \* MICROCHIP SAMA5D2-COMPATIBLE SHUTDOWN CONTROLLER

**Mail** Nicolas Ferre <[nicolas.ferre@microchip.com](mailto:nicolas.ferre@microchip.com)>

**Status** Supported

**Files** drivers/power/reset/at91-sama5d2\_shdw.c

## \* MICROCHIP SPI DRIVER

**Mail** Nicolas Ferre <[nicolas.ferre@microchip.com](mailto:nicolas.ferre@microchip.com)>

**Status** Supported

**Files** drivers/spi/spi-atmel.\*

## \* MICROCHIP SSC DRIVER

**Mail** Nicolas Ferre <[nicolas.ferre@microchip.com](mailto:nicolas.ferre@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/misc/atmel-ssc.c include/linux/atmel-ssc.h

## \* MICROCHIP USB251XB DRIVER

**Mail** Richard Leitner <[richard.leitner@skidata.com](mailto:richard.leitner@skidata.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/usb/usb251xb.txt  
drivers/usb/misc/usb251xb.c

## \* MICROCHIP USBA UDC DRIVER

**Mail** Cristian Birsan <[cristian.birsan@microchip.com](mailto:cristian.birsan@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/usb/gadget/udc/atmel\_usba\_udc.\*

## \* MICROCHIP XDMA DRIVER

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org),  
[dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org)

**Status** Supported

**Files** drivers/dma/at\_xdmac.c

## \* MICROSEMI MIPS SOCS

**Mail** Alexandre Belloni <[alexandre.belloni@bootlin.com](mailto:alexandre.belloni@bootlin.com)>, Microchip  
Linux Driver Support <[UNGLinuxDriver@microchip.com](mailto:UNGLinuxDriver@microchip.com)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mips/mscc.txt  
arch/mips/boot/dts/mscc/ arch/mips/configs/generic/  
board-ocelot.config arch/mips/generic/board-ocelot.c

## \* MICROSEMI SMART ARRAY SMARTPQI DRIVER (smartpqi)

**Mail** Don Brace <[don.brace@microsemi.com](mailto:don.brace@microsemi.com)>

**Mailing list** [esc.storagedev@microsemi.com](mailto:esc.storagedev@microsemi.com), [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** scsi/smartpqi drivers/scsi/smartpqi/Kconfig drivers/scsi/  
smartpqi/Makefile drivers/scsi/smartpqi/smartpqi\*.ch  
include/linux/cciss\*.h include/uapi/linux/cciss\*.h

## \* MICROSOFT SURFACE PRO 3 BUTTON DRIVER

**Mail** Chen Yu <[yu.c.chen@intel.com](mailto:yu.c.chen@intel.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Supported

**Files** drivers/platform/x86/surfacepro3\_button.c

## \* MICROTEK X6 SCANNER

**Mail** Oliver Neukum <[oliver@neukum.org](mailto:oliver@neukum.org)>

**Status** Maintained

**Files** drivers/usb/image/microtek.\*

## \* MIPS

**Mail** Thomas Bogendoerfer <[tsbogend@alpha.franken.de](mailto:tsbogend@alpha.franken.de)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-mips.org/>

**Patchwork** <https://patchwork.kernel.org/project/linux-mips/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mips/linux.git>

**Files** Documentation/devicetree/bindings/mips/ Documentation/  
mips/ arch/mips/ drivers/platform/mips/

### \* MIPS BOSTON DEVELOPMENT BOARD

**Mail** Paul Burton <paulburton@kernel.org>

**Mailing list** linux-mips@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/clock/img,  
boston-clock.txt arch/mips/boot/dts/img/boston.dts  
arch/mips/configs/generic/board-boston.config drivers/  
clk/imgtec/clk-boston.c include/dt-bindings/clock/  
boston-clock.h

### \* MIPS GENERIC PLATFORM

**Mail** Paul Burton <paulburton@kernel.org>

**Mailing list** linux-mips@vger.kernel.org

**Status** Supported

**Files** Documentation/devicetree/bindings/power/mti,  
mips-cpc.txt arch/mips/generic/ arch/mips/tools/  
generic-board-config.sh

### \* MIPS RINT INSTRUCTION EMULATION

**Mail** Aleksandar Markovic <aleksandar.markovic@mips.com>

**Mailing list** linux-mips@vger.kernel.org

**Status** Supported

**Files** arch/mips/math-emu/dp\_rint.c arch/mips/math-emu/  
sp\_rint.c

### \* MIPS/LOONGSON1 ARCHITECTURE

**Mail** Keguang Zhang <keguang.zhang@gmail.com>

**Mailing list** linux-mips@vger.kernel.org

**Status** Maintained

**Files** arch/mips/include/asm/mach-loongson32/ arch/mips/  
loongson32/ drivers/\*/\*/\*loongson1\* drivers/\*/\*/\*loongson1\*

### \* MIPS/LOONGSON2EF ARCHITECTURE

**Mail** Jiaxun Yang <jiaxun.yang@flygoat.com>

**Mailing list** linux-mips@vger.kernel.org

**Status** Maintained

**Files** arch/mips/include/asm/mach-loongson2ef/ arch/mips/loongson2ef/ drivers/\*/\*/\*loongson2\* drivers/\*/\*loongson2\*

### \* MIPS/LOONGSON64 ARCHITECTURE

**Mail** Huacai Chen <chenhc@lemote.com>, Jiaxun Yang <jiaxun.yang@flygoat.com>

**Mailing list** linux-mips@vger.kernel.org

**Status** Maintained

**Files** arch/mips/include/asm/mach-loongson64/ arch/mips/loongson64/ drivers/\*/\*/\*loongson3\* drivers/\*/\*loongson3\* drivers/irqchip/irq-loongson\* drivers/platform/mips/cpu\_hwmon.c

### \* MIROSOUND PCM20 FM RADIO RECEIVER DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/radio/radio-miropcm20\*

### \* MMP SUPPORT

**Reviewer** Lubomir Rintel <lkundrak@v3.sk>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Odd Fixes

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/lkundrak/linux-mmp.git

**Files** arch/arm/boot/dts/mmp\* arch/arm/mach-mmp/ linux/soc/mmp/

### \* MMP USB PHY DRIVERS

**Reviewer** Lubomir Rintel <lkundrak@v3.sk>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/phy/marvell/phy-mmp3-usb.c drivers/phy/marvell/phy-pxa-usb.c

### \* MMU GATHER AND TLB INVALIDATION

**Mail** Will Deacon <will@kernel.org>, “Aneesh Kumar K.V” <aneesh.kumar@linux.ibm.com>, Andrew Morton <akpm@linux-foundation.org>, Nick Piggin <npiggin@gmail.com>, Peter Zijlstra <peterz@infradead.org>

**Mailing list** linux-arch@vger.kernel.org, linux-mm@kvack.org

**Status** Maintained

**Files** arch/\*/include/asm/tlb.h include/asm-generic/tlb.h mm/mm\_gather.c

### \* MN88472 MEDIA DRIVER

**Mail** Antti Palosaari <crope@iki.fi>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/mn88472\*

### \* MN88473 MEDIA DRIVER

**Mail** Antti Palosaari <crope@iki.fi>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/mn88473\*

## \* MODULE SUPPORT

**Mail** Jessica Yu <[jeyu@kernel.org](mailto:jeyu@kernel.org)>

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jeyu/linux.git  
modules-next

**Files** include/linux/module.h kernel/module.c

## \* MONOLITHIC POWER SYSTEM PMIC DRIVER

**Mail** Saravanan Sekar <[sravanhome@gmail.com](mailto:sravanhome@gmail.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/mfd/mps,mp2629.yaml  
Documentation/devicetree/bindings/regulator/mps,mp\*.yaml  
drivers/iio/adc/mp2629\_adc.c drivers/mfd/mp2629.c drivers/  
power/supply/mp2629\_charger.c drivers/regulator/mp5416.c  
drivers/regulator/mpq7920.c drivers/regulator/mpq7920.h  
include/linux/mfd/mp2629.h

## \* MOTION EYE VAIO PICTUREBOOK CAMERA DRIVER

**Status** Orphan

**Web-page** <http://popies.net/meye/>

**Files** Documentation/userspace-api/media/drivers/meye\*  
drivers/media/pci/meye/ include/uapi/linux/meye.h

## \* MOXA SMARTIO/INDUSTIO/INTELLIO SERIAL CARD

**Mail** Jiri Slaby <[jirislaby@gmail.com](mailto:jirislaby@gmail.com)>

**Status** Maintained

**Files** driver-api/serial/moxa-smartio drivers/tty/mxser.\*

## \* MR800 AVERMEDIA USB FM RADIO DRIVER

**Mail** Alexey Klimov <[klimov.linux@gmail.com](mailto:klimov.linux@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/radio/radio-mr800.c

### \* MRF24J40 IEEE 802.15.4 RADIO DRIVER

**Mail** Alan Ott <[alan@signal11.us](mailto:alan@signal11.us)>

**Mailing list** [linux-wpan@vger.kernel.org](mailto:linux-wpan@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/ieee802154/  
mrf24j40.txt drivers/net/ieee802154/mrf24j40.c

### \* MSI LAPTOP SUPPORT

**Mail** “Lee, Chun-Yi” <[jlee@suse.com](mailto:jlee@suse.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/platform/x86/msi-laptop.c

### \* MSI WMI SUPPORT

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Orphan

**Files** drivers/platform/x86/msi-wmi.c

### \* MSI001 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/msi001\*

### \* MSI2500 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/usb/msi2500/

### \* **MSYSTEMS DISKONCHIP G3 MTD DRIVER**

**Mail** Robert Jarzmik <[robert.jarzmik@free.fr](mailto:robert.jarzmik@free.fr)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** drivers/mtd/devices/docg3\*

### \* **MT9M032 APTINA SENSOR DRIVER**

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/mt9m032.c include/media/i2c/mt9m032.h

### \* **MT9P031 APTINA CAMERA SENSOR**

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/mt9p031.c include/media/i2c/mt9p031.h

### \* **MT9T001 APTINA CAMERA SENSOR**

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/mt9t001.c include/media/i2c/mt9t001.h

## \* MT9T112 APTINA CAMERA SENSOR

**Mail** Jacopo Mondi <[jacopo@jmondi.org](mailto:jacopo@jmondi.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/mt9t112.c include/media/i2c/mt9t112.h

## \* MT9V032 APTINA CAMERA SENSOR

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/mt9v032.txt  
drivers/media/i2c/mt9v032.c include/media/i2c/mt9v032.h

## \* MT9V111 APTINA CAMERA SENSOR

**Mail** Jacopo Mondi <[jacopo@jmondi.org](mailto:jacopo@jmondi.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/aptina,  
mt9v111.txt drivers/media/i2c/mt9v111.c

## \* MULTIFUNCTION DEVICES (MFD)

**Mail** Lee Jones <[lee.jones@linaro.org](mailto:lee.jones@linaro.org)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/lee/mfd.git>

**Files** Documentation/devicetree/bindings/mfd/ drivers/mfd/  
include/dt-bindings/mfd/ include/linux/mfd/

## \* MULTIMEDIA CARD (MMC) ETC. OVER SPI

**Status** Orphan

**Files** drivers/mmc/host/mmc\_spi.c include/linux/spi/mmc\_spi.h

## \* MULTIMEDIA CARD (MMC), SECURE DIGITAL (SD) AND SDIO SUB-SYSTEM

**Mail** Ulf Hansson <ulf.hansson@linaro.org>

**Mailing list** linux-mmc@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/ulfh/mmc.git

**Files** Documentation/devicetree/bindings/mmc/ drivers/mmc/ include/linux/mmc/ include/uapi/linux/mmc/

## \* MULTIPLEXER SUBSYSTEM

**Mail** Peter Rosin <peda@axentia.se>

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-class-mux\*  
Documentation/devicetree/bindings/mux/ drivers/mux/  
include/dt-bindings/mux/ include/linux/mux/

## \* MULTITECH MULTIPORT CARD (ISICOM)

**Status** Orphan

**Files** drivers/tty/isicom.c include/linux/isicom.h

## \* MUSB MULTIPOINT HIGH SPEED DUAL-ROLE CONTROLLER

**Mail** Bin Liu <b-liu@ti.com>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**Files** drivers/usb/musb/

### \* MXL301RF MEDIA DRIVER

**Mail** Akihiro Tsukada <[tskd08@gmail.com](mailto:tskd08@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/media/tuners/mxl301rf\*

### \* MXL5007T MEDIA DRIVER

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/tuners.git>

**Files** drivers/media/tuners/mxl5007t.\*

### \* MXSFB DRM DRIVER

**Mail** Marek Vasut <[marex@denx.de](mailto:marex@denx.de)>, Stefan Agner <[stefan@agner.ch](mailto:stefan@agner.ch)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Supported

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** Documentation/devicetree/bindings/display/mxsfb.txt  
drivers/gpu/drm/mxsfb/

### \* MYLEX DAC960 PCI RAID Controller

**Mail** Hannes Reinecke <[hare@kernel.org](mailto:hare@kernel.org)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/myrb.\* drivers/scsi/myrs.\*

## \* MYRICOM MYRI-10G 10GbE DRIVER (MYRI10GE)

**Mail** Chris Lee <[christopher.lee@cspi.com](mailto:christopher.lee@cspi.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <https://www.cspi.com/ethernet-products/support/downloads/>

**Files** drivers/net/ethernet/myricom/myri10ge/

## \* NAND FLASH SUBSYSTEM

**Mail** Miquel Raynal <[miquel.raynal@bootlin.com](mailto:miquel.raynal@bootlin.com)>

**Reviewer** Richard Weinberger <[richard@nod.at](mailto:richard@nod.at)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Web-page** <http://www.linux-mtd.infradead.org/>

**Patchwork** <http://patchwork.ozlabs.org/project/linux-mtd/list/>

**chat** <irc://irc.oftc.net/mtd>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mtd/linux.git>  
nand/next

**Files** drivers/mtd/nand/ include/linux/mtd/\*nand\*.h

## \* NATIVE INSTRUMENTS USB SOUND INTERFACE DRIVER

**Mail** Daniel Mack <[zonque@gmail.com](mailto:zonque@gmail.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.native-instruments.com>

**Files** sound/usb/caiaq/

## \* NATSEMI ETHERNET DRIVER (DP8381x)

**Status** Orphan

**Files** drivers/net/ethernet/natsemi/natsemi.c

## \* NCR 5380 SCSI DRIVERS

**Mail** Finn Thain <[fthain@telegraphics.com.au](mailto:fthain@telegraphics.com.au)>, Michael Schmitz <[schmitzmic@gmail.com](mailto:schmitzmic@gmail.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** scsi/g\_NCR5380 drivers/scsi/NCR5380.\* drivers/scsi/arm/cumana\_1.c drivers/scsi/arm/oak.c drivers/scsi/atari\_scsi.\* drivers/scsi/dmx3191d.c drivers/scsi/g\_NCR5380.\* drivers/scsi/mac\_scsi.\* drivers/scsi/sun3\_scsi.\* drivers/scsi/sun3\_scsi\_vme.c

## \* NCSI LIBRARY

**Mail** Samuel Mendoza-Jonas <[sam@mendozajonas.com](mailto:sam@mendozajonas.com)>

**Status** Maintained

**Files** net/ncsi/

## \* NCT6775 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/nct6775 drivers/hwmon/nct6775.c

## \* NETDEVSIM

**Mail** Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>

**Status** Maintained

**Files** drivers/net/netdevsim/\*

## \* NETEM NETWORK EMULATOR

**Mail** Stephen Hemminger <[stephen@networkplumber.org](mailto:stephen@networkplumber.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** net/sched/sch\_netem.c

## \* NETERION 10GbE DRIVERS (s2io/vxge)

**Mail** Jon Mason <[jdmason@kudzu.us](mailto:jdmason@kudzu.us)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** networking/device\_drivers/neterion/s2io  
networking/device\_drivers/neterion/vxge  
drivers/net/ethernet/  
neterion/

## \* NETFILTER

**Mail** Pablo Neira Ayuso <[pablo@netfilter.org](mailto:pablo@netfilter.org)>, Jozsef Kadlecik <[kadlec@netfilter.org](mailto:kadlec@netfilter.org)>, Florian Westphal <[fw@strlen.de](mailto:fw@strlen.de)>

**Mailing list** [netfilter-devel@vger.kernel.org](mailto:netfilter-devel@vger.kernel.org), [coreteam@netfilter.org](mailto:coreteam@netfilter.org)

**Status** Maintained

**Web-page** <http://www.netfilter.org/> <http://www.iptables.org/>  
<http://www.nftables.org/>

**Patchwork** <http://patchwork.ozlabs.org/project/netfilter-devel/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pablo/nf.git> git <git://git.kernel.org/pub/scm/linux/kernel/git/pablo/nf-next.git>

**Files** include/linux/netfilter\* include/linux/netfilter/  
include/net/netfilter/ include/uapi/linux/netfilter\*  
include/uapi/linux/netfilter/ net/\*/netfilter.c net/\*/  
netfilter/ net/bridge/br\_netfilter\*.c net/netfilter/

## \* NETROM NETWORK LAYER

**Mail** Ralf Baechle <[ralf@linux-mips.org](mailto:ralf@linux-mips.org)>

**Mailing list** [linux-hams@vger.kernel.org](mailto:linux-hams@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-ax25.org/>

**Files** include/net/netrom.h include/uapi/linux/netrom.h net/  
netrom/

### \* NETRIONOME ETHERNET DRIVERS

**Mail** Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>

**Mailing list** [oss-drivers@netronome.com](mailto:oss-drivers@netronome.com)

**Status** Maintained

**Files** drivers/net/ethernet/netronome/

### \* NETWORK BLOCK DEVICE (NBD)

**Mail** Josef Bacik <[josef@toxicpanda.com](mailto:josef@toxicpanda.com)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org), [nbd@other.debian.org](mailto:nbd@other.debian.org)

**Status** Maintained

**Files** admin-guide/blockdev/nbd drivers/block/nbd.c include/trace/events/nbd.h include/uapi/linux/nbd.h

### \* NETWORK DROP MONITOR

**Mail** Neil Horman <[nhorman@tuxdriver.com](mailto:nhorman@tuxdriver.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <https://fedorahosted.org/dropwatch/>

**Files** include/net/drop\_monitor.h include/uapi/linux/net\_dropmon.h net/core/drop\_monitor.c

### \* NETWORKING DRIVERS

**Mail** “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>, Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linuxfoundation.org/en/Net>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/netdev/net.git> <git://git.kernel.org/pub/scm/linux/kernel/git/netdev/net-next.git>

**Files** Documentation/devicetree/bindings/net/ drivers/net/include/linux/etherdevice.h include/linux/fcdevice.h include/linux/fddidevice.h include/linux/hippidevice.h include/linux/if\_\* include/linux/inetdevice.h include/linux/netdevice.h include/uapi/linux/if\_\* include/uapi/linux/netdevice.h

## \* NETWORKING DRIVERS (WIRELESS)

**Mail** Kalle Valo <[kvalo@codeaurora.org](mailto:kvalo@codeaurora.org)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/linux-wireless/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kvalo/wireless-drivers.git> <git://git.kernel.org/pub/scm/linux/kernel/git/kvalo/wireless-drivers-next.git>

**Files** Documentation/devicetree/bindings/net/wireless/drivers/net/wireless/

## \* NETWORKING [DSA]

**Mail** Andrew Lunn <[andrew@lunn.ch](mailto:andrew@lunn.ch)>, Vivien Didelot <[vivien.didelot@gmail.com](mailto:vivien.didelot@gmail.com)>, Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/dsa/ drivers/net/dsa/ include/linux/dsa/ include/linux/platform\_data/dsa.h include/net/dsa.h net/dsa/

## \* NETWORKING [GENERAL]

**Mail** “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>, Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linuxfoundation.org/en/Net>

**Patchwork** <http://patchwork.ozlabs.org/project/netdev/list/>

**bugs** <mailto:netdev@vger.kernel.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/netdev/net.git> <git://git.kernel.org/pub/scm/linux/kernel/git/netdev/net-next.git>

**Files** Documentation/networking/ include/linux/in.h include/linux/net.h include/linux/netdevice.h include/net/include/uapi/linux/in.h include/uapi/linux/net.h include/uapi/linux/net\_namespace.h include/uapi/linux/netdevice.h lib/net\_utils.c lib/random32.c net/ tools/testing/selftests/net/

### \* NETWORKING [IPSEC]

**Mail** Steffen Klassert <[steffen.klassert@secunet.com](mailto:steffen.klassert@secunet.com)>, Herbert Xu <[herbert@gondor.apana.org.au](mailto:herbert@gondor.apana.org.au)>, “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/klassert/ipsec.git>  
<git://git.kernel.org/pub/scm/linux/kernel/git/klassert/ipsec-next.git>

**Files** include/net/xfrm.h include/uapi/linux/xfrm.h net/ipv4/ah4.c net/ipv4/esp4\* net/ipv4/ip\_vti.c net/ipv4/ipcomp.c net/ipv4/xfrm\* net/ipv6/ah6.c net/ipv6/esp6\* net/ipv6/ip6\_vti.c net/ipv6/ipcomp6.c net/ipv6/xfrm\* net/key/ net/xfrm/

### \* NETWORKING [IPv4/IPv6]

**Mail** “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>, Alexey Kuznetsov <[kuznet@ms2.inr.ac.ru](mailto:kuznet@ms2.inr.ac.ru)>, Hideaki YOSHIFUJI <[yoshfuji@linux-ipv6.org](mailto:yoshfuji@linux-ipv6.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/netdev/net.git>

**Files** arch/x86/net/\* include/net/ip\* net/ipv4/ net/ipv6/

### \* NETWORKING [LABELED] (NetLabel, Labeled IPsec, SECMARK)

**Mail** Paul Moore <[paul@paul-moore.com](mailto:paul@paul-moore.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linux-security-module@vger.kernel.org](mailto:linux-security-module@vger.kernel.org)

**Status** Maintained

**Web-page** <https://github.com/netlabel>

**Files** Documentation/netlabel/ include/net/calipso.h include/net/cipso\_ipv4.h include/net/netlabel.h include/uapi/linux/netfilter/xt\_CONNSECMARK.h include/uapi/linux/netfilter/xt\_SECMARK.h net/ipv4/cipso\_ipv4.c net/ipv6/calipso.c net/netfilter/xt\_CONNSECMARK.c net/netfilter/xt\_SECMARK.c net/netlabel/

## \* NETWORKING [MPTCP]

**Mail** Mat Martineau <[mathew.j.martineau@linux.intel.com](mailto:mathew.j.martineau@linux.intel.com)>, Matthieu Baerts <[matthieu.baerts@tessares.net](mailto:matthieu.baerts@tessares.net)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [mptcp@lists.01.org](mailto:mptcp@lists.01.org)

**Status** Maintained

**Web-page** [https://github.com/multipath-tcp/mptcp\\_net-next/wiki](https://github.com/multipath-tcp/mptcp_net-next/wiki)

**bugs** [https://github.com/multipath-tcp/mptcp\\_net-next/issues](https://github.com/multipath-tcp/mptcp_net-next/issues)

**Files** include/net/mptcp.h include/uapi/linux/mptcp.h net/mptcp/tools/testing/selftests/net/mptcp/

## \* NETWORKING [TCP]

**Mail** Eric Dumazet <[edumazet@google.com](mailto:edumazet@google.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** include/linux/tcp.h include/net/tcp.h include/trace/events/tcp.h include/uapi/linux/tcp.h net/ipv4/syncookies.c net/ipv4/tcp\*.c net/ipv6/syncookies.c net/ipv6/tcp\*.c

## \* NETWORKING [TLS]

**Mail** Boris Pismenny <[borisp@mellanox.com](mailto:borisp@mellanox.com)>, Aviad Yehezkel <[aviadye@mellanox.com](mailto:aviadye@mellanox.com)>, John Fastabend <[john.fastabend@gmail.com](mailto:john.fastabend@gmail.com)>, Daniel Borkmann <[daniel@iogearbox.net](mailto:daniel@iogearbox.net)>, Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** include/net/tls.h include/uapi/linux/tls.h net/tls/\*

## \* NETWORKING [WIRELESS]

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Patchwork** <http://patchwork.kernel.org/project/linux-wireless/list/>

### \* **NETXEN (1/10) GbE SUPPORT**

**Mail** Manish Chopra <[manishc@marvell.com](mailto:manishc@marvell.com)>, Rahul Verma <[rahulv@marvell.com](mailto:rahulv@marvell.com)>, GR-Linux-NIC-Dev@marvell.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/qlogic/netxen/

### \* **NET\_FAILOVER MODULE**

**Mail** Sridhar Samudrala <[sridhar.samudrala@intel.com](mailto:sridhar.samudrala@intel.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** networking/net\_failover drivers/net/net\_failover.c include/net/net\_failover.h

### \* **NEXTHOP**

**Mail** David Ahern <[dsahern@kernel.org](mailto:dsahern@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** include/net/netns/nexthop.h include/net/nexthop.h  
include/uapi/linux/nexthop.h net/ipv4/nexthop.c

### \* **NFC SUBSYSTEM**

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Orphan

**Files** Documentation/devicetree/bindings/net/nfc/ drivers/nfc/  
include/linux/platform\_data/nfc\_mrvl.h include/net/nfc/  
include/uapi/linux/nfc.h net/nfc/

### \* **NFS, SUNRPC, AND LOCKD CLIENTS**

**Mail** Trond Myklebust <[trond.myklebust@hammerspace.com](mailto:trond.myklebust@hammerspace.com)>, Anna Schumaker <[anna.schumaker@netapp.com](mailto:anna.schumaker@netapp.com)>

**Mailing list** [linux-nfs@vger.kernel.org](mailto:linux-nfs@vger.kernel.org)

**Status** Maintained

**Web-page** <http://client.linux-nfs.org>

**SCM** git git://git.linux-nfs.org/projects/trondmy/linux-nfs.git

**Files** fs/lockd/ fs/nfs/ fs/nfs\_common/ include/linux/lockd/  
include/linux/nfs\* include/linux/sunrpc/ include/uapi/  
linux/nfs\* include/uapi/linux/sunrpc/ net/sunrpc/

## \* NILFS2 FILESYSTEM

**Mail** Ryusuke Konishi <konishi.ryusuke@gmail.com>

**Mailing list** linux-nilfs@vger.kernel.org

**Status** Supported

**Web-page** <https://nilfs.sourceforge.io/> <https://nilfs.osdn.jp/>

**SCM** git git://github.com/konis/nilfs2.git

**Files** filesystems/nilfs2 fs/nilfs2/ include/trace/events/nilfs2.h  
include/uapi/linux/nilfs2\_api.h include/uapi/linux/nilfs2\_ondisk.h

## \* NINJA SCSI-3 / NINJA SCSI-32Bi (16bit/CardBus) PCMCIA SCSI HOST ADAPTER DRIVER

**Mail** YOKOTA Hiroshi <yokota@netlab.is.tsukuba.ac.jp>

**Status** Maintained

**Web-page** <http://www.netlab.is.tsukuba.ac.jp/~yokota/izumi/ninja/>

**Files** scsi/NinjaSCSI drivers/scsi/pcmcia/nsp\_\*

## \* NINJA SCSI-32Bi/UDE PCI/CARDBUS SCSI HOST ADAPTER DRIVER

**Mail** GOTO Masanori <gotom@debian.or.jp>, YOKOTA Hiroshi <yokota@netlab.is.tsukuba.ac.jp>

**Status** Maintained

**Web-page** <http://www.netlab.is.tsukuba.ac.jp/~yokota/izumi/ninja/>

**Files** scsi/NinjaSCSI drivers/scsi/nsp32\*

## \* NIOS2 ARCHITECTURE

**Mail** Ley Foon Tan <ley.foon.tan@intel.com>

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/lftan/nios2.git

**Files** arch/nios2/

### \* NOHZ, DYN TICKS SUPPORT

**Mail** Frederic Weisbecker <[fweisbec@gmail.com](mailto:fweisbec@gmail.com)>, Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>, Ingo Molnar <[mingo@kernel.org](mailto:mingo@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
timers/nohz

**Files** include/linux/sched/nohz.h include/linux/tick.h kernel/time/tick\*.\*

### \* NOKIA N900 CAMERA SUPPORT (ET8EK8 SENSOR, AD5820 FOCUS)

**Mail** Pavel Machek <[pavel@ucw.cz](mailto:pavel@ucw.cz)>, Sakari Ailus <[sakari.ailus@iki.fi](mailto:sakari.ailus@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/ad5820.c drivers/media/i2c/et8ek8

### \* NOKIA N900 POWER SUPPLY DRIVERS

**Reviewer** Pali Rohár <[pali@kernel.org](mailto:pali@kernel.org)>

**Files** drivers/power/supply/bq2415x\_charger.c drivers/  
power/supply/bq27xxx\_battery.c drivers/power/  
supply/bq27xxx\_battery\_i2c.c drivers/power/supply/  
isp1704\_charger.c drivers/power/supply/rx51\_battery.c  
include/linux/power/bq2415x\_charger.h include/linux/  
power/bq27xxx\_battery.h

### \* NOLIBC HEADER FILE

**Mail** Willy Tarreau <[w@1wt.eu](mailto:w@1wt.eu)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/wtarreau/nolibc.git>

**Files** tools/include/nolibc/

## \* NSDEPS

**Mail** Matthias Maennich <maennich@google.com>

**Status** Maintained

**Files** core-api/symbol-namespaces scripts/nsdeps

## \* NTB AMD DRIVER

**Mail** Sanjay R Mehta <sanju.mehta@amd.com>, Shyam Sundar S K <Shyam-sundar.S-k@amd.com>

**Mailing list** linux-ntb@googlegroups.com

**Status** Supported

**Files** drivers/ntb/hw/amd/

## \* NTB DRIVER CORE

**Mail** Jon Mason <jdmason@kudzu.us>, Dave Jiang <dave.jiang@intel.com>, Allen Hubbe <allenbh@gmail.com>

**Mailing list** linux-ntb@googlegroups.com

**Status** Supported

**Web-page** <https://github.com/jonmason/ntb/wiki>

**SCM** git git://github.com/jonmason/ntb.git

**Files** drivers/net/ntb\_netdev.c drivers/ntb/include/linux/ntb.h include/linux/ntb\_transport.h tools/testing/selftests/ntb/

## \* NTB IDT DRIVER

**Mail** Serge Semin <fancer.lancer@gmail.com>

**Mailing list** linux-ntb@googlegroups.com

**Status** Supported

**Files** drivers/ntb/hw/idt/

### \* NTB INTEL DRIVER

**Mail** Dave Jiang <[dave.jiang@intel.com](mailto:dave.jiang@intel.com)>

**Mailing list** [linux-ntb@googlegroups.com](mailto:linux-ntb@googlegroups.com)

**Status** Supported

**Web-page** <https://github.com/davejiang/linux/wiki>

**SCM** git <https://github.com/davejiang/linux.git>

**Files** drivers/ntb/hw/intel/

### \* NTFS FILESYSTEM

**Mail** Anton Altaparmakov <[anton@tuxera.com](mailto:anton@tuxera.com)>

**Mailing list** [linux-ntfs-dev@lists.sourceforge.net](mailto:linux-ntfs-dev@lists.sourceforge.net)

**Status** Supported

**Web-page** <http://www.tuxera.com/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/aia21/ntfs.git>

**Files** filesystems/ntfs fs/ntfs/

### \* NUBUS SUBSYSTEM

**Mail** Finn Thain <[fthain@telegraphics.com.au](mailto:fthain@telegraphics.com.au)>

**Mailing list** [linux-m68k@lists.linux-m68k.org](mailto:linux-m68k@lists.linux-m68k.org)

**Status** Maintained

**Files** arch/\*/include/asm/nibus.h drivers/nibus/ include/linux/nibus.h  
include/uapi/linux/nibus.h

### \* NVIDIA (rivafb and nvidiafb) FRAMEBUFFER DRIVER

**Mail** Antonino Daplas <[adaplas@gmail.com](mailto:adaplas@gmail.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/nvidia/ drivers/video/fbdev/riva/

## \* NVM EXPRESS DRIVER

**Mail** Keith Busch <[kbusch@kernel.org](mailto:kbusch@kernel.org)>, Jens Axboe <[axboe@fb.com](mailto:axboe@fb.com)>, Christoph Hellwig <[hch@lst.de](mailto:hch@lst.de)>, Sagi Grimberg <[sagi@grimberg.me](mailto:sagi@grimberg.me)>

**Mailing list** [linux-nvme@lists.infradead.org](mailto:linux-nvme@lists.infradead.org)

**Status** Supported

**Web-page** <http://git.infradead.org/nvme.git>

**SCM** <git://git.infradead.org/nvme.git>

**Files** drivers/nvme/host/ include/linux/nvme.h include/uapi/linux/nvme\_ioctl.h

## \* NVM EXPRESS FC TRANSPORT DRIVERS

**Mail** James Smart <[james.smart@broadcom.com](mailto:james.smart@broadcom.com)>

**Mailing list** [linux-nvme@lists.infradead.org](mailto:linux-nvme@lists.infradead.org)

**Status** Supported

**Files** drivers/nvme/host/fc.c drivers/nvme/target/fc.c drivers/nvme/target/fcloop.c include/linux/nvme-fc-driver.h include/linux/nvme-fc.h

## \* NVM EXPRESS TARGET DRIVER

**Mail** Christoph Hellwig <[hch@lst.de](mailto:hch@lst.de)>, Sagi Grimberg <[sagi@grimberg.me](mailto:sagi@grimberg.me)>, Chaitanya Kulkarni <[chaitanya.kulkarni@wdc.com](mailto:chaitanya.kulkarni@wdc.com)>

**Mailing list** [linux-nvme@lists.infradead.org](mailto:linux-nvme@lists.infradead.org)

**Status** Supported

**Web-page** <http://git.infradead.org/nvme.git>

**SCM** <git://git.infradead.org/nvme.git>

**Files** drivers/nvme/target/

## \* NVMM FRAMEWORK

**Mail** Srinivas Kandagatla <[srinivas.kandagatla@linaro.org](mailto:srinivas.kandagatla@linaro.org)>

**Status** Maintained

**Files** Documentation/ABI/stable/sysfs-bus-nvmm Documentation/devicetree/bindings/nvmm/ drivers/nvmm/ include/linux/nvmm-consumer.h include/linux/nvmm-provider.h

## \* NXP FSPI DRIVER

**Mail** Ashish Kumar <[ashish.kumar@nxp.com](mailto:ashish.kumar@nxp.com)>

**Reviewer** Yogesh Gaur <[yogeshgaur.83@gmail.com](mailto:yogeshgaur.83@gmail.com)>

**Mailing list** [linux-spi@vger.kernel.org](mailto:linux-spi@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/spi/spi-nxp-fspi.txt  
drivers/spi/spi-nxp-fspi.c

## \* NXP FXAS21002C DRIVER

**Mail** Rui Miguel Silva <[rmfrfs@gmail.com](mailto:rmfrfs@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/gyroscope/nxp,  
fxas21002c.txt drivers/iio/gyro/fxas21002c.h drivers/iio/  
gyro/fxas21002c\_core.c drivers/iio/gyro/fxas21002c\_i2c.c  
drivers/iio/gyro/fxas21002c\_spi.c

## \* NXP SGTL5000 DRIVER

**Mail** Fabio Estevam <[festevam@gmail.com](mailto:festevam@gmail.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/sgtl5000.txt  
sound/soc/codecs/sgtl5000\*

## \* NXP SJA1105 ETHERNET SWITCH DRIVER

**Mail** Vladimir Oltean <[olteanv@gmail.com](mailto:olteanv@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/dsa/sja1105

## \* NXP TDA998X DRM DRIVER

**Mail** Russell King <linux@armlinux.org.uk>

**Status** Maintained

**SCM** git git://git.armlinux.org.uk/~rmk/linux-arm.git drm-tda998x-devel git git://git.armlinux.org.uk/~rmk/linux-arm.git drm-tda998x-fixes

**Files** drivers/gpu/drm/i2c/tda998x\_drv.c include/drm/i2c/tda998x.h include/dt-bindings/display/tda998x.h

**Content regex** "nxp,tda998x"

## \* NXP TFA9879 DRIVER

**Mail** Peter Rosin <peda@axentia.se>

**Mailing list** alsa-devel@alsa-project.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/tfa9879.txt  
sound/soc/codecs/tfa9879\*

## \* NXP-NCI NFC DRIVER

**Mail** Clément Perrochaud <clement.perrochaud@effinnov.com>

**Reviewer** Charles Gorand <charles.gorand@effinnov.com>

**Mailing list** linux-nfc@lists.01.org (moderated for non-subscribers)

**Status** Supported

**Files** drivers/nfc/nxp-nci

## \* OBJAGG

**Mail** Jiri Pirko <jiri@mellanox.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** include/linux/objagg.h lib/objagg.c lib/test\_objagg.c

### \* OBJTOOL

**Mail** Josh Poimboeuf <[jpoimboe@redhat.com](mailto:jpoimboe@redhat.com)>, Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>

**Status** Supported

**Files** tools/objtool/

### \* OCELOT ETHERNET SWITCH DRIVER

**Mail** Microchip Linux Driver Support <[UNGLinuxDriver@microchip.com](mailto:UNGLinuxDriver@microchip.com)>, Vladimir Oltean <[vladimir.oltean@nxp.com](mailto:vladimir.oltean@nxp.com)>, Claudio Manoil <[claudio.manoil@nxp.com](mailto:claudio.manoil@nxp.com)>, Alexandre Belloni <[alexandre.belloni@bootlin.com](mailto:alexandre.belloni@bootlin.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/dsa/ocelot/\* drivers/net/ethernet/mscc/include/soc/mscc/ocelot\* net/dsa/tag\_ocelot.c

### \* OCXL (Open Coherent Accelerator Processor Interface OpenCAPI) DRIVER

**Mail** Frederic Barrat <[fbarrat@linux.ibm.com](mailto:fbarrat@linux.ibm.com)>, Andrew Donnellan <[ajd@linux.ibm.com](mailto:ajd@linux.ibm.com)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Supported

**Files** userspace-api/accelerators/ocxl arch/powerpc/include/asm/pnv-ocxl.h arch/powerpc/platforms/powernv/ocxl.c drivers/misc/ocxl/include/misc/ocxl\* include/uapi/misc/ocxl.h

### \* OMAP AUDIO SUPPORT

**Mail** Peter Ujfalusi <[peter.ujfalusi@ti.com](mailto:peter.ujfalusi@ti.com)>, Jarkko Nikula <[jarkko.nikula@bitmer.com](mailto:jarkko.nikula@bitmer.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers), [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** sound/soc/ti/n810.c sound/soc/ti/omap\* sound/soc/ti/rx51.c sound/soc/ti/sdma-pcm.\*

### \* OMAP CLOCK FRAMEWORK SUPPORT

**Mail** Paul Walmsley <[paul@pwsan.com](mailto:paul@pwsan.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/\*omap\*/\*clock\*

### \* OMAP DEVICE TREE SUPPORT

**Mail** Benoît Cousson <[bcousson@baylibre.com](mailto:bcousson@baylibre.com)>, Tony Lindgren <[tony@atomide.com](mailto:tony@atomide.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org), [devicetree@vger.kernel.org](mailto:devicetree@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/boot/dts/\*am3\* arch/arm/boot/dts/\*am4\* arch/arm/boot/dts/\*am5\* arch/arm/boot/dts/\*dra7\* arch/arm/boot/dts/\*omap\* arch/arm/boot/dts/logicpd-som-lv\* arch/arm/boot/dts/logicpd-torpedo\*

### \* OMAP DISPLAY SUBSYSTEM and FRAMEBUFFER SUPPORT (DSS2)

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org), [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Orphan

**Files** arm/omap/dss drivers/video/fbdev/omap2/

### \* OMAP FRAMEBUFFER SUPPORT

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org), [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Orphan

**Files** drivers/video/fbdev/omap/

### \* OMAP GENERAL PURPOSE MEMORY CONTROLLER SUPPORT

**Mail** Roger Quadros <[rogerq@ti.com](mailto:rogerq@ti.com)>, Tony Lindgren <[tony@atomide.com](mailto:tony@atomide.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/mach-omap2/\*gpmc\* drivers/memory/omap-gpmc.c

## \* OMAP GPIO DRIVER

**Mail** Grygorii Strashko <[grygorii.strashko@ti.com](mailto:grygorii.strashko@ti.com)>, Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>, Kevin Hilman <[khilman@kernel.org](mailto:khilman@kernel.org)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/gpio/gpio-omap.txt  
drivers/gpio/gpio-omap.c

## \* OMAP HARDWARE SPINLOCK SUPPORT

**Mail** Ohad Ben-Cohen <[ohad@wizery.com](mailto:ohad@wizery.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwspinlock/omap\_hwspinlock.c

## \* OMAP HS MMC SUPPORT

**Mailing list** [linux-mmc@vger.kernel.org](mailto:linux-mmc@vger.kernel.org), [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Orphan

**Files** drivers/mmc/host/omap\_hsmmc.c

## \* OMAP HWMOD DATA

**Mail** Paul Walmsley <[paul@pwsan.com](mailto:paul@pwsan.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/mach-omap2/omap\_hwmod\*data\*

## \* OMAP HWMOD DATA FOR OMAP4-BASED DEVICES

**Mail** Benoît Cousson <[bcousson@baylibre.com](mailto:bcousson@baylibre.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/mach-omap2/omap\_hwmod\_44xx\_data.c

## \* OMAP HWMOD SUPPORT

**Mail** Benoît Cousson <[bcousson@baylibre.com](mailto:bcousson@baylibre.com)>, Paul Walmsley <[pwsan.com](mailto:pwsan.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/mach-omap2/omap\_hwmod.\*

## \* OMAP I2C DRIVER

**Mail** Vignesh R <[vigneshr@ti.com](mailto:vigneshr@ti.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org), [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-omap.txt  
drivers/i2c/busses/i2c-omap.c

## \* OMAP IMAGING SUBSYSTEM (OMAP3 ISP and OMAP4 ISS)

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/ti,omap3isp.txt  
drivers/media/platform/omap3isp/ drivers/staging/media/  
omap4iss/

## \* OMAP MMC SUPPORT

**Mail** Aaro Koskinen <[aaro.koskinen@iki.fi](mailto:aaro.koskinen@iki.fi)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/mmc/host/omap.c

## \* OMAP POWER MANAGEMENT SUPPORT

**Mail** Kevin Hilman <[khilman@kernel.org](mailto:khilman@kernel.org)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/\*omap\*/\*pm\* drivers/cpufreq/omap-cpufreq.c

## \* OMAP POWERDOMAIN SOC ADAPTATION LAYER SUPPORT

**Mail** Rajendra Nayak <[rnavayak@codeaurora.org](mailto:rnavayak@codeaurora.org)>, Paul Walmsley <[paul@pwsan.com](mailto:paul@pwsan.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/mach-omap2/prm\*

## \* OMAP RANDOM NUMBER GENERATOR SUPPORT

**Mail** Deepak Saxena <[dsaxena@plexity.net](mailto:dsaxena@plexity.net)>

**Status** Maintained

**Files** drivers/char/hw\_random/omap-rng.c

## \* OMAP USB SUPPORT

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org), [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Orphan

**Files** arch/arm/\*omap\*/usb\* drivers/usb/\*/\*omap\*

## \* OMAP/NEWFLOW NANOBONE MACHINE SUPPORT

**Mail** Mark Jackson <[mpfj@newflow.co.uk](mailto:mpfj@newflow.co.uk)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** arch/arm/boot/dts/am335x-nano.dts

## \* OMAP1 SUPPORT

**Mail** Aaro Koskinen <[aaro.koskinen@iki.fi](mailto:aaro.koskinen@iki.fi)>, Tony Lindgren <[tony@atomide.com](mailto:tony@atomide.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/linux-omap/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tmlind/linux-omap.git>

**Files** arch/arm/configs/omap1\_defconfig arch/arm/mach-omap1/arch/arm/plat-omap/drivers/i2c/busses/i2c-omap.c include/linux/platform\_data/ams-delta-fiq.h include/linux/platform\_data/i2c-omap.h

## \* OMAP2+ SUPPORT

**Mail** Tony Lindgren <[tony@atomide.com](mailto:tony@atomide.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.muru.com/linux/omap/> <http://linux omap.com/>

**Patchwork** <http://patchwork.kernel.org/project/linux-omap/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tmlind/linux-omap.git>

**Files** arch/arm/configs/omap2plus\_defconfig arch/arm/  
mach-omap2/ arch/arm/plat-omap/ drivers/bus/ti-sysc.  
c drivers/i2c/busses/i2c-omap.c drivers/irqchip/  
irq-omap-intc.c drivers/mfd/\*omap\*.c drivers/mfd/  
menelaus.c drivers/mfd/palmas.c drivers/mfd/tps65217.c  
drivers/mfd/tps65218.c drivers/mfd/tps65910.c drivers/  
mfd/twl-core.[ch] drivers/mfd/twl4030\*.c drivers/mfd/  
twl6030\*.c drivers/mfd/twl6040\*.c drivers/regulator/  
palmas-regulator\*.c drivers/regulator/pbias-regulator.  
c drivers/regulator/tps65217-regulator.c drivers/  
regulator/tps65218-regulator.c drivers/regulator/  
tps65910-regulator.c drivers/regulator/twl-regulator.c  
drivers/regulator/twl6030-regulator.c include/linux/  
platform\_data/i2c-omap.h include/linux/platform\_data/  
ti-sysc.h

## \* OMFS FILESYSTEM

**Mail** Bob Copeland <[me@bobcopeland.com](mailto:me@bobcopeland.com)>

**Mailing list** [linux-karma-devel@lists.sourceforge.net](mailto:linux-karma-devel@lists.sourceforge.net)

**Status** Maintained

**Files** filesystems/omfs fs/omfs/

## \* OMNIKEY CARDMAN 4000 DRIVER

**Mail** Harald Welte <[laforge@gnumonks.org](mailto:laforge@gnumonks.org)>

**Status** Maintained

**Files** drivers/char/pcmcia/cm4000\_cs.c include/linux/  
cm4000\_cs.h include/uapi/linux/cm4000\_cs.h

## \* OMNIKEY CARDMAN 4040 DRIVER

**Mail** Harald Welte <[laforge@gnumonks.org](mailto:laforge@gnumonks.org)>

**Status** Maintained

**Files** drivers/char/pcmcia/cm4040\_cs.\*

## \* OMNIVISION OV13858 SENSOR DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/ov13858.c

## \* OMNIVISION OV2680 SENSOR DRIVER

**Mail** Rui Miguel Silva <[rmfrfs@gmail.com](mailto:rmfrfs@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/ov2680.txt  
drivers/media/i2c/ov2680.c

## \* OMNIVISION OV2685 SENSOR DRIVER

**Mail** Shunqian Zheng <[zhengsq@rock-chips.com](mailto:zhengsq@rock-chips.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/ov2685.c

## \* OMNIVISION OV2740 SENSOR DRIVER

**Mail** Tianshu Qiu <[tian.shu.qiu@intel.com](mailto:tian.shu.qiu@intel.com)>

**Reviewer** Shawn Tu <[shawnx.tu@intel.com](mailto:shawnx.tu@intel.com)>, Bingbu Cao <[bingbu.cao@intel.com](mailto:bingbu.cao@intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/ov2740.c

### \* OMNIVISION OV5640 SENSOR DRIVER

**Mail** Steve Longerbeam <slongerbeam@gmail.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/i2c/ov5640.c

### \* OMNIVISION OV5647 SENSOR DRIVER

**Mail** Luis Oliveira <lolivei@synopsys.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/i2c/ov5647.c

### \* OMNIVISION OV5670 SENSOR DRIVER

**Mail** Chiranjeevi Rapolu <chiranjeevi.rapolu@intel.com>, Hyungwoo Yang <hyungwoo.yang@intel.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/i2c/ov5670.c

### \* OMNIVISION OV5675 SENSOR DRIVER

**Mail** Shawn Tu <shawnx.tu@intel.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/i2c/ov5675.c

## \* OMNIVISION OV5695 SENSOR DRIVER

**Mail** Shunqian Zheng <[zhengsq@rock-chips.com](mailto:zhengsq@rock-chips.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/ov5695.c

## \* OMNIVISION OV7670 SENSOR DRIVER

**Mail** Jonathan Corbet <[corbet@lwn.net](mailto:corbet@lwn.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/ov7670.txt  
drivers/media/i2c/ov7670.c

## \* OMNIVISION OV772x SENSOR DRIVER

**Mail** Jacopo Mondi <[jacopo@jmondi.org](mailto:jacopo@jmondi.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/ov772x.txt  
drivers/media/i2c/ov772x.c include/media/i2c/ov772x.h

## \* OMNIVISION OV7740 SENSOR DRIVER

**Mail** Wenyu Yang <[wenyu.yang@microchip.com](mailto:wenyu.yang@microchip.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/ov7740.txt  
drivers/media/i2c/ov7740.c

## \* OMNIVISION OV8856 SENSOR DRIVER

**Mail** Dongchun Zhu <[dongchun.zhu@mediatek.com](mailto:dongchun.zhu@mediatek.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/ov8856.yaml  
drivers/media/i2c/ov8856.c

## \* OMNIVISION OV9640 SENSOR DRIVER

**Mail** Petr Cvek <[petrcvekcz@gmail.com](mailto:petrcvekcz@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/i2c/ov9640.\*

## \* OMNIVISION OV9650 SENSOR DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Reviewer** Akinobu Mita <[akinobu.mita@gmail.com](mailto:akinobu.mita@gmail.com)>, Sylwester Nawrocki <[s.nawrocki@samsung.com](mailto:s.nawrocki@samsung.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/ov9650.txt  
drivers/media/i2c/ov9650.c

## \* ONENAND FLASH DRIVER

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** drivers/mtd/nand/onenand/ include/linux/mtd/onenand\*.h

### \* ONION OMEGA2+ BOARD

**Mail** Harvey Hunt <[harveyhuntnexus@gmail.com](mailto:harveyhuntnexus@gmail.com)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Files** arch/mips/boot/dts/ralink/omega2p.dts

### \* OP-TEE DRIVER

**Mail** Jens Wiklander <[jens.wiklander@linaro.org](mailto:jens.wiklander@linaro.org)>

**Mailing list** [op-tee@lists.trustedfirmware.org](mailto:op-tee@lists.trustedfirmware.org)

**Status** Maintained

**Files** drivers/tee/optee/

### \* OP-TEE RANDOM NUMBER GENERATOR (RNG) DRIVER

**Mail** Sumit Garg <[sumit.garg@linaro.org](mailto:sumit.garg@linaro.org)>

**Mailing list** [op-tee@lists.trustedfirmware.org](mailto:op-tee@lists.trustedfirmware.org)

**Status** Maintained

**Files** drivers/char/hw\_random/optee-rng.c

### \* OPA-VNIC DRIVER

**Mail** Dennis Dalessandro <[dennis.dalessandro@intel.com](mailto:dennis.dalessandro@intel.com)>, Niranjana Vishwanathapura <[niranjana.vishwanathapura@intel.com](mailto:niranjana.vishwanathapura@intel.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/ulp/opa\_vnic

### \* OPEN FIRMWARE AND DEVICE TREE OVERLAYS

**Mail** Pantelis Antoniou <[pantelis.antoniou@konsulko.com](mailto:pantelis.antoniou@konsulko.com)>, Frank Rowand <[frowand.list@gmail.com](mailto:frowand.list@gmail.com)>

**Mailing list** [devicetree@vger.kernel.org](mailto:devicetree@vger.kernel.org)

**Status** Maintained

**Files** devicetree/dynamic-resolution-notes      devicetree/overlay-notes  
drivers/of/overlay.c    drivers/of/resolver.c

**Content regex** of\_overlay\_notifier\_

## \* OPEN FIRMWARE AND FLATTENED DEVICE TREE

**Mail** Rob Herring <[robh+dt@kernel.org](mailto:robh+dt@kernel.org)>, Frank Rowand <[frowand.list@gmail.com](mailto:frowand.list@gmail.com)>

**Mailing list** [devicetree@vger.kernel.org](mailto:devicetree@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.devicetree.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/robh/linux.git>

**Files** Documentation/ABI/testing/sysfs-firmware-ofw drivers/of/include/linux/of\*.h scripts/dtc/

## \* OPEN FIRMWARE AND FLATTENED DEVICE TREE BINDINGS

**Mail** Rob Herring <[robh+dt@kernel.org](mailto:robh+dt@kernel.org)>

**Mailing list** [devicetree@vger.kernel.org](mailto:devicetree@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.ozlabs.org/project/devicetree-bindings/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/robh/linux.git>

**Files** Documentation/devicetree/arch/\*/boot/dts/include/dt-bindings/

## \* OPENCORES I2C BUS DRIVER

**Mail** Peter Korsgaard <[peter@korsgaard.com](mailto:peter@korsgaard.com)>, Andrew Lunn <[andrew@lunn.ch](mailto:andrew@lunn.ch)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-ocores.txt  
i2c/busses/i2c-ocores drivers/i2c/busses/i2c-ocores.c  
include/linux/platform\_data/i2c-ocores.h

## \* OPENRISC ARCHITECTURE

**Mail** Jonas Bonn <[jonas@southpole.se](mailto:jonas@southpole.se)>, Stefan Kristiansson <[stefan.kristiansson@saunalahti.fi](mailto:stefan.kristiansson@saunalahti.fi)>, Stafford Horne <[shorne@gmail.com](mailto:shorne@gmail.com)>

**Mailing list** [openrisc@lists.librecores.org](mailto:openrisc@lists.librecores.org)

**Status** Maintained

**Web-page** <http://openrisc.io>

**SCM** git <git://github.com/openrisc/linux.git>

**Files** Documentation/devicetree/bindings/openrisc/  
Documentation/openrisc/ arch/openrisc/ drivers/irqchip/  
irq-ompic.c drivers/irqchip/irq-orlk-\*

### \* OPENVSWITCH

**Mail** Pravin B Shelar <pshelar@ovn.org>

**Mailing list** netdev@vger.kernel.org, dev@openvswitch.org

**Status** Maintained

**Web-page** <http://openvswitch.org>

**Files** include/uapi/linux/openvswitch.h net/openvswitch/

### \* OPERATING PERFORMANCE POINTS (OPP)

**Mail** Viresh Kumar <vireshk@kernel.org>, Nishanth Menon  
<nm@ti.com>, Stephen Boyd <sboyd@kernel.org>

**Mailing list** linux-pm@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/vireshk/pm.git

**Files** Documentation/devicetree/bindings/opp/ power/opp  
drivers/opp/ include/linux/pm\_opp.h

### \* OPL4 DRIVER

**Mail** Clemens Ladisch <clemens@ladisch.de>

**Mailing list** alsa-devel@alsa-project.org (moderated for non-subscribers)

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git

**Files** sound/drivers/opl4/

### \* OPROFILE

**Mail** Robert Richter <rric@kernel.org>

**Mailing list** oprofile-list@lists.sf.net

**Status** Maintained

**Files** arch/\*/include/asm/oprofile\*.h arch/\*/oprofile/ drivers/  
oprofile/ include/linux/oprofile.h

### \* ORACLE CLUSTER FILESYSTEM 2 (OCFS2)

**Mail** Mark Fasheh <[mark@fasheh.com](mailto:mark@fasheh.com)>, Joel Becker <[jlbec@evilplan.org](mailto:jlbec@evilplan.org)>, Joseph Qi <[joseph.qi@linux.alibaba.com](mailto:joseph.qi@linux.alibaba.com)>

**Mailing list** [ocfs2-devel@oss.oracle.com](mailto:ocfs2-devel@oss.oracle.com) (moderated for non-subscribers)

**Status** Supported

**Web-page** <http://ocfs2.wiki.kernel.org>

**Files** fileystems/dlmfs fileystems/ocfs2 fs/ocfs2/

### \* ORANGEFS FILESYSTEM

**Mail** Mike Marshall <[hubcap@omnibond.com](mailto:hubcap@omnibond.com)>

**Reviewer** Martin Brandenburg <[martin@omnibond.com](mailto:martin@omnibond.com)>

**Mailing list** [devel@lists.orangefs.org](mailto:devel@lists.orangefs.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/hubcap/linux.git>

**Files** fileystems/orangefs fs/orangefs/

### \* ORINOCO DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Orphan

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/orinoco>  
<http://www.nongnu.org/orinoco/>

**Files** drivers/net/wireless/intersil/orinoco/

### \* OV2659 OMNIVISION SENSOR DRIVER

**Mail** “Lad, Prabhakar” <[prabhakar.csengg@gmail.com](mailto:prabhakar.csengg@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/mhadli/v4l-dvb-davinci\\_devices.git](git://linuxtv.org/mhadli/v4l-dvb-davinci_devices.git)

**Files** drivers/media/i2c/ov2659.c include/media/i2c/ov2659.h

### \* OVERLAY FILESYSTEM

**Mail** Miklos Szeredi <miklos@szeredi.hu>

**Mailing list** linux-unionfs@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/mszeredi/vfs.git

**Files** filesystems/overlayfs fs/overlayfs/

### \* P54 WIRELESS DRIVER

**Mail** Christian Lamparter <chunkeey@googlemail.com>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/p54>

**Files** drivers/net/wireless/intersil/p54/

### \* PACKING

**Mail** Vladimir Oltean <olteanv@gmail.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** core-api/packing include/linux/packing.h lib/packing.c

### \* PADATA PARALLEL EXECUTION MECHANISM

**Mail** Steffen Klassert <steffen.klassert@secunet.com>

**Mailing list** linux-crypto@vger.kernel.org

**Status** Maintained

**Files** core-api/padata include/linux/padata.h kernel/padata.c

### \* PAGE POOL

**Mail** Jesper Dangaard Brouer <hawk@kernel.org>, Ilias Apalodimas <iliias.apalodimas@linaro.org>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** include/net/page\_pool.h net/core/page\_pool.c

## \* PANASONIC LAPTOP ACPI EXTRAS DRIVER

**Mail** Harald Welte <[laforge@gnumonks.org](mailto:laforge@gnumonks.org)>  
**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)  
**Status** Maintained  
**Files** drivers/platform/x86/panasonic-laptop.c

## \* PARALLAX PING IIO SENSOR DRIVER

**Mail** Andreas Klinger <[ak@it-klinger.de](mailto:ak@it-klinger.de)>  
**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)  
**Status** Maintained  
**Files** Documentation/devicetree/bindings/iio/proximity/  
parallax-ping.yaml drivers/iio/proximity/ping.c

## \* PARALLEL LCD/KEYPAD PANEL DRIVER

**Mail** Willy Tarreau <[willy@haproxy.com](mailto:willy@haproxy.com)>, Ksenija Stanojevic  
<[ksenija.stanojevic@gmail.com](mailto:ksenija.stanojevic@gmail.com)>  
**Status** Odd Fixes  
**Files** admin-guide/lcd-panel-cgram drivers/auxdisplay/panel.c

## \* PARALLEL PORT SUBSYSTEM

**Mail** Sudip Mukherjee <[sudipm.mukherjee@gmail.com](mailto:sudipm.mukherjee@gmail.com)>, Sudip Mukherjee <[sudip.mukherjee@codethink.co.uk](mailto:sudip.mukherjee@codethink.co.uk)>  
**Mailing list** [linux-parport@lists.infradead.org](mailto:linux-parport@lists.infradead.org) (subscribers-only)  
**Status** Maintained  
**Files** Documentation/driver-api/parport\*.rst drivers/char/  
ppdev.c drivers/parport/ include/linux/parport\*.h include/  
uapi/linux/ppdev.h

## \* PARAVIRT\_OPS INTERFACE

**Mail** Juergen Gross <[jgross@suse.com](mailto:jgross@suse.com)>, Deep Shah  
<[sdeep@vmware.com](mailto:sdeep@vmware.com)>, “VMware,  
Inc.” <[pv-drivers@vmware.com](mailto:pv-drivers@vmware.com)>  
**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)  
**Status** Supported  
**Files** virt/paravirt\_ops arch/\*/include/asm/paravirt\*.h arch/\*/  
kernel/paravirt\* include/linux/hypervisor.h

### \* PARIDE DRIVERS FOR PARALLEL PORT IDE DEVICES

**Mail** Tim Waugh <tim@cyberelk.net>

**Mailing list** linux-parport@lists.infradead.org (subscribers-only)

**Status** Maintained

**Files** admin-guide/blockdev/paride\_drivers/block/paride/

### \* PARISC ARCHITECTURE

**Mail** “James E.J. Bottomley”<James.Bottomley@HansenPartnership.com>, Helge Deller <deller@gmx.de>

**Mailing list** linux-parisc@vger.kernel.org

**Status** Maintained

**Web-page** <https://parisc.wiki.kernel.org>

**Patchwork** <http://patchwork.kernel.org/project/linux-parisc/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jejb/parisc-2.6.git  
git git://git.kernel.org/pub/scm/linux/kernel/git/deller/parisc-linux.git

**Files** Documentation/parisc/ arch/parisc/ drivers/char/agp/parisc-agp.c drivers/input/misc/hp\_sdc\_rtc.c drivers/input/serio/gscps2.c drivers/input/serio/hp\_sdc\* drivers/parisc/ drivers/parport/parport\_gsc.\* drivers/tty/serial/8250/8250\_gsc.c drivers/video/console/sti\* drivers/video/fbdev/sti\* drivers/video/logo/logo\_parisc\* include/linux/hp\_sdc.h

### \* PARMAN

**Mail** Jiri Pirko <jiri@mellanox.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** include/linux/parman.h lib/parman.c lib/test\_parman.c

### \* PC ENGINES APU BOARD DRIVER

**Mail** Enrico Weigelt, metux IT consult <info@metux.net>

**Status** Maintained

**Files** drivers/platform/x86/pcengines-apuv2.c

## \* PC87360 HARDWARE MONITORING DRIVER

**Mail** Jim Cromie <jim.cromie@gmail.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/pc87360 drivers/hwmon/pc87360.c

## \* PC8736x GPIO DRIVER

**Mail** Jim Cromie <jim.cromie@gmail.com>

**Status** Maintained

**Files** drivers/char/pc8736x\_gpio.c

## \* PC87427 HARDWARE MONITORING DRIVER

**Mail** Jean Delvare <jdelvare@suse.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/pc87427 drivers/hwmon/pc87427.c

## \* PCA9532 LED DRIVER

**Mail** Riku Voipio <riku.voipio@iki.fi>

**Status** Maintained

**Files** drivers/leds/leds-pca9532.c include/linux/leds-pca9532.h

## \* PCA9541 I2C BUS MASTER SELECTOR DRIVER

**Mail** Guenter Roeck <linux@roeck-us.net>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Maintained

**Files** drivers/i2c/muxes/i2c-mux-pca9541.c

### \* PCDP - PRIMARY CONSOLE AND DEBUG PORT

**Mail** Khalid Aziz <khalid@gonehiking.org>

**Status** Maintained

**Files** drivers/firmware/pcdp.\*

### \* PCI DRIVER FOR AARDVARK (Marvell Armada 3700)

**Mail** Thomas Petazzoni <thomas.petazzoni@bootlin.com>

**Mailing list** linux-pci@vger.kernel.org, linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/aardvark-pci.txt  
drivers/pci/controller/pci-aardvark.c

### \* PCI DRIVER FOR ALTERA PCIE IP

**Mail** Ley Foon Tan <ley.foon.tan@intel.com>

**Mailing list** rfi@lists.rocketboards.org (moderated for non-subscribers), linux-pci@vger.kernel.org

**Status** Supported

**Files** Documentation/devicetree/bindings/pci/altera-pcie.txt  
drivers/pci/controller/pcie-altera.c

### \* PCI DRIVER FOR APPLIEDMICRO XGENE

**Mail** Toan Le <toan@os.amperecomputing.com>

**Mailing list** linux-pci@vger.kernel.org, linux-arm-kernel@lists.infradead.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/xgene-pci.txt  
drivers/pci/controller/pci-xgene.c

### \* PCI DRIVER FOR ARM VERSATILE PLATFORM

**Mail** Rob Herring <robh@kernel.org>

**Mailing list** linux-pci@vger.kernel.org, linux-arm-kernel@lists.infradead.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/versatile.yaml  
drivers/pci/controller/pci-versatile.c

## \* PCI DRIVER FOR ARMADA 8K

**Mail** Thomas Petazzoni <thomas.petazzoni@bootlin.com>

**Mailing list** linux-pci@vger.kernel.org, kernel@lists.infradead.org      linux-arm-

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/pci-armada8k.txt  
drivers/pci/controller/dwc/pcie-armada8k.c

## \* PCI DRIVER FOR CADENCE PCIE IP

**Mail** Tom Joseph <tjoseph@cadence.com>

**Mailing list** linux-pci@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/cdns,\*    drivers/  
pci/controller/cadence/

## \* PCI DRIVER FOR FREESCALE LAYERSCAPE

**Mail** Minghuan Lian <minghuan.Lian@nxp.com>, Mingkai Hu  
<mingkai.hu@nxp.com>, Roy Zang <roy.zang@nxp.com>

**Mailing list** linuxppc-dev@lists.ozlabs.org, linux-pci@vger.kernel.org,  
linux-arm-kernel@lists.infradead.org

**Status** Maintained

**Files** drivers/pci/controller/dwc/\*layerscape\*

## \* PCI DRIVER FOR GENERIC OF HOSTS

**Mail** Will Deacon <will@kernel.org>

**Mailing list** linux-pci@vger.kernel.org      linux-arm-  
kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/host-generic-pci.  
yaml    drivers/pci/controller/pci-host-common.c    drivers/  
pci/controller/pci-host-generic.c

### \* PCI DRIVER FOR IMX6

**Mail** Richard Zhu <[hongxing.zhu@nxp.com](mailto:hongxing.zhu@nxp.com)>, Lucas Stach <[l.stach@penguintronix.de](mailto:l.stach@penguintronix.de)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/fsl\_imx6q-pcie.txt  
drivers/pci/controller/dwc/\*imx6\*

### \* PCI DRIVER FOR INTEL VOLUME MANAGEMENT DEVICE (VMD)

**Mail** Jonathan Derrick <[jonathan.derrick@intel.com](mailto:jonathan.derrick@intel.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Supported

**Files** drivers/pci/controller/vmd.c

### \* PCI DRIVER FOR MICROSEMI SWITCHTEC

**Mail** Kurt Schwemmer <[kurt.schwemmer@microsemi.com](mailto:kurt.schwemmer@microsemi.com)>, Logan Gunthorpe <[logang@deltatee.com](mailto:logang@deltatee.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-class-switchtec\_driver-api/switchtec  
drivers/ntb/hw/mscc/  
drivers/pci/switch/switchtec\*  
include/linux/switchtec.h  
include/uapi/linux/switchtec\_ioctl.h

### \* PCI DRIVER FOR MOBIVEIL PCIE IP

**Mail** Karthikeyan Mitran <[m.karthikeyan@mobiveil.co.in](mailto:m.karthikeyan@mobiveil.co.in)>, Hou Zhiqiang <[Zhiqiang.Hou@nxp.com](mailto:Zhiqiang.Hou@nxp.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/pci/mobiveil-pcie.txt  
drivers/pci/controller/mobiveil/pcie-mobiveil\*

## \* PCI DRIVER FOR MVEBU (Marvell Armada 370 and Armada XP SOC support)

**Mail** Thomas Petazzoni <[thomas.petazzoni@bootlin.com](mailto:thomas.petazzoni@bootlin.com)>, Jason Cooper <[jason@lakedaemon.net](mailto:jason@lakedaemon.net)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/pci/controller/\*mvebu\*

## \* PCI DRIVER FOR NVIDIA TEGRA

**Mail** Thierry Reding <[thierry.reding@gmail.com](mailto:thierry.reding@gmail.com)>

**Mailing list** [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org), [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/pci/nvidia,  
tegra20-pcie.txt drivers/pci/controller/pci-tegra.c

## \* PCI DRIVER FOR NXP LAYERSCAPE GEN4 CONTROLLER

**Mail** Hou Zhiqiang <[Zhiqiang.Hou@nxp.com](mailto:Zhiqiang.Hou@nxp.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/  
layerscape-pcie-gen4.txt drivers/pci/controller/mobiveil/  
pcie-layerscape-gen4.c

## \* PCI DRIVER FOR RENESAS R-CAR

**Mail** Marek Vasut <[marek.vasut+renesas@gmail.com](mailto:marek.vasut+renesas@gmail.com)>, Yoshihiro Shimoda <[yoshihiro.shimoda.uh@renesas.com](mailto:yoshihiro.shimoda.uh@renesas.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/\*rcar\* drivers/  
pci/controller/\*rcar\*

### \* PCI DRIVER FOR SAMSUNG EXYNOS

**Mail** Jingoo Han <jingoohan1@gmail.com>

**Mailing list** linux-pci@vger.kernel.org, linux-arm-kernel@lists.infradead.org (moderated for non-subscribers), linux-samsung-soc@vger.kernel.org (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/pci/controller/dwc/pci-exynos.c

### \* PCI DRIVER FOR SYNOPSYS DESIGNWARE

**Mail** Jingoo Han <jingoohan1@gmail.com>, Gustavo Pimentel <gustavo.pimentel@synopsys.com>

**Mailing list** linux-pci@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/designware-pcie.txt  
drivers/pci/controller/dwc/\*designware\*

### \* PCI DRIVER FOR TI DRA7XX

**Mail** Kishon Vijay Abraham I <kishon@ti.com>

**Mailing list** linux-omap@vger.kernel.org, linux-pci@vger.kernel.org

**Status** Supported

**Files** Documentation/devicetree/bindings/pci/ti-pci.txt  
drivers/pci/controller/dwc/pci-dra7xx.c

### \* PCI DRIVER FOR TI KEYSTONE

**Mail** Murali Karicheri <m-karicheri2@ti.com>

**Mailing list** linux-pci@vger.kernel.org, linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/pci/controller/dwc/pci-keystone.c

## \* PCI DRIVER FOR V3 SEMICONDUCTOR V360EPC

**Mail** Linus Walleij <linus.walleij@linaro.org>

**Mailing list** linux-pci@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/v3-v360epc-pci.txt  
drivers/pci/controller/pci-v3-semi.c

## \* PCI ENDPOINT SUBSYSTEM

**Mail** Kishon Vijay Abraham I <kishon@ti.com>, Lorenzo Pieralisi <lorenzo.pieralisi@arm.com>

**Mailing list** linux-pci@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/kishon/pci-endpoint.git

**Files** drivers/misc/pci\_endpoint\_test.c drivers/pci/endpoint/tools/pci/

## \* PCI ENHANCED ERROR HANDLING (EEH) FOR POWERPC

**Mail** Russell Currey <ruscur@russell.cc>, Sam Broff <sbobroff@linux.ibm.com>, Oliver Bo O'Halloran <oohall@gmail.com>

**Mailing list** linuxppc-dev@lists.ozlabs.org

**Status** Supported

**Files** PCI/pci-error-recovery powerpc/eeh-pci-error-recovery arch/powerpc/include/\*/\*.h arch/powerpc/kernel/eeh\*.c arch/powerpc/platforms/\*/\*.c drivers/pci/pcie/aer.c drivers/pci/pcie/dpc.c drivers/pci/pcie/err.c

## \* PCI ERROR RECOVERY

**Mail** Linas Vepstas <linasvepstas@gmail.com>

**Mailing list** linux-pci@vger.kernel.org

**Status** Supported

**Files** PCI/pci-error-recovery

### \* PCI MSI DRIVER FOR ALTERA MSI IP

**Mail** Ley Foon Tan <[ley.foon.tan@intel.com](mailto:ley.foon.tan@intel.com)>

**Mailing list** [rfi@lists.rocketboards.org](mailto:rfi@lists.rocketboards.org) (moderated for non-subscribers), [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/pci/altera-pcie-msi.txt  
drivers/pci/controller/pcie-altera-msi.c

### \* PCI MSI DRIVER FOR APPLIEDMICRO XGENE

**Mail** Toan Le <[toan@os.amperecomputing.com](mailto:toan@os.amperecomputing.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/xgene-pci-msi.txt  
drivers/pci/controller/pci-xgene-msi.c

### \* PCI NATIVE HOST BRIDGE AND ENDPOINT DRIVERS

**Mail** Lorenzo Pieralisi <[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>

**Reviewer** Rob Herring <[robb@kernel.org](mailto:robb@kernel.org)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Supported

**Patchwork** <http://patchwork.ozlabs.org/project/linux-pci/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/lpieralisi/pci.git>

**Files** drivers/pci/controller/

### \* PCI SUBSYSTEM

**Mail** Bjorn Helgaas <[bhelgaas@google.com](mailto:bhelgaas@google.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Supported

**Patchwork** <http://patchwork.ozlabs.org/project/linux-pci/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/helgaas/pci.git>

**Files** Documentation/PCI/ Documentation/devicetree/bindings/pci/ arch/x86/kernel/early-quirks.c arch/x86/kernel/quirks.c arch/x86/pci/ drivers/acpi/pci\* drivers/pci/include/asm-generic/pci\* include/linux/of\_pci.h include/linux/pci\* include/uapi/linux/pci\* lib/pci\*

## \* PCIE DRIVER FOR AMAZON ANNAPURNA LABS

**Mail** Jonathan Chocron <[jonnyc@amazon.com](mailto:jonnyc@amazon.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/pcie-al.txt  
drivers/pci/controller/dwc/pcie-al.c

## \* PCIE DRIVER FOR AMLOGIC MESON

**Mail** Yue Wang <[yue.wang@Amlogic.com](mailto:yue.wang@Amlogic.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org),  
[amlogic@lists.infradead.org](mailto:amlogic@lists.infradead.org) linux-

**Status** Maintained

**Files** drivers/pci/controller/dwc/pci-meson.c

## \* PCIE DRIVER FOR AXIS ARTPEC

**Mail** Jesper Nilsson <[jesper.nilsson@axis.com](mailto:jesper.nilsson@axis.com)>

**Mailing list** [linux-arm-kernel@axis.com](mailto:linux-arm-kernel@axis.com), [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/axis,artpec\*  
drivers/pci/controller/dwc/\*artpec\*

## \* PCIE DRIVER FOR CAVIUM THUNDERX

**Mail** Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org),  
[linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers) linux-arm-

**Status** Supported

**Files** drivers/pci/controller/pci-thunder-\*

## \* PCIE DRIVER FOR HISILICON

**Mail** Zhou Wang <[wangzhou1@hisilicon.com](mailto:wangzhou1@hisilicon.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/hisilicon-pcie.  
txt drivers/pci/controller/dwc/pcie-hisi.c

## \* PCIE DRIVER FOR HISILICON KIRIN

**Mail** Xiaowei Song <[songxiaowei@hisilicon.com](mailto:songxiaowei@hisilicon.com)>, Binghui Wang <[wangbinghui@hisilicon.com](mailto:wangbinghui@hisilicon.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/kirin-pcie.txt  
drivers/pci/controller/dwc/pcie-kirin.c

## \* PCIE DRIVER FOR HISILICON STB

**Mail** Shawn Guo <[shawn.guo@linaro.org](mailto:shawn.guo@linaro.org)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/  
hisilicon-histb-pcie.txt        drivers/pci/controller/dwc/  
pcie-histb.c

## \* PCIE DRIVER FOR MEDIATEK

**Mail** Ryder Lee <[ryder.lee@mediatek.com](mailto:ryder.lee@mediatek.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org),  
[mediatek@lists.infradead.org](mailto:mediatek@lists.infradead.org) linux-

**Status** Supported

**Files** Documentation/devicetree/bindings/pci/mediatek\*  
drivers/pci/controller/\*mediatek\*

## \* PCIE DRIVER FOR QUALCOMM MSM

**Mail** Stanimir Varbanov <[svarbanov@mm-sol.com](mailto:svarbanov@mm-sol.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org),  
[msm@vger.kernel.org](mailto:msm@vger.kernel.org) linux-arm-

**Status** Maintained

**Files** drivers/pci/controller/dwc/\*qcom\*

## \* PCIE DRIVER FOR ROCKCHIP

**Mail** Shawn Lin <[shawn.lin@rock-chips.com](mailto:shawn.lin@rock-chips.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org), [rockchip@lists.infradead.org](mailto:rockchip@lists.infradead.org) linux-

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/rockchip-pcie\*  
drivers/pci/controller/pcie-rockchip\*

## \* PCIE DRIVER FOR SOCIONEXT UNIPHIER

**Mail** Kunihiko Hayashi <[hayashi.kunihiko@socionext.com](mailto:hayashi.kunihiko@socionext.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pci/uniphier-pcie\*  
drivers/pci/controller/dwc/pcie-uniphier\*

## \* PCIE DRIVER FOR ST SPEAR13XX

**Mail** Pratyush Anand <[pratyush.anand@gmail.com](mailto:pratyush.anand@gmail.com)>

**Mailing list** [linux-pci@vger.kernel.org](mailto:linux-pci@vger.kernel.org)

**Status** Maintained

**Files** drivers/pci/controller/dwc/\*spear\*

## \* PCMCIA SUBSYSTEM

**Mail** Dominik Brodowski <[linux@dominikbrodowski.net](mailto:linux@dominikbrodowski.net)>

**Status** Odd Fixes

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/brodo/pcmcia.git>

**Files** Documentation/pcmcia/ drivers/pcmcia/ include/pcmcia/  
tools/pcmcia/

## \* PCNET32 NETWORK DRIVER

**Mail** Don Fry <[pcnet32@frontier.com](mailto:pcnet32@frontier.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/amd/pcnet32.c

#### \* PCRYPT PARALLEL CRYPTO ENGINE

**Mail** Steffen Klassert <steffen.klassert@secunet.com>

**Mailing list** linux-crypto@vger.kernel.org

**Status** Maintained

**Files** crypto/pcrypt.c include/crypto/pcrypt.h

## \* PEAQ WMI HOTKEYS DRIVER

**Mail** Hans de Goede <hdegoede@redhat.com>

**Mailing list** platform-driver-x86@vger.kernel.org

## Status Maintained

## Files drivers/platform/x86/peaq-wmi.c

## \* PENSANDO ETHERNET DRIVERS

**Mail** Shannon Nelson <[snelson@pensando.io](mailto:snelson@pensando.io)>, Pensando Drivers <[drivers@pensando.io](mailto:drivers@pensando.io)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

## Status Supported

**Files** networking/device\_drivers/pensando/ionic  
drivers/net/  
ethernet/pensando/

## \* PER-CPU MEMORY ALLOCATOR

**Mail** Dennis Zhou <[dennis@kernel.org](mailto:dennis@kernel.org)>, Tejun Heo <[tj@kernel.org](mailto:tj@kernel.org)>,  
Christoph Lameter <[cl@linux.com](mailto:cl@linux.com)>

## Status Maintained

**SCM** git qit://qit.kernel.org/pub/scm/linux/kernel/qit/dennis/percpu.qit

**Files** arch/\*/include/asm/percpu.h include/linux/percpu\*.h mm/  
percpu\*.c

## \* PER-TASK DELAY ACCOUNTING

**Mail** Balbir Singh <bsingharora@gmail.com>

## Status Maintained

**Files** include/linux/delayacct.h kernel/delayacct.c

## \* PERFORMANCE EVENTS SUBSYSTEM

**Mail** Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>, Ingo Molnar <[mingo@redhat.com](mailto:mingo@redhat.com)>, Arnaldo Carvalho de Melo <[acme@kernel.org](mailto:acme@kernel.org)>

**Reviewer** Mark Rutland <[mark.rutland@arm.com](mailto:mark.rutland@arm.com)>, Alexander Shishkin <[alexander.shishkin@linux.intel.com](mailto:alexander.shishkin@linux.intel.com)>, Jiri Olsa <[jolsa@redhat.com](mailto:jolsa@redhat.com)>, Namhyung Kim <[namhyung@kernel.org](mailto:namhyung@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
perf/core

**Files** arch/\*/events/\* arch/\*/events/\*/\* arch/\*/include/asm/  
perf\_event.h arch/\*/kernel/\*/\*/perf\_event\*.c arch/\*/  
kernel/\*/perf\_event\*.c arch/\*/kernel/perf\_callchain.c  
arch/\*/kernel/perf\_event\*.c include/linux/perf\_event.h  
include/uapi/linux/perf\_event.h kernel/events/\* tools/  
perf/

## \* PERFORMANCE EVENTS SUBSYSTEM ARM64 PMU EVENTS

**Reviewer** John Garry <[john.garry@huawei.com](mailto:john.garry@huawei.com)>, Will Deacon  
<[will@kernel.org](mailto:will@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Files** tools/perf/pmu-events/arch/arm64/

## \* PERSONALITY HANDLING

**Mail** Christoph Hellwig <[hch@infradead.org](mailto:hch@infradead.org)>

**Mailing list** [linux-abi-devel@lists.sourceforge.net](mailto:linux-abi-devel@lists.sourceforge.net)

**Status** Maintained

**Files** include/linux/personality.h include/uapi/linux/  
personality.h

### \* PHOENIX RC FLIGHT CONTROLLER ADAPTER

**Mail** Marcus Folkesson <[marcus.folkesson@gmail.com](mailto:marcus.folkesson@gmail.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** input/devices/pxrc drivers/input/joystick/pxrc.c

### \* PHONET PROTOCOL

**Mail** Remi Denis-Courmont <[courmisch@gmail.com](mailto:courmisch@gmail.com)>

**Status** Supported

**Files** networking/phonet include/linux/phonet.h include/net/phonet/ include/uapi/linux/phonet.h net/phonet/

### \* PHRAM MTD DRIVER

**Mail** Joern Engel <[joern@lazybastard.org](mailto:joern@lazybastard.org)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Maintained

**Files** drivers/mtd/devices/phram.c

### \* PICOLCD HID DRIVER

**Mail** Bruno Prémont <[bonbons@linux-vserver.org](mailto:bonbons@linux-vserver.org)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/hid/hid-picolcd\*

### \* PICOXCELL SUPPORT

**Mail** Jamie Iles <[jamie@jamieiles.com](mailto:jamie@jamieiles.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**SCM** git <git://github.com/jamieiles/linux-2.6-ji.git>

**Files** arch/arm/boot/dts/picoxcell\* arch/arm/mach-picoxcell/drivers/crypto/picoxcell\*

## \* PIDFD API

**Mail** Christian Brauner <[christian@brauner.io](mailto:christian@brauner.io)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/brauner/linux.git>

**Files** samples/pidfd/ tools/testing/selftests/clone3/ tools/ testing/selftests/pid\_namespace/ tools/testing/selftests/ pidfd/

**Content regex** (?i)pidfd (?i)clone3 \b(clone\_args|kernel\_clone\_args)\b

## \* PIN CONTROL SUBSYSTEM

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/linusw/linux-pinctrl.git>

**Files** Documentation/devicetree/bindings/pinctrl/ driver-api/pinctrl drivers/pinctrl/ include/linux/pinctrl/

## \* PIN CONTROLLER - FREESCALE

**Mail** Dong Aisheng <[aisheng.dong@nxp.com](mailto:aisheng.dong@nxp.com)>, Fabio Estevam <[festevam@gmail.com](mailto:festevam@gmail.com)>, Shawn Guo <[shawnguo@kernel.org](mailto:shawnguo@kernel.org)>, Stefan Agner <[stefan@agner.ch](mailto:stefan@agner.ch)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pinctrl/fsl, \* drivers/pinctrl/freescale/

## \* PIN CONTROLLER - INTEL

**Mail** Mika Westerberg <[mika.westerberg@linux.intel.com](mailto:mika.westerberg@linux.intel.com)>, Andy Shevchenko <[andy@kernel.org](mailto:andy@kernel.org)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pinctrl/intel.git>

**Files** drivers/pinctrl/intel/

### \* PIN CONTROLLER - MEDIATEK

**Mail** Sean Wang <[sean.wang@kernel.org](mailto:sean.wang@kernel.org)>

**Mailing list** [linux-mediatek@lists.infradead.org](mailto:linux-mediatek@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pinctrl/  
pinctrl-mt65xx.txt Documentation/devicetree/bindings/  
pinctrl/pinctrl-mt7622.txt drivers/pinctrl/mediatek/

### \* PIN CONTROLLER - MICROCHIP AT91

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Supported

**Files** drivers/gpio/gpio-sama5d2-piobu.c drivers/pinctrl/  
pinctrl-at91\*

### \* PIN CONTROLLER - QUALCOMM

**Mail** Bjorn Andersson <[bjorn.andersson@linaro.org](mailto:bjorn.andersson@linaro.org)>

**Mailing list** [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/pinctrl/qcom,\*.txt  
drivers/pinctrl/qcom/

### \* PIN CONTROLLER - RENESAS

**Mail** Geert Uytterhoeven <[geert+renesas@glider.be](mailto:geert+renesas@glider.be)>

**Mailing list** [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-drivers.git> sh-pfc

**Files** Documentation/devicetree/bindings/pinctrl/renesas, \*  
drivers/pinctrl/pinctrl-rz\* drivers/pinctrl/sh-pfc/

### \* PIN CONTROLLER - SAMSUNG

**Mail** Tomasz Figa <[tomasz.figa@gmail.com](mailto:tomasz.figa@gmail.com)>, Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>, Sylvester Nawrocki <[s.nawrocki@samsung.com](mailto:s.nawrocki@samsung.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org) (moderated for non-subscribers)

**Status** Maintained

**Patchwork** <https://patchwork.kernel.org/project/linux-samsung-soc/list/>

**SCM** [git git://git.kernel.org/pub/scm/linux/kernel/git/pinctrl/samsung.git](git://git.kernel.org/pub/scm/linux/kernel/git/pinctrl/samsung.git)

**Files** Documentation/devicetree/bindings/pinctrl/samsung-pinctrl.txt drivers/pinctrl/samsung/ include/dt-bindings/pinctrl/samsung.h

### \* PIN CONTROLLER - SINGLE

**Mail** Tony Lindgren <[tony@atomide.com](mailto:tony@atomide.com)>, Haojian Zhuang <[haojian.zhuang@linaro.org](mailto:haojian.zhuang@linaro.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers), [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** drivers/pinctrl/pinctrl-single.c

### \* PIN CONTROLLER - ST SPEAR

**Mail** Viresh Kumar <[vireshk@kernel.org](mailto:vireshk@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.st.com/spear>

**Files** drivers/pinctrl/spear/

### \* PISTACHIO SOC SUPPORT

**Mail** James Hartley <james.hartley@sondrel.com>

**Mailing list** linux-mips@vger.kernel.org

**Status** Odd Fixes

**Files** arch/mips/boot/dts/img/pistachio\* arch/mips/  
configs/pistachio\*\_defconfig arch/mips/include/asm/  
mach-pistachio/ arch/mips/pistachio/

### \* PKTCDVD DRIVER

**Mail** linux-block@vger.kernel.org

**Status** Orphan

**Files** drivers/block/pktcdvd.c include/linux/pktcdvd.h include/  
uapi/linux/pktcdvd.h

### \* PKUNITY SOC DRIVERS

**Mail** Guan Xuetao <gxt@pku.edu.cn>

**Status** Maintained

**Web-page** <http://mprc.pku.edu.cn/~guanxuetao/linux>

**SCM** git git://github.com/gxt/linux.git

**Files** drivers/i2c/busses/i2c-puv3.c drivers/input/serio/  
i8042-unicore32io.h drivers/rtc/rtc-puv3.c drivers/video/  
fbdev/fb-puv3.c

### \* PLANTOWER PMS7003 AIR POLLUTION SENSOR DRIVER

**Mail** Tomasz Duszynski <tduszyns@gmail.com>

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/chemical/  
plantower,pms7003.yaml drivers/iio/chemical/pms7003.c

### \* PLX DMA DRIVER

**Mail** Logan Gunthorpe <logang@deltatee.com>

**Status** Maintained

**Files** drivers/dma/plx\_dma.c

### \* PM-GRAF UTILITY

**Mail** “Todd E Brandt” <[todd.e.brandt@linux.intel.com](mailto:todd.e.brandt@linux.intel.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**Web-page** <https://01.org/pm-graph>

**bugs** <https://bugzilla.kernel.org/buglist.cgi?component=pm-graph&product=Tools>

**SCM** git [git://github.com/intel/pm-graph](https://github.com/intel/pm-graph)

**Files** tools/power/pm-graph

### \* PMBUS HARDWARE MONITORING DRIVERS

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Web-page** <http://hwmon.wiki.kernel.org/>      <http://www.roeck-us.net/linux/drivers/>

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/groeck/linux-staging.git](https://git.kernel.org/pub/scm/linux/kernel/git/groeck/linux-staging.git)

**Files** Documentation/devicetree/bindings/hwmon/ibm,cffps1.txt  
Documentation/devicetree/bindings/hwmon/ltc2978.txt  
Documentation/devicetree/bindings/hwmon/max31785.txt  
hwmon/adm1275 hwmon/ibm-cffps hwmon/ir35221 hwmon/lm25066 hwmon/ltc2978 hwmon/ltc3815 hwmon/max16064 hwmon/max20751 hwmon/max31785 hwmon/max34440 hwmon/max8688 hwmon/pmbus-core hwmon/pmbus hwmon/tps40422 hwmon/ucd9000 hwmon/ucd9200 hwmon/zl6100 drivers/hwmon/pmbus/include/linux/pmbus.h

### \* PMC SIERRA MaxRAID DRIVER

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Orphan

**Web-page** <http://www.pmc-sierra.com/>

**Files** drivers/scsi/pmcraid.\*

### \* PMC SIERRA PM8001 DRIVER

**Mail** Jack Wang <jinpu.wang@cloud.ionos.com>

**Mailing list** linux-scsi@vger.kernel.org

**Status** Supported

**Files** drivers/scsi/pm8001/

### \* PNI RM3100 IIO DRIVER

**Mail** Song Qiang <songqiang1304521@gmail.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/magnetometer/pni,  
rm3100.txt drivers/iio/magnetometer/rm3100\*

### \* PNP SUPPORT

**Mail** “Rafael J. Wysocki” <rafael.j.wysocki@intel.com>

**Mailing list** linux-acpi@vger.kernel.org

**Status** Maintained

**Files** drivers/pnp/ include/linux/pnp.h

### \* POSIX CLOCKS and TIMERS

**Mail** Thomas Gleixner <tglx@linutronix.de>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git  
timers/core

**Files** fs/timerfd.c include/linux/time\_namespace.h include/  
linux/timer\* kernel/time/\*timer\* kernel/time/namespaces.c

### \* POWER MANAGEMENT CORE

**Mail** “Rafael J. Wysocki” <rjw@rjwysocki.net>

**Mailing list** linux-pm@vger.kernel.org

**Status** Supported

**bugs** <https://bugzilla.kernel.org>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/rafael/linux-pm

**Files** drivers/base/power/ drivers/powercap/ include/linux/  
intel\_rapl.h include/linux/pm.h include/linux/pm\_\*  
include/linux/powercap.h kernel/configs/nopm.config

## \* POWER STATE COORDINATION INTERFACE (PSCI)

**Mail** Mark Rutland <[mark.rutland@arm.com](mailto:mark.rutland@arm.com)>, Lorenzo Pieralisi  
<[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** drivers/firmware/psci/ include/linux/psci.h include/  
uapi/linux/psci.h

## \* POWER SUPPLY CLASS/SUBSYSTEM and DRIVERS

**Mail** Sebastian Reichel <[sre@kernel.org](mailto:sre@kernel.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/sre/linux-power-supply.git>

**Files** Documentation/ABI/testing/sysfs-class-power  
Documentation/devicetree/bindings/power/supply/ drivers/  
power/supply/ include/linux/power\_supply.h

## \* POWERNV OPERATOR PANEL LCD DISPLAY DRIVER

**Mail** Suraj Jitindar Singh <[sjitindarsingh@gmail.com](mailto:sjitindarsingh@gmail.com)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/char/powernv-op-panel.c

## \* PPP OVER ATM (RFC 2364)

**Mail** Mitchell Blank Jr <[mitch@sfgoth.com](mailto:mitch@sfgoth.com)>

**Status** Maintained

**Files** include/uapi/linux/atmppp.h net/atm/ppoatm.c

### \* PPP OVER ETHERNET

**Mail** Michal Ostrowski <[mostrows@earthlink.net](mailto:mostrows@earthlink.net)>

**Status** Maintained

**Files** drivers/net/ppp/pppoe.c drivers/net/ppp/pppox.c

### \* PPP OVER L2TP

**Mail** James Chapman <[jchapman@katalix.com](mailto:jchapman@katalix.com)>

**Status** Maintained

**Files** include/linux/if\_pppol2tp.h include/uapi/linux/  
if\_pppol2tp.h net/l2tp/l2tp\_ppp.c

### \* PPP PROTOCOL DRIVERS AND COMPRESSORS

**Mail** Paul Mackerras <[paulus@samba.org](mailto:paulus@samba.org)>

**Mailing list** [linux-ppp@vger.kernel.org](mailto:linux-ppp@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ppp/ppp\_\*

### \* PPS SUPPORT

**Mail** Rodolfo Giometti <[giometti@enneenne.com](mailto:giometti@enneenne.com)>

**Mailing list** [linuxpps@ml.enneenne.com](mailto:linuxpps@ml.enneenne.com) (subscribers-only)

**Status** Maintained

**Web-page** [http://wiki.enneenne.com/index.php/LinuxPPS\\_support](http://wiki.enneenne.com/index.php/LinuxPPS_support)

**Files** Documentation/ABI/testing/sysfs-pps Documentation/  
devicetree/bindings/pps/pps-gpio.txt driver-api/pps drivers/  
pps/ include/linux/pps\*.h include/uapi/linux/pps.h

### \* PPTP DRIVER

**Mail** Dmitry Kozlov <[xeb@mail.ru](mailto:xeb@mail.ru)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://sourceforge.net/projects/accel-pptp>

**Files** drivers/net/ppp/pptp.c

## \* PRESSURE STALL INFORMATION (PSI)

**Mail** Johannes Weiner <[hannes@cmpxchg.org](mailto:hannes@cmpxchg.org)>

**Status** Maintained

**Files** include/linux/psi\* kernel/sched/psi.c

## \* PRINTK

**Mail** Petr Mladek <[pmladek@suse.com](mailto:pmladek@suse.com)>, Sergey Senozhatsky <[sergey.senozhatsky@gmail.com](mailto:sergey.senozhatsky@gmail.com)>

**Reviewer** Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>

**Status** Maintained

**Files** include/linux/printk.h kernel/printk/

## \* PRISM54 WIRELESS DRIVER

**Mail** Luis Chamberlain <[mcgrof@kernel.org](mailto:mcgrof@kernel.org)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Obsolete

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/p54>

**Files** drivers/net/wireless/intersil/prism54/

## \* PROC FILESYSTEM

**Reviewer** Alexey Dobriyan <[adobriyan@gmail.com](mailto:adobriyan@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org), [fsdevel@vger.kernel.org](mailto:fsdevel@vger.kernel.org) linux-

**Status** Maintained

**Files** filesystems/proc/fs/proc/ include/linux/proc\_fs.h tools/testing/selftests/proc/

## \* PROC SYSCTL

**Mail** Luis Chamberlain <[mcgrof@kernel.org](mailto:mcgrof@kernel.org)>, Kees Cook <[keescook@chromium.org](mailto:keescook@chromium.org)>, Iurii Zaikin <[yzaikin@google.com](mailto:yzaikin@google.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org), [fsdevel@vger.kernel.org](mailto:fsdevel@vger.kernel.org) linux-

**Status** Maintained

**Files** fs/proc/proc\_sysctl.c include/linux/sysctl.h kernel/sysctl-test.c kernel/sysctl.c tools/testing/selftests/sysctl/

### \* PS3 NETWORK SUPPORT

**Mail** Geoff Levand <[geoff@infradead.org](mailto:geoff@infradead.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/net/ethernet/toshiba/ps3\_gelic\_net.\*

### \* PS3 PLATFORM SUPPORT

**Mail** Geoff Levand <[geoff@infradead.org](mailto:geoff@infradead.org)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** arch/powerpc/boot/ps3\* arch/powerpc/include/asm/lv1call.h arch/powerpc/include/asm/ps3\*.h arch/powerpc/platforms/ps3/ drivers/\*/ps3\* drivers/ps3/ drivers/rtc/rtc-ps3.c drivers/usb/host/\*ps3.c sound/ppc/snd\_ps3\*

### \* PS3VRAM DRIVER

**Mail** Jim Paris <[jim@jtan.com](mailto:jim@jtan.com)>, Geoff Levand <[geoff@infradead.org](mailto:geoff@infradead.org)>

**Mailing list** [linuxppc-dev@lists.ozlabs.org](mailto:linuxppc-dev@lists.ozlabs.org)

**Status** Maintained

**Files** drivers/block/ps3vram.c

### \* PSAMPLE PACKET SAMPLING SUPPORT

**Mail** Yotam Gigi <[yotam.gi@gmail.com](mailto:yotam.gi@gmail.com)>

**Status** Maintained

**Files** include/net/psample.h include/uapi/linux/psample.h net/psample

### \* PSTORE FILESYSTEM

**Mail** Kees Cook <[keescook@chromium.org](mailto:keescook@chromium.org)>, Anton Vorontsov <[anton@enomsg.org](mailto:anton@enomsg.org)>, Colin Cross <[ccross@android.com](mailto:ccross@android.com)>, Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kees/linux.git> for-next/pstore

**Files** admin-guide/ramoops admin-guide/pstore-blk Documentation/  
devicetree/bindings/reserved-memory/ramoops.txt drivers/  
acpi/apei/erst.c drivers/firmware/efi/efi-pstore.c fs/  
pstore/ include/linux/pstore\*

**Content regex** \b(pstore|ramoops)

## \* PTP HARDWARE CLOCK SUPPORT

**Mail** Richard Cochran <[richardcochran@gmail.com](mailto:richardcochran@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://linuxptp.sourceforge.net/>

**Files** Documentation/ABI/testing/sysfs-ptp driver-api/ptp  
drivers/net/phy/dp83640\* drivers/ptp/\* include/linux/  
ptp\_cl\*

## \* PTRACE SUPPORT

**Mail** Oleg Nesterov <[oleg@redhat.com](mailto:oleg@redhat.com)>

**Status** Maintained

**Files** arch/\*\*/\*ptrace\*.c arch/\*/\*include/asm/ptrace\*.h arch/  
\*/ptrace\*.c include/asm-generic/syscall.h include/linux/  
ptrace.h include/linux/regset.h include/linux/tracehook.h  
include/uapi/linux/ptrace.h include/uapi/linux/ptrace.h  
kernel/ptrace.c

## \* PULSE8-CEC DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** admin-guide/media/pulse8-cec drivers/media/cec/usb/pulse8/

### \* PVRUSB2 VIDEO4LINUX DRIVER

**Mail** Mike Isely <[isely@pobox.com](mailto:isely@pobox.com)>

**Mailing list** [pvrusb2@isely.net](mailto:pvrusb2@isely.net) (subscribers-only), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.isely.net/pvrusb2/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/driver-api/media/drivers/pvrusb2/\*  
drivers/media/usb/pvrusb2/

### \* PWC WEBCAM DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/pwc/\* include/trace/events/pwc.h

### \* PWM FAN DRIVER

**Mail** Kamil Debski <[kamil@wypas.org](mailto:kamil@wypas.org)>, Bartlomiej Zolnierkiewicz  
<[b.zolnierkie@samsung.com](mailto:b.zolnierkie@samsung.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/hwmon/pwm-fan.txt  
hwmon/pwm-fan drivers/hwmon/pwm-fan.c

### \* PWM IR Transmitter

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/pwm-ir-tx.c

## \* PWM SUBSYSTEM

**Mail** Thierry Reding <thierry.reding@gmail.com>

**Reviewer** Uwe Kleine-König <u.kleine-koenig@pengutronix.de>

**Mail** Lee Jones <lee.jones@linaro.org>

**Mailing list** linux-pwm@vger.kernel.org

**Status** Maintained

**Patchwork** <https://patchwork.ozlabs.org/project/linux-pwm/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/thierry.reding/linux-pwm.git

**Files** Documentation/devicetree/bindings/gpio/gpio-mvebu.txt  
Documentation/devicetree/bindings/pwm/ driver-api/pwm  
drivers/gpio/gpio-mvebu.c drivers/pwm/ drivers/video/  
backlight/pwm\_bl.c include/linux/pwm.h include/linux/  
pwm\_backlight.h

**Content regex** pwm\_(config|apply\_state|ops)

## \* PXA GPIO DRIVER

**Mail** Robert Jarzmik <robert.jarzmik@free.fr>

**Mailing list** linux-gpio@vger.kernel.org

**Status** Maintained

**Files** drivers/gpio/gpio-pxa.c

## \* PXA MMCI DRIVER

**Status** Orphan

## \* PXA RTC DRIVER

**Mail** Robert Jarzmik <robert.jarzmik@free.fr>

**Mailing list** linux-rtc@vger.kernel.org

**Status** Maintained

### \* **PXA2xx/PXA3xx SUPPORT**

**Mail** Daniel Mack <[daniel@zonque.org](mailto:daniel@zonque.org)>, Haojian Zhuang <[haojian.zhuang@gmail.com](mailto:haojian.zhuang@gmail.com)>, Robert Jarzmik <[robert.jarzmik@free.fr](mailto:robert.jarzmik@free.fr)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://github.com/hzhuang1/linux.git> git <git://github.com/rjarzmik/linux.git>

**Files** arch/arm/boot/dts/pxa\* arch/arm/mach-pxa/ drivers/dma/ pxa\* drivers/pcmcia/pxa2xx\* drivers/pinctrl/pxa/ drivers/spi/spi-pxa2xx\* drivers/usb/gadget/udc/pxa2\* include/sound/pxa2xx-lib.h sound/arm/pxa\* sound/soc/pxa/

### \* **QAT DRIVER**

**Mail** Giovanni Cabiddu <[giovanni.cabiddu@intel.com](mailto:giovanni.cabiddu@intel.com)>

**Mailing list** [qat-linux@intel.com](mailto:qat-linux@intel.com)

**Status** Supported

**Files** drivers/crypto/qat/

### \* **QCOM AUDIO (ASoC) DRIVERS**

**Mail** Patrick Lai <[plai@codeaurora.org](mailto:plai@codeaurora.org)>, Banajit Goswami <[bgoswami@codeaurora.org](mailto:bgoswami@codeaurora.org)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**Files** sound/soc/qcom/

### \* **QCOM IPA DRIVER**

**Mail** Alex Elder <[elder@kernel.org](mailto:elder@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ipa/

## \* QEMU MACHINE EMULATOR AND VIRTUALIZER SUPPORT

**Mail** Gabriel Somlo <[somlo@cmu.edu](mailto:somlo@cmu.edu)>, “Michael S. Tsirkin”  
<[mst@redhat.com](mailto:mst@redhat.com)>

**Mailing list** [qemu-devel@nongnu.org](mailto:qemu-devel@nongnu.org)

**Status** Maintained

**Files** drivers/firmware/qemu\_fw\_cfg.c      include/uapi/linux/  
qemu\_fw\_cfg.h

## \* QIB DRIVER

**Mail** Dennis Dalessandro <[dennis.dalessandro@intel.com](mailto:dennis.dalessandro@intel.com)>, Mike  
Marciniszyn <[mike.marciniszyn@intel.com](mailto:mike.marciniszyn@intel.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/hw/qib/

## \* QLOGIC QL41xxx FCOE DRIVER

**Mail** QLogic-Storage-Upstream@cavium.com

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/qedf/

## \* QLOGIC QL41xxx ISCSI DRIVER

**Mail** QLogic-Storage-Upstream@cavium.com

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/qedi/

## \* QLOGIC QL4xxx ETHERNET DRIVER

**Mail** Ariel Elior <[aelior@marvell.com](mailto:aelior@marvell.com)>, GR-everest-linux-  
l2@marvell.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/qlogic/qed/    drivers/net/ethernet/  
qlogic/qede/ include/linux/qed/

### \* QLOGIC QL4xxx RDMA DRIVER

**Mail** Michal Kalderon <[mkalderon@marvell.com](mailto:mkalderon@marvell.com)>, Ariel Elior <[aelior@marvell.com](mailto:aelior@marvell.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/hw/qedr/ include/uapi/rdma/qedr-abi.h

### \* QLOGIC QLA1280 SCSI DRIVER

**Mail** Michael Reed <[mdr@sgi.com](mailto:mdr@sgi.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** drivers/scsi/qla1280.[ch]

### \* QLOGIC QLA2XXX FC-SCSI DRIVER

**Mail** Nilesh Javali <[njavali@marvell.com](mailto:njavali@marvell.com)>, GR-QLogic-Storage-Upstream@marvell.com

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** Documentation/scsi/LICENSE.qla2xxx drivers/scsi/qla2xxx/

### \* QLOGIC QLA3XXX NETWORK DRIVER

**Mail** GR-Linux-NIC-Dev@marvell.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** Documentation/networking/device\_drivers/qlogic/LICENSE.qla3xxx drivers/net/ethernet/qlogic/qla3xxx.\*

### \* QLOGIC QLA4XXX iSCSI DRIVER

**Mail** QLogic-Storage-Upstream@qlogic.com

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** Documentation/scsi/LICENSE.qla4xxx drivers/scsi/qla4xxx/

### \* **QLOGIC QLCNIC (1/10)Gb ETHERNET DRIVER**

**Mail** Shahed Shaikh <[shshaikh@marvell.com](mailto:shshaikh@marvell.com)>, Manish Chopra <[manishc@marvell.com](mailto:manishc@marvell.com)>, GR-Linux-NIC-Dev@marvell.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/qlogic/qlcnic/

### \* **QLOGIC QLGE 10Gb ETHERNET DRIVER**

**Mail** Manish Chopra <[manishc@marvell.com](mailto:manishc@marvell.com)>, GR-Linux-NIC-Dev@marvell.com

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/staging/qlge/

### \* **QM1D1B0004 MEDIA DRIVER**

**Mail** Akihiro Tsukada <[tskd08@gmail.com](mailto:tskd08@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/media/tuners/qm1d1b0004\*

### \* **QM1D1C0042 MEDIA DRIVER**

**Mail** Akihiro Tsukada <[tskd08@gmail.com](mailto:tskd08@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/media/tuners/qm1d1c0042\*

### \* **QNX4 FILESYSTEM**

**Mail** Anders Larsen <[al@alarsen.net](mailto:al@alarsen.net)>

**Status** Maintained

**Web-page** <http://www.alarsen.net/linux/qnx4fs/>

**Files** fs/qnx4/ include/uapi/linux/qnx4\_fs.h include/uapi/linux/qnxtypes.h

## \* QORIQ DPAA2 FSL-MC BUS DRIVER

**Mail** Stuart Yoder <[stuyoder@gmail.com](mailto:stuyoder@gmail.com)>, Laurentiu Tudor <[laurentiu.tudor@nxp.com](mailto:laurentiu.tudor@nxp.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/misc/fsl,qoriq-mc.txt  
networking/device\_drivers/freescale/dpaa2/overview drivers/  
bus/fsl-mc/

## \* QT1010 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/qt1010\*

## \* QUALCOMM AHEROS ATH10K WIRELESS DRIVER

**Mail** Kalle Valo <[kvalo@codeaurora.org](mailto:kvalo@codeaurora.org)>

**Mailing list** [ath10k@lists.infradead.org](mailto:ath10k@lists.infradead.org)

**Status** Supported

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/ath10k>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kvalo/ath.git>

**Files** drivers/net/wireless/ath/ath10k/

## \* QUALCOMM AHEROS ATH11K WIRELESS DRIVER

**Mail** Kalle Valo <[kvalo@codeaurora.org](mailto:kvalo@codeaurora.org)>

**Mailing list** [ath11k@lists.infradead.org](mailto:ath11k@lists.infradead.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kvalo/ath.git>

**Files** drivers/net/wireless/ath/ath11k/

## \* **QUALCOMM ATHEROS ATH9K WIRELESS DRIVER**

**Mail** QCA ath9k Development <[ath9k-devel@qca.qualcomm.com](mailto:ath9k-devel@qca.qualcomm.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Supported

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/ath9k>

**Files** drivers/net/wireless/ath/ath9k/

## \* **QUALCOMM CAMERA SUBSYSTEM DRIVER**

**Mail** Todor Tomov <[todor.too@gmail.com](mailto:todor.too@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** admin-guide/media/qcom\_camss  
bindings/media/qcom,camss.txt  
qcom/camss/ Documentation/devicetree/  
drivers/media/platform/

## \* **QUALCOMM CORE POWER REDUCTION (CPR) AVS DRIVER**

**Mail** Niklas Cassel <[nks@flawful.org](mailto:nks@flawful.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org),  
[msm@vger.kernel.org](mailto:msm@vger.kernel.org) linux-arm-

**Status** Maintained

**Files** Documentation/devicetree/bindings/power/avs/qcom,cpr.  
txt drivers/power/avs/qcom-cpr.c

## \* **QUALCOMM CPUFREQ DRIVER MSM8996/APQ8096**

**Mail** Ilia Lin <[ilia.lin@kernel.org](mailto:ilia.lin@kernel.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/opp/  
qcom-nvmem-cpufreq.txt  
qcom-cpufreq-nvmem.c drivers/cpufreq/

## \* **QUALCOMM EMAC GIGABIT ETHERNET DRIVER**

**Mail** Timur Tabi <[timur@kernel.org](mailto:timur@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/qualcomm/emac/

## \* **QUALCOMM ETHQOS ETHERNET DRIVER**

**Mail** Vinod Koul <[vkoul@kernel.org](mailto:vkoul@kernel.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/qcom,ethqos.txt  
drivers/net/ethernet/stmicro/stmmac/dwmac-qcom-ethqos.c

## \* **QUALCOMM GENERIC INTERFACE I2C DRIVER**

**Mail** Alok Chauhan <[alokc@codeaurora.org](mailto:alokc@codeaurora.org)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org),  
[msm@vger.kernel.org](mailto:msm@vger.kernel.org) linux-arm-

**Status** Supported

**Files** drivers/i2c/busses/i2c-qcom-geni.c

## \* **QUALCOMM HEXAGON ARCHITECTURE**

**Mail** Brian Cain <[bcain@codeaurora.org](mailto:bcain@codeaurora.org)>

**Mailing list** [linux-hexagon@vger.kernel.org](mailto:linux-hexagon@vger.kernel.org)

**Status** Supported

**Files** arch/hexagon/

## \* **QUALCOMM HIDMA DRIVER**

**Mail** Sinan Kaya <[okaya@kernel.org](mailto:okaya@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org),  
[msm@vger.kernel.org](mailto:msm@vger.kernel.org), [dmaengine@vger.kernel.org](mailto:dmaengine@vger.kernel.org) linux-arm-

**Status** Supported

**Files** drivers/dma/qcom/hidma\*

## \* QUALCOMM I2C CCI DRIVER

**Mail** Loic Poulain <[loic.poulain@linaro.org](mailto:loic.poulain@linaro.org)>, Robert Foss <[robert.foss@linaro.org](mailto:robert.foss@linaro.org)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org), [msm@vger.kernel.org](mailto:msm@vger.kernel.org) [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-qcom-cci.txt  
drivers/i2c/busses/i2c-qcom-cci.c

## \* QUALCOMM IOMMU

**Mail** Rob Clark <[robdclark@gmail.com](mailto:robdclark@gmail.com)>

**Mailing list** [iommu@lists.linux-foundation.org](mailto:iommu@lists.linux-foundation.org), [msm@vger.kernel.org](mailto:msm@vger.kernel.org) [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org)

**Status** Maintained

**Files** drivers/iommu/qcom\_iommu.c

## \* QUALCOMM IPCC MAILBOX DRIVER

**Mail** Manivannan Sadhasivam <[manivannan.sadhasivam@linaro.org](mailto:manivannan.sadhasivam@linaro.org)>

**Mailing list** [linux-arm-msm@vger.kernel.org](mailto:linux-arm-msm@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mailbox/qcom-ipcc.yaml  
drivers/mailbox/qcom-ipcc.c include/dt-bindings/mailbox/qcom-ipcc.h

## \* QUALCOMM RMNET DRIVER

**Mail** Subash Abhinav Kasiviswanathan <[subashab@codeaurora.org](mailto:subashab@codeaurora.org)>, Sean Tranchetti <[stranche@codeaurora.org](mailto:stranche@codeaurora.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** networking/device\_drivers/qualcomm/rmnet drivers/net/ethernet/qualcomm/rmnet/ include/linux/if\_rmnet.h

## \* **QUALCOMM TSSENS THERMAL DRIVER**

**Mail** Amit Kucheria <[amit.kucheria@linaro.org](mailto:amit.kucheria@linaro.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org), [msm@vger.kernel.org](mailto:msm@vger.kernel.org) linux-arm-

**Status** Maintained

**Files** Documentation/devicetree/bindings/thermal/qcom-tsens.yaml  
drivers/thermal/qcom/

## \* **QUALCOMM VENUS VIDEO ACCELERATOR DRIVER**

**Mail** Stanimir Varbanov <[stanimir.varbanov@linaro.org](mailto:stanimir.varbanov@linaro.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [msm@vger.kernel.org](mailto:msm@vger.kernel.org) linux-arm-

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/\*venus\*  
drivers/media/platform/qcom/venus/

## \* **QUALCOMM WCN36XX WIRELESS DRIVER**

**Mail** Kalle Valo <[kvalo@codeaurora.org](mailto:kvalo@codeaurora.org)>

**Mailing list** [wcn36xx@lists.infradead.org](mailto:wcn36xx@lists.infradead.org)

**Status** Supported

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/wcn36xx>

**SCM** git <git://github.com/KrasnikovEugene/wcn36xx.git>

**Files** drivers/net/wireless/ath/wcn36xx/

## \* **QUANTENNA QTNFMAC WIRELESS DRIVER**

**Mail** Igor Mitsyanko <[imitsyanko@quantenna.com](mailto:imitsyanko@quantenna.com)>

**Reviewer** Sergey Matyukevich <[geomatsi@gmail.com](mailto:geomatsi@gmail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireless/quantenna

### \* RADEON and AMDGPU DRM DRIVERS

**Mail** Alex Deucher <[alexander.deucher@amd.com](mailto:alexander.deucher@amd.com)>, Christian König <[christian.koenig@amd.com](mailto:christian.koenig@amd.com)>

**Mailing list** [amd-gfx@lists.freedesktop.org](mailto:amd-gfx@lists.freedesktop.org)

**Status** Supported

**SCM** git <git://people.freedesktop.org/~agd5f/linux>

**Files** drivers/gpu/drm/amd/ drivers/gpu/drm/radeon/ include/uapi/drm/amdgpu\_drm.h include/uapi/drm/radeon\_drm.h

### \* RADEON FRAMEBUFFER DISPLAY DRIVER

**Mail** Benjamin Herrenschmidt <[benh@kernel.crashing.org](mailto:benh@kernel.crashing.org)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/aty/radeon\* include/uapi/linux/radeonfb.h

### \* RADIOSHARK RADIO DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-shark.c

### \* RADIOSHARK2 RADIO DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/radio-shark2.c drivers/media/radio/radio-tea5777.c

## \* RADOS BLOCK DEVICE (RBD)

**Mail** Ilya Dryomov <[idryomov@gmail.com](mailto:idryomov@gmail.com)>

**Reviewer** Dongsheng Yang <[dongsheng.yang@easystack.cn](mailto:dongsheng.yang@easystack.cn)>

**Mailing list** [ceph-devel@vger.kernel.org](mailto:ceph-devel@vger.kernel.org)

**Status** Supported

**Web-page** <http://ceph.com/>

**SCM** git <git://github.com/ceph/ceph-client.git>

**Files** Documentation/ABI/testing/sysfs-bus-rbd drivers/block/rbd.c drivers/block/rbd\_types.h

## \* RAGE128 FRAMEBUFFER DISPLAY DRIVER

**Mail** Paul Mackerras <[paulus@samba.org](mailto:paulus@samba.org)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/aty/aty128fb.c

## \* RAINSHADOW-CEC DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/cec/usb/rainshadow/

## \* RALINK MIPS ARCHITECTURE

**Mail** John Crispin <[john@phrozen.org](mailto:john@phrozen.org)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Files** arch/mips/ralink

\* **RALINK RT2X00 WIRELESS LAN DRIVER**

**Mail** Stanislaw Gruszka <[stf\\_xl@wp.pl](mailto:stf_xl@wp.pl)>, Helmut Schaa <[helmut.schaa@googlemail.com](mailto:helmut.schaa@googlemail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireless/ralink/rt2x00/

\* **RAMDISK RAM BLOCK DEVICE DRIVER**

**Mail** Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Status** Maintained

**Files** admin-guide/blockdev/ramdisk drivers/block/brd.c

\* **RANCHU VIRTUAL BOARD FOR MIPS**

**Mail** Miodrag Dinic <[miodrag.dinic@mips.com](mailto:miodrag.dinic@mips.com)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Supported

**Files** arch/mips/configs/generic/board-ranchu.config      arch/mips/generic/board-ranchu.c

\* **RANDOM NUMBER DRIVER**

**Mail** “Theodore Ts’o” <[tytso@mit.edu](mailto:tytso@mit.edu)>

**Status** Maintained

**Files** drivers/char/random.c

\* **RAPIDIO SUBSYSTEM**

**Mail** Matt Porter <[mporter@kernel.crashing.org](mailto:mporter@kernel.crashing.org)>, Alexandre Bounine <[alex.bou9@gmail.com](mailto:alex.bou9@gmail.com)>

**Status** Maintained

**Files** drivers/rapidio/

## \* RAS INFRASTRUCTURE

**Mail** Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>, Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** admin-guide/ras drivers/ras/ include/linux/ras.h include/ras/ras\_event.h

## \* RAYLINK/WEBGEAR 802.11 WIRELESS LAN DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Orphan

**Files** drivers/net/wireless/ray\*

## \* RCMM REMOTE CONTROLS DECODER

**Mail** Patrick Lerda <[patrick9876@free.fr](mailto:patrick9876@free.fr)>

**Status** Maintained

**Files** drivers/media/rc/ir-rcmm-decoder.c

## \* RCUTORTURE TEST FRAMEWORK

**Mail** “Paul E. McKenney” <[paulmck@kernel.org](mailto:paulmck@kernel.org)>, Josh Triplett <[josh@joshtTriplett.org](mailto:josh@joshtTriplett.org)>

**Reviewer** Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>, Mathieu Desnoyers <[mathieu.desnoyers@efficios.com](mailto:mathieu.desnoyers@efficios.com)>, Lai Jiangshan <[jiangshanlai@gmail.com](mailto:jiangshanlai@gmail.com)>

**Mailing list** [rcu@vger.kernel.org](mailto:rcu@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/paulmck/linux-rcu.git> dev

**Files** tools/testing/selftests/rcutorture

## \* RDC R-321X SoC

**Mail** Florian Fainelli <[florian@openwrt.org](mailto:florian@openwrt.org)>

**Status** Maintained

## \* RDC R6040 FAST ETHERNET DRIVER

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/rdc/r6040.c

## \* RDMAVT - RDMA verbs software

**Mail** Dennis Dalessandro <[dennis.dalessandro@intel.com](mailto:dennis.dalessandro@intel.com)>, Mike Marciniszyn <[mike.marciniszyn@intel.com](mailto:mike.marciniszyn@intel.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/sw/rdmavt

## \* RDS - RELIABLE DATAGRAM SOCKETS

**Mail** Santosh Shilimkar <[santosh.shilimkar@oracle.com](mailto:santosh.shilimkar@oracle.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org), [rds-devel@oss.oracle.com](mailto:rds-devel@oss.oracle.com) (moderated for non-subscribers)

**Status** Supported

**Web-page** <https://oss.oracle.com/projects/rds/>

**Files** networking/rds net/rds/

## \* RDT - RESOURCE ALLOCATION

**Mail** Fenghua Yu <[fenghua.yu@intel.com](mailto:fenghua.yu@intel.com)>, Reinette Chatre <[reinette.chatre@intel.com](mailto:reinette.chatre@intel.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** Documentation/x86/resctrl\* arch/x86/include/asm/resctrl.h arch/x86/kernel/cpu/resctrl/ tools/testing/selftests/resctrl/

### \* READ-COPY UPDATE (RCU)

**Mail** “Paul E. McKenney” <[paulmck@kernel.org](mailto:paulmck@kernel.org)>, Josh Triplett <[josh@joshtTriplett.org](mailto:josh@joshtTriplett.org)>

**Reviewer** Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>, Mathieu Desnoyers <[mathieu.desnoyers@efficios.com](mailto:mathieu.desnoyers@efficios.com)>, Lai Jiangshan <[jiangshanlai@gmail.com](mailto:jiangshanlai@gmail.com)>, Joel Fernandes <[joel@joelfernandes.org](mailto:joel@joelfernandes.org)>

**Mailing list** [rcu@vger.kernel.org](mailto:rcu@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.rdrop.com/users/paulmck/RCU/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/paulmck/linux-rcu.git> dev

**Files** Documentation/RCU/ include/linux/rcu\* kernel/rcu/

**Excluded** Documentation/RCU/torture.txt include/linux/srcu\*.h  
kernel/rcu/srcu\*.c

### \* REAL TIME CLOCK (RTC) SUBSYSTEM

**Mail** Alessandro Zummo <[a.zummo@towertech.it](mailto:a.zummo@towertech.it)>, Alexandre Belloni <[alexandre.belloni@bootlin.com](mailto:alexandre.belloni@bootlin.com)>

**Mailing list** [linux-rtc@vger.kernel.org](mailto:linux-rtc@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.ozlabs.org/project/rtc-linux/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/abelloni/linux.git>

**Files** admin-guide/rtc Documentation/devicetree/bindings/rtc/  
drivers/rtc/ include/linux/platform\_data/rtc-\* include/  
linux/rtc.h include/linux/rtc/ include/uapi/linux/rtc.h  
tools/testing/selftests/rtc/

### \* REALTEK AUDIO CODECS

**Mail** Oder Chiou <[oder\\_chiou@realtek.com](mailto:oder_chiou@realtek.com)>

**Status** Maintained

**Files** include/sound/rt\*.h sound/soc/codecs/rt\*

## \* REALTEK RTL83xx SMI DSA ROUTER CHIPS

**Mail** Linus Walleij <linus.walleij@linaro.org>

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/dsa/realtek-smi.txt  
drivers/net/dsa/realtek-smi\* drivers/net/dsa/rtl83\*

## \* REALTEK WIRELESS DRIVER (rtlwifi family)

**Mail** Ping-Ke Shih <pkshih@realtek.com>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/linville/wireless-testing.git

**Files** drivers/net/wireless/realtek/rtlwifi/

## \* REALTEK WIRELESS DRIVER (rtw88)

**Mail** Yan-Hsuan Chuang <yhchuang@realtek.com>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Files** drivers/net/wireless/realtek/rtw88/

## \* REDPINE WIRELESS DRIVER

**Mail** Amitkumar Karwar <amitkarwar@gmail.com>, Siva Rebbagondla <siva8118@gmail.com>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Files** drivers/net/wireless/rsi/

## \* REGISTER MAP ABSTRACTION

**Mail** Mark Brown <broonie@kernel.org>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/broonie/regmap.git

**Files** Documentation/devicetree/bindings/regmap/ drivers/base/regmap/ include/linux/regmap.h

### \* REISERFS FILE SYSTEM

**Mailing list** [reiserfs-devel@vger.kernel.org](mailto:reiserfs-devel@vger.kernel.org)

**Status** Supported

**Files** fs/reiserfs/

### \* REMOTE PROCESSOR (REMOTEPROC) SUBSYSTEM

**Mail** Ohad Ben-Cohen <[ohad@wizery.com](mailto:ohad@wizery.com)>, Bjorn Andersson <[bjorn.andersson@linaro.org](mailto:bjorn.andersson@linaro.org)>

**Mailing list** [linux-remoteproc@vger.kernel.org](mailto:linux-remoteproc@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/andersson/remoteproc.git> remoteproc-next

**Files** Documentation/ABI/testing/sysfs-class-remoteproc  
Documentation/devicetree/bindings/remoteproc/  
Documentation/remoteproc.txt drivers/remoteproc/include/  
linux/remoteproc.h include/linux/remoteproc/

### \* REMOTE PROCESSOR MESSAGING (RPMMSG) SUBSYSTEM

**Mail** Ohad Ben-Cohen <[ohad@wizery.com](mailto:ohad@wizery.com)>, Bjorn Andersson <[bjorn.andersson@linaro.org](mailto:bjorn.andersson@linaro.org)>

**Mailing list** [linux-remoteproc@vger.kernel.org](mailto:linux-remoteproc@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/andersson/remoteproc.git> rpmmsg-next

**Files** Documentation/ABI/testing/sysfs-bus-rpmmsg  
Documentation/rpmmsg.txt drivers/rpmmsg/include/linux/rpmmsg.h  
include/linux/rpmmsg/include/uapi/linux/rpmmsg.h  
samples/rpmmsg/

### \* RENESAS CLOCK DRIVERS

**Mail** Geert Uytterhoeven <[geert+renesas@glider.be](mailto:geert+renesas@glider.be)>

**Mailing list** [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/geert/renesas-drivers.git> clk-renesas

**Files** Documentation/devicetree/bindings/clock/renesas,\*  
drivers/clk/renesas/

## \* RENESAS EMEV2 I2C DRIVER

**Mail** Wolfram Sang <[wsa+renesas@sang-engineering.com](mailto:wsa+renesas@sang-engineering.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/i2c/renesas,  
iic-emev2.txt drivers/i2c/busses/i2c-emev2.c

## \* RENESAS ETHERNET DRIVERS

**Reviewer** Sergei Shtylyov <[sergei.shtylyov@gmail.com](mailto:sergei.shtylyov@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Files** Documentation/devicetree/bindings/net/renesas,\*.txt  
Documentation/devicetree/bindings/net/renesas,\*.yaml  
drivers/net/ethernet/renesas/include/linux/sh\_eth.h

## \* RENESAS R-CAR GYROADC DRIVER

**Mail** Marek Vasut <[marek.vasut@gmail.com](mailto:marek.vasut@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/iio/adc/renesas,  
gyroadc.txt drivers/iio/adc/rcar-gyroadc.c

## \* RENESAS R-CAR I2C DRIVERS

**Mail** Wolfram Sang <[wsa+renesas@sang-engineering.com](mailto:wsa+renesas@sang-engineering.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/i2c/renesas,i2c.  
txt Documentation/devicetree/bindings/i2c/renesas,iic.  
txt drivers/i2c/busses/i2c-rcar.c drivers/i2c/busses/  
i2c-sh\_mobile.c

## \* RENESAS R-CAR THERMAL DRIVERS

**Mail** Niklas Söderlund <[niklas.soderlund@ragnatech.se](mailto:niklas.soderlund@ragnatech.se)>

**Mailing list** [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/thermal/  
rcar-gen3-thermal.yaml Documentation/devicetree/  
bindings/thermal/rcar-thermal.yaml drivers/thermal/  
rcar\_gen3\_thermal.c drivers/thermal/rcar\_thermal.c

### \* RENESAS RIIC DRIVER

**Mail** Chris Brandt <[chris.brandt@renesas.com](mailto:chris.brandt@renesas.com)>

**Status** Supported

**Files** Documentation/devicetree/bindings/i2c/renesas,riic.txt  
drivers/i2c/busses/i2c-riic.c

### \* RENESAS USB PHY DRIVER

**Mail** Yoshihiro Shimoda <[yoshihiro.shimoda.uh@renesas.com](mailto:yoshihiro.shimoda.uh@renesas.com)>

**Mailing list** [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Maintained

**Files** drivers/phy/renesas/phy-rkar-gen3-usb\*.c

### \* RESET CONTROLLER FRAMEWORK

**Mail** Philipp Zabel <[p.zabel@pengutronix.de](mailto:p.zabel@pengutronix.de)>

**Status** Maintained

**SCM** git <git://git.pengutronix.de/git/pza/linux>

**Files** Documentation/devicetree/bindings/reset/ drivers/  
reset/ include/dt-bindings/reset/ include/linux/  
reset-controller.h include/linux/reset.h include/linux/  
reset/

**Content regex** \b(?:devm\_|of\_)?reset\_control(?  
:ler\_[a-z]+|\_[a-z\_]+)\b

### \* RESTARTABLE SEQUENCES SUPPORT

**Mail** Mathieu Desnoyers <[mathieu.desnoyers@efficios.com](mailto:mathieu.desnoyers@efficios.com)>, Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>, “Paul E. McKenney” <[paulmck@kernel.org](mailto:paulmck@kernel.org)>, Boqun Feng <[boqun.feng@gmail.com](mailto:boqun.feng@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** include/trace/events/rseq.h include/uapi/linux/rseq.h  
kernel/rseq.c tools/testing/selftests/rseq/

### \* **RFKILL**

**Mail** Johannes Berg <johannes@sipsolutions.net>

**Mailing list** linux-wireless@vger.kernel.org

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jberg/mac80211.git  
git git://git.kernel.org/pub/scm/linux/kernel/git/jberg/mac80211-  
next.git

**Files** Documentation/ABI/stable/sysfs-class-rfkill driver-  
api/rfkill include/linux/rfkill.h include/uapi/linux/rfkill.  
h net/rfkill/

### \* **RHASHTABLE**

**Mail** Thomas Graf <tgraf@suug.ch>, Herbert Xu  
<herbert@gondor.apana.org.au>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** include/linux/rhashtable-types.h include/linux/  
rhashtable.h lib/rhashtable.c lib/test\_rhashtable.c

### \* **RICOH R5C592 MEMORYSTICK DRIVER**

**Mail** Maxim Levitsky <maximlevitsky@gmail.com>

**Status** Maintained

**Files** drivers/memstick/host/r592.\*

### \* **RICOH SMARTMEDIA/XD DRIVER**

**Mail** Maxim Levitsky <maximlevitsky@gmail.com>

**Status** Maintained

**Files** drivers/mtd/nand/raw/r852.c drivers/mtd/nand/raw/r852.h

### \* RISC-V ARCHITECTURE

**Mail** Paul Walmsley <[paul.walmsley@sifive.com](mailto:paul.walmsley@sifive.com)>, Palmer Dabbelt <[palmer@dabbelt.com](mailto:palmer@dabbelt.com)>, Albert Ou <[aou@eecs.berkeley.edu](mailto:aou@eecs.berkeley.edu)>

**Mailing list** [linux-riscv@lists.infradead.org](mailto:linux-riscv@lists.infradead.org)

**Status** Supported

**P** riscv/patch-acceptance

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/riscv/linux.git>

**Files** arch/riscv/

**Regex** riscv

**Content regex** riscv

### \* RNBD BLOCK DRIVERS

**Mail** Danil Kipnis <[daniel.kipnis@cloud.ionos.com](mailto:daniel.kipnis@cloud.ionos.com)>, Jack Wang <[jinpu.wang@cloud.ionos.com](mailto:jinpu.wang@cloud.ionos.com)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Maintained

**Files** drivers/block/rnbd/

### \* ROCCAT DRIVERS

**Mail** Stefan Achatz <[erazor\\_de@users.sourceforge.net](mailto:erazor_de@users.sourceforge.net)>

**Status** Maintained

**Web-page** <http://sourceforge.net/projects/roccat/>

**Files** Documentation/ABI/\*/sysfs-driver-hid-roccat\* drivers/hid/hid-roccat\* include/linux/hid-roccat\*

### \* ROCKCHIP ISP V1 DRIVER

**Mail** Helen Koike <[helen.koike@collabora.com](mailto:helen.koike@collabora.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/media/rkisp1/

## \* ROCKCHIP RASTER 2D GRAPHIC ACCELERATION UNIT DRIVER

**Mail** Jacob Chen <jacob-chen@iotwrt.com>, Ezequiel Garcia <ezequiel@collabora.com>

**Mailing list** linux-media@vger.kernel.org, linux-rockchip@lists.infradead.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/rockchip-rga.yaml  
drivers/media/platform/rockchip/rga/

## \* ROCKCHIP VIDEO DECODER DRIVER

**Mail** Ezequiel Garcia <ezequiel@collabora.com>

**Mailing list** linux-media@vger.kernel.org, linux-rockchip@lists.infradead.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/rockchip,vdec.yaml  
drivers/staging/media/rkvdec/

## \* ROCKER DRIVER

**Mail** Jiri Pirko <jiri@resnulli.us>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/rocker/

## \* ROCKETPORT DRIVER

**Status** Maintained

**Web-page** <http://www.comtrol.com>

**Files** driver-api/serial/rocket drivers/tty/rocket\*

## \* ROCKETPORT EXPRESS/INFINITY DRIVER

**Mail** Kevin Cernekee <cernekee@gmail.com>

**Mailing list** linux-serial@vger.kernel.org

**Status** Odd Fixes

**Files** drivers/tty/serial/rp2.\*

### \* ROHM BH1750 AMBIENT LIGHT SENSOR DRIVER

**Mail** Tomasz Duszynski <[tduszyns@gmail.com](mailto:tduszyns@gmail.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/light/bh1750.yaml  
drivers/iio/light/bh1750.c

### \* ROHM MULTIFUNCTION BD9571MWV-M PMIC DEVICE DRIVERS

**Mail** Marek Vasut <[marek.vasut+renesas@gmail.com](mailto:marek.vasut+renesas@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org), [linux-renesas-soc@vger.kernel.org](mailto:linux-renesas-soc@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/mfd/bd9571mwv.txt  
drivers/gpio/gpio-bd9571mwv.c drivers/mfd/bd9571mwv.c  
drivers/regulator/bd9571mwv-regulator.c include/linux/  
mfd/bd9571mwv.h

### \* ROSE NETWORK LAYER

**Mail** Ralf Baechle <[ralf@linux-mips.org](mailto:ralf@linux-mips.org)>

**Mailing list** [linux-hams@vger.kernel.org](mailto:linux-hams@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-ax25.org/>

**Files** include/net/rose.h include/uapi/linux/rose.h net/rose/

### \* ROTATION DRIVER FOR ALLWINNER A83T

**Mail** Jernej Skrabec <[jernej.skrabec@siol.net](mailto:jernej.skrabec@siol.net)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/allwinner,  
sun8i-a83t-de2-rotate.yaml drivers/media/platform/sunxi/  
sun8i-rotate/

## \* RTL2830 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/rtl2830\*

## \* RTL2832 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/rtl2832\*

## \* RTL2832\_SDR MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/rtl2832\_sdr\*

## \* RTL8180 WIRELESS DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Orphan

**Web-page** <https://wireless.wiki.kernel.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/linville/wireless-testing.git>

**Files** drivers/net/wireless/realtek/rtl818x/rtl8180/

### \* RTL8187 WIRELESS DRIVER

**Mail** Herton Ronaldo Krzesinski <[herton@canonical.com](mailto:herton@canonical.com)>, Hin-Tak Leung <[htl10@users.sourceforge.net](mailto:htl10@users.sourceforge.net)>, Larry Finger <[Larry.Finger@lwfinger.net](mailto:Larry.Finger@lwfinger.net)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Web-page** <https://wireless.wiki.kernel.org/>

**SCM git** <git://git.kernel.org/pub/scm/linux/kernel/git/linville/wireless-testing.git>

**Files** [drivers/net/wireless/realtek/rtl818x/rtl8187/](#)

### \* RTL8XXXU WIRELESS DRIVER (rtl8xxxu)

**Mail** Jes Sorensen <[Jes.Sorensen@gmail.com](mailto:Jes.Sorensen@gmail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**SCM git** <git://git.kernel.org/pub/scm/linux/kernel/git/jes/linux.git>  
rtl8xxxu-devel

**Files** [drivers/net/wireless/realtek/rtl8xxxu/](#)

### \* RTRS TRANSPORT DRIVERS

**Mail** Danil Kipnis <[daniel.kipnis@cloud.ionos.com](mailto:daniel.kipnis@cloud.ionos.com)>, Jack Wang <[jinp.wang@cloud.ionos.com](mailto:jinp.wang@cloud.ionos.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Maintained

**Files** [drivers/infiniband/ulp/rtrs/](#)

### \* RXRPC SOCKETS (AF\_RXRPC)

**Mail** David Howells <[dhowells@redhat.com](mailto:dhowells@redhat.com)>

**Mailing list** [linux-afs@lists.infradead.org](mailto:linux-afs@lists.infradead.org)

**Status** Supported

**Web-page** <https://www.infradead.org/~dhowells/kafs/>

**Files** [networking/rxrpc/include/keys/rxrpc-type.h](#) [include/net/af\\_rxrpc.h](#) [include/trace/events/rxrpc.h](#) [include/uapi/linux/rxrpc.h](#) [net/rxrpc/](#)

## \* S3 SAVAGE FRAMEBUFFER DRIVER

**Mail** Antonino Daplas <[adaplas@gmail.com](mailto:adaplas@gmail.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/video/fbdev/savage/

## \* S390

**Mail** Heiko Carstens <[hca@linux.ibm.com](mailto:hca@linux.ibm.com)>, Vasily Gor-bik <[gor@linux.ibm.com](mailto:gor@linux.ibm.com)>, Christian Borntraeger <[borntraeger@de.ibm.com](mailto:borntraeger@de.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**SCM** git [git://git.kernel.org/pub/scm/linux/kernel/git/s390/linux.git](http://git.kernel.org/pub/scm/linux/kernel/git/s390/linux.git)

**Files** driver-api/s390-drivers Documentation/s390/ arch/s390/ drivers/s390/

## \* S390 COMMON I/O LAYER

**Mail** Vineeth Vijayan <[vneethv@linux.ibm.com](mailto:vneethv@linux.ibm.com)>, Peter Oberparleiter <[oberpar@linux.ibm.com](mailto:oberpar@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** drivers/s390/cio/

## \* S390 DASD DRIVER

**Mail** Stefan Haberland <[sth@linux.ibm.com](mailto:sth@linux.ibm.com)>, Jan Hoeppner <[hoeppner@linux.ibm.com](mailto:hoeppner@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** block/partitions/ibm.c drivers/s390/block/dasd\* include/linux/dasd\_mod.h

### \* S390 IOMMU (PCI)

**Mail** Gerald Schaefer <[gerald.schaefer@linux.ibm.com](mailto:gerald.schaefer@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** drivers/iommu/s390-iommu.c

### \* S390 IUCV NETWORK LAYER

**Mail** Julian Wiedmann <[jwi@linux.ibm.com](mailto:jwi@linux.ibm.com)>, Karsten Graul <[kgraul@linux.ibm.com](mailto:kgraul@linux.ibm.com)>, Ursula Braun <[ubraun@linux.ibm.com](mailto:ubraun@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** drivers/s390/net/\*iucv\* include/net/iucv/ net/iucv/

### \* S390 NETWORK DRIVERS

**Mail** Julian Wiedmann <[jwi@linux.ibm.com](mailto:jwi@linux.ibm.com)>, Karsten Graul <[kgraul@linux.ibm.com](mailto:kgraul@linux.ibm.com)>, Ursula Braun <[ubraun@linux.ibm.com](mailto:ubraun@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** drivers/s390/net/

### \* S390 PCI SUBSYSTEM

**Mail** Niklas Schnelle <[schnelle@linux.ibm.com](mailto:schnelle@linux.ibm.com)>, Gerald Schaefer <[gerald.schaefer@linux.ibm.com](mailto:gerald.schaefer@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** arch/s390/pci/ drivers/pci/hotplug/s390\_pci\_hpc.c  
s390/pci

## \* S390 VFIO AP DRIVER

**Mail** Tony Krowiak <[akrowiak@linux.ibm.com](mailto:akrowiak@linux.ibm.com)>, Pierre Morel <[pmorel@linux.ibm.com](mailto:pmorel@linux.ibm.com)>, Halil Pasic <[pasic@linux.ibm.com](mailto:pasic@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** s390/vfio-ap drivers/s390/crypto/vfio\_ap\_drv.c drivers/s390/crypto/vfio\_ap\_ops.c drivers/s390/crypto/vfio\_ap\_private.h

## \* S390 VFIO-CCW DRIVER

**Mail** Cornelia Huck <[cohuck@redhat.com](mailto:cohuck@redhat.com)>, Eric Farman <[farman@linux.ibm.com](mailto:farman@linux.ibm.com)>

**Reviewer** Halil Pasic <[pasic@linux.ibm.com](mailto:pasic@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org), [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Files** s390/vfio-ccw drivers/s390/cio/vfio\_ccw\* include/uapi/linux/vfio\_ccw.h

## \* S390 ZCRYPT DRIVER

**Mail** Harald Freudenberger <[freude@linux.ibm.com](mailto:freude@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** drivers/s390/crypto/

## \* S390 ZFCP DRIVER

**Mail** Steffen Maier <[maier@linux.ibm.com](mailto:maier@linux.ibm.com)>, Benjamin Block <[bblock@linux.ibm.com](mailto:bblock@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** drivers/s390/scsi/zfcp\_\*

### \* S3C24XX SD/MMC Driver

**Mail** Ben Dooks <[ben-linux@fluff.org](mailto:ben-linux@fluff.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/mmc/host/s3cmci.\*

### \* SAA6588 RDS RECEIVER DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/saa6588\*

### \* SAA7134 VIDEO4LINUX DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/driver-api/media/drivers/saa7134\*  
drivers/media/pci/saa7134/

### \* SAA7146 VIDEO4LINUX-2 DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/common/saa7146/ drivers/media/pci/  
saa7146/ include/media/driv-intf/saa7146\*

## \* SAFESETID SECURITY MODULE

**Mail** Micah Morton <[mortonm@chromium.org](mailto:mortonm@chromium.org)>

**Status** Supported

**Files** admin-guide/LSM/SafeSetID security/safesetid/

## \* SAMSUNG AUDIO (ASoC) DRIVERS

**Mail** Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>, Sangbeom Kim <[sbkim73@samsung.com](mailto:sbkim73@samsung.com)>, Sylwester Nawrocki <[s.nawrocki@samsung.com](mailto:s.nawrocki@samsung.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**Files** Documentation/devicetree/bindings/sound/samsung\* sound/soc/samsung/

## \* SAMSUNG EXYNOS PSEUDO RANDOM NUMBER GENERATOR (RNG) DRIVER

**Mail** Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org), [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/rng/samsung, exynos4-rng.yaml drivers/crypto/exynos-rng.c

## \* SAMSUNG EXYNOS TRUE RANDOM NUMBER GENERATOR (TRNG) DRIVER

**Mail** Łukasz Stelmach <[l.stelmach@samsung.com](mailto:l.stelmach@samsung.com)>

**Mailing list** [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/rng/samsung, exynos5250-trng.txt drivers/char/hw\_random/exynos-trng.c

### \* SAMSUNG FRAMEBUFFER DRIVER

**Mail** Jingoo Han <jingoohan1@gmail.com>

**Mailing list** linux-fbdev@vger.kernel.org

**Status** Maintained

**Files** drivers/video/fbdev/s3c-fb.c

### \* SAMSUNG LAPTOP DRIVER

**Mail** Corentin Chary <corentin.chary@gmail.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/samsung-laptop.c

### \* SAMSUNG MULTIFUNCTION PMIC DEVICE DRIVERS

**Mail** Sangbeom Kim <sbkim73@samsung.com>, Krzysztof Ko-zlowski <krzk@kernel.org>, Bartłomiej Zolnierkiewicz <b.zolnierkie@samsung.com>

**Mailing list** linux-kernel@vger.kernel.org, linux-samsung-soc@vger.kernel.org

**Status** Supported

**Files** Documentation/devicetree/bindings/clock/samsung,  
s2mps11.txt Documentation/devicetree/bindings/mfd/  
samsung,sec-core.txt Documentation/devicetree/bindings/  
regulator/samsung,s2m\*.txt Documentation/devicetree/  
bindings/regulator/samsung,s5m\*.txt drivers/clk/  
clk-s2mps11.c drivers/mfd/sec\*.c drivers/regulator/s2m\*.c  
drivers/regulator/s5m\*.c drivers/rtc/rtc-s5m.c include/  
linux/mfd/samsung/

### \* SAMSUNG S3C24XX/S3C64XX SOC SERIES CAMIF DRIVER

**Mail** Sylvester Nawrocki <sylvester.nawrocki@gmail.com>

**Mailing list** linux-media@vger.kernel.org, linux-samsung-soc@vger.kernel.org (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/media/platform/s3c-camif/ include/media/  
drv-intf/s3c\_camif.h

## \* SAMSUNG S3FWRN5 NFC DRIVER

**Mail** Robert Baldyga <[r.baldyga@samsung.com](mailto:r.baldyga@samsung.com)>, Krzysztof Opasiak <[k.opasiak@samsung.com](mailto:k.opasiak@samsung.com)>

**Mailing list** [linux-nfc@lists.01.org](mailto:linux-nfc@lists.01.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/nfc/s3fwrn5

## \* SAMSUNG S5C73M3 CAMERA DRIVER

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>, Andrzej Hajda <[a.hajda@samsung.com](mailto:a.hajda@samsung.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Files** drivers/media/i2c/s5c73m3/\*

## \* SAMSUNG S5K5BAF CAMERA DRIVER

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>, Andrzej Hajda <[a.hajda@samsung.com](mailto:a.hajda@samsung.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Files** drivers/media/i2c/s5k5baf.c

## \* SAMSUNG SSP Security SubSystem (SSS) DRIVER

**Mail** Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>, Vladimir Zapolskiy <[vz@mleia.com](mailto:vz@mleia.com)>, Kamil Konieczny <[k.konieczny@samsung.com](mailto:k.konieczny@samsung.com)>

**Mailing list** [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org), [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/crypto/  
samsung-slimsss.yaml Documentation/devicetree/bindings/  
crypto/samsung-sss.yaml drivers/crypto/s5p-sss.c

### \* SAMSUNG S5P/EXYNOS4 SOC SERIES CAMERA SUBSYSTEM DRIVERS

**Mail** Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>, Sylvester Nawrocki <[s.nawrocki@samsung.com](mailto:s.nawrocki@samsung.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Patchwork** <https://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/platform/exynos4-is/

### \* SAMSUNG SOC CLOCK DRIVERS

**Mail** Sylvester Nawrocki <[s.nawrocki@samsung.com](mailto:s.nawrocki@samsung.com)>, Tomasz Figa <[tomasz.figa@gmail.com](mailto:tomasz.figa@gmail.com)>, Chanwoo Choi <[cw00.choi@samsung.com](mailto:cw00.choi@samsung.com)>

**Mailing list** [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org) (moderated for non-subscribers)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/snawrocki/clk.git>

**Files** Documentation/devicetree/bindings/clock/exynos\*.txt  
Documentation/devicetree/bindings/clock/samsung,s3c\*  
Documentation/devicetree/bindings/clock/samsung,s5p\*  
drivers/clk/samsung/include/dt-bindings/clock/exynos\*.h

### \* SAMSUNG SPI DRIVERS

**Mail** Kukjin Kim <[kgene@kernel.org](mailto:kgene@kernel.org)>, Krzysztof Kozlowski <[krzk@kernel.org](mailto:krzk@kernel.org)>, Andi Shyti <[andi@etezian.org](mailto:andi@etezian.org)>

**Mailing list** [linux-spi@vger.kernel.org](mailto:linux-spi@vger.kernel.org), [linux-samsung-soc@vger.kernel.org](mailto:linux-samsung-soc@vger.kernel.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/spi/spi-samsung.txt  
drivers/spi/spi-s3c\* include/linux/platform\_data/spi-s3c64xx.h

## \* SAMSUNG SXGBE DRIVERS

**Mail** Byungho An <bh74.an@samsung.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/samsung/sxgbe/

## \* SAMSUNG THERMAL DRIVER

**Mail** Bartlomiej Zolnierkiewicz <b.zolnierkie@samsung.com>

**Mailing list** linux-pm@vger.kernel.org, linux-samsung-soc@vger.kernel.org

**Status** Supported

**SCM** git <https://github.com/lmajewski/linux-samsung-thermal.git>

**Files** drivers/thermal/samsung/

## \* SAMSUNG USB2 PHY DRIVER

**Mail** Kamil Debski <kamil@wypas.org>, Sylwester Nawrocki <s.nawrocki@samsung.com>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Supported

**Files** Documentation/devicetree/bindings/phy/samsung-phy.txt  
driver-api/phy/samsung-usb2.c  
phy-exynos4210-usb2.c  
phy-exynos4x12-usb2.c  
phy-exynos5250-usb2.c  
phy-s5pv210-usb2.c  
drivers/phy/samsung/phy-samsung-usb2.c  
drivers/phy/samsung/phy-samsung-usb2.h

## \* SC1200 WDT DRIVER

**Mail** Zwane Mwaikambo <zwanem@gmail.com>

**Status** Maintained

**Files** drivers/watchdog/sc1200wdt.c

### \* SCHEDULER

**Mail** Ingo Molnar <[mingo@redhat.com](mailto:mingo@redhat.com)>, Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>, Juri Lelli <[juri.elli@redhat.com](mailto:juri.elli@redhat.com)> (SCHED\_DEADLINE), Vincent Guittot <[vincent.guittot@linaro.org](mailto:vincent.guittot@linaro.org)> (SCHED\_NORMAL)

**Reviewer** Dietmar Eggemann <[dietmar.eggemann@arm.com](mailto:dietmar.eggemann@arm.com)> (SCHED\_NORMAL), Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)> (SCHED\_FIFO/SCHED\_RR), Ben Segall <[bsegall@google.com](mailto:bsegall@google.com)> (CONFIG\_CFS\_BANDWIDTH), Mel Gorman <[mgorman@suse.de](mailto:mgorman@suse.de)> (CONFIG\_NUMA\_BALANCING)

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> sched/core

**Files** include/linux/preempt.h include/linux/sched.h include/linux/wait.h include/uapi/linux/sched.h kernel/sched/

### \* SCR24X CHIP CARD INTERFACE DRIVER

**Mail** Lubomir Rintel <[lkundrak@v3.sk](mailto:lkundrak@v3.sk)>

**Status** Supported

**Files** drivers/char/pcmcia/scr24x\_cs.c

### \* SCSI CDROM DRIVER

**Mail** Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.kernel.dk>

**Files** drivers/scsi/sr\*

### \* SCSI RDMA PROTOCOL (SRP) INITIATOR

**Mail** Bart Van Assche <[bvanassche@acm.org](mailto:bvanassche@acm.org)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Patchwork** <http://patchwork.kernel.org/project/linux-rdma/list/>

**Files** drivers/infiniband/ulp/srp/ include/scsi/srp.h

## \* SCSI RDMA PROTOCOL (SRP) TARGET

**Mail** Bart Van Assche <[bvanassche@acm.org](mailto:bvanassche@acm.org)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org), [devel@vger.kernel.org](mailto:devel@vger.kernel.org) target-

**Status** Supported

**Patchwork** <http://patchwork.kernel.org/project/linux-rdma/list/>

**Files** drivers/infiniband/ulp/srpt/

## \* SCSI SG DRIVER

**Mail** Doug Gilbert <[dgilbert@interlog.com](mailto:dgilbert@interlog.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Web-page** <http://sg.danny.cz/sg>

**Files** scsi/scsi-generic drivers/scsi/sg.c include/scsi/sg.h

## \* SCSI SUBSYSTEM

**Mail** “James E.J. Bottomley” <[jejb@linux.ibm.com](mailto:jejb@linux.ibm.com)>, “Martin K. Petersen” <[martin.petersen@oracle.com](mailto:martin.petersen@oracle.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Patchwork** <https://patchwork.kernel.org/project/linux-scsi/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/jejb/scsi.git> git <git://git.kernel.org/pub/scm/linux/kernel/git/mkp/scsi.git>

**Files** Documentation/devicetree/bindings/scsi/ drivers/scsi/include/scsi/

## \* SCSI TAPE DRIVER

**Mail** Kai Mäkisara <[Kai.Makisara@kolumbus.fi](mailto:Kai.Makisara@kolumbus.fi)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** scsi/st drivers/scsi/st.\* drivers/scsi/st\_\*.h

### \* SCSI TARGET SUBSYSTEM

**Mail** “Martin K. Petersen” <[martin.petersen@oracle.com](mailto:martin.petersen@oracle.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org), [target-devel@vger.kernel.org](mailto:target-devel@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.linux-iscsi.org>

**Patchwork** <https://patchwork.kernel.org/project/target-devel/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mkp/scsi.git>

**Files** Documentation/target/ drivers/target/ include/target/

### \* SCTP PROTOCOL

**Mail** Vlad Yasevich <[vyasevich@gmail.com](mailto:vyasevich@gmail.com)>, Neil Horman <[norman@tuxdriver.com](mailto:norman@tuxdriver.com)>, Marcelo Ricardo Leitner <[marcelo.leitner@gmail.com](mailto:marcelo.leitner@gmail.com)>

**Mailing list** [linux-sctp@vger.kernel.org](mailto:linux-sctp@vger.kernel.org)

**Status** Maintained

**Web-page** <http://lksctp.sourceforge.net>

**Files** networking/sctp include/linux/sctp.h include/net/sctp/include/uapi/linux/sctp.h net/sctp/

### \* SCx200 CPU SUPPORT

**Mail** Jim Cromie <[jim.cromie@gmail.com](mailto:jim.cromie@gmail.com)>

**Status** Odd Fixes

**Files** i2c/busses/scx200\_acb arch/x86/platform/scx200/ drivers/i2c/busses/scx200\* drivers/mtd/maps/scx200\_docflash.c drivers/watchdog/scx200\_wdt.c include/linux/scx200.h

### \* SCx200 GPIO DRIVER

**Mail** Jim Cromie <[jim.cromie@gmail.com](mailto:jim.cromie@gmail.com)>

**Status** Maintained

**Files** drivers/char/scx200\_gpio.c include/linux/scx200\_gpio.h

#### \* SCx200 HRT CLOCKSOURCE DRIVER

**Mail** Jim Cromie <jim.cromie@gmail.com>

## Status Maintained

**Files** drivers/clocksource/scx200\_hrt.c

\* SDRICOH CS MMC/SD HOST CONTROLLER INTERFACE DRIVER

**Mail** Sascha Sommer <[saschasommer@freenet.de](mailto:saschasommer@freenet.de)>

**Mailing list** [sdricohcs-devel@lists.sourceforge.net](mailto:sdricohcs-devel@lists.sourceforge.net) (subscribers-only)

## Status Maintained

## Files drivers/mmc/host/sdriconh.cs.c

\* SECO BOARDS CEC DRIVER

**Mail** Ettore Chimenti <ek5.chimenti@gmail.com>

## Status Maintained

**Files** drivers/media/platform/sec0-cec/sec0-cec.c      drivers/  
  media/platform/sec0-cec/sec0-cec.h

#### \* SECURE COMPUTING

**Mail** Kees Cook <keescook@chromium.org>

**Reviewer** Andy Lutomirski <[luto@amacapital.net](mailto:luto@amacapital.net)>, Will Drewry <[wad@chromium.org](mailto:wad@chromium.org)>

## Status Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/kees/linux.git sec-comp

**Files** userspace-api/seccomp\_filter include/linux/seccomp.h  
include/uapi/linux/seccomp.h kernel/seccomp.c tools/  
testing/selftests/kselbstest\_harness.h tools/testing/  
selftests/seccomp/\*

**Content regex** \bsecure computing\bTIF SECCOMP\b

**\* SECURE DIGITAL HOST CONTROLLER INTERFACE (SDHCI) Broadcom BRCMSTB DRIVER**

**Mail** Al Cooper <[alcooperx@gmail.com](mailto:alcooperx@gmail.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org), [bcm kernel feedback-list@broadcom.com](mailto:bcm kernel feedback-list@broadcom.com)

**Status** Maintained

**Files** drivers/mmc/host/sdhci-brcmstb\*

**\* SECURE DIGITAL HOST CONTROLLER INTERFACE (SDHCI) DRIVER**

**Mail** Adrian Hunter <[adrian.hunter@intel.com](mailto:adrian.hunter@intel.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/sdhci\* include/linux/mmc/sdhci\*

**\* SECURE DIGITAL HOST CONTROLLER INTERFACE (SDHCI) MICROCHIP DRIVER**

**Mail** Ludovic Desroches <[ludovic.desroches@microchip.com](mailto:ludovic.desroches@microchip.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Supported

**Files** drivers/mmc/host/sdhci-of-at91.c

**\* SECURE DIGITAL HOST CONTROLLER INTERFACE (SDHCI) SAMSUNG DRIVER**

**Mail** Ben Dooks <[ben linux@fluff.org](mailto:ben linux@fluff.org)>, Jaehoon Chung <[jh80.chung@samsung.com](mailto:jh80.chung@samsung.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/sdhci-s3c\*

**\* SECURE DIGITAL HOST CONTROLLER INTERFACE (SDHCI) ST SPEAR DRIVER**

**Mail** Viresh Kumar <[vireshk@kernel.org](mailto:vireshk@kernel.org)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/sdhci-spear.c

## \* SECURE DIGITAL HOST CONTROLLER INTERFACE (SDHCI) TI OMAP DRIVER

**Mail** Kishon Vijay Abraham I <[kishon@ti.com](mailto:kishon@ti.com)>

**Mailing list** [linux-mmc@vger.kernel.org](mailto:linux-mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/sdhci-omap.c

## \* SECURE ENCRYPTING DEVICE (SED) OPAL DRIVER

**Mail** Jonathan Derrick <[jonathan.derrick@intel.com](mailto:jonathan.derrick@intel.com)>, Revanth Rajashekhar <[revanth.rajashekhar@intel.com](mailto:revanth.rajashekhar@intel.com)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Supported

**Files** block/opal\_proto.h block/sed\* include/linux/sed\* include/uapi/linux/sed\*

## \* SECURITY CONTACT

**Mail** Security Officers <[security@kernel.org](mailto:security@kernel.org)>

**Status** Supported

## \* SECURITY SUBSYSTEM

**Mail** James Morris <[jmorris@namei.org](mailto:jmorris@namei.org)>, “Serge E. Hallyn” <[serge@hallyn.com](mailto:serge@hallyn.com)>

**Mailing list** [linux-security-module@vger.kernel.org](mailto:linux-security-module@vger.kernel.org) (suggested Cc:)

**Status** Supported

**Web-page** <http://kernsec.org/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/jmorris/linux-security.git

**Files** security/

**Excluded** security/selinux/

### \* SELINUX SECURITY MODULE

**Mail** Paul Moore <[paul@paul-moore.com](mailto:paul@paul-moore.com)>, Stephen Smalley <[stephen.smalley.work@gmail.com](mailto:stephen.smalley.work@gmail.com)>, Eric Paris <[eparis@parisplace.org](mailto:eparis@parisplace.org)>

**Mailing list** [selinux@vger.kernel.org](mailto:selinux@vger.kernel.org)

**Status** Supported

**Web-page** <https://selinuxproject.org> <https://github.com/SELinuxProject>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pcmoore/selinux.git>

**Files** Documentation/ABI/obsolete/sysfs-selinux-checkreqprot  
Documentation/ABI/obsolete/sysfs-selinux-disable admin-guide/LSM/SELinux include/uapi/linux/selinux\_netlink.h  
scripts/selinux/security/selinux/

### \* SENSABLE PHANTOM

**Mail** Jiri Slaby <[jirislaby@gmail.com](mailto:jirislaby@gmail.com)>

**Status** Maintained

**Files** drivers/misc/phantom.c include/uapi/linux/phantom.h

### \* SENSIION SPS30 AIR POLLUTION SENSOR DRIVER

**Mail** Tomasz Duszynski <[tduszyns@gmail.com](mailto:tduszyns@gmail.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/chemical/  
sensirion\_sps30.yaml drivers/iio/chemical/sps30.c

### \* SERIAL DEVICE BUS

**Mail** Rob Herring <[rohb@kernel.org](mailto:robh@kernel.org)>

**Mailing list** [linux-serial@vger.kernel.org](mailto:linux-serial@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/serial/serial.yaml  
drivers/tty/serdev/include/linux/serdev.h

## \* SERIAL DRIVERS

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [linux-serial@vger.kernel.org](mailto:linux-serial@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/serial/ drivers/tty/ serial/

## \* SERIAL IR RECEIVER

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/serial\_ir.c

## \* SERIAL LOW-POWER INTER-CHIP MEDIA BUS (SLIMbus)

**Mail** Srinivas Kandagatla <[srinivas.kandagatla@linaro.org](mailto:srinivas.kandagatla@linaro.org)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/slimbus/ drivers/slimbus/ include/linux/slimbus.h

## \* SFC NETWORK DRIVER

**Mail** Solarflare linux maintainers <[linux-net-drivers@solarflare.com](mailto:linux-net-drivers@solarflare.com)>, Edward Cree <[ecree@solarflare.com](mailto:ecree@solarflare.com)>, Martin Habets <[mhabets@solarflare.com](mailto:mhabets@solarflare.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/ethernet/sfc/

## \* SFF/SFP/SFP+ MODULE SUPPORT

**Mail** Russell King <[linux@armlinux.org.uk](mailto:linux@armlinux.org.uk)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/phy/phylink.c drivers/net/phy/sfp\* include/linux/phylink.h include/linux/sfp.h

**Content regex** phylink

### \* SGI GRU DRIVER

**Mail** Dimitri Sivanich <[sivanich@sgi.com](mailto:sivanich@sgi.com)>

**Status** Maintained

**Files** drivers/misc/sgi-gru/

### \* SGI XP/XPC/XPNET DRIVER

**Mail** Cliff Whickman <[cpw@sgi.com](mailto:cpw@sgi.com)>, Robin Holt  
<[robinmholt@gmail.com](mailto:robinmholt@gmail.com)>

**Status** Maintained

**Files** drivers/misc/sgi-xp/

### \* SHARED MEMORY COMMUNICATIONS (SMC) SOCKETS

**Mail** Ursula Braun <[ubraun@linux.ibm.com](mailto:ubraun@linux.ibm.com)>, Karsten Graul  
<[kgraul@linux.ibm.com](mailto:kgraul@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/linux/linux390/>

**Files** net/smc/

### \* SHARP GP2AP002A00F/GP2AP002S00F SENSOR DRIVER

**Mail** Linus Walleij <[linus.walleij@linaro.org](mailto:linus.walleij@linaro.org)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/jic23/iio.git>

**Files** Documentation/devicetree/bindings/iio/light/sharp,  
gp2ap002.yaml drivers/iio/light/gp2ap002.c

### \* SHARP RJ54N1CB0C SENSOR DRIVER

**Mail** Jacopo Mondi <[jacopo@jmondi.org](mailto:jacopo@jmondi.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/rj54n1cb0c.c include/media/i2c/  
rj54n1cb0c.h

## \* SH\_VOU V4L2 OUTPUT DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Status** Orphan

**Files** drivers/media/platform/sh\_vou.c include/media/drv-intf/  
sh\_vou.h

## \* SI2157 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/si2157\*

## \* SI2165 MEDIA DRIVER

**Mail** Matthias Schwarzott <[zzam@gentoo.org](mailto:zzam@gentoo.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/si2165\*

## \* SI2168 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/si2168\*

## \* SI470X FM RADIO RECEIVER I2C DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/si470x/radio-si470x-i2c.c

## \* SI470X FM RADIO RECEIVER USB DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/si470x/radio-si470x-common.c  
drivers/media/radio/si470x/radio-si470x-usb.c      drivers/  
media/radio/si470x/radio-si470x.h

## \* SI4713 FM RADIO TRANSMITTER I2C DRIVER

**Mail** Eduardo Valentin <[edubezval@gmail.com](mailto:edubezval@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/si4713/si4713.?

## \* SI4713 FM RADIO TRANSMITTER PLATFORM DRIVER

**Mail** Eduardo Valentin <[edubezval@gmail.com](mailto:edubezval@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/si4713/radio-platform-si4713.c

## \* SI4713 FM RADIO TRANSMITTER USB DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/radio/si4713/radio-usb-si4713.c

## \* SIANO DVB DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/common/siano/ drivers/media/mmc/siano/  
drivers/media/usb/siano/ drivers/media/usb/siano/

## \* SIFIVE DRIVERS

**Mail** Palmer Dabbelt <[palmer@dabbelt.com](mailto:palmer@dabbelt.com)>, Paul Walmsley <[paul.walmsley@sifive.com](mailto:paul.walmsley@sifive.com)>

**Mailing list** [linux-riscv@lists.infradead.org](mailto:linux-riscv@lists.infradead.org)

**Status** Supported

**SCM** git <git://github.com/sifive/riscv-linux.git>

**Regex** sifive

**Content regex** [^@]sifive

## \* SIFIVE FU540 SYSTEM-ON-CHIP

**Mail** Paul Walmsley <[paul.walmsley@sifive.com](mailto:paul.walmsley@sifive.com)>, Palmer Dabbelt <[palmer@dabbelt.com](mailto:palmer@dabbelt.com)>

**Mailing list** [linux-riscv@lists.infradead.org](mailto:linux-riscv@lists.infradead.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pjw/sifive.git>

**Regex** fu540

**Content regex** fu540

### \* SIFIVE PDMA DRIVER

**Mail** Green Wan <[green.wan@sifive.com](mailto:green.wan@sifive.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/dma/sifive,  
fu540-c000-pdma.yaml drivers/dma/sf-pdma/

### \* SILEAD TOUCHSCREEN DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org), [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/touchscreen/silead.c      drivers/platform/x86/touchscreen\_dmi.c

### \* SILICON LABS WIRELESS DRIVERS (for WFxxx series)

**Mail** Jérôme Pouiller <[jerome.pouiller@silabs.com](mailto:jerome.pouiller@silabs.com)>

**Status** Supported

**Files** drivers/staging/wfx/

### \* SILICON MOTION SM712 FRAME BUFFER DRIVER

**Mail** Sudip Mukherjee <[sudipm.mukherjee@gmail.com](mailto:sudipm.mukherjee@gmail.com)>, Teddy Wang <[teddy.wang@siliconmotion.com](mailto:teddy.wang@siliconmotion.com)>, Sudip Mukherjee <[sudip.mukherjee@codethink.co.uk](mailto:sudip.mukherjee@codethink.co.uk)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** fb/sm712fb drivers/video/fbdev/sm712\*

### \* SIMPLE FIRMWARE INTERFACE (SFI)

**Status** Obsolete

**Web-page** <http://simplefirmware.org/>

**Files** arch/x86/platform/sfi/ drivers/sfi/ include/linux/sfi\*.h

### \* SIMPLEFB FB DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/  
simple-framebuffer.yaml drivers/video/fbdev/simplefb.c  
include/linux/platform\_data/simplefb.h

### \* SIMTEC EB110ATX (Chalice CATS)

**Mail** Vincent Sanders <[vince@simtec.co.uk](mailto:vince@simtec.co.uk)>, Simtec Linux Team  
<[linux@simtec.co.uk](mailto:linux@simtec.co.uk)>

**Status** Supported

**Web-page** <http://www.simtec.co.uk/products/EB110ATX/>

### \* SIMTEC EB2410ITX (BAST)

**Mail** Vincent Sanders <[vince@simtec.co.uk](mailto:vince@simtec.co.uk)>, Simtec Linux Team  
<[linux@simtec.co.uk](mailto:linux@simtec.co.uk)>

**Status** Supported

**Web-page** <http://www.simtec.co.uk/products/EB2410ITX/>

**Files** arch/arm/mach-s3c24xx/bast-ide.c arch/arm/mach-s3c24xx/  
bast-irq.c arch/arm/mach-s3c24xx/mach-bast.c

### \* SIOX

**Mail** Thorsten Scherer <[t.scherer@eckelmann.de](mailto:t.scherer@eckelmann.de)>, Uwe Kleine-König  
<[u.kleine-koenig@pengutronix.de](mailto:u.kleine-koenig@pengutronix.de)>

**Reviewer** Pengutronix Kernel Team <[kernel@pengutronix.de](mailto:kernel@pengutronix.de)>

**Status** Supported

**Files** drivers/gpio/gpio-siox.c drivers/siox/\* include/trace/  
events/siox.h

## \* SIPHASH PRF ROUTINES

**Mail** Jason A. Donenfeld <[Jason@zx2c4.com](mailto:Jason@zx2c4.com)>

**Status** Maintained

**Files** include/linux/siphash.h lib/siphash.c lib/test\_siphash.c

## \* SIS 190 ETHERNET DRIVER

**Mail** Francois Romieu <[romieu@fr.zoreil.com](mailto:romieu@fr.zoreil.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/sis/sis190.c

## \* SIS 900/7016 FAST ETHERNET DRIVER

**Mail** Daniele Venzano <[venza@brownhat.org](mailto:venza@brownhat.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.brownhat.org/sis900.html>

**Files** drivers/net/ethernet/sis/sis900.\*

## \* SIS FRAMEBUFFER DRIVER

**Mail** Thomas Winischhofer <[thomas@winischhofer.net](mailto:thomas@winischhofer.net)>

**Status** Maintained

**Web-page** <http://www.winischhofer.net/linuxsisvga.shtml>

**Files** fb/sisfb drivers/video/fbdev/sis/ include/video/sisfb.h

## \* SIS USB2VGA DRIVER

**Mail** Thomas Winischhofer <[thomas@winischhofer.net](mailto:thomas@winischhofer.net)>

**Status** Maintained

**Web-page** <http://www.winischhofer.at/linuxsisusbvga.shtml>

**Files** drivers/usb/misc/sisusbvga/

## \* SLAB ALLOCATOR

**Mail** Christoph Lameter <[cl@linux.com](mailto:cl@linux.com)>, Pekka Enberg <[penberg@kernel.org](mailto:penberg@kernel.org)>, David Rientjes <[rientjes@google.com](mailto:rientjes@google.com)>, Joonsoo Kim <[iamjoonsoo.kim@lge.com](mailto:iamjoonsoo.kim@lge.com)>, Andrew Morton <[akpm@linux-foundation.org](mailto:akpm@linux-foundation.org)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** `include/linux/sl?b*.h mm/sl?b*`

## \* SLEEPABLE READ-COPY UPDATE (SRCU)

**Mail** Lai Jiangshan <[jiangshanlai@gmail.com](mailto:jiangshanlai@gmail.com)>, “Paul E. McKenney” <[paulmck@kernel.org](mailto:paulmck@kernel.org)>, Josh Triplett <[josh@joshtTriplett.org](mailto:josh@joshtTriplett.org)>

**Reviewer** Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>, Mathieu Desnoyers <[mathieu.desnoyers@efficios.com](mailto:mathieu.desnoyers@efficios.com)>

**Mailing list** [rcu@vger.kernel.org](mailto:rcu@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.rdrop.com/users/paulmck/RCU/>

**SCM** git `git://git.kernel.org/pub/scm/linux/kernel/git/paulmck/linux-rcu.git dev`

**Files** `include/linux/srcu*.h kernel/rcu/srcu*.c`

## \* SMACK SECURITY MODULE

**Mail** Casey Schaufler <[casey@schaufler-ca.com](mailto:casey@schaufler-ca.com)>

**Mailing list** [linux-security-module@vger.kernel.org](mailto:linux-security-module@vger.kernel.org)

**Status** Maintained

**Web-page** <http://schaufler-ca.com>

**SCM** git `git://github.com/cschaufler/smack-next`

**Files** `admin-guide/LSM/Smack security/smack/`

## \* SMC91x ETHERNET DRIVER

**Mail** Nicolas Pitre <[nico@fluxnic.net](mailto:nico@fluxnic.net)>

**Status** Odd Fixes

**Files** `drivers/net/ethernet/smsc/smc91x.*`

## \* SECURE MONITOR CALL(SMC) CALLING CONVENTION (SMCCC)

**Mail** Mark Rutland <[mark.rutland@arm.com](mailto:mark.rutland@arm.com)>, Lorenzo Pieralisi <[lorenzo.pieralisi@arm.com](mailto:lorenzo.pieralisi@arm.com)>, Sudeep Holla <[sudeep.holla@arm.com](mailto:sudeep.holla@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** drivers/firmware/smccc/ include/linux/arm-smccc.h

## \* SMIA AND SMIA++ IMAGE SENSOR DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/i2c/nokia\_smia.txt  
drivers/media/i2c/smiapp.PLL.c drivers/media/i2c/  
smiapp.PLL.h drivers/media/i2c/smiapp/ include/uapi/linux/  
smiapp.h

## \* SMM665 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/smm665 drivers/hwmon/smm665.c

## \* SMSC EMC2103 HARDWARE MONITOR DRIVER

**Mail** Steve Glendinning <[steve.glendinning@shawell.net](mailto:steve.glendinning@shawell.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/emc2103 drivers/hwmon/emc2103.c

## \* SMSC SCH5627 HARDWARE MONITOR DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Supported

**Files** hwmon/sch5627 drivers/hwmon/sch5627.c

## \* **SMSC UFX6000 and UFX7000 USB to VGA DRIVER**

**Mail** Steve Glendinning <steve.glendinning@shawell.net>

**Mailing list** linux-fbdev@vger.kernel.org

**Status** Maintained

**Files** drivers/video/fbdev/smscufx.c

## \* **SMSC47B397 HARDWARE MONITOR DRIVER**

**Mail** Jean Delvare <jdelvare@suse.com>

**Mailing list** linux-hwmon@vger.kernel.org

**Status** Maintained

**Files** hwmon/smsc47b397 drivers/hwmon/smsc47b397.c

## \* **SMSC911x ETHERNET DRIVER**

**Mail** Steve Glendinning <steve.glendinning@shawell.net>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/smsc/smsc911x.\* include/linux/smsc911x.h

## \* **SMSC9420 PCI ETHERNET DRIVER**

**Mail** Steve Glendinning <steve.glendinning@shawell.net>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/smsc/smsc9420.\*

## \* **SOC-CAMERA V4L2 SUBSYSTEM**

**Mailing list** linux-media@vger.kernel.org

**Status** Orphan

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/staging/media/soc\_camera/ include/media/soc\_camera.h

### \* SOCIONEXT (SNI) AVE NETWORK DRIVER

**Mail** Kunihiro Hayashi <[hayashi.kunihiro@socionext.com](mailto:hayashi.kunihiro@socionext.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/socionext,  
uniphier-ave4.yaml                    drivers/net/ethernet/socionext/  
sni\_ave.c

### \* SOCIONEXT (SNI) NETSEC NETWORK DRIVER

**Mail** Jassi Brar <[jaswinder.singh@linaro.org](mailto:jaswinder.singh@linaro.org)>, Ilias Apalodimas  
<[ilias.apalodimas@linaro.org](mailto:ilias.apalodimas@linaro.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/socionext-netsec.  
txt drivers/net/ethernet/socionext/netsec.c

### \* SOCIONEXT (SNI) Synquacer SPI DRIVER

**Mail** Masahisa Kojima <[masahisa.kojima@linaro.org](mailto:masahisa.kojima@linaro.org)>, Jassi Brar  
<[jaswinder.singh@linaro.org](mailto:jaswinder.singh@linaro.org)>

**Mailing list** [linux-spi@vger.kernel.org](mailto:linux-spi@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/spi/spi-synquacer.txt  
drivers/spi/spi-synquacer.c

### \* SOCIONEXT SYNQUACER I2C DRIVER

**Mail** Ard Biesheuvel <[ardb@kernel.org](mailto:ardb@kernel.org)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/i2c/i2c-synquacer.txt  
drivers/i2c/busses/i2c-synquacer.c

## \* SOCIONEXT UNIPHIER SOUND DRIVER

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Orphan

**Files** sound/soc/uniphier/

## \* SOEKRIS NET48XX LED SUPPORT

**Mail** Chris Boot <[bootc@bootc.net](mailto:bootc@bootc.net)>

**Status** Maintained

**Files** drivers/leds/leds-net48xx.c

## \* SOFT-IWARP DRIVER (siw)

**Mail** Bernard Metzler <[bmt@zurich.ibm.com](mailto:bmt@zurich.ibm.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/sw/siw/ include/uapi/rdma/siw-abi.h

## \* SOFT-ROCE DRIVER (rxe)

**Mail** Zhu Yanjun <[yanjunz@mellanox.com](mailto:yanjunz@mellanox.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

**Status** Supported

**Files** drivers/infiniband/sw/rxe/ include/uapi/rdma/  
rdma\_user\_rxe.h

## \* SOFTLOGIC 6x10 MPEG CODEC

**Mail** Bluecherry Maintainers <[maintainers@bluecherrydvr.com](mailto:maintainers@bluecherrydvr.com)>, Anton Sviridenko <[anton@corp.bluecherry.net](mailto:anton@corp.bluecherry.net)>, Andrey Utkin <[andrey.utkin@corp.bluecherry.net](mailto:andrey.utkin@corp.bluecherry.net)>, Andrey Utkin <[andrey\\_utkin@fastmail.com](mailto:andrey_utkin@fastmail.com)>, Ismael Luceno <[ismael@iodev.co.uk](mailto:ismael@iodev.co.uk)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**Files** drivers/media/pci/solo6x10/

### \* SOFTWARE DELEGATED EXCEPTION INTERFACE (SDEI)

**Mail** James Morse <james.morse@arm.com>

**Mailing list** linux-arm-kernel@lists.infradead.org

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/firmware/sdei.  
txt drivers/firmware/arm\_sdei.c include/linux/arm\_sdei.h  
include/uapi/linux/arm\_sdei.h

### \* SOFTWARE RAID (Multiple Disks) SUPPORT

**Mail** Song Liu <song@kernel.org>

**Mailing list** linux-raid@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/song/md.git

**Files** drivers/md/Kconfig drivers/md/Makefile drivers/md/md\*  
drivers/md/raid\* include/linux/raid/ include/uapi/linux/  
raid/

### \* SOLIDRUN CLEARFOG SUPPORT

**Mail** Russell King <linux@armlinux.org.uk>

**Status** Maintained

**Files** arch/arm/boot/dts/armada-388-clearfog\* arch/arm/boot/  
dts/armada-38x-solidrun-\*

### \* SOLIDRUN CUBOX-I/HUMMINGBOARD SUPPORT

**Mail** Russell King <linux@armlinux.org.uk>

**Status** Maintained

**Files** arch/arm/boot/dts/imx6\*-cubox-i\* arch/arm/boot/dts/  
imx6\*-hummingboard\* arch/arm/boot/dts/imx6\*-sr-\*

### \* SONIC NETWORK DRIVER

**Mail** Thomas Bogendoerfer <tsbogend@alpha.franken.de>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/natsemi/sonic.\*

## \* SONICS SILICON BACKPLANE DRIVER (SSB)

**Mail** Michael Buesch <[m@bues.ch](mailto:m@bues.ch)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/ssb/ include/linux/ssb/

## \* SONY IMX214 SENSOR DRIVER

**Mail** Ricardo Ribalda <[ribalda@kernel.org](mailto:ribalda@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/sony,  
imx214.txt drivers/media/i2c/imx214.c

## \* SONY IMX219 SENSOR DRIVER

**Mail** Dave Stevenson <[dave.stevenson@raspberrypi.com](mailto:dave.stevenson@raspberrypi.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/imx219.yaml  
drivers/media/i2c/imx219.c

## \* SONY IMX258 SENSOR DRIVER

**Mail** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/imx258.c

## \* SONY IMX274 SENSOR DRIVER

**Mail** Leon Luo <[leonl@leopardimaging.com](mailto:leonl@leopardimaging.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/imx274.txt  
drivers/media/i2c/imx274.c

## \* SONY IMX290 SENSOR DRIVER

**Mail** Manivannan Sadhasivam <[manivannan.sadhasivam@linaro.org](mailto:manivannan.sadhasivam@linaro.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/imx290.txt  
drivers/media/i2c/imx290.c

## \* SONY IMX319 SENSOR DRIVER

**Mail** Bingbu Cao <[bingbu.cao@intel.com](mailto:bingbu.cao@intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/imx319.c

## \* SONY IMX355 SENSOR DRIVER

**Mail** Tianshu Qiu <[tian.shu.qiu@intel.com](mailto:tian.shu.qiu@intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/imx355.c

## \* SONY MEMORYSTICK SUBSYSTEM

**Mail** Maxim Levitsky <[maximlevitsky@gmail.com](mailto:maximlevitsky@gmail.com)>, Alex Dubov <[oakad@yahoo.com](mailto:oakad@yahoo.com)>, Ulf Hansson <[ulf.hansson@linaro.org](mailto:ulf.hansson@linaro.org)>

**Mailing list** [linux-mmc@vger.kernel.org](mailto:linux-mmc@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/ulfh/mmc.git>

**Files** drivers/memstick/ include/linux/memstick.h

## \* SONY VAIO CONTROL DEVICE DRIVER

**Mail** Mattia Dongili <[malattia@linux.it](mailto:malattia@linux.it)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Web-page** [http://www.linux.it/~malattia/wiki/index.php/Sony\\_drivers](http://www.linux.it/~malattia/wiki/index.php/Sony_drivers)

**Files** admin-guide/laptops/sony-laptop drivers/char/sonypi.c  
drivers/platform/x86/sony-laptop.c include/linux/sony-laptop.h

## \* SOUND

**Mail** Jaroslav Kysela <[perex@perex.cz](mailto:perex@perex.cz)>, Takashi Iwai <[tiwai@suse.com](mailto:tiwai@suse.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.alsa-project.org/>

**Patchwork** <http://patchwork.kernel.org/project/alsa-devel/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git>

**Files** Documentation/sound/ include/sound/ include/uapi/sound/sound/

## \* SOUND - COMPRESSED AUDIO

**Mail** Vinod Koul <[vkoul@kernel.org](mailto:vkoul@kernel.org)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git>

**Files** sound/designs/compress-offload  
compress\_driver.h include/uapi/sound/compress\_\* sound/  
core/compress\_offload.c sound/soc/soc-compress.c  
include/sound/

### \* SOUND - DMAENGINE HELPERS

**Mail** Lars-Peter Clausen <lars@metafoo.de>

**Status** Supported

**Files** include/sound/dmaengine\_pcm.h sound/core/pcm\_dmaengine.  
c sound/soc/soc-generic-dmaengine-pcm.c

### \* SOUND - SOC LAYER / DYNAMIC AUDIO POWER MANAGEMENT (ASoC)

**Mail** Liam Girdwood <lgirdwood@gmail.com>, Mark Brown  
<broonie@kernel.org>

**Mailing list** alsa-devel@alsa-project.org (moderated for non-  
subscribers)

**Status** Supported

**Web-page** <http://alsa-project.org/main/index.php/ASoC>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/broonie/sound.git

**Files** Documentation/devicetree/bindings/sound/ Documentation/  
sound/soc/ include/dt-bindings/sound/ include/sound/soc\*  
sound/soc/

### \* SOUND - SOUND OPEN FIRMWARE (SOF) DRIVERS

**Mail** Pierre-Louis Bossart <pierre-louis.bossart@linux.intel.com>,  
Liam Girdwood <lgirdwood@gmail.com>, Ranjani Sridharan  
<ranjani.sridharan@linux.intel.com>, Kai Vehmanen  
<kai.vehmanen@linux.intel.com>, Daniel Baluta  
<daniel.baluta@nxp.com>

**Mailing list** sound-open-firmware@alsa-project.org (moderated for  
non-subscribers)

**Status** Supported

**Web-page** <https://github.com/thesofproject/linux/>

**Files** sound/soc/sof/

## \* SOUNDWIRE SUBSYSTEM

**Mail** Vinod Koul <[vkoul@kernel.org](mailto:vkoul@kernel.org)>, Sanyog Kale <[sanyog.r.kale@intel.com](mailto:sanyog.r.kale@intel.com)>

**Reviewer** Pierre-Louis Bossart <[pierre-louis.bossart@linux.intel.com](mailto:pierre-louis.bossart@linux.intel.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**Files** Documentation/driver-api/soundwire/ drivers/soundwire/include/linux/soundwire/

## \* SP2 MEDIA DRIVER

**Mail** Olli Salonen <[olli.salonen@iki.fi](mailto:olli.salonen@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/sp2\*

## \* SPARC + UltraSPARC (sparc/sparc64)

**Mail** “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>

**Mailing list** [sparclinux@vger.kernel.org](mailto:sparclinux@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.ozlabs.org/project/sparclinux/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/davem/sparc.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/davem/sparc-next.git>

**Files** arch/sparc/drivers/sbus/

## \* SPARC SERIAL DRIVERS

**Mail** “David S. Miller” <[davem@davemloft.net](mailto:davem@davemloft.net)>

**Mailing list** [sparclinux@vger.kernel.org](mailto:sparclinux@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/davem/sparc.git>  
git <git://git.kernel.org/pub/scm/linux/kernel/git/davem/sparc-next.git>

**Files** drivers/tty/serial/suncore.c drivers/tty/serial/sunhv.c  
drivers/tty/serial/sunsab.c drivers/tty/serial/sunsab.h  
drivers/tty/serial/sunsu.c drivers/tty/serial/sunzilog.c  
drivers/tty/serial/sunzilog.h drivers/tty/vcc.c include/  
linux/sunserialcore.h

### \* SPARSE CHECKER

**Mail** “Luc Van Oostenryck” <luc.vanoostenryck@gmail.com>

**Mailing list** linux-sparse@vger.kernel.org

**Status** Maintained

**Web-page** <https://sparse.docs.kernel.org/>

**SCM** git git://git.kernel.org/pub/scm-devel/sparse/sparse.git

**Patchwork** <https://patchwork.kernel.org/project/linux-sparse/list/>

**bugs** [https://bugzilla.kernel.org/enter\\_bug.cgi?component=Sparse&product=Tools](https://bugzilla.kernel.org/enter_bug.cgi?component=Sparse&product=Tools)

**Files** include/linux/compiler.h

### \* SPEAR CLOCK FRAMEWORK SUPPORT

**Mail** Viresh Kumar <vireshk@kernel.org>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.st.com/spear>

**Files** drivers/clk/spear/

### \* SPEAR PLATFORM SUPPORT

**Mail** Viresh Kumar <vireshk@kernel.org>, Shiraz Hashim <shiraz.linux.kernel@gmail.com>

**Mailing list** linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Web-page** <http://www.st.com/spear>

**Files** arch/arm/boot/dts/spear\* arch/arm/mach-spear/

## \* SPI NOR SUBSYSTEM

**Mail** Tudor Ambarus <tudor.ambarus@microchip.com>

**Mailing list** linux-mtd@lists.infradead.org

**Status** Maintained

**Web-page** <http://www.linux-mtd.infradead.org/>

**Patchwork** <http://patchwork.ozlabs.org/project/linux-mtd/list/>

**chat** irc://irc.oftc.net/mtd

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/mtd/linux.git spi-nor/next

**Files** drivers/mtd/spi-nor/ include/linux/mtd/spi-nor.h

## \* SPI SUBSYSTEM

**Mail** Mark Brown <broonie@kernel.org>

**Mailing list** linux-spi@vger.kernel.org

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/spi-devel-general/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/broonie/spi.git

**Files** Documentation/devicetree/bindings/spi/ Documentation/spi/ drivers/spi/ include/linux/spi/ include/uapi/linux/spi/ tools/spi/

## \* SPIDERNET NETWORK DRIVER for CELL

**Mail** Ishizaki Kou <kou.ishizaki@toshiba.co.jp>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** networking/device\_drivers/toshiba/spider\_net drivers/net/ ethernet/toshiba/spider\_net\*

## \* SPMI SUBSYSTEM

**Reviewer** Stephen Boyd <sboyd@kernel.org>

**Mailing list** linux-arm-msm@vger.kernel.org

**Files** Documentation/devicetree/bindings/spmi/ drivers/spmi/ include/dt-bindings/spmi/spmi.h include/linux/spmi.h include/trace/events/spmi.h

### \* SPU FILE SYSTEM

**Mail** Jeremy Kerr <jk@ozlabs.org>

**Mailing list** linuxppc-dev@lists.ozlabs.org

**Status** Supported

**Web-page** <http://www.ibm.com/developerworks/power/cell/>

**Files** filesystems/spufs/spufs arch/powerpc/platforms/cell/spufs/

### \* SQUASHFS FILE SYSTEM

**Mail** Phillip Louher <phillip@squashfs.org.uk>

**Mailing list** squashfs-devel@lists.sourceforge.net (subscribers-only)

**Status** Maintained

**Web-page** <http://squashfs.org.uk>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pkl/squashfs-next.git>

**Files** filesystems/squashfs fs/squashfs/

### \* SRM (Alpha) environment access

**Mail** Jan-Benedict Glaw <jbglaw@lug-owl.de>

**Status** Maintained

**Files** arch/alpha/kernel/srm\_env.c

### \* ST LSM6DSx IMU IIO DRIVER

**Mail** Lorenzo Bianconi <lorenzo.bianconi83@gmail.com>

**Mailing list** linux-iio@vger.kernel.org

**Status** Maintained

**Web-page** <http://www.st.com/>

**Files** Documentation/devicetree/bindings/iio imu/st\_lsm6dsx.txt drivers/iio imu/st\_lsm6dsx/

## \* ST MIPID02 CSI-2 TO PARALLEL BRIDGE DRIVER

**Mail** Mickael Guene <[mickael.guene@st.com](mailto:mickael.guene@st.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/i2c/st,  
st-mipid02.txt drivers/media/i2c/st-mipid02.c

## \* ST STM32 I2C/SMBUS DRIVER

**Mail** Pierre-Yves MORDRET <[pierre-yves.mordret@st.com](mailto:pierre-yves.mordret@st.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Maintained

**Files** drivers/i2c/busses/i2c-stm32\*

## \* ST VL53L0X ToF RANGER(I2C) IIO DRIVER

**Mail** Song Qiang <[songqiang1304521@gmail.com](mailto:songqiang1304521@gmail.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/iio/proximity/  
vl53l0x.txt drivers/iio/proximity/vl53l0x-i2c.c

## \* STABLE BRANCH

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>, Sasha Levin <[sashal@kernel.org](mailto:sashal@kernel.org)>

**Mailing list** [stable@vger.kernel.org](mailto:stable@vger.kernel.org)

**Status** Supported

**Files** process/stable-kernel-rules

## \* STAGING - ATOMISP DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Reviewer** Sakari Ailus <[sakari.ailus@linux.intel.com](mailto:sakari.ailus@linux.intel.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/media/atomisp/

### \* STAGING - COMEDI

**Mail** Ian Abbott <[abbotti@mev.co.uk](mailto:abbotti@mev.co.uk)>, H Hartley Sweeten <[hsweeten@visionengravers.com](mailto:hsweeten@visionengravers.com)>

**Status** Odd Fixes

**Files** drivers/staging/comedi/

### \* STAGING - FIELDBUS SUBSYSTEM

**Mail** Sven Van Asbroeck <[TheSven73@gmail.com](mailto:TheSven73@gmail.com)>

**Status** Maintained

**Files** drivers/staging/fieldbus/\*      drivers/staging/fieldbus/  
Documentation/

### \* STAGING - HMS ANYBUS-S BUS

**Mail** Sven Van Asbroeck <[TheSven73@gmail.com](mailto:TheSven73@gmail.com)>

**Status** Maintained

**Files** drivers/staging/fieldbus/anybuss/

### \* STAGING - INDUSTRIAL IO

**Mail** Jonathan Cameron <[jic23@kernel.org](mailto:jic23@kernel.org)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Odd Fixes

**Files** Documentation/devicetree/bindings/staging/iio/ drivers/  
staging/iio/

### \* STAGING - NVIDIA COMPLIANT EMBEDDED CONTROLLER INTERFACE (nvec)

**Mail** Marc Dietrich <[marvin24@gmx.de](mailto:marvin24@gmx.de)>

**Mailing list** [ac100@lists.launchpad.net](mailto:ac100@lists.launchpad.net) (moderated for non-  
subscribers), [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/nvec/

## \* STAGING - OLPC SECONDARY DISPLAY CONTROLLER (DCON)

**Mail** Jens Frederich <[jfrederich@gmail.com](mailto:jfrederich@gmail.com)>, Daniel Drake <[dsd@laptop.org](mailto:dsd@laptop.org)>, Jon Nettleton <[jon.nettleton@gmail.com](mailto:jon.nettleton@gmail.com)>

**Status** Maintained

**Web-page** <http://wiki.laptop.org/go/DCON>

**Files** drivers/staging/olpc\_dcon/

## \* STAGING - REALTEK RTL8188EU DRIVERS

**Mail** Larry Finger <[Larry.Finger@lwfinger.net](mailto:Larry.Finger@lwfinger.net)>

**Status** Odd Fixes

**Files** drivers/staging/rtl8188eu/

## \* STAGING - REALTEK RTL812U DRIVERS

**Mail** Larry Finger <[Larry.Finger@lwfinger.net](mailto:Larry.Finger@lwfinger.net)>, Florian Schilhabel <[florian.c.schilhabel@googlemail.com](mailto:florian.c.schilhabel@googlemail.com)>.

**Status** Odd Fixes

**Files** drivers/staging/rtl812u/

## \* STAGING - SEPS525 LCD CONTROLLER DRIVERS

**Mail** Michael Hennerich <[michael.hennerich@analog.com](mailto:michael.hennerich@analog.com)>, Benjamin Bia <[benjamin.bia@analog.com](mailto:benjamin.bia@analog.com)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/iio/adc/adi,ad7606.yaml  
drivers/staging/fbtft/fb\_seps525.c

## \* STAGING - SILICON MOTION SM750 FRAME BUFFER DRIVER

**Mail** Sudip Mukherjee <[sudipm.mukherjee@gmail.com](mailto:sudipm.mukherjee@gmail.com)>, Teddy Wang <[teddy.wang@siliconmotion.com](mailto:teddy.wang@siliconmotion.com)>, Sudip Mukherjee <[sudip.mukherjee@codethink.co.uk](mailto:sudip.mukherjee@codethink.co.uk)>

**Mailing list** [linux-fbdev@vger.kernel.org](mailto:linux-fbdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/staging/sm750fb/

## \* STAGING - SPEAKUP CONSOLE SPEECH DRIVER

**Mail** William Hubbs <[w.d.hubbs@gmail.com](mailto:w.d.hubbs@gmail.com)>, Chris Brannon <[chris@the-brannons.com](mailto:chris@the-brannons.com)>, Kirk Reiser <[kirk@reisers.ca](mailto:kirk@reisers.ca)>, Samuel Thibault <[samuel.thibault@ens-lyon.org](mailto:samuel.thibault@ens-lyon.org)>

**Mailing list** [speakup@linux-speakup.org](mailto:speakup@linux-speakup.org)

**Status** Odd Fixes

**Web-page** <http://www.linux-speakup.org/>

**Files** drivers/staging/speakup/

## \* STAGING - VIA VT665X DRIVERS

**Mail** Forest Bond <[forest@alittletooquiet.net](mailto:forest@alittletooquiet.net)>

**Status** Odd Fixes

**Files** drivers/staging/vt665?/

## \* STAGING - WILC1000 WIFI DRIVER

**Mail** Adham Abozaeid <[adham.abozaeid@microchip.com](mailto:adham.abozaeid@microchip.com)>, Ajay Singh <[ajay.kathat@microchip.com](mailto:ajay.kathat@microchip.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Supported

**Files** drivers/staging/wilc1000/

## \* STAGING SUBSYSTEM

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [devel@driverdev.osuosl.org](mailto:devel@driverdev.osuosl.org)

**Status** Supported

**SCM** <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/staging.git>

**Files** drivers/staging/

## \* STARFIRE/DURALAN NETWORK DRIVER

**Mail** Ion Badulescu <[ionut@badula.org](mailto:ionut@badula.org)>

**Status** Odd Fixes

**Files** drivers/net/ethernet/adaptec/starfire\*

## \* STEC S1220 SKD DRIVER

**Mail** Damien Le Moal <[Damien.LeMoal@wdc.com](mailto:Damien.LeMoal@wdc.com)>

**Mailing list** [linux-block@vger.kernel.org](mailto:linux-block@vger.kernel.org)

**Status** Maintained

**Files** drivers/block/skd\*[ch]

## \* STI AUDIO (ASoC) DRIVERS

**Mail** Arnaud Pouliquen <[arnaud.pouliquen@st.com](mailto:arnaud.pouliquen@st.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/st, sti-asoc-card.txt sound/soc/sti/

## \* STI CEC DRIVER

**Mail** Benjamin Gaignard <[benjamin.gaignard@linaro.org](mailto:benjamin.gaignard@linaro.org)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/media/stih-cec.txt  
drivers/media/platform/sti/cec/

## \* STK1160 USB VIDEO CAPTURE DRIVER

**Mail** Ezequiel Garcia <[ezequiel@vanguardiasur.com.ar](mailto:ezequiel@vanguardiasur.com.ar)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/stk1160/

## \* STM32 AUDIO (ASoC) DRIVERS

**Mail** Olivier Moysan <[olivier.moysan@st.com](mailto:olivier.moysan@st.com)>, Arnaud Pouliquen <[arnaud.pouliquen@st.com](mailto:arnaud.pouliquen@st.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/st\_stm32-\* .txt  
sound/soc/stm/

### \* STM32 TIMER/LPTIMER DRIVERS

**Mail** Fabrice Gasnier <[fabrice.gasnier@st.com](mailto:fabrice.gasnier@st.com)>

**Status** Maintained

**Files** Documentation/ABI/testing/\*timer-stm32 Documentation/  
devicetree/bindings/\*/\*stm32-\*timer\* drivers/\*/  
stm32-\*timer\* drivers/pwm/pwm-stm32\* include/linux/\*/  
stm32-\*tim\*

### \* STMMAC ETHERNET DRIVER

**Mail** Giuseppe Cavallaro <[peppe.cavallaro@st.com](mailto:peppe.cavallaro@st.com)>, Alexandre Torgue <[alexandre.torgue@st.com](mailto:alexandre.torgue@st.com)>, Jose Abreu <[joabreu@synopsys.com](mailto:joabreu@synopsys.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.stlinux.com>

**Files** Documentation/networking/device\_drivers/stmicro/  
drivers/net/ethernet/stmicro/stmmac/

### \* SUN3/3X

**Mail** Sam Creasey <[sammy@sammy.net](mailto:sammy@sammy.net)>

**Status** Maintained

**Web-page** <http://sammy.net/sun3/>

**Files** arch/m68k/include/asm/sun3\* arch/m68k/kernel/\*sun3\*  
arch/m68k/sun3\*/ drivers/net/ethernet/i825xx/sun3\*

### \* SUN4I LOW RES ADC ATTACHED TABLET KEYS DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/input/allwinner,  
sun4i-a10-lradc-keys.yaml drivers/input/keyboard/  
sun4i-lradc-keys.c

### \* SUNDANCE NETWORK DRIVER

**Mail** Denis Kirjanov <[kda@linux-powerpc.org](mailto:kda@linux-powerpc.org)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/dlink/sundance.c

### \* SUPERH

**Mail** Yoshinori Sato <[ysato@users.sourceforge.jp](mailto:ysato@users.sourceforge.jp)>, Rich Felker <[dalias@libc.org](mailto:dalias@libc.org)>

**Mailing list** [linux-sh@vger.kernel.org](mailto:linux-sh@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.kernel.org/project/linux-sh/list/>

**Files** Documentation/sh/ arch/sh/ drivers/sh/

### \* SUSPEND TO RAM

**Mail** “Rafael J. Wysocki” <[rjw@rjwysocki.net](mailto:rjw@rjwysocki.net)>, Len Brown <[len.brown@intel.com](mailto:len.brown@intel.com)>, Pavel Machek <[pavel@ucw.cz](mailto:pavel@ucw.cz)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Supported

**bugs** <https://bugzilla.kernel.org>

**Files** Documentation/power/ arch/x86/kernel/acpi/ drivers/base/ power/ include/linux/freezer.h include/linux/pm.h include/ linux/suspend.h kernel/power/

### \* SVGA HANDLING

**Mail** Martin Mares <[mj@ucw.cz](mailto:mj@ucw.cz)>

**Mailing list** [linux-video@atrey.karlin.mff.cuni.cz](mailto:linux-video@atrey.karlin.mff.cuni.cz)

**Status** Maintained

**Files** admin-guide/svgab arch/x86/boot/video\*

## \* SWIOTLB SUBSYSTEM

**Mail** Konrad Rzeszutek Wilk <[konrad.wilk@oracle.com](mailto:konrad.wilk@oracle.com)>

**Mailing list** [iommu@lists.linux-foundation.org](mailto:iommu@lists.linux-foundation.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/konrad/swiotlb.git>

**Files** arch/\*/kernel/pci-swiotlb.c include/linux/swiotlb.h  
kernel/dma/swiotlb.c

## \* SWITCHDEV

**Mail** Jiri Pirko <[jiri@resnulli.us](mailto:jiri@resnulli.us)>, Ivan Vecera <[ivecera@redhat.com](mailto:ivecera@redhat.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** include/net/switchdev.h net/switchdev/

## \* SY8106A REGULATOR DRIVER

**Mail** Icenowy Zheng <[icenowy@aosc.io](mailto:icenowy@aosc.io)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/regulator/  
sy8106a-regulator.txt drivers/regulator/  
sy8106a-regulator.c

## \* SYNC FILE FRAMEWORK

**Mail** Sumit Semwal <[sumit.semwal@linaro.org](mailto:sumit.semwal@linaro.org)>

**Reviewer** Gustavo Padovan <[gustavo@padovan.org](mailto:gustavo@padovan.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org),  
[devel@lists.freedesktop.org](mailto:devel@lists.freedesktop.org) dri-

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** driver-api/sync\_file drivers/dma-buf/dma-fence\* drivers/  
dma-buf/sw\_sync.c drivers/dma-buf/sync\_\* include/linux/  
sync\_file.h include/uapi/linux/sync\_file.h

## \* SYNOPSYS ARC ARCHITECTURE

**Mail** Vineet Gupta <vgupta@synopsys.com>

**Mailing list** linux-snps-arc@lists.infradead.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/vgupta/arc.git

**Files** Documentation/devicetree/bindings/arc/\* Documentation/devicetree/bindings/interrupt-controller/snps,arc\* arch/arc/drivers/clocksource/arc\_timer.c drivers/tty/serial/arc\_uart.c

## \* SYNOPSYS ARC HSDK SDP pll clock driver

**Mail** Eugeniy Paltsev <Eugeniy.Paltsev@synopsys.com>

**Status** Supported

**Files** Documentation/devicetree/bindings/clock/snps\_hsdk-pll-clock.txt drivers/clk/clk-hsdk-pll.c

## \* SYNOPSYS ARC SDP clock driver

**Mail** Eugeniy Paltsev <Eugeniy.Paltsev@synopsys.com>

**Status** Supported

**Files** Documentation/devicetree/bindings/clock/snps\_pll-clock.txt drivers/clk/axs10x/\*

## \* SYNOPSYS ARC SDP platform support

**Mail** Alexey Brodkin <abrodkin@synopsys.com>

**Status** Supported

**Files** Documentation/devicetree/bindings/arc/axs10\* arch/arc/boot/dts/ax\* arch/arc/plat-axs10x

## \* SYNOPSYS AXS10x RESET CONTROLLER DRIVER

**Mail** Eugeniy Paltsev <Eugeniy.Paltsev@synopsys.com>

**Status** Supported

**Files** Documentation/devicetree/bindings/reset/snps\_axs10x-reset.txt drivers/reset/reset-axs10x.c

## \* SYNOPSYS CREG GPIO DRIVER

**Mail** Eugeniy Paltsev <[Eugeniy.Paltsev@synopsys.com](mailto:Eugeniy.Paltsev@synopsys.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/gpio/snps,creg-gpio.txt  
drivers/gpio/gpio-creg-snps.c

## \* SYNOPSYS DESIGNWARE 8250 UART DRIVER

**Reviewer** Andy Shevchenko <[andriy.shevchenko@linux.intel.com](mailto:andriy.shevchenko@linux.intel.com)>

**Status** Maintained

**Files** drivers/tty/serial/8250/8250\_dw.c    drivers/tty/serial/8250/8250\_dwlib.\*    drivers/tty/serial/8250/8250\_lpss.c

## \* SYNOPSYS DESIGNWARE APB GPIO DRIVER

**Mail** Hoan Tran <[hoan@os.amperecomputing.com](mailto:hoan@os.amperecomputing.com)>, Serge Semin <[fancer.lancer@gmail.com](mailto:fancer.lancer@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/gpio/snps,  
dw-apb-gpio.yaml    drivers/gpio/gpio-dwapb.c

## \* SYNOPSYS DESIGNWARE AXI DMAC DRIVER

**Mail** Eugeniy Paltsev <[Eugeniy.Paltsev@synopsys.com](mailto:Eugeniy.Paltsev@synopsys.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/dma/snps,dw-axi-dmac.txt  
drivers/dma/dw-axi-dmac/

## \* SYNOPSYS DESIGNWARE DMAC DRIVER

**Mail** Viresh Kumar <[vireshk@kernel.org](mailto:vireshk@kernel.org)>

**Reviewer** Andy Shevchenko <[andriy.shevchenko@linux.intel.com](mailto:andriy.shevchenko@linux.intel.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/dma/snps-dma.txt  
drivers/dma/dw/include/dt-bindings/dma/dw-dmac.h include/  
linux/dma/dw.h include/linux/platform\_data/dma-dw.h

## \* SYNOPSYS DESIGNWARE ENTERPRISE ETHERNET DRIVER

**Mail** Jose Abreu <Jose.Abreu@synopsys.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/synopsys/

## \* SYNOPSYS DESIGNWARE ETHERNET XPCS DRIVER

**Mail** Jose Abreu <Jose.Abreu@synopsys.com>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/phy/mdiobus-xpcs.c include/linux/mdiobus-xpcs.h

## \* SYNOPSYS DESIGNWARE I2C DRIVER

**Mail** Jarkko Nikula <jarkko.nikula@linux.intel.com>

**Reviewer** Andy Shevchenko <andriy.shevchenko@linux.intel.com>,  
Mika Westerberg <mika.westerberg@linux.intel.com>

**Mailing list** linux-i2c@vger.kernel.org

**Status** Maintained

**Files** drivers/i2c/busses/i2c-designware-\* include/linux/  
platform\_data/i2c-designware.h

## \* SYNOPSYS DESIGNWARE MMC/SD/SDIO DRIVER

**Mail** Jaehoon Chung <jh80.chung@samsung.com>

**Mailing list** linux-mmc@vger.kernel.org

**Status** Maintained

**Files** drivers/mmc/host/dw\_mmc\*

## \* SYNOPSYS HSDK RESET CONTROLLER DRIVER

**Mail** Eugeniy Paltsev <Eugeniy.Paltsev@synopsys.com>

**Status** Supported

**Files** Documentation/devicetree/bindings/reset/snps,  
hsdk-reset.txt drivers/reset/reset-hsdk.c include/  
dt-bindings/reset/snps,hsdk-reset.h

## \* SYNOPSYS SDHCI COMPLIANT DWC MSHC DRIVER

**Mail** Prabu Thangamuthu <[prabu.t@synopsys.com](mailto:prabu.t@synopsys.com)>, Manjunath M B <[manjumb@synopsys.com](mailto:manjumb@synopsys.com)>

**Mailing list** [linux-mmc@vger.kernel.org](mailto:linux-mmc@vger.kernel.org)

**Status** Maintained

**Files** drivers/mmc/host/sdhci-pci-dwc-mshc.c

## \* SYSTEM CONFIGURATION (SYSCON)

**Mail** Lee Jones <[lee.jones@linaro.org](mailto:lee.jones@linaro.org)>, Arnd Bergmann <[arnd@arndb.de](mailto:arnd@arndb.de)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/lee/mfd.git>

**Files** drivers/mfd/syscon.c

## \* SYSTEM CONTROL & POWER/MANAGEMENT INTERFACE (SCPI/SCMI) Message Protocol drivers

**Mail** Sudeep Holla <[sudeep.holla@arm.com](mailto:sudeep.holla@arm.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/arm\_sc[mp]i.txt  
drivers/clk/clk-sc[mp]i.c drivers/cpufreq/sc[mp]i-cpufreq.c  
drivers/firmware/arm\_scmi/ drivers/firmware/arm\_scpi.c  
drivers/reset/reset-scmi.c include/linux/sc[mp]i\_protocol.h  
include/trace/events/scmi.h

## \* SYSTEM RESET/SHUTDOWN DRIVERS

**Mail** Sebastian Reichel <[sre@kernel.org](mailto:sre@kernel.org)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/sre/linux-power-supply.git>

**Files** Documentation/devicetree/bindings/power/reset/ drivers/power/reset/

## \* SYSTEM TRACE MODULE CLASS

**Mail** Alexander Shishkin <alexander.shishkin@linux.intel.com>

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/ash/stm.git

**Files** trace/stm drivers/hwtracing/stm/ include/linux/stm.h  
include/uapi/linux/stm.h

## \* SYSTEM76 ACPI DRIVER

**Mail** Jeremy Soller <jeremy@system76.com>, System76 Product Development <productdev@system76.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/system76\_acpi.c

## \* SYSV FILESYSTEM

**Mail** Christoph Hellwig <hch@infradead.org>

**Status** Maintained

**Files** filesystems/sysv-fs fs/sysv/ include/linux/sysv\_fs.h

## \* TASKSTATS STATISTICS INTERFACE

**Mail** Balbir Singh <bsingharora@gmail.com>

**Status** Maintained

**Files** Documentation/accounting/taskstats\* include/linux/taskstats\* kernel/taskstats.c

## \* TC subsystem

**Mail** Jamal Hadi Salim <jhs@mojatatu.com>, Cong Wang <xiyou.wangcong@gmail.com>, Jiri Pirko <jiri@resnulli.us>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** include/net/pkt\_cls.h include/net/pkt\_sched.h include/net/tc\_act/ include/uapi/linux/pkt\_cls.h include/uapi/linux/pkt\_sched.h include/uapi/linux/tc\_act/ include/uapi/linux/tc\_ematch/ net/sched/

### \* TC90522 MEDIA DRIVER

**Mail** Akihiro Tsukada <[tskd08@gmail.com](mailto:tskd08@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/media/dvb-frontends/tc90522\*

### \* TCP LOW PRIORITY MODULE

**Mail** “Wong Hoi Sing, Edison” <[hswong3i@gmail.com](mailto:hswong3i@gmail.com)>, “Hung Hing Lun, Mike” <[hlhung3i@gmail.com](mailto:hlhung3i@gmail.com)>

**Status** Maintained

**Web-page** <http://tcp-lp-mod.sourceforge.net/>

**Files** net/ipv4/tcp\_lp.c

### \* TDA10071 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/dvb-frontends/tda10071\*

### \* TDA18212 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/tda18212\*

### \* TDA18218 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/tda18218\*

### \* TDA18250 MEDIA DRIVER

**Mail** Olli Salonen <[olli.salonen@iki.fi](mailto:olli.salonen@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/tuners/tda18250\*

### \* TDA18271 MEDIA DRIVER

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/tuners.git>

**Files** drivers/media/tuners/tda18271\*

### \* TDA1997x MEDIA DRIVER

**Mail** Tim Harvey <[tharvey@gateworks.com](mailto:tharvey@gateworks.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/i2c/tda1997x.\*

### \* TDA827x MEDIA DRIVER

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/tuners.git>

**Files** drivers/media/tuners/tda8290.\*

### \* TDA8290 MEDIA DRIVER

**Mail** Michael Krufky <[mkrufky@linuxtv.org](mailto:mkrufky@linuxtv.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://github.com/mkrufky>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git <git://linuxtv.org/mkrufky/tuners.git>

**Files** drivers/media/tuners/tda8290.\*

### \* TDA9840 MEDIA DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/tda9840\*

### \* TEA5761 TUNER DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/tuners/tea5761.\*

### \* TEA5767 TUNER DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/tuners/tea5767.\*

### \* TEA6415C MEDIA DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/tea6415c\*

### \* TEA6420 MEDIA DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/i2c/tea6420\*

### \* TEAM DRIVER

**Mail** Jiri Pirko <[jiri@resnulli.us](mailto:jiri@resnulli.us)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/team/ include/linux/if\_team.h include/uapi/linux/if\_team.h

### \* TECHNOLOGIC SYSTEMS TS-5500 PLATFORM SUPPORT

**Mail** “Savoir-faire Linux Inc.” <[kernel@savoirfairelinux.com](mailto:kernel@savoirfairelinux.com)>

**Status** Maintained

**Files** arch/x86/platform/ts5500/

### \* TECHNOTREND USB IR RECEIVER

**Mail** Sean Young <[sean@mess.org](mailto:sean@mess.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/rc/ttusbir.c

### \* TECHWELL TW9910 VIDEO DECODER

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Orphan

**Files** drivers/media/i2c/tw9910.c include/media/i2c/tw9910.h

### \* TEE SUBSYSTEM

**Mail** Jens Wiklander <[jens.wiklander@linaro.org](mailto:jens.wiklander@linaro.org)>

**Mailing list** [op-tee@lists.trustedfirmware.org](mailto:op-tee@lists.trustedfirmware.org)

**Status** Maintained

**Files** Documentation/tee.txt drivers/tee/ include/linux/  
tee\_drv.h include/uapi/linux/tee.h

### \* TEGRA ARCHITECTURE SUPPORT

**Mail** Thierry Reding <[thierry.reding@gmail.com](mailto:thierry.reding@gmail.com)>, Jonathan Hunter  
<[jonathanh@nvidia.com](mailto:jonathanh@nvidia.com)>

**Mailing list** [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org)

**Status** Supported

**Patchwork** <http://patchwork.ozlabs.org/project/linux-tegra/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tegra/linux.git>

**Regex** [^a-z]tegra

## \* TEGRA CLOCK DRIVER

**Mail** Peter De Schrijver <[pdeschrijver@nvidia.com](mailto:pdeschrijver@nvidia.com)>, Prashant Gaikwad <[pgaikwad@nvidia.com](mailto:pgaikwad@nvidia.com)>

**Status** Supported

**Files** drivers/clk/tegra/

## \* TEGRA DMA DRIVERS

**Mail** Laxman Dewangan <[ldewangan@nvidia.com](mailto:ldewangan@nvidia.com)>, Jon Hunter <[jonathanh@nvidia.com](mailto:jonathanh@nvidia.com)>

**Status** Supported

**Files** drivers/dma/tegra\*

## \* TEGRA I2C DRIVER

**Mail** Laxman Dewangan <[ldewangan@nvidia.com](mailto:ldewangan@nvidia.com)>

**Reviewer** Dmitry Osipenko <[digetx@gmail.com](mailto:digetx@gmail.com)>

**Status** Supported

**Files** drivers/i2c/busses/i2c-tegra.c

## \* TEGRA IOMMU DRIVERS

**Mail** Thierry Reding <[thierry.reding@gmail.com](mailto:thierry.reding@gmail.com)>

**Mailing list** [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org)

**Status** Supported

**Files** drivers/iommu/tegra\*

## \* TEGRA KBC DRIVER

**Mail** Laxman Dewangan <[ldewangan@nvidia.com](mailto:ldewangan@nvidia.com)>

**Status** Supported

**Files** drivers/input/keyboard/tegra-kbc.c

### \* TEGRA NAND DRIVER

**Mail** Stefan Agner <[stefan@agner.ch](mailto:stefan@agner.ch)>, Lucas Stach  
<[dev@lynxeye.de](mailto:dev@lynxeye.de)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/mtd/  
nvidia-tegra20-nand.txt drivers/mtd/nand/raw/tegra\_nand.c

### \* TEGRA PWM DRIVER

**Mail** Thierry Reding <[thierry.reding@gmail.com](mailto:thierry.reding@gmail.com)>

**Status** Supported

**Files** drivers/pwm/pwm-tegra.c

### \* TEGRA SERIAL DRIVER

**Mail** Laxman Dewangan <[ldewangan@nvidia.com](mailto:ldewangan@nvidia.com)>

**Status** Supported

**Files** drivers/tty/serial/serial-tegra.c

### \* TEGRA SPI DRIVER

**Mail** Laxman Dewangan <[ldewangan@nvidia.com](mailto:ldewangan@nvidia.com)>

**Status** Supported

**Files** drivers/spi/spi-tegra\*

### \* TEGRA VIDEO DRIVER

**Mail** Thierry Reding <[thierry.reding@gmail.com](mailto:thierry.reding@gmail.com)>, Jonathan Hunter <[jonathanh@nvidia.com](mailto:jonathanh@nvidia.com)>, Sowjanya Komatineni <[skomatineni@nvidia.com](mailto:skomatineni@nvidia.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org), [linux-tegra@vger.kernel.org](mailto:linux-tegra@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/display/tegra/nvidia,  
tegra20-host1x.txt drivers/staging/media/tegra-video/

## \* TEGRA XUSB PADCTL DRIVER

**Mail** JC Kuo <jckuo@nvidia.com>

**Status** Supported

**Files** drivers/phy/tegra/xusb\*

## \* TEHUTI ETHERNET DRIVER

**Mail** Andy Gospodarek <andy@greyhouse.net>

**Mailing list** netdev@vger.kernel.org

**Status** Supported

**Files** drivers/net/ethernet/tehuti/\*

## \* TELECOM CLOCK DRIVER FOR MCPL0010

**Mail** Mark Gross <mark.gross@intel.com>

**Status** Supported

**Files** drivers/char/tlclk.c

## \* TEMPO SEMICONDUCTOR DRIVERS

**Mail** Steven Eckhoff <steven.eckhoff.opensource@gmail.com>

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/tscs\*.txt  
sound/soc/codecs/tscs\*.c sound/soc/codecs/tscs\*.h

## \* TENSILICA XTENSA PORT (**xtensa**)

**Mail** Chris Zankel <chris@zankel.net>, Max Filippov <jcmvbkb@gmail.com>

**Mailing list** linux-xtensa@linux-xtensa.org

**Status** Maintained

**SCM** git git://github.com/czankel/xtensa-linux.git

**Files** arch/xtensa/ drivers/irqchip/irq-xtensa-\*

## \* TEXAS INSTRUMENTS ASoC DRIVERS

**Mail** Peter Ujfalusi <[peter.ujfalusi@ti.com](mailto:peter.ujfalusi@ti.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** sound/soc/ti/

## \* TEXAS INSTRUMENTS' DAC7612 DAC DRIVER

**Mail** Ricardo Ribalda <[ribalda@kernel.org](mailto:ribalda@kernel.org)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Status** Supported

**Files** Documentation/devicetree/bindings/iio/dac/ti,dac7612.txt  
drivers/iio/dac/ti-dac7612.c

## \* TEXAS INSTRUMENTS' SYSTEM CONTROL INTERFACE (TISCI) PROTOCOL DRIVER

**Mail** Nishanth Menon <[nm@ti.com](mailto:nm@ti.com)>, Tero Kristo <[t-kristo@ti.com](mailto:t-kristo@ti.com)>, Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/arm/keystone/  
ti,sci.txt Documentation/devicetree/bindings/clock/  
ti,sci-clk.txt Documentation/devicetree/bindings/  
interrupt-controller/ti,sci-inta.txt Documentation/  
devicetree/bindings/interrupt-controller/ti,sci-intr.  
txt Documentation/devicetree/bindings/reset/ti,  
sci-reset.txt Documentation/devicetree/bindings/soc/  
ti/sci-pm-domain.txt drivers/clk/keystone/sci-clk.c  
drivers/firmware/ti\_sci\* drivers/irqchip/irq-ti-sci-inta.  
c drivers/irqchip/irq-ti-sci-intr.c drivers/reset/  
reset-ti-sci.c drivers/soc/ti/ti\_sci\_inta\_msi.c drivers/  
soc/ti/ti\_sci\_pm\_domains.c include/dt-bindings/soc/ti,  
sci\_pm\_domain.h include/linux/soc/ti/ti\_sci\_inta\_msi.h  
include/linux/soc/ti/ti\_sci\_protocol.h

## \* THANKO' S RAREMONO AM/FM/SW RADIO RECEIVER USB DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/radio/raremono.c

## \* THERMAL

**Mail** Zhang Rui <rui.zhang@intel.com>, Daniel Lezcano <daniel.lezcano@linaro.org>

**Reviewer** Amit Kucherla <amit.kucherla@verdurent.com>

**Mailing list** linux-pm@vger.kernel.org

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-pm/list/>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/thermal/linux.git

**Files** Documentation/devicetree/bindings/thermal/ drivers/thermal/ include/linux/cpu\_cooling.h include/linux/thermal.h include/uapi/linux/thermal.h

## \* THERMAL DRIVER FOR AMLOGIC SOCS

**Mail** Guillaume La Roque <glaroque@baylibre.com>

**Mailing list** linux-pm@vger.kernel.org, linux-amlogic@lists.infradead.org

**Status** Supported

**Web-page** <http://linux-meson.com/>

**Files** Documentation/devicetree/bindings/thermal/amlogic\_thermal.yaml drivers/thermal/amlogic\_thermal.c

## \* THERMAL/CPU\_COOLING

**Mail** Amit Daniel Kachhap <amit.kachhap@gmail.com>, Daniel Lezcano <daniel.lezcano@linaro.org>, Viresh Kumar <viresh.kumar@linaro.org>, Javi Merino <javi.merino@kernel.org>

**Mailing list** linux-pm@vger.kernel.org

**Status** Supported

**Files** driver-api/thermal/cpu-cooling-api    driver-api/thermal/cpu-idle-cooling drivers/thermal/cpufreq\_cooling.c drivers/thermal/cpuidle\_cooling.c include/linux/cpu\_cooling.h

### \* THINKPAD ACPI EXTRAS DRIVER

**Mail** Henrique de Moraes Holschuh <ibm-acpi@hmh.eng.br>

**Mailing list** ibm-acpi-devel@lists.sourceforge.net, platform-driver-x86@vger.kernel.org

**Status** Maintained

**Web-page** <http://ibm-acpi.sourceforge.net>    <http://thinkwiki.org/wiki/Ibm-acpi>

**SCM** git <git://repo.or.cz/linux-2.6/linux-acpi-2.6/ibm-acpi-2.6.git>

**Files** drivers/platform/x86/thinkpad\_acpi.c

### \* THUNDERBOLT DRIVER

**Mail** Andreas Noever <[andreas.noever@gmail.com](mailto:andreas.noever@gmail.com)>, Michael Jamet <[michael.jamet@intel.com](mailto:michael.jamet@intel.com)>, Mika Westerberg <[mika.westerberg@linux.intel.com](mailto:mika.westerberg@linux.intel.com)>, Yehezkel Bernat <[YehezkelShB@gmail.com](mailto:YehezkelShB@gmail.com)>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/westeri/thunderbolt.git>

**Files** admin-guide/thunderbolt    drivers/thunderbolt/    include/linux/thunderbolt.h

### \* THUNDERBOLT NETWORK DRIVER

**Mail** Michael Jamet <[michael.jamet@intel.com](mailto:michael.jamet@intel.com)>, Mika Westerberg <[mika.westerberg@linux.intel.com](mailto:mika.westerberg@linux.intel.com)>, Yehezkel Bernat <[YehezkelShB@gmail.com](mailto:YehezkelShB@gmail.com)>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/thunderbolt.c

## \* THUNDERX GPIO DRIVER

**Mail** Robert Richter <[rrichter@marvell.com](mailto:rrichter@marvell.com)>

**Status** Maintained

**Files** drivers/gpio/gpio-thunderx.c

## \* TI AM437X VPFE DRIVER

**Mail** “Lad, Prabhakar” <[prabhakar.csengg@gmail.com](mailto:prabhakar.csengg@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/mhadli/v4l-dvb-davinci\\_devices.git](git://linuxtv.org/mhadli/v4l-dvb-davinci_devices.git)

**Files** drivers/media/platform/am437x/

## \* TI BANDGAP AND THERMAL DRIVER

**Mail** Eduardo Valentin <[edubezval@gmail.com](mailto:edubezval@gmail.com)>, Keerthy <[j-keerthy@ti.com](mailto:j-keerthy@ti.com)>

**Mailing list** [linux-pm@vger.kernel.org](mailto:linux-pm@vger.kernel.org), [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** drivers/thermal/ti-soc-thermal/

## \* TI BQ27XXX POWER SUPPLY DRIVER

**Reviewer** Andrew F. Davis <[afd@ti.com](mailto:afd@ti.com)>

**Files** drivers/power/supply/bq27xxx\_battery.c    drivers/power/  
      supply/bq27xxx\_battery\_i2c.c              include/linux/power/  
      bq27xxx\_battery.h

## \* TI CDCE706 CLOCK DRIVER

**Mail** Max Filippov <[jcmvbkb@gmail.com](mailto:jcmvbkb@gmail.com)>

**Status** Maintained

**Files** drivers/clk/clk-cdce706.c

### \* TI CLOCK DRIVER

**Mail** Tero Kristo <[t-kristo@ti.com](mailto:t-kristo@ti.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org)

**Status** Maintained

**Files** drivers/clk/ti/ include/linux/clk/ti.h

### \* TI DAVINCI MACHINE SUPPORT

**Mail** Sekhar Nori <[nsekhar@ti.com](mailto:nsekhar@ti.com)>

**Reviewer** Bartosz Golaszewski <[bgolaszewski@baylibre.com](mailto:bgolaszewski@baylibre.com)>

**Mailing list** [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/nsekhar/linux-davinci.git>

**Files** Documentation/devicetree/bindings/i2c/i2c-davinci.txt  
arch/arm/boot/dts/da850\* arch/arm/mach-davinci/ drivers/  
i2c/busses/i2c-davinci.c

### \* TI DAVINCI SERIES CLOCK DRIVER

**Mail** David Lechner <[david@lechnology.com](mailto:david@lechnology.com)>

**Reviewer** Sekhar Nori <[nsekhar@ti.com](mailto:nsekhar@ti.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/clock/ti/davinci/  
drivers/clk/davinci/

### \* TI DAVINCI SERIES GPIO DRIVER

**Mail** Keerthy <[j-keerthy@ti.com](mailto:j-keerthy@ti.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/gpio/gpio-davinci.txt  
drivers/gpio/gpio-davinci.c

### \* TI DAVINCI SERIES MEDIA DRIVER

**Mail** “Lad, Prabhakar” <[prabhakar.csengg@gmail.com](mailto:prabhakar.csengg@gmail.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/mhadli/v4l-dvb-davinci\\_devices.git](git://linuxtv.org/mhadli/v4l-dvb-davinci_devices.git)

**Files** drivers/media/platform/davinci/ include/media/davinci/

### \* TI ENHANCED QUADRATURE ENCODER PULSE (eQEP) DRIVER

**Reviewer** David Lechner <[david@lechnology.com](mailto:david@lechnology.com)>

**Mailing list** [linux-iio@vger.kernel.org](mailto:linux-iio@vger.kernel.org)

**Files** Documentation/devicetree/bindings/counter/ti-eqep.yaml  
drivers/counter/ti-eqep.c

### \* TI ETHERNET SWITCH DRIVER (CPSW)

**Reviewer** Grygorii Strashko <[grygorii.strashko@ti.com](mailto:grygorii.strashko@ti.com)>

**Mailing list** [linux-omap@vger.kernel.org](mailto:linux-omap@vger.kernel.org), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/ti/cpsw\* drivers/net/ethernet/ti/  
davinci\*

### \* TI FLASH MEDIA MEMORYSTICK/MMC DRIVERS

**Mail** Alex Dubov <[oakad@yahoo.com](mailto:oakad@yahoo.com)>

**Status** Maintained

**Web-page** <http://tifmxx.berlios.de/>

**Files** drivers/memstick/host/tifm\_ms.c drivers/misc/tifm\*  
drivers/mmc/host/tifm\_sd.c include/linux/tifm.h

## \* TI KEYSTONE MULTICORE NAVIGATOR DRIVERS

**Mail** Santosh Shilimkar <[ssantosh@kernel.org](mailto:ssantosh@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org), [linux-arm-kernel@lists.infradead.org](mailto:linux-arm-kernel@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/ssantosh/linux-keystone.git>

**Files** drivers/soc/ti/\*

## \* TI LM49xxx FAMILY ASoC CODEC DRIVERS

**Mail** M R Swami Reddy <[mr.swami.reddy@ti.com](mailto:mr.swami.reddy@ti.com)>, Vishwas A Deshpande <[vishwas.a.deshpande@ti.com](mailto:vishwas.a.deshpande@ti.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** sound/soc/codecs/isabelle\* sound/soc/codecs/lm49453\*

## \* TI LP855x BACKLIGHT DRIVER

**Mail** Milo Kim <[milo.kim@ti.com](mailto:milo.kim@ti.com)>

**Status** Maintained

**Files** driver-api/backlight/lp855x-driver drivers/video/backlight/lp855x\_bl.c include/linux/platform\_data/lp855x.h

## \* TI LP8727 CHARGER DRIVER

**Mail** Milo Kim <[milo.kim@ti.com](mailto:milo.kim@ti.com)>

**Status** Maintained

**Files** drivers/power/supply/lp8727\_charger.c include/linux/platform\_data/lp8727.h

## \* TI LP8788 MFD DRIVER

**Mail** Milo Kim <[milo.kim@ti.com](mailto:milo.kim@ti.com)>

**Status** Maintained

**Files** drivers/iio/adc/lp8788\_adc.c drivers/leds/leds-lp8788.c drivers/mfd/lp8788\*.c drivers/power/supply/lp8788-charger.c drivers/regulator/lp8788-\*.c include/linux/mfd/lp8788\*.h

## \* TI NETCP ETHERNET DRIVER

**Mail** Wingman Kwok <[w-kwok2@ti.com](mailto:w-kwok2@ti.com)>, Murali Karicheri <[m-karicheri2@ti.com](mailto:m-karicheri2@ti.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/ethernet/ti/netcp\*

## \* TI PCM3060 ASoC CODEC DRIVER

**Mail** Kirill Marinushkin <[kmarinushkin@birdec.com](mailto:kmarinushkin@birdec.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** Documentation/devicetree/bindings/sound/pcm3060.txt  
sound/soc/codecs/pcm3060\*

## \* TI TAS571X FAMILY ASoC CODEC DRIVER

**Mail** Kevin Cernekee <[cernekee@chromium.org](mailto:cernekee@chromium.org)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Odd Fixes

**Files** sound/soc/codecs/tas571x\*

## \* TI TCAN4X5X DEVICE DRIVER

**Mail** Dan Murphy <[dmurphy@ti.com](mailto:dmurphy@ti.com)>

**Mailing list** [linux-can@vger.kernel.org](mailto:linux-can@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/can/tcan4x5x.txt  
drivers/net/can/m\_can/tcan4x5x.c

## \* TI TRF7970A NFC DRIVER

**Mail** Mark Greer <[mgreer@animalcreek.com](mailto:mgreer@animalcreek.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org), [linux-nfc@lists.01.org](mailto:linux-nfc@lists.01.org) (moderated for non-subscribers)

**Status** Supported

**Files** Documentation/devicetree/bindings/net/nfc/trf7970a.txt  
drivers/nfc/trf7970a.c

## \* TI TWL4030 SERIES SOC CODEC DRIVER

**Mail** Peter Ujfalusi <[peter.ujfalusi@ti.com](mailto:peter.ujfalusi@ti.com)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**Files** sound/soc/codecs/twl4030\*

## \* TI VPE/CAL DRIVERS

**Mail** Benoit Parrot <[bparrot@ti.com](mailto:bparrot@ti.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <http://linuxtv.org/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**Files** Documentation/devicetree/bindings/media/ti,cal.yaml  
Documentation/devicetree/bindings/media/ti,vpe.yaml  
drivers/media/platform/ti-vpe/

## \* TI WILINK WIRELESS DRIVERS

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Orphan

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/wl12xx>  
<https://wireless.wiki.kernel.org/en/users/Drivers/wl1251>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/luca/wl12xx.git>

**Files** drivers/net/wireless/ti/ include/linux/wl12xx.h

## \* TIMEKEEPING, CLOCKSOURCE CORE, NTP, ALARMTIMER

**Mail** John Stultz <[john.stultz@linaro.org](mailto:john.stultz@linaro.org)>, Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>

**Reviewer** Stephen Boyd <[sboyd@kernel.org](mailto:sboyd@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
timers/core

**Files** include/linux/clocksource.h        include/linux/time.h  
      include/linux/timex.h include/uapi/linux/time.h include/  
      uapi/linux/timex.h kernel/time/alarmtimer.c kernel/time/  
      clocksource.c kernel/time/ntp.c kernel/time/time\*.c tools/  
      testing/selftests/timers/

### \* TIPC NETWORK LAYER

**Mail** Jon Maloy <[jmaloy@redhat.com](mailto:jmaloy@redhat.com)>, Ying Xue  
<[ying.xue@windriver.com](mailto:ying.xue@windriver.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org) (core kernel code), [tipc-discussion@lists.sourceforge.net](mailto:tipc-discussion@lists.sourceforge.net) (user apps, general discussion)

**Status** Maintained

**Web-page** <http://tipc.sourceforge.net/>

**Files** include/uapi/linux/tipc\*.h net/tipc/

### \* TLAN NETWORK DRIVER

**Mail** Samuel Chessman <[chessman@tux.org](mailto:chessman@tux.org)>

**Mailing list** [tlan-devel@lists.sourceforge.net](mailto:tlan-devel@lists.sourceforge.net) (subscribers-only)

**Status** Maintained

**Web-page** <http://sourceforge.net/projects/tlan/>

**Files** networking/device\_drivers/ti/tlan    drivers/net/ethernet/ti/  
      tlan.\*

### \* TM6000 VIDEO4LINUX DRIVER

**Mail** Mauro Carvalho Chehab <[mcchehab@kernel.org](mailto:mcchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/admin-guide/media/tm6000\*    drivers/media/  
      usb/tm6000/

### \* TMIO/SDHI MMC DRIVER

**Mail** Wolfram Sang <[wsa+renesas@sang-engineering.com](mailto:wsa+renesas@sang-engineering.com)>

**Mailing list** [linux mmc@vger.kernel.org](mailto:linux mmc@vger.kernel.org)

**Status** Supported

**Files** drivers/mmc/host/renesas\_sdhi\* drivers/mmc/host/  
tmio\_mmc\* include/linux/mfd/tmio.h

### \* TMP401 HARDWARE MONITOR DRIVER

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/tmp401 drivers/hwmon/tmp401.c

### \* TMP513 HARDWARE MONITOR DRIVER

**Mail** Eric Tremblay <[etremblay@distech-controls.com](mailto:etremblay@distech-controls.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/tmp513 drivers/hwmon/tmp513.c

### \* TMPFS (SHMEM FILESYSTEM)

**Mail** Hugh Dickins <[hughd@google.com](mailto:hughd@google.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** include/linux/shmem\_fs.h mm/shmem.c

### \* TOMOYO SECURITY MODULE

**Mail** Kentaro Takeda <[takedakn@nttdata.co.jp](mailto:takedakn@nttdata.co.jp)>, Tetsuo Handa <[penguin-kernel@I-love.SAKURA.ne.jp](mailto:penguin-kernel@I-love.SAKURA.ne.jp)>

**Mailing list** [tomoyo-dev-en@lists.osdn.me](mailto:tomoyo-dev-en@lists.osdn.me) (subscribers-only, for developers in English), [tomoyo-users-en@lists.osdn.me](mailto:tomoyo-users-en@lists.osdn.me) (subscribers-only, for users in English), [tomoyo-dev@lists.osdn.me](mailto:tomoyo-dev@lists.osdn.me) (subscribers-only, for developers in Japanese), [tomoyo-users@lists.osdn.me](mailto:tomoyo-users@lists.osdn.me) (subscribers-only, for users in Japanese)

**Status** Maintained

**Web-page** <https://tomoyo.osdn.jp/>

**Files** security/tomoyo/

## \* TOPSTAR LAPTOP EXTRAS DRIVER

**Mail** Herton Ronaldo Krzesinski <herton@canonical.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/topstar-laptop.c

## \* TORTURE-TEST MODULES

**Mail** Davidlohr Bueso <dave@stgolabs.net>, “Paul E. McKenney” <paulmck@kernel.org>, Josh Triplett <josh@joshtTriplett.org>

**Mailing list** linux-kernel@vger.kernel.org

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/paulmck/linux-rcu.git dev

**Files** Documentation/RCU/torture.txt kernel/locking/  
locktorture.c kernel/rcu/rcuperf.c kernel/rcu/rcutorture.c  
kernel/torture.c

## \* TOSHIBA ACPI EXTRAS DRIVER

**Mail** Azael Avalos <coproscefalo@gmail.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/toshiba\_acpi.c

## \* TOSHIBA BLUETOOTH DRIVER

**Mail** Azael Avalos <coproscefalo@gmail.com>

**Mailing list** platform-driver-x86@vger.kernel.org

**Status** Maintained

**Files** drivers/platform/x86/toshiba\_bluetooth.c

## \* TOSHIBA HDD ACTIVE PROTECTION SENSOR DRIVER

**Mail** Azael Avalos <[coproscefalo@gmail.com](mailto:coproscefalo@gmail.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** `drivers/platform/x86/toshiba_haps.c`

## \* TOSHIBA SMM DRIVER

**Mail** Jonathan Buzzard <[jonathan@buzzard.org.uk](mailto:jonathan@buzzard.org.uk)>

**Status** Maintained

**Web-page** <http://www.buzzard.org.uk/toshiba/>

**Files** `drivers/char/toshiba.c` `include/linux/toshiba.h` `include/uapi/linux/toshiba.h`

## \* TOSHIBA TC358743 DRIVER

**Mail** Mats Randgaard <[matrandg@cisco.com](mailto:matrandg@cisco.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** `drivers/media/i2c/tc358743*` `include/media/i2c/tc358743.h`

## \* TOSHIBA WMI HOTKEYS DRIVER

**Mail** Azael Avalos <[coproscefalo@gmail.com](mailto:coproscefalo@gmail.com)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Maintained

**Files** `drivers/platform/x86/toshiba-wmi.c`

## \* TPM DEVICE DRIVER

**Mail** Peter Huewe <[peterhuewe@gmx.de](mailto:peterhuewe@gmx.de)>, Jarkko Sakkinen <[jarkko.sakkinen@linux.intel.com](mailto:jarkko.sakkinen@linux.intel.com)>

**Reviewer** Jason Gunthorpe <[jgg@ziepe.ca](mailto:jgg@ziepe.ca)>

**Mailing list** [linux-integrity@vger.kernel.org](mailto:linux-integrity@vger.kernel.org)

**Status** Maintained

**Web-page** [https://kernsec.org/wiki/index.php/Linux\\_Kernel\\_Integrity](https://kernsec.org/wiki/index.php/Linux_Kernel_Integrity)

**Patchwork** <https://patchwork.kernel.org/project/linux-integrity/list/>

**SCM** git `git://git.infradead.org/users/jjs/linux-tpmdd.git`

**Files** drivers/char/tpm/

## \* TRACING

**Mail** Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>, Ingo Molnar <[mingo@redhat.com](mailto:mingo@redhat.com)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> perf/core

**Files** trace/ftrace arch/\*/\*/\*/ftrace.h arch/\*/\*/kernel/ftrace.c include/\*/\*/ftrace.h include/linux/trace\*.h include/trace/kernel/trace/tools/testing/selftests/ftrace/

## \* TRACING MMIO ACCESSES (MMIOTRACE)

**Mail** Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>, Ingo Molnar <[mingo@kernel.org](mailto:mingo@kernel.org)>

**Reviewer** Karol Herbst <[karolherbst@gmail.com](mailto:karolherbst@gmail.com)>, Pekka Paalanen <[ppaalanan@gmail.com](mailto:ppaalanan@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org), nouveau@lists.freedesktop.org

**Status** Maintained

**Files** arch/x86/mm/kmmio.c arch/x86/mm/mmio-mod.c arch/x86/mm/testmmiotrace.c include/linux/mmiotrace.h kernel/trace/trace\_mmiotrace.c

## \* TRIVIAL PATCHES

**Mail** Jiri Kosina <[trivial@kernel.org](mailto:trivial@kernel.org)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/jikos/trivial.git>

**Content regex** ^Subject:.\*(?i)trivial

## \* TTY LAYER

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>, Jiri Slaby <[jslaby@suse.com](mailto:jslaby@suse.com)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/tty.git>

**Files** Documentation/driver-api/serial/ drivers/tty/ drivers/tty/serial/serial\_core.c include/linux/serial.h include/linux/serial\_core.h include/linux/tty.h include/uapi/linux/serial.h include/uapi/linux/serial\_core.h include/uapi/linux/tty.h

### \* TUA9001 MEDIA DRIVER

**Mail** Antti Palosaari <[crope@iki.fi](mailto:crope@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org> <http://palosaari.fi/linux/>

**Patchwork** <http://patchwork.linuxtv.org/project/linux-media/list/>

**SCM** git [git://linuxtv.org/anttip/media\\_tree.git](git://linuxtv.org/anttip/media_tree.git)

**Files** drivers/media/tuners/tua9001\*

### \* TULIP NETWORK DRIVERS

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [linux-parisc@vger.kernel.org](mailto:linux-parisc@vger.kernel.org)

**Status** Orphan

**Files** drivers/net/ethernet/dec/tulip/

### \* TUN/TAP driver

**Mail** Maxim Krasnyansky <[maxk@qti.qualcomm.com](mailto:maxk@qti.qualcomm.com)>

**Status** Maintained

**Web-page** <http://vtun.sourceforge.net/tun>

**Files** networking/tuntap arch/um/os-Linux/drivers/

### \* TURBOCHANNEL SUBSYSTEM

**Mail** “Maciej W. Rozycki” <[macro@linux-mips.org](mailto:macro@linux-mips.org)>, Ralf Baechle <[ralf@linux-mips.org](mailto:ralf@linux-mips.org)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Patchwork** <http://patchwork.linux-mips.org/project/linux-mips/list/>

**Files** drivers/tc/ include/linux/tc.h

### \* TURBOSTAT UTILITY

**Mail** “Len Brown” <lenb@kernel.org>

**Mailing list** linux-pm@vger.kernel.org

**Status** Supported

**Patchwork** <https://patchwork.kernel.org/project/linux-pm/list/>

**bugs** <https://bugzilla.kernel.org>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/lenb/linux.git> turbostat

**Files** tools/power/x86/turbostat/

### \* TW5864 VIDEO4LINUX DRIVER

**Mail** Bluecherry Maintainers <maintainers@bluecherrydvr.com>, Anton Sviridenko <anton@corp.bluecherry.net>, Andrey Utkin <andrey.utkin@corp.bluecherry.net>, Andrey Utkin <andrey\_utkin@fastmail.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Supported

**Files** drivers/media/pci/tw5864/

### \* TW68 VIDEO4LINUX DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/tw68/

### \* TW686X VIDEO4LINUX DRIVER

**Mail** Ezequiel Garcia <ezequiel@vanguardiasur.com.ar>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <http://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/pci/tw686x/

### \* UACCE ACCELERATOR FRAMEWORK

**Mail** Zhangfei Gao <[zhangfei.gao@linaro.org](mailto:zhangfei.gao@linaro.org)>, Zhou Wang <[wangzhou1@hisilicon.com](mailto:wangzhou1@hisilicon.com)>

**Mailing list** [linux-accelerators@lists.ozlabs.org](mailto:linux-accelerators@lists.ozlabs.org), [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-driver-uacce misc-devices/uacce drivers/misc/uacce/ include/linux/uacce.h  
include/uapi/misc/uacce/

### \* UBI FILE SYSTEM (UBIFS)

**Mail** Richard Weinberger <[richard@nod.at](mailto:richard@nod.at)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Supported

**Web-page** <http://www.linux-mtd.infradead.org/doc/ubifs.html>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rw/ubifs.git> next  
git <git://git.kernel.org/pub/scm/linux/kernel/git/rw/ubifs.git> fixes

**Files** filesystems/ubifs fs/ubifs/

### \* UCLINUX (M68KNOMMU AND COLDFIRE)

**Mail** Greg Ungerer <[gerg@linux-m68k.org](mailto:gerg@linux-m68k.org)>

**Mailing list** [linux-m68k@lists.linux-m68k.org](mailto:linux-m68k@lists.linux-m68k.org), [uclinux-dev@uclinux.org](mailto:uclinux-dev@uclinux.org) (subscribers-only)

**Status** Maintained

**Web-page** <http://www.linux-m68k.org/> <http://www.uclinux.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gerg/m68knommu.git>

**Files** arch/m68k/\*/\*\_no.\* arch/m68k/68\*/ arch/m68k/coldfire/  
arch/m68k/include/asm/\*\_no.\*

### \* UDF FILESYSTEM

**Mail** Jan Kara <[jack@suse.com](mailto:jack@suse.com)>

**Status** Maintained

**Files** filesystems/udf fs/udf/

## \* **UDRAW TABLET**

**Mail** Bastien Nocera <[hadess@hadess.net](mailto:hadess@hadess.net)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/hid/hid-udraw-ps3.c

## \* **UFS FILESYSTEM**

**Mail** Evgeniy Dushistov <[dushistov@mail.ru](mailto:dushistov@mail.ru)>

**Status** Maintained

**Files** admin-guide/ufs fs/ufs/

## \* **UHID USERSPACE HID IO DRIVER**

**Mail** David Herrmann <[dh.herrmann@googlemail.com](mailto:dh.herrmann@googlemail.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/hid/uhid.c include/uapi/linux/uhid.h

## \* **ULPI BUS**

**Mail** Heikki Krogerus <[heikki.krogerus@linux.intel.com](mailto:heikki.krogerus@linux.intel.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/common/ulpi.c include/linux/ulpi/

## \* **UNICODE SUBSYSTEM**

**Mail** Gabriel Krisman Bertazi <[krisman@collabora.com](mailto:krisman@collabora.com)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Supported

**Files** fs/unicode/

### \* UNICORE32 ARCHITECTURE

**Mail** Guan Xuetao <[gxt@pku.edu.cn](mailto:gxt@pku.edu.cn)>

**Status** Maintained

**Web-page** <http://mprc.pku.edu.cn/~guanxuetao/linux>

**SCM** git git://github.com/gxt/linux.git

**Files** arch/unicore32/

### \* UNIFDEF

**Mail** Tony Finch <[dot@dotat.at](mailto:dot@dotat.at)>

**Status** Maintained

**Web-page** <http://dotat.at/prog/unifdef>

**Files** scripts/unifdef.c

### \* UNIFORM CDROM DRIVER

**Mail** Jens Axboe <[axboe@kernel.dk](mailto:axboe@kernel.dk)>

**Status** Maintained

**Web-page** <http://www.kernel.dk>

**Files** Documentation/cdrom/ drivers/cdrom/cdrom.c include/linux/cdrom.h include/uapi/linux/cdrom.h

### \* UNISYS S-PAR DRIVERS

**Mail** David Kershner <[david.kershner@unisys.com](mailto:david.kershner@unisys.com)>

**Mailing list** [sparmaintainer@unisys.com](mailto:sparmaintainer@unisys.com) (Unisys internal)

**Status** Supported

**Files** drivers/staging/unisys/ drivers/visorbus/ include/linux/visorbus.h

### \* UNIVERSAL FLASH STORAGE HOST CONTROLLER DRIVER

**Reviewer** Alim Akhtar <[alim.akhtar@samsung.com](mailto:alim.akhtar@samsung.com)>, Avri Altman <[avri.altman@wdc.com](mailto:avri.altman@wdc.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** scsi/ufs drivers/scsi/ufs/

## \* UNIVERSAL FLASH STORAGE HOST CONTROLLER DRIVER DWC HOOKS

**Mail** Pedro Sousa <[pedrom.sousa@synopsys.com](mailto:pedrom.sousa@synopsys.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/ufs/\*dwc\*

## \* UNIVERSAL FLASH STORAGE HOST CONTROLLER DRIVER MEDIATEK HOOKS

**Mail** Stanley Chu <[stanley.chu@mediatek.com](mailto:stanley.chu@mediatek.com)>

**Mailing list** [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org), [mediatek@lists.infradead.org](mailto:mediatek@lists.infradead.org) (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/scsi/ufs/ufs-mediatek\*

## \* UNSORTED BLOCK IMAGES (UBI)

**Mail** Richard Weinberger <[richard@nod.at](mailto:richard@nod.at)>

**Mailing list** [linux-mtd@lists.infradead.org](mailto:linux-mtd@lists.infradead.org)

**Status** Supported

**Web-page** <http://www.linux-mtd.infradead.org/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rw/ubifs.git> next  
git <git://git.kernel.org/pub/scm/linux/kernel/git/rw/ubifs.git> fixes

**Files** drivers/mtd/ubi/ include/linux/mtd/ubi.h include/uapi/mtd/ubi-user.h

## \* USB “USBNET” DRIVER FRAMEWORK

**Mail** Oliver Neukum <[oneukum@suse.com](mailto:oneukum@suse.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-usb.org/usbnet>

**Files** drivers/net/usb/usbnet.c include/linux/usb/usbnet.h

### \* USB ACM DRIVER

**Mail** Oliver Neukum <[oneukum@suse.com](mailto:oneukum@suse.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** `usb/acm drivers/usb/class/cdc-acm.*`

### \* USB APPLE MFI FASTCHARGE DRIVER

**Mail** Bastien Nocera <[hadess@hadess.net](mailto:hadess@hadess.net)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** `drivers/usb/misc/apple-mfi-fastcharge.c`

### \* USB AR5523 WIRELESS DRIVER

**Mail** Pontus Fuchs <[pontus.fuchs@gmail.com](mailto:pontus.fuchs@gmail.com)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** `drivers/net/wireless/ath/ar5523/`

### \* USB ATTACHED SCSI

**Mail** Oliver Neukum <[oneukum@suse.com](mailto:oneukum@suse.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org), [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Maintained

**Files** `drivers/usb/storage/uas.c`

### \* USB CDC ETHERNET DRIVER

**Mail** Oliver Neukum <[oliver@neukum.org](mailto:oliver@neukum.org)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** `drivers/net/usb/cdc_*.c` `include/uapi/linux/usb/cdc.h`

### \* USB CHAOSKEY DRIVER

**Mail** Keith Packard <keithp@keithp.com>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**Files** drivers/usb/misc/chaoskey.c

### \* USB CYPRESS C67X00 DRIVER

**Mail** Peter Korsgaard <jacmet@sunsite.dk>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**Files** drivers/usb/c67x00/

### \* USB DAVICOM DM9601 DRIVER

**Mail** Peter Korsgaard <jacmet@sunsite.dk>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Web-page** <http://www.linux-usb.org/usbnet>

**Files** drivers/net/usb/dm9601.c

### \* USB EHCI DRIVER

**Mail** Alan Stern <stern@rowland.harvard.edu>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**Files** usb/ehci drivers/usb/host/ehci\*

### \* USB GADGET/PERIPHERAL SUBSYSTEM

**Mail** Felipe Balbi <balbi@kernel.org>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**Web-page** <http://www.linux-usb.org/gadget>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/balbi/usb.git

**Files** drivers/usb/gadget/ include/linux/usb/gadget\*

### \* USB HID/HIDBP DRIVERS (USB KEYBOARDS, MICE, REMOTE CONTROLS, ...)

**Mail** Jiri Kosina <[jikos@kernel.org](mailto:jikos@kernel.org)>, Benjamin Tissoires  
<[benjamin.tissoires@redhat.com](mailto:benjamin.tissoires@redhat.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/hid/hid.git>

**Files** hid/hiddev drivers/hid/usbhid/

### \* USB INTEL XHCI ROLE MUX DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/roles/intel-xhci-usb-role-switch.c

### \* USB IP DRIVER FOR HISILICON KIRIN

**Mail** Yu Chen <[chenyu56@huawei.com](mailto:chenyu56@huawei.com)>, Binghui Wang  
<[wangbinghui@hisilicon.com](mailto:wangbinghui@hisilicon.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/phy/phy-hi3660-usb3.  
txt drivers/phy/hisilicon/phy-hi3660-usb3.c

### \* USB ISP116X DRIVER

**Mail** Olav Kongas <[ok@artecdesign.ee](mailto:ok@artecdesign.ee)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/host/isp116x\* include/linux/usb/isp116x.h

## \* USB LAN78XX ETHERNET DRIVER

**Mail** Woojung Huh <[woojung.huh@microchip.com](mailto:woojung.huh@microchip.com)>, Microchip Linux Driver Support <[UNGLinuxDriver@microchip.com](mailto:UNGLinuxDriver@microchip.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/microchip, lan78xx.txt drivers/net/usb/lan78xx.\* include/dt-bindings/net/microchip-lan78xx.h

## \* USB MASS STORAGE DRIVER

**Mail** Alan Stern <[stern@rowland.harvard.edu](mailto:stern@rowland.harvard.edu)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org), [usb-storage@lists.one-eyed-alien.net](mailto:usb-storage@lists.one-eyed-alien.net)

**Status** Maintained

**Files** drivers/usb/storage/

## \* USB MIDI DRIVER

**Mail** Clemens Ladisch <[clemens@ladisch.de](mailto:clemens@ladisch.de)>

**Mailing list** [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tiwai/sound.git>

**Files** sound/usb/midi.\*

## \* USB NETWORKING DRIVERS

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Odd Fixes

**Files** drivers/net/usb/

## \* USB OHCI DRIVER

**Mail** Alan Stern <[stern@rowland.harvard.edu](mailto:stern@rowland.harvard.edu)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** usb/ohci drivers/usb/host/ohci\*

### \* USB OTG FSM (Finite State Machine)

**Mail** Peter Chen <Peter.Chen@nxp.com>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/peter.chen/usb.git

**Files** drivers/usb/common/usb-otg-fsm.c

### \* USB OVER IP DRIVER

**Mail** Valentina Manea <valentina.manea.m@gmail.com>, Shuah Khan <shuah@kernel.org>, Shuah Khan <skhan@linuxfoundation.org>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**Files** usb/usbip\_protocol drivers/usb/usbip/ tools/testing/ selftests/drivers/usb/usbip/ tools/usb/usbip/

### \* USB PEGASUS DRIVER

**Mail** Petko Manolov <petkan@nucleusys.com>

**Mailing list** linux-usb@vger.kernel.org, netdev@vger.kernel.org

**Status** Maintained

**Web-page** <https://github.com/petkan/pegasus>

**SCM** git git://github.com/petkan/pegasus.git

**Files** drivers/net/usb/pegasus.\*

### \* USB PHY LAYER

**Mail** Felipe Balbi <balbi@kernel.org>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/balbi/usb.git

**Files** drivers/usb/phy/

### \* USB PRINTER DRIVER (usblp)

**Mail** Pete Zaitcev <zaitcev@redhat.com>

**Mailing list** linux-usb@vger.kernel.org

**Status** Supported

**Files** drivers/usb/class/usblp.c

### \* USB QMI WWAN NETWORK DRIVER

**Mail** Bjørn Mork <bjorn@mork.no>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-class-net-qmi drivers/net/usb/qmi\_wwan.c

### \* USB RTL8150 DRIVER

**Mail** Petko Manolov <petkan@nucleusys.com>

**Mailing list** linux-usb@vger.kernel.org, netdev@vger.kernel.org

**Status** Maintained

**Web-page** <https://github.com/petkan/rtl8150>

**SCM** git git://github.com/petkan/rtl8150.git

**Files** drivers/net/usb/rtl8150.c

### \* USB SERIAL SUBSYSTEM

**Mail** Johan Hovold <johan@kernel.org>

**Mailing list** linux-usb@vger.kernel.org

**Status** Maintained

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/johan/usb-serial.git

**Files** usb/usb-serial drivers/usb/serial/ include/linux/usb/serial.h

### \* USB SMSC75XX ETHERNET DRIVER

**Mail** Steve Glendinning <[steve.glendinning@shawell.net](mailto:steve.glendinning@shawell.net)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/usb/smsc75xx.\*

### \* USB SMSC95XX ETHERNET DRIVER

**Mail** Steve Glendinning <[steve.glendinning@shawell.net](mailto:steve.glendinning@shawell.net)>, Microchip  
Linux Driver Support <[UNGLinuxDriver@microchip.com](mailto:UNGLinuxDriver@microchip.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/usb/smsc95xx.\*

### \* USB SUBSYSTEM

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.linux-usb.org>

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/usb.git

**Files** Documentation/devicetree/bindings/usb/ Documentation/  
usb/ drivers/usb/ include/linux/usb.h include/linux/usb/

### \* USB TYPEC BUS FOR ALTERNATE MODES

**Mail** Heikki Krogerus <[heikki.krogerus@linux.intel.com](mailto:heikki.krogerus@linux.intel.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-bus-typec driver-  
api/usb/typec\_bus drivers/usb/typec/altmodes/ include/  
linux/usb/typec\_almode.h

### \* USB TYPEC CLASS

**Mail** Heikki Krogerus <[heikki.krogerus@linux.intel.com](mailto:heikki.krogerus@linux.intel.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** Documentation/ABI/testing/sysfs-class-typec      driver-api/usb/typec drivers/usb/typec/ include/linux/usb/typec.h

### \* USB TYPEC INTEL PMC MUX DRIVER

**Mail** Heikki Krogerus <[heikki.krogerus@linux.intel.com](mailto:heikki.krogerus@linux.intel.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** firmware-guide/acpi/intel-pmc-mux      drivers/usb/typec/mux/intel\_pmc\_mux.c

### \* USB TYPEC PI3USB30532 MUX DRIVER

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/typec/mux/pi3usb30532.c

### \* USB TYPEC PORT CONTROLLER DRIVERS

**Mail** Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/typec/tcpm/

### \* USB UHCI DRIVER

**Mail** Alan Stern <[stern@rowland.harvard.edu](mailto:stern@rowland.harvard.edu)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/host/uhci\*

### \* USB VIDEO CLASS

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-uvc-devel@lists.sourceforge.net](mailto:linux-uvc-devel@lists.sourceforge.net) (subscribers-only),  
[linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.ideasonboard.org/uvc/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/usb/uvc/ include/uapi/linux/uvcvideo.h

### \* USB VISION DRIVER

**Mail** Hans Verkuil <[hverkuil@xs4all.nl](mailto:hverkuil@xs4all.nl)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Odd Fixes

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/staging/media/usbvision/

### \* USB WEBCAM GADGET

**Mail** Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Maintained

**Files** drivers/usb/gadget/function/\*uvc\* drivers/usb/gadget/legacy/webcam.c include/uapi/linux/usb/g\_uvc.h

### \* USB WIRELESS RNDIS DRIVER (rndis\_wlan)

**Mail** Jussi Kivilinna <[jussi.kivilinna@iki.fi](mailto:jussi.kivilinna@iki.fi)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireless/rndis\_wlan.c

## \* USB XHCI DRIVER

**Mail** Mathias Nyman <[mathias.nyman@intel.com](mailto:mathias.nyman@intel.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org)

**Status** Supported

**Files** drivers/usb/host/pci-quirks\* drivers/usb/host/xhci\*

## \* USB ZD1201 DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Orphan

**Web-page** <http://linux-lc100020.sourceforge.net>

**Files** drivers/net/wireless/zydas/zd1201.\*

## \* USB ZR364XX DRIVER

**Mail** Antoine Jacquet <[royale@zerezo.com](mailto:royale@zerezo.com)>

**Mailing list** [linux-usb@vger.kernel.org](mailto:linux-usb@vger.kernel.org), [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <http://royale.zerezo.com/zr364xx/>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/admin-guide/media/zr364xx\* drivers/media/usb/zr364xx/

## \* USER-MODE LINUX (UML)

**Mail** Jeff Dike <[jdiike@addtoit.com](mailto:jdiike@addtoit.com)>, Richard Weinberger <[richard@nod.at](mailto:richard@nod.at)>, Anton Ivanov <[anton.ivanov@cambridgegreys.com](mailto:anton.ivanov@cambridgegreys.com)>

**Mailing list** [linux-um@lists.infradead.org](mailto:linux-um@lists.infradead.org)

**Status** Maintained

**Web-page** <http://user-mode-linux.sourceforge.net>

**Patchwork** <https://patchwork.ozlabs.org/project/linux-um/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/rw/uml.git>

**Files** Documentation/virt/uml/ arch/um/ arch/x86/um/ fs/hostfs/

### \* **USERSPACE COPYIN/COPYOUT (UIOVEC)**

**Mail** Alexander Viro <[viro@zeniv.linux.org.uk](mailto:viro@zeniv.linux.org.uk)>

**Status** Maintained

**Files** `include/linux/uio.h` `lib/iov_iter.c`

### \* **USERSPACE DMA BUFFER DRIVER**

**Mail** Gerd Hoffmann <[kraxel@redhat.com](mailto:kraxel@redhat.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org)

**Status** Maintained

**SCM** git `git://anongit.freedesktop.org/drm/drm-misc`

**Files** `drivers/dma-buf/udmabuf.c` `include/uapi/linux/udmabuf.h`

### \* **USERSPACE I/O (UIO)**

**Mail** Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Status** Maintained

**SCM** git `git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/char-misc.git`

**Files** `driver-api/uio-howto` `drivers/uio/` `include/linux/uio_driver.h`

### \* **UTIL-LINUX PACKAGE**

**Mail** Karel Zak <[kzak@redhat.com](mailto:kzak@redhat.com)>

**Mailing list** [util-linux@vger.kernel.org](mailto:util-linux@vger.kernel.org)

**Status** Maintained

**Web-page** <http://en.wikipedia.org/wiki/Util-linux>

**SCM** git `git://git.kernel.org/pub/scm/utils/util-linux/util-linux.git`

### \* **UUID HELPERS**

**Mail** Christoph Hellwig <[hch@lst.de](mailto:hch@lst.de)>

**Reviewer** Andy Shevchenko <[andriy.shevchenko@linux.intel.com](mailto:andriy.shevchenko@linux.intel.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git `git://git.infradead.org/users/hch/uuid.git`

**Files** `include/linux/uuid.h` `include/uapi/linux/uuid.h` `lib/test_uuid.c` `lib/uuid.c`

## \* UVESAFB DRIVER

**Mail** Michal Januszewski <spock@gentoo.org>

**Mailing list** linux-fbdev@vger.kernel.org

**Status** Maintained

**Web-page** <https://github.com/mjanusz/v86d>

**Files** fb/uvesafb drivers/video/fbdev/uvesafb.\*

## \* UX500 CLOCK DRIVERS

**Mail** Ulf Hansson <ulf.hansson@linaro.org>

**Mailing list** linux-clk@vger.kernel.org, linux-arm-kernel@lists.infradead.org (moderated for non-subscribers)

**Status** Maintained

**Files** drivers/clk/ux500/

## \* VF610 NAND DRIVER

**Mail** Stefan Agner <stefan@agner.ch>

**Mailing list** linux-mtd@lists.infradead.org

**Status** Supported

**Files** drivers/mtd/nand/raw/vf610\_nfc.c

## \* VFAT/FAT/MSDOS FILESYSTEM

**Mail** OGAWA Hirofumi <hirofumi@mail.parknet.co.jp>

**Status** Maintained

**Files** filesystems/vfat fs/fat/

## \* VFIO DRIVER

**Mail** Alex Williamson <alex.williamson@redhat.com>

**Reviewer** Cornelia Huck <cohuck@redhat.com>

**Mailing list** kvm@vger.kernel.org

**Status** Maintained

**SCM** git://github.com/awilliam/linux-vfio.git

**Files** driver-api/vfio drivers/vfio/ include/linux/vfio.h include/uapi/linux/vfio.h

## \* VFIO MEDIATED DEVICE DRIVERS

**Mail** Kirti Wankhede <[kwankhede@nvidia.com](mailto:kwankhede@nvidia.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Maintained

**Files** driver-api/vfio-mediated-device drivers/vfio/mdev/ include/linux/mdev.h samples/vfio-mdev/

## \* VFIO PLATFORM DRIVER

**Mail** Eric Auger <[eric.auger@redhat.com](mailto:eric.auger@redhat.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Maintained

**Files** drivers/vfio/platform/

## \* VGA\_SWITCHEROO

**Reviewer** Lukas Wunner <[lukas@wunner.de](mailto:lukas@wunner.de)>

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** gpu/vga-switcheroo drivers/gpu/vga/vga\_switcheroo.c  
include/linux/vga\_switcheroo.h

## \* VIA RHINE NETWORK DRIVER

**Status** Orphan

**Files** drivers/net/ethernet/via/via-rhine.c

## \* VIA SD/MMC CARD CONTROLLER DRIVER

**Mail** Bruce Chang <[brucechang@via.com.tw](mailto:brucechang@via.com.tw)>, Harald Welte <[HaraldWelte@viatech.com](mailto:HaraldWelte@viatech.com)>

**Status** Maintained

**Files** drivers/mmc/host/via-sdmmc.c

## \* VIA UNICHROME(PRO)/CHROME9 FRAMEBUFFER DRIVER

**Mail** Florian Tobias Schandinat <FlorianSchandinat@gmx.de>

**Mailing list** linux-fbdev@vger.kernel.org

**Status** Maintained

**Files** drivers/video/fbdev/via/ include/linux/via-core.h  
include/linux/via-gpio.h include/linux/via\_i2c.h

## \* VIA VELOCITY NETWORK DRIVER

**Mail** Francois Romieu <romieu@fr.zoreil.com>

**Mailing list** netdev@vger.kernel.org

**Status** Maintained

**Files** drivers/net/ethernet/via/via-velocity.\*

## \* VICODEC VIRTUAL CODEC DRIVER

**Mail** Hans Verkuil <hverkuil-cisco@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/test-drivers/vicodec/\*

## \* VIDEO I2C POLLING DRIVER

**Mail** Matt Ranostay <matt.ranostay@konsulko.com>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Files** drivers/media/i2c/video-i2c.c

## \* VIDEO MULTIPLEXER DRIVER

**Mail** Philipp Zabel <p.zabel@pengutronix.de>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Files** drivers/media/platform/video-mux.c

### \* VIDEOBUF2 FRAMEWORK

**Mail** Paweł Osciak <[pawel@osciak.com](mailto:pawel@osciak.com)>, Marek Szyprowski <[m.szyprowski@samsung.com](mailto:m.szyprowski@samsung.com)>, Kyungmin Park <[kyungmin.park@samsung.com](mailto:kyungmin.park@samsung.com)>

**Reviewer** Tomasz Figa <[tfiga@chromium.org](mailto:tfiga@chromium.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Files** drivers/media/common/videobuf2/\* include/media/  
videobuf2-\*

### \* VIMC VIRTUAL MEDIA CONTROLLER DRIVER

**Mail** Helen Koike <[helen.koike@collabora.com](mailto:helen.koike@collabora.com)>

**Reviewer** Shuah Khan <[skhan@linuxfoundation.org](mailto:skhan@linuxfoundation.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/test-drivers/vimc/\*

### \* VIRT LIB

**Mail** Alex Williamson <[alex.williamson@redhat.com](mailto:alex.williamson@redhat.com)>, Paolo Bonzini <[pbonzini@redhat.com](mailto:pbonzini@redhat.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Files** virt/lib/

### \* VIRTIO AND VHOST VSOCK DRIVER

**Mail** Stefan Hajnoczi <[stefanha@redhat.com](mailto:stefanha@redhat.com)>, Stefano Garzarella <[sgarzare@redhat.com](mailto:sgarzare@redhat.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org), [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/vsockmon.c drivers/vhost/vsock.c include/linux/virtio\_vsock.h include/uapi/linux/virtio\_vsock.h

```
include/uapi/linux/vm_sockets_diag.h include/uapi/linux/
vsockmon.h net/vmw_vsock/af_vsock_tap.c net/vmw_vsock/
diag.c net/vmw_vsock/virtio_transport.c net/vmw_vsock/
virtio_transport_common.c net/vmw_vsock/vsock_loopback.c
tools/testing/vsock/
```

## \* VIRTIO BLOCK AND SCSI DRIVERS

**Mail** Michael S. Tsirkin <[mst@redhat.com](mailto:mst@redhat.com)>, Jason Wang <[jasowang@redhat.com](mailto:jasowang@redhat.com)>

**Reviewer** Paolo Bonzini <[pbonzini@redhat.com](mailto:pbonzini@redhat.com)>, Stefan Hajnoczi <[stefanha@redhat.com](mailto:stefanha@redhat.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**Files** drivers/block/virtio\_blk.c drivers/scsi/virtio\_scsi.c drivers/vhost/scsi.c include/uapi/linux/virtio\_blk.h include/uapi/linux/virtio\_scsi.h

## \* VIRTIO CONSOLE DRIVER

**Mail** Amit Shah <[amit@kernel.org](mailto:amit@kernel.org)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**Files** drivers/char/virtio\_console.c include/linux/virtio\_console.h include/uapi/linux/virtio\_console.h

## \* VIRTIO CORE AND NET DRIVERS

**Mail** Michael S. Tsirkin <[mst@redhat.com](mailto:mst@redhat.com)>, Jason Wang <[jasowang@redhat.com](mailto:jasowang@redhat.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/virtio/ drivers/block/virtio\_blk.c drivers/crypto/virtio/ drivers/net/virtio\_net.c drivers/vdpa/ drivers/virtio/ include/linux/vdpa.h include/linux/virtio\*.h include/uapi/linux/virtio\_\*.h tools/virtio/

### \* VIRTIO BALLOON

**Mail** Michael S. Tsirkin <[mst@redhat.com](mailto:mst@redhat.com)>, David Hildenbrand <[david@redhat.com](mailto:david@redhat.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**Files** drivers/virtio/virtio\_balloon.c include/uapi/linux/virtio\_balloon.h include/linux/balloon\_compaction.h mm/balloon\_compaction.c

### \* VIRTIO CRYPTO DRIVER

**Mail** Goglei <[arei.goglei@huawei.com](mailto:arei.goglei@huawei.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org), [linux-crypto@vger.kernel.org](mailto:linux-crypto@vger.kernel.org)

**Status** Maintained

**Files** drivers/crypto/virtio/ include/uapi/linux/virtio\_crypto.h

### \* VIRTIO DRIVERS FOR S390

**Mail** Cornelia Huck <[cohuck@redhat.com](mailto:cohuck@redhat.com)>, Halil Pasic <[pasic@linux.ibm.com](mailto:pasic@linux.ibm.com)>

**Mailing list** [linux-s390@vger.kernel.org](mailto:linux-s390@vger.kernel.org), [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org), [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org)

**Status** Supported

**Files** arch/s390/include/uapi/asm/virtio-ccw.h drivers/s390/virtio/

### \* VIRTIO FILE SYSTEM

**Mail** Vivek Goyal <[vgoyal@redhat.com](mailto:vgoyal@redhat.com)>, Stefan Hajnoczi <[stefanha@redhat.com](mailto:stefanha@redhat.com)>, Miklos Szeredi <[miklos@szeredi.hu](mailto:miklos@szeredi.hu)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org), [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Supported

**Web-page** <https://virtio-fs.gitlab.io/>

**Files** filesystems/virtiofs fs/fuse/virtio\_fs.c include/uapi/linux/virtio\_fs.h

## \* VIRTIO GPU DRIVER

**Mail** David Airlie <[airlied@linux.ie](mailto:airlied@linux.ie)>, Gerd Hoffmann <[kraxel@redhat.com](mailto:kraxel@redhat.com)>

**Mailing list** [dri-devel@lists.freedesktop.org](mailto:dri-devel@lists.freedesktop.org), [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**SCM** git <git://anongit.freedesktop.org/drm/drm-misc>

**Files** drivers/gpu/drm/virtio/ include/uapi/linux/virtio\_gpu.h

## \* VIRTIO HOST (VHOST)

**Mail** “Michael S. Tsirkin” <[mst@redhat.com](mailto:mst@redhat.com)>, Jason Wang <[jasowang@redhat.com](mailto:jasowang@redhat.com)>

**Mailing list** [kvm@vger.kernel.org](mailto:kvm@vger.kernel.org), [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/mst/vhost.git>

**Files** drivers/vhost/ include/linux/vhost\_iotlb.h include/uapi/linux/vhost.h

## \* VIRTIO INPUT DRIVER

**Mail** Gerd Hoffmann <[kraxel@redhat.com](mailto:kraxel@redhat.com)>

**Status** Maintained

**Files** drivers/virtio/virtio\_input.c include/uapi/linux/virtio\_input.h

## \* VIRTIO IOMMU DRIVER

**Mail** Jean-Philippe Brucker <[jean-philippe@linaro.org](mailto:jean-philippe@linaro.org)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Maintained

**Files** drivers/iommu/virtio-iommu.c include/uapi/linux/virtio\_iommu.h

### \* VIRTIO MEM DRIVER

**Mail** David Hildenbrand <david@redhat.com>

**Mailing list** virtualization@lists.linux-foundation.org

**Status** Maintained

**Files** drivers/virtio/virtio\_mem.c                            include/uapi/linux/  
    virtio\_mem.h

### \* VIRTUAL BOX GUEST DEVICE DRIVER

**Mail** Hans de Goede <hdegoede@redhat.com>, Arnd Bergmann <arnd@arndb.de>, Greg Kroah-Hartman <gregkh@linuxfoundation.org>

**Status** Maintained

**Files** drivers/virt/vboxguest/                            include/linux/vbox\_utils.h  
    include/uapi/linux/vbox\*.h

### \* VIRTUAL BOX SHARED FOLDER VFS DRIVER

**Mail** Hans de Goede <hdegoede@redhat.com>

**Mailing list** linux-fsdevel@vger.kernel.org

**Status** Maintained

**Files** fs/vboxsf/\*

### \* VIRTUAL SERIO DEVICE DRIVER

**Mail** Stephen Chandler Paul <thatslyude@gmail.com>

**Status** Maintained

**Files** drivers/input/serio/userio.c include/uapi/linux/userio.h

### \* VIVID VIRTUAL VIDEO DRIVER

**Mail** Hans Verkuil <hverkuil@xs4all.nl>

**Mailing list** linux-media@vger.kernel.org

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git git://linuxtv.org/media\_tree.git

**Files** drivers/media/test-drivers/vivid/\*

## \* VLYNQ BUS

**Mail** Florian Fainelli <[f.fainelli@gmail.com](mailto:f.fainelli@gmail.com)>

**Mailing list** [openwrt-devel@lists.openwrt.org](mailto:openwrt-devel@lists.openwrt.org) (subscribers-only)

**Status** Maintained

**Files** drivers/vlynq/vlynq.c include/linux/vlynq.h

## \* VME SUBSYSTEM

**Mail** Martyn Welch <[martyn@welchs.me.uk](mailto:martyn@welchs.me.uk)>, Manohar Vanga <[manohar.vanga@gmail.com](mailto:manohar.vanga@gmail.com)>, Greg Kroah-Hartman <[gregkh@linuxfoundation.org](mailto:gregkh@linuxfoundation.org)>

**Mailing list** [devel@driverdev.osuosl.org](mailto:devel@driverdev.osuosl.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/gregkh/char-misc.git>

**Files** driver-api/vme drivers/staging/vme/ drivers/vme/ include/linux/vme\*

## \* VMWARE BALLOON DRIVER

**Mail** Nadav Amit <[namit@vmware.com](mailto:namit@vmware.com)>, “VMware, Inc.” <[pv-drivers@vmware.com](mailto:pv-drivers@vmware.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** drivers/misc/vmw\_balloon.c

## \* VMWARE HYPERVISOR INTERFACE

**Mail** Deep Shah <[sdeep@vmware.com](mailto:sdeep@vmware.com)>, “VMware, Inc.” <[pv-drivers@vmware.com](mailto:pv-drivers@vmware.com)>

**Mailing list** [virtualization@lists.linux-foundation.org](mailto:virtualization@lists.linux-foundation.org)

**Status** Supported

**Files** arch/x86/include/asm/vmware.h arch/x86/kernel/cpu/vmware.c

#### \* VMWARE PVRDMA DRIVER

**Mail** Adit Ranadive <[aditr@vmware.com](mailto:aditr@vmware.com)>, VMware PV-Drivers <[pv-drivers@vmware.com](mailto:pv-drivers@vmware.com)>

**Mailing list** [linux-rdma@vger.kernel.org](mailto:linux-rdma@vger.kernel.org)

## Status Maintained

## Files drivers/infiniband/hw/vmw\_pvrdma/

## \* VMware PVSCSI driver

**Mail** Jim Gill <jgill@vmware.com>, VMware PV-Drivers <pv-drivers@vmware.com>

**Mailing list** linux-scsi@vger.kernel.org

## Status Maintained

**Files** drivers/scsi/vmw\_pvscsi.c drivers/scsi/vmw\_pvscsi.h

## \* VMWARE VIRTUAL PTP CLOCK DRIVER

**Mail** Vivek Thampi <[vithampi@vmware.com](mailto:vithampi@vmware.com)>, “VMware, Inc.” <[pv-drivers@vmware.com](mailto:pv-drivers@vmware.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

## Status Supported

## Files drivers/ptp/ptp\_vmw.c

## \* VMWARE VMMOUSE SUBDRIVER

**Mail** “VMware Graphics” <[linux-graphics-maintainer@vmware.com](mailto:linux-graphics-maintainer@vmware.com)>,  
“VMware, Inc.” <[pv-drivers@vmware.com](mailto:pv-drivers@vmware.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/mouse/vmmouse.c      drivers/input/mouse/vmmouse.h

#### \* VMWARE VMXNET3 ETHERNET DRIVER

**Mail** Ronak Doshi <doshir@vmware.com>, “VMware, Inc.” <pv-drivers@vmware.com>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

## Status Maintained

## Files drivers/net/vmxnet3/

## \* VOCORE VOCORE2 BOARD

**Mail** Harvey Hunt <[harveyhuntnexus@gmail.com](mailto:harveyhuntnexus@gmail.com)>

**Mailing list** [linux-mips@vger.kernel.org](mailto:linux-mips@vger.kernel.org)

**Status** Maintained

**Files** arch/mips/boot/dts/ralink/vocore2.dts

## \* VOLTAGE AND CURRENT REGULATOR FRAMEWORK

**Mail** Liam Girdwood <[lgirdwood@gmail.com](mailto:lgirdwood@gmail.com)>, Mark Brown <[broonie@kernel.org](mailto:broonie@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.slimlogic.co.uk/?p=48>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/broonie/regulator.git>

**Files** Documentation/devicetree/bindings/regulator/  
Documentation/power/regulator/drivers/regulator/include/  
dt-bindings/regulator/include/linux/regulator/

**Content regex** regulator\_get\_optional

## \* VRF

**Mail** David Ahern <[dsahern@kernel.org](mailto:dsahern@kernel.org)>, Shrijeet Mukherjee <[shrijeet@gmail.com](mailto:shrijeet@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** networking/vrf drivers/net/vrf.c

## \* VSPRINTF

**Mail** Petr Mladek <[pmladek@suse.com](mailto:pmladek@suse.com)>, Steven Rostedt <[rostedt@goodmis.org](mailto:rostedt@goodmis.org)>, Sergey Senozhatsky <[sergey.senozhatsky@gmail.com](mailto:sergey.senozhatsky@gmail.com)>

**Reviewer** Andy Shevchenko <[andriy.shevchenko@linux.intel.com](mailto:andriy.shevchenko@linux.intel.com)>, Rasmus Villemoes <[linux@rasmusvillemoes.dk](mailto:linux@rasmusvillemoes.dk)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/pmladek/printk.git>

**Files** core-api/printk-formats lib/test\_printf.c lib/vsprintf.c

\* **VT1211 HARDWARE MONITOR DRIVER**

**Mail** Juerg Haefliger <[juergh@gmail.com](mailto:juergh@gmail.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/vt1211 drivers/hwmon/vt1211.c

\* **VT8231 HARDWARE MONITOR DRIVER**

**Mail** Roger Lucas <[vt8231@hiddenengine.co.uk](mailto:vt8231@hiddenengine.co.uk)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/vt8231.c

\* **VUB300 USB to SDIO/SD/MMC bridge chip**

**Mailing list** [linux-mmc@vger.kernel.org](mailto:linux-mmc@vger.kernel.org)

**Status** Orphan

**Files** drivers/mmc/host/vub300.c

\* **W1 DALLAS' S 1-WIRE BUS**

**Mail** Evgeniy Polyakov <[zbr@ioremap.net](mailto:zbr@ioremap.net)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/w1/ Documentation/w1/ drivers/w1/ include/linux/w1.h

\* **W83791D HARDWARE MONITORING DRIVER**

**Mail** Marc Hulsman <[m.hulsman@tudelft.nl](mailto:m.hulsman@tudelft.nl)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/w83791d drivers/hwmon/w83791d.c

### \* W83793 HARDWARE MONITORING DRIVER

**Mail** Rudolf Marek <[r.marek@assembler.cz](mailto:r.marek@assembler.cz)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** hwmon/w83793 drivers/hwmon/w83793.c

### \* W83795 HARDWARE MONITORING DRIVER

**Mail** Jean Delvare <[jdelvare@suse.com](mailto:jdelvare@suse.com)>

**Mailing list** [linux-hwmon@vger.kernel.org](mailto:linux-hwmon@vger.kernel.org)

**Status** Maintained

**Files** drivers/hwmon/w83795.c

### \* W83L51xD SD/MMC CARD INTERFACE DRIVER

**Mail** Pierre Ossman <[pierre@ossman.eu](mailto:pierre@ossman.eu)>

**Status** Maintained

**Files** drivers/mmc/host/wbsd.\*

### \* WACOM PROTOCOL 4 SERIAL TABLETS

**Mail** Julian Squires <[julian@cipht.net](mailto:julian@cipht.net)>, Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/input/tablet/wacom\_serial4.c

### \* WATCHDOG DEVICE DRIVERS

**Mail** Wim Van Sebroeck <[wim@linux-watchdog.org](mailto:wim@linux-watchdog.org)>, Guenter Roeck <[linux@roeck-us.net](mailto:linux@roeck-us.net)>

**Mailing list** [linux-watchdog@vger.kernel.org](mailto:linux-watchdog@vger.kernel.org)

**Status** Maintained

**Web-page** <http://www.linux-watchdog.org/>

**SCM** git git://[www.linux-watchdog.org/linux-watchdog.git](http://www.linux-watchdog.org/linux-watchdog.git)

**Files** Documentation/devicetree/bindings/watchdog/  
Documentation/watchdog/ drivers/watchdog/ include/linux/  
watchdog.h include/uapi/linux/watchdog.h

## \* WHISKEYCOVE PMIC GPIO DRIVER

**Mail** Kuppuswamy Sathyanarayanan <[sathyanarayanan.kuppuswamy@linux.intel.com](mailto:sathyanarayanan.kuppuswamy@linux.intel.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-wcove.c

## \* WHWAVE RTC DRIVER

**Mail** Dianlong Li <[long17.cool@163.com](mailto:long17.cool@163.com)>

**Mailing list** [linux-rtc@vger.kernel.org](mailto:linux-rtc@vger.kernel.org)

**Status** Maintained

**Files** drivers/rtc/rtc-sd3078.c

## \* WIIMOTE HID DRIVER

**Mail** David Herrmann <[dh.herrmann@googlemail.com](mailto:dh.herrmann@googlemail.com)>

**Mailing list** [linux-input@vger.kernel.org](mailto:linux-input@vger.kernel.org)

**Status** Maintained

**Files** drivers/hid/hid-wiimote\*

## \* WILOCITY WIL6210 WIRELESS DRIVER

**Mail** Maya Erez <[merez@codeaurora.org](mailto:merez@codeaurora.org)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org), [wil6210@qti.qualcomm.com](mailto:wil6210@qti.qualcomm.com)

**Status** Supported

**Web-page** <https://wireless.wiki.kernel.org/en/users/Drivers/wil6210>

**Files** drivers/net/wireless/ath/wil6210/

## \* WIMAX STACK

**Mail** Inaky Perez-Gonzalez <[inaky.perez-gonzalez@intel.com](mailto:inaky.perez-gonzalez@intel.com)>, [linux-wimax@intel.com](mailto:linux-wimax@intel.com)

**Mailing list** [wimax@linuxwimax.org](mailto:wimax@linuxwimax.org) (subscribers-only)

**Status** Supported

**Web-page** <http://linuxwimax.org>

**Files** admin-guide/wimax/wimax include/linux/wimax/debug.h  
include/net/wimax.h include/uapi/linux/wimax.h net/wimax/

### \* WINBOND CIR DRIVER

**Mail** David Härdeman <[david@hardeman.nu](mailto:david@hardeman.nu)>

**Status** Maintained

**Files** drivers/media/rc/winbond-cir.c

### \* WINSYSTEMS EBC-C384 WATCHDOG DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-watchdog@vger.kernel.org](mailto:linux-watchdog@vger.kernel.org)

**Status** Maintained

**Files** drivers/watchdog/ebc-c384\_wdt.c

### \* WINSYSTEMS WS16C48 GPIO DRIVER

**Mail** William Breathitt Gray <[vilhelm.gray@gmail.com](mailto:vilhelm.gray@gmail.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** drivers/gpio/gpio-ws16c48.c

### \* WIREGUARD SECURE NETWORK TUNNEL

**Mail** Jason A. Donenfeld <[Jason@zx2c4.com](mailto:Jason@zx2c4.com)>

**Mailing list** [wireguard@lists.zx2c4.com](mailto:wireguard@lists.zx2c4.com), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/wireguard/ tools/testing/selftests/  
wireguard/

### \* WISTRON LAPTOP BUTTON DRIVER

**Mail** Miloslav Trmac <[mitr@volny.cz](mailto:mitr@volny.cz)>

**Status** Maintained

**Files** drivers/input/misc/wistron\_btns.c

### \* WL3501 WIRELESS PCMCIA CARD DRIVER

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org)

**Status** Odd fixes

**Files** drivers/net/wireless/wl3501\*

### \* WOLFSON MICROELECTRONICS DRIVERS

**Mailing list** [patches@opensource.cirrus.com](mailto:patches@opensource.cirrus.com)

**Status** Supported

**Web-page** <https://github.com/CirrusLogic/linux-drivers/wiki>

**SCM** git <https://github.com/CirrusLogic/linux-drivers.git>

**Files** Documentation/devicetree/bindings/extcon/wlf\_arizona.  
yaml Documentation/devicetree/bindings/mfd/wlf\_arizona.  
yaml Documentation/devicetree/bindings/mfd/wm831x.  
txt Documentation/devicetree/bindings/regulator/wlf\_arizona.yaml Documentation/devicetree/bindings/sound/wlf\_arizona.yaml Documentation/hwmon/wm83???.rst arch/arm/mach-s3c64xx/mach-crag6410\* drivers/clk/clk-wm83\*.c  
drivers/extcon/extcon-arizona.c drivers/gpio/gpio-\*wm\*.c  
drivers/gpio/gpio-arizona.c drivers/hwmon/wm83??-hwmon.c  
drivers/input/misc/wm831x-on.c drivers/input/touchscreen/wm831x-ts.c drivers/input/touchscreen/wm97\*.c drivers/leds/leds-wm83\*.c drivers/mfd/arizona\* drivers/mfd/cs47l24\* drivers/mfd/wm\*.c drivers/power/supply/wm83\*.c  
drivers/regulator/arizona\* drivers/regulator/wm8\*.c  
drivers/rtc/rtc-wm83\*.c drivers/video/backlight/wm83\*\_bl.c  
drivers/watchdog/wm83\*\_wdt.c include/linux/mfd/arizona/include/linux/mfd/wm831x/ include/linux/mfd/wm8350/include/linux/mfd/wm8400\* include/linux/regulator/arizona\* include/linux/wm97xx.h include/sound/wm????.h  
sound/soc/codecs/arizona.? sound/soc/codecs/cs47l24\*  
sound/soc/codecs/wm\*

### \* WORKQUEUE

**Mail** Tejun Heo <[tj@kernel.org](mailto:tj@kernel.org)>

**Reviewer** Lai Jiangshan <[jiangshanlai@gmail.com](mailto:jiangshanlai@gmail.com)>

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tj/wq.git>

**Files** core-api/workqueue include/linux/workqueue.h kernel/workqueue.c

### \* X-POWERS AXP288 PMIC DRIVERS

**Mail** Hans de Goede <[hdegoede@redhat.com](mailto:hdegoede@redhat.com)>

**Status** Maintained

**Files** drivers/acpi/pmic/intel\_pmic\_xpower.c

**Regex** axp288

### \* X-POWERS MULTIFUNCTION PMIC DEVICE DRIVERS

**Mail** Chen-Yu Tsai <[wens@csie.org](mailto:wens@csie.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Regex** axp[128]

### \* X.25 NETWORK LAYER

**Mail** Andrew Hendry <[andrew.hendry@gmail.com](mailto:andrew.hendry@gmail.com)>

**Mailing list** [linux-x25@vger.kernel.org](mailto:linux-x25@vger.kernel.org)

**Status** Odd Fixes

**Files** Documentation/networking/x25\* include/net/x25\* net/x25/

### \* X86 ARCHITECTURE (32-BIT AND 64-BIT)

**Mail** Thomas Gleixner <[tglx@linutronix.de](mailto:tglx@linutronix.de)>, Ingo Molnar <[mingo@redhat.com](mailto:mingo@redhat.com)>, Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>, [x86@kernel.org](mailto:x86@kernel.org)

**Reviewer** "H. Peter Anvin" <[hpa@zytor.com](mailto:hpa@zytor.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
x86/core

**Files** Documentation/devicetree/bindings/x86/ Documentation/  
x86/arch/x86/

### \* X86 ENTRY CODE

**Mail** Andy Lutomirski <[luto@kernel.org](mailto:luto@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> x86/asm

**Files** arch/x86/entry/

### \* X86 MCE INFRASTRUCTURE

**Mail** Tony Luck <[tony.luck@intel.com](mailto:tony.luck@intel.com)>, Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>

**Mailing list** [linux-edac@vger.kernel.org](mailto:linux-edac@vger.kernel.org)

**Status** Maintained

**Files** arch/x86/kernel/cpu/mce/\*

### \* X86 MICROCODE UPDATE SUPPORT

**Mail** Borislav Petkov <[bp@alien8.de](mailto:bp@alien8.de)>

**Status** Maintained

**Files** arch/x86/kernel/cpu/microcode/\*

### \* X86 MM

**Mail** Dave Hansen <[dave.hansen@linux.intel.com](mailto:dave.hansen@linux.intel.com)>, Andy Lutomirski <[luto@kernel.org](mailto:luto@kernel.org)>, Peter Zijlstra <[peterz@infradead.org](mailto:peterz@infradead.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git> x86/mm

**Files** arch/x86/mm/

### \* X86 PLATFORM DRIVERS

**Mail** Darren Hart <[dvhart@infradead.org](mailto:dvhart@infradead.org)>, Andy Shevchenko <[andy@infradead.org](mailto:andy@infradead.org)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org)

**Status** Odd Fixes

**SCM** git <git://git.infradead.org/linux-platform-drivers-x86.git>

**Files** drivers/platform/olpc/ drivers/platform/x86/

### \* X86 PLATFORM DRIVERS - ARCH

**Reviewer** Darren Hart <[dvhart@infradead.org](mailto:dvhart@infradead.org)>, Andy Shevchenko <[andy@infradead.org](mailto:andy@infradead.org)>

**Mailing list** [platform-driver-x86@vger.kernel.org](mailto:platform-driver-x86@vger.kernel.org), [x86@kernel.org](mailto:x86@kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
x86/core

**Files** arch/x86/platform

### \* X86 VDSO

**Mail** Andy Lutomirski <[luto@kernel.org](mailto:luto@kernel.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/tip/tip.git>  
x86/vdso

**Files** arch/x86/entry/vdso/

### \* XARRAY

**Mail** Matthew Wilcox <[willy@infradead.org](mailto:willy@infradead.org)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Supported

**Files** core-api/xarray include/linux/idr.h include/linux/xarray.h  
lib/idr.c lib/xarray.c tools/testing/radix-tree

### \* XBOX DVD IR REMOTE

**Mail** Benjamin Valentin <[benpicco@googlemail.com](mailto:benpicco@googlemail.com)>

**Status** Maintained

**Files** drivers/media/rc/keymaps/rc-xbox-dvd.c drivers/media/  
rc/xbox\_remote.c

## \* XC2028/3028 TUNER DRIVER

**Mail** Mauro Carvalho Chehab <[mchehab@kernel.org](mailto:mchehab@kernel.org)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org>

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** drivers/media/tuners/tuner-xc2028.\*

## \* XDP (eXpress Data Path)

**Mail** Alexei Starovoitov <[ast@kernel.org](mailto:ast@kernel.org)>, Daniel Borkmann <[daniel@iogearbox.net](mailto:daniel@iogearbox.net)>, David S. Miller <[davem@davemloft.net](mailto:davem@davemloft.net)>, Jakub Kicinski <[kuba@kernel.org](mailto:kuba@kernel.org)>, Jesper Dangaard Brouer <[hawk@kernel.org](mailto:hawk@kernel.org)>, John Fastabend <[john.fastabend@gmail.com](mailto:john.fastabend@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Supported

**Files** include/net/xdp.h include/trace/events/xdp.h kernel/bpf/cpumap.c kernel/bpf/devmap.c net/core/xdp.c

**Regex** xdp

**Content regex** xdp

## \* XDP SOCKETS (AF\_XDP)

**Mail** Björn Töpel <[bjorn.topel@intel.com](mailto:bjorn.topel@intel.com)>, Magnus Karlsson <[magnus.karlsson@intel.com](mailto:magnus.karlsson@intel.com)>

**Reviewer** Jonathan Lemon <[jonathan.lemon@gmail.com](mailto:jonathan.lemon@gmail.com)>

**Mailing list** [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org), [bpf@vger.kernel.org](mailto:bpf@vger.kernel.org)

**Status** Maintained

**Files** include/net/xdp\_sock\* include/net/xsk\_buff\_pool.h include/uapi/linux/if\_xdp.h net/xdp/ samples/bpf/xdpsock\* tools/lib/bpf/xsk\*

## \* XEN BLOCK SUBSYSTEM

**Mail** Konrad Rzeszutek Wilk <[konrad.wilk@oracle.com](mailto:konrad.wilk@oracle.com)>, Roger Pau Monné <[roger.pau@citrix.com](mailto:roger.pau@citrix.com)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers)

**Status** Supported

**Files** drivers/block/xen\* drivers/block/xen-blkback/\*

## \* XEN HYPERVISOR ARM

**Mail** Stefano Stabellini <[sstabellini@kernel.org](mailto:sstabellini@kernel.org)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm/include/asm/xen/ arch/arm/xen/

## \* XEN HYPERVISOR ARM64

**Mail** Stefano Stabellini <[sstabellini@kernel.org](mailto:sstabellini@kernel.org)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers)

**Status** Maintained

**Files** arch/arm64/include/asm/xen/ arch/arm64/xen/

## \* XEN HYPERVISOR INTERFACE

**Mail** Boris Ostrovsky <[boris.ostrovsky@oracle.com](mailto:boris.ostrovsky@oracle.com)>, Juergen Gross <[jgross@suse.com](mailto:jgross@suse.com)>

**Reviewer** Stefano Stabellini <[sstabellini@kernel.org](mailto:sstabellini@kernel.org)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers)

**Status** Supported

**SCM** git git://git.kernel.org/pub/scm/linux/kernel/git/xen/tip.git

**Files** Documentation/ABI/stable/sysfs-hypervisor-xen  
Documentation/ABI/testing/sysfs-hypervisor-xen arch/x86/  
include/asm/pvclock-abi.h arch/x86/include/asm/xen/ arch/  
x86/platform/pvh/ arch/x86/xen/ drivers/\*/\*xen-\*front.c  
drivers/xen/ include/uapi/xen/ include/xen/

## \* XEN NETWORK BACKEND DRIVER

**Mail** Wei Liu <[wei.liu@kernel.org](mailto:wei.liu@kernel.org)>, Paul Durrant <[paul@xen.org](mailto:paul@xen.org)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers), [netdev@vger.kernel.org](mailto:netdev@vger.kernel.org)

**Status** Supported

**Files** drivers/net/xen-netback/\*

## \* XEN PCI SUBSYSTEM

**Mail** Konrad Rzeszutek Wilk <[konrad.wilk@oracle.com](mailto:konrad.wilk@oracle.com)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers)

**Status** Supported

**Files** arch/x86/pci/\*xen\* drivers/pci/\*xen\*

## \* XEN PVSCSI DRIVERS

**Mail** Juergen Gross <[jgross@suse.com](mailto:jgross@suse.com)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers), [linux-scsi@vger.kernel.org](mailto:linux-scsi@vger.kernel.org)

**Status** Supported

**Files** drivers/scsi/xen-scsifront.c drivers/xen/xen-scsiback.c  
include/xen/interface/io/vscsiif.h

## \* XEN SOUND FRONTEND DRIVER

**Mail** Oleksandr Andrushchenko <[oleksandr\\_andrushchenko@epam.com](mailto:oleksandr_andrushchenko@epam.com)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers), [alsa-devel@alsa-project.org](mailto:alsa-devel@alsa-project.org) (moderated for non-subscribers)

**Status** Supported

**Files** sound/xen/\*

### \* XEN SWIOTLB SUBSYSTEM

**Mail** Konrad Rzeszutek Wilk <[konrad.wilk@oracle.com](mailto:konrad.wilk@oracle.com)>

**Mailing list** [xen-devel@lists.xenproject.org](mailto:xen-devel@lists.xenproject.org) (moderated for non-subscribers), [iommu@lists.linux-foundation.org](mailto:iommu@lists.linux-foundation.org)

**Status** Supported

**Files** arch/x86/xen/\*swiotlb\* drivers/xen/\*swiotlb\*

### \* XFS FILESYSTEM

**Mail** Darrick J. Wong <[darrick.wong@oracle.com](mailto:darrick.wong@oracle.com)>, [linux-xfs@vger.kernel.org](mailto:linux-xfs@vger.kernel.org)

**Mailing list** [linux-xfs@vger.kernel.org](mailto:linux-xfs@vger.kernel.org)

**Status** Supported

**Web-page** <http://xfs.org/>

**SCM** git <git://git.kernel.org/pub/scm/fs/xfs/xfs-linux.git>

**Files** Documentation/ABI/testing/sysfs-fs-xfs admin-guide/xfs filesystems/xfs-delayed-logging-design filesystems/xfs-self-describing-metadata fs/xfs/ include/uapi/linux/dqblk\_xfs.h include/uapi/linux/fsmap.h

### \* XILINX AXI ETHERNET DRIVER

**Mail** Radhey Shyam Pandey <[radhey.shyam.pandey@xilinx.com](mailto:radhey.shyam.pandey@xilinx.com)>

**Status** Maintained

**Files** drivers/net/ethernet/xilinx/xilinx\_axienet\*

### \* XILINX CAN DRIVER

**Mail** Appana Durga Kedareswara rao <[appana.durga.rao@xilinx.com](mailto:appana.durga.rao@xilinx.com)>

**Reviewer** Naga Sureshkumar Relli <[naga.sureshkumar.relli@xilinx.com](mailto:naga.sureshkumar.relli@xilinx.com)>

**Mailing list** [linux-can@vger.kernel.org](mailto:linux-can@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/net/can/xilinx\_can.txt drivers/net/can/xilinx\_can.c

## \* XILINX SD-FEC IP CORES

**Mail** Derek Kiernan <[derek.kiernan@xilinx.com](mailto:derek.kiernan@xilinx.com)>, Dragan Cvetic <[dragan.cvetic@xilinx.com](mailto:dragan.cvetic@xilinx.com)>

**Status** Maintained

**Files** Documentation/devicetree/bindings/misc/xlnx\_sd-fec.txt  
misc-devices/xilinx\_sdfec drivers/misc/Kconfig drivers/misc/  
Makefile drivers/misc/xilinx\_sdfec.c include/uapi/misc/  
xilinx\_sdfec.h

## \* XILINX UARTLITE SERIAL DRIVER

**Mail** Peter Korsgaard <[jacmet@sunsite.dk](mailto:jacmet@sunsite.dk)>

**Mailing list** [linux-serial@vger.kernel.org](mailto:linux-serial@vger.kernel.org)

**Status** Maintained

**Files** drivers/tty/serial/uartlite.c

## \* XILINX VIDEO IP CORES

**Mail** Hyun Kwon <[hyun.kwon@xilinx.com](mailto:hyun.kwon@xilinx.com)>, Laurent Pinchart <[laurent.pinchart@ideasonboard.com](mailto:laurent.pinchart@ideasonboard.com)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Supported

**SCM** git [git://linuxtv.org/media\\_tree.git](git://linuxtv.org/media_tree.git)

**Files** Documentation/devicetree/bindings/media/xilinx/  
drivers/media/platform/xilinx/ include/uapi/linux/  
xilinx-v4l2-controls.h

## \* XILLYBUS DRIVER

**Mail** Eli Billauer <[eli.billauer@gmail.com](mailto:eli.billauer@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Supported

**Files** drivers/char/xillybus/

### \* XLP9XX I2C DRIVER

**Mail** George Cherian <[gcherian@marvell.com](mailto:gcherian@marvell.com)>

**Mailing list** [linux-i2c@vger.kernel.org](mailto:linux-i2c@vger.kernel.org)

**Status** Supported

**Web-page** <http://www.marvell.com>

**Files** Documentation/devicetree/bindings/i2c/i2c-xlp9xx.txt  
drivers/i2c/busses/i2c-xlp9xx.c

### \* XRA1403 GPIO EXPANDER

**Mail** Nandor Han <[nandor.han@ge.com](mailto:nandor.han@ge.com)>, Semi Malinen  
<[semi.malinen@ge.com](mailto:semi.malinen@ge.com)>

**Mailing list** [linux-gpio@vger.kernel.org](mailto:linux-gpio@vger.kernel.org)

**Status** Maintained

**Files** Documentation/devicetree/bindings/gpio/gpio-xra1403.txt  
drivers/gpio/gpio-xra1403.c

### \* XTENSA XTFPGA PLATFORM SUPPORT

**Mail** Max Filippov <[jcmvbkb@gmail.com](mailto:jcmvbkb@gmail.com)>

**Mailing list** [linux-xtensa@linux-xtensa.org](mailto:linux-xtensa@linux-xtensa.org)

**Status** Maintained

**Files** drivers/spi/spi-xtensa-xtfpga.c sound/soc/xtensa/  
xtfpga-i2s.c

### \* YAM DRIVER FOR AX.25

**Mail** Jean-Paul Roubelat <[jpr@f6fbb.org](mailto:jpr@f6fbb.org)>

**Mailing list** [linux-hams@vger.kernel.org](mailto:linux-hams@vger.kernel.org)

**Status** Maintained

**Files** drivers/net/hamradio/yam\* include/linux/yam.h

### \* YAMA SECURITY MODULE

**Mail** Kees Cook <[keescook@chromium.org](mailto:keescook@chromium.org)>

**Status** Supported

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/kees/linux.git>  
yama/tip

**Files** admin-guide/LSM/Yama security/yama/

### \* YEALINK PHONE DRIVER

**Mail** Henk Vergonet <[Henk.Vergonet@gmail.com](mailto:Henk.Vergonet@gmail.com)>

**Mailing list** [usbb2k-api-dev@nongnu.org](mailto:usbb2k-api-dev@nongnu.org)

**Status** Maintained

**Files** input/devices/yealink drivers/input/misc/yealink.\*

### \* Z8530 DRIVER FOR AX.25

**Mail** Joerg Reuter <[jreuter@yaina.de](mailto:jreuter@yaina.de)>

**Mailing list** [linux-hams@vger.kernel.org](mailto:linux-hams@vger.kernel.org)

**Status** Maintained

**Web-page** <http://yaina.de/jreuter/> <http://www.qsl.net/dl1bke/>

**Files** networking/z8530drv drivers/net/hamradio/\*scc.c drivers/  
net/hamradio/z8530.h

### \* ZBUD COMPRESSED PAGE ALLOCATOR

**Mail** Seth Jennings <[sjenning@redhat.com](mailto:sjenning@redhat.com)>, Dan Streetman  
<[ddstreet@ieee.org](mailto:ddstreet@ieee.org)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** include/linux/zbud.h mm/zbud.c

### \* ZD1211RW WIRELESS DRIVER

**Mail** Daniel Drake <[dsd@gentoo.org](mailto:dsd@gentoo.org)>, Ulrich Kunitz <[kune@deinetaler.de](mailto:kune@deinetaler.de)>

**Mailing list** [linux-wireless@vger.kernel.org](mailto:linux-wireless@vger.kernel.org),  
[devs@lists.sourceforge.net](mailto:devs@lists.sourceforge.net) (subscribers-only) zd1211-

**Status** Maintained

**Web-page** <http://zd1211.ath.cx/wiki/DriverRewrite>

**Files** drivers/net/wireless/zydas/zd1211rw/

### \* ZD1301 MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org/> <http://palosaari.fi/linux/>

**Patchwork** <https://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/usb/dvb-usb-v2/zd1301\*

### \* ZD1301\_DEMOD MEDIA DRIVER

**Mail** Antti Palosaari <[crophe@iki.fi](mailto:crophe@iki.fi)>

**Mailing list** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status** Maintained

**Web-page** <https://linuxtv.org/> <http://palosaari.fi/linux/>

**Patchwork** <https://patchwork.linuxtv.org/project/linux-media/list/>

**Files** drivers/media/dvb-frontends/zd1301\_demod\*

### \* ZHAOXIN PROCESSOR SUPPORT

**Mail** Tony W Wang-oc <[TonyWWang-oc@zhaoxin.com](mailto:TonyWWang-oc@zhaoxin.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** arch/x86/kernel/cpu/zhaoxin.c

### \* ZONEFS FILESYSTEM

**Mail** Damien Le Moal <[damien.lemoal@wdc.com](mailto:damien.lemoal@wdc.com)>, Naohiro Aota <[naohiro.aota@wdc.com](mailto:naohiro.aota@wdc.com)>

**Reviewer** Johannes Thumshirn <[jth@kernel.org](mailto:jth@kernel.org)>

**Mailing list** [linux-fsdevel@vger.kernel.org](mailto:linux-fsdevel@vger.kernel.org)

**Status** Maintained

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/dlemoal/zonefs.git>

**Files** filesystems/zonefs/fs/zonefs/

## \* ZPOOL COMPRESSED PAGE STORAGE API

**Mail** Dan Streetman <[ddstreet@ieee.org](mailto:ddstreet@ieee.org)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** `include/linux/zpool.h` `mm/zpool.c`

## \* ZRAM COMPRESSED RAM BLOCK DEVICE DRVIER

**Mail** Minchan Kim <[minchan@kernel.org](mailto:minchan@kernel.org)>, Nitin Gupta <[ngupta@vflare.org](mailto:ngupta@vflare.org)>

**Reviewer** Sergey Senozhatsky <[sergey.senozhatsky.work@gmail.com](mailto:sergey.senozhatsky.work@gmail.com)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Maintained

**Files** `admin-guide/blockdev/zram` `drivers/block/zram/`

## \* ZS DECSTATION Z85C30 SERIAL DRIVER

**Mail** “Maciej W. Rozycki” <[macro@linux-mips.org](mailto:macro@linux-mips.org)>

**Status** Maintained

**Files** `drivers/tty/serial/zs.*`

## \* ZSMALLOC COMPRESSED SLAB MEMORY ALLOCATOR

**Mail** Minchan Kim <[minchan@kernel.org](mailto:minchan@kernel.org)>, Nitin Gupta <[ngupta@vflare.org](mailto:ngupta@vflare.org)>

**Reviewer** Sergey Senozhatsky <[sergey.senozhatsky.work@gmail.com](mailto:sergey.senozhatsky.work@gmail.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** `vm/zsmalloc` `include/linux/zsmalloc.h` `mm/zsmalloc.c`

## \* ZSWAP COMPRESSED SWAP CACHING

**Mail** Seth Jennings <[sjenning@redhat.com](mailto:sjenning@redhat.com)>, Dan Streetman <[ddstreet@ieee.org](mailto:ddstreet@ieee.org)>, Vitaly Wool <[vitaly.wool@konsulko.com](mailto:vitaly.wool@konsulko.com)>

**Mailing list** [linux-mm@kvack.org](mailto:linux-mm@kvack.org)

**Status** Maintained

**Files** `mm/zswap.c`

### \* THE REST

**Mail** Linus Torvalds <[torvalds@linux-foundation.org](mailto:torvalds@linux-foundation.org)>

**Mailing list** [linux-kernel@vger.kernel.org](mailto:linux-kernel@vger.kernel.org)

**Status** Buried alive in reporters

**Patchwork** <http://patchwork.kernel.org/project/LKML/list/>

**SCM** git <git://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git>

**Files** \* \*/

These are some overall technical guides that have been put here for now for lack of a better place.



---

CHAPTER  
TWENTYTHREE

---

## APPLYING PATCHES TO THE LINUX KERNEL

**Original by:** Jesper Juhl, August 2005

---

**Note:** This document is obsolete. In most cases, rather than using patch manually, you'll almost certainly want to look at using Git instead.

---

A frequently asked question on the Linux Kernel Mailing List is how to apply a patch to the kernel or, more specifically, what base kernel a patch for one of the many trees/branches should be applied to. Hopefully this document will explain this to you.

In addition to explaining how to apply and revert patches, a brief description of the different kernel trees (and examples of how to apply their specific patches) is also provided.

### \* What is a patch?

A patch is a small text document containing a delta of changes between two different versions of a source tree. Patches are created with the `diff` program.

To correctly apply a patch you need to know what base it was generated from and what new version the patch will change the source tree into. These should both be present in the patch file metadata or be possible to deduce from the filename.

### \* How do I apply or revert a patch?

You apply a patch with the `patch` program. The `patch` program reads a `diff` (or `patch`) file and makes the changes to the source tree described in it.

Patches for the Linux kernel are generated relative to the parent directory holding the kernel source dir.

This means that paths to files inside the patch file contain the name of the kernel source directories it was generated against (or some other directory names like "a/" and "b/" ).

Since this is unlikely to match the name of the kernel source dir on your local machine (but is often useful info to see what version an otherwise unlabeled patch was generated against) you should change into your kernel source directory and then

strip the first element of the path from filenames in the patch file when applying it (the `-p1` argument to `patch` does this).

To revert a previously applied patch, use the `-R` argument to `patch`. So, if you applied a patch like this:

```
patch -p1 < ../patch-x.y.z
```

You can revert (undo) it like this:

```
patch -R -p1 < ../patch-x.y.z
```

### \* How do I feed a patch/diff file to patch?

This (as usual with Linux and other UNIX like operating systems) can be done in several different ways.

In all the examples below I feed the file (in uncompressed form) to `patch` via `stdin` using the following syntax:

```
patch -p1 < path/to/patch-x.y.z
```

If you just want to be able to follow the examples below and don't want to know of more than one way to use `patch`, then you can stop reading this section here.

`Patch` can also get the name of the file to use via the `-i` argument, like this:

```
patch -p1 -i path/to/patch-x.y.z
```

If your patch file is compressed with `gzip` or `xz` and you don't want to uncompress it before applying it, then you can feed it to `patch` like this instead:

```
xzcat path/to/patch-x.y.z.xz | patch -p1  
bzip2 -c path/to/patch-x.y.z.gz | patch -p1
```

If you wish to uncompress the patch file by hand first before applying it (what I assume you've done in the examples below), then you simply run `gunzip` or `xz` on the file - like this:

```
gunzip patch-x.y.z.gz  
xz -d patch-x.y.z.xz
```

Which will leave you with a plain text `patch-x.y.z` file that you can feed to `patch` via `stdin` or the `-i` argument, as you prefer.

A few other nice arguments for `patch` are `-s` which causes `patch` to be silent except for errors which is nice to prevent errors from scrolling out of the screen too fast, and `--dry-run` which causes `patch` to just print a listing of what would happen, but doesn't actually make any changes. Finally `--verbose` tells `patch` to print more information about the work being done.

## \* Common errors when patching

When patch applies a patch file it attempts to verify the sanity of the file in different ways.

Checking that the file looks like a valid patch file and checking the code around the bits being modified matches the context provided in the patch are just two of the basic sanity checks patch does.

If patch encounters something that doesn't look quite right it has two options. It can either refuse to apply the changes and abort or it can try to find a way to make the patch apply with a few minor changes.

One example of something that's not 'quite right' that patch will attempt to fix up is if all the context matches, the lines being changed match, but the line numbers are different. This can happen, for example, if the patch makes a change in the middle of the file but for some reasons a few lines have been added or removed near the beginning of the file. In that case everything looks good it has just moved up or down a bit, and patch will usually adjust the line numbers and apply the patch.

Whenever patch applies a patch that it had to modify a bit to make it fit it'll tell you about it by saying the patch applied with **fuzz**. You should be wary of such changes since even though patch probably got it right it doesn't /always/ get it right, and the result will sometimes be wrong.

When patch encounters a change that it can't fix up with fuzz it rejects it outright and leaves a file with a `.rej` extension (a reject file). You can read this file to see exactly what change couldn't be applied, so you can go fix it up by hand if you wish.

If you don't have any third-party patches applied to your kernel source, but only patches from kernel.org and you apply the patches in the correct order, and have made no modifications yourself to the source files, then you should never see a fuzz or reject message from patch. If you do see such messages anyway, then there's a high risk that either your local source tree or the patch file is corrupted in some way. In that case you should probably try re-downloading the patch and if things are still not OK then you'd be advised to start with a fresh tree downloaded in full from kernel.org.

Let's look a bit more at some of the messages patch can produce.

If patch stops and presents a **File to patch:** prompt, then patch could not find a file to be patched. Most likely you forgot to specify `-p1` or you are in the wrong directory. Less often, you'll find patches that need to be applied with `-p0` instead of `-p1` (reading the patch file should reveal if this is the case - if so, then this is an error by the person who created the patch but is not fatal).

If you get **Hunk #2 succeeded at 1887 with fuzz 2 (offset 7 lines)**. or a message similar to that, then it means that patch had to adjust the location of the change (in this example it needed to move 7 lines from where it expected to make the change to make it fit).

The resulting file may or may not be OK, depending on the reason the file was different than expected.

This often happens if you try to apply a patch that was generated against a different kernel version than the one you are trying to patch.

If you get a message like Hunk #3 FAILED at 2387., then it means that the patch could not be applied correctly and the patch program was unable to fuzz its way through. This will generate a .rej file with the change that caused the patch to fail and also a .orig file showing you the original content that couldn't be changed.

If you get Reversed (or previously applied) patch detected! Assume -R? [n] then patch detected that the change contained in the patch seems to have already been made.

If you actually did apply this patch previously and you just re-applied it in error, then just say [n]o and abort this patch. If you applied this patch previously and actually intended to revert it, but forgot to specify -R, then you can say [y]es here to make patch revert it for you.

This can also happen if the creator of the patch reversed the source and destination directories when creating the patch, and in that case reverting the patch will in fact apply it.

A message similar to patch: \*\*\*\* unexpected end of file in patch or patch unexpectedly ends in middle of line means that patch could make no sense of the file you fed to it. Either your download is broken, you tried to feed patch a compressed patch file without uncompressed it first, or the patch file that you are using has been mangled by a mail client or mail transfer agent along the way somewhere, e.g., by splitting a long line into two lines. Often these warnings can easily be fixed by joining (concatenating) the two lines that had been split.

As I already mentioned above, these errors should never happen if you apply a patch from kernel.org to the correct version of an unmodified source tree. So if you get these errors with kernel.org patches then you should probably assume that either your patch file or your tree is broken and I'd advise you to start over with a fresh download of a full kernel tree and the patch you wish to apply.

## \* Are there any alternatives to patch?

Yes there are alternatives.

You can use the interdiff program (<http://cyberelk.net/tim/patchutils/>) to generate a patch representing the differences between two patches and then apply the result.

This will let you move from something like 5.7.2 to 5.7.3 in a single step. The -z flag to interdiff will even let you feed it patches in gzip or bzip2 compressed form directly without the use of zcat or bzcat or manual decompression.

Here's how you'd go from 5.7.2 to 5.7.3 in a single step:

```
interdiff -z ./patch-5.7.2.gz ./patch-5.7.3.gz | patch -p1
```

Although interdiff may save you a step or two you are generally advised to do the additional steps since interdiff can get things wrong in some cases.

Another alternative is ketchup, which is a python script for automatic downloading and applying of patches (<https://www.selenic.com/ketchup/>).

Other nice tools are diffstat, which shows a summary of changes made by a patch; lsdiff, which displays a short listing of affected files in a patch file, along with (optionally) the line numbers of the start of each patch; and grepdiff, which displays a list of the files modified by a patch where the patch contains a given regular expression.

## \* Where can I download the patches?

The patches are available at <https://kernel.org/> Most recent patches are linked from the front page, but they also have specific homes.

The 5.x.y (-stable) and 5.x patches live at

<https://www.kernel.org/pub/linux/kernel/v5.x/>

The -rc patches are not stored on the webserver but are generated on demand from git tags such as

<https://git.kernel.org/torvalds/p/v5.1-rc1/v5.0>

The stable -rc patches live at

<https://www.kernel.org/pub/linux/kernel/v5.x/stable-review/>

## \* The 5.x kernels

These are the base stable releases released by Linus. The highest numbered release is the most recent.

If regressions or other serious flaws are found, then a -stable fix patch will be released (see below) on top of this base. Once a new 5.x base kernel is released, a patch is made available that is a delta between the previous 5.x kernel and the new one.

To apply a patch moving from 5.6 to 5.7, you'd do the following (note that such patches do **NOT** apply on top of 5.x.y kernels but on top of the base 5.x kernel - if you need to move from 5.x.y to 5.x+1 you need to first revert the 5.x.y patch).

Here are some examples:

```
# moving from 5.6 to 5.7

$ cd ~/linux-5.6          # change to kernel source dir
$ patch -p1 < ../patch-5.7 # apply the 5.7 patch
$ cd ..
$ mv linux-5.6 linux-5.7 # rename source dir

# moving from 5.6.1 to 5.7

$ cd ~/linux-5.6.1        # change to kernel source dir
$ patch -p1 -R < ../patch-5.6.1 # revert the 5.6.1 patch
```

(continues on next page)

(continued from previous page)

```
$ patch -p1 < ../patch-5.7      # source dir is now 5.6
$ cd ..
$ mv linux-5.6.1 linux-5.7      # apply new 5.7 patch
# rename source dir
```

### \* The 5.x.y kernels

Kernels with 3-digit versions are -stable kernels. They contain small(ish) critical fixes for security problems or significant regressions discovered in a given 5.x kernel.

This is the recommended branch for users who want the most recent stable kernel and are not interested in helping test development/experimental versions.

If no 5.x.y kernel is available, then the highest numbered 5.x kernel is the current stable kernel.

---

**Note:** The -stable team usually do make incremental patches available as well as patches against the latest mainline release, but I only cover the non-incremental ones below. The incremental ones can be found at <https://www.kernel.org/pub/linux/kernel/v5.x/incr/>

---

These patches are not incremental, meaning that for example the 5.7.3 patch does not apply on top of the 5.7.2 kernel source, but rather on top of the base 5.7 kernel source.

So, in order to apply the 5.7.3 patch to your existing 5.7.2 kernel source you have to first back out the 5.7.2 patch (so you are left with a base 5.7 kernel source) and then apply the new 5.7.3 patch.

Here's a small example:

```
$ cd ~/linux-5.7.2          # change to the kernel source dir
$ patch -p1 -R < ../patch-5.7.2 # revert the 5.7.2 patch
$ patch -p1 < ../patch-5.7.3  # apply the new 5.7.3 patch
$ cd ..
$ mv linux-5.7.2 linux-5.7.3  # rename the kernel source dir
```

### \* The -rc kernels

These are release-candidate kernels. These are development kernels released by Linus whenever he deems the current git (the kernel's source management tool) tree to be in a reasonably sane state adequate for testing.

These kernels are not stable and you should expect occasional breakage if you intend to run them. This is however the most stable of the main development branches and is also what will eventually turn into the next stable kernel, so it is important that it be tested by as many people as possible.

This is a good branch to run for people who want to help out testing development kernels but do not want to run some of the really experimental stuff (such people should see the sections about -next and -mm kernels below).

The -rc patches are not incremental, they apply to a base 5.x kernel, just like the 5.x.y patches described above. The kernel version before the -rcN suffix denotes the version of the kernel that this -rc kernel will eventually turn into.

So, 5.8-rc5 means that this is the fifth release candidate for the 5.8 kernel and the patch should be applied on top of the 5.7 kernel source.

Here are 3 examples of how to apply these patches:

```
# first an example of moving from 5.7 to 5.8-rc3

$ cd ~/linux-5.7                                # change to the 5.7 source dir
$ patch -p1 < ../patch-5.8-rc3                  # apply the 5.8-rc3 patch
$ cd ..
$ mv linux-5.7 linux-5.8-rc3                   # rename the source dir

# now let's move from 5.8-rc3 to 5.8-rc5

$ cd ~/linux-5.8-rc3                            # change to the 5.8-rc3 dir
$ patch -p1 -R < ../patch-5.8-rc3               # revert the 5.8-rc3 patch
$ patch -p1 < ../patch-5.8-rc5                  # apply the new 5.8-rc5 patch
$ cd ..
$ mv linux-5.8-rc3 linux-5.8-rc5                # rename the source dir

# finally let's try and move from 5.7.3 to 5.8-rc5

$ cd ~/linux-5.7.3                             # change to the kernel source dir
$ patch -p1 -R < ../patch-5.7.3                 # revert the 5.7.3 patch
$ patch -p1 < ../patch-5.8-rc5                  # apply new 5.8-rc5 patch
$ cd ..
$ mv linux-5.7.3 linux-5.8-rc5                 # rename the kernel source dir
```

## \* The -mm patches and the linux-next tree

The -mm patches are experimental patches released by Andrew Morton.

In the past, -mm tree were used to also test subsystem patches, but this function is now done via the linux-next <<https://www.kernel.org/doc/man-pages/linux-next.html>> tree. The Subsystem maintainers push their patches first to linux-next, and, during the merge window, sends them directly to Linus.

The -mm patches serve as a sort of proving ground for new features and other experimental patches that aren't merged via a subsystem tree. Once such patches has proved its worth in -mm for a while Andrew pushes it on to Linus for inclusion in mainline.

The linux-next tree is daily updated, and includes the -mm patches. Both are in constant flux and contains many experimental features, a lot of debugging patches not appropriate for mainline etc., and is the most experimental of the branches described in this document.

These patches are not appropriate for use on systems that are supposed to be stable and they are more risky to run than any of the other branches (make sure you have up-to-date backups - that goes for any experimental kernel but even more so for -mm patches or using a Kernel from the linux-next tree).

Testing of -mm patches and linux-next is greatly appreciated since the whole point of those are to weed out regressions, crashes, data corruption bugs, build breakage (and any other bug in general) before changes are merged into the more stable mainline Linus tree.

But testers of -mm and linux-next should be aware that breakages are more common than in any other tree.

This concludes this list of explanations of the various kernel trees. I hope you are now clear on how to apply the various patches and help testing the kernel.

Thank you's to Randy Dunlap, Rolf Eike Beer, Linus Torvalds, Bodo Eggert, Johannes Stezenbach, Grant Coady, Pavel Machek and others that I may have forgotten for their reviews and contributions to this document.

## **ADDING A NEW SYSTEM CALL**

This document describes what's involved in adding a new system call to the Linux kernel, over and above the normal submission advice in Documentation/process/submitting-patches.rst.

### **\* System Call Alternatives**

The first thing to consider when adding a new system call is whether one of the alternatives might be suitable instead. Although system calls are the most traditional and most obvious interaction points between userspace and the kernel, there are other possibilities - choose what fits best for your interface.

- If the operations involved can be made to look like a filesystem-like object, it may make more sense to create a new filesystem or device. This also makes it easier to encapsulate the new functionality in a kernel module rather than requiring it to be built into the main kernel.
  - If the new functionality involves operations where the kernel notifies userspace that something has happened, then returning a new file descriptor for the relevant object allows userspace to use `poll/select/epoll` to receive that notification.
  - However, operations that don't map to `read(2)/write(2)`-like operations have to be implemented as `ioctl(2)` requests, which can lead to a somewhat opaque API.
- If you're just exposing runtime system information, a new node in sysfs (see Documentation/filesystems/sysfs.rst) or the /proc filesystem may be more appropriate. However, access to these mechanisms requires that the relevant filesystem is mounted, which might not always be the case (e.g. in a namespaced/sandboxed/chrooted environment). Avoid adding any API to debugfs, as this is not considered a 'production' interface to userspace.
- If the operation is specific to a particular file or file descriptor, then an additional `fcntl(2)` command option may be more appropriate. However, `fcntl(2)` is a multiplexing system call that hides a lot of complexity, so this option is best for when the new function is closely analogous to existing `fcntl(2)` functionality, or the new functionality is very simple (for example, getting/setting a simple flag related to a file descriptor).
- If the operation is specific to a particular task or process, then an additional `prctl(2)` command option may be more appropriate. As with `fcntl(2)`, this

system call is a complicated multiplexor so is best reserved for near-analogs of existing `prctl()` commands or getting/setting a simple flag related to a process.

## \* Designing the API: Planning for Extension

A new system call forms part of the API of the kernel, and has to be supported indefinitely. As such, it's a very good idea to explicitly discuss the interface on the kernel mailing list, and it's important to plan for future extensions of the interface.

(The syscall table is littered with historical examples where this wasn't done, together with the corresponding follow-up system calls - `eventfd/eventfd2`, `dup2/dup3`, `inotify_init/inotify_init1`, `pipe/pipe2`, `renameat/ renameat2` - so learn from the history of the kernel and plan for extensions from the start.)

For simpler system calls that only take a couple of arguments, the preferred way to allow for future extensibility is to include a flags argument to the system call. To make sure that userspace programs can safely use flags between kernel versions, check whether the flags value holds any unknown flags, and reject the system call (with `EINVAL`) if it does:

```
if (flags & ~(THING_FLAG1 | THING_FLAG2 | THING_FLAG3))
    return -EINVAL;
```

(If no flags values are used yet, check that the flags argument is zero.)

For more sophisticated system calls that involve a larger number of arguments, it's preferred to encapsulate the majority of the arguments into a structure that is passed in by pointer. Such a structure can cope with future extension by including a size argument in the structure:

```
struct xyzzy_params {
    u32 size; /* userspace sets p->size = sizeof(struct xyzzy_params) */
    u32 param_1;
    u64 param_2;
    u64 param_3;
};
```

As long as any subsequently added field, say `param_4`, is designed so that a zero value gives the previous behaviour, then this allows both directions of version mismatch:

- To cope with a later userspace program calling an older kernel, the kernel code should check that any memory beyond the size of the structure that it expects is zero (effectively checking that `param_4 == 0`).
- To cope with an older userspace program calling a newer kernel, the kernel code can zero-extend a smaller instance of the structure (effectively setting `param_4 = 0`).

See `perf_event_open(2)` and the `perf_copy_attr()` function (in `kernel/events/core.c`) for an example of this approach.

## \* Designing the API: Other Considerations

If your new system call allows userspace to refer to a kernel object, it should use a file descriptor as the handle for that object – don’t invent a new type of userspace object handle when the kernel already has mechanisms and well-defined semantics for using file descriptors.

If your new `xyzzy(2)` system call does return a new file descriptor, then the flags argument should include a value that is equivalent to setting `O_CLOEXEC` on the new FD. This makes it possible for userspace to close the timing window between `xyzzy()` and calling `fcntl(fd, F_SETFD, FD_CLOEXEC)`, where an unexpected `fork()` and `execve()` in another thread could leak a descriptor to the exec’ed program. (However, resist the temptation to re-use the actual value of the `O_CLOEXEC` constant, as it is architecture-specific and is part of a numbering space of `O_*` flags that is fairly full.)

If your system call returns a new file descriptor, you should also consider what it means to use the `poll(2)` family of system calls on that file descriptor. Making a file descriptor ready for reading or writing is the normal way for the kernel to indicate to userspace that an event has occurred on the corresponding kernel object.

If your new `xyzzy(2)` system call involves a filename argument:

```
int sys_xyzzy(const char __user *path, ..., unsigned int flags);
```

you should also consider whether an `xyzzyat(2)` version is more appropriate:

```
int sys_xyzzyat(int dfd, const char __user *path, ..., unsigned int flags);
```

This allows more flexibility for how userspace specifies the file in question; in particular it allows userspace to request the functionality for an already-opened file descriptor using the `AT_EMPTY_PATH` flag, effectively giving an `fxyzzy(3)` operation for free:

```
- xyzzyat(AT_FDCWD, path, ..., 0) is equivalent to xyzzy(path,...)
- xyzzyat(fd, "", ..., AT_EMPTY_PATH) is equivalent to fxyzzy(fd, ...)
```

(For more details on the rationale of the `*at()` calls, see the `openat(2)` man page; for an example of `AT_EMPTY_PATH`, see the `fstatat(2)` man page.)

If your new `xyzzy(2)` system call involves a parameter describing an offset within a file, make its type `loff_t` so that 64-bit offsets can be supported even on 32-bit architectures.

If your new `xyzzy(2)` system call involves privileged functionality, it needs to be governed by the appropriate Linux capability bit (checked with a call to `capable()`), as described in the `capabilities(7)` man page. Choose an existing capability bit that governs related functionality, but try to avoid combining lots of only vaguely related functions together under the same bit, as this goes against capabilities’ purpose of splitting the power of root. In particular, avoid adding new uses of the already overly-general `CAP_SYS_ADMIN` capability.

If your new `xyzzy(2)` system call manipulates a process other than the calling process, it should be restricted (using a call to `ptrace_may_access()`) so that only

a calling process with the same permissions as the target process, or with the necessary capabilities, can manipulate the target process.

Finally, be aware that some non-x86 architectures have an easier time if system call parameters that are explicitly 64-bit fall on odd-numbered arguments (i.e. parameter 1, 3, 5), to allow use of contiguous pairs of 32-bit registers. (This concern does not apply if the arguments are part of a structure that's passed in by pointer.)

### \* Proposing the API

To make new system calls easy to review, it's best to divide up the patchset into separate chunks. These should include at least the following items as distinct commits (each of which is described further below):

- The core implementation of the system call, together with prototypes, generic numbering, Kconfig changes and fallback stub implementation.
- Wiring up of the new system call for one particular architecture, usually x86 (including all of x86\_64, x86\_32 and x32).
- A demonstration of the use of the new system call in userspace via a selftest in tools/testing/selftests/.
- A draft man-page for the new system call, either as plain text in the cover letter, or as a patch to the (separate) man-pages repository.

New system call proposals, like any change to the kernel's API, should always be cc'ed to [linux-api@vger.kernel.org](mailto:linux-api@vger.kernel.org).

### \* Generic System Call Implementation

The main entry point for your new xyzzy(2) system call will be called `sys_xyzzy()`, but you add this entry point with the appropriate `SYSCALL_DEFINEn()` macro rather than explicitly. The 'n' indicates the number of arguments to the system call, and the macro takes the system call name followed by the (type, name) pairs for the parameters as arguments. Using this macro allows metadata about the new system call to be made available for other tools.

The new entry point also needs a corresponding function prototype, in `include/linux/syscalls.h`, marked as `asmlinkage` to match the way that system calls are invoked:

```
asmlinkage long sys_xyzzy(...);
```

Some architectures (e.g. x86) have their own architecture-specific syscall tables, but several other architectures share a generic syscall table. Add your new system call to the generic list by adding an entry to the list in `include/uapi/asm-generic/unistd.h`:

```
#define __NR_xyzzy 292
__SYSCALL(__NR_xyzzy, sys_xyzzy)
```

Also update the `_NR_syscalls` count to reflect the additional system call, and note that if multiple new system calls are added in the same merge window, your new syscall number may get adjusted to resolve conflicts.

The file `kernel/sys_ni.c` provides a fallback stub implementation of each system call, returning `-ENOSYS`. Add your new system call here too:

```
COND_SYSCALL(xyzzy);
```

Your new kernel functionality, and the system call that controls it, should normally be optional, so add a `CONFIG` option (typically to `init/Kconfig`) for it. As usual for new `CONFIG` options:

- Include a description of the new functionality and system call controlled by the option.
- Make the option depend on `EXPERT` if it should be hidden from normal users.
- Make any new source files implementing the function dependent on the `CONFIG` option in the Makefile (e.g. `obj-$(CONFIG_XYZZY_SYSCALL) += xyzzy.o`).
- Double check that the kernel still builds with the new `CONFIG` option turned off.

To summarize, you need a commit that includes:

- `CONFIG` option for the new function, normally in `init/Kconfig`
- `SYSCALL_DEFINEn(xyzzy, ...)` for the entry point
- corresponding prototype in `include/linux/syscalls.h`
- generic table entry in `include/uapi/asm-generic/unistd.h`
- fallback stub in `kernel/sys_ni.c`

## \* x86 System Call Implementation

To wire up your new system call for x86 platforms, you need to update the master syscall tables. Assuming your new system call isn't special in some way (see below), this involves a "common" entry (for x86\_64 and x32) in `arch/x86/entry/syscalls/syscall_64.tbl`:

```
333    common    xyzzy      sys_xyzzy
```

and an "i386" entry in `arch/x86/entry/syscalls/syscall_32.tbl`:

```
380    i386     xyzzy      sys_xyzzy
```

Again, these numbers are liable to be changed if there are conflicts in the relevant merge window.

## \* Compatibility System Calls (Generic)

For most system calls the same 64-bit implementation can be invoked even when the userspace program is itself 32-bit; even if the system call's parameters include an explicit pointer, this is handled transparently.

However, there are a couple of situations where a compatibility layer is needed to cope with size differences between 32-bit and 64-bit.

The first is if the 64-bit kernel also supports 32-bit userspace programs, and so needs to parse areas of (`_user`) memory that could hold either 32-bit or 64-bit values. In particular, this is needed whenever a system call argument is:

- a pointer to a pointer
- a pointer to a struct containing a pointer (e.g. `struct iovec __user *`)
- a pointer to a varying sized integral type (`time_t`, `off_t`, `long`, ...)
- a pointer to a struct containing a varying sized integral type.

The second situation that requires a compatibility layer is if one of the system call's arguments has a type that is explicitly 64-bit even on a 32-bit architecture, for example `loff_t` or `__u64`. In this case, a value that arrives at a 64-bit kernel from a 32-bit application will be split into two 32-bit values, which then need to be re-assembled in the compatibility layer.

(Note that a system call argument that's a pointer to an explicit 64-bit type does **not** need a compatibility layer; for example, `splice(2)`'s arguments of type `loff_t __user *` do not trigger the need for a `compat_system` call.)

The compatibility version of the system call is called `compat_sys_xyzzy()`, and is added with the `COMPAT_SYSCALL_DEFINEn()` macro, analogously to `SYSCALL_DEFINEn`. This version of the implementation runs as part of a 64-bit kernel, but expects to receive 32-bit parameter values and does whatever is needed to deal with them. (Typically, the `compat_sys_` version converts the values to 64-bit versions and either calls on to the `sys_` version, or both of them call a common inner implementation function.)

The compat entry point also needs a corresponding function prototype, in `include/linux/compat.h`, marked as `asmlinkage` to match the way that system calls are invoked:

```
asmlinkage long compat_sys_xyzzy(...);
```

If the system call involves a structure that is laid out differently on 32-bit and 64-bit systems, say `struct xyzzy_args`, then the `include/linux/compat.h` header file should also include a compat version of the structure (`struct compat_xyzzy_args`) where each variable-size field has the appropriate `compat_` type that corresponds to the type in `struct xyzzy_args`. The `compat_sys_xyzzy()` routine can then use this `compat_` structure to parse the arguments from a 32-bit invocation.

For example, if there are fields:

```
struct xyzzy_args {
    const char __user *ptr;
    __kernel_long_t varying_val;
    u64 fixed_val;
    /* ... */
};
```

in struct xyzzy\_args, then struct compat\_xyzzy\_args would have:

```
struct compat_xyzzy_args {
    compat_uptr_t ptr;
    compat_long_t varying_val;
    u64 fixed_val;
    /* ... */
};
```

The generic system call list also needs adjusting to allow for the compat version; the entry in `include/uapi/asm-generic/unistd.h` should use `_SC_COMP` rather than `_SYSCALL`:

```
#define __NR_xyzzy 292
__SC_COMP(__NR_xyzzy, sys_xyzzy, compat_sys_xyzzy)
```

To summarize, you need:

- a `COMPAT_SYSCALL_DEFINExyzzy(...)` for the compat entry point
- corresponding prototype in `include/linux/compat.h`
- (if needed) 32-bit mapping struct in `include/linux/compat.h`
- instance of `_SC_COMP` not `_SYSCALL` in `include/uapi/asm-generic/unistd.h`

## \* Compatibility System Calls (x86)

To wire up the x86 architecture of a system call with a compatibility version, the entries in the syscall tables need to be adjusted.

First, the entry in `arch/x86/entry/syscalls/syscall_32.tbl` gets an extra column to indicate that a 32-bit userspace program running on a 64-bit kernel should hit the compat entry point:

380	i386	xyzzy	sys_xyzzy	<code>_ia32_compat_sys_xyzzy</code>
-----	------	-------	-----------	-------------------------------------

Second, you need to figure out what should happen for the x32 ABI version of the new system call. There's a choice here: the layout of the arguments should either match the 64-bit version or the 32-bit version.

If there's a pointer-to-a-pointer involved, the decision is easy: x32 is ILP32, so the layout should match the 32-bit version, and the entry in `arch/x86/entry/syscalls/syscall_64.tbl` is split so that x32 programs hit the compatibility wrapper:

333	64	xyzzy	sys_xyzzy
...			
555	x32	xyzzy	__x32_compat_sys_xyzzy

If no pointers are involved, then it is preferable to re-use the 64-bit system call for the x32 ABI (and consequently the entry in arch/x86/entry/syscalls/syscall\_64.tbl is unchanged).

In either case, you should check that the types involved in your argument layout do indeed map exactly from x32 (-mx32) to either the 32-bit (-m32) or 64-bit (-m64) equivalents.

### \* System Calls Returning Elsewhere

For most system calls, once the system call is complete the user program continues exactly where it left off - at the next instruction, with the stack the same and most of the registers the same as before the system call, and with the same virtual memory space.

However, a few system calls do things differently. They might return to a different location (`rt_sigreturn`) or change the memory space (`fork/vfork/clone`) or even architecture (`execve/execveat`) of the program.

To allow for this, the kernel implementation of the system call may need to save and restore additional registers to the kernel stack, allowing complete control of where and how execution continues after the system call.

This is arch-specific, but typically involves defining assembly entry points that save/restore additional registers and invoke the real system call entry point.

For x86\_64, this is implemented as a `stub_xyzzy` entry point in `arch/x86/entry/entry_64.S`, and the entry in the syscall table (`arch/x86/entry/syscalls/syscall_64.tbl`) is adjusted to match:

333	common	xyzzy	stub_xyzzy
-----	--------	-------	------------

The equivalent for 32-bit programs running on a 64-bit kernel is normally called `stub32_xyzzy` and implemented in `arch/x86/entry/entry_64_compat.S`, with the corresponding syscall table adjustment in `arch/x86/entry/syscalls/syscall_32.tbl`:

380	i386	xyzzy	sys_xyzzy	stub32_xyzzy
-----	------	-------	-----------	--------------

If the system call needs a compatibility layer (as in the previous section) then the `stub32_` version needs to call on to the `compat_sys_` version of the system call rather than the native 64-bit version. Also, if the x32 ABI implementation is not common with the x86\_64 version, then its syscall table will also need to invoke a stub that calls on to the `compat_sys_` version.

For completeness, it's also nice to set up a mapping so that user-mode Linux still works - its syscall table will reference `stub_xyzzy`, but the UML build doesn't include `arch/x86/entry/entry_64.S` implementation (because UML simulates

registers etc). Fixing this is as simple as adding a #define to arch/x86/um/sys\_call\_table\_64.c:

```
#define stub_xyzy sys_xyzy
```

## \* Other Details

Most of the kernel treats system calls in a generic way, but there is the occasional exception that may need updating for your particular system call.

The audit subsystem is one such special case; it includes (arch-specific) functions that classify some special types of system call – specifically file open (open/openat), program execution (execve/exeveat) or socket multiplexor (socketcall) operations. If your new system call is analogous to one of these, then the audit system should be updated.

More generally, if there is an existing system call that is analogous to your new system call, it's worth doing a kernel-wide grep for the existing system call to check there are no other special cases.

## \* Testing

A new system call should obviously be tested; it is also useful to provide reviewers with a demonstration of how user space programs will use the system call. A good way to combine these aims is to include a simple self-test program in a new directory under tools/testing/selftests/.

For a new system call, there will obviously be no libc wrapper function and so the test will need to invoke it using `syscall()`; also, if the system call involves a new userspace-visible structure, the corresponding header will need to be installed to compile the test.

Make sure the selftest runs successfully on all supported architectures. For example, check that it works when compiled as an x86\_64 (-m64), x86\_32 (-m32) and x32 (-mx32) ABI program.

For more extensive and thorough testing of new functionality, you should also consider adding tests to the Linux Test Project, or to the xfstests project for filesystem-related changes.

- <https://linux-test-project.github.io/>
- <git://git.kernel.org/pub/scm/fs/xfs/xfstests-dev.git>

### \* **Man Page**

All new system calls should come with a complete man page, ideally using groff markup, but plain text will do. If groff is used, it's helpful to include a pre-rendered ASCII version of the man page in the cover email for the patchset, for the convenience of reviewers.

The man page should be cc'ed to [linux-man@vger.kernel.org](mailto:linux-man@vger.kernel.org). For more details, see <https://www.kernel.org/doc/man-pages/patches.html>

### \* **Do not call System Calls in the Kernel**

System calls are, as stated above, interaction points between userspace and the kernel. Therefore, system call functions such as `sys_xyzzy()` or `compat_sys_xyzzy()` should only be called from userspace via the syscall table, but not from elsewhere in the kernel. If the syscall functionality is useful to be used within the kernel, needs to be shared between an old and a new syscall, or needs to be shared between a syscall and its compatibility variant, it should be implemented by means of a "helper" function (such as `kern_xyzzy()`). This kernel function may then be called within the syscall stub (`sys_xyzzy()`), the compatibility syscall stub (`compat_sys_xyzzy()`), and/or other kernel code.

At least on 64-bit x86, it will be a hard requirement from v4.17 onwards to not call system call functions in the kernel. It uses a different calling convention for system calls where `struct pt_regs` is decoded on-the-fly in a syscall wrapper which then hands processing over to the actual syscall function. This means that only those parameters which are actually needed for a specific syscall are passed on during syscall entry, instead of filling in six CPU registers with random user space content all the time (which may cause serious trouble down the call chain).

Moreover, rules on how data may be accessed may differ between kernel data and user data. This is another reason why calling `sys_xyzzy()` is generally a bad idea.

Exceptions to this rule are only allowed in architecture-specific overrides, architecture-specific compatibility wrappers, or other code in arch/.

### \* **References and Sources**

- LWN article from Michael Kerrisk on use of flags argument in system calls: <https://lwn.net/Articles/585415/>
- LWN article from Michael Kerrisk on how to handle unknown flags in a system call: <https://lwn.net/Articles/588444/>
- LWN article from Jake Edge describing constraints on 64-bit system call arguments: <https://lwn.net/Articles/311630/>
- Pair of LWN articles from David Drysdale that describe the system call implementation paths in detail for v3.14:
  - <https://lwn.net/Articles/604287/>

- <https://lwn.net/Articles/604515/>
- Architecture-specific requirements for system calls are discussed in the `syscall(2)` man-page: <http://man7.org/linux/man-pages/man2/syscall.2.html#NOTES>
- Collated emails from Linus Torvalds discussing the problems with `ioctl()`: <https://yarchive.net/comp/linux/ioctl.html>
- “How to not invent kernel interfaces” , Arnd Bergmann, <https://www.ukuug.org/events/linux2007/2007/papers/Bergmann.pdf>
- LWN article from Michael Kerrisk on avoiding new uses of `CAP_SYS_ADMIN`: <https://lwn.net/Articles/486306/>
- Recommendation from Andrew Morton that all related information for a new system call should come in the same email thread: <https://lkml.org/lkml/2014/7/24/641>
- Recommendation from Michael Kerrisk that a new system call should come with a man page: <https://lkml.org/lkml/2014/6/13/309>
- Suggestion from Thomas Gleixner that x86 wire-up should be in a separate commit: <https://lkml.org/lkml/2014/11/19/254>
- Suggestion from Greg Kroah-Hartman that it’s good for new system calls to come with a man-page & selftest: <https://lkml.org/lkml/2014/3/19/710>
- Discussion from Michael Kerrisk of new system call vs. `prctl(2)` extension: <https://lkml.org/lkml/2014/6/3/411>
- Suggestion from Ingo Molnar that system calls that involve multiple arguments should encapsulate those arguments in a struct, which includes a size field for future extensibility: <https://lkml.org/lkml/2015/7/30/117>
- Numbering oddities arising from (re-)use of `O_*` numbering space flags:
  - commit 75069f2b5bfb (“vfs: renumber `FMODE_NONOTIFY` and add to uniqueness check” )
  - commit 12ed2e36c98a (“fanotify: `FMODE_NONOTIFY` and `_O_SYNC` in sparc conflict” )
  - commit bb458c644a59 (“Safer ABI for `O_TMPFILE`” )
- Discussion from Matthew Wilcox about restrictions on 64-bit arguments: <https://lkml.org/lkml/2008/12/12/187>
- Recommendation from Greg Kroah-Hartman that unknown flags should be policed: <https://lkml.org/lkml/2014/7/17/577>
- Recommendation from Linus Torvalds that x32 system calls should prefer compatibility with 64-bit versions rather than 32-bit versions: <https://lkml.org/lkml/2011/8/31/244>



---

CHAPTER  
TWENTYFIVE

---

## LINUX MAGIC NUMBERS

This file is a registry of magic numbers which are in use. When you add a magic number to a structure, you should also add it to this file, since it is best if the magic numbers used by various structures are unique.

It is a **very** good idea to protect kernel data structures with magic numbers. This allows you to check at run time whether (a) a structure has been clobbered, or (b) you've passed the wrong structure to a routine. This last is especially useful—particularly when you are passing pointers to structures via a void \* pointer. The tty code, for example, does this frequently to pass driver-specific and line discipline-specific structures back and forth.

The way to use magic numbers is to declare them at the beginning of the structure, like so:

```
struct tty_ldisc {  
    int     magic;  
    ...  
};
```

Please follow this discipline when you are adding future enhancements to the kernel! It has saved me countless hours of debugging, especially in the screwy cases where an array has been overrun and structures following the array have been overwritten. Using this discipline, these cases get detected quickly and safely.

Changelog:

Theodore Ts'o  
31 Mar 94

The magic table is current to Linux 2.1.55.

Michael Chastain  
<mailto:mec@shout.net>  
22 Sep 1997

Now it should be up to date with Linux 2.1.112. Because we are in feature freeze time it is very unlikely that something will change before 2.2.x. The entries are sorted by number field.

Krzysztof G. Baranowski  
<mailto: kgb@knm.org.pl>  
29 Jul 1998

(continues on next page)

(continued from previous page)

Updated the magic table to Linux 2.5.45. Right over the feature freeze, but it is possible that some new magic numbers will sneak into the kernel before 2.6.x yet.

Petr Baudis  
 <pasky@ucw.cz>  
 03 Nov 2002

Updated the magic table to Linux 2.5.74.

Fabian Frederick  
 <ffrederick@users.sourceforge.net>  
 09 Jul 2003

Magic Name	Number	Structure	File
PG_MAGIC	'P'	pg_{read,write}_hdr	include/linux/pg.h
CMAGIC	0x0111	user	include/linux/a.out.h
MKISS_DRIVER_MAGIC	0x04bf	mkiss_channel	drivers/net/mkiss.h
HDLC_MAGIC	0x239e	n_hdlc	drivers/char/n_hdlc.c
APM BIOS MAGIC	0x4101	apm_user	arch/x86/kernel/apm_32.c
CYCLADES_MAGIC	0x4359	cyclades_port	include/linux/cyclades.h
DB_MAGIC	0x4442	fc_info	drivers/net/iph5526_novram.c
DL_MAGIC	0x444d	fc_info	drivers/net/iph5526_novram.c
FASYNC_MAGIC	0x4601	fasync_struct	include/linux/fs.h
FF_MAGIC	0x4646	fc_info	drivers/net/iph5526_novram.c
ISICOM_MAGIC	0x4d54	isi_port	include/linux/isicom.h
PTY_MAGIC	0x5001		drivers/char/pty.c
PPP_MAGIC	0x5002	ppp	include/linux/if_pppvar.h
SSTATE_MAGIC	0x5302	serial_state	include/linux/serial.h
SLIP_MAGIC	0x5302	slip	drivers/net/slip.h
STRIP_MAGIC	0x5303	strip	drivers/net/strip.c
X25_ASY_MAGIC	0x5303	x25_asy	drivers/net/x25_asy.h
SIXPACK_MAGIC	0x5304	sixpack	drivers/net/hamradio/6pack.h
AX25_MAGIC	0x5316	ax_disp	drivers/net/mkiss.h
TTY_MAGIC	0x5401	tty_struct	include/linux/tty.h
MGSL_MAGIC	0x5401	mgsl_info	drivers/char/sync
TTY_DRIVER_MAGIC	0x5402	tty_driver	include/linux/tty_
MGSLPC_MAGIC	0x5402	mgslpc_info	drivers/char/pcmci
TTY_LDISC_MAGIC	0x5403	tty_ldisc	include/linux/tty_
USB_SERIAL_MAGIC	0x6702	usb_serial	drivers/usb/serial
FULL_DUPLEX_MAGIC	0x6969		drivers/net/etherr
USB_BLUETOOTH_MAGIC	0x6d02	usb_bluetooth	drivers/usb/class/
RFCOMM_TTY_MAGIC	0x6d02		net/bluetooth/rfco
USB_SERIAL_PORT_MAGIC	0x7301	usb_serial_port	drivers/usb/serial
CG_MAGIC	0x00090255	ufs_cylinder_group	include/linux/ufs_
RPORT_MAGIC	0x00525001	r_port	drivers/char/rocke
LSEMAGIC	0x05091998	lse	drivers/fc4/fc.c
GDTIOCTL_MAGIC	0x06030f07	gdth_iowr_str	drivers/scsi/gdth_

Continued on next page

Table 1 - continued from previous page

Magic Name	Number	Structure	File
RIEBL_MAGIC	0x09051990		drivers/net/atari.c
NBD_REQUEST_MAGIC	0x12560953	nbd_request	include/linux/nbd.h
RED_MAGIC2	0x170fc2a5	(any)	mm/slab.c
BAYCOM_MAGIC	0x19730510	baycom_state	drivers/net/baycom.c
ISDN_X25IFACE_MAGIC	0x1e75a2b9	isdn_x25iface_proto_data	drivers/isdn/isdn_x25iface.c
ECP_MAGIC	0x21504345	cdkecpsig	include/linux/cdk.h
LSOMAGIC	0x27091997	lso	drivers/fc4/fc.c
LSMAGIC	0x2a3b4d2a	ls	drivers/fc4/fc.c
WANPIPE_MAGIC	0x414C4453	sdlal_{dump,exec}	include/linux/wanpipe.h
CS_CARD_MAGIC	0x43525553	cs_card	sound/oss/cs46xx.c
LABELCL_MAGIC	0x4857434c	labelcl_info_s	include/asm/ia64/include/asm/labelcl.h
ISDN_ASYNC_MAGIC	0x49344C01	modem_info	include/linux/isdn.h
CTC_ASYNC_MAGIC	0x49344C01	ctc_tty_info	drivers/s390/net/ctc.h
ISDN_NET_MAGIC	0x49344C02	isdn_net_local_s	drivers/isdn/i4l.h
SAVEKMSG_MAGIC2	0x4B4D5347	savekmsg	arch/*/amiga/config.h
CS_STATE_MAGIC	0x4c4f4749	cs_state	sound/oss/cs46xx.h
SLAB_C_MAGIC	0x4f17a36d	kmem_cache	mm/slab.c
COW_MAGIC	0x4f4f4f4d	cow_header_v1	arch/um/drivers/unified.c
I810_CARD_MAGIC	0x5072696E	i810_card	sound/oss/i810_audio.c
TRIDENT_CARD_MAGIC	0x5072696E	trident_card	sound/oss/trident.h
ROUTER_MAGIC	0x524d4157	wan_device	[in wanrouter.h pre]
SAVEKMSG_MAGIC1	0x53415645	savekmsg	arch/*/amiga/config.h
GDA_MAGIC	0x58464552	gda	arch/mips/include/asm/gda.h
RED_MAGIC1	0x5a2cf071	(any)	mm/slab.c
EEPROM_MAGIC_VALUE	0x5ab478d2	lanai_dev	drivers/atm/lanai.h
HDLCDRV_MAGIC	0x5ac6e778	hdlcdrv_state	include/linux/hdlcdrv.h
PCXX_MAGIC	0x5c6df104	channel	drivers/char/pcxx.h
KV_MAGIC	0x5f4b565f	kernel_vars_s	arch/mips/include/asm/kv.h
I810_STATE_MAGIC	0x63657373	i810_state	sound/oss/i810_audio.h
TRIDENT_STATE_MAGIC	0x63657373	trient_state	sound/oss/trident.h
M3_CARD_MAGIC	0x646e6f50	m3_card	sound/oss/maestro.h
FW_HEADER_MAGIC	0x65726F66	fw_header	drivers/atm/fore.h
SLOT_MAGIC	0x67267321	slot	drivers/hotplug/slot.h
SLOT_MAGIC	0x67267322	slot	drivers/hotplug/slot.h
LO_MAGIC	0x68797548	nbd_device	include/linux/nbd.h
OPROFILE_MAGIC	0x6f70726f	super_block	drivers/oprofile.h
M3_STATE_MAGIC	0x734d724d	m3_state	sound/oss/maestro.h
VMALLOC_MAGIC	0x87654320	snd_alloc_track	sound/core/memory.h
KMALLOC_MAGIC	0x87654321	snd_alloc_track	sound/core/memory.h
PWC_MAGIC	0x89DC10AB	pwc_device	drivers/usb/media.h
NBD_REPLY_MAGIC	0x96744668	nbd_reply	include/linux/nbd.h
ENI155_MAGIC	0xa54b872d	midway_eeprom	drivers/atm/eni155.h
CODA_MAGIC	0xC0DAC0DA	coda_file_info	fs/coda/coda_fs.h
DPMEM_MAGIC	0xc0ffee11	gdt_pci_sram	drivers/scsi/gdtr.h
YAM_MAGIC	0xF10A7654	yam_port	drivers/net/hamradio.h
CCB_MAGIC	0xf2691ad2	ccb	drivers/scsi/ncr5380.h
QUEUE_MAGIC_FREE	0xf7e1c9a3	queue_entry	drivers/scsi/arm.h

Continued on next page

Table 1 - continued from previous page

Magic Name	Number	Structure	File
QUEUE_MAGIC_USED	0xf7e1cc33	queue_entry	drivers/scs
HTB_CMAGIC	0xFEFAFEF1	htb_class	net/sched/s
NMI_MAGIC	0x48414d4d455201	nmi_s	arch/mips/i

Note that there are also defined special per-driver magic numbers in sound memory management. See `include/sound/sndmagic.h` for complete list of them. Many OSS sound drivers have their magic numbers constructed from the sound-card PCI ID - these are not listed here as well.

HFS is another larger user of magic numbers - you can find them in `fs/hfs/hfs.h`.

---

CHAPTER  
**TWENTYSIX**

---

## **WHY THE “VOLATILE” TYPE CLASS SHOULD NOT BE USED**

C programmers have often taken volatile to mean that the variable could be changed outside of the current thread of execution; as a result, they are sometimes tempted to use it in kernel code when shared data structures are being used. In other words, they have been known to treat volatile types as a sort of easy atomic variable, which they are not. The use of volatile in kernel code is almost never correct; this document describes why.

The key point to understand with regard to volatile is that its purpose is to suppress optimization, which is almost never what one really wants to do. In the kernel, one must protect shared data structures against unwanted concurrent access, which is very much a different task. The process of protecting against unwanted concurrency will also avoid almost all optimization-related problems in a more efficient way.

Like volatile, the kernel primitives which make concurrent access to data safe (spinlocks, mutexes, memory barriers, etc.) are designed to prevent unwanted optimization. If they are being used properly, there will be no need to use volatile as well. If volatile is still necessary, there is almost certainly a bug in the code somewhere. In properly-written kernel code, volatile can only serve to slow things down.

Consider a typical block of kernel code:

```
spin_lock(&the_lock);
do_something_on(&shared_data);
do_something_else_with(&shared_data);
spin_unlock(&the_lock);
```

If all the code follows the locking rules, the value of shared\_data cannot change unexpectedly while the\_lock is held. Any other code which might want to play with that data will be waiting on the lock. The spinlock primitives act as memory barriers - they are explicitly written to do so - meaning that data accesses will not be optimized across them. So the compiler might think it knows what will be in shared\_data, but the spin\_lock() call, since it acts as a memory barrier, will force it to forget anything it knows. There will be no optimization problems with accesses to that data.

If shared\_data were declared volatile, the locking would still be necessary. But the compiler would also be prevented from optimizing access to shared\_data \_within\_ the critical section, when we know that nobody else can be working with it. While

the lock is held, shared\_data is not volatile. When dealing with shared data, proper locking makes volatile unnecessary - and potentially harmful.

The volatile storage class was originally meant for memory-mapped I/O registers. Within the kernel, register accesses, too, should be protected by locks, but one also does not want the compiler “optimizing” register accesses within a critical section. But, within the kernel, I/O memory accesses are always done through accessor functions; accessing I/O memory directly through pointers is frowned upon and does not work on all architectures. Those accessors are written to prevent unwanted optimization, so, once again, volatile is unnecessary.

Another situation where one might be tempted to use volatile is when the processor is busy-waiting on the value of a variable. The right way to perform a busy wait is:

```
while (my_variable != what_i_want)
    cpu_relax();
```

The `cpu_relax()` call can lower CPU power consumption or yield to a hyperthreaded twin processor; it also happens to serve as a compiler barrier, so, once again, volatile is unnecessary. Of course, busy-waiting is generally an anti-social act to begin with.

There are still a few rare situations where volatile makes sense in the kernel:

- The above-mentioned accessor functions might use volatile on architectures where direct I/O memory access does work. Essentially, each accessor call becomes a little critical section on its own and ensures that the access happens as expected by the programmer.
- Inline assembly code which changes memory, but which has no other visible side effects, risks being deleted by GCC. Adding the volatile keyword to `asm` statements will prevent this removal.
- The jiffies variable is special in that it can have a different value every time it is referenced, but it can be read without any special locking. So jiffies can be volatile, but the addition of other variables of this type is strongly frowned upon. Jiffies is considered to be a “stupid legacy” issue (Linus’ s words) in this regard; fixing it would be more trouble than it is worth.
- Pointers to data structures in coherent memory which might be modified by I/O devices can, sometimes, legitimately be volatile. A ring buffer used by a network adapter, where that adapter changes pointers to indicate which descriptors have been processed, is an example of this type of situation.

For most code, none of the above justifications for volatile apply. As a result, the use of volatile is likely to be seen as a bug and will bring additional scrutiny to the code. Developers who are tempted to use volatile should take a step back and think about what they are truly trying to accomplish.

Patches to remove volatile variables are generally welcome - as long as they come with a justification which shows that the concurrency issues have been properly thought through.

## \* **References**

[1] <https://lwn.net/Articles/233481/>

[2] <https://lwn.net/Articles/233482/>

## \* **Credits**

Original impetus and research by Randy Dunlap

Written by Jonathan Corbet

Improvements via comments from Satyam Sharma, Johannes Stezenbach, Jesper Juhl, Heikki Orsila, H. Peter Anvin, Philipp Hahn, and Stefan Richter.



---

CHAPTER  
**TWENTYSEVEN**

---

## **(HOW TO AVOID) BOTCHING UP IOCTLS**

From: <http://blog.ffwll.ch/2013/11/botching-up-ioctls.html>

By: Daniel Vetter, Copyright © 2013 Intel Corporation

One clear insight kernel graphics hackers gained in the past few years is that trying to come up with a unified interface to manage the execution units and memory on completely different GPUs is a futile effort. So nowadays every driver has its own set of ioctls to allocate memory and submit work to the GPU. Which is nice, since there's no more insanity in the form of fake-generic, but actually only used once interfaces. But the clear downside is that there's much more potential to screw things up.

To avoid repeating all the same mistakes again I've written up some of the lessons learned while botching the job for the drm/i915 driver. Most of these only cover technicalities and not the big-picture issues like what the command submission ioctl exactly should look like. Learning these lessons is probably something every GPU driver has to do on its own.

### **\* Prerequisites**

First the prerequisites. Without these you have already failed, because you will need to add a 32-bit compat layer:

- Only use fixed sized integers. To avoid conflicts with typedefs in userspace the kernel has special types like `_u32`, `_s64`. Use them.
- Align everything to the natural size and use explicit padding. 32-bit platforms don't necessarily align 64-bit values to 64-bit boundaries, but 64-bit platforms do. So we always need padding to the natural size to get this right.
- Pad the entire struct to a multiple of 64-bits if the structure contains 64-bit types - the structure size will otherwise differ on 32-bit versus 64-bit. Having a different structure size hurts when passing arrays of structures to the kernel, or if the kernel checks the structure size, which e.g. the drm core does.
- Pointers are `_u64`, cast from/to a `uintptr_t` on the userspace side and from/to a `void __user *` in the kernel. Try really hard not to delay this conversion or worse, fiddle the raw `_u64` through your code since that diminishes the checking tools like sparse can provide. The macro `u64_to_user_ptr` can be

used in the kernel to avoid warnings about integers and pointers of different sizes.

## \* **Basics**

With the joys of writing a compat layer avoided we can take a look at the basic fumbles. Neglecting these will make backward and forward compatibility a real pain. And since getting things wrong on the first attempt is guaranteed you will have a second iteration or at least an extension for any given interface.

- Have a clear way for userspace to figure out whether your new ioctl or ioctl extension is supported on a given kernel. If you can't rely on old kernels rejecting the new flags/modes or ioctls (since doing that was botched in the past) then you need a driver feature flag or revision number somewhere.
- Have a plan for extending ioctls with new flags or new fields at the end of the structure. The drm core checks the passed-in size for each ioctl call and zero-extends any mismatches between kernel and userspace. That helps, but isn't a complete solution since newer userspace on older kernels won't notice that the newly added fields at the end get ignored. So this still needs a new driver feature flags.
- Check all unused fields and flags and all the padding for whether it's 0, and reject the ioctl if that's not the case. Otherwise your nice plan for future extensions is going right down the gutters since someone will submit an ioctl struct with random stack garbage in the yet unused parts. Which then bakes in the ABI that those fields can never be used for anything else but garbage. This is also the reason why you must explicitly pad all structures, even if you never use them in an array - the padding the compiler might insert could contain garbage.
- Have simple testcases for all of the above.

## \* **Fun with Error Paths**

Nowadays we don't have any excuse left any more for drm drivers being neat little root exploits. This means we both need full input validation and solid error handling paths - GPUs will die eventually in the oddmost corner cases anyway:

- The ioctl must check for array overflows. Also it needs to check for over/underflows and clamping issues of integer values in general. The usual example is sprite positioning values fed directly into the hardware with the hardware just having 12 bits or so. Works nicely until some odd display server doesn't bother with clamping itself and the cursor wraps around the screen.
- Have simple testcases for every input validation failure case in your ioctl. Check that the error code matches your expectations. And finally make sure that you only test for one single error path in each subtest by submitting otherwise perfectly valid data. Without this an earlier check might reject the ioctl already and shadow the codepath you actually want to test, hiding bugs and regressions.

- Make all your ioctls restartable. First X really loves signals and second this will allow you to test 90% of all error handling paths by just interrupting your main test suite constantly with signals. Thanks to X's love for signal you'll get an excellent base coverage of all your error paths pretty much for free for graphics drivers. Also, be consistent with how you handle ioctl restarting - e.g. drm has a tiny drmIoctl helper in its userspace library. The i915 driver botched this with the set\_tiling ioctl, now we're stuck forever with some arcane semantics in both the kernel and userspace.
- If you can't make a given codepath restartable make a stuck task at least killable. GPUs just die and your users won't like you more if you hang their entire box (by means of an unkillable X process). If the state recovery is still too tricky have a timeout or hangcheck safety net as a last-ditch effort in case the hardware has gone bananas.
- Have testcases for the really tricky corner cases in your error recovery code - it's way too easy to create a deadlock between your hangcheck code and waiters.

## \* Time, Waiting and Missing it

GPUs do most everything asynchronously, so we have a need to time operations and wait for outstanding ones. This is really tricky business; at the moment none of the ioctls supported by the drm/i915 get this fully right, which means there's still tons more lessons to learn here.

- Use CLOCK\_MONOTONIC as your reference time, always. It's what alsaa, drm and v4l use by default nowadays. But let userspace know which timestamps are derived from different clock domains like your main system clock (provided by the kernel) or some independent hardware counter somewhere else. Clocks will mismatch if you look close enough, but if performance measuring tools have this information they can at least compensate. If your userspace can get at the raw values of some clocks (e.g. through in-command-stream performance counter sampling instructions) consider exposing those also.
- Use \_\_s64 seconds plus \_\_u64 nanoseconds to specify time. It's not the most convenient time specification, but it's mostly the standard.
- Check that input time values are normalized and reject them if not. Note that the kernel native struct ktime has a signed integer for both seconds and nanoseconds, so beware here.
- For timeouts, use absolute times. If you're a good fellow and made your ioctl restartable relative timeouts tend to be too coarse and can indefinitely extend your wait time due to rounding on each restart. Especially if your reference clock is something really slow like the display frame counter. With a spec lawyer hat on this isn't a bug since timeouts can always be extended - but users will surely hate you if their neat animations starts to stutter due to this.
- Consider ditching any synchronous wait ioctls with timeouts and just deliver an asynchronous event on a pollable file descriptor. It fits much better into event driven applications' main loop.

- Have testcases for corner-cases, especially whether the return values for already-completed events, successful waits and timed-out waits are all sane and suiting to your needs.

## \* **Leaking Resources, Not**

A full-blown drm driver essentially implements a little OS, but specialized to the given GPU platforms. This means a driver needs to expose tons of handles for different objects and other resources to userspace. Doing that right entails its own little set of pitfalls:

- Always attach the lifetime of your dynamically created resources to the lifetime of a file descriptor. Consider using a 1:1 mapping if your resource needs to be shared across processes - fd-passing over unix domain sockets also simplifies lifetime management for userspace.
- Always have O\_CLOEXEC support.
- Ensure that you have sufficient insulation between different clients. By default pick a private per-fd namespace which forces any sharing to be done explicitly. Only go with a more global per-device namespace if the objects are truly device-unique. One counterexample in the drm modeset interfaces is that the per-device modeset objects like connectors share a namespace with framebuffer objects, which mostly are not shared at all. A separate namespace, private by default, for framebuffers would have been more suitable.
- Think about uniqueness requirements for userspace handles. E.g. for most drm drivers it's a userspace bug to submit the same object twice in the same command submission ioctl. But then if objects are shareable userspace needs to know whether it has seen an imported object from a different process already or not. I haven't tried this myself yet due to lack of a new class of objects, but consider using inode numbers on your shared file descriptors as unique identifiers - it's how real files are told apart, too. Unfortunately this requires a full-blown virtual filesystem in the kernel.

## \* **Last, but not Least**

Not every problem needs a new ioctl:

- Think hard whether you really want a driver-private interface. Of course it's much quicker to push a driver-private interface than engaging in lengthy discussions for a more generic solution. And occasionally doing a private interface to spearhead a new concept is what's required. But in the end, once the generic interface comes around you'll end up maintaining two interfaces. Indefinitely.
- Consider other interfaces than ioctls. A sysfs attribute is much better for per-device settings, or for child objects with fairly static lifetimes (like output connectors in drm with all the detection override attributes). Or maybe only your testsuite needs this interface, and then debugfs with its disclaimer of not having a stable ABI would be better.

Finally, the name of the game is to get it right on the first attempt, since if your driver proves popular and your hardware platforms long-lived then you'll be stuck with a given ioctl essentially forever. You can try to deprecate horrible ioctls on newer iterations of your hardware, but generally it takes years to accomplish this. And then again years until the last user able to complain about regressions disappears, too.



---

CHAPTER  
**TWENTYEIGHT**

---

## **CLANG-FORMAT**

`clang-format` is a tool to format C/C++/…code according to a set of rules and heuristics. Like most tools, it is not perfect nor covers every single case, but it is good enough to be helpful.

`clang-format` can be used for several purposes:

- Quickly reformat a block of code to the kernel style. Specially useful when moving code around and aligning/sorting. See `clangformatreformat`.
- Spot style mistakes, typos and possible improvements in files you maintain, patches you review, diffs, etc. See `clangformatreview`.
- Help you follow the coding style rules, specially useful for those new to kernel development or working at the same time in several projects with different coding styles.

Its configuration file is `.clang-format` in the root of the kernel tree. The rules contained there try to approximate the most common kernel coding style. They also try to follow `Documentation/process/coding-style.rst` as much as possible. Since not all the kernel follows the same style, it is possible that you may want to tweak the defaults for a particular subsystem or folder. To do so, you can override the defaults by writing another `.clang-format` file in a subfolder.

The tool itself has already been included in the repositories of popular Linux distributions for a long time. Search for `clang-format` in your repositories. Otherwise, you can either download pre-built LLVM/clang binaries or build the source code from:

<http://releases.llvm.org/download.html>

See more information about the tool at:

<https://clang.llvm.org/docs/ClangFormat.html>

<https://clang.llvm.org/docs/ClangFormatStyleOptions.html>

## \* Review files and patches for coding style

By running the tool in its inline mode, you can review full subsystems, folders or individual files for code style mistakes, typos or improvements.

To do so, you can run something like:

```
# Make sure your working directory is clean!
clang-format -i kernel/*.[ch]
```

And then take a look at the git diff.

Counting the lines of such a diff is also useful for improving/tweaking the style options in the configuration file; as well as testing new clang-format features/versions.

clang-format also supports reading unified diffs, so you can review patches and git diffs easily. See the documentation at:

<https://clang.llvm.org/docs/ClangFormat.html#script-for-patch-reformatting>

To avoid clang-format formatting some portion of a file, you can do:

```
int formatted_code;
// clang-format off
void unformatted_code ;
// clang-format on
void formatted_code_again;
```

While it might be tempting to use this to keep a file always in sync with clang-format, specially if you are writing new files or if you are a maintainer, please note that people might be running different clang-format versions or not have it available at all. Therefore, you should probably refrain yourself from using this in kernel sources; at least until we see if clang-format becomes commonplace.

## \* Reformatting blocks of code

By using an integration with your text editor, you can reformat arbitrary blocks (selections) of code with a single keystroke. This is specially useful when moving code around, for complex code that is deeply intended, for multi-line macros (and aligning their backslashes), etc.

Remember that you can always tweak the changes afterwards in those cases where the tool did not do an optimal job. But as a first approximation, it can be very useful.

There are integrations for many popular text editors. For some of them, like vim, emacs, BBEdit and Visual Studio you can find support built-in. For instructions, read the appropriate section at:

<https://clang.llvm.org/docs/ClangFormat.html>

For Atom, Eclipse, Sublime Text, Visual Studio Code, XCode and other editors and IDEs you should be able to find ready-to-use plugins.

For this use case, consider using a secondary .clang-format so that you can tweak a few options. See clangformatextra.

## \* Missing support

clang-format is missing support for some things that are common in kernel code. They are easy to remember, so if you use the tool regularly, you will quickly learn to avoid/ignore those.

In particular, some very common ones you will notice are:

- Aligned blocks of one-line #defines, e.g.:

```
#define TRACING_MAP_BITS_DEFAULT      11
#define TRACING_MAP_BITS_MAX          17
#define TRACING_MAP_BITS_MIN          7
```

vs.:

```
#define TRACING_MAP_BITS_DEFAULT 11
#define TRACING_MAP_BITS_MAX 17
#define TRACING_MAP_BITS_MIN 7
```

- Aligned designated initializers, e.g.:

```
static const struct file_operations uprobe_events_ops = {
    .owner        = THIS_MODULE,
    .open         = probes_open,
    .read         = seq_read,
    .llseek       = seq_llseek,
    .release     = seq_release,
    .write        = probes_write,
};
```

vs.:

```
static const struct file_operations uprobe_events_ops = {
    .owner = THIS_MODULE,
    .open = probes_open,
    .read = seq_read,
    .llseek = seq_llseek,
    .release = seq_release,
    .write = probes_write,
};
```

## \* Extra features/options

Some features/style options are not enabled by default in the configuration file in order to minimize the differences between the output and the current code. In other words, to make the difference as small as possible, which makes reviewing full-file style, as well diffs and patches as easy as possible.

In other cases (e.g. particular subsystems/folders/files), the kernel style might be different and enabling some of these options may approximate better the style there.

For instance:

- Aligning assignments (`AlignConsecutiveAssignments`).
- Aligning declarations (`AlignConsecutiveDeclarations`).
- Reflowing text in comments (`ReflowComments`).
- Sorting `#includes` (`SortIncludes`).

They are typically useful for block re-formatting, rather than full-file. You might want to create another `.clang-format` file and use that one from your editor/IDE instead.

## **ARCH/RISCV MAINTENANCE GUIDELINES FOR DEVELOPERS**

### **\* Overview**

The RISC-V instruction set architecture is developed in the open: in-progress drafts are available for all to review and to experiment with implementations. New module or extension drafts can change during the development process - sometimes in ways that are incompatible with previous drafts. This flexibility can present a challenge for RISC-V Linux maintenance. Linux maintainers disapprove of churn, and the Linux development process prefers well-reviewed and tested code over experimental code. We wish to extend these same principles to the RISC-V-related code that will be accepted for inclusion in the kernel.

### **\* Submit Checklist Addendum**

We'll only accept patches for new modules or extensions if the specifications for those modules or extensions are listed as being "Frozen" or "Ratified" by the RISC-V Foundation. (Developers may, of course, maintain their own Linux kernel trees that contain code for any draft extensions that they wish.)

Additionally, the RISC-V specification allows implementors to create their own custom extensions. These custom extensions aren't required to go through any review or ratification process by the RISC-V Foundation. To avoid the maintenance complexity and potential performance impact of adding kernel code for implementor-specific RISC-V extensions, we'll only accept patches for extensions that have been officially frozen or ratified by the RISC-V Foundation. (Implementors, may, of course, maintain their own Linux kernel trees containing code for any custom extensions that they wish.)



## UNALIGNED MEMORY ACCESSES

**Author** Daniel Drake <[dsd@gentoo.org](mailto:dsd@gentoo.org)>,

**Author** Johannes Berg <[johannes@sipsolutions.net](mailto:johannes@sipsolutions.net)>

**With help from** Alan Cox, Avuton Olrich, Heikki Orsila, Jan Engelhardt, Kyle McMarn, Kyle Moffett, Randy Dunlap, Robert Hancock, Uli Kunitz, Vadim Lobanov

Linux runs on a wide variety of architectures which have varying behaviour when it comes to memory access. This document presents some details about unaligned accesses, why you need to write code that doesn't cause them, and how to write such code!

### \* The definition of an unaligned access

Unaligned memory accesses occur when you try to read N bytes of data starting from an address that is not evenly divisible by N (i.e.  $\text{addr \% } N \neq 0$ ). For example, reading 4 bytes of data from address 0x10004 is fine, but reading 4 bytes of data from address 0x10005 would be an unaligned memory access.

The above may seem a little vague, as memory access can happen in different ways. The context here is at the machine code level: certain instructions read or write a number of bytes to or from memory (e.g. `movb`, `movw`, `movl` in x86 assembly). As will become clear, it is relatively easy to spot C statements which will compile to multiple-byte memory access instructions, namely when dealing with types such as `u16`, `u32` and `u64`.

### \* Natural alignment

The rule mentioned above forms what we refer to as natural alignment: When accessing N bytes of memory, the base memory address must be evenly divisible by N, i.e.  $\text{addr \% } N == 0$ .

When writing code, assume the target architecture has natural alignment requirements.

In reality, only a few architectures require natural alignment on all sizes of memory access. However, we must consider ALL supported architectures; writing code that satisfies natural alignment requirements is the easiest way to achieve full portability.

## \* Why unaligned access is bad

The effects of performing an unaligned memory access vary from architecture to architecture. It would be easy to write a whole document on the differences here; a summary of the common scenarios is presented below:

- Some architectures are able to perform unaligned memory accesses transparently, but there is usually a significant performance cost.
- Some architectures raise processor exceptions when unaligned accesses happen. The exception handler is able to correct the unaligned access, at significant cost to performance.
- Some architectures raise processor exceptions when unaligned accesses happen, but the exceptions do not contain enough information for the unaligned access to be corrected.
- Some architectures are not capable of unaligned memory access, but will silently perform a different memory access to the one that was requested, resulting in a subtle code bug that is hard to detect!

It should be obvious from the above that if your code causes unaligned memory accesses to happen, your code will not work correctly on certain platforms and will cause performance problems on others.

## \* Code that does not cause unaligned access

At first, the concepts above may seem a little hard to relate to actual coding practice. After all, you don't have a great deal of control over memory addresses of certain variables, etc.

Fortunately things are not too complex, as in most cases, the compiler ensures that things will work for you. For example, take the following structure:

```
struct foo {  
    u16 field1;  
    u32 field2;  
    u8 field3;  
};
```

Let us assume that an instance of the above structure resides in memory starting at address 0x10000. With a basic level of understanding, it would not be unreasonable to expect that accessing field2 would cause an unaligned access. You'd be expecting field2 to be located at offset 2 bytes into the structure, i.e. address 0x10002, but that address is not evenly divisible by 4 (remember, we're reading a 4 byte value here).

Fortunately, the compiler understands the alignment constraints, so in the above case it would insert 2 bytes of padding in between field1 and field2. Therefore, for standard structure types you can always rely on the compiler to pad structures so that accesses to fields are suitably aligned (assuming you do not cast the field to a type of different length).

Similarly, you can also rely on the compiler to align variables and function parameters to a naturally aligned scheme, based on the size of the type of the variable.

At this point, it should be clear that accessing a single byte (u8 or char) will never cause an unaligned access, because all memory addresses are evenly divisible by one.

On a related topic, with the above considerations in mind you may observe that you could reorder the fields in the structure in order to place fields where padding would otherwise be inserted, and hence reduce the overall resident memory size of structure instances. The optimal layout of the above example is:

```
struct foo {
    u32 field2;
    u16 field1;
    u8 field3;
};
```

For a natural alignment scheme, the compiler would only have to add a single byte of padding at the end of the structure. This padding is added in order to satisfy alignment constraints for arrays of these structures.

Another point worth mentioning is the use of `_attribute_((packed))` on a structure type. This GCC-specific attribute tells the compiler never to insert any padding within structures, useful when you want to use a C struct to represent some data that comes in a fixed arrangement ‘off the wire’ .

You might be inclined to believe that usage of this attribute can easily lead to unaligned accesses when accessing fields that do not satisfy architectural alignment requirements. However, again, the compiler is aware of the alignment constraints and will generate extra instructions to perform the memory access in a way that does not cause unaligned access. Of course, the extra instructions obviously cause a loss in performance compared to the non-packed case, so the packed attribute should only be used when avoiding structure padding is of importance.

## \* Code that causes unaligned access

With the above in mind, let’s move onto a real life example of a function that can cause an unaligned memory access. The following function taken from include/linux/etherdevice.h is an optimized routine to compare two ethernet MAC addresses for equality:

```
bool ether_addr_equal(const u8 *addr1, const u8 *addr2)
{
#define CONFIG_HAVE_EFFICIENT_UNALIGNED_ACCESS
    u32 fold = ((*(const u32 *)addr1) ^ (*(const u32 *)addr2)) |
               ((*(const u16 *)(addr1 + 4)) ^ (*(const u16 *)(addr2 +
→4)));
    return fold == 0;
#else
    const u16 *a = (const u16 *)addr1;
    const u16 *b = (const u16 *)addr2;
```

(continues on next page)

(continued from previous page)

```
        return ((a[0] ^ b[0]) | (a[1] ^ b[1]) | (a[2] ^ b[2])) == 0;
#endif
}
```

In the above function, when the hardware has efficient unaligned access capability, there is no issue with this code. But when the hardware isn't able to access memory on arbitrary boundaries, the reference to a[0] causes 2 bytes (16 bits) to be read from memory starting at address addr1.

Think about what would happen if addr1 was an odd address such as 0x10003. (Hint: it'd be an unaligned access.)

Despite the potential unaligned access problems with the above function, it is included in the kernel anyway but is understood to only work normally on 16-bit-aligned addresses. It is up to the caller to ensure this alignment or not use this function at all. This alignment-unsafe function is still useful as it is a decent optimization for the cases when you can ensure alignment, which is true almost all of the time in ethernet networking context.

Here is another example of some code that could cause unaligned accesses:

```
void myfunc(u8 *data, u32 value)
{
    [...]
    *((u32 *) data) = cpu_to_le32(value);
    [...]
}
```

This code will cause unaligned accesses every time the data parameter points to an address that is not evenly divisible by 4.

In summary, the 2 main scenarios where you may run into unaligned access problems involve:

1. Casting variables to types of different lengths
2. Pointer arithmetic followed by access to at least 2 bytes of data

## \* Avoiding unaligned accesses

The easiest way to avoid unaligned access is to use the `get_unaligned()` and `put_unaligned()` macros provided by the `<asm/unaligned.h>` header file.

Going back to an earlier example of code that potentially causes unaligned access:

```
void myfunc(u8 *data, u32 value)
{
    [...]
    *((u32 *) data) = cpu_to_le32(value);
    [...]
}
```

To avoid the unaligned memory access, you would rewrite it as follows:

```
void myfunc(u8 *data, u32 value)
{
    [...]
    value = cpu_to_le32(value);
    put_unaligned(value, (u32 *) data);
    [...]
}
```

The `get_unaligned()` macro works similarly. Assuming ‘`data`’ is a pointer to memory and you wish to avoid unaligned access, its usage is as follows:

```
u32 value = get_unaligned((u32 *) data);
```

These macros work for memory accesses of any length (not just 32 bits as in the examples above). Be aware that when compared to standard access of aligned memory, using these macros to access unaligned memory can be costly in terms of performance.

If use of such macros is not convenient, another option is to use `memcpy()`, where the source or destination (or both) are of type `u8*` or `unsigned char*`. Due to the byte-wise nature of this operation, unaligned accesses are avoided.

## \* Alignment vs. Networking

On architectures that require aligned loads, networking requires that the IP header is aligned on a four-byte boundary to optimise the IP stack. For regular ethernet hardware, the constant `NET_IP_ALIGN` is used. On most architectures this constant has the value 2 because the normal ethernet header is 14 bytes long, so in order to get proper alignment one needs to DMA to an address which can be expressed as  $4*n + 2$ . One notable exception here is powerpc which defines `NET_IP_ALIGN` to 0 because DMA to unaligned addresses can be very expensive and dwarf the cost of unaligned loads.

For some ethernet hardware that cannot DMA to unaligned addresses like  $4*n+2$  or non-ethernet hardware, this can be a problem, and it is then required to copy the incoming frame into an aligned buffer. Because this is unnecessary on architectures that can do unaligned accesses, the code can be made dependent on `CONFIG_HAVE_EFFICIENT_UNALIGNED_ACCESS` like so:

```
#ifdef CONFIG_HAVE_EFFICIENT_UNALIGNED_ACCESS
    skb = original_skb
#else
    skb = copy_skb
#endif
```



## BIBLIOGRAPHY

- [c-language] <http://www.open-std.org/jtc1/sc22/wg14/www/standards>
- [gcc] <https://gcc.gnu.org>
- [clang] <https://clang.llvm.org>
- [icc] <https://software.intel.com/en-us/c-compilers>
- [gcc-c-dialect-options] <https://gcc.gnu.org/onlinedocs/gcc/C-Dialect-Options.html>
- [gnu-extensions] <https://gcc.gnu.org/onlinedocs/gcc/C-Extensions.html>
- [gcc-attribute-syntax] <https://gcc.gnu.org/onlinedocs/gcc/Attribute-Syntax.html>
- [n2049] <http://www.open-std.org/jtc1/sc22/wg14/www/docs/n2049.pdf>