What's up in Kernel-Land?
Target audience? Users of these!

...and many more

Linux-Distributions for Laptops, Desktops and Servers
Persönliche Angaben von Thorsten Leemhuis

Thorsten Leemhuis

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MSN: AIM/Chat: 
ICQ: GroupWise:

Benutzername: thl
Passwort ändern ...

Schließen
Persönliche Angaben von Thorsten Leemhuis

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MSN:   
ICQ:   
Yahoo:   
AIM@Chat:   
GroupWise:   

Benutzername: knurd
Passwort ändern ...

Schließen
Micro-Blogging

- @thleemhuis: private/personal stuff, German
- @knurd666: Fedora related things, English
- @kernellogauthor: Kernel-Log topics, English
- @kernellog: announces new Kernel Logs on heise.de, German
- @kernellog2: announces new Kernel Logs on h-online.com, English
The next 35 minutes

- quick overview: Linux development model, stable series
- main part: the different areas of the kernel
  - what got improved recently
  - what people are working on
- how to help
- summing up + questions
- there are a lot of more topics I can talk about if you want
  - but I doubt there will be much free time remaining, as the main part is packed with details already
"Use bullet points rarely"

- you
  - won't
    - see
      - many
        - bullet
          - points
            - in
              - this
                - presentation
"Use bullet points rarely"

- you
  - won't
  - see
    - many
      - bullet
        - points
          - in
            - this
              - presentation

If you really think you need something to read, then open your laptop and look at the notes of this presentation: http://bit.ly/lk2010-kernellog
From: Linus Torvalds <torvalds <at> linuxfoundation.org>
Subject: Re: From 2.4 to 2.6 to 2.7?
Newsgroups: gmane.linux.kernel
Date: 2008-07-15 02:22:04 GMT (2 years, 9 weeks, 2 days, 16 hours and 41 minutes ago)

On Mon, 14 Jul 2008, Stoyan Gaydarov wrote:
> Second I wanted to talk about the linux 2.7.x kernel, what's in the
> making or maybe even not started

Nothing.

I'm not going back to the old model. The new model is so much better that it's not even worth entertaining as a theory to go back.

That said, I am considering changing just the numbering. Not to go back to the old model, but because a constantly increasing minor number leads to big numbers. I'm not all that thrilled with "26" as a number: it's hard to remember.

So I would not dismiss (and have been thinking about starting) talk about a simple numbering reset (perhaps yearly), but the old model of 3-year development trees is simply not coming back as far as I'm concerned.
Merge window


2.6.30 → 2.6.31 -rc1

Merge Window
Stabilization phase


2.6.30 → 2.6.31 -rc1 → 2.6.31 -rc2 → 2.6.31 -rc3 → 2.6.31 -rc4 → 2.6.26 -rc n → 2.6.31

Merge Window → stabilization phase
Growth

Zeilen Quellcode

Kernel-Version

2.6.27  2.6.28  2.6.29  2.6.30  2.6.31  2.6.32  2.6.33
Growth

Kernel-Version

Zeilen Quellcode

late merge of a SCSI FC driver

RC1

2.6.27
2.6.28
2.6.29
2.6.30
2.6.31
2.6.32
2.6.33
## Some stats

<table>
<thead>
<tr>
<th>Linux-Version</th>
<th>Anzahl Dateien¹</th>
<th>Zeilen Quelltext² (Ohne Dokum.)</th>
<th>Entwicklungszeitraum</th>
<th>Anzahl Commits³</th>
<th>Diffstat⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6.31</td>
<td>29111</td>
<td>12046317 (10778469)</td>
<td>92 Tage</td>
<td>10883</td>
<td>8938 files changed, 914135 insertions(+), 504980 deletions(-)</td>
</tr>
<tr>
<td>2.6.32</td>
<td>30485</td>
<td>12610030 (11242136)</td>
<td>84 Tage</td>
<td>10998</td>
<td>10315 files changed, 1092987 insertions(+), 530428 deletions(-)</td>
</tr>
<tr>
<td>2.6.33</td>
<td>31565</td>
<td>12990041 (11564768)</td>
<td>83 Tage</td>
<td>10871</td>
<td>9673 files changed, 859458 insertions(+), 479452 deletions(-)</td>
</tr>
<tr>
<td>2.6.34</td>
<td>32297</td>
<td>13320934 (11861616)</td>
<td>82 Tage</td>
<td>9443</td>
<td>11154 files changed, 609854 insertions(+), 278958 deletions(-)</td>
</tr>
<tr>
<td>2.6.35</td>
<td>33316</td>
<td>13545604 (12250679)</td>
<td>77 Tage</td>
<td>9801</td>
<td>8889 files changed, 691927 insertions(+), 467252 deletions(-)</td>
</tr>
</tbody>
</table>

¹ find . -type f -not-regex '.*git/.*' | wc -l
² find . -type f -not-regex '.*git.*' | xargs cat | wc -l (find . -name *.hcS -not-regex '.*git.*' | xargs cat | wc -l)
³ git-log --no-merges --pretty=oneline v2.6.(x-1)..v2.6.(x) | wc -l
⁴ git diff --shortstat v2.6.(x-1)..v2.6.(x)
Stable series

2.6.29 (24.03.09) → 2.6.30 -rc n → 2.6.30 (10.06.09) → 2.6.31 -rc n → 2.6.31 (10.09.09)

2.6.29.1 (02.04.) → ... → 2.6.29.4 (20.05.) → 2.6.29.5 (15.06.) → 2.6.29.6 (03.07.)

2.6.30.1 (03.07.) → ... → 2.6.30.10 (04.12.)

2.6.31.1 (24.09.)
Stable series

2.6.29 (24.03.09) → 2.6.30 -rc n → 2.6.30 (10.06.09) → 2.6.31 -rc n → 2.6.31 (10.09.09)

EOL: after 3 months

2.6.30.1 (03.07) → ... → 2.6.30.10 (04.12)

EOL: after six months

2.6.29.1 (02.04) → ... → 2.6.29.4 (20.05) → 2.6.29.5 (15.06) → 2.6.29.6 (03.07)
Everything you ever wanted to know about Linux 2.6-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.
- 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/SubmittingPatches rules.
- It or an equivalent fix must already exist in Linus' tree (upstream).
Stable series: status

- 2.4.xx: not yet dead, but dying
- 2.6.27: growing old: will soon be dropped or frozen deeper
- 2.6.32: current "long term stable release"
- 2.6.34: support stopped recently
- 2.6.35: current

---

From: Greg KH <gregkh <at> suse.de>
Subject: Linux 2.6.35.2
Newsgroups: gmane_linux_kernel
Date: 2010-08-13 21:23:13 GMT

I'm announcing the release of the 2.6.35.2 kernel.

All users of the 2.6.35 kernel series must upgrade.

I'm tired of people trying to parse my words like I'm the Federal Reserve Chairman, just go update already. If you use a kernel.org-based kernel, and you aren't updating to the latest -stable updates, well, why are you using a kernel.org kernel in the first place?
Where we are, where we head

The Linux Kernel Archives

Welcome to the Linux Kernel Archives. This is the primary site for the Linux kernel source, but it has much more than just Linux kernels.

Frequently Asked Questions

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td><a href="http://www.kernel.org/pub/">http://www.kernel.org/pub/</a></td>
</tr>
<tr>
<td>RSYNC</td>
<td>rsync://rsync.kernel.org/pub/</td>
</tr>
</tbody>
</table>

Latest Stable Kernel: 2.6.35.5

linux-next: **next-20100921** 2010-09-21 [Patch] [View Patch] [Gitweb]
mainline: **2.6.36-rc5** 2010-09-20 [Full Source] [Patch] [View Patch] [View Inc.] [Gitweb] [Changelog]
snapshot: **2.6.36-rc4-git5** 2010-09-20 [Patch] [View Patch]
stable: **2.6.35.5** 2010-09-20 [Full Source] [Patch] [View Patch] [View Inc.] [Gitweb] [Changelog]
stable: **2.6.34.7** 2010-09-13 [Full Source] [Patch] [View Patch] [View Inc.] [Gitweb] [Changelog]
stable: **2.6.33.7** 2010-08-02 [Full Source] [Patch] [View Patch] [View Inc.] [Gitweb] [Changelog]
stable: **2.6.32.22** 2010-09-20 [Full Source] [Patch] [View Patch] [View Inc.] [Gitweb] [Changelog]
Graphics hardware: AMD/ATI
Graphics hardware: Intel

Intel® HD Graphics

Intel® HD Graphics built into 2010 Intel® Core™ processors¹ provides everyday visual computing on desktop and mobile PCs. Equipped with an advanced video engine, Intel® HD Graphics delivers high-quality, high-definition (HD) video playback, advanced 3D capabilities, and full support for the Microsoft Windows 7* operating system, without the need for a discrete graphics card.

Intel HD Graphics architecture

Delivering flexibility while enabling support for use by future media, Intel HD Graphics dynamically processes graphics and media data. With support for dynamic load balancing, multi-threading, and multi-functional data processing, Intel HD Graphics delivers increased performance for enthusiast-class media capabilities, along with casual and mainstream gaming.

Intel HD Graphics delivers key media and graphics technologies, including the following:

Graphics WOW

The Intel® Core™ i5 processor now comes with Intel® HD Graphics built in.

» Learn more
Graphics hardware: Nvidia
Graphics hardware: Various

KGDB + KDB + KMS the hyper fast fly through

A lightning fast demonstration of using kgdb kdb and kernel mode setting
Network
Side note: staging

From: Greg KH <greg <at> kroah.com>
Subject: [ANNOUNCE] linux-staging tree created
Newsgroups: gmane.linux.kernel.next, gmane.linux.kernel,
Date: 2008-06-10 19:05:40 GMT

PURPOSE

The linux-staging tree was created to hold drivers and filesystems and other semi-major additions to the Linux kernel that are not ready to be merged at this point in time. It is here for companies and authors to get a wider range of testing, and to allow for other members of the community to help with the development of these features for the eventual inclusion into the main kernel tree.

This tree will be included in the daily linux-next builds, and will get testing by all users of that tree.

The rules of what can be included here is as follows:
- the code must be released under a Linux kernel-compatible license
- the goal of the developers must be to merge this code into the main kernel tree in the near future, but not for the next kernel release.
- the code must build properly on the x86 platform
- this is not a tree for bugfixes or rewrites of existing kernel code, this should be for new features, drivers, and filesystems.
- the patches included must detail exactly what is needed to be completed in order for them to be included into the main kernel tree.
- there must be some email address associated with the patch that can be used for bug reporting and questions about cleanups and testing the code.
Storage
Storage
File systems
File systems

[3D graph showing file system performance metrics, including CPU cache effect and buffer cache effect. The graph plots read performance against file size in Kbytes and transfer size in Kbytes, with Kbytes per second shown on a logarithmic scale.]
Architecture
Virtualization

```bash
[thl@ankan-morpork tmp]$ modinfo kvm
filename: /lib/modules/2.6.35.4-28.fc14.x86_64/kernel/arch/x86/kvm/kvm.ko
license: GPL
author: Qumranet
srcversion: 4819CF9603D4535B68C5ED9
depends: 
vermagic: 2.6.35.4-28.fc14.x86_64 SMP mod_unload
parm: oos_shadow:bool
parm: ignore_msr:bool
[thl@ankan-morpork tmp]$ modinfo kvm-intel
filename: /lib/modules/2.6.35.4-28.fc14.x86_64/kernel/arch/x86/kvm/kvm-intel.ko
license: GPL
author: Qumranet
srcversion: 3733E64B0127064F5398119
depends: kvm
vermagic: 2.6.35.4-28.fc14.x86_64 SMP mod_unload
parm: bypass_guest_pf:bool
parm: vpid:bool
parm: flexpriority:bool
parm: ept:bool
parm: unrestricted_guest:bool
parm: emulate_invalid_guest_state:bool
parm: ple_gap:int
parm: ple_window:int
[thl@ankan-morpork tmp]$
```
Security

CONFIG_SECURITY_SELINUX:

This selects NSA Security-Enhanced Linux (SELinux).
You will also need a policy configuration and a labeled filesystem.
If you are unsure how to answer this question, answer N.

Symbol: SECURITY_SELINUX [=y]
Type: boolean
Prompt: NSA SELinux Support

 NSA SELinux Support

This selects NSA Security-Enhanced Linux (SELinux).
You will also need a policy configuration and a labeled filesystem.
If you are unsure how to answer this question, answer N.

Symbol: SECURITY_SELINUX [=y]
Type: boolean
Prompt: NSA SELinux Support

 NSA SELinux Support
Tracing/Debugging

```
[thl@ankh-morpork tmp]$ sudo perf record -- /bin/ls /sys/devices/block char
[ perf record: Woken up 1 times to write data ]
[ perf record: Captured and wrote 0.008 MB perf.data (~333 samples) ]
[thl@ankh-morpork tmp]$ sudo perf report
# Events: 13 cycles
#
# Overhead Command Shared Object Symbol
# ........ ......... ................. ........
#
 50.83%   ls [kernel.kallsyms] [k] mem_cgroup_update_file_mapped
 42.27%   ls [kernel.kallsyms] [k] trace_hardirqs_off_caller
   6.00%   ls [kernel.kallsyms] [k] slab_pad_check
   0.73%   ls [kernel.kallsyms] [k] native_write_msr_safe
   0.18%   ls [kernel.kallsyms] [k] trace_hardirqs_on
#
# (For a higher level overview, try: perf report --sort comm,dso)
#
[thl@ankh-morpork tmp]$
```
Memory management (MM)
Power management (PM)
Various: drivers

```
[thl@cd-rom:~/linux-2.6]$ ls drivers/
accessibility  cpufreq  hwmon  Makefile  oprofile  s390  uio
acpi           cpuidle  i2c    mca       parisc    sbus  usb
amba           crypto   ide    md        parport    scsi  uwb
ata            dca      idle   media     pci       serial vhost
atm            dio      ieeel394 memstick pcmcia    sfi   video
auxdisplay     dma      iee802154 message platform sh    virtio
base           edac     infiniband mfd       pnp       sn    vlynq
block          eisa     input  misc      power     spi   wl
bluetooth      firewire isdn   mmc       pps       ssb   watchdog
cdrom          firmware Kconfig mtd       ps3       staging xen
clocksource    gpu      lguest  nbus      regulator telephony
connector      hid      macintosh of       rtc       thermal
[thl@cd-rom linux-2.6]$ 
```
Various: infrastructure

**System V IPC**

CONFIG_SYSVIPC:

Inter Process Communication is a suite of library functions and system calls which let processes (running programs) synchronize and exchange information. It is generally considered to be a good thing, and some programs won't run unless you say Y here. In particular, if you want to run the DOS emulator dosemu under Linux (read the DOSEMU-HOWTO, available from <http://www.tldp.org/docs.html#howto>), you'll need to say Y here.
Various: userspace
Staying up2date: Kernel-Log (de)

Staying up2date: Kernel-Log

Thorsten Leemhuis

Kernel-Log: Alsa-Treiber für die X-Fi, Diskussionen um TuxOnice

Der Linux-Kernel wird wohl bald einen Treiber für die X-Fi-Soundkarten von Creative enthalten. Nach langer Ruhephase diskutieren die Kernel-Entwickler wieder über eine Aufnahme von TuxOnice.


10 September 2010, 16:05

Kernel Log: Coming in 2.6.36 (Part 1) - Graphics
by Thorsten Leemhuis

Various changes improve the performance and functionality of drivers for graphics chips in the latest Intel mobile processors. Nouveau now supports the Fermi chips used on recent GeForce graphics cards. The Radeon driver in 2.6.36 adds support for underscan, HyperZ and tiling. Extensions for the KDB debugger and Intel’s KMS driver allow new debugging functionality.

After releasing the third RC of Linux 2.6.36 at the end of August nothing has happened in the main development tree of Linux for eight days, as Torvalds had visited LinuxCon Brazil 2010. Since Tuesday the tree is moving again; the fourth RC should show up for the start of next week if Linus Torvalds sticks to his usual work patterns.

The current developer version of 2.6.36 already closely resembles the final version, as kernel hackers have, as ever, used the merge window which opens the development cycle to merge all major changes into the main development tree. The current stabilisation phase is reserved primarily for bug-fix changes rather than major enhancements, as the latter tend to introduce further bugs. Torvalds stuck to this approach more strictly in 2.6.35 and is taking a similar line in 2.6.36, the approach having proved its worth.

The Kernel Log thus can now already offer a comprehensive overview of the major changes in the new kernel version scheduled for release in late October.

http://www.h-online.com/open/
Welcome to LWN.net

LWN featured content

[$] What ever happened to chunkfs?
[Kernel] Posted Jun 17, 2009 12:23 UTC (Wed) by jake

Guest author Valerie Aurora is frequently asked about chunkfs, which is a prototype file system implementing "repair-driven" file system features. Her answer: "Chunkfs works, the overhead is reasonable, and it is only practical if it is part of the file system design from the beginning, not tacked on after the fact. I just need to write up the paper summarizing all the data." That paper is now available, subscribers only, from this week's Kernel page.

Full Story (comments: 25)

[$] FreedomHEC Taipei 2009
[Front] Posted Jun 15, 2009 15:31 UTC (Mon) by corbet

FreedomHEC (Freedom Hardware Engineer's Conference) Taipei was held June 10 and 11 in, unsurprisingly, Taipei, Taiwan. The event, sponsored by the governmental Institute for Information Industry, followed the huge Computex conference in the hope of attracting hardware developers who are interested in supporting Linux. LWN Executive Editor Jonathan Corbet spoke at FreedomHEC; the following report (subscribers only) gives a look at the conference and what it accomplished.

What is LWN.net?
LWN.net is a reader-supported news site dedicated to producing the best coverage from within the Linux and free software development communities. See the LWN FAQ for more information, and please consider subscribing to gain full access and support our activities.

Current news
OpenSource World Unlocks the Word on Keynote Speakers (Linux Journal)
[Press] Posted Jun 19, 2009 23:05 UTC (Fri) by ris

Linux Journal looks forward to the OpenSource World conference, previously known as LinuxWorld. "Keynote speakers are always a highlight of any conference, and OpenSource World is no exception. The expo's main speaker will be California Secretary of State Debra Bowen, who is known to the Open Source community for understanding and advocating Open Source software. Additionally, there will be a keynote panel, "Assessing the Real Market Opportunities and Obstacles for Making Cloud Computing Mainstream," lead by CloudWorld conference chairman Jeffrey Kaplan and including discussion and debate by panelists Joe Weinman of AT&T Business Solutions, Sam Charlington of Appistry, and James Urquhart of Cisco."

Comments (none posted)
openSUSE Factory is Now Open

http://lwn.net
Staying up2date: Weather Forecast

Linux Weather Forecast

Welcome to the Linux Weather Forecast.

This page is an attempt to track ongoing developments in the Linux development community that have a good chance of appearing in a mainline kernel and/or major distributions sometime in the near future. Your “chief meteorologist” is Jonathan Corbet, Executive Editor at LWN.net. If you have suggestions on improving the forecast (and particularly if you have a project or patchset that you think should be tracked), please add your comments to the Discussion page. There’s a blog that reports on the main changes to the forecast. You can view it directly or use a feed reader to subscribe to the blog feed. You can also subscribe directly to the changes feed for this page to see all forecast edits.

Forecast summaries

Current conditions: The 2.6.29 kernel was released on March 23, 2009. This development cycle incorporated nearly 12,000 changesets from almost 1200 developers, see this article for a look at where that code came from.

Some of the key features in 2.6.29 are:

- Kernel-based mode setting for graphics adapters - for Intel hardware in particular, at this time. The addition of this code is the beginning of the end of a multi-year effort to rationalize our handling of 3D graphics hardware and provide a top-quality graphical experience to Linux users.
- The development version of the Btrfs filesystem. Btrfs is widely expected to become the default Linux filesystem in the future, but it remains in a developmental stage currently and should not be used for production data.
- The squashfs filesystem. Squashfs is a compressed, read-only filesystem used.
Staying up2date: Kernelnewbies

LinuxChanges

List of the major changes done to each Linux kernel release. Other places to get news about the Linux kernel are LWN kernel status, LWN list of API changes in 2.6, KernaPodcast or www.lmli.org. List of changes of older releases can be found at Linux26Changes. If you’re going to add something here look first at LinuxChangesRules!

Discuss the latest Linux kernel changes on the Kernelnewbies web forum.

Linux 2.6.35 has been released on 1 Aug, 2010

Summary Linux 2.6.35 includes support for transparent spreading of incoming network load across CPUs, Direct-IO support for Extfs, an new experimental journal mode for XFS, the KDB debugger UI based on top of KGDB, improvements to 'perf'. H.264 and VC1 video acceleration in Intel G45+ chips, support for the future Intel Cougarpoint graphic chip, power management for AMD Radeon chips, a memory defragmentation mechanism, support for the Tunnelling Protocol version 3 (RFC 3931), support for multiple multicast route tables, support for the CAIF protocol used by ST-Ericsson products, support for the ACPI Platform Error Interface, and many new drivers and small improvements.

Note: Details on architecture-specific and driver changes have been moved to this page: Linux_2_6_35-DriverArch

1. Prominent features (the cool stuff)
   1. Transparent spreading of incoming network traffic load across CPUs
   2. Extfs improvements
   3. XFS Delayed logging
   4. KDB kernel debugger frontend
   5. perf improvements
   6. Graphic improvements
   7. Memory compaction
   8. Support for multiple multicast route tables
   9. L2TP Version 3 (RFC 3931) support
   10. CAIF Protocol support
   11. ACPI Platform Error Interface support

2. Various core changes

3. Filesystems

4. Block

5. Memory management

6. Networking

7. Tracing/Profiling

8. Crypto

9. Virtualization

10. MD

11. CPU scheduler

12. Cpufreq/spindle

13. Security
Test and Report bugs!

This is the Kernel Tracker system (based on Bugzilla) for posting bugs against the mainline Linux kernels (not distribution kernels). If you have problems or questions related to the Kernel Tracker itself, please contact the bugme admin or submit a bug report against it. You can find the answer to some of your questions in the FAQ page too. All new categories are created owned by "virtual users". You may also want to read the Kernel Bug Tracker User's Guide to find out more about Kernel Bug Tracker and how to use it.

Most common actions:
Search existing bug reports
Enter a new bug report
Summary reports and charts

Login:
Password:
[ ] Restrict this session to this IP address (using this option improves security)

Login [Forgot my Password]

Open a new Kernel Bug Tracker account

Add to Sidebar (requires a Mozilla browser like Mozilla Firefox)
Install the Quick Search plugin (requires Firefox 2 or Internet Explorer 7)

Enter a bug # or some search terms:
Find [Help]
Test -rc Kernels!

From: Ted Ts'o <tytso <at> mit.edu>
Subject: Re: stable? quality assurance?
Newsgroups: gmane.linux.kernel
Date: 2010-07-11 13:16:40 GMT (9 weeks, 4 days, 5 hours and 26 minutes ago)

On Sun, Jul 11, 2010 at 09:18:41AM +0200, Martin Steigerwald wrote:
>
> I still actually *use* my machines for something else than hunting patches
> for kernel bugs and on kernel.org it is written "Latest *Stable* Kernel"
> (accentuation from me). I know of the argument that one should use a
> distro kernel for machines that are for production use. But frankly, does
> that justify to deliver in advance known crap to the distributors? What
> impact do partly grave bugs reported on bugzilla have on the release
> decision?
>
So I tend to use -rc3, -rc4, and -rc5 kernels on my laptops, and when I find bugs, I report them and I help fix them. If more people did that, then the 2.6.X.0 releases would be more stable. But kernel development is a volunteer effort, so it's up to the volunteers to test and fix bugs during the rc4, -rc5 and -rc6 time frame. But if the work tails off, because the developers are busily working on new features for the new release, then past a certain point, delaying the release reaches a point of diminishing returns. This is why we do time-based releases.

It is possible to do other types of release strategies, but look at Debian Obsolete~H~H~H~H~H~H~H~H Stable if you want to see what happens if you insist on waiting until all release blockers are fixed (and even with Debian, past a certain point the release engineer will still just reclassify bugs as no longer being release blockers --- after the stable release has slipped for months or years past the original projected release date.)

So if you and others like you are willing to help, then the quality of the Linux kernels can continue to improve. But simply complaining about it is not likely to solve things, since threatening to not be willing to upgrade kernels is generally not going to motivate many, if not most, of the volunteers who work on stabilizing the kernel.
Regression Reports

This message contains a list of some regressions introduced between 2.6.28 and 2.6.29, for which there are no fixes in the mainline I know of. If any of them have been fixed already, please let me know.

If you know of any other unresolved regressions introduced between 2.6.28 and 2.6.29, please let me know either and I'll add them to the list. Also, please let me know if any of the entries below are invalid.

Each entry from the list will be sent additionally in an automatic reply to this message with CCs to the people involved in reporting and handling the issue.

Listed regressions statistics:

<table>
<thead>
<tr>
<th>Date</th>
<th>Total</th>
<th>Pending</th>
<th>Unresolved</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009-06-07</td>
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Finally ()

- 2.6.35 (released in August)
  - RPS, RFS, memory compaction, direct I/O for Btrfs, Kdb, perf
- 2.6.36 in mid October
  - AppArmor, fanotify, Concurrency-managed workqueues, new OOM, latency reduction, CIFS FS-Cache
  - improved hardware support thanks to new and improved drivers
- 2.6.37 for the start of next year
- still a lot happening, as there still is a lot to do
  - but yes, maybe things are slowing down a bit
- support for 2.6.27 might soon stop (and 2.4 as well)
- always upgrade to the latest stable releases
  - or use a kernel from a distribution to let the distributor fix all security bugs for you
Wanna know more about these? Ask!

- LWN: Who writes the kernel
  - Hobby vs. payed
  - which companies are good citizens
- BFS-Scheduler/CK-Serie
- proprietary drivers
- distributors, please ship updated kernels to get new drivers to the users
- kernel series:
  - linux-next, mm-Kernel, RT-Tree, distribution kernels, devel trees
- how the Kernel-Log is written
- How to handle LKML and commit traffic
- how to become a kernel hacker
Copyright

• download
  – Hint: read notes ;-)

• copyright stuff:
  – the wordclouds created with the applet on http://www.wordle.net
    and licensed under Creative Commons Attribution 3.0 United
    States License
What’s up in Kernel-Land?

- Words for the graphics created with the applet from www.wordle.net
- Linux-Kongress 2010:15
  - Nurnberg:5
  - Thursday:5
  - 2010/09/23:5
  - 10:45:5
- Thorsten Leemhuis:15
  - Heise Zeitschriften Verlag GmbH&Co. KG:5
  - thl@ct.de:5
  - thorsten@leemhuis.info:5
- Linux-Kernel:15
  - 2.6.34 :12
    - Radeon 5xxx :6
  - 2.6.35 :12
    - RPS, RFS:4
    - memory compaction:4
    - direct I/O for Btrfs:4
    - Kdb:4
    - perf:4
  - 2.6.36 :12
    - AppArmor:4
    - fanotify:4
    - Concurrency-managed workqueues:4
    - new OOM:4
    - latency reduction:4
    - CIFS FS-Cache:4
- status:12
- outlook:12
- Development:10
- stable-series:5
* everyone that uses Linux on a laptop, desktop or server
* even if most of us are not running a mainstream kernel, it still is important for us
* the kernels of distributions like these are based on the kernel from kernel.org/ the kernel developed by Linus and his fellows
* most drivers are part of the kernel
* these days that even includes core parts of the graphics drivers
* even changes under the hood/at the core sometimes have an impact on ordinary users
* decisions by linus and his fellows have impact
* world might look different today if reiser4 or xen would have been merged
* better or not? no idea ;-)

Target audience? Users of these!
* Thorsten Leemhuis @ work
* nickname: thl
* thl@ct.de
* XMMP: thl_at_home@jabber.ccc.de
* editor for Heise Zeitschriften Verlag GmbH&Co. KG (Hannover, Germany)
* writing the "Kernel-Log" for heise.de and c't
* english translations are published with a lag of about 24 to 72 hours on "The H" (h-online.com)
* my work at heise
* write for c't and heise online about
  * mobile stuff (smartphones, Laptops); don't find much time for it
  * Linux stuff: takes nearly all of my time
• Thorsten Leemhuis @ home
• nick: knurd
• linux@leemhuis.info
• 33 years old
• raised in northern Germany (east frisia, to be precise)
• uses distributions kernels
• not a kernel developer!
• „Things should just work“!
• interested in PC hardware, Linux Kernel, Gnome, X, Fedora
• sports: badminton, biking, jogging
• "owns" three cats: Linus, Lucy and Ginger (pictured)
• IRC: knurd on freenode.net and oftc.net
• XMMP: thl_at_home@jabber.ccc.de
• Fedora
• RPM Fusion
• never been to the US or any other English speaking countries for longer than a few days and hence my spoken English might not the best
• mad people have two or three microblog accounts
• I manage 2 x 5 :-/
• I don't use facebook
The next 35 minutes

- quick overview: Linux development model, stable series
- main part: the different areas of the kernel
  - what got improved recently
  - what people are working on
- how to help
- summing up + questions
- there are a lot of more topics I can talk about if you want
  - but I doubt there will be much free time remaining, as the main part is packed with details already

* I likely know enough about the topics convered to fill 2 or three hours
* lot of details following, but
* a lot more details to the topics mentioned are available on the net
* problem: there are likely experts of some areas in the audience
* if I tell something stupid yell at me
* my view in some areas is a bit different to the one from Corbet
* I'm for example focusing a bit more on the usual c't / heise online reader
"Use bullet points rarely"

- you
- won't
- see
- many
- bullet
- points
- in
- this
- presentation

- nothing to see here, move along
"Use bullet points rarely"

- you
- won't
- see
  - many
  - bullet
  - points
  - in
  - this
  - presentation

If you really think you need something to read, then open your laptop and look at the notes of this presentation: http://bit.ly/lk2010-kernellog

- URL in the lower right all the time
* since more than 6 years now
* round about 4 to 5 (closer to 4) new kernels a year
* the old model with a unstable series (2.3 preparing 2.4, 2.5 preparing 2.6) is gone
* the current model really works well
* new version numbering scheme discussed more than two years ago
* no outcome (yet)
* all the big changes get integrated in this phase
* round about 4/5 to 9/10 commits in this part
* all the big changes
* begins directly after a new version got released
  * IOW: 2.6.(n+1) development begins right after 2.6.n got released
* ends with rc1
  * round about two weeks long
* details: Documentation/development-process
* normally lasts eight to eleven weeks
* getting a bit shorter
* only patches that fix things
* in some aspects maybe similar to the stable rules (later)
* since 2.6.35 Linus enforces this more strictly
  * makes this period a bit shorter
* there are exceptions, especially between rc1 and rc2
* new rc’s weekly
* often in the night from Sunday to Monday
* Details: Documentation/development-process
* every version get round about 500,000 lines bigger
* looks like this growth is not a big problem for embedded
* merge window can be seen easily
* devel cycle is getting a bit quicker
* Corbet: "last year: consolidation and completion" but also "[...] there is still a lot in the works
- older example, but you'll get the idea
• older example, but you'll get the idea
- some kernels only get bugfixes for 3 months, other six or more
- now and then a version is deemed "long term stable release"
- currently those are 2.6.27 and 2.6.32
fixes for released version, with an additional number in the version field

• 2.6.32.6 = the sixth bug fix version based on 2.6.32

• (similar) change hat to be in Linus tree first

• full text: Documentation/stable_kernel_rules.txt
### Stable series: status

- **2.4.xx**: not yet dead, but dying
- **2.6.27**: growing old: will soon be dropped or frozen deeper
- **2.6.32**: current "long term stable release"
- **2.6.34**: support stopped recently
- **2.6.35**: current

From: Greg KH <gregkh <at> suse.de>
Subject: Linux 2.6.35.2
Newsgroups: gmane.linux.kernel
Date: 2010-08-13 21:23:13 GMT

I’m announcing the release of the 2.6.35.2 kernel.

All users of the 2.6.35 kernel series must upgrade.

If I’m tired of people trying to parse my words like I’m the Federal Reserve Chairman, just go update already. If you use a kernel.org based kernel, and you aren’t updating to the latest stable updates, well, why are you using a kernel.org kernel first place?

---

- security fixes are not made obvious
- so either update to latest or use a distribution kernel!
- Questions so far?
Where we are, where we head

Questions so far?

screenshot from last Tuesday evening CEST
• with a bit of luck it's not yet outdated to much ;-
• mention linux-next quickly
* 2.6.33 Radeon KMS left staging
* 2.6.34 KMS for evergreen/the Radeon 5000 series
* 2.6.35 power management for Radeon
* 2.6.35 basic DRM support for Evergreen
* experimental 3D code in Mesa 7.9
* experimental 3D code in the works for xf86-video-ati
* 2.6.36: Underscan, Tiling, Hyper-Z, Hwmon
* MISC
* Gallium3D driver for r600 and later in development
* this doesn't matter to much for users, even if it sometimes looks different from the articles on a particular website that has focuses around Linux and PC hardware
* support for HD 6000 series might come quicker
* rumors: chips might be not that different from HD 5000 series
* KMS not (yet) mandatory
* (userspace) radeonhd is dead
* 2.6.34 / 2.6.35 / 2.6.36 Sandy-Bridge
* yes, support for boring integrated graphics is important ;-) 
* 2.6.34 Memory Self-Refresh for 9xx (saved 0,8 Watts for the developer)
* 2.6.35 H264 decoding for G45 and Ironlake (Core i3/i5)
* 2.6.35 Memory Self-Refresh for Ironlake (saved 1 Watt)
* 2.6.35 Frame Buffer Compression (saved 0,2 watts)
* 2.6.36 Intelligent Power Sharing (IPS) for Ironlake
* called "HD Graphics Dynamic Frequency Technology"
* sort of "Turbo Boost now including GPU"
* Notebooks only for now

* MISC
* In case you missed it:The GPU becomes a part of the processor
* KMS mandatory
* support for GMA500/GMA600 aka poulsbo still sucks
* seems that even makes a lot of Intel developer unhappy
* avoid it (hard to find in Netbooks these days anyway)
Graphics hardware: Nvidia

- 2.6.33 Nouveau merged
- 2.6.34 big rework, broke userspace interface
- UMS support removed/KMS only now
- allowed because it's (a special kind of) staging driver
- 2.6.36: basic, still quite limited support for Fermi (GeForce 4xx series)
- 2.6.36 improved Suspend and Resume
- MISC
  - still changing fast
  - still a lot to do
- experimental 3D in Fedora 13
- PM Support in the works
- still no FAN control :-/
* 2.6.34 VGA-Switcheroo
  * switch between integrated and discrete graphics chip
  * 3D or maximum battery depending on what you want/need/do
  * Optimus support not in sight
  * Notebook buyers beware
* 2.6.33 vmwgfx
  * (kind of) staging (just like nouveau, but not that much changing )
* 2.6.36 KGDB + KDB & KMS
  * Intel only
  * Radeon und Nouveau will likely follow in the not to distant future
* 3d driver support for embedded chips still problematic
* vendors still need to learn understanding the benefits of open drivers
* 2.6.36 Receive Packet Steering (RPS) and Receive Flow Steering (RFS)
  * uses multicore systems more efficient
  * both might need individual tuning; see the docs and the commit message for details
  * that's why reading websites with sum up the most important changes is important
* new and improved drivers all the time
  * SR-IOV support for Enterprise network adapters in 2.6.34, .35 and .36
* 2.6.35 automatically load PHY drivers
  * wlan drivers: getting better
  * still a lot to do
  * otus (Atheros USB) replacement carl9170 will likely be in 2.6.27
  * ralink support improving
  * same with realtek
  * pm support for example could get improved
  * some verndors (inlcuding intel) no docs, only drivers
  * intel recently stopped maintaining the ipw2??00 drivers
  * fresh addition: brcm80211
  * supports three recent 802.11n chips
* mcgrof in http://identi.ca/notice/49652702: I think we're done with the mission of opening up all #802.11 #Linux wireless drivers... Took more than 5 years, but we're there!
* firmware for old devices stays problematic
* lot's of important WLAN drivers are in the staging tree
Side note: staging

* contains Hyper-V-Drivers from MS as well as udlfb, crystalhd and several of WLAN drivers from Ralink, Realtek and Via
* Kernel hackers often referred to staging (or the code in it) as "crap"
* Hyper-V long lacked SMP support
* the new Broadcom driver misses certain features like 40 MHz support, PM and Hardware encryption
* drivers use old stack (and different ones even, each with its own copy)
* that's one of the reasons why the NM developer doesn't like staging drivers much
* a lot of NM problems in fact are driver failures
* in the past two years (since staging got merged into 2.6.28) only one* driver matured so much that it could be moved out of staging
* some more to come with 2.6.37
* lot's of drivers got dropped again because nobody took care of them
* new: staging as a way to kick out drivers
* happened to a few old and likely obsolete wifi drivers
* might happen soon again in the BKL removal
* some distributions don't even ship the most well known staging drivers (like the ones for Ralink, Realtek and VIA Wifi chips)
* better avoid hardware that needs staging drivers!
* only partly holds true for nouveau (and maybe) vmwgfx
* marked as staging
* but not located in drivers/staging/
* nouveau has developers that certainly will take care of the drivers in the future
* 2.6.31 topology
  * important for drives with 4k-sektors (and other things)
  * use a fresh fdisk to align partitions properly!
* 2.6.32 and ongoing: discard support in various subsystems
* 2.6.33 drbd
  * 2.6.33 I/O bandwidth controller, dm snapshots merge
  * Fri, 9.30: Shared snapshots by Mikulas Patocka
* 2.6.3x various RAID migration paths were made possible
* raid unification
  * 2.6.36 btrfs will use raid6 core formally based in md layer
  * dmraid might soon be able to use raid5 code from md layer
  * maybe HostRAID support then will finally work better...
* CFQ
  * obsoleted AS in 2.6.33
* lot's of optimizations recently and a lot more in the works
  * among those that are in already: interactivity optimizations
  * makes you think your system got faster
* Barriers
  * will be realized differently soon, should improve performance
* 2.6.33 I/O controller stuff
  * still a lot changing
* challenges
* SSDs
  * many IOPs and thuns a bit like 10G network
* hierarchical storage (bcache, btrfs, ...)
  * fast data on fast storage devices
* thin provisioning
* MISC
* EFI / GPT: kernel should work, but seems distributions suck
* new drivers still important, but not that important anymore thanks to ahci :-)
* Talks on KVM at LK2010
• Ext[234]
  • ext4 is getting production ready; default in RHEL6
  • interim solution on the way to btrfs?
• Btrfs
  • 2.6.35 Direct I/O, better out of space handling
  • still experimental, default in Meego
  • last Ondisk format change 2.6.31
  • RAID 5 and 6 in the works
  • likely needs 6 to 12 months to mature, but getting closer
  • fsck tool in heavy development
  • COW downsides being worked on
  • Video from Linuxcon
• Features: COW, Performance, check summing, snapshots, internal RAID, snapshot for system updates
2.6.35 Splice for Fuse
XFS: lots of optimizations happening, great monthly reports!
2.6.34 Logfs
2.6.34 Ceph
  - based on Btrfs, targeting clusters
  - still changing a lot, big re-work missed 2.6.36 and now is in linux next
2.6.36 NFS 4.1 server and client support matures
2.6.36 CIFS FSCache
2.6.36 / 2.6.37 VFS Scalibility
2.6.36 LZO support for Squashfs
  * LZMA in 2.6.37?
MISC
  - Reiserfs: BKL removal, otherwise dead
  - Union Mounts: maybe getting closer (maybe not: new approach)
  - Challenges: "One billion Files on Linux" (LWN.net)
Fri, 10:45 Tracking filesystem modifications by Jan Kára
Fri, 11:30, Log2fs or how to achieve 150.000 IO/s by Jörn Engel
• 2.6.35 proper Turbo Core support
  • fixes for a bug that reduced performance had earlier been added to stable kernels
• 2.6.36 tegra
• 2.6.36 Tile
Virtualization

* 2.6.32 KSM
* 2.6.34 macvtap
  * reduces load when VM on one host communicate with each other
* 2.6.34 vhost-net
  * reduces load when communicating with other machines
  * zero-copy support in the works
* 2.6.34 vmware-ballon
* 2.6.35 perf kvm
* 2.6.35 ppc64 port
  * in the works: Nested Paging Virtualization for KVM
  * still a lot changes in and around KVM
  * but not that earth shaking anymore
* looks like Xen Dom0 support is getting closer to a merge again
  * some parts for it already in 2.6.36
* Lightweight Virtualization/Containers
  * not that much in the focus, but getting better
* Talks on KVM at LK2010
  * Thu, 13:45  Desktop virtualization with spice by Gerd Hoffmann
  * Thu, 14:30  Architecture of the Kernel-based Virtual Machine (KVM) by Jan Kiszka
  * Thu, 15:45  Virtual Machine timekeeping by Glauber Costa
  * Thu, 16:30  KVM on Server Class PowerPC by Alexander Graf
- 2.6.36 AppArmor
- 2.6.36 Fanotify
- 2.6.36 Tomoyo: "intreactive enforcing mode"
* changing rapidly
* 2.6.31 perf events
* 2.6.33 dynamic ftrace
* 2.6.35 perf kvm
* 2.6.35 APEI (ACPI Platform Error Interface)
* 2.6.35 Kdb
* 2.6.36 Kdb + Kgdb & KMS integration (intel)
* latency, power
* expect more
* userspace side?
* perf and ftrace coming closer together
* becomes a dtrace-like solution: more tracepoints, interrupts, ...
* might systemtab in the long run be based on top of perf and ftrace?
* Talks on KVM at LK2010
* Fri, 9:30: The New Linux 'perf' Tools by Arnaldo Melo
* 2.6.32: hwpoison (still improving)
* 2.6.32: KSM
  * not only of interest for virtualization
* 2.6.35: memory compaction
  * defrag your RAM
  * make room to use RAM with big pages
* 2.6.36 fix PAGEOUT_IO_SYNC stalls
* 2.6.36: new OOM
* 2.6.36 compcachex now called zram
* coming
  * SLAB improvements/"kind of" merge of SLAB and SLUB
* Transparent hugepages
* hugepage migration
* zcache, cleancache
* writeback is being optimized
• 2.6.34/35 quicker suspend and resume
  • I noticed it
• 2.6.34 and ongoing: runtime PM for I/O devices
• 2.6.35 CPUidle optimizations
  • might speed things up, as CPU sometimes earlier slept to often
• 2.6.35 timer slack
• 2.6.35 acpi_idle
• 2.6.36 race free suspend (one of the problems Android solved differently earlier)
• idle cycle injection under discussion
• tuxonice: unlikely, but (once again) attempts to merge parts or ideas of it
Various: drivers

* 2.6.35 New IR-Subsystem
* 2.6.36 a LIRC interface, lot of new IR-drivers (most LIRC ports) and LIRC drivers in staging
* audio drivers close to alsa upstream
* USB audio support got better in 2.6.34 and 2.6.35
* a lot of quirks needed for todays hardware
* report your problems!
* USB 3.0 still improving
* IR/Infrared hardware
* Old Firewire-Stack soon gone
* magic trackpad support will like be part of 2.6.37
ongoing, but soon kind of finished: BKL removal
2.6.35 make nconfig
2.6.36 saveconfig and alldefconfig(+more) new mechanisms to generate default config files
  • saves a lot of space
2.6.36 Concurrency-managed workqueues
2.6.36 kfifo rewrite
unlikely to come: BFS-Scheduler/CK-Serie, realtime
  • coming: deadline scheduler
  • not fast, predictable
  • sleeping spinlocks, prepared with 2.6.33
desktop responsiveness
  • mm preemtibility
  • scalability fixes
mobile/embedded developers and the kernel
  • Android
general effort: scalability
  • more cores
  • SSDs
  • quick random access = lots of IOPS
- systemd
  - Fri, 13:30: systemd by Lennart Poettering
- Xorg might merge some drivers back into the server
  - input drivers first
  - not yet sure if video driver will follow
Staying up2date: Kernel-Log (de)

http://www.heise.de/open/
Staying up2date: Kernelnewbies

http://kernelnewbies.org/LinuxChanges

LinuxChanges

LinuxChanges lists changes done to each Linux kernel release. Other patches (new, modified or removed) from kernel sources (code or documentation or related work) are not listed here. Also not listed here are packages or documentation that are not part of the Linux kernel. The provided links will redirect you to the sourceforge pages.

Note: Changes on architecture-specific and driver changes have been removed here. For more information, please visit the kernelnewbies.org site.

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http://sourceforge.net/projects/linuxchanges/

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Test and Report bugs!

http://bugzilla.kernel.org/
Test -rc Kernels!


Test -rc Kernels!


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# Regression Reports

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<th>Size</th>
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<td>[Bug #123456] false negative in firewall</td>
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<td>07/08/2009</td>
<td>4KB</td>
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<td>[Bug #654321] issue with kernel version 2.6.32</td>
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<td>07/08/2009</td>
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<tr>
<td>[Bug #111222] kernel panic in network module</td>
<td>カリオヒ, 甲子男</td>
<td>07/08/2009</td>
<td>4KB</td>
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This message contains a list of some regressions introduced between 2.6.32 and 2.6.36, for which there are no fixes in the meantime. If any of these tests have fixed already, please let us know.

If you have any other unreported regressions introduced between 2.6.32 and 2.6.36, please let us know either via the list or via the list.

Each entry will be sent automatically as an automatic reply to this message with the list to the people involved in reporting and handling the issues.

Listed regressions statistics:

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<th>Total</th>
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Finally ()

- 2.6.35 (released in August)
  - RPS, RFS, memory compaction, direct I/O for Btrfs, Kdb, perf
- 2.6.36 in mid October
  - AppArmor, fanotify, Concurrency-managed workqueues, new OOM, latency reduction, CIFS FS-Cache
  - improved hardware support thanks to new and improved drivers
- 2.6.37 for the start of next year
- still a lot happening, as there still is a lot to do
  - but yes, maybe things are slowing down a bit
- support for 2.6.27 might soon stop (and 2.4 as well)
- always upgrade to the latest stable releases
  - or use a kernel from a distribution to let the distributor fix all security bugs for you

- Things slowing down because most of the important things are in place?
- Maybe in some areas
- Lot’s of drivers still missing or offer only basic support
- Testing and QA improvements needed?
- Unsolved: Get new drivers/new kernels to the users quickly
More details to anything I mentioned earlier?

**Wanna know more about these? Ask!**

- LWN: Who writes the kernel
  - Hobby vs. payed
  - which companies are good citizens
- BFS-Scheduler/CK-Serie
- proprietary drivers
- distributors, please ship updated kernels to get new drivers to the users
- kernel series:
  - linux-next, mm-Kernel, RT-Tree, distribution kernels, devel trees
- how the Kernel-Log is written
- How to handle LKML and commit traffic
- how to become a kernel hacker

- More details to anything I mentioned earlier?
- How the KL is done?
- Motivation/Who writes the Kernel?
- Proprietary drivers
- linux-next, mm-Kernel, RT-Tree, subsystem trees
- Distributions and the kernel?
- How to become a kernel developer
- "Survival of the fittest"
- Linux 2.8/3.0
- external drivers are expensive
- Roadmap?
- LKML and Patch-Flow
- Regressions
Copyright

• download
  - Hint: read notes ;-)  

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