

# Make Linux developers fix your kernel bug

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Thorsten Leemhuis

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intro;

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sometimes reports on kernel  
bugs will just fizzle out

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intro;

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in rare cases, developers will  
be unable to fix an issues

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intro;

---

kernel contains code nobody  
is really responsible for

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intro;

---

the Linux kernel is  
made by volunteers

---

intro;

---

you can't really force  
volunteers to do work they  
can't do or don't want to do

---









intro;

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Linux kernel developers are  
obliged to fix some issues!

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intro;

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developers will gladly address  
most issues in their code

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intro;

developers will gladly address  
most issues in their code,  
unless life gets in the way :-/

intro;

then bad bug reports are the  
first developers will let  
fall through the cracks!

intro;

developers will gladly address  
most issues in their code,  
unless life gets in the way :-/



intro;

developers will gladly address  
most issues in their code,  
if you write a decent report!

intro;

---

developers will gladly address  
most issues in their code,  
if you write a decent report!

intro;

that's how you make most  
developers fix your bug,  
if they are able to

intro;

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you'll also learn when  
you can insist on a fix

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intro;

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and how to spot issues  
unlikely to be fixed

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[ act 1 ]

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1. create a decent report

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*Takes just a flick of your fingers*



# Build your own 'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



*Takes just a flick of your fingers*

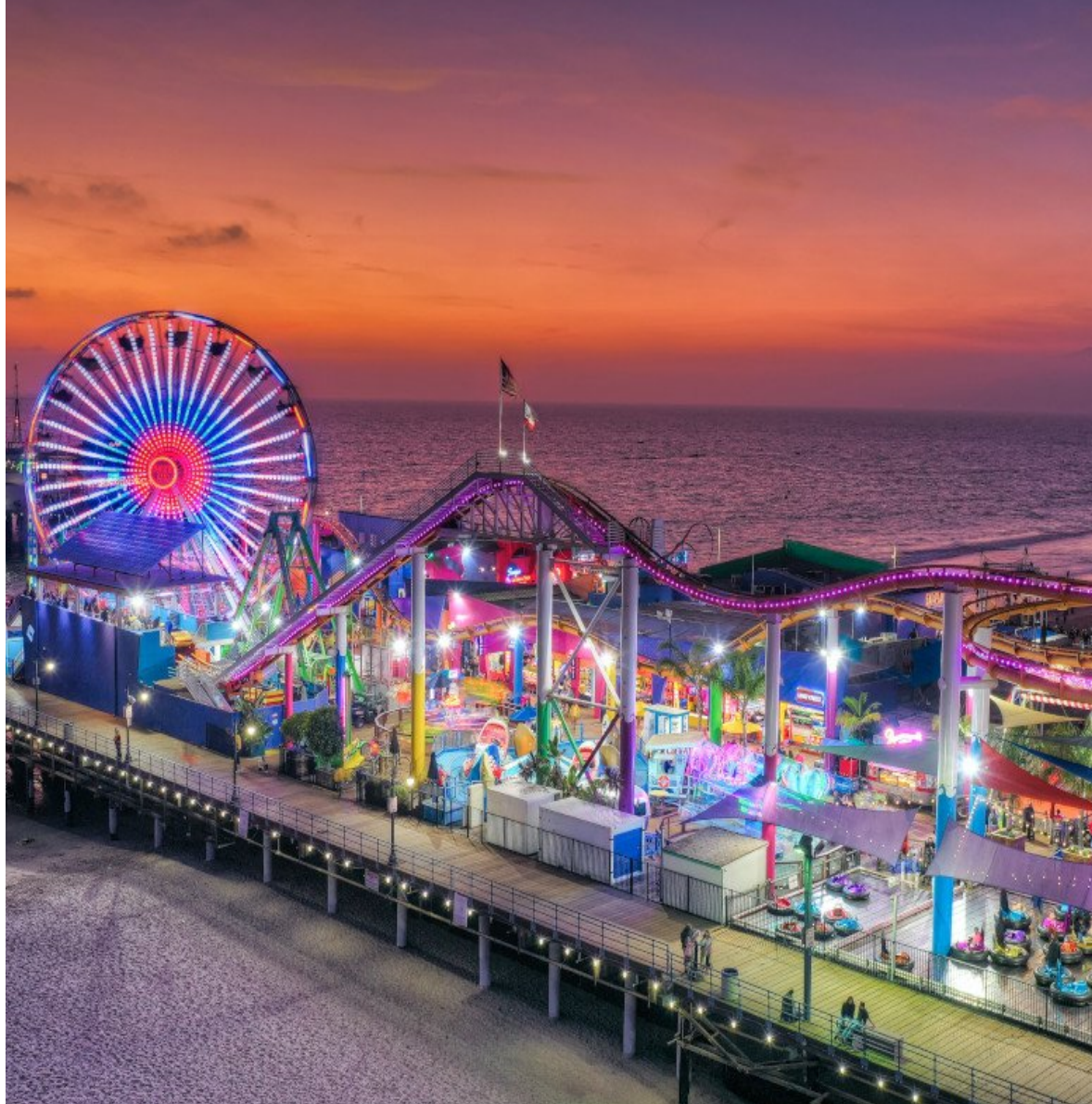


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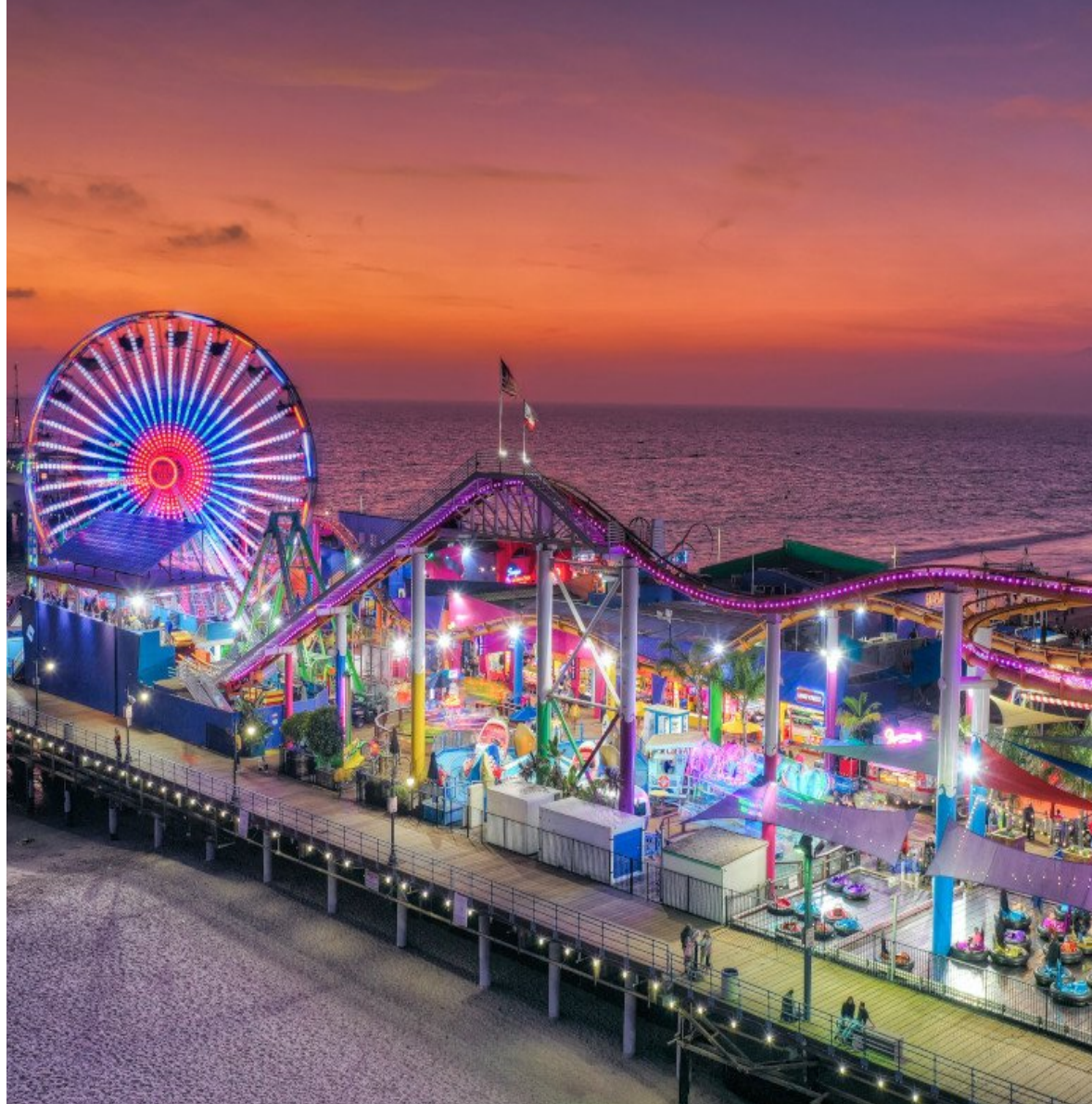


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decent report;

---

1. create a decent report

a) ensure your kernel is vanilla

---

decent report; vanilla;

most kernels used in  
the wild are not vanilla  
often heavily modified & enhanced

decent report; vanilla;

makes most distro kernel's  
unsuitable for reporting  
issues Linux kernel devs.

decent report; vanilla;

you might want to report the  
issue to your Linux distributor

decent report; vanilla;

or install a vanilla kernel  
yourself instead – for  
example a pre-built one

decent report; vanilla;

or compile a kernel yourself

hint: `make olddefconfig localmodconfig`  
makes things easier and relatively fast

decent report; vanilla;

check if issue happens with a  
vanilla kernel, too

decent report; vanilla;

focus on this kernel in your  
report, forget the distro's  
mentioning the distro's even briefly  
often just complicates report unnecessarily



decent report;

---

1. create a decent report

a) ensure your kernel is vanilla

---

*Takes just a flick of your fingers*

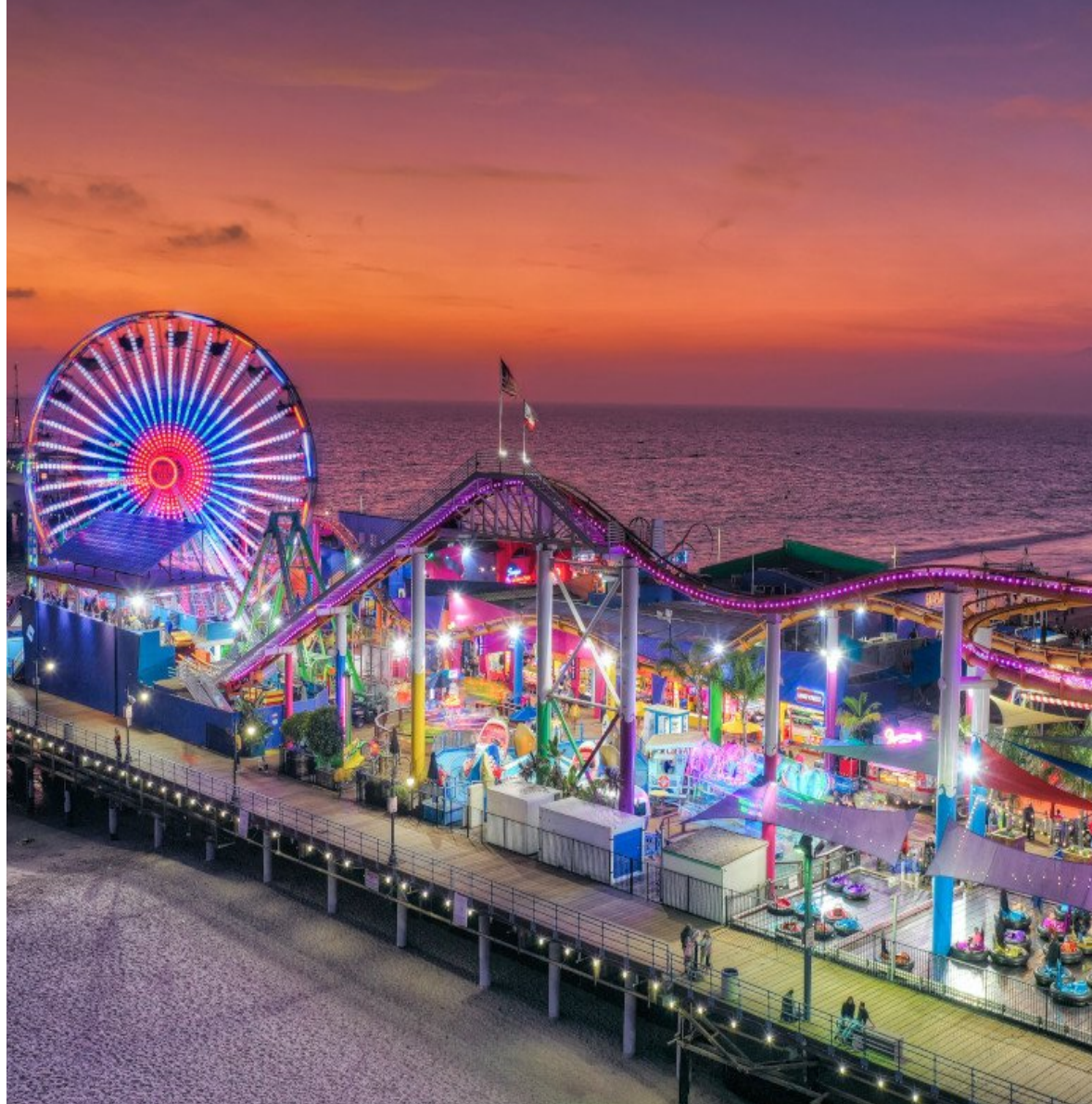


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decent report;

---

1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

---


decent report; freshness;

test with latest mainline  
(aka -RC) release

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<a href="#">GIT</a>	<a href="https://git.kernel.org/">https://git.kernel.org/</a>
<a href="#">RSYNC</a>	<a href="rsync://rsync.kernel.org/pub/">rsync://rsync.kernel.org/pub/</a>

Latest Release  
**5.16.14** 


mainline: 5.17-rc7	2022-03-06	<a href="#">[tarball]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>		
stable: 5.16.14	2022-03-11	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>
longterm: 5.15.28	2022-03-11	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>
longterm: 5.10.105	2022-03-11	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>



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Latest Release  
**5.18.1** 

mainline: <b>5.18</b>	2022-05-22	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>
stable: <b>5.18.1</b>	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
stable: <del>5.17.12</del>	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a> <a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm: 5.15.44	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a> <a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>
longterm: 5.10.119	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a> <a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a> <a href="#">[changelog]</a>

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decent report; freshness;

focus your report on the  
freshest kernel you tested

mentioning older briefly somewhere can be  
okay, but often just make report hard to grasp




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decent report; freshness;

some bugfixes  
are never backported to  
stable/longterm kernel series

decent report; freshness;

makes longterm (LTS) kernels  
quite unsuitable for reporting

decent report; freshness;

exception: regressions within  
a stable or longterm series  
something breaks 5.15.10 -> 5.15.11

decent report;

---

# 1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

---

*Takes just a flick of your fingers*

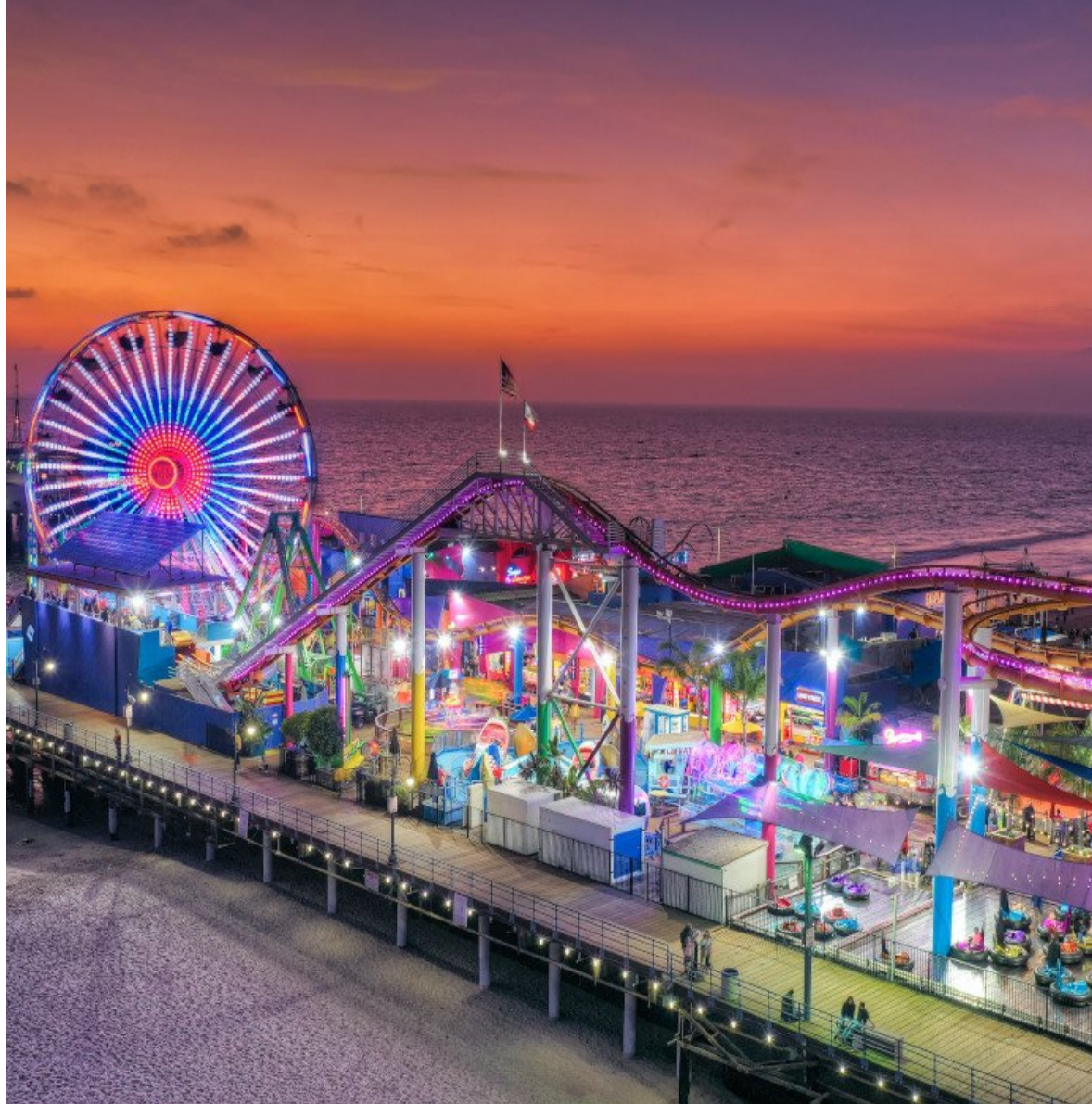


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O RLY?

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decent report;

# 1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

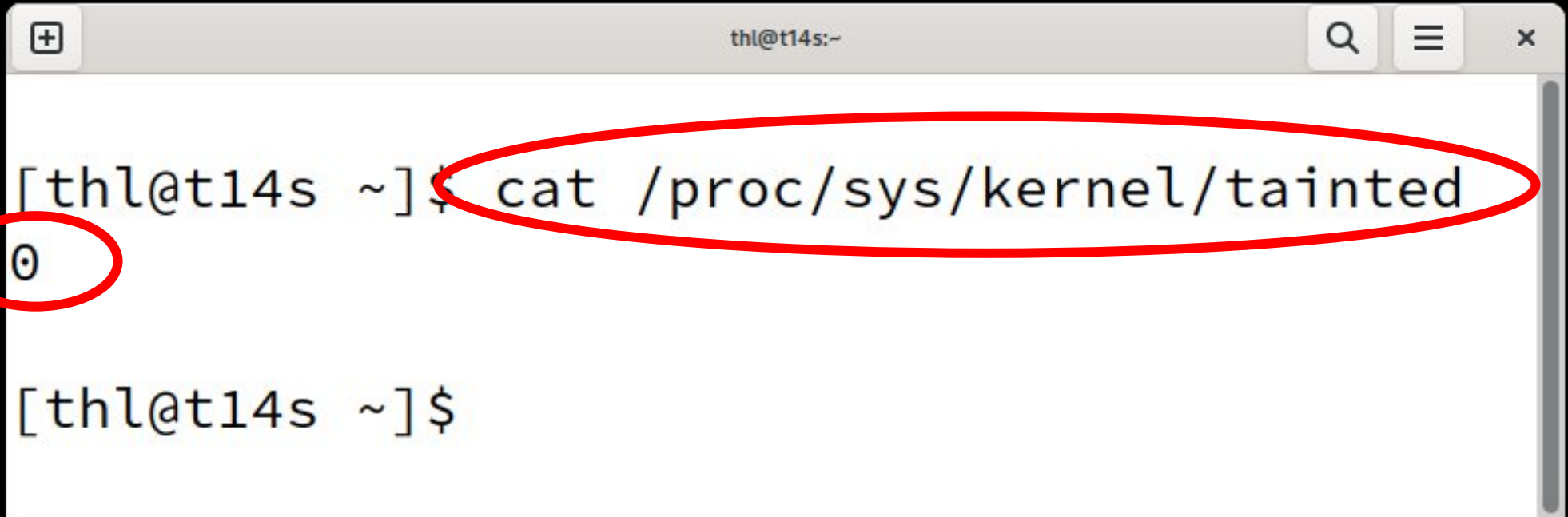
c) ensure your kernel's and system's integrity







decent report; integrity;



A terminal window titled "thl@t14s:~" with search, menu, and close icons in the title bar. The prompt is "[thl@t14s ~]\$". The command "cat /proc/sys/kernel/tainted" is entered and circled in red. The output "0" is displayed and also circled in red. The prompt "[thl@t14s ~]\$" is shown again below.

```
[thl@t14s ~]$ cat /proc/sys/kernel/tainted
0
[thl@t14s ~]$
```

decent report; integrity;



```
thl@t14s:~  
[thl@t14s ~]$ cat /proc/sys/kernel/tainted  
1  
[thl@t14s ~]$
```

The image shows a terminal window with a title bar that reads "thl@t14s:~". The terminal content shows a user prompt "[thl@t14s ~]" followed by the command "cat /proc/sys/kernel/tainted". The output of the command is the number "1", which is circled in red. Below the output, there is another user prompt "[thl@t14s ~]" followed by a black cursor bar.

decent report; integrity;

Nvidia's proprietary  
graphics driver

decent report; integrity;

all out-of-tree drivers  
are a problem

incl. Nvidia's new open kernel driver

decent report; integrity;

deinstall such drivers, reboot,  
check if issue still present  
and recheck the tainted flag!

decent report; integrity;

many other incidents  
can taint kernel

decent report; integrity;

an "Oops" for example

```
1.807314] [drm] qxl 0.1.0 20120117 for 0000:00:02.0 on minor 0
[ 121.823610] general protection fault: 0000 [#1] SMP
[ 121.824474] Modules linked in: virtio_scsi qxl virtio_console virtio_net drm_kms_helper crc32c_intel ttm ata_generic drm seri
o_raw_pata_acpi virtio_pci virtio_ring virtio
[ 121.826079] CPU: 0 PID: 261 Comm: dracut-initqueue Tainted: G      D      4.11.0-rc2n-00157-gae50dfd61665 #14
[ 121.826849] Hardware name: Red Hat KVM, BIOS 0.5.1 01/01/2011
[ 121.827594] task: ffff9b90f18d2400 task.stack: ffffacc0810b0000
[ 121.828338] RIP: 0010:__kmalloc+0xa4/0x210
[ 121.829052] RSP: 0018:ffffacc0810b3ce0 EFLAGS: 00010246
[ 121.829767] RAX: 2d316f6974726976 RBX: 00000000015012c0 RCX: 00000000000022f5
[ 121.830537] RDX: 0000000000000143 RSI: 0000000000000000 RDI: 000000000001ca60
[ 121.831298] RBP: ffffacc0810b3d10 R08: ffff9b90fe41ca60 R09: ffff9b90f8802000
[ 121.832055] R10: 0000000055555400 R11: 000000000001d698 R12: 2d316f6974726976
[ 121.832795] R13: 00000000015012c0 R14: 0000000000000800 R15: ffff9b90f8802000
[ 121.833508] FS: 00007f27765b9b40(0000) GS:ffff9b90fe400000(0000) knlGS:0000000000000000
[ 121.834188] CS: 0010 DS: 0000 ES: 0000 CR0: 0000000080050033
[ 121.834839] CR2: 000056038b7088b0 CR3: 0000000171584000 CR4: 00000000000006f0
[ 121.835529] Call Trace:
[ 121.836202] ? alloc_fdmem+0x20/0x50
[ 121.836841] alloc_fdmem+0x20/0x50
[ 121.837486] alloc_fhtable+0x6a/0xf0
[ 121.838116] dup_fd+0x1d8/0x280
[ 121.838743] ? audit_alloc+0xc5/0x170
[ 121.839379] copy_process.part.36+0x887/0x1ce0
[ 121.840017] ? cp_new_stat+0x14f/0x180
[ 121.840637] _do_fork+0xd7/0x390
[ 121.841271] Sys_clone+0x19/0x20
[ 121.841891] do_syscall_64+0x67/0x170
[ 121.842524] entry_SYSCALL64_slow_path+0x25/0x25
[ 121.843159] RIP: 0033:0x7f2775c6c95d
[ 121.843709] RSP: 002b:00007ffdb0e803570 EFLAGS: 00000246 ORIG_RAX: 0000000000000038
[ 121.844315] RAX: ffffffffda RBX: 0000000000000000 RCX: 00007f2775c6c95d
[ 121.844903] RDX: 0000000000000000 RSI: 0000000000000000 RDI: 0000000001200011
[ 121.845498] RBP: 00007ffdb0e8035b0 R08: 0000000000000000 R09: 00007f27765b9b40
[ 121.846103] R10: 00007f27765b9e10 R11: 0000000000000246 R12: 0000000000000000
[ 121.846700] R13: 00007ffdb0e80360 R14: 0000000000000000 R15: 000056038b725a90
[ 121.847314] Code: 49 83 28 10 00 4d 8b 20 0f 84 03 01 00 00 4d 85 e4 0f 84 fa 00 00 00 49 63 41 20 49 8b 39 4c 01 e0 40 f6 c2
```



```
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[ 121.839379] copy_process.part.36+0x887/0x1ce0
[ 121.840017] ? cp_new_stat+0x14f/0x180
[ 121.840637] _do_fork+0xd7/0x390
[ 121.841271] Sys_clone+0x19/0x20
[ 121.841891] do_syscall_64+0x67/0x170
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[ 121.846700] R13: 00007ffdb0e80360 R14: 0000000000000000 R15: 000056038b725a90
[ 121.847314] Code: 49 83 28 10 00 4d 8b 20 0f 84 03 01 00 00 4d 85 e4 0f 84 fa 00 00 00 49 63 41 20 49 8b 39 4c 01 e0 40 f6 c2
```

decent report; integrity;

tainted kernels most  
of the time unsuitable for  
reporting bugs

decent report; integrity;

big exception:  
the first Oops, warning, etc.

☐ The Linux kernel user's and administrator's guide

Linux kernel release 5.x  
<<http://kernel.org/>>

The kernel's command-line parameters

Linux allocated devices (4.x+ version)

Documentation for /proc/sys

Linux ABI description

Feature status on all architectures

Hardware vulnerabilities

☐ Reporting issues

The short guide (aka TL;DR)

3rd party kernel module.

## Check 'taint' flag

*Check if your kernel was 'tainted' when the issue occurred, as the event that made the kernel set this flag might be causing the issue you face.*

The kernel marks itself with a 'taint' flag when something happens that might lead to follow-up errors that look totally unrelated. The issue you face might be such an error if your kernel is tainted. That's why it's in your interest to rule this out early before investing more time into this process. This is the only reason why this step is here, as this process later will tell you to install the latest mainline kernel; you will need to check the taint flag again then, as that's when it matters because it's the kernel the report will focus on.

On a running system is easy to check if the kernel tainted itself: if `cat /proc/sys/kernel/tainted` returns '0' then the kernel is not tainted and everything is fine. Checking that file is impossible in some situations; that's why the kernel also mentions the taint status when it reports an internal problem (a 'kernel bug'), a recoverable error (a 'kernel Oops') or a

## Table for decoding tainted state

Bit	Log	Number	Reason that got the kernel tainted
0	G/P	1	proprietary module was loaded
1	_/F	2	module was force loaded
2	_/S	4	kernel running on an out of specification system
3	_/R	8	module was force unloaded
4	_/M	16	processor reported a Machine Check Exception (MCE)
5	_/B	32	bad page referenced or some unexpected page flags
6	_/U	64	taint requested by userspace application
7	_/D	128	kernel died recently, i.e. there was an OOPS or BUG
8	_/A	256	ACPI table overridden by user
9	_/W	512	kernel issued warning
10	_/C	1024	staging driver was loaded
11	_/I	2048	workaround for bug in platform firmware applied
12	_/O	4096	externally-built ("out-of-tree") module was loaded
13	_/E	8192	unsigned module was loaded
14	_/L	16384	soft lockup occurred
15	_/K	32768	kernel has been live patched
16	_/X	65536	auxiliary taint, defined for and used by distros
17	_/T	131072	kernel was built with the struct randomization plugin

decent report; integrity;

# 1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

c) ensure your kernel's and system's integrity

[continued]

decent report; integrity;

is your hardware working  
reliably and as specified?

memtest: great idea!

overclocking: stupid idea!



decent report; integrity;

issue with file-system?  
fsck the volume!

decent report; integrity;

check `dmesg -H`

look out for anything red or bold

```
[239864.983817] pci_bus 0000:02: Allocating resources
[239864.983840] pci_bus 0000:03: Allocating resources
[239864.984059] pci_bus 0000:04: Allocating resources
[239864.984069] pci_bus 0000:05: Allocating resources
[239864.984356] pci_bus 0000:06: Allocating resources
[239864.986799] done.
[239864.986813] thermal thermal_zone0: failed to read out thermal zone (-61)
[239864.988006] PM: suspend exit
[239865.018435] Generic FE-GE Realtek PHY r8169-0-200:00: attached PHY driver (mii_bus:phy_addr=r8169-0-200:00,
irq=MAC)
[239865.129471] r8169 0000:02:00.0 enp2s0f0: Link is Down
[239868.473622] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.829440] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.843878] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.858171] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.914570] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.914584] psmouse serio1: issuing reconnect request
[243755.838959] r8169 0000:02:00.0 enp2s0f0: Link is Down
[243756.737592] PM: suspend entry (deep)
[243756.767244] Filesystems sync: 0.029 seconds
[243757.114220] Bluetooth: hci0: Suspend notifier action (3) failed: 2
[243757.114233] Freezing user space processes ... (elapsed 0.004 seconds) done.
[243757.118906] OOM killer disabled.
[243757.118907] Freezing remaining freezable tasks ... (elapsed 0.001 seconds) done.
[243757.120865] printk: Suspending console(s) (use no_console_suspend to debug)
[243757.230397] [drm] free PSP TMR buffer
[243757.461447] PM: suspend devices took 0.341 seconds
[243757.463029] ACPI: EC: interrupt blocked
[243757.474759] amdgpu 0000:06:00.0: amdgpu: MODE2 reset
[243757.494763] ACPI: PM: Preparing to enter system sleep state S3
[243757.500046] ACPI: EC: event blocked
```

decent report;

---

# 1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

c) ensure your kernel's and system's integrity

---



*Takes just a flick of your fingers*

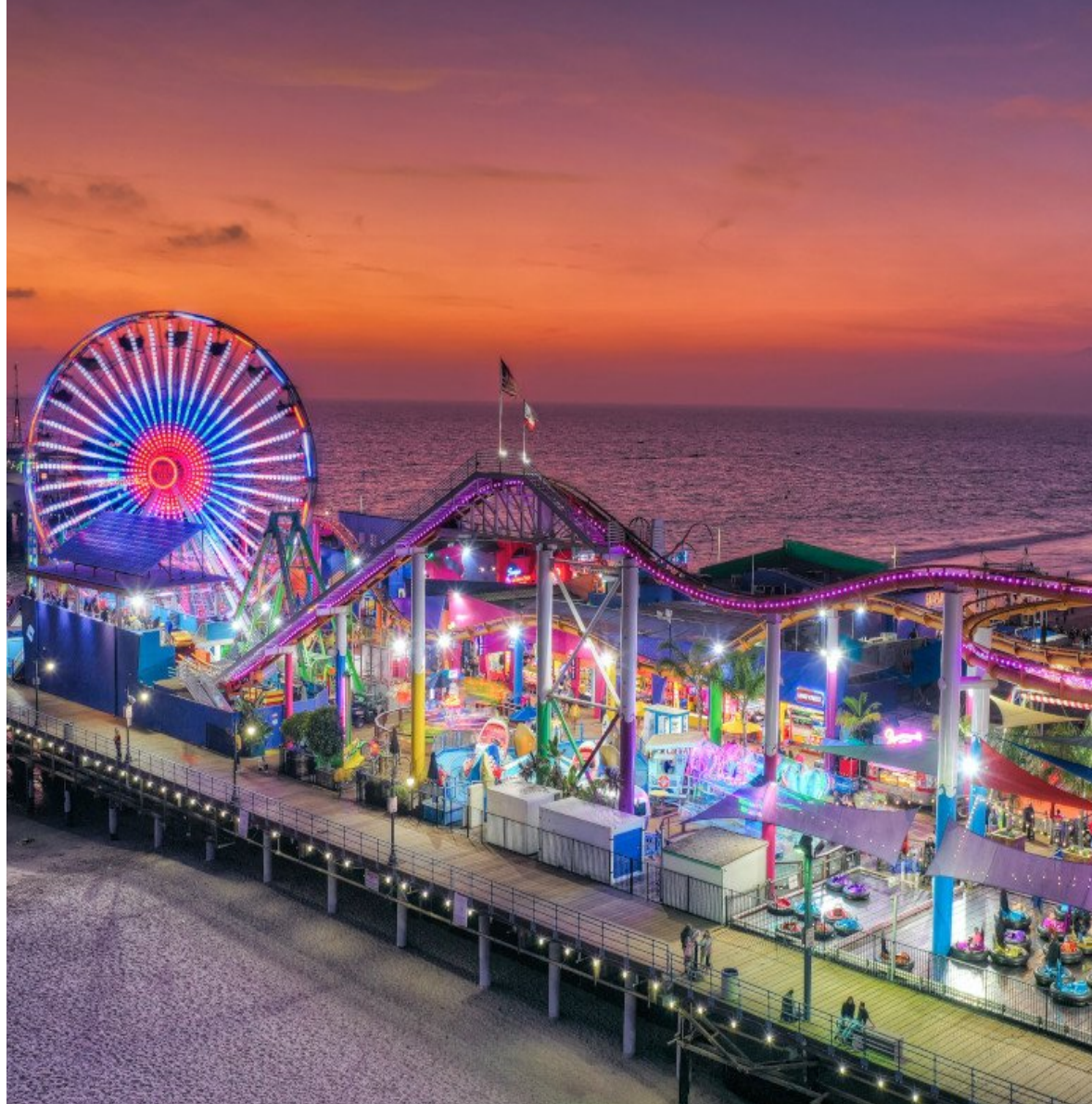


Build your own  
'Linux land'

*Full instructions inside*

O RLY?

*Linux kernel community*



decent report;

# 1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

c) ensure your kernel's and system's integrity

d) submit your report to the right place

## Welcome to Kernel.org Bugzilla

**Please use your distribution's bug tracking tools**

This bugzilla is for reporting bugs against **upstream Linux kernels**.

If you did not compile your own kernel from scratch, you are probably in the wrong place.

Please use the following links to report a bug to your distribution instead:

[Ubuntu](#) | [Fedora](#) | [Arch](#) | [Mint](#) | [Debian](#) | [Red Hat](#) | [OpenSUSE](#) | [SUSE](#)

To report an issue upstream, please consult this document before opening a new bug:

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With questions about this site contact [bugzilla admins](#).

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## Check where you need to report your issue

*Locate the driver or kernel subsystem that seems to be causing the issue. Find out how and where its developers expect reports. Note: [most of the time this won't be bugzilla.kernel.org](#), as issues typically need to be sent by mail to a maintainer and a public mailing list.*

It's crucial to send your report to the right people, as the Linux kernel is a big project and most of its developers are only familiar with a small subset of it. Quite a few programmers for example only care for just one driver, for example one for a WiFi chip; its developer likely will only have small or no knowledge about the internals of remote or unrelated "subsystems", like the TCP stack, the PCIe/PCI subsystem, memory management or file systems.

Problem is: the Linux kernel lacks a central bug tracker where you can simply file your issue and make it reach the developers that need to know about it. That's why you have to find the right place and way to report issues yourself. You can do that with the help of a script (see below), but it mainly targets kernel developers and experts. For everybody else the MAINTAINERS file is the better place.

## How to read the MAINTAINERS file

To illustrate how to use the MAINTAINERS file, let's assume the WiFi in your Laptop suddenly misbehaves after updating the kernel. In that case it's likely an issue in the WiFi driver. Obviously it could also be some code it builds



switching from 5.9.15 to 5.10.5) do not quality.

## Check where you need to report your issue

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## 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/>

**chat:** <irc://irc.libera.chat/btrfs>

**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*`

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>

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## BTRFS FILE SYSTEM

**Mail:** Chris Mason <[clm@fb.com](mailto:clm@fb.com)>, Josef Bacik <[josef@toxicpanda.com](mailto:josef@toxicpanda.com)>

**Mailing list:** [linux-btrfs@vger.kernel.org](mailto:linux-btrfs@vger.kernel.org)

**Status:** Maintained

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>



**Files:** drivers/platform/x86/acer-wmi.c

## ACPI

**Mail:** "Rafael J. Wysocki" <rafael@kernel.org>

**Reviewer:** Len Brown <lenb@kernel.org>

**Mailing list:** 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/pnpacpi/ include/acpi/ include/linux/acpi.h include/linux/fwnode.h tools/power/acpi/

## ACPI APEI

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>

## 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)>, Pan, Xinhui <[Xinhui.Pan@amd.com](mailto:Xinhui.Pan@amd.com)>

**Mailing list:** [amd-gfx@lists.freedesktop.org](mailto:amd-gfx@lists.freedesktop.org)

**Status:** Supported

**SCM:** git <https://gitlab.freedesktop.org/aqd5f/linux.git>

**bugs:** <https://gitlab.freedesktop.org/drm/amd/-/issues>

**chat:** <irc://irc.oftc.net/radeon>

**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

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>



decent report; right place;

sadly MAINTAINERS  
contains more than  
2000 entries:-/

decent report;

# 1. create a decent report

a) ensure your kernel is vanilla

b) ensure your kernel is fresh

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*Takes just a flick of your fingers*

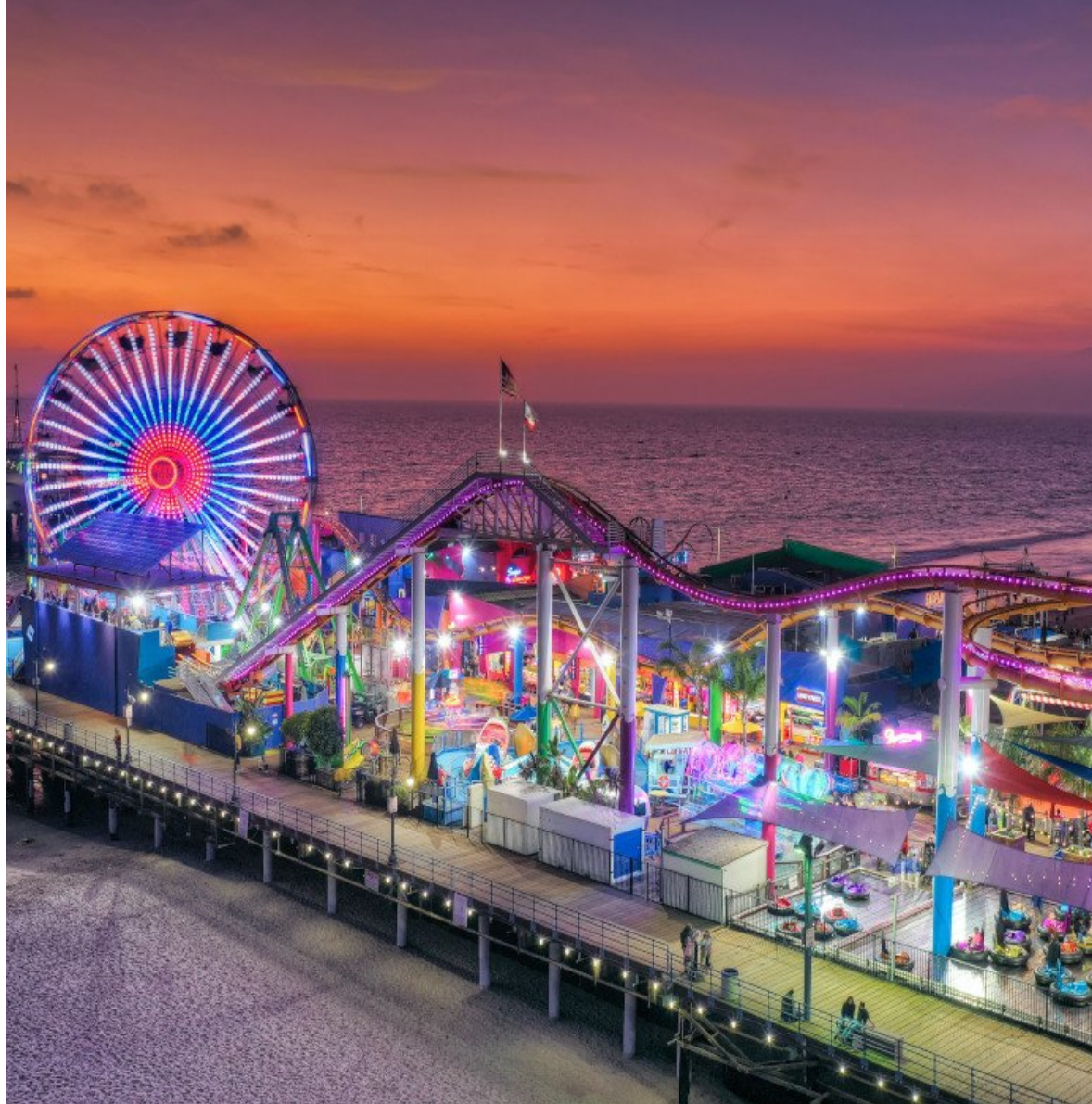


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decent report;

# 1. create a decent report

a) ensure your kernel is vanilla

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d) submit your report to the right place

e) depict the problem adequately

decent report; depiction;

"how to write a good report"  
worth its own, quite long talk

decent report; depiction;

a balancing act

decent report; depiction;

think of it  
as asking for a favor



decent report; depiction;

a favor from someone  
that doesn't have to help you

decent report; depiction;

a favor from a someone  
that might be stressed  
or really short on time

decent report; depiction;

hence, make your depiction  
easy to grasp for recipients

decent report; depiction;

describe the problem neither  
to brief nor as a novella

decent report; depiction;

mention version, vanilla,  
and taint status

decent report; depiction;

upload & link clearly relevant  
logs or attach them

but *\*don't\** overload the report!

decent report; depiction;

often relevant: output from  
`dmesg` & `lspci -nn`;  
maybe kernel's '.config', too



decent report; depiction;

add two or three sentences  
summarizing the situation on  
top of your depiction

decent report; depiction;

use a even more condensed  
and crystal-clear depiction  
as subject

decent report; depiction;

in general: don't over-think  
or overdo your report!

decent report; depiction;

short report will often do  
getting the basics right (vanilla, fresh  
version, no taint, easy to grasp, ...)  
is important

decent report; depiction;

check for existing reports  
about the problem to join

check <insert favorite search engine>,  
[lore.kernel.org/all/](http://lore.kernel.org/all/), and [bugzilla.kernel.org](http://bugzilla.kernel.org)

# Step-by-step guide how to report issues to the kernel maintainers

The above TL;DR outlines roughly how to report issues to the Linux kernel developers. It might be all that's needed for people already familiar with reporting issues to Free/Libre & Open Source Software (FLOSS) projects. For everyone else there is this section. It is more detailed and uses a step-by-step approach. It still tries to be brief for readability and leaves out a lot of details; those are described below the step-by-step guide in a reference section, which explains each of the steps in more detail.

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- Are you facing an issue with a Linux kernel a hardware or software vendor provided? Then in almost all cases you are better off to stop reading this document and reporting the issue to your vendor instead, unless you are willing to install the latest Linux version yourself. Be aware the latter will often be needed anyway to hunt down and fix issues.
- Perform a rough search for existing reports with your favorite internet search engine; additionally, check the archives of the [Linux Kernel Mailing List \(LKML\)](#). If you find matching reports, join the discussion instead of sending a new one.
- See if the issue you are dealing with qualifies as regression, security issue, or a really severe problem: those are 'issues of high priority' that need special handling in some steps that are about to follow.
- Make sure it's not the kernel's surroundings that are causing the issue you face.
- Create a fresh backup and put system repair and restore tools at hand.
- Ensure your system does not enhance its kernels by building additional kernel modules on-the-fly, which solutions like DKMS might be doing locally without your knowledge.
- Check if your kernel was 'tainted' when the issue occurred, as the event that made the kernel set this flag might be causing the issue you face.
- Write down coarsely how to reproduce the issue. If you deal with multiple issues at once, create separate notes for each of

<https://www.kernel.org/doc/html/latest/admin-guide/reporting-issues.html>

decent report; depiction;

it tells you to check what  
kind of issue you deal with



---

[ act 2 ]

---

---

---

## 2. the kind of issue at hand

---

---

kind of issue;

---

## 2. the kind of issue at hand

a) issues someone is obliged to address

---

kind of issue; mustfix;

## 2. the kind of issue at hand

a) issues someone is obliged to address

I. security vulnerabilities

☐ The Linux kernel user's and administrator's guide

Linux kernel release 5.x  
<<http://kernel.org/>>

The kernel's command-line parameters

Linux allocated devices (4.x+ version)

Documentation for /proc/sys

Linux ABI description

Feature status on all architectures

Hardware vulnerabilities

Reporting issues



[The Linux kernel user's and administrator's guide](#) »

Security bugs

[View page source](#)

## Security bugs

Linux kernel developers take security very seriously. As such, we'd like to know when a security bug is found so that it can be fixed and disclosed as quickly as possible. Please report security bugs to the Linux kernel security team.

### Contact

The Linux kernel security team can be contacted by email at <[security@kernel.org](mailto:security@kernel.org)>. This is a private list of security officers who will help verify the bug report and

kind of issue; mustfix;

## 2. the kind of issue at hand

a) issues someone is obliged to address

I. security vulnerabilities

II. devastating bugs

kind of issue; mustfix; devastating;

something really really bad

data is lost or damaged,  
hardware is bricked, ...



kind of issue; mustfix; devastating;

---

make impact & urgency  
obvious in your report

---



kind of issue; mustfix;

## 2. the kind of issue at hand

a) issues someone is obliged to address

I. security vulnerabilities

II. devastating bugs

III. regressions

kind of issue; mustfix; regressions;

something breaks when  
updating the kernel

say from 5.15 -> 5.16 or  
from 5.17.3 -> 5.17.4

kind of issue; mustfix; regressions;

---

first rule of Linux kernel development:  
"we don't cause regressions"

---

# Linux kernel regression status

[\[next\]](#) [\[mainline\]](#) [\[stable/longterm\]](#) [\[dormant\]](#) [\[resolved\]](#) | [\[new\]](#) | [\[all\]](#)

---

current cycle (v5.18.. aka v5.18-post), culprit identified

none known by regzbot

---

current cycle (v5.18.. aka v5.18-post), unkown culprit

none known by regzbot

---

previous cycle (v5.17..v5.18), culprit identified, with activity in the past three months

- [ff042f4a9b05](#) (v5.18-rc1) ▶ *mm: chiq\_test runs 7 minutes instead of ~ 1 second.* by [Stefan Wahren](#)  
Earliest & latest [activity](#): [7](#) & [3](#) days ago. Noteworthy: [\[patch\]](#).
- [f26b3fa04611](#) (v5.18-rc1) ▶ *mm: [mm/page\_alloc] f26b3fa046: netperf.Throughput\_Mbps -18.0% regression* by [kernel test robot](#)  
Earliest & latest [activity](#): [39](#) & [7](#) days ago. Noteworthy: [\[patch\]](#).

---

older cycles (..v5.17), culprit identified, with activity in the past three months

- [44c57f205876](#) (v5.15-rc1) ▶ *qla2xxx: tape drive not removed after unplug FC cable* by [Tony Battersby](#)  
Earliest & latest [activity](#): [3](#) & [1](#) days ago.
- [b2af264ad3af](#) (v5.16-rc1) ▶ *bluetooth: HSP/HFP mSBC profile broken with QCA6174* by [bugzilla-daemon@kernel.org](#)  
Earliest & latest [activity](#): [110](#) & [1](#) days ago. Noteworthy: [\[1\]](#), [\[2\]](#), [\[3\]](#), [\[4\]](#), [\[fix incoming\]](#).
- [bdd8b6c98239](#) (v5.17-rc1) ▶ *Xorg SEGV in Xen PV dom0 after updating from 5.16.18 to 5.17.5* by [Marek Marczykowski-Górecki](#)  
Earliest & latest [activity](#): [25](#) & [1](#) days ago. Noteworthy: [\[1\]](#), [\[patch\]](#).
- [453e41085183](#) (v5.17-rc1) ▶ *tboot suspend broken on Lenovo T460p* by [Derek Dolney](#)  
Earliest & latest [activity](#): [20](#) & [2](#) days ago. Noteworthy: [\[1\]](#).



POINTER



This website is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 871528.





Meta

# Linux kernel regression status

[\[next\]](#) [\[mainline\]](#) [\[stable/longterm\]](#) [\[dormant\]](#) [\[resolved\]](#) | [\[new\]](#) | [\[all\]](#)

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## FO 15 The Linux kernel user's and administrator's guide

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Reporting issues

## FO 15 Reporting regressions

FO 15 » [The Linux kernel user's and administrator's guide](#) »

Reporting regressions

[View page source](#)

## Reporting regressions

*"We don't cause regressions"* is the first rule of Linux kernel development; Linux founder and lead developer Linus Torvalds established it himself and ensures it's obeyed.

This document describes what the rule means for users and how the Linux kernel's development model ensures to address all reported regressions; aspects relevant for kernel developers are left to [Handling regressions](#).

### The important bits (aka "TL;DR")

1. It's a regression if something running fine with one Linux kernel works worse or not at all with a newer version.

Note: the newer kernel has to be compiled using a similar

kind of issue; mustfix; regressions;

---

make it obvious your report  
is about a regression

---

kind of issue; mustfix; regressions;

---

CC for forward the report to  
[regressions@lists.linux.dev](mailto:regressions@lists.linux.dev)

---

kind of issue; mustfix; regressions;

---

fine print(1):

only userland interfaces matter

[it's thus not a regression if your  
out-of-tree kernel module breaks]

---

kind of issue; mustfix; regressions;

fine print(2):

the build config of the newer  
kernel version must be  
similar to the older one

kind of issue; mustfix; regressions;

fine print(3):

you often will be asked  
to find the culprit yourself



kind of issue; mustfix; regressions;

---

if you find the culprit, a  
fix is pretty much guaranteed

---

kind of issue; mustfix;

## 2. the kind of issue at hand

a) issues someone is obliged to address

I. security vulnerabilities

II. devastating bugs

III. regressions







kind of issue;

## 2. the kind of issue at hand

a) issues someone is obliged to address

b) issues most likely to be ignored

kind of issue; unlikely;

## 2. the kind of issue at hand

b) issues most likely to be ignored

l. known deficits

kind of issue; unlikely; deficits;

---

Linux contains many  
incomplete drivers

---

kind of issue; unlikely; deficits;

---

might lack a volunteer  
with enough time and/or  
motivation to improve it

---



kind of issue; unlikely; deficits;

---

or some real-world issue  
prevents improvements

---

kind of issue; unlikely; deficits;

check internet and docs  
for known deficits

kind of issue; unlikely;

## 2. the kind of issue at hand

b) issues most likely to be ignored

l. known deficits

kind of issue; unlikely;

## 2. the kind of issue at hand

b) issues most likely to be ignored

I. known deficits

II. code without an active maintainer

kind of issue; unlikely; w/o maintainer;

code often remains,  
as it useful for people

## 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/`

kind of issue; unlikely; w/o maintainer;

sending at least a quick brief  
report definitely a good idea

# CAFE CMOS INTEGRATED CAMERA CONTROLLER DRIVER

**Mailing list:** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)  
**Status:** Orphan  
**SCM:** git git://linuxtv.org/media\_tree.git  
**Files:** Documentation/admin-guide/media/caffe\_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/



kind of issue; unlikely; w/o maintainer;

---

sending at least a quick brief  
report likely worth it

---

---

## 2. the kind of issue at hand

- a) issues someone is obliged to address
  - b) issues most likely to be ignored
-

---

## 2. the kind of issue at hand

- a) issues someone is obliged to address
  - b) issues most likely to be ignored
  - c) all the other issues
-

kind of issue; unlikely; the rest;

---

the quality of your report!

---

---

---

[ grand finale ]

---

---

---

take this with you

---

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- Perform a rough search for existing reports with your favorite internet search engine; additionally, check the archives of the [Linux Kernel Mailing List \(LKML\)](#). If you find matching reports, join the discussion instead of sending a new one.
- See if the issue you are dealing with qualifies as regression, security issue, or a really severe problem: those are 'issues of high priority' that need special handling in some steps that are about to follow.
- Make sure it's not the kernel's surroundings that are causing the issue you face.
- Create a fresh backup and put system repair and restore tools at hand.
- Ensure your system does not enhance its kernels by building additional kernel modules on-the-fly, which solutions like DKMS might be doing locally without your knowledge.
- Check if your kernel was 'tainted' when the issue occurred, as the event that made the kernel set this flag might be causing the issue you face.
- Write down coarsely how to reproduce the issue. If you deal with multiple issues at once, create separate notes for each of

<https://www.kernel.org/doc/html/latest/admin-guide/reporting-issues.html>

takeaways;

---

almost all kernel  
developer are volunteers

---



takeaways;

they should act on  
every bug report, but can  
and will ignore bad reports

takeaways;

act accordingly and  
sent a decent report,  
then you'll be heard

takeaways;

(1) check what kind of issue  
you deal with, as it...

takeaways;

(a) might save you from  
wasting time on  
reporting known deficits

takeaways;

(b) tells you what to expect  
from developers

takeaways;

---

(2) do your homework

---

takeaways;

(a) test and report with a  
\*vanilla\* kernel

takeaways;

(b) test with a fresh  
mainline kernel



takeaways;

---

(c) rule out local interferences

---

takeaways;

(d) check MAINTAINERS  
to submit the report  
to the right place

takeaways;

(e) write a friendly and decent  
report easy to gasp for others

# Step-by-step guide how to report issues to the kernel maintainers

The above TL;DR outlines roughly how to report issues to the Linux kernel developers. It might be all that's needed for people already familiar with reporting issues to Free/Libre & Open Source Software (FLOSS) projects. For everyone else there is this section. It is more detailed and uses a step-by-step approach. It still tries to be brief for readability and leaves out a lot of details; those are described below the step-by-step guide in a reference section, which explains each of the steps in more detail.

Note: this section covers a few more aspects than the TL;DR and does things in a slightly different order. That's in your interest, to make sure you notice early if an issue that looks like a Linux kernel problem is actually caused by something else. These steps thus help to ensure the time you invest in this process won't feel wasted in the end:

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- Write down coarsely how to reproduce the issue. If you deal with multiple issues at once, create separate notes for each of

<https://www.kernel.org/doc/html/latest/admin-guide/reporting-issues.html>

takeaways;

---

chances then are pretty good  
someone will help you

---

takeaways;

and nearly perfect, if you  
report a bisected regression

takeaways;

that's how you make the  
Linux developers fix kernel  
bugs they are able to fix







---

---

questions?

---

---

# Thorsten Leemhuis

---

mail: linux@leemhuis.info

GPG Key: 0x72B6E6EF4C583D2D

social media: @kernellogger, @knurd42,  
@knurd42rhfc, @thleemhuis and  
@thleemhuisfoss on #twitter & #friendica

#EOF

---

# Make Linux developers fix your kernel bug

---

Thorsten Leemhuis

- \* let me start by being fully honest
- \* the title promises a little more than the reality can fulfill

[simple reason]

intro;

sometimes reports on kernel  
bugs will just fizzle out

\* this will always happen

[not even worsed news yet]

intro;

in rare cases, developers will  
be unable to fix an issues

[one more bad thing]

intro;

kernel contains code nobody  
is really responsible for

[there is a simple reason for these three aspects]

intro;

# the Linux kernel is made by volunteers

- \* note: volunteers != hobbyists
- \* some of them hobbyists
- \* most of them employees
- \* but employees from companies contributing voluntarily

[thing with them is]

intro;

you can't really force  
volunteers to do work they  
can't do or don't want to do

- \* motivate them
- \* which Linus Torvalds actually does
- \* only works up to a point
- \* risk alienating them
- \* might make them stop contributing
- \* companies might decide to team up and fork

[analogy helps understanding this situation]





- \* Linux is a bit like an playground built and maintained completely by a volunteers
  - \* some of those volunteers are hobbyist that wanted to build something for their kids, to learn new stuff, or enjoy helping
  - \* many of those volunteers are actually employees from local or international companies that see some benefit in helping – for example if they have a coffee or gift shop nearby
- [but the thing is: sooner or later all all hobbyists and companies move to something new, as their interest and priorities change over time]



- \* say because kids became adults or companies closed
- \* some volunteer then vanish
- \* others still help when at least kindly asked
- \* often some other volunteer will step in
- \* but you can force them
- \* luckily their often is no need to
- \* unless some play structure breaks or is found to be dangerous

[and that's the same with Linux and the reason]

```
intro;
```

Linux kernel developers are  
obliged to fix some issues!

\* if they don't they will be looked at like this





\* luckily things seldom breaks or become dangerous, as Software doesn't decay like play structures on a playground, ;-)

[more good news: developer should fix other issues as well; and most]

```
intro;
```

developers will gladly address  
most issues in their code

- \* as most feel proud of what they build and want to ensure it works well
- \* thing is:

intro;

---

developers will gladly address  
most issues in their code,  
unless life gets in the way :-/

---

- \* the particular developer might be short on time
- \* stressed, sick, overwhelmed with reports or the boss forces the developer to focus on other things
- \* thing is: that happens frequently
- \* I guess you all know these from your life  
[and then...]

intro;

then bad bug reports are the  
first developers will let  
fall through the cracks!

- \* happens quite often
- \* most kernel devs have a lot on their plate already
- \* it's in your hand to prevent this fate

[so let's reframe...]

```
intro;
```

developers will gladly address  
most issues in their code,  
unless life gets in the way :-/

[as it's more like this]



intro;

developers will gladly address  
most issues in their code,  
if you write a decent report!

[emphasis]

```
intro;
```

developers will gladly address  
most issues in their code,  
if you write a decent report!

[that's why I'll tell you how to write one]

intro;

---

that's how you make most  
developers fix your bug,  
if they are able to

---

[in addition ...]

intro;

you'll also learn when  
you can insist on a fix

\* in case such a report isn't acted upon

intro;

and how to spot issues  
unlikely to be fixed

\* safe yourself trouble

[which concludes the intro and brings us...]

[ act 1 ]

---

create a decent report

---



\* let me please stretch the playground analogy a bit further

\* for two reasons

[first: the example is too small; think of something bigger]





- \* these days Linux more like a really big amusement park
- \* even bigger than this
- \* let's call it "Linus land"
- \* no entry free
- \* doesn't need staff
- \* built, maintained, and constantly improved by volunteers
- \* that's more accurate

[the second: the kernel is immaterial ]

*Takes just a flick of your fingers*



## Build your own 'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*

- \* Linux is this more like an freely available ebook with instructions how to build your own "Linus land"
- \* maintained by volunteers
- \* and everyone everywhere can put the book into a gigantic 3d printer to build their own "Linus land" within a few minutes
- \* or update theirs in a few minutes
  
- \* sorry, a bit fat fetched, but good real life analogies for Software are hard to come by

[got that? okay]

*Takes just a flick of your fingers*

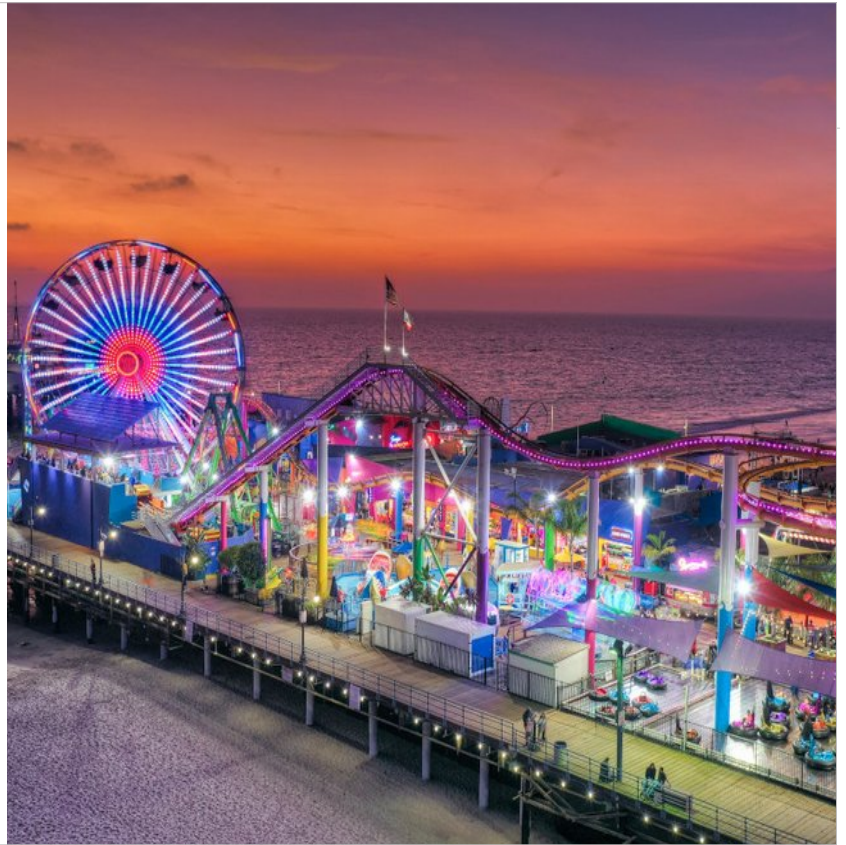


## Build your own 'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



- \* you visit some park build from the book
- \* your kid is injured on an water coaster a really good friend from school days designed
- \* you tell your friend, who's living 2000 km away and just got a kid
- \* friend checks the instructions for hours
- \* can't find anything and reluctantly flies over,
- \* notices that a few things look slightly different



*Takes just a flick of your fingers*

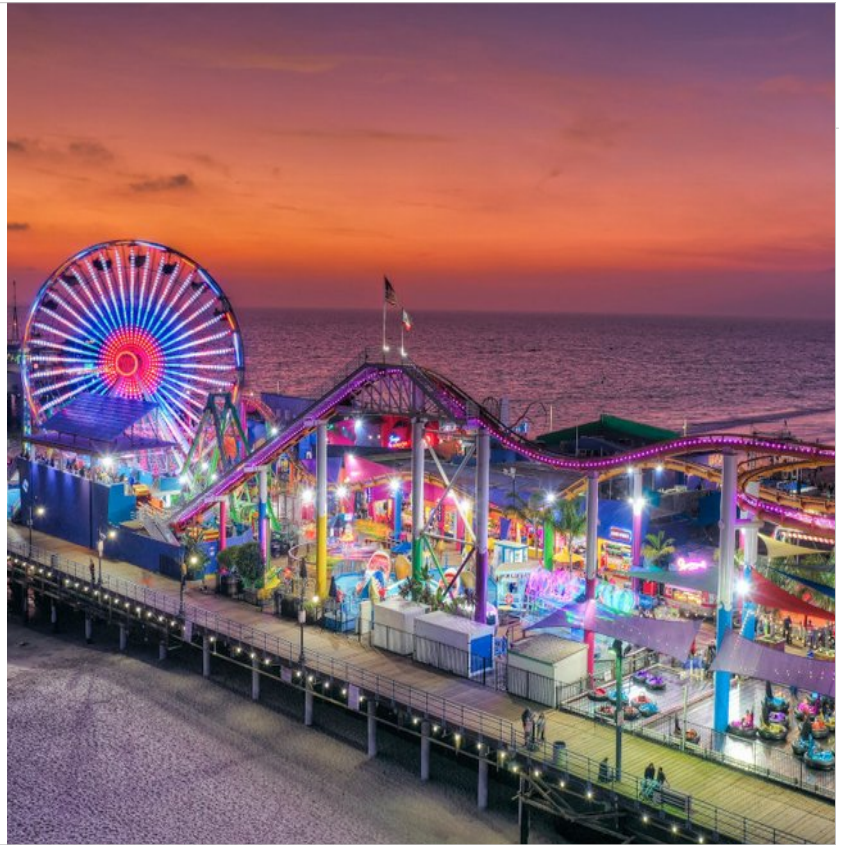


## Build your own 'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



- \* turns out: the one that built that park modified the book before building the park
- \* bigger water pipes and higher water pressure were used to "improve the performance", which lead to the accident
- \* your friend travels home really annoyed, he wasted money and hours and was blamed for an accident that's someone else fault
- \* you don't want to do that to a friend, don't you?
- \* that's way you don't want to do that to the volunteers that ,make Linux

[and that's why want to...]

decent report;

create a decent report

ensure your kernel is vanilla

\* vanilla == built from sources as distributed by  
kernel.org

[thing is: most kernels...]

decent report; vanilla;

most kernels used in  
the wild are not vanilla  
often heavily modified & enhanced

\* especially those from RHEL, SLE, and Ubuntu  
kernels

[ such modification make... ]

decent report; vanilla;

makes most distro kernel's  
unsuitable for reporting  
issues Linux kernel devs.

- \* most kernel devs don't care at all about bugs with them
- \* small mods can have a big impact
- \* that's why some devs even reject bugs from distros that use a lightly patched kernel, like Fedora

decent report; vanilla;

you might want to report the  
issue to your Linux distributor

\* warning: but most of the time it will be a dead end,  
as they don't have the resources to deal with all the  
reports they got

[that's why you might...]



decent report; vanilla;

or install a vanilla kernel  
yourself instead – for  
example a pre-built one

- \* pretty easy
- \* available for all the big distros
- \* and a few actually use them directly

[there is another option]

decent report; vanilla;

or compile a kernel yourself

hint: `make olddefconfig localmodconfig`  
makes things easier and relatively fast

- \* lots of howtos on the net
- \* use those with the mentioned commands

[after installing vanilla...]

decent report; vanilla;

check if issue happens with a  
vanilla kernel, too

decent report; vanilla;

---

focus on this kernel in your  
report, forget the distro's  
mentioning the distro's even briefly  
often just complicates report unnecessarily

---

decent report;

---

create a decent report

ensure your kernel is vanilla

- \* concludes this point
- \* next one is related

*Takes just a flick of your fingers*

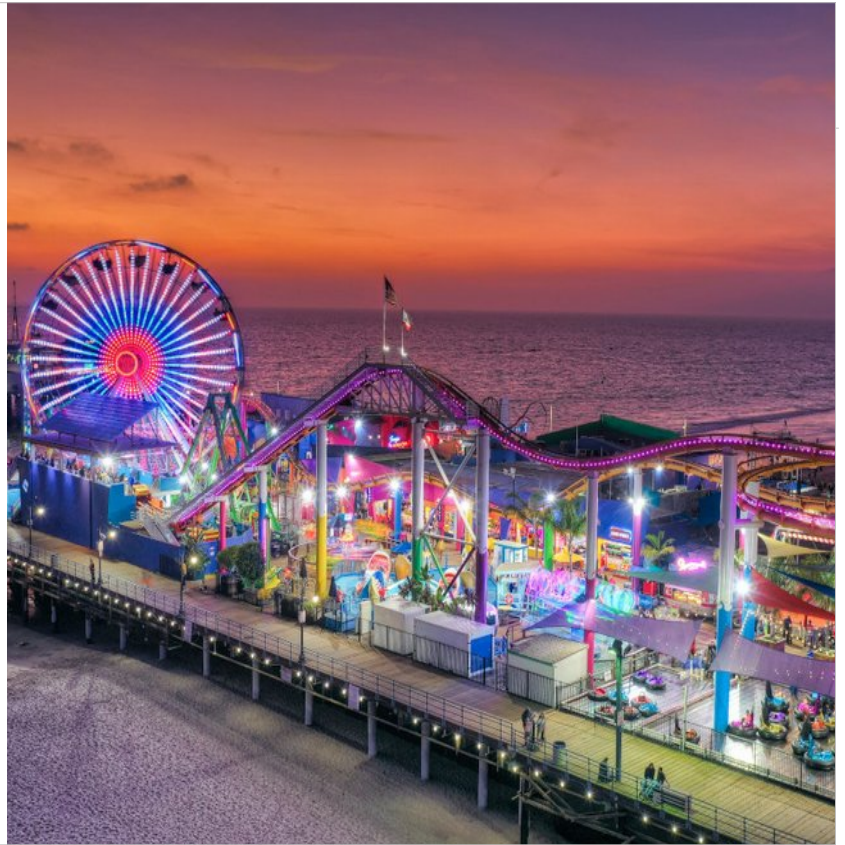


Build your own  
'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



- \* you build a park and complain to your friend about a problem with an attraction designed by the friend
- \* checks unsuccessfully and flies over
  
- \* turns out: you used a two year old book that had a bug eliminated 18 months ago
- \* friend was not aware of the bug as it was caused by the infrastructure used by friend's attraction
- \* or accidentally fixed it with a big redesign or improvement
- \* or fixed it and forgot about it

[you don't want to do this to a friend, don't you?]

decent report;

## create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

- \* kernel changes a lot all the time
- \* bug might be fixed already

[what qualifies as fresh?]

decent report; freshness;

# test with latest mainline (aka -RC) release

- \* every bugfix has to land here first
- \* no, it's testing RCs is dangerous, they are pretty stable
- \* and you have backups, don't you?


[find it on [kernel.org](http://kernel.org)]



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<a href="#">RSYNC</a>	<a href="rsync://rsync.kernel.org/pub/">rsync://rsync.kernel.org/pub/</a>

Latest Release  
**5.16.14** 

mainline:	<b>5.17-rc7</b>	2022-03-06	<a href="#">[tarball]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>		
stable:	5.16.14	2022-03-11	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>
longterm:	5.15.28	2022-03-11	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>
longterm:	5.10.105	2022-03-11	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>

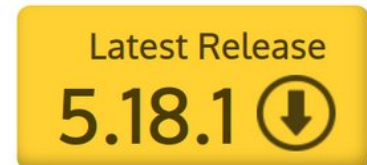
- \* ignore the big yellow field
- \* look at the top of table
- \* pick that version

[unless it looks like]

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<a href="#">GIT</a>	<a href="https://git.kernel.org/">https://git.kernel.org/</a>
<a href="#">RSYNC</a>	<a href="rsync://rsync.kernel.org/pub/">rsync://rsync.kernel.org/pub/</a>



mainline:	<b>5.18</b>	2022-05-22	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>		
stable:	<b>5.18.1</b>	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>	
stable:	5.17.12	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>
longterm:	5.15.44	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>
longterm:	5.10.119	2022-05-30	<a href="#">[tarball]</a>	<a href="#">[pgp]</a>	<a href="#">[patch]</a>	<a href="#">[inc. patch]</a>	<a href="#">[view diff]</a>	<a href="#">[browse]</a>	<a href="#">[changelog]</a>

\* then test the latest stable release


[but when a rc-kernel exists...]

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- \* you better avoid the latest stable
- \* developer will wonder if the bug was fixed already by someone
- \* already increases the chances your report might be ignored
- \* while it's not ideal to use such kernel, but not totally bad
- \* okay as fallback
- \* definitely better reporting with this than not at all

decent report; freshness;

focus your report on the  
freshest kernel you tested

mentioning older briefly somewhere can be  
okay, but often just make report hard to grasp

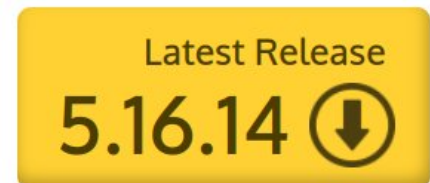
[one more thing: don't use a longterm kernel]

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\* not even when a new version was released today  
[because]

decent report; freshness;

some bugfixes  
are never backported to  
stable/longterm kernel series

- \* sometimes that's simply too risky
- \* quite a few known bugs there

decent report; freshness;

makes longterm (LTS) kernels  
quite unsuitable for reporting

- \* still better than not reporting at all
- \* but there is a high risk that your report will not lead to anything
- \* depends on the developer

[no rule without...]

decent report; freshness;

exception: regressions within  
a stable or longterm series  
something breaks 5.15.10 -> 5.15.11

\* then it's okay to test the latest version from that  
series



decent report;

---

create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

---

[another important aspect follows]

*Takes just a flick of your fingers*

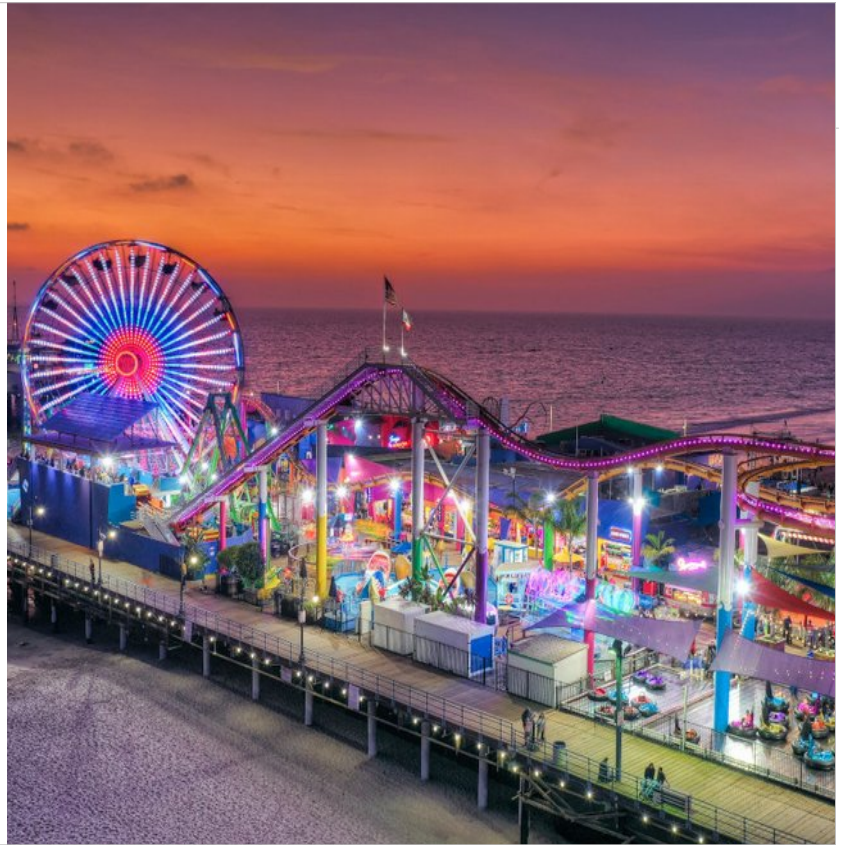


## Build your own 'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



- \* accidents regularly in your own up2date Linus land
- \* say water and roller coasters stop somewhere along the track often
- \* friend can't explain things and flies over
- \* spot a mobile attraction in a corner of your park you allowed to come by every day and use the park's infra
- \* friend notices the workers of the mobile attraction even modified some water pipes in the park
- \* friend suspects the power grid is able to handle the extra load
- \* but is not allowed to look closer at the mobile attraction, as owners consider it their "trade secret"

[you don't want to annoy friends like that]

decent report;

---

## create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

ensure your kernel's and system's integrity

---

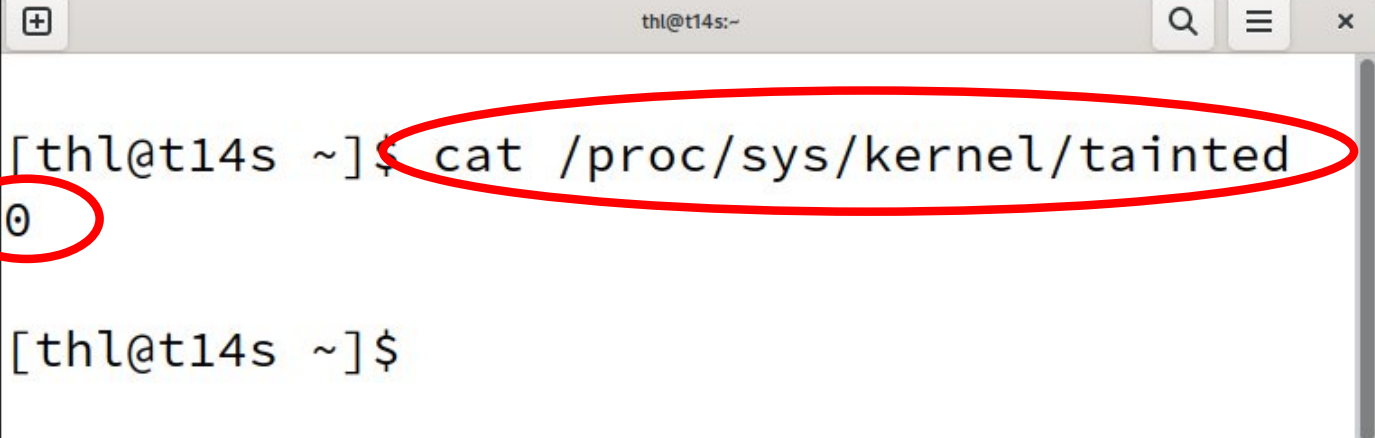
\* IOW: make sure kernel remains vanilla when used and is healthy



\* kernel can detect some integrity problems itself

[check...]

decent report; integrity;

A terminal window titled 'thl@t14s:~' with search, menu, and close icons. The prompt is '[thl@t14s ~]\$'. The command 'cat /proc/sys/kernel/tainted' is entered and circled in red. The output '0' is displayed below the command and also circled in red. The prompt '[thl@t14s ~]\$' is shown again on the next line.

```
[thl@t14s ~]$ cat /proc/sys/kernel/tainted
0
[thl@t14s ~]$
```

\* this is how it should look like

[and not like...]

decent report; integrity;



```
thl@t14s:~  
[thl@t14s ~]$ cat /proc/sys/kernel/tainted  
1  
[thl@t14s ~]$
```

- \* everything other than a 0:
- \* kernel likely unsuitable for reporting

[one popular thing that can cause a "1" here]

decent report; integrity;

# Nvidia's proprietary graphics driver

- \* uses the kernel in unexpected ways and even changes it
- \* that's why most kernel developers don't care about reports with kernels using this drivers

[but the thing is]

decent report; integrity;

all out-of-tree drivers  
are a problem

incl. Nvidia's new open kernel driver

- \* kernel not vanilla anymore
- \* taint number for FOSS drivers just different

[that's why you...]



decent report; integrity;

deinstall such drivers, reboot,  
check if issue still present  
and recheck the tainted flag!

\* then you are free to proceed with reporting

[but note, there are]

decent report; integrity;

many other incidents  
can taint kernel

decent report; integrity;

an "Oops" for example

- \* Oops = a critical error that could have been detected, intercepted, and contained
- \* kernel can continue, but is in an undefined state
- \* which can lead to subsequent faults
- \* and thus considered unreliable
- \* taint flag indicates that

```

[ 1.807314] ldrm] initialized qxl 0.1.0 20120117 for 0000:00:02.0 on minor 0
[ 121.823610] general protection fault: 0000 [#1] SMP
[ 121.824474] Modules linked in: virtio_scsi qxl virtio_console virtio_net drm_kms_helper crc32c_intel ttm ata_generic drm seri
o_raw pata_acpi virtio_pci virtio_ring virtio
[ 121.826079] CPU: 0 PID: 261 Comm: dracut-initqueue Tainted: G      D      4.11.0-rc2n-00157-gae50dfd61665 #14
[ 121.826849] Hardware name: Red Hat KVM, BIOS 0.5.1 01/01/2011
[ 121.827594] task: ffff9b90f18d2400 task.stack: ffffacc0810b0000
[ 121.828338] RIP: 0010: __kmalloc+0xa4/0x210
[ 121.829052] RSP: 0018:ffffacc0810b3ce0 EFLAGS: 00010246
[ 121.829767] RAX: 2d316f6974726976 RBX: 00000000015012c0 RCX: 00000000000022f5
[ 121.830537] RDX: 0000000000000143 RSI: 0000000000000000 RDI: 000000000001ca60
[ 121.831298] RBP: ffffacc0810b3d10 R08: ffff9b90fe41ca60 R09: ffff9b90f8802000
[ 121.832055] R10: 0000000055555400 R11: 00000000001a698 R12: 2d316f6974726976
[ 121.832795] R13: 00000000015012c0 R14: 0000000000000000 R15: ffff9b90f8802000
[ 121.833508] FS: 00007f27765b9b40(0000) GS:ffff9b90fe400000(0000) knlGS:0000000000000000
[ 121.834188] CS: 0010 DS: 0000 ES: 0000 CR0: 0000000080050033
[ 121.834839] CR2: 000056030b7088b0 CR3: 0000000171584000 CR4: 00000000000006f0
[ 121.835529] Call Trace:
[ 121.836202] ? alloc_fdmem+0x20/0x50
[ 121.836841] alloc_fdmem+0x20/0x50
[ 121.837486] alloc_fdttable+0x6a/0xf0
[ 121.838116] dup_fd+0x1d8/0x280
[ 121.838743] ? audit_alloc+0xc5/0x170
[ 121.839379] copy_process.part.36+0x887/0x1ce0
[ 121.840017] ? cp_new_stat+0x14f/0x180
[ 121.840637] _do_fork+0xd7/0x390
[ 121.841271] Sys_clone+0x19/0x20
[ 121.841891] do_syscall_64+0x67/0x170
[ 121.842524] entry_SYSCALL64_slow_path+0x25/0x25
[ 121.843159] RIP: 0033:0x7f2775c6c95d
[ 121.843709] RSP: 002b:00007ffdb03570 EFLAGS: 00000246 ORIG_RAX: 0000000000000038
[ 121.844315] RAX: ffffffffdfdb0357da RBX: 0000000000000000 RCX: 00007f2775c6c95d
[ 121.844903] RDX: 0000000000000000 RSI: 0000000000000000 RDI: 0000000001200011
[ 121.845498] RBP: 00007ffdb035b0 R08: 0000000000000000 R09: 00007f27765b9b40
[ 121.846103] R10: 00007f27765b9e10 R11: 0000000000000246 R12: 0000000000000000
[ 121.846700] R13: 00007ffdb03660 R14: 0000000000000000 R15: 000056030b725a90
[ 121.847314] Code: 49 83 78 10 00 4d 8b 20 86 84 03 01 00 00 4d 85 c4 8f 84 fa 00 00 00 49 63 41 20 49 8b 39 4c 01 c0 40 f6 c7

```

[BTW: the oops shows if kernel is tainted]

```
[ 1.807314] ldrm] initialized qxl 0.1.0 20120117 for 0000:00:02.0 on minor 0
[ 121.823610] general protection fault: 0000 [#1] SMP
[ 121.824474] Modules linked in: virtio_scsi qxl virtio_console virtio_net drm_kms_helper crc32c_intel ttm ata_generic drm seri
o_raw pata_acpi virtio_pci virtio_ring virtio
[ 121.826079] CPU: 0 PID: 261 Comm: dracut-initqueue Tainted: G      D      4.11.0-rc2n-00157-gae50dfd61665 #14
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[ 121.829052] RSP: 0018: ffffacc0810b3ce0 EFLAGS: 00010246
[ 121.829767] RAX: 2d316f6974726976 RBX: 0000000015012c0 RCX: 0000000000022f5
[ 121.830537] RDX: 0000000000000143 RSI: 0000000000000000 RDI: 000000000001ca60
[ 121.831298] RBP: ffffacc0810b3d10 R08: ffff9b90fe41ca60 R09: ffff9b90f8802000
[ 121.832055] R10: 0000000055555400 R11: 00000000001a698 R12: 2d316f6974726976
[ 121.832795] R13: 0000000015012c0 R14: 0000000000000000 R15: ffff9b90f8802000
[ 121.833508] FS: 00007f27765b9b40(0000) GS: ffff9b90fe400000(0000) knlGS: 0000000000000000
[ 121.834188] CS: 0010 DS: 0000 ES: 0000 CR0: 0000000080050033
[ 121.834839] CR2: 000056030b7088b0 CR3: 0000000171584000 CR4: 00000000000006f0
[ 121.835529] Call Trace:
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[ 121.837486] alloc_fdttable+0x6a/0xf0
[ 121.838116] dup_fd+0x1d8/0x280
[ 121.838743] ? audit_alloc+0xc5/0x170
[ 121.839379] copy_process.part.36+0x887/0x1ce0
[ 121.840017] ? cp_new_stat+0x14f/0x180
[ 121.840637] _do_fork+0xd7/0x390
[ 121.841271] Sys_clone+0x19/0x20
[ 121.841891] do_syscall_64+0x67/0x170
[ 121.842524] entry_SYSCALL64_slow_path+0x25/0x25
[ 121.843159] RIP: 0033: 0x7f2775c6c95d
[ 121.843709] RSP: 002b: 00007ffdb03570 EFLAGS: 00000246 ORIG_RAX: 0000000000000038
[ 121.844315] RAX: ffffffffda RBX: 0000000000000000 RCX: 00007f2775c6c95d
[ 121.844903] RDX: 0000000000000000 RSI: 0000000000000000 RDI: 000000001200011
[ 121.845498] RBP: 00007ffdb035b0 R08: 0000000000000000 R09: 00007f27765b9b40
[ 121.846103] R10: 00007f27765b9e10 R11: 0000000000000246 R12: 0000000000000000
[ 121.846700] R13: 00007ffdb03660 R14: 0000000000000000 R15: 000056030b725a90
[ 121.847314] Code: 49 83 78 10 00 4d 8b 20 86 84 03 01 00 00 4d 85 c4 8f 84 fa 00 00 00 49 63 41 20 49 8b 39 4c 01 c0 40 f6 c7
```

[in the end: tainted kernels in the end...]

decent report; integrity;

tainted kernels most  
of the time unsuitable for  
reporting bugs

[exception]

decent report; integrity;

big exception:  
the first Oops, warning, etc.

[the kernel's docs explain this in more detail]

**☐ The Linux kernel user's and administrator's guide**Linux kernel release 5.x  
<<http://kernel.org/>>

The kernel's command-line parameters

Linux allocated devices (4.x+ version)

Documentation for `/proc/sys`

Linux ABI description

Feature status on all architectures

Hardware vulnerabilities

**☐ Reporting issues**

The short guide (aka TL;DR)

3rd party kernel module.

## Check 'taint' flag

*Check if your kernel was 'tainted' when the issue occurred, as the event that made the kernel set this flag might be causing the issue you face.*

The kernel marks itself with a 'taint' flag when something happens that might lead to follow-up errors that look totally unrelated. The issue you face might be such an error if your kernel is tainted. That's why it's in your interest to rule this out early before investing more time into this process. This is the only reason why this step is here, as this process later will tell you to install the latest mainline kernel; you will need to check the taint flag again then, as that's when it matters because it's the kernel the report will focus on.

On a running system is easy to check if the kernel tainted itself: if `cat /proc/sys/kernel/tainted` returns '0' then the kernel is not tainted and everything is fine. Checking that file is impossible in some situations; that's why the kernel also mentions the taint status when it reports an internal problem (a 'kernel bug'), a recoverable error (a 'kernel Oops') or a

<https://www.kernel.org/doc/html/latest/admin-guide/reporting-issues.html>

- \* reporting issues
- \* section
- \* links to a page dedicated to tainted kernels
- \* which has a script and a table to decode the taint number/flags



## Table for decoding tainted state

Bit	Log	Number	Reason that got the kernel tainted
0	G/P	1	proprietary module was loaded
1	_F	2	module was force loaded
2	_S	4	kernel running on an out of specification system
3	_R	8	module was force unloaded
4	_M	16	processor reported a Machine Check Exception (MCE)
5	_B	32	bad page referenced or some unexpected page flags
6	_U	64	taint requested by userspace application
7	_D	128	kernel died recently, i.e. there was an OOPS or BUG
8	_A	256	ACPI table overridden by user
9	_W	512	kernel issued warning
10	_C	1024	staging driver was loaded
11	_I	2048	workaround for bug in platform firmware applied
12	_O	4096	externally-built ("out-of-tree") module was loaded
13	_E	8192	unsigned module was loaded
14	_L	16384	soft lockup occurred
15	_K	32768	kernel has been live patched
16	_X	65536	auxiliary taint, defined for and used by distros
17	_T	131072	kernel was built with the struct randomization plugin

<https://www.kernel.org/doc/html/latest/admin-guide/tainted-kernels.html>

[there is more about integrity]

decent report; integrity;

## create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

ensure your kernel's and system's integrity  
[continued]

- \* there are things the kernel can't detect
- \* that's why you better want to think about a few other things as well

decent report; integrity;

is your hardware working  
reliably and as specified?

memtest: great idea!  
overclocking: stupid idea!

decent report; integrity;

issue with file-system?  
fsck the volume!

decent report; integrity;

check `dmesg -H`

look out for anything red or bold

[looks like this]

```
[239864.983817] pci_bus 0000:02: Allocating resources
[239864.983840] pci_bus 0000:03: Allocating resources
[239864.984059] pci_bus 0000:04: Allocating resources
[239864.984069] pci_bus 0000:05: Allocating resources
[239864.984356] pci_bus 0000:06: Allocating resources
[239864.986799] done.
[239864.986813] thermal thermal_zone0: failed to read out thermal zone (-61)
[239864.988006] PM: suspend exit
[239865.018435] Generic FE-GE Realtek PHY r8169-0-200:00: attached PHY driver (mii_bus:phy_addr=r8169-0-200:00,
irq=MAC)
[239865.129471] r8169 0000:02:00.0 enp2s0f0: Link is Down
[239868.473622] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.829440] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.843878] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.858171] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.914570] psmouse serio1: Touchpad at isa0060/serio1/input0 lost sync at byte 6
[239881.914584] psmouse serio1: issuing reconnect request
[243755.838959] r8169 0000:02:00.0 enp2s0f0: Link is Down
[243756.737592] PM: suspend entry (deep)
[243756.767244] Filesystems sync: 0.029 seconds
[243757.114220] Bluetooth: hci0: Suspend notifier action (3) failed: 2
[243757.114233] Freezing user space processes ... (elapsed 0.004 seconds) done.
[243757.118906] OOM killer disabled.
[243757.118907] Freezing remaining freezable tasks ... (elapsed 0.001 seconds) done.
[243757.120865] printk: Suspending console(s) (use no_console_suspend to debug)
[243757.230397] [drm] free PSP TMR buffer
[243757.461447] PM: suspend devices took 0.341 seconds
[243757.463029] ACPI: EC: interrupt blocked
[243757.474759] amdgpu 0000:06:00.0: amdgpu: MODE2 reset
[243757.494763] ACPI: PM: Preparing to enter system sleep state S3
[243757.500046] ACPI: EC: event blocked
```

- \* it might tell you what's wrong
- \* might give you a error msg to google
- \* and save everyone a lot of time

decent report;

---

## create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

ensure your kernel's and system's integrity

---

*Takes just a flick of your fingers*

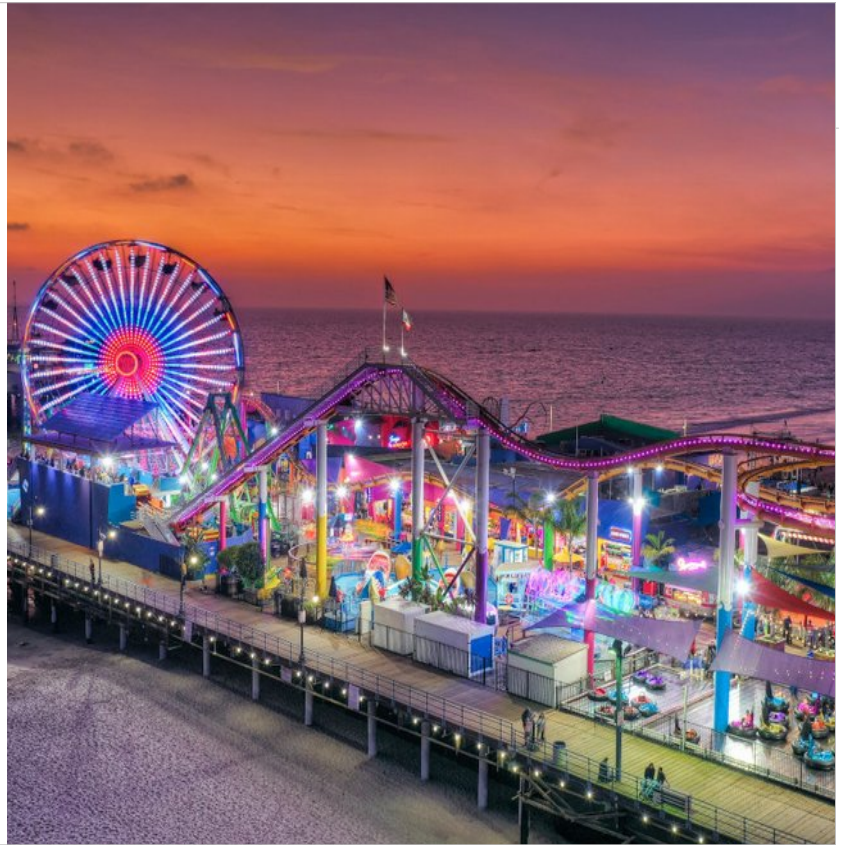


## Build your own 'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



- \* you have a valid problem but only mention it on a school reunion where the friend later got pretty drunk and headed off with love interest from the school days
- \* or you reported it via a chat, message board, or forum on a website you know your friend used to visit when you both where young
- \* even after months or years, your friend didn't do anything to fix the problem
- \* that's your fault, as you friend might not visit the website anymore
- \* and maybe someone else is responsible anywayway these days



decent report;

## create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

ensure your kernel's and system's integrity

submit your report to the right place

- \* web-forums definitely won't work
- \* distro's bug tracker often a dead end as well

[sadly. most of the time bugzilla.kernel.org is the wrong place, too]

## Welcome to Kernel.org Bugzilla

**Please use your distribution's bug tracking tools**

This bugzilla is for reporting bugs against **upstream Linux kernels**.

If you did not compile your own kernel from scratch, you are probably in the wrong place.

Please use the following links to report a bug to your distribution instead:

[Ubuntu](#) | [Fedora](#) | [Arch](#) | [Mint](#) | [Debian](#) | [Red Hat](#) | [OpenSUSE](#) | [SUSE](#)

To report an issue upstream, please consult this document before opening a new bug:

[Reporting Issues](#)

With questions about this site contact [bugzilla admins](#).

Please check the [FAQ](#) before you do so.

\* might look like the central bug tracker

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\* but it's not, which you learn when you follow that link

switching from 5.9.15 to 5.10.5) do not qualify.

## Check where you need to report your issue

*Locate the driver or kernel subsystem that seems to be causing the issue. Find out how and where its developers expect reports. Note: [most of the time this won't be bugzilla.kernel.org](#), as issues typically need to be sent by mail to a maintainer and a public mailing list.*

It's crucial to send your report to the right people, as the Linux kernel is a big project and most of its developers are only familiar with a small subset of it. Quite a few programmers for example only care for just one driver, for example one for a WiFi chip; its developer likely will only have small or no knowledge about the internals of remote or unrelated "subsystems", like the TCP stack, the PCIe/PCI subsystem, memory management or file systems.

Problem is: the Linux kernel lacks a central bug tracker where you can simply file your issue and make it reach the developers that need to know about it. That's why you have to find the right place and way to report issues yourself. You can do that with the help of a script (see below), but it mainly targets kernel developers and experts. For everybody else the MAINTAINERS file is the better place.

## How to read the MAINTAINERS file

To illustrate how to use the MAINTAINERS file, let's assume the WiFi in your Laptop suddenly misbehaves after updating the kernel. In that case it's likely an issue in the WiFi driver. Obviously it could also be some code it builds

bugzilla situation: it's complicated

- \* set up by some people that thought it was a good idea
- \* some devs liked it and started using it
- \* but many (most?) devs never liked the idea
- \* didn't really fit into the email based work-flow
- \* the idea was to have volunteers as go-between for such subsystems/maintainers
- \* that never really worked out
- \* that's why even today a lot of reports never reach the responsible developers (and are thus ignored)
  
- \* that's why bugzilla.kernel.org often is a bad idea [instead do, what...]

switching from 5.9.15 to 5.10.5) do not qualify.

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\* used by developers to find each others contact addresses



## 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/>  
**chat:** <irc://irc.libera.chat/btrfs>  
**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*`

<https://www.kernel.org/doc/html/latest/process/maintainers.html>  
<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>

[most of the entries]

## BT8XXGPIO DRIVER

**Mail:** Michael Buesch <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>, Josef Bacik <josef@toxicpanda.com>  
**Mailing list:** [linux-btrfs@vger.kernel.org](mailto:linux-btrfs@vger.kernel.org)  
**Status:** Maintained

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>

- \* mention the maintainer and the list
- \* just sent your report by mail there
- \* always CC the lists!
- \* most prefer this way and it should always work
- \* some subsystems uses a bug-tracker
- \* MAINTAINERS file mentions those few that do

**Files:** drivers/platform/x86/acer-wmi.c

## ACPI

**Mail:** "Rafael J. Wysocki" <rafael@kernel.org>

**Reviewer:** Len Brown <lenb@kernel.org>

**Mailing list:** 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](https://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/pnpacpi/ include/acpi/ include/linux/acpi.h include/linux/fwnode.h tools/power/acpi/

## ACPI APEI

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>

- \* mainly ACPI, PCI, and PM
- \* about 20 out of more than 2000 entries

[there are also a few that use other bug-trackers]



## 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)>, Pan, Xinhui <[Xinhui.Pan@amd.com](mailto:Xinhui.Pan@amd.com)>

**Mailing list:** [amd-gfx@lists.freedesktop.org](mailto:amd-gfx@lists.freedesktop.org)

**Status:** Supported

**SCM:** git <https://gitlab.freedesktop.org/aqd5f/linux.git>

**bugs:** <https://gitlab.freedesktop.org/drm/amd/-/issues>

**chat:** <irc://irc.oftc.net/radeon>

**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

<https://www.kernel.org/doc/html/latest/process/maintainers.html>  
<https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/tree/MAINTAINERS>

\* graphics drivers for AMD, Intel, etc.

decent report; right place;

sadly MAINTAINERS  
contains more than  
2000 entries:-/

- \* why are things so complicated and [bugzilla.kernel.org](http://bugzilla.kernel.org)?
- \* not design, just happened over time
- \* and no volunteer in sight to bring order into this

decent report;

---

## create a decent report

ensure your kernel is vanilla

ensure your kernel is fresh

ensure your kernel's and system's integrity

submit your report to the right place

---

[brings us to the last point]

*Takes just a flick of your fingers*

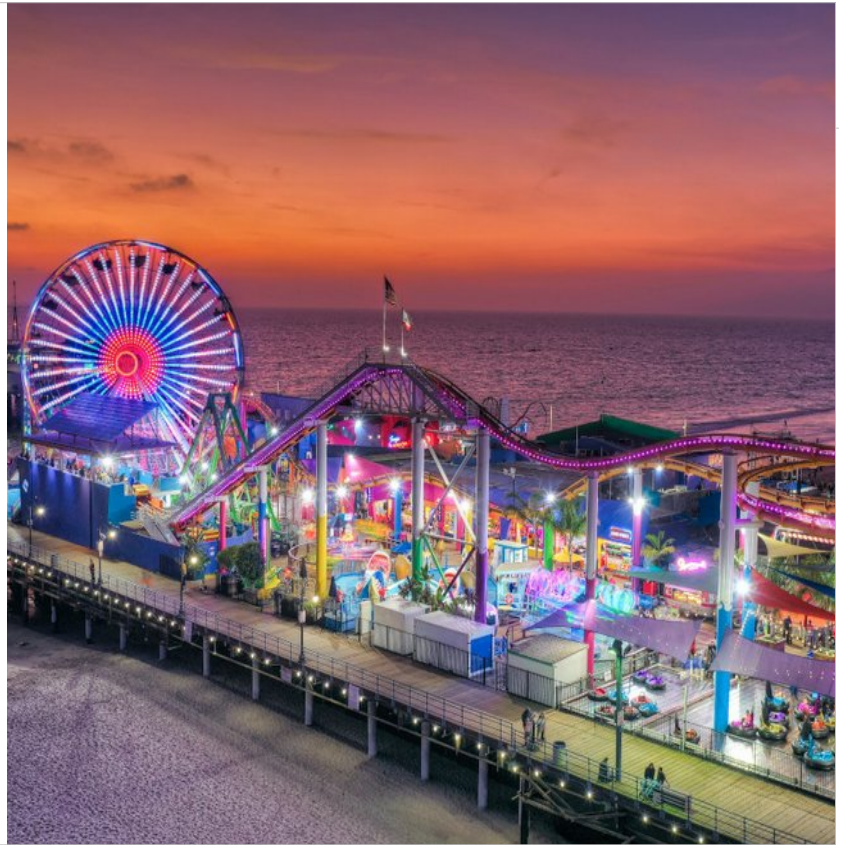


Build your own  
'Linus land'

*Full instructions inside*

O RLY?

*Linux kernel community*



- \* imagine your friend showing you a bug report from someone you both both went to school with, but never really liked
- \* you read subject and first para of a report and don't get the slightest idea what this is all about
- \* and the whole text is confusing and full of unnecessary or distracting details
- \* and has five attachments and ten links
- \* and is written in a unfriendly, demanding, and bearish way
- \* reminder, friend can ignore this without consequences
- \* would you suggest to do that?

decent report;

---

## create a decent report

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submit your report to the right place

depict the problem adequately

---

decent report; depiction;

---

"how to write a good report"  
worth its own, quite long talk

---

decent report; depiction;

---

a balancing act

---

decent report; depiction;

---

think of it  
as asking for a favor

---



decent report; depiction;

---

a favor from someone  
that doesn't have to help you

---

decent report; depiction;

---

a favor from a someone  
that might be stressed  
or really short on time

---

decent report; depiction;

---

hence, make your depiction  
easy to grasp for recipients

---

decent report; depiction;

---

describe the problem neither  
to brief nor as a novella

---

decent report; depiction;

mention version, vanilla,  
and taint status

- \* avoids doubts
- \* mention environment (distro, hw if relevant)

decent report; depiction;

upload & link clearly relevant  
logs or attach them  
but *\*don't\** overload the report!

\* if something missing, developer will ask for it

decent report; depiction;

often relevant: output from  
`dmesg` & `lspci -nn`;  
maybe kernel's '.config', too

\* depends on the issue

[then]

decent report; depiction;

add two or three sentences  
summarizing the situation on  
top of your depiction

- \* really important to get right
- \* developers get a lot of reports
- \* many will stop reading after first para

[some don't even get that far]



decent report; depiction;

use a even more condensed  
and crystal-clear depiction  
as subject

- \* also really important to get right
- \* most people will only read that

decent report; depiction;

---

**in general: don't over-think  
or overdo your report!**

---

decent report; depiction;

short report will often do  
getting the basics right (vanilla, fresh  
version, no taint, easy to grasp, ...)  
is important

[ohh, and remember]

decent report; depiction;

check for existing reports  
about the problem to join

check <insert favorite search engine>,  
lore.kernel.org/all/, and bugzilla.kernel.org

- \* You might wonder:
- \* shouldn't I have done this earlier
- \* correct, that's why you should do things in the order described by this talk  
[instead]

## Step-by-step guide how to report issues to the kernel maintainers

The above TL;DR outlines roughly how to report issues to the Linux kernel developers. It might be all that's needed for people already familiar with reporting issues to Free/Libre & Open Source Software (FLOSS) projects. For everyone else there is this section. It is more detailed and uses a step-by-step approach. It still tries to be brief for readability and leaves out a lot of details; those are described below the step-by-step guide in a reference section, which explains each of the steps in more detail.

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- Create a fresh backup and put system repair and restore tools at hand.
- Ensure your system does not enhance its kernels by building additional kernel modules on-the-fly, which solutions like DKMS might be doing locally without your knowledge.
- Check if your kernel was 'tainted' when the issue occurred, as the event that made the kernel set this flag might be causing the issue you face.
- Write down coarsely how to reproduce the issue. If you deal with multiple issues at once, create separate notes for each of

<https://www.kernel.org/doc/html/latest/admin-guide/reporting-issues.html>

- \* tries to catch local problems early
- \* reference section providing details when you need them

[document also tells you]

decent report; depiction;

it tells you to check what  
kind of issue you deal with

- \* a some require a few additional steps
- \* there is another reason why you want to do that
- \* it determines what you can expect
- \* which is kinda important, too

[which brings us to]

[ act 2 ]

---

the kind of issue at hand

---

[one kind are those]



kind of issue;

---

the kind of issue at hand

issues someone is obliged to address

---

\* and there are three of those  
[the first]

kind of issue; mustfix;

the kind of issue at hand

issues someone is obliged to address  
security vulnerabilities

- \* will only happen to a few of you
- \* but if follow the reporting issue

[which will point you]

☐ The Linux kernel user's and administrator's guide

Linux kernel release 5.x  
<<http://kernel.org/>>

The kernel's command-line parameters

Linux allocated devices (4.x+ version)

Documentation for /proc/sys

Linux ABI description

Feature status on all architectures

Hardware vulnerabilities

Reporting issues

## Security bugs

Linux kernel developers take security very seriously. As such, we'd like to know when a security bug is found so that it can be fixed and disclosed as quickly as possible. Please report security bugs to the Linux kernel security team.

### Contact

The Linux kernel security team can be contacted by email at <[security@kernel.org](mailto:security@kernel.org)>. This is a private list of security officers who will help verify the bug report and

<https://www.kernel.org/doc/html/latest/admin-guide/security-bugs.html>

[the second]

kind of issue; mustfix;

the kind of issue at hand

issues someone is obliged to address

security vulnerabilities

devastating bugs

\* not "the paint is off" somewhere

[something...]

kind of issue; mustfix; devastating;

something really really bad

data is lost or damaged,  
hardware is bricked, ...

[luckily even more rare]

kind of issue; mustfix; devastating;

make impact & urgency  
obvious in your report

[and in case it's not quickly acted upon, get Linus in  
the loop]



[which brings us to the third, more common type]

kind of issue; mustfix;

---

## the kind of issue at hand

issues someone is obliged to address

security vulnerabilities

devastating bugs

regressions

---

[a regression is...]



kind of issue; mustfix; regressions;

something breaks when  
updating the kernel

say from 5.15 -> 5.16 or  
from 5.17.3 -> 5.17.4

[not allowed in Linux]

kind of issue; mustfix; regressions;

first rule of Linux kernel development:  
"we don't cause regressions"

- \* coined and enforced by Linus
- \* wants to take the fear out of updating
- \* they nevertheless happen frequently :-/
- \* sadly some of the reports even fall through the cracks :-/
- \* that why I volunteered as the kernel's regression tracker

[and built a bot]

# Linux kernel regression status

[\[next\]](#) [\[mainline\]](#) [\[stable/longterm\]](#) [\[dormant\]](#) [\[resolved\]](#) | [\[new\]](#) | [\[all\]](#)

current cycle (v5.18.. aka v5.18-post), culprit identified

none known by regzbot

current cycle (v5.18.. aka v5.18-post), unkown culprit

none known by regzbot

previous cycle (v5.17..v5.18), culprit identified, with activity in the past three months

- [ff042f4a9b05](#) (v5.18-rc1) ▶ *mm: chiq\_test runs 7 minutes instead of ~ 1 second.* by [Stefan Wahren](#)  
Earliest & latest [activity](#): 7 & 3 days ago. Noteworthy: [\[patch\]](#).
- [f26b3fa04611](#) (v5.18-rc1) ▶ *mm: [mm/page\_alloc] f26b3fa046: netperf.Throughput\_Mbps -18.0% regression* by [kernel test robot](#)  
Earliest & latest [activity](#): 39 & 7 days ago. Noteworthy: [\[patch\]](#).

older cycles (..v5.17), culprit identified, with activity in the past three months

- [44c57f205876](#) (v5.15-rc1) ▶ *qla2xxx: tape drive not removed after unplug FC cable* by [Tony Battersby](#)  
Earliest & latest [activity](#): 3 & 1 days ago.
- [b2af264ad3af](#) (v5.16-rc1) ▶ *bluetooth: HSP/HFP mSBC profile broken with QCA6174* by [bugzilla-daemon@kernel.org](#)  
Earliest & latest [activity](#): 110 & 1 days ago. Noteworthy: [\[1\]](#), [\[2\]](#), [\[3\]](#), [\[4\]](#), [\[fix incoming\]](#).
- [bdd8b6c98239](#) (v5.17-rc1) ▶ *Xorg SEGV in Xen PV dom0 after updating from 5.16.18 to 5.17.5* by [Marek Marczykowski-Górecki](#)  
Earliest & latest [activity](#): 25 & 1 days ago. Noteworthy: [\[1\]](#), [\[patch\]](#).
- [453e41085183](#) (v5.17-rc1) ▶ *tboot suspend broken on Lenovo T460p* by [Derek Dolney](#)  
Earliest & latest [activity](#): 28 & 2 days ago. Noteworthy: [\[1\]](#), [\[patch\]](#).

\* ugly, isn't it? :-/

[funding from EU]



This website is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 871528.

<https://linux-regtracking.leemhuis.info/about/>

- \* many thx for that
- \* project ended

The image shows the Meta logo, which consists of a blue infinity symbol followed by the word "Meta" in a dark blue, sans-serif font. The logo is centered within a white rectangular area, which is itself set against a black background. There are thin white lines at the top and bottom of the black background, and small white corner markers in the top-right and bottom-right corners.

## Linux kernel regression status

[\[next\]](#) [\[mainline\]](#) [\[stable/longterm\]](#) [\[dormant\]](#) [\[resolved\]](#) | [\[new\]](#) | [\[all\]](#)

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\* could talk about regressions and tracking them for hours

\* no time for it

[once again there is a document]

Linux kernel release 5.x  
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The kernel's command-line parameters

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Documentation for `/proc/sys`

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Hardware vulnerabilities

Reporting issues

## Reporting regressions

*"We don't cause regressions"* is the first rule of Linux kernel development; Linux founder and lead developer Linus Torvalds established it himself and ensures it's obeyed.

This document describes what the rule means for users and how the Linux kernel's development model ensures to address all reported regressions; aspects relevant for kernel developers are left to [Handling regressions](#).

### The important bits (aka "TL;DR")

1. It's a regression if something running fine with one Linux kernel works worse or not at all with a newer version.

Note: the newer kernel has to be compiled using a similar

<https://www.kernel.org/doc/html/latest/admin-guide/reporting-regressions.html>

\* new in 5.18

\* mentioning everything important  
[that among others includes]

kind of issue; mustfix; regressions;

---

make it obvious your report  
is about a regression

---



kind of issue; mustfix; regressions;

CC for forward the report to  
[regressions@lists.linux.dev](mailto:regressions@lists.linux.dev)

[note, there is some...]

kind of issue; mustfix; regressions;

fine print(1):

only userland interfaces matter

[it's thus not a regression if your  
out-of-tree kernel module breaks]

\* these modules use kernel-internal interfaces

kind of issue; mustfix; regressions;

fine print(2):

the build config of the newer  
kernel version must be  
similar to the older one

- \* otherwise optional new features might interfere
- \* say a new security technique blocking something a few very rare apps need
- \* the doc I mentioned explains you how to realize

kind of issue; mustfix; regressions;

fine print(3):

you often will be asked  
to find the culprit yourself

- \* many bug only happen in a certain environment
- \* that why the change that causes often needs to be found by the reporter
- \* the aforementioned doc explains you how to do that with a bisection using "git bisec"
- \* sounds hard, but might only take an hour or two
- \* initial report without this is okay, as problem might be known already

[and the good thing is]

kind of issue; mustfix; regressions;

if you find the culprit, a  
fix is pretty much guaranteed

- \* and the responsible volunteer and subsystem will be known
- \* might be possible to revert it
- \* tell me if that doesn't work out
- \* that's why you really want to do that in case you face a regression!

kind of issue; mustfix;

## the kind of issue at hand

issues someone is obliged to address

security vulnerabilities

devastating bugs

regressions

- \* enough about regressions and issues that have to be fixed
- \* just one more thing you might be wondering about
- \* who will take care of fixing such bugs
- \* for regressions it's the author of the culprit
- \* if MIA and for everything else it's the [maintainer]



[and sometimes this person]





kind of issue;

---

the kind of issue at hand

issues someone is obliged to address

issues most likely to be ignored

---

kind of issue; unlikely;

the kind of issue at hand

issues most likely to be ignored

known deficits

kind of issue; unlikely; deficits;

# Linux contains many incomplete drivers

\* a basic, incomplete driver is way better than none at all

[sometimes these drivers are never improved, if...]

kind of issue; unlikely; deficits;

might lack a volunteer  
with enough time and/or  
motivation to improve it

[second reason for known deficits]

kind of issue; unlikely; deficits;

or some real-world issue  
prevents improvements

- \* example: Nouveau
  - \* docs scarce
  - \* firmware prevents using the full capabilities of the hardware
- \* what do these known deficits mean for your report?  
[if it looks like a missing feature]

kind of issue; unlikely; deficits;

check internet and docs  
for known deficits

- \* prevents wasting your time on preparing a report
- \* if in a doubt, send a quick "is this known" before writing a proper and lengthy report

kind of issue; unlikely;

the kind of issue at hand

issues most likely to be ignored

known deficits

[another reason why some bugs are ignored]

kind of issue; unlikely;

the kind of issue at hand

issues most likely to be ignored

known deficits

code without an active maintainer

\* Linux contains quite a bit of such code  
[and it remains]



kind of issue; unlikely; w/o maintainer;

code often remains,  
as it useful for people

- \* removing it would cause a regression, too
- \* "no regression rule" should ensure it nothings break
- \* if people like you and me tests and reports problems

[two different kinds of unmaintained code]

## 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/`

<https://www.kernel.org/doc/html/latest/process/maintainers.html>

\* nearly orphaned, but not fully

kind of issue; unlikely; w/o maintainer;

sending at least a quick brief  
report definitely a good idea

\* the "odd fixer" or someone else might take care of it  
[there is also fully orphaned code]

## CAFE CMOS INTEGRATED CAMERA CONTROLLER DRIVER

**Mailing list:** [linux-media@vger.kernel.org](mailto:linux-media@vger.kernel.org)

**Status:** Orphan

**SCM:** git git://linuxtv.org/media\_tree.git

**Files:** Documentation/admin-guide/media/cape\_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/  
<https://www.kernel.org/doc/html/latest/process/maintainers.html>

kind of issue; unlikely; w/o maintainer;

sending at least a quick brief  
report likely worth it

\* maybe you find others affected and can team up  
with them

# the kind of issue at hand

issues someone is obliged to address

issues most likely to be ignored

\* this concludes this section

[leaves the big and wibbly-wobbly area in between those two extremes]

# the kind of issue at hand

issues someone is obliged to address

issues most likely to be ignored

all the other issues

[what matters here is quickly explained, as we  
discussed this in act 1 already]

kind of issue; unlikely; the rest;

the quality of your report!

[which brings us...]



[ grand finale ]

\* summary

---

take this with you

---

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<https://www.kernel.org/doc/html/latest/admin-guide/reporting-issues.html>

- \* looks a bit scary, but it is not
- \* tries to catch local problems early
- \* it's in your own interest to follow the steps

[to understand why things are as they are, always keep in mind]

takeaways;

---

almost all kernel  
developer are volunteers

---

takeaways;

---

they should act on  
every bug report, but can  
and will ignore bad reports

---

takeaways;

---

act accordingly and  
sent a decent report,  
then you'll be heard

---

[to do that, you]

takeaways;

---

(1) check what kind of issue  
you deal with, as it...

---

takeaways;

---

(a) might save you from  
wasting time on  
reporting known deficits

---



takeaways;

(b) tells you what to expect  
from developers

[in addition to that]

takeaways;

---

(2) do your homework

---

takeaways;

---

(a) test and report with a  
\*vanilla\* kernel

---

takeaways;

---

(b) test with a fresh  
mainline kernel

---

takeaways;

---

(c) rule out local interferences

---

takeaways;

---

(d) check MAINTAINERS  
to submit the report  
to the right place

---

takeaways;

---

(e) write a friendly and decent  
report easy to gasp for others

---

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\* reporting issues takes care of this



takeaways;

---

chances then are pretty good  
someone will help you

---

takeaways;

and nearly perfect, if you  
report a bisected regression

[and in the end that is]

takeaways;

that's how you make the  
Linux developers fix kernel  
bugs they are able to fix

[which is in everybody's interest and makes everyone  
happy]



---

questions?

---

Thorsten Leemhuis

---

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social media: @kernellogger, @knurd42,  
@knurd42rhfc, @thleemhuis and  
@thleemhuisfoss on #twitter & #friendica

#EOF

---