# Tails - Bug #17320

## Kernel Panic with some Macbook Pro

12/06/2019 06:38 PM - goupille

<table>
<thead>
<tr>
<th>Status:</th>
<th>Resolved</th>
<th>Start date:</th>
<th>Due date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority:</td>
<td>Elevated</td>
<td>% Done:</td>
<td>0%</td>
</tr>
<tr>
<td>Assignee:</td>
<td>CyrilBrulebois</td>
<td>Estimated time:</td>
<td>0.00 hour</td>
</tr>
<tr>
<td>Category:</td>
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<td>Spent time:</td>
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<tr>
<td>Target version:</td>
<td></td>
<td>Starter:</td>
<td></td>
</tr>
<tr>
<td>Feature Branch:</td>
<td></td>
<td>Affected tool:</td>
<td></td>
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<td>Blueprint:</td>
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**Description**

two different users with three different apple computers (one unidentified, on macbook pro 8,1, and one macbook pro 9,1) have reported this problem with Tails 4.1:

the boot process stops with the following kernel panic error message:

```
[    1.894460] Initramfs unpacking failed: invalid magic at start of compressed archive
[    1.991176] Kernel panic - not syncing: VFS: Unable to mount root fs on unknown-block(0,0)
[    1.991229] CPU: 1 PID: 1 Comm: swapper/0 Not tainted 5.3.0-2-amd64 #1 Debian 5.3.9-2
[    1.991270] Hardware name: Apple Inc. MacBookPro8,1/Mac-94245B3640C91C81, BIOS 87.0.0.0.0 06/13/2019
[    1.991319] Call Trace:
[    1.991342]     dump_stack+0x5c/0x80
[    1.991365]     panic+0x101/0x2d7
[    1.991388]     mount_block_root+0x2c4/0x2e8
[    1.991415]     prepare_namespace+0x136/0x16c
[    1.991441]     kernel_init_freeable+0x1ff/0x20a
[    1.991468]     ? rest_init+0xa/0xa
[    1.991491]     kernel_init+0xa/0x106
[    1.991512]     ret_from_fork+0x35/0x40
[    1.991569] Kernel Offset: 0x10400000 from 0xffffffff81000000
(relocation range: 0xffffffff80000000-0xffffffffbfffffff)
[    1.991633] ---[ end Kernel panic - not syncing: VFS: Unable to mount root fs on unknown-block(0,0) ]---
```

one of the pictures show this message instead of the initramfs one:

list of all partitions:
No filesystem could mount root, tried:

Bug report: 6c589ea7443b70b3592ec58f3f8137ca

**Related issues:**

- Related to Tails - Bug #17430: No network unless MAC spoofing is disabled with...  [Confirmed]
- Related to Tails - Bug #17388: RTL8101 ethernet chipset doesn't work anymore...  [Confirmed]
- Related to Tails - Bug #17418: MAC spoofing break RTL8192EE since tails 4.2  [Confirmed]
Duplicated by Tails - Feature #17349: Unable to start
Blocks Tails - Feature #16209: Core work: Foundations Team

Associated revisions

Revision 1c9e7a0a - 12/12/2019 02:32 PM - CyrilBrulebois
Drop net drivers from the initramfs to shrink initramfs size drastically.
Hitting the 32 MiB mark might be the reason why so many Mac machines can't boot 4.1 while they could boot 4.0 (refs: #17320).

Revision acadc5f2 - 12/12/2019 02:32 PM - CyrilBrulebois
Only allow up to (but excluding) 32 MiB for initramfs (refs: #17320).

History

#1 - 12/06/2019 06:46 PM - goupille
just resent the second report (the ticket number is in the subject line)

#2 - 12/06/2019 06:52 PM - goupille
I just resent you a third report (Apple Macbook air 4,1 mid 2011)

#3 - 12/06/2019 07:15 PM - goupille
more reports:
macbook pro 2012 -> forwarded
macbook air 2012 -> Bug report: e5e2e75f8dccb894ec897184ccc295b4 (this user says that a macbook air 2013 is not affected)
macbook pro mid 2012 -> forwarded
then I stopped forwarding the reports (I can do that if needed) but it seems that a lot of people are affected...

#4 - 12/07/2019 12:15 PM - goupille
- Priority changed from Normal to Elevated

I'm setting the priority on this ticket to Elevated, given the number of user reports

#5 - 12/07/2019 04:21 PM - goupille
- Assignee changed from intrigeri to CyrilBrulebois

#6 - 12/07/2019 11:25 PM - CyrilBrulebois
Haven't spotted anything obvious on the Linux kernel side at this point. And I couldn't reproduce the issue with some other hardware (tails-installer'd 4.0 image upgraded to 4.1 after enabling persistence, or tails-installer'd 4.1 image).
I'm currently wondering whether some microcode update might be responsible for this apparently rather hardware-specific (even if affecting a wide range of models) issue. I couldn't spot anything obvious in the Debian BTS though.
I think it might make sense to prepare unofficial images: one with the intel-microcode package downgraded to its earlier version (in Tails 4.0), and one with the linux-image-* package downgraded to its earlier version (in Tails 4.0). Possibly a third one with both packages downgraded, just in case.
Would submitters be happy to test such images? In which case, would they prefer ISO and/or IMG images?
I've pushed three branches to git:

1. hack/17320-revert-microcode
2. hack/17320-revert-linux
3. hack/17320-revert-both-linux-and-microcode

The relevant diffs of .packages files, compared to 4.1, are respectively:

1. with hack/17320-revert-microcode:

```
-intel-microcode 3.20191112.1~deb10u1
+intel-microcode 3.20190618.1
-libnss3:amd64 2:3.42.1-1+deb10u1
+libnss3:amd64 2:3.42.1-1+deb10u2
```

2. with hack/17320-revert-linux:

```
-libnss3:amd64 2:3.42.1-1+deb10u1
+libnss3:amd64 2:3.42.1-1+deb10u2
-linux-image-5.3.0-2-amd64 5.3.9-2
+linux-image-5.3.0-trunk-amd64 5.3.2-1~exp1
```

3. with hack/17320-revert-both-linux-and-microcode:

```
-intel-microcode 3.20191112.1~deb10u1
+intel-microcode 3.20190618.1
-libnss3:amd64 2:3.42.1-1+deb10u1
+libnss3:amd64 2:3.42.1-1+deb10u2
-linux-image-5.3.0-2-amd64 5.3.9-2
+linux-image-5.3.0-trunk-amd64 5.3.2-1~exp1
```

(I didn't try to get rid of the libnss3 difference.)

All resulting .img files were tested by dropping them on USB devices with gnome-disks, and can boot properly on a Thinkpad X230. I didn't try to run the test suite, and didn't test much more than booting to the desktop. But at least they aren't obviously broken, so I'd be happy to have test results from users affected by this MacBookPro booting issue.

I'm thinking about sharing the resulting files, signed with my ckb@riseup.net key, on my company's webserver and maybe via Torrent files if people are more comfortable with this way of grabbing files. Of course, the latter would likely result in fewer peers than is usual for official releases.
#8 - 12/08/2019 04:42 PM - pushbox
I can test the images on macbook pro.
Using balenaEtcher, so both formats should work.
I'm okay with downloading them from web or torrent.

#9 - 12/08/2019 06:36 PM - CyrilBrulebois
Here we go: https://tails.debamar.com/ has ISO+IMG images for all 3 proposed branches, with detached signatures from my personal Tails key.
If users would have enough time/bandwidth/patience, I'd be happy to have results of Tails 4.1 image deployed “from scratch” (to rule out possible troubles due to upgrading from 4.0), and with the 3 images available on my company's webserver. I have no guarantee the issue is caused by the microcode update and/or the linux update, but those are my best guess at the moment...
Also please mention which MacBookPro you're testing with (e.g. 4,1 or 8,1, etc.).

Thanks already!

#10 - 12/08/2019 09:45 PM - pushbox
MacBookPro10,1
All 3 of the branches booting up without any problem.
ISO and IMG format.
The official 4.1 build is not booting, I had to recheck it after the 6 successes.

#11 - 12/10/2019 06:54 AM - Jambalaya
I just registered after finding this thread and it being my savior for Tails 4.1 release. I do not have a MacBook Pro, I have an iMac (iMac11,3) that could no longer boot Tails with 4.1, no other changes. Got kernel panic screen and saw a lot of people on Reddit had the same issue. I found my way back here and this thread, tried the above and can report - after having nothing to lose - that the “Revert both Linux and microcode” img fixed my issue. The “Revert Linux” img produced the same kernel panic. Thanks for your test builds and hope this data helps.

#12 - 12/10/2019 03:43 PM - goupille
@CyrilBrulebois, given the reports we're receiving, it looks like the problem is fixed with hack/17320-revert-microcode and hack/17320-revert-both-linux-and-microcode. However hack/17320-revert-linux doesn't fixe the issue. I'm forwarding you the reports

#13 - 12/11/2019 12:23 PM - geb
Hi,
Just tested on a MacBook Pro (13 pouces, mi-2009) (as presented on https://checkcoverage.apple.com/) / Macbook pro 5.5 (as show in mac os / linux kernel panic trace).
- 4.1 generated the same kernel panic message other reported (have pictures if needed).
- tails-amd64-hack_17320-revert-both-linux-and-microcode-4.1.1-20191208T1518Z-84f1e5957a.img works
- tails-amd64-hack_17320-revert-linux-4.1.1-20191208T1328Z-1af7c412ed.img do not work
- tails-amd64-hack_17320-revert-microcode-4.1.1-20191208T1411Z-927a0f8b85.img works
If needed I could ask the owner of the computer to do more tests later.
Thanks everyone who's been helping debug this problem!

FWIW here's a semi-random hunch (disclaimer: I have some fever).

The Initramfs unpacking failed: invalid magic at start of compressed archive message, combined with the fact only Apple hardware seems to be affected (as opposed to specific CPU models that may be installed on MacBooks and on PCs) makes me wonder if the microcode update is directly the culprit, or if it broke stuff indirectly.

For example, in 4.0, initrd.img is 33367476 bytes large, which is less than 32 MiB; while in 4.1, it is 33817076 bytes large, which is greater than 32 MiB. I find this suspicious and I would not be surprised if Apple's EFI firmware behaved in a different way than others.

I can't easily build/download @CyrilBrulebois's test images today but I would be very curious to know if the test images that fix the problem bring back the initramfs size under 32 MiB :) If they do, it would be interesting to test images that have the updated microcodes but an initramfs smaller than 32 MiB.

Also, it would be nice if affected users could try adding the dis_ucodeldr boot option, which disables the microcode loader.

---

Applied in changeset tails|1c9e7a0a601b28c304d848dfa0b33b9191f4f15e.

Looking back at the size of our initramfs in test images:

```
-r--r--r-- 1 root root 33353972 Dec  8 15:09 tails-amd64-hack_17320-revert-both-linux-and-microcode-4.1.1-20191208T1518Z-84f1e5957a.iso.loop/live/initrd.img
-r--r--r-- 1 root root 33362904 Dec  8 15:09 tails-amd64-hack_17320-revert-microcode-4.1.1-20191208T1411Z-927a0f6f85.iso.loop/live/initrd.img
-r--r--r-- 1 root root 33797596 Dec  8 14:26 tails-amd64-hack_17320-revert-linux-4.1.1-20191208T1328Z-1af7ed.iso.loop/live/initrd.img
```

With 32 MiB = 33554432 meaning both images with a microcode revert are below this limit, and the one with just the linux revert is above the limit. This seems to neatly match most of our findings, except for the very first report by @pushbox who mentioned the third image booted fine as well. I'm going to concentrate on the other reports for the time being.

While wondering what we could strip from the 4.1 image, without touching anything else, we figured removing all network drivers from the initramfs would make a huge difference, possibly without having high impacts on general use cases.

I've therefore pushed a new branch called hack/17320-remove-net-drivers which implements that by removing them from the generated initramfs, also lowering the maximal allowed size from 35 MiB to 32 MiB (this check was initially intended to make sure compression happens), with a final
commit adding the +x bit on the initramfs hook after I verified failing to do so triggers a build failure because the check is triggered. The resulting initramfs is way smaller than 32 MiB:

```
```

and I'd be happy to have confirmations from everyone able to test that this image (containing the same versions of intel-microcode and linux as 4.1) boots fine, which would likely confirm the size of the initramfs is the matter, rather than the actual versions/contents of those packages.

Direct links (add .sig for the detached signature):


#18 - 12/12/2019 04:18 PM - intrigeri

Yeah! :)))

Direct links (add .sig for the detached signature):


Dear testers, please use the .img, not the .iso. Thanks!

(Rationale: the ISO image is known to not boot on MacBooks, for mostly unrelated reasons, and when it fails the error message is very similar to the one we're seeing here, so testing reports about the ISO won't provide useful info but can instead muddy the water.)

#19 - 12/12/2019 04:23 PM - CyrilBrulebois

Thanks for mentioning that. I wasn't sure at first whether the ISO→IMG process might have anything to do with the issue, and some users mentioned tails-installer, that's why I published ISO+IMG for all test images, so that everyone could pick their favorite process.
Thanks for mentioning that. I wasn't sure at first whether the ISO→IMG process might have anything to do with the issue, and some users mentioned tails-installer, that's why I published ISO+IMG for all test images, so that everyone could pick their favorite process.

Indeed, you're right, ISO + Tails Installer should work. But ISO installed "ala dd/cat" (e.g. with GNOME Disks) will not.

I've got an offline report that iMac12,2 boots successfully with my latest image (shrinking initramfs without downgrading components), hardware that was not booting with Tails 4.1.

I tried using the .IMG with balenaEtcher and the 17320-remove-net-drivers-4.1.1 .IMG and it booted without the previous kernel panic that I was suffering. It's a MacBookPro8_1 per everymac.com.

Gracias!

- Target version set to Tails_4.2

- Target version deleted (Tails_4.2)

Thanks, @goupille, that's very encouraging.

I'm contemplating shipping a variant of this bugfix as 4.1.1, seeing if removing drivers we blacklist anyway would be sufficient. Otherwise, double-checking we don't regress with my latest published image, on various non-Mac laptops would be great. I'll be trying to report back on this front during the week-end.

The remove-net-drivers version boots fine on MacBookPro8,1 and MacBookPro9,1
(Assuming the previous removal of Target version was a mistake caused by Redmine's buggy client-side caching of metadata.)

Awesome news! 'o/

- Related to Bug #17257: Mac Mini 2018 kernel panic added
- Related to deleted (Bug #17257: Mac Mini 2018 kernel panic)
- Duplicated by Feature #17349: Unable to start added

CyrilBrulebois wrote:

Thanks, @goupille, that's very encouraging.

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I think that would be great

CyrilBrulebois wrote:

Thanks, @goupille, that's very encouraging.

I'm contemplating shipping a variant of this bugfix as 4.1.1

+1 on this (especially considering that it may prevent people who did not already upgrade to need to manually upgrade). Happy to perform tests (or more precisely ask somebody to do, who would only be available this week) if that helps.
Target version changed from Tails_4.2 to Tails_4.1.1

Fixed in c89d3549fa6b8bd4e149155dc55440ba66098bc3

Status changed from In Progress to Resolved

Target version deleted (Tails_4.1.1)

Thanks to everyone who helped test images!

For the avoidance of doubt/surprise if users were to stumble upon this bug report in the future: I've removed the test images to the staging area hosted by my company (https://tails.debamax.com), following the 4.1.1 release; I've also mentioned this in its new README.txt (as I might re-use this space for other Tails purposes later on).

Related to Bug #17430: No network unless MAC spoofing is disabled with Intel I210 Gigabit added

Related to Bug #17388: RTL8101 ethernet chipset doesn't work anymore since Tails 4.1.1 added

Related to Bug #17418: MAC spoofing break RTL8192EE since tails 4.2 added