RHEL/CentOS 7 and NVidia Drivers

发布日期: 2014 年 8 月 8 日

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Check out my RHEL/CentOS 7 and NVidia Drviers: Now with Secure Boot Code Signing! article for information about installing NVidia Drivers in EFI Secure Boot environments such as 7.4 and up.

Check out my RHEL/CentOS 7 and NVidia Drviers (Updated) article for information about installing NVidia Drivers on 7.1 and installing on an NVidia 800 or 900 series chipset.

Red Hat Enterprise Linux (RHEL) and the Community Enterprise Operating System (CentOS), the free alternative to RHEL most faithful to it, have been around for quite some time. And don't forget Scientific Linux! They have increased in popularity over the last decade, both for Red Hat's stellar technical support and for it's open source nature which allows end user modification at all levels of the OS.

The most recent release, version 7, has a large number of the latest updates across the entire Linux community. This has both huge benefits and huge drawbacks. One simultaneous benefit/drawback is that 7 supports the open source NVidia driver, Nouveau, by default. For someone who just wants a 3D accelerated desktop experience this is wonderful news. For someone who needs to run applications that severely tax the video card, this is another obstacle to avoid before getting to work. Unfortunately, while the Nouveau driver provides acceptable performance, it does not use the full capabilities of the video card because, as of the writing of this article, the Nouveau

typically boot at their most power saving mode, this does not bode well for Linux power users.

All that to say that the Nouveau drivers need to be disabled prior to installing the NVidia drivers, which is a difficult task this time around. I just spent the worst 6 hours of my professional life trying to figure this one out, so let me save you the grief.

This process is made more difficult than previous RHEL versions because there have been a number of improvements this time around. Initialization and system management is performed by systemd instead of the old init system, so commands for reducing the system state have changed. Grub2 is used for the boot loader, which requires more steps when blacklisting the Nouveau drivers. Version 7 supports EFI booting, so if that method is selected, Grub2 will load differently. And lastly a "new" interactive bootsplash, called Plymouth, is used to save the user the confusion of mentally processing the boot messages when performing interactive tasks such as entering an encryption key passphrase. This guide will probably work fine on most other RHEL alternatives, but make sure you backup everything as you go, just in case.

If you'd like to have the install process automatically rebuild the drivers when a new kernel update is installed, be sure to install dkms (sudo yum install dkms) before going through this process. Support for dkms has been included in the NVidia installer since version 304. Simply choose to enable it when the option is presented during the install. Note: As of 390.25, the installer does not support automated rebuild of signed kernel modules.

And without further ado:

Prerequisite: Make sure you have gcc, kernel-headers, kernel-devel, glibc-devel, and all their dependencies installed before you start this process. Optionally, dkms.

1. Disable X Windows
2. a) open a terminal and *"su"* or *"sudo -i"*
3. b) *ln -fs /lib/systemd/system/multi-user.target /etc/systemd/system/default.target*
4. c) *reboot*
5. d) Press Alt+F2 to get to a terminal prompt (See ***RHEL/CentOS 7 and NVidia Drviers (Updated)*** for an explanation for why this

6. Remove Nouveau
7. a) *rpm -e xorg-x11-drivers xorg-x11-drv-nouveau*
8. Blacklist Nouveau
9. a) edit /etc/modprobe.d/blacklist.conf and add line:
10. *blacklist nouveau*
11. b) edit /etc/default/grub and append to GRUB_CMDLINE_LINUX:
12. *rd.driver.blacklist=nouveau*
13. (After step 5, if the nouveau driver is still running, try *rdblacklist=nouveau* here instead. Sometimes *rd.driver.blacklist=nouveau* fails.)
14. -If you have an encrypted root drive, remove *"rhgb"* from GRUB_CMDLINE_LINUX. This will allow you to interact with the encryption passphrase prompt, since Plymouth doesn't seem to run without a framebuffer friendly video driver loaded. (This appears to be unnecessary for 7.4 and later.)
15. c) Two options for booting now days are BIOS and EFI
16. -If you chose BIOS boot run this command:
17. *grub2-mkconfig -o /boot/grub2/grub.cfg*
18. -If EFI boot on CentOS:
19. *grub2-mkconfig -o /boot/efi/EFI/centos/grub.cfg*
20. -If EFI boot on RHEL:
21. *grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg*
22. Reboot and Install NVidia Driver
23. -This process has not changed from previous versions. Just execute the binary installer you downloaded and follow the prompts (usually just hitting enter).
24. Enable X Windows (If Desired)
25. -Some like to execute startx after logging in at the terminal prompt... I don't

/etc/systemd/system/default.target

27. b) *reboot*

Something else that hasn't changed from previous versions of RHEL is that, if you haven't installed dkms before running the nvidia installer, you will need to rerun the NVidia Drivers Installer every time you update your kernel. But don't worry! I'm sure Nouveau will get that clock speed modifier working by version 7.1 of Red Hat Enterprise Linux. My fingers are certainly crossed in anticipation!

Edit (2014-NOV-25): Added compiler dependencies prerequisite, courtesy of KaJun Cheng (in the comments below).

Edit (2015-MAR-13): Replaced "rdblacklist" with "rd.driver.blacklist" and removed references to "nouveau.modeset=0", courtesy of Aaron Sierra (in the comments below).

Edit (2015-MAY-19): Given Anders Eklund's comment below, I've searched around and apparently there are a few occasions where the system fails to honor rd.driver.blacklist. I imagine "rdblacklist" will be deprecated in RHEL 8, but for now, it has never given me any problems. I've changed the directions to reflect that.

Edit (2015-JUN-27): Added Step 1d for Linux terminal novices.

Edit (2017-DEC-01) Added "(This appears to be unnecessary for 7.4 and later.)" regarding removal of rhgb for encrypted drives.

Edit (2018-MAR-03) Added dkms information.

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José Mario Torres Servin ··· 6 个月
Ingeniero de soporte de tecnologías de la información

follow all steps in this post, but when I run startx command my workstation gets lock and I can't do anything. Then, I connect via SSH and the dmesg shows nvidia-modeset: WARNING: GPU:0: Lost display notification (0:0x00000000); continuing and the Xorg.log shows the nvidia card o

… **展开**

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Christopher Meacham 6 个月

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Try rd.driver.blacklist=nouveau or rdblacklist=nouveau in the Linux kernel command line and make sure you are spelling nouveau correctly. Let me know if that doesn't help.

赞 回复

José Mario Torres Servin 6 个月

Ingeniero de soporte de tecnologías de la información

Thanks for you reply but that does not help. The driver nouveau is in black list and the kernel does not load it, I verified with lsmod | grep nouveau. Now I see that Warning message change to error:

nvidia-modeset: ERROR: GPU:0: Idling display engine timed out: 0x0000987d:0:0

赞 回复

Namrata Jagad ··· 1 年

Engineer at Honeywell Technology Solutions Pvt. Ltd Lab

Thanks....This is really a saviour for me..!!

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其他 16 条评论。 展开。

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