Ubuntu Linux Setup Guide

For Lenovo ThinkPad P15 and P17

****Official support of Debian 10.7 and later.*

Section 1 – BIOS Setup and Pre-Installation Steps

The first step before installing Linux is to make sure the system BIOS is setup correctly.

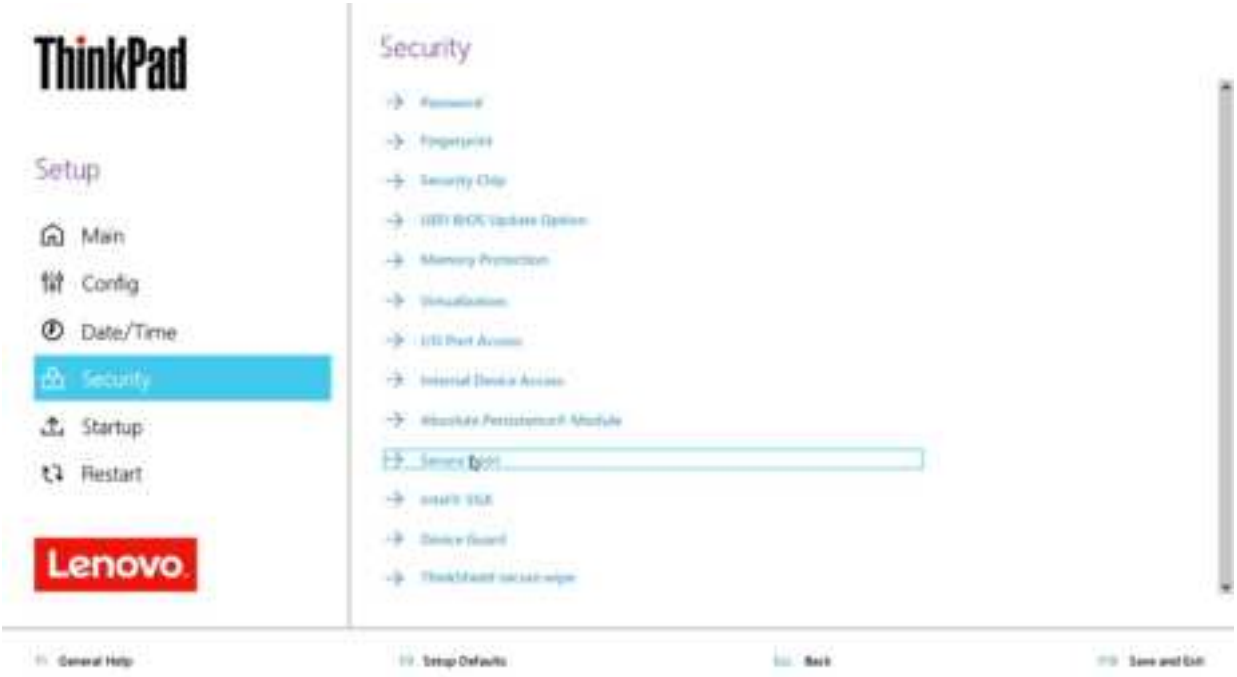
- Boot into BIOS by pressing the function F1 key at the “Lenovo” splash screen.

- Tab over to the “Config” menu tab

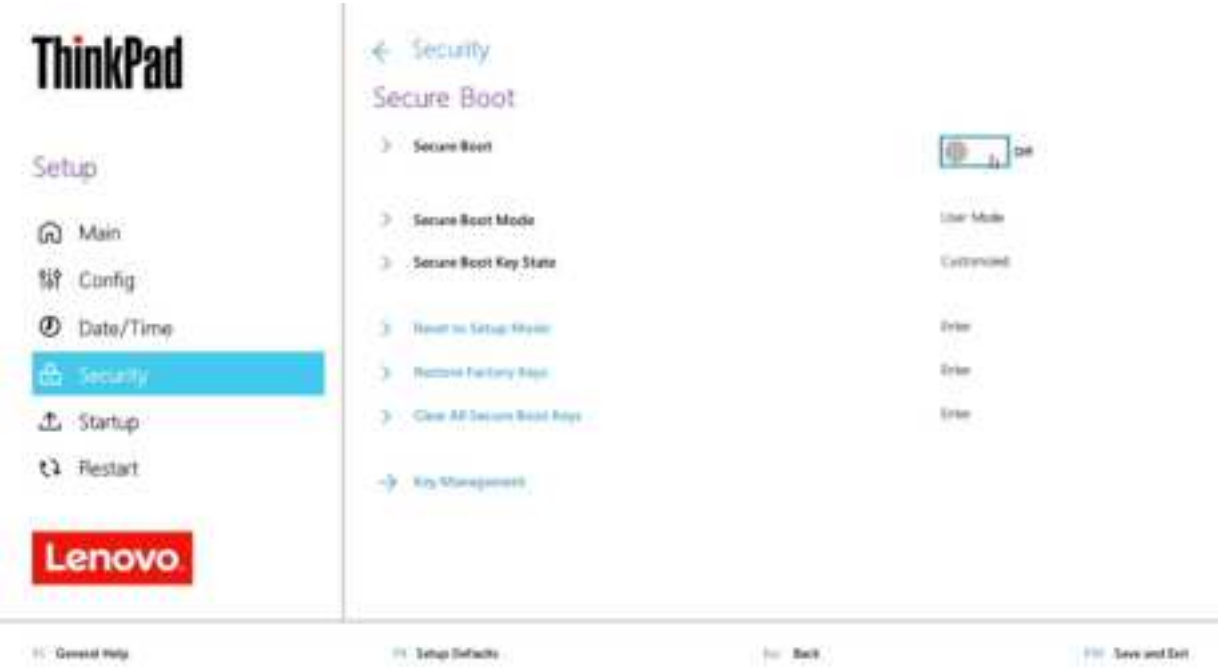
- Enter the “Storage” category and change the “Controller Mode” to “AHCI mode”

- Select “Yes” to proceed with changing the Controller Mode

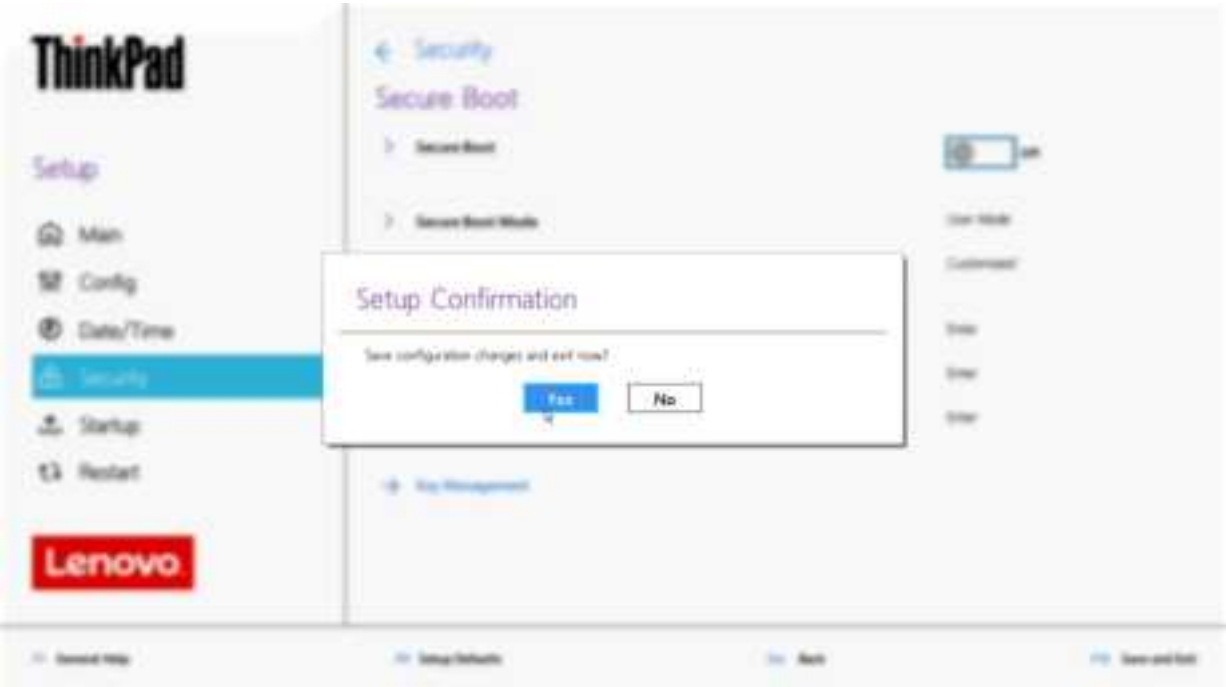
- Tab over to the “Security” menu tab and enter the “Secure Boot” category



- Set “Secure Boot” to “Off”



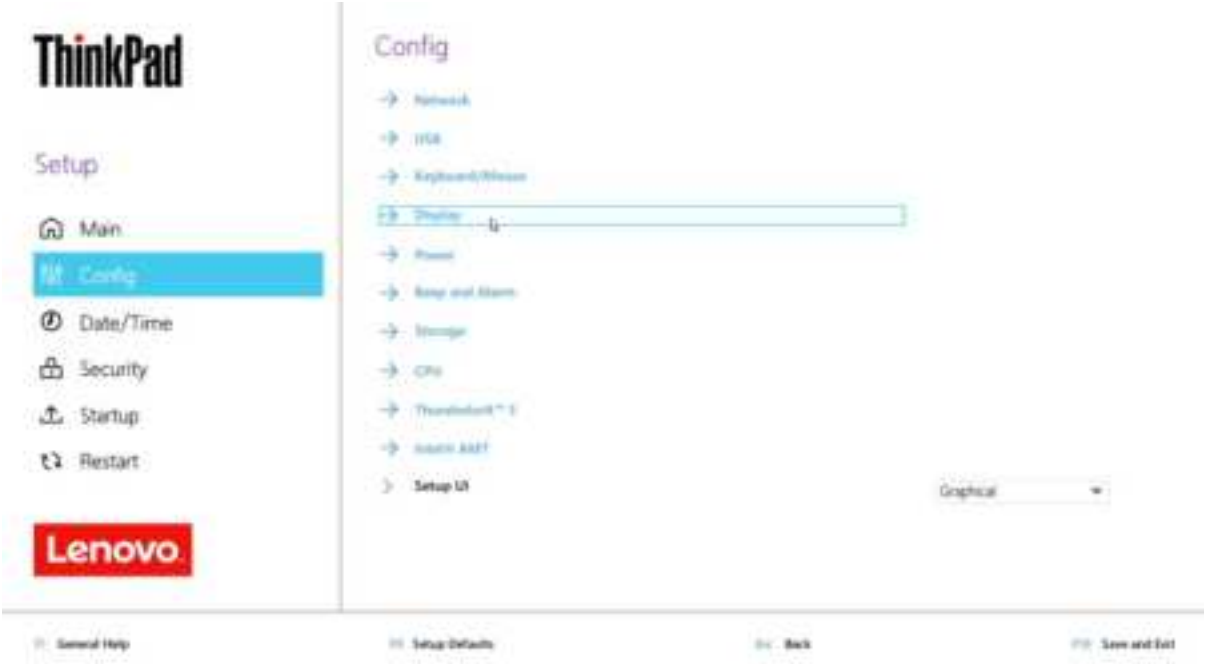
- Press function F10 key to save and exit BIOS setup.



Section 2 – Discrete vs Hybrid Graphics

The Lenovo ThinkPad P15, P17, and P1 Gen 3 systems offer both Nvidia and Intel graphics. “Discrete Graphics” must be used until the Nvidia graphics driver is updated in Section 5.

- Boot into BIOS and tab over to the “Config” menu option, then select the “Display” option.



- Ensure that the “Graphics Device” is set to “Discrete Graphics”.

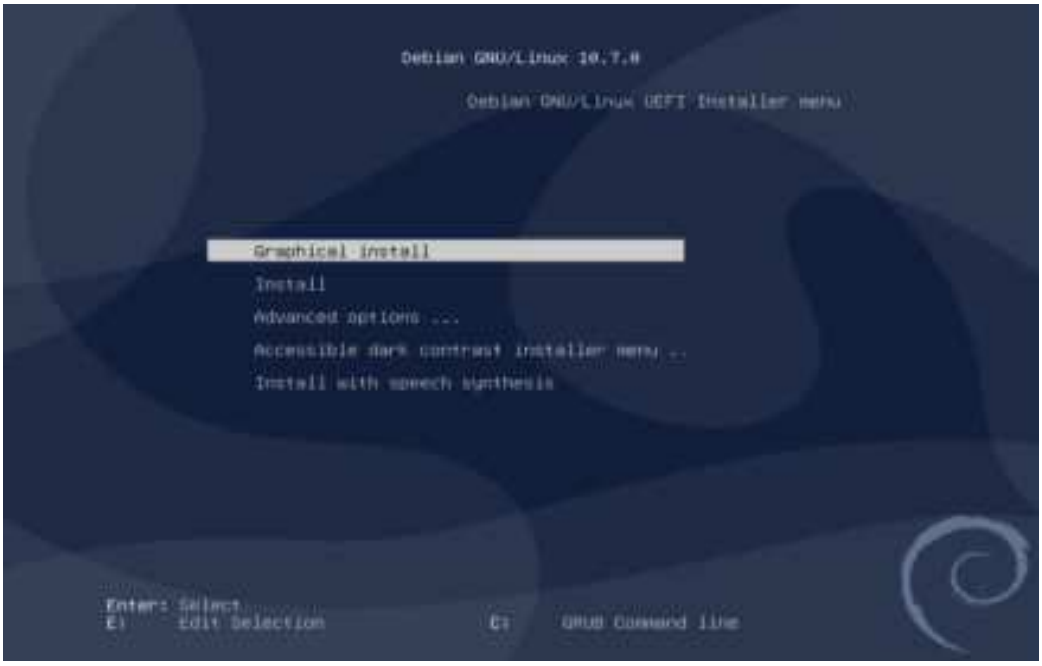
Section 3 – Installing Debian 10.7

Please refer to the following instructions and screenshots on how to install Debian 10.7 on the Lenovo ThinkPad P15 and P17

- Insert the Ubuntu 10.7 installation media.
- Power on the system and press the F12 function key whenever the following Lenovo splash screen appears.

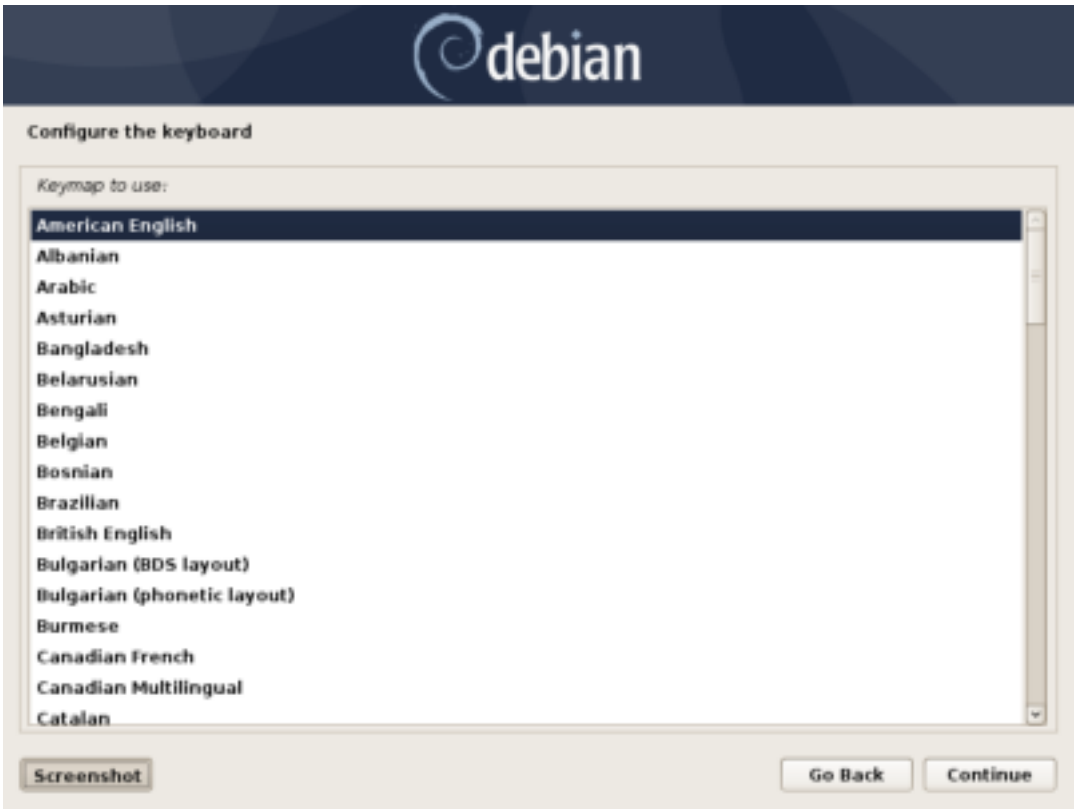
- Select the Linux bootable installation media from the F12 boot menu list.

- Highlight “Graphical install” from the Debian boot menu and press ‘E’ to edit.



- Select the appropriate language and “Continue”.

- Continue to personalize options.



- Set the desired root password

- Set the desired user name.

- Set the password for the user.

- Choose “Guided – use entire disk” partitioning method.

- Select the storage device on which to install the operating system.

- Chose “All files in one partition…” as the partitioning scheme.

- Choose to “Finish partitioning and write changes to disk”

- Next select “Yes” to write the changes to the disk.

- Choose “No” when asked to use a network mirror.

- Choose desired software to install.

- Choose the desired default display manager.

- Select “Yes” to install the GRUB boot loader to the master boot record.

- Select the boot disk for boot loader installation.

Section 4 – Update Debian and Prepare Environment

To access a Graphical User Interface, you will need to update your Debian kernel to the latest version and install essential packages.

- Note that a wired network connection is required until the wireless network driver can be installed during Step 6.

- After starting up the system, you should see a flashing cursor on the top left of the screen. Press “ALT + F2” keys to log in.

- Edit the sources list to include necessary sources

su

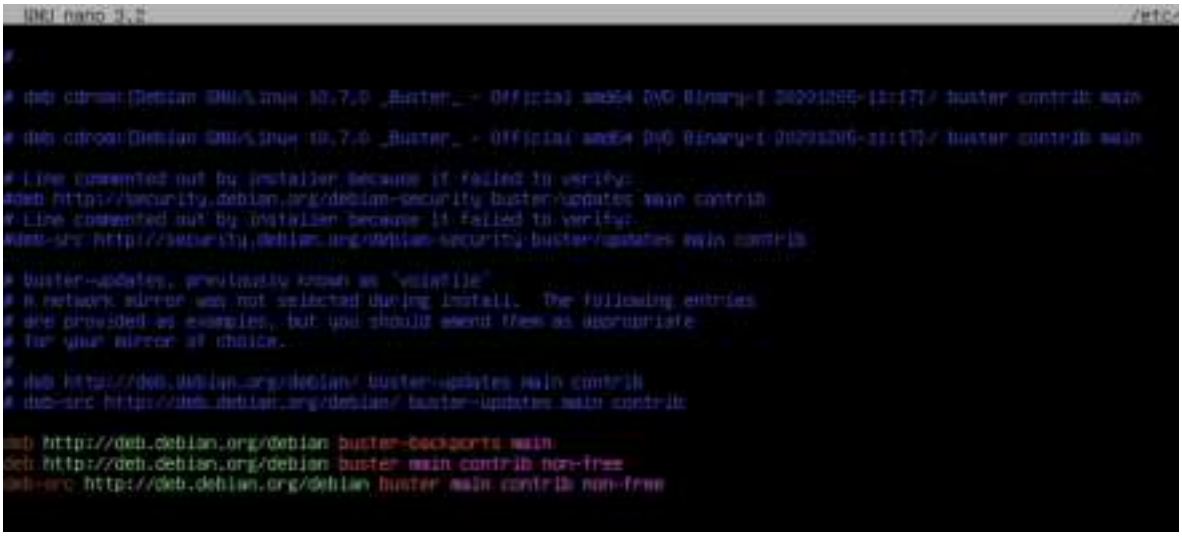
sudo nano /etc/apt/sources.list

- Comment out the “deb cdrom…: source

deb http://deb.debian.org/debian buster-backports main

deb http://deb.debian.org/debian buster main contrib non-free

deb-src http://deb.debian.org/debian buster main contrib non-free



- Update sources

apt-get update

```
root@debian:/home/lenovo# apt-get update
Get:1 http://deb.debian.org/debian buster-backports InRelease [46.7 kB]
Get:2 http://deb.debian.org/debian buster InRelease [121 kB]
Get:3 http://deb.debian.org/debian buster-backports/main amd64 Packages [423 kB]
Get:4 http://deb.debian.org/debian buster-backports/main Translation-en [361 kB]
Get:5 http://deb.debian.org/debian buster/contrib Sources [42.5 kB]
Get:6 http://deb.debian.org/debian buster/non-free Sources [85.6 kB]
Get:7 http://deb.debian.org/debian buster/main Sources [7,842 kB]
Get:8 http://deb.debian.org/debian buster/main amd64 Packages [7,907 kB]
Get:9 http://deb.debian.org/debian buster/main Translation-en [5,971 kB]
Get:10 http://deb.debian.org/debian buster/main amd64 DEP-11 Metadata [3,807 kB]
Get:11 http://deb.debian.org/debian buster/main DEP-11 48x48 Icons [3,770 kB]
Get:12 http://deb.debian.org/debian buster/main DEP-11 64x64 Icons [7,596 kB]
Get:13 http://deb.debian.org/debian buster/contrib amd64 Packages [50.2 kB]
Get:14 http://deb.debian.org/debian buster/contrib Translation-en [44.2 kB]
Get:15 http://deb.debian.org/debian buster/contrib amd64 DEP-11 Metadata [11.5 kB]
Get:16 http://deb.debian.org/debian buster/contrib DEP-11 48x48 Icons [56.4 kB]
Get:17 http://deb.debian.org/debian buster/contrib DEP-11 64x64 Icons [110 kB]
Get:18 http://deb.debian.org/debian buster/non-free amd64 Packages [87.7 kB]
Get:19 http://deb.debian.org/debian buster/non-free Translation-en [88.8 kB]
Get:20 http://deb.debian.org/debian buster/non-free amd64 DEP-11 Metadata [9,096 B]
Get:21 http://deb.debian.org/debian buster/non-free DEP-11 48x48 Icons [3,491 B]
Get:22 http://deb.debian.org/debian buster/non-free DEP-11 64x64 Icons [38.3 kB]
Fetched 38.5 MB in 5s (7,537 kB/s)
Reading package lists... Done
root@debian:/home/lenovo# _
```

- Install the following packages

apt-get install ‘build essential’

apt-get install linux-headers*

apt -t buster-backports install linux-image-amd64

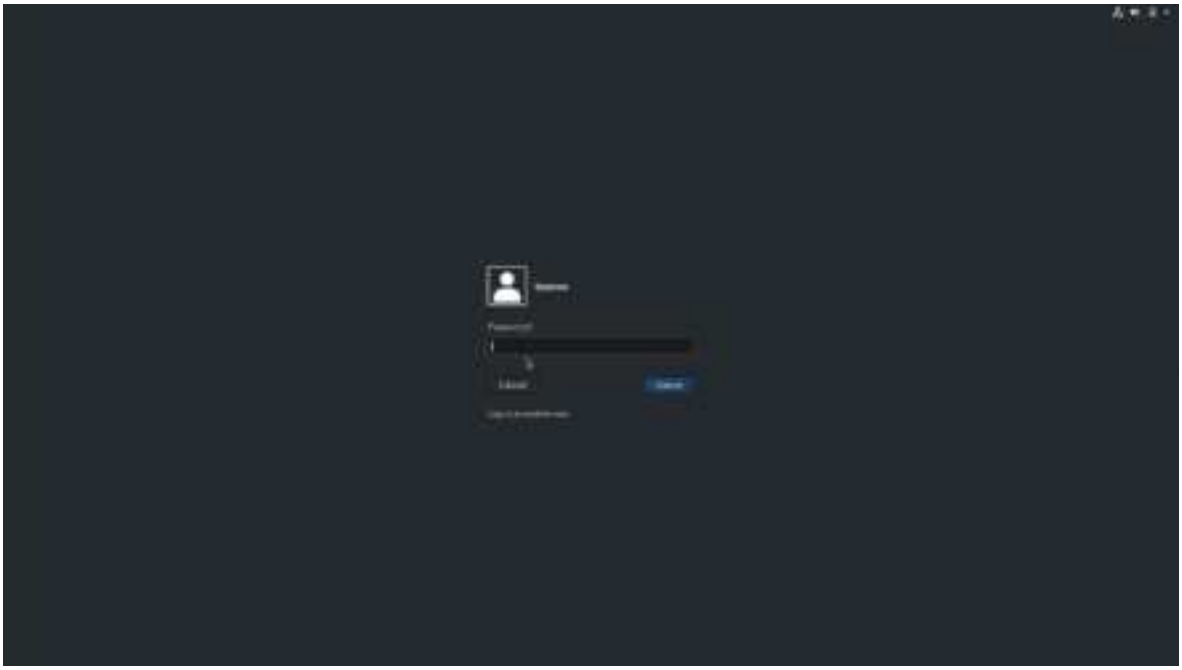
  - This will install kernel 5.9

- Update the initramfs image then reboot the system

sudo update-initramfs -u

sudo reboot

- After rebooting, the graphical login screen should be visible

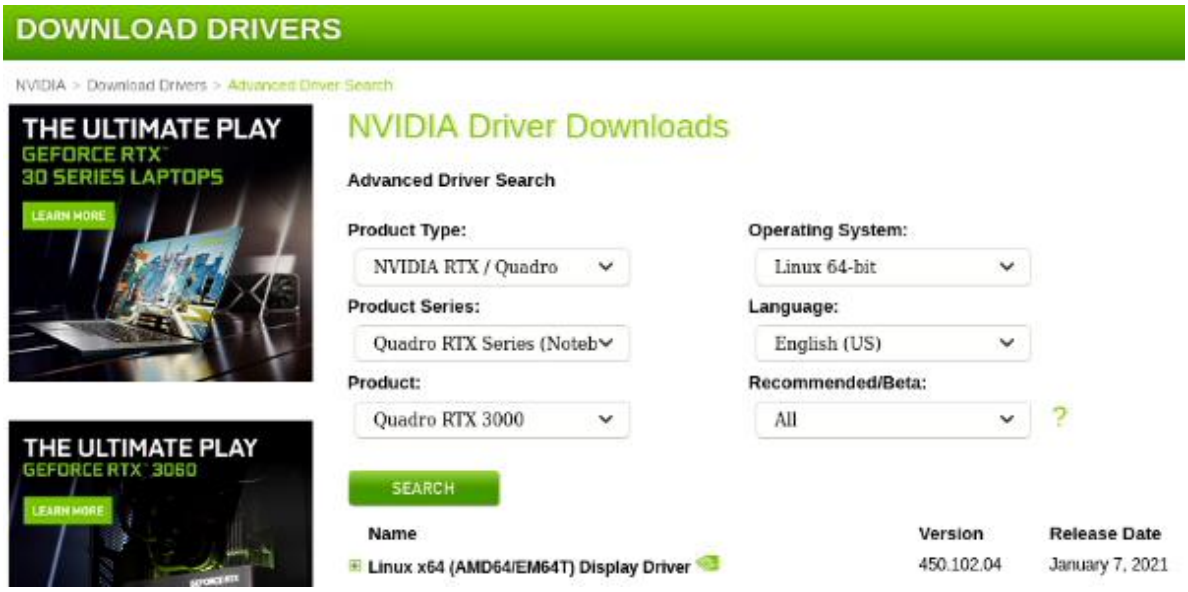


Section 5 – Installing the Nvidia Graphics Driver

In order to get optimal performance out of the Nvidia GPU, it's a good idea to install the Nvidia graphics driver by following the steps below:

- Download the latest Nvidia graphics driver for your system's appropriate Nvidia GPU.

https://www.nvidia.com/Download/Find.aspx?lang=en-us



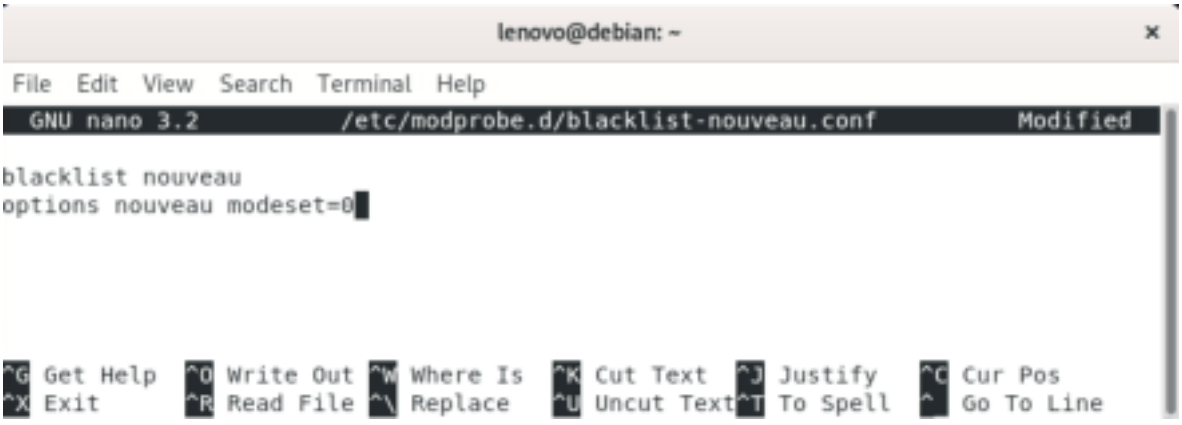
- Use the terminal to blacklist the nouveau graphics driver

su

nano /etc/modprobe.d/blacklist-nouveau.conf

blacklist nouveau

options nouveau modeset=0

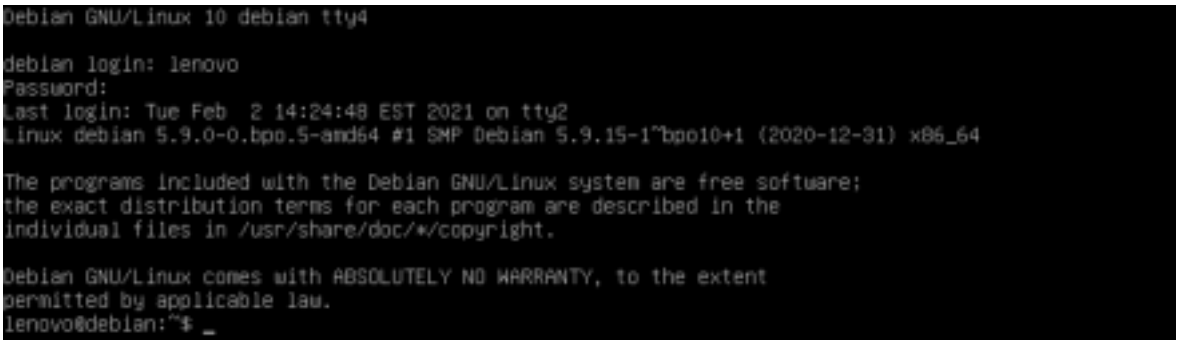


- Update the initramfs image then reboot the system

sudo update-initramfs -u

sudo reboot

- On startup, only a flashing cursor in the top left of the screen should be visible. Access the text login by pressing “CTRL + ALT + F4”



- Use the Telinit command to stop all x processes

su

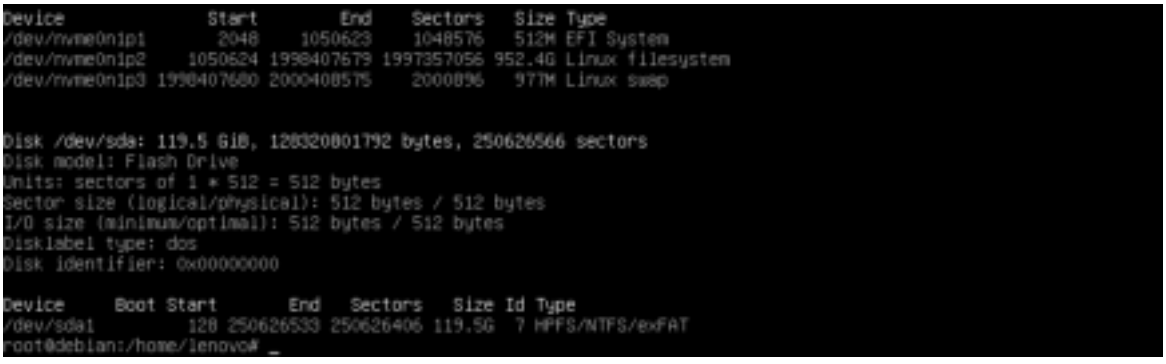
sudo telinit 3

- Navigate to the file location of the Nvidia driver. If located on a USB driver, follow these steps to access the drive:

mkdir /media/usb

sudo fdisk -l

  - This will list connected storage devices



mount /dev/sda1 /media/usb

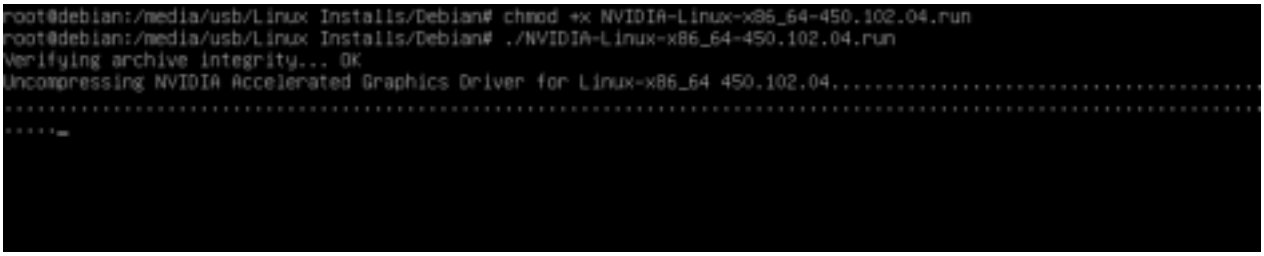
- Continue to change directory to the driver file location

cd /media/usb

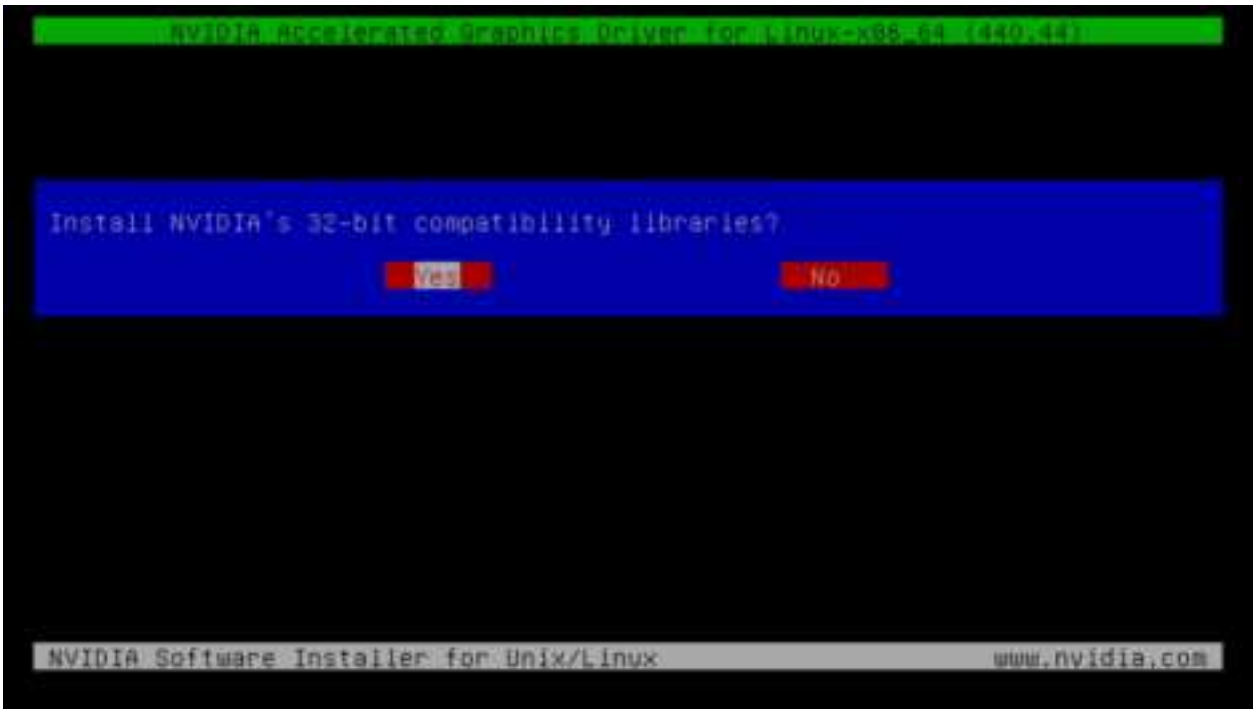
- Make the Nvidia installer an executable then run the executable

chmod +x NVIDIA-Linux-x86-64-*

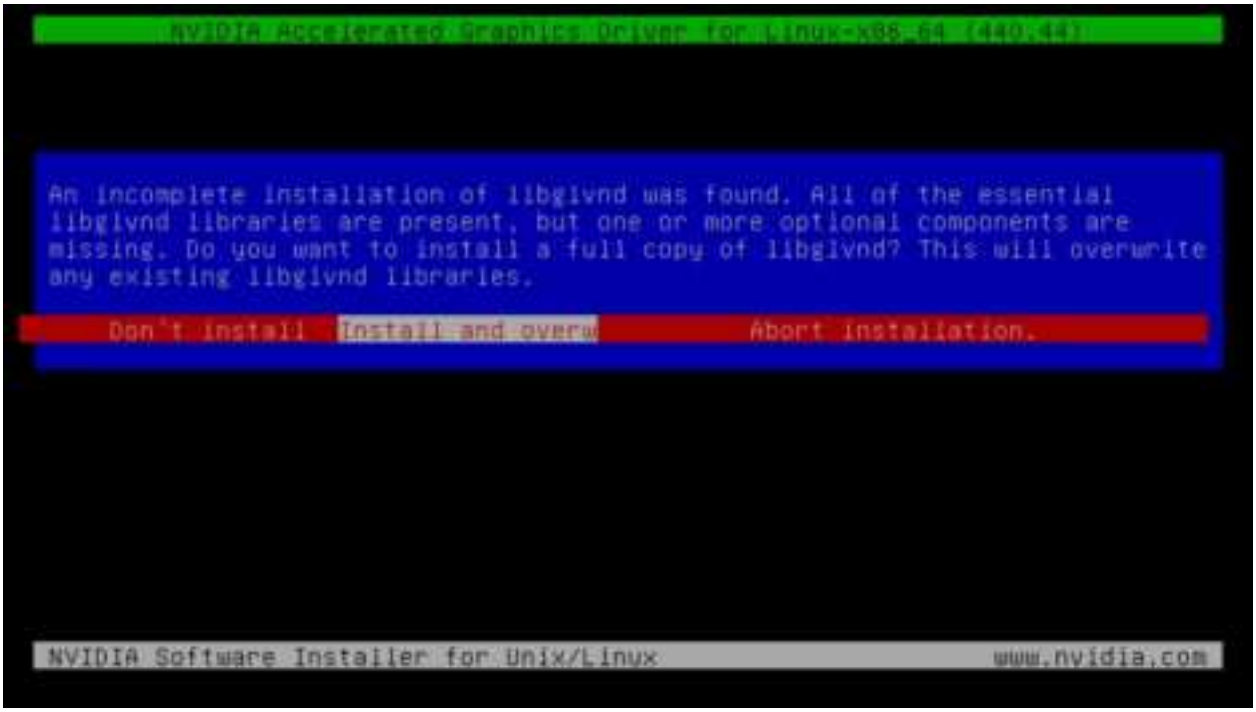
./NVIDIA-Linux-x86_64*



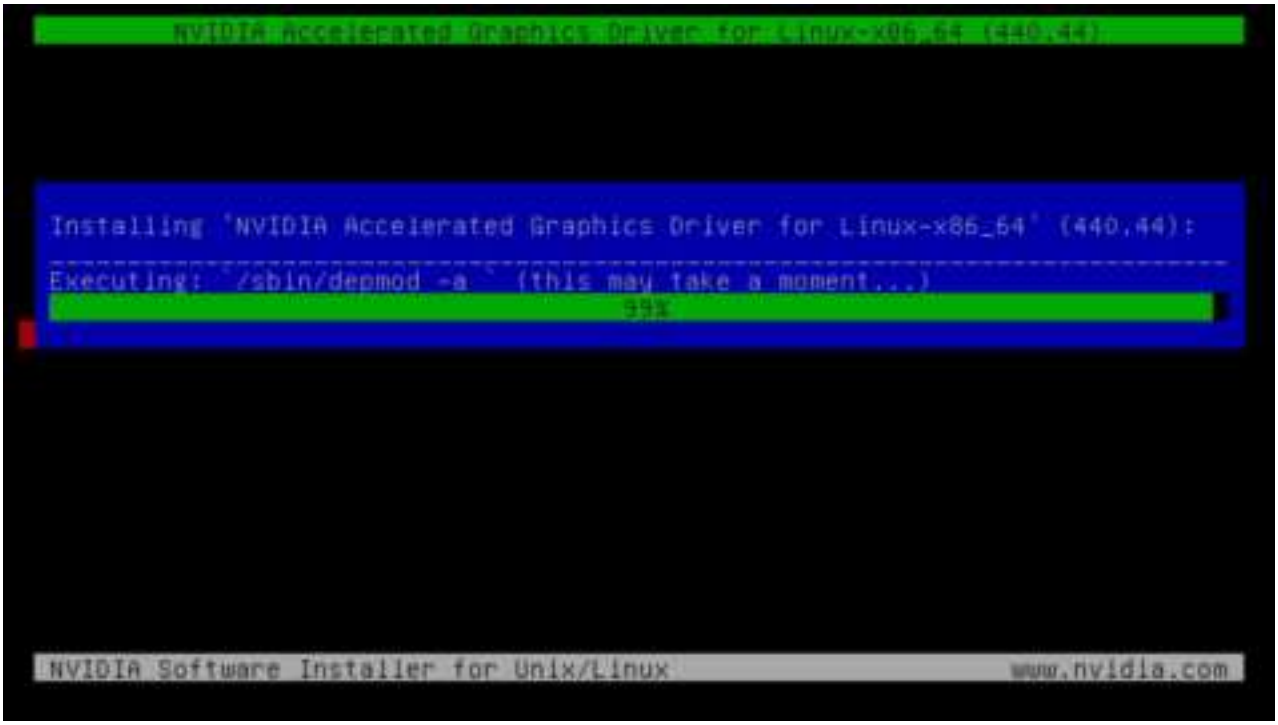
- Optional: Choose whether to install the 32-bit compatibility libraries.



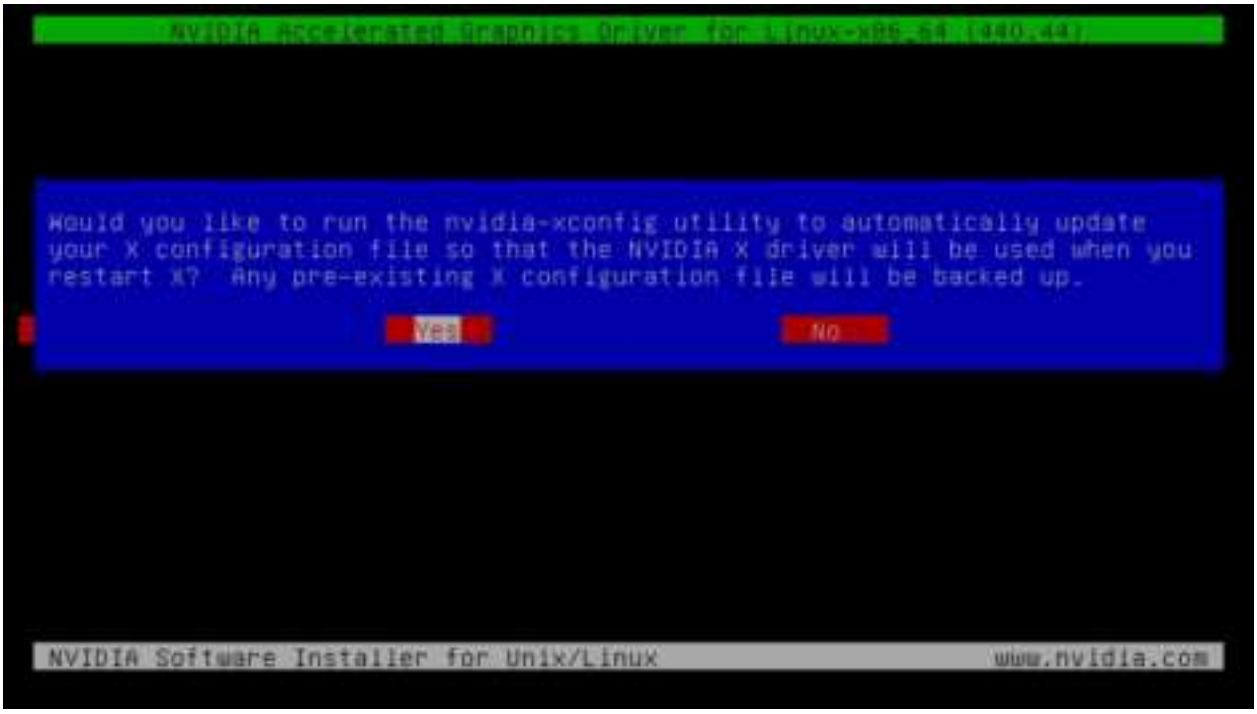
- Select to “Install and overwrite” libglvnd libraries.



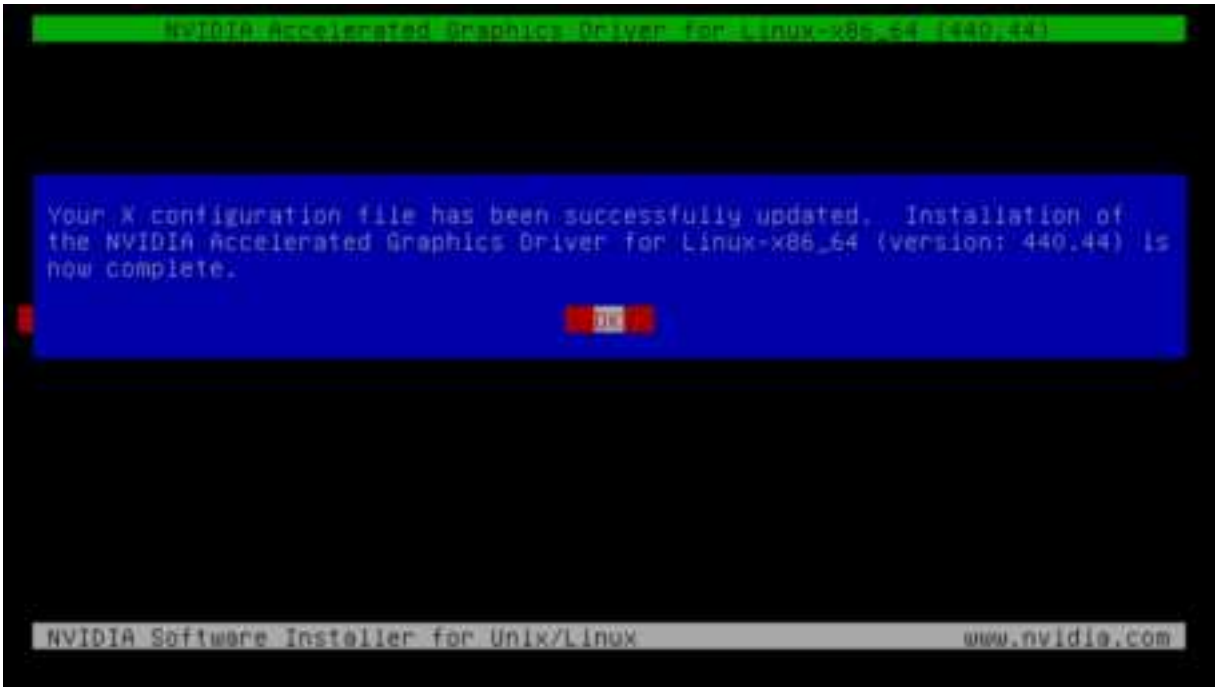
- Nvidia driver installing progress bar may appear.



- Select “Yes” to update the X-configuration file to use the Nvidia X driver.

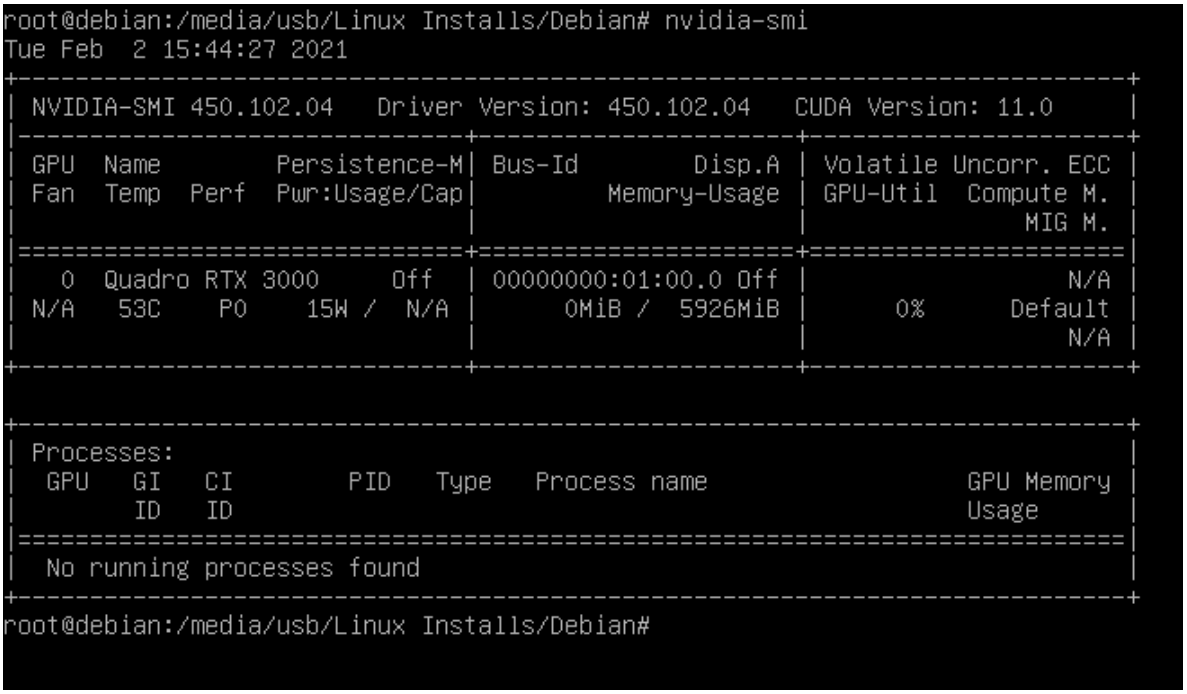


- Select “OK” to acknowledge the driver installation is complete.



- Execute the following command to verify the Nvidia driver is loaded.

nvidia-smi



- Reboot the system.

sudo reboot

Section 6 – Wireless Network Driver

The wireless network driver is not native to the Debian 10 kernel, so users will not be able to connect to wireless networks by default. The following steps can be followed to install the Wi-Fi driver on a ThinkPad P15 and P17.

- Download the AX201 Wi-Fi driver from the following link:

https://git.kernel.org/pub/scm/linux/kernel/git/firmware/linux-firmware.git/tree/iwlwifi-QuZ-a0-hr-b0-55.ucode

- Using the terminal, copy the Wi-Fi driver from its location to the firmware library

su

cd <file location>

cp iwlwifi-QuZ-a0-hr-b0-55.ucode /usr/lib/firmware

- Update the initramfs image

sudo update-initramfs -u

- Reboot the system and ensure that wireless connections are now enabled

sudo reboot

Section 7 – Revision History

Version	Date	Authors	Changes/Updates
1.0	2/12/2021	Gregor Linzmeier & Hady Asad	Initial launch release