

Ubuntu Linux 20.04 LTS Installation





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Section 1 – Supported Platforms

List of supported platforms:

- P14s Gen 1 (Intel)
- P14s Gen 1 (AMD)
- P14s Gen 2 (Intel)
- P14s Gen 2 (AMD)
- P14s Gen 3 (Intel)
- P14s Gen 3 (AMD)
- P15s Gen 1 (Intel)
- P15s Gen 2 (Intel)
- P16s Gen 1 (Intel)
- P16s Gen 1 (AMD)

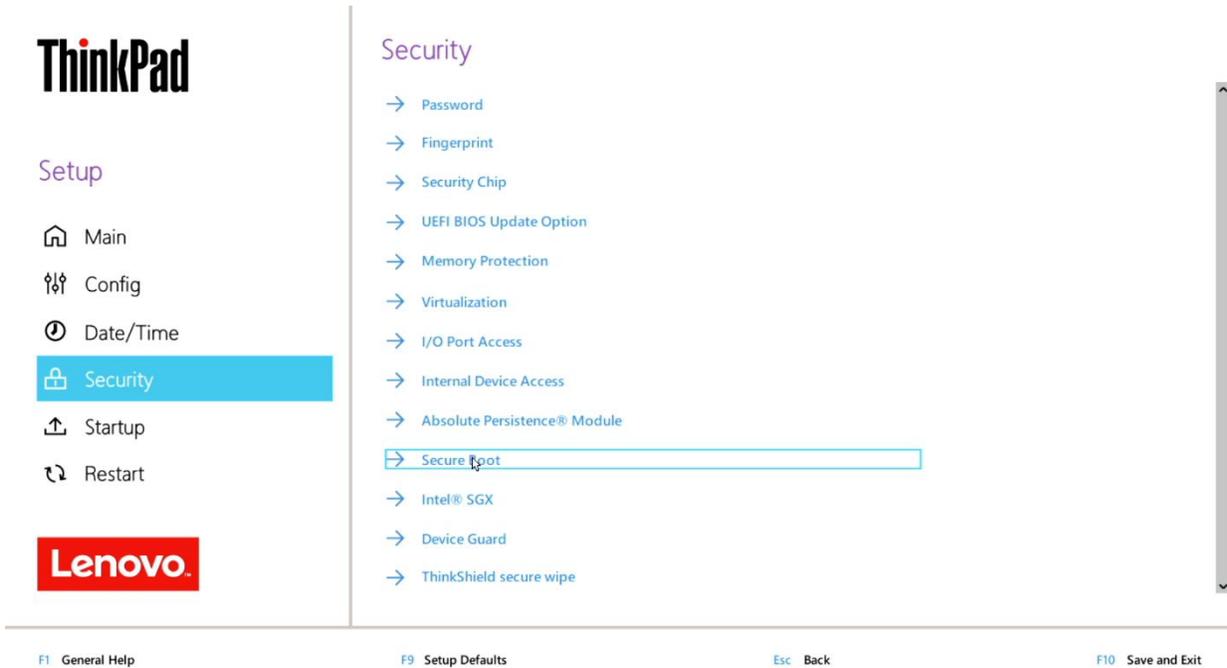
Section 2 – BIOS Configuration

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

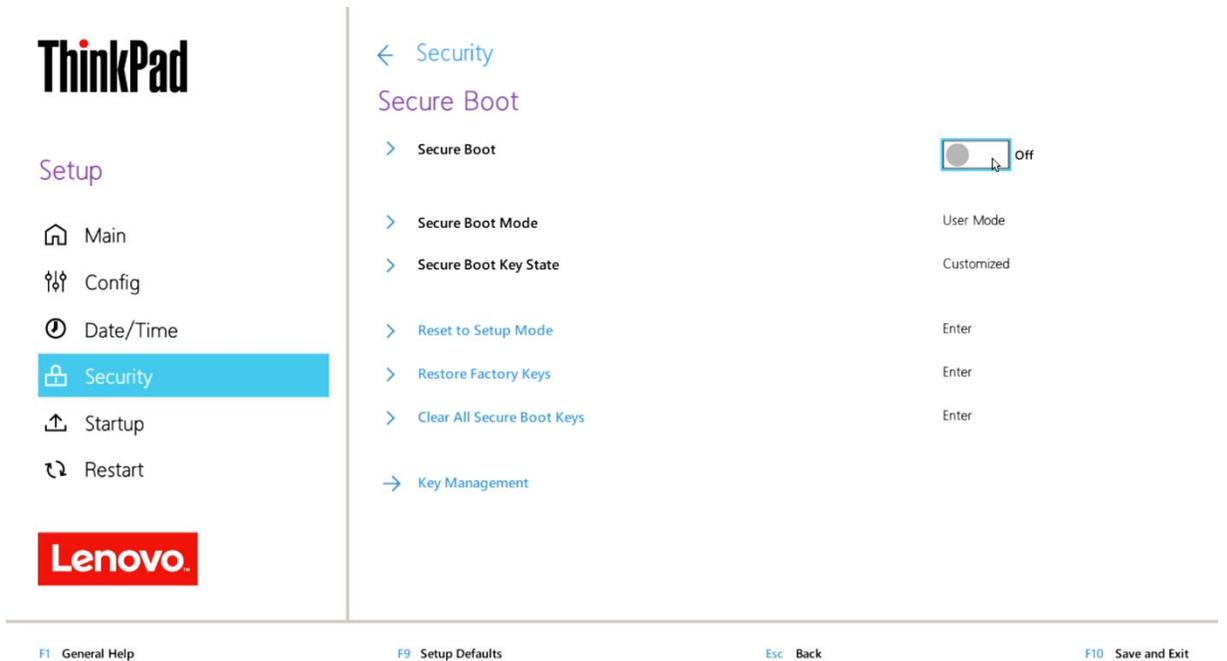
- Boot into BIOS by pressing the function F1 key at the “Lenovo” splash screen.



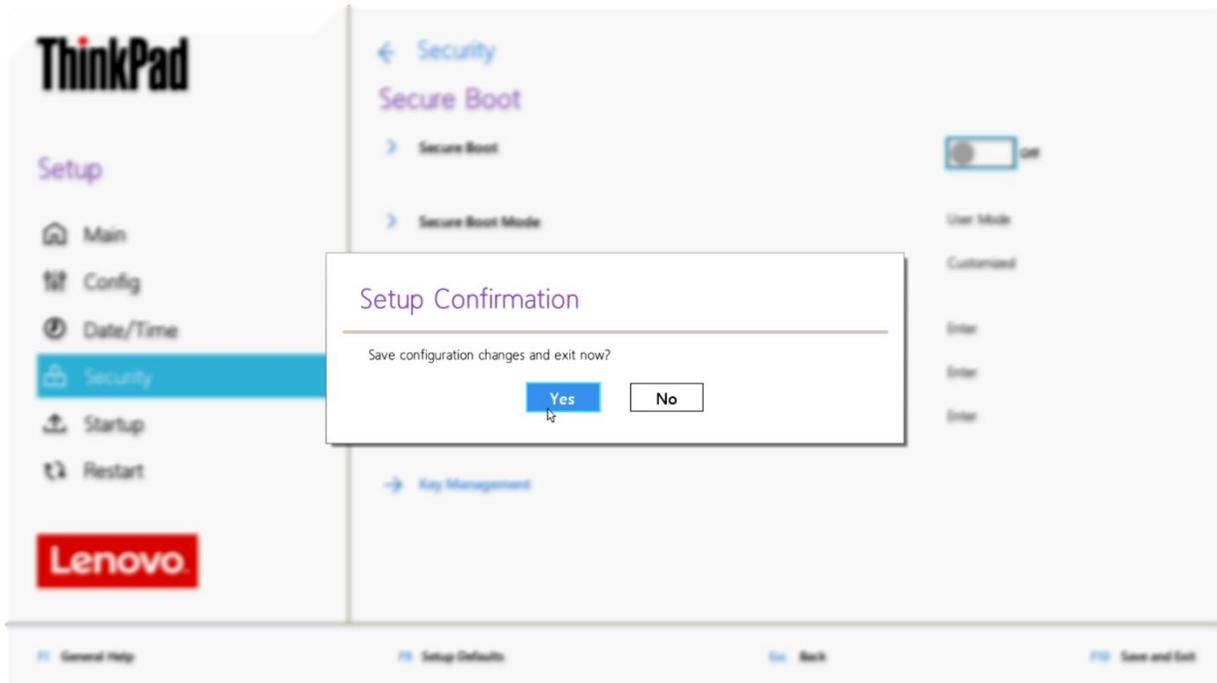
- Tab over to the “Security” menu tab and enter the “Secure Boot” category



- Set “Secure Boot” to “Off”



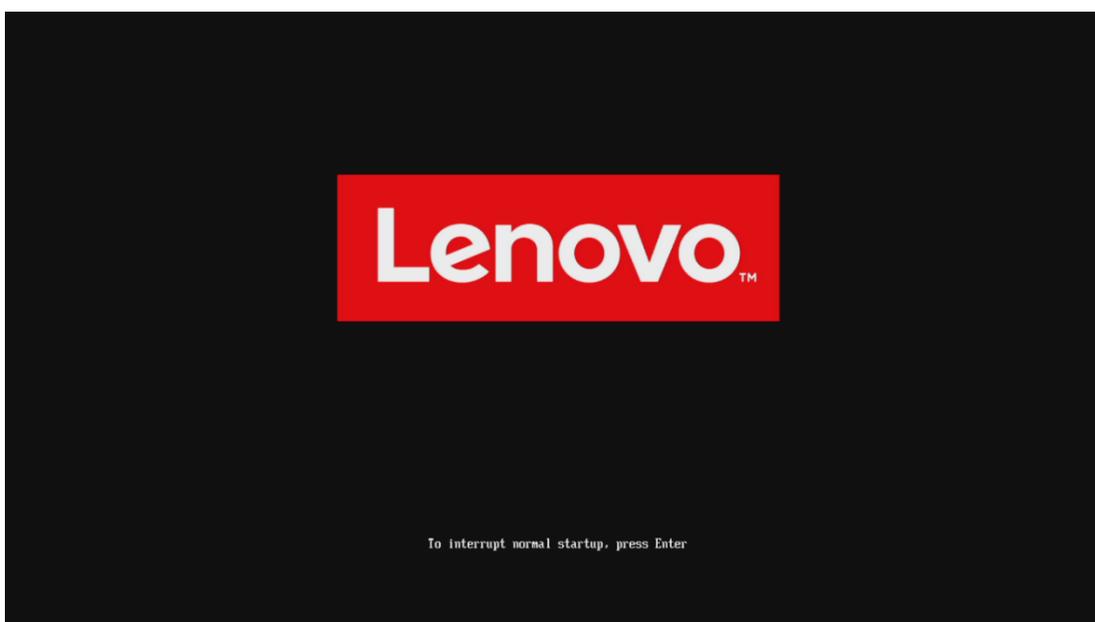
- Press function F10 key to save and exit BIOS setup.



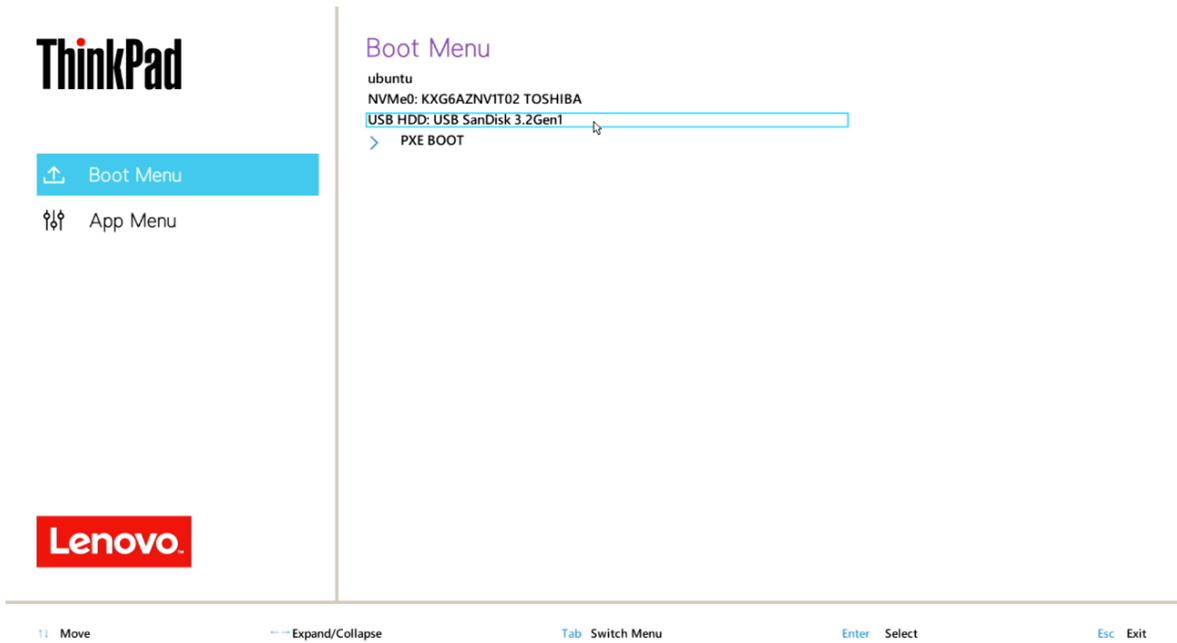
Section 3 – Installing Ubuntu Linux 20.04 LTS

Please refer to the following instructions and screenshots on how to install Ubuntu 20.04 LTS on the Lenovo ThinkPad P14s gen 2 and P15s Gen 2

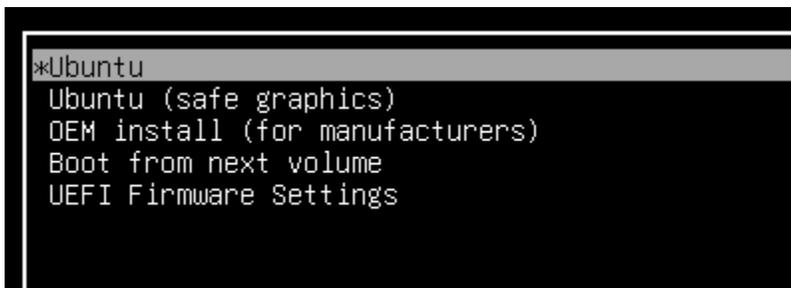
- Insert the Ubuntu 20.04 LTS installation media (either through USB or CD/DVD).
- Power on the system and press the F12 function key whenever the following Lenovo splash screen appears.



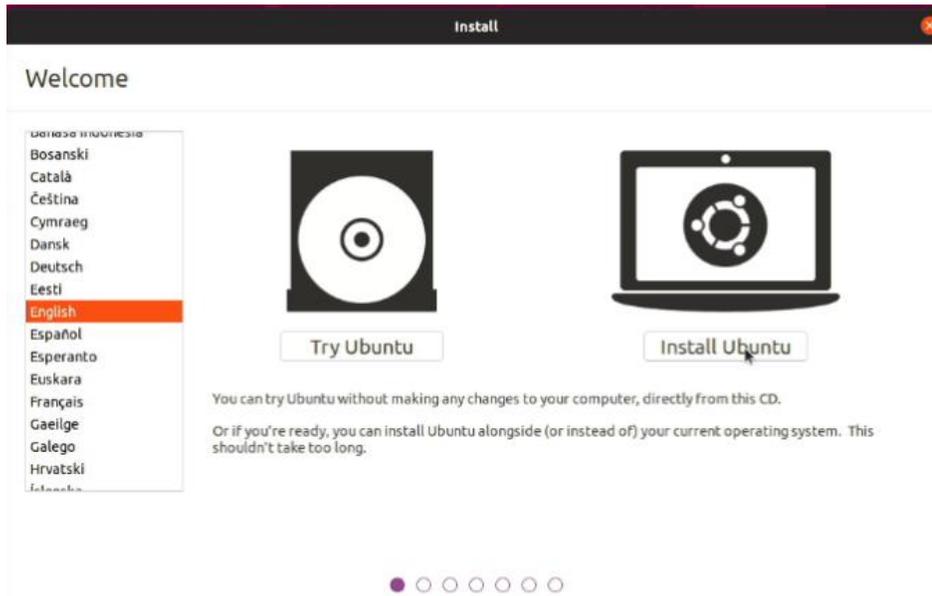
- Select the Linux bootable installation media from the F12 boot menu list.



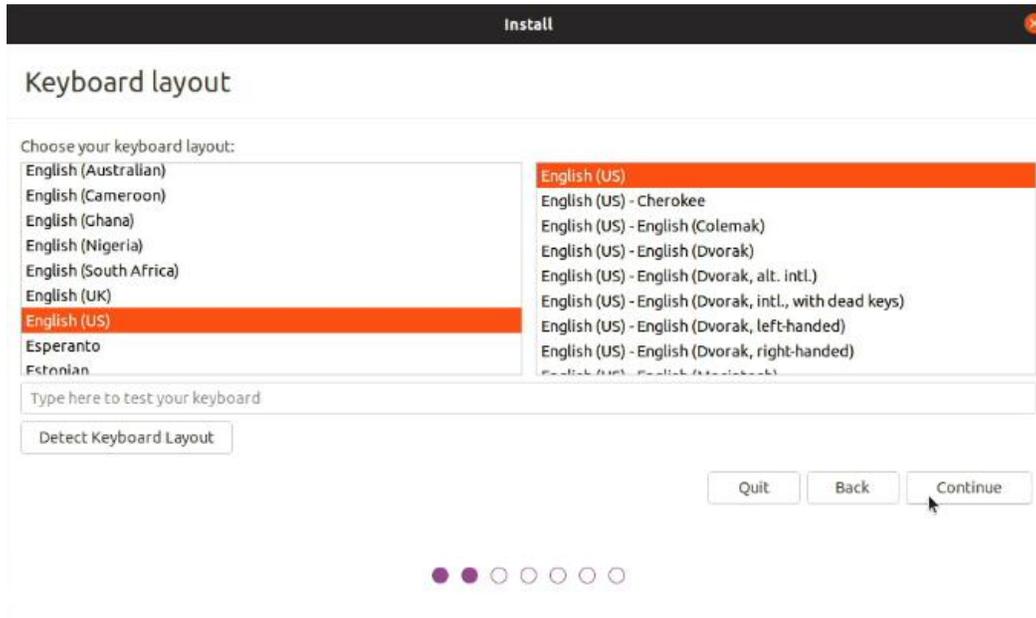
- Highlight “Ubuntu” from the GRUB boot menu and press ‘enter’.



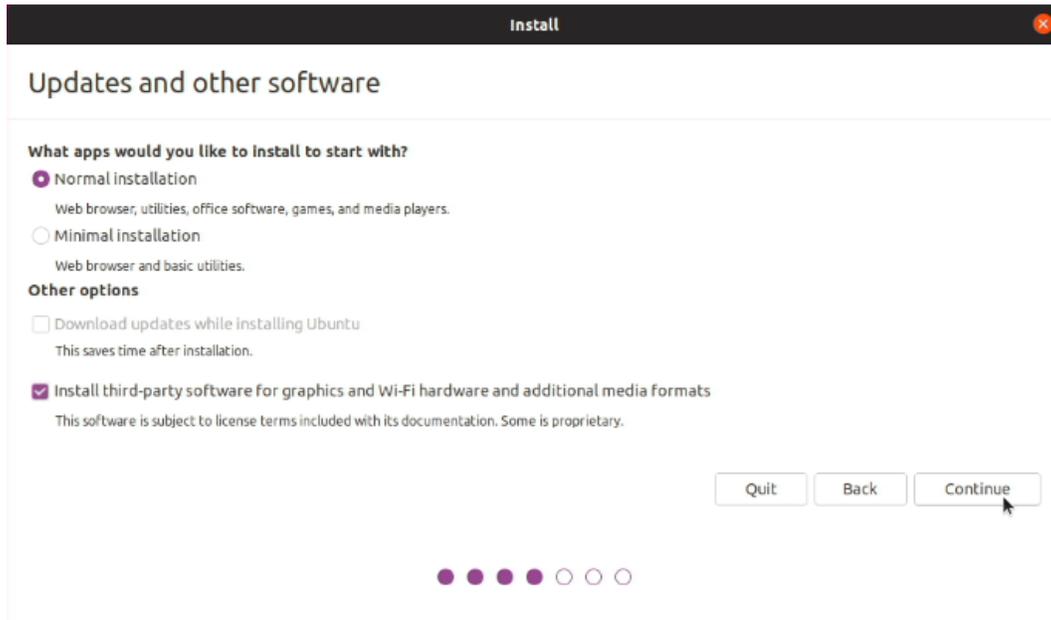
- The Ubuntu Linux Welcome Screen should appear. Click “Install Ubuntu” to proceed.



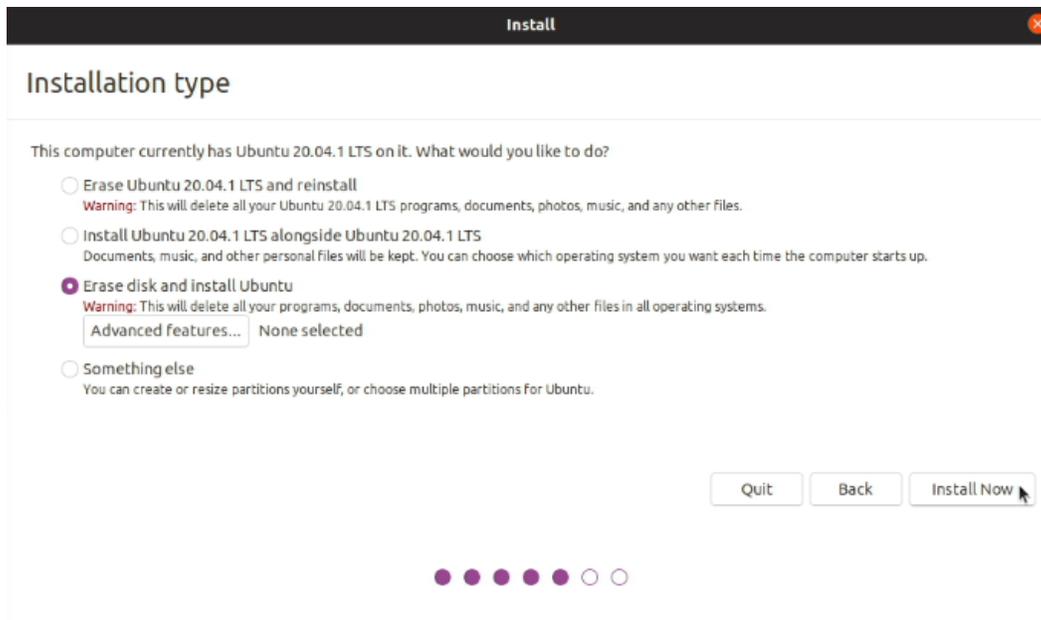
- Select the appropriate keyboard layout and language and “Continue”.



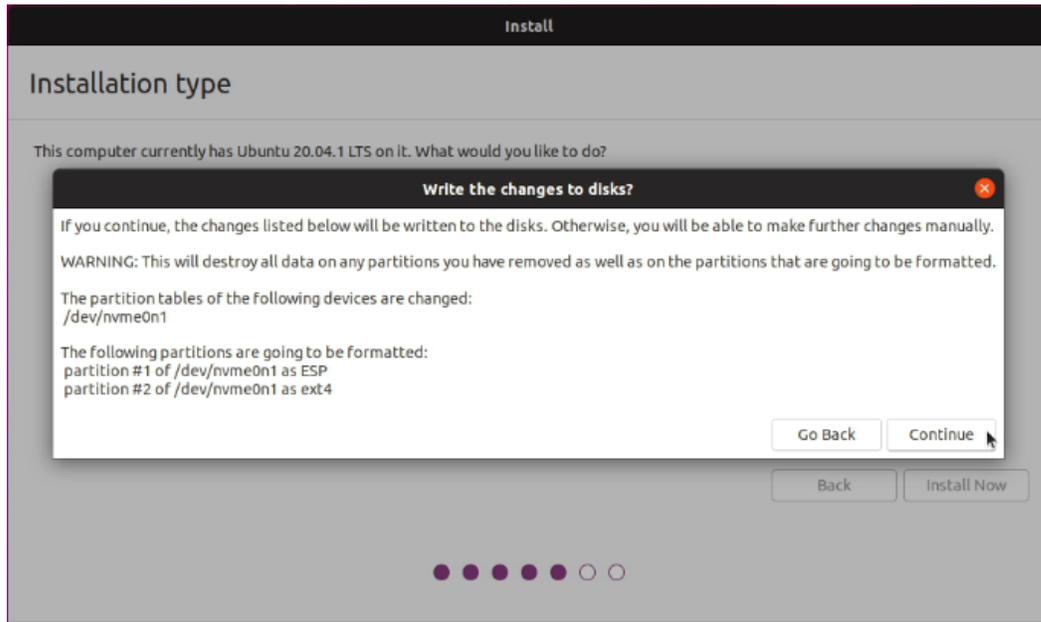
- Select “Normal Installation” as well as “Install third-party software...” then “Continue”.



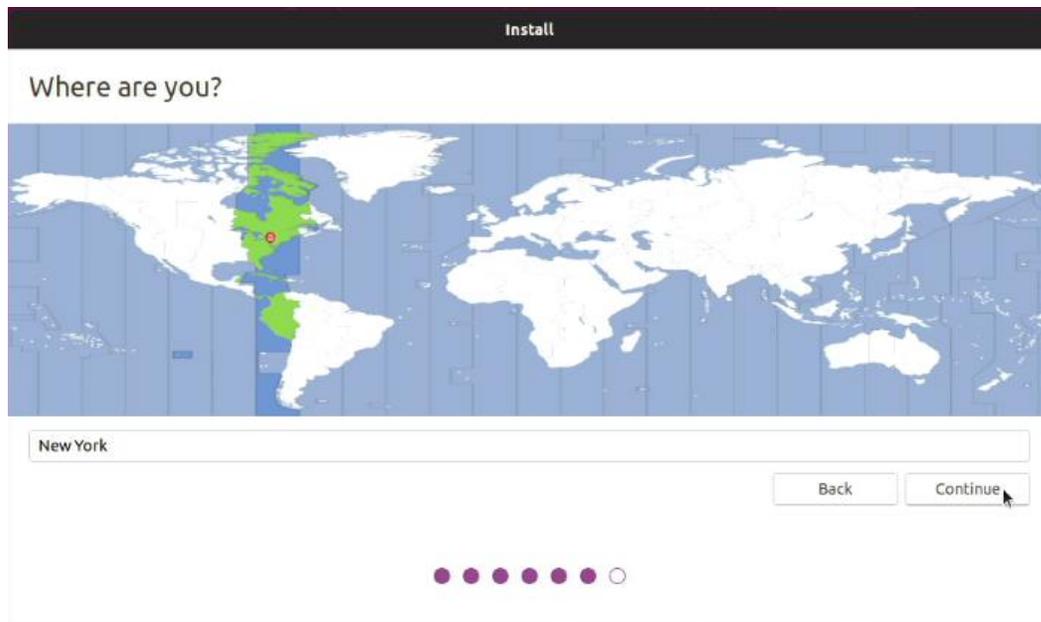
- Choose the installation type. For simplicity, this guide was done using “Erase disk and install Ubuntu”



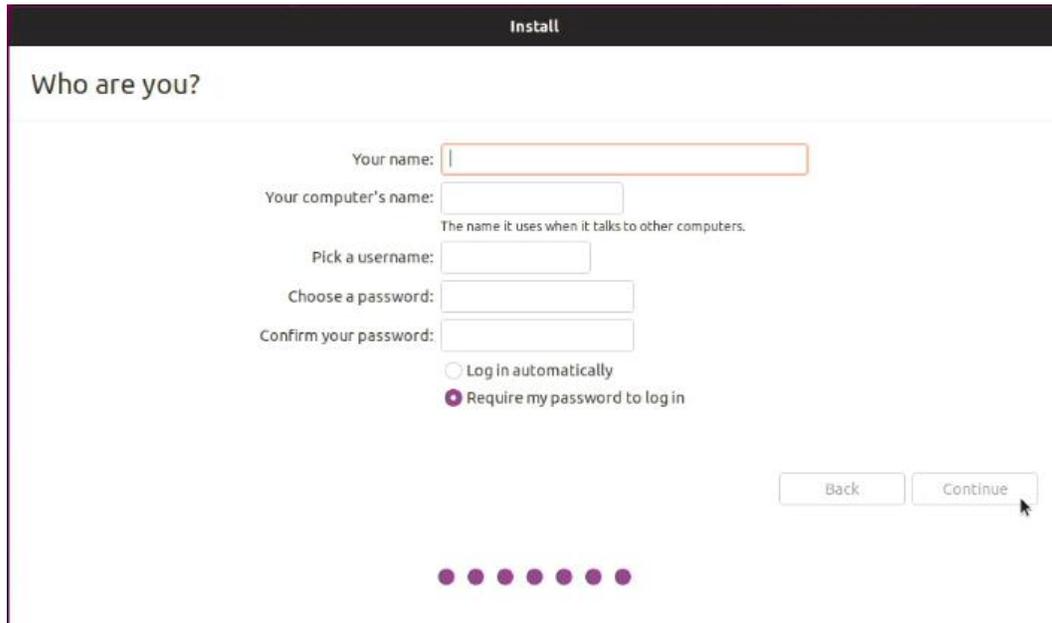
- Select “Continue” to confirm changes will be made to the disk.



- Choose the appropriate geographical location and select “Continue”.



- Fill out the appropriate information and select “Continue”.

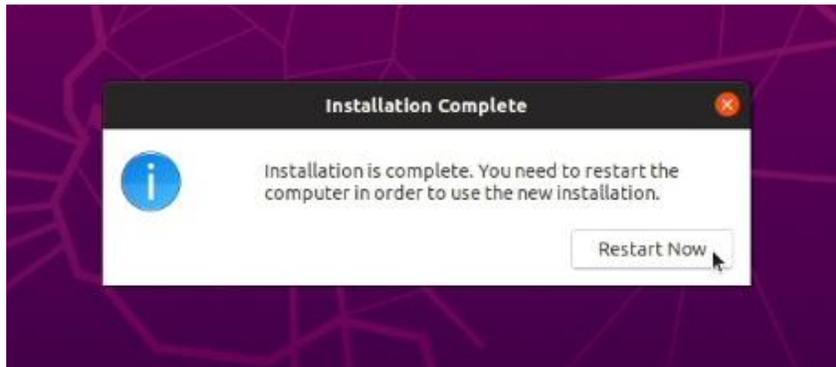


The screenshot shows the 'Install' window for Ubuntu. The title bar says 'Install'. The main heading is 'Who are you?'. Below this, there are several input fields: 'Your name:' with a text box, 'Your computer's name:' with a text box and a sub-label 'The name it uses when it talks to other computers.', 'Pick a username:' with a text box, 'Choose a password:' with a text box, and 'Confirm your password:' with a text box. Below the password fields are two radio buttons: 'Log in automatically' (unselected) and 'Require my password to log in' (selected). At the bottom right, there are 'Back' and 'Continue' buttons. At the bottom center, there is a progress indicator consisting of seven purple dots, with the first one being larger than the others.

- Ubuntu installation progress bar will be shown.



- Once the installation completes, select "Restart Now".



- Remove the installation media and press ENTER.



Section 4 – Installing the AMD Radeon Graphics Driver (AMD platform only)

In order to get optimal performance out of the integrated AMD Radeon Pro graphics, it's a good idea to ensure the latest AMD graphics driver is installed.

- Note that by selecting “Install third-party software...” during the Ubuntu installation in Step 3, a compatible driver should already be installed if system, connected to the internet.

To install the latest graphics driver, connect to the internet via a wireless or wired connection, and then follow the steps below:

- Download “Radeon™ Software for Linux® version 22.20 for Ubuntu 20.04” from the AMD support site linked below.

<https://www.amd.com/en/support/kb/release-notes/rn-amdgpu-unified-linux-22-20>

The screenshot shows the AMD website's support page for the Radeon™ Software for Linux® 22.20 Release Notes. The page header includes the AMD logo and navigation links for PRODUCTS, SOLUTIONS, SHOP, and DRIVERS & SUPPORT. The main heading is "Radeon™ Software for Linux® 22.20 Release Notes". Below this, the article number (RN-AMDGPU-UNIFIED-LINUX-22-20) and release date (June 28, 2022) are listed. A brief description states that the article provides information on the latest version of Radeon™ Software for Linux®. The "Radeon™ Software for Linux® 22.20 Highlights" section lists three key updates: support for Ubuntu 22.04 and 22.04.1, support for SLED/SLES 15 SP4, and preview support for Ubuntu 20.04.5 HWE. The "Radeon™ Software for Linux® installer can be downloaded from the following links:" section provides a list of download links for various Linux distributions and versions, including Ubuntu 20.04.5 HWE, Ubuntu 22.04 and 22.04.1 HWE, RHEL 7.9, RHEL 8.6, RHEL 9.0, and SLED/SLES 15 SP 3.

- Detailed instructions for installing this software can also be found below.

<https://amdgpu-install.readthedocs.io/en/latest/index.html>

In the following commands, replace `amdgpu-install-VERSION.deb` with the actual file name of the downloaded installer package:

- Change directory to the download location.

```
# cd ~/Downloads
```

- Prior to installation make the downloaded file executable and then proceed to install the AMDGPU graphics package.

```
# chmod +x amdgpu-install-VERSION.deb
```

```
# sudo apt-get install ./amdgpu-install-VERSION.deb
```

```
root@lenovo-ThinkPad-P14s-Gen-2a:/home/lenovo# cd Downloads/
root@lenovo-ThinkPad-P14s-Gen-2a:/home/lenovo/Downloads# chmod +x amdgpu-install_22.20.50200-1_all.deb
root@lenovo-ThinkPad-P14s-Gen-2a:/home/lenovo/Downloads# apt-get install ./amdgpu-install_22.20.50200-1_all.deb
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'amdgpu-install' instead of './amdgpu-install_22.20.50200-1_all.deb'
The following additional packages will be installed:
  dialog
The following NEW packages will be installed:
  amdgpu-install dialog
0 upgraded, 2 newly installed, 0 to remove and 126 not upgraded.
Need to get 231 kB/245 kB of archives.
After this operation, 1,282 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

- Then press “y” for yes.
- The installation may run for a few minutes.

```
Get:1 /home/lenovo/Downloads/amdgpu-install_22.20.50200-1_all.deb amdgpu-install all 22.20.50200-1438746~20.04 [13.9 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 dialog amd64 1.3-20190808-1 [231 kB]
Fetched 231 kB in 10s (22.5 kB/s)
Selecting previously unselected package amdgpu-install.
(Reading database ... 143767 files and directories currently installed.)
Preparing to unpack ../amdgpu-install_22.20.50200-1_all.deb ...
Unpacking amdgpu-install (22.20.50200-1438746~20.04) ...
Selecting previously unselected package dialog.
Preparing to unpack ../dialog_1.3-20190808-1_amd64.deb ...
Unpacking dialog (1.3-20190808-1) ...
Setting up dialog (1.3-20190808-1) ...
Setting up amdgpu-install (22.20.50200-1438746~20.04) ...
Processing triggers for man-db (2.9.1-1) ...
root@lenovo-ThinkPad-P14s-Gen-2a:/home/lenovo/Downloads#
```

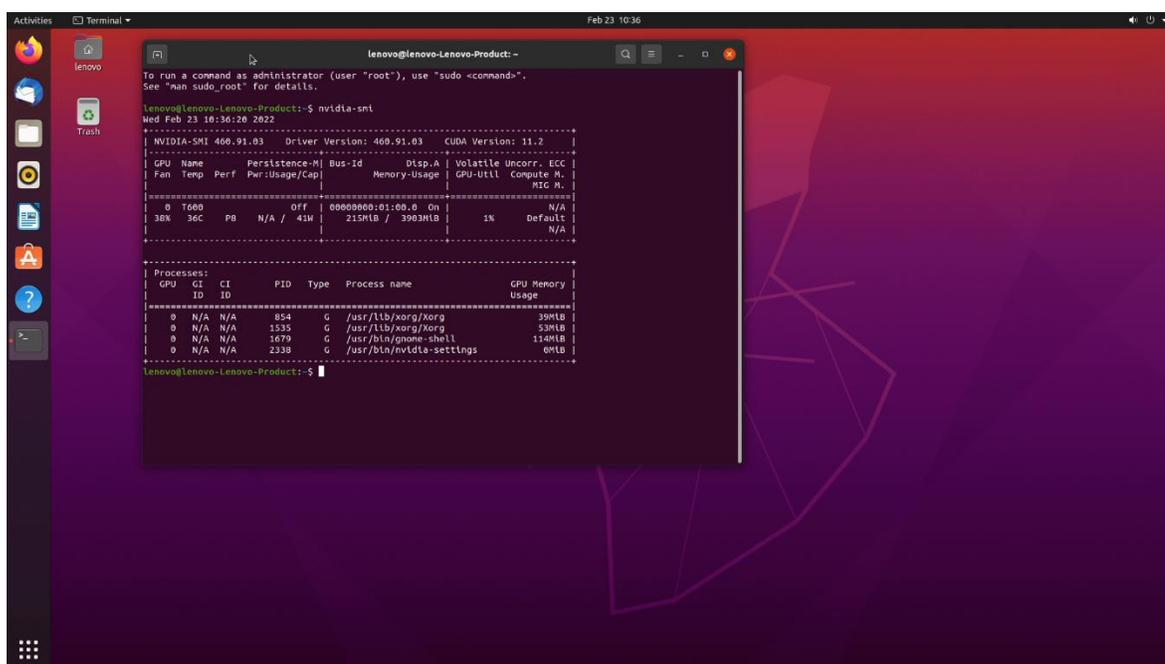
- Once the installation is complete, reboot the system.

```
# sudo reboot
```

Section 5 – Installing the Nvidia Graphics Driver (Intel platform only)

To get optimal performance out of the Nvidia GPU, it is a good idea to install the Nvidia graphics driver.

- To make sure the Nvidia GPU is working, open the terminal and write the command `nvidia-smi`.



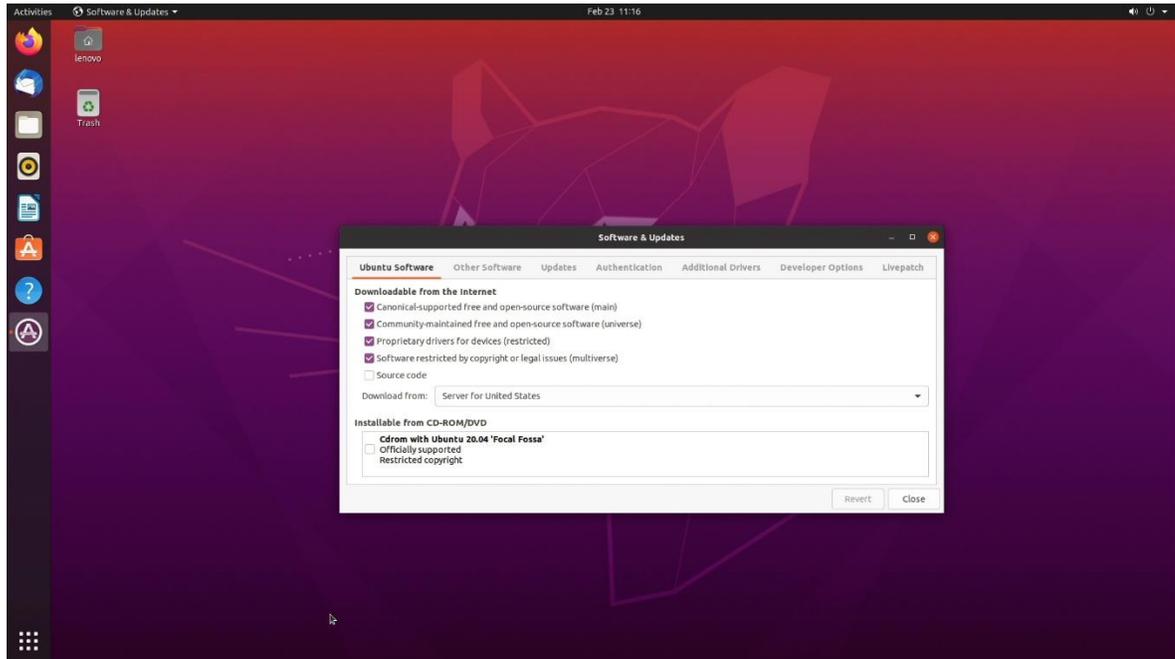
```

lenovo@lenovo-Lenovo-Product:~$ nvidia-smi
Thu Feb 23 10:36:20 2022
+-----+
| NVIDIA-SMI 466.91.03   Driver Version: 466.91.03   CUDA Version: 11.2   |
+-----+-----+-----+-----+-----+-----+
| GPU Name      Persistence-M| Bus-Id        Disp-A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|  Memory-Usage | GPU-Util  Compute M. |
|-----+-----+-----+-----+-----+-----+
| 0  T600      Off      | 00000000:01:00:0  On |          | N/A |
| 38%  36C    P8    N/A / 41W | 215MB / 3903MB | 1%      Default |
+-----+-----+-----+-----+-----+
| Processes:
| GPU   GI   CI          PID    Type   Process name          GPU Memory
|-----+-----+-----+-----+-----+
| 0     N/A  N/A       854      G   /usr/lib/xorg/Xorg          39MB
| 0     N/A  N/A      1535     G   /usr/lib/xorg/Xorg          53MB
| 0     N/A  N/A      1679     G   /usr/bin/gnome-shell       148MB
| 0     N/A  N/A      2238     G   /usr/bin/nvidia-settings    6MB
+-----+-----+-----+-----+-----+
lenovo@lenovo-Lenovo-Product:~$

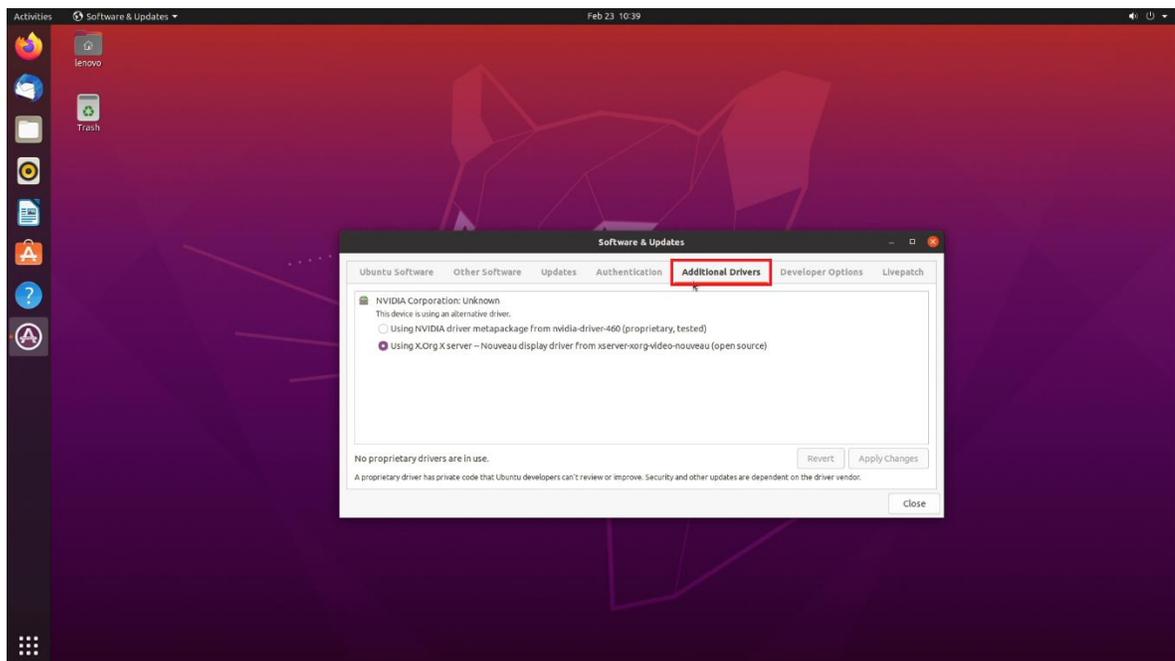
```

In case Nvidia GPU is not native, follow the steps below to install the GPU driver:

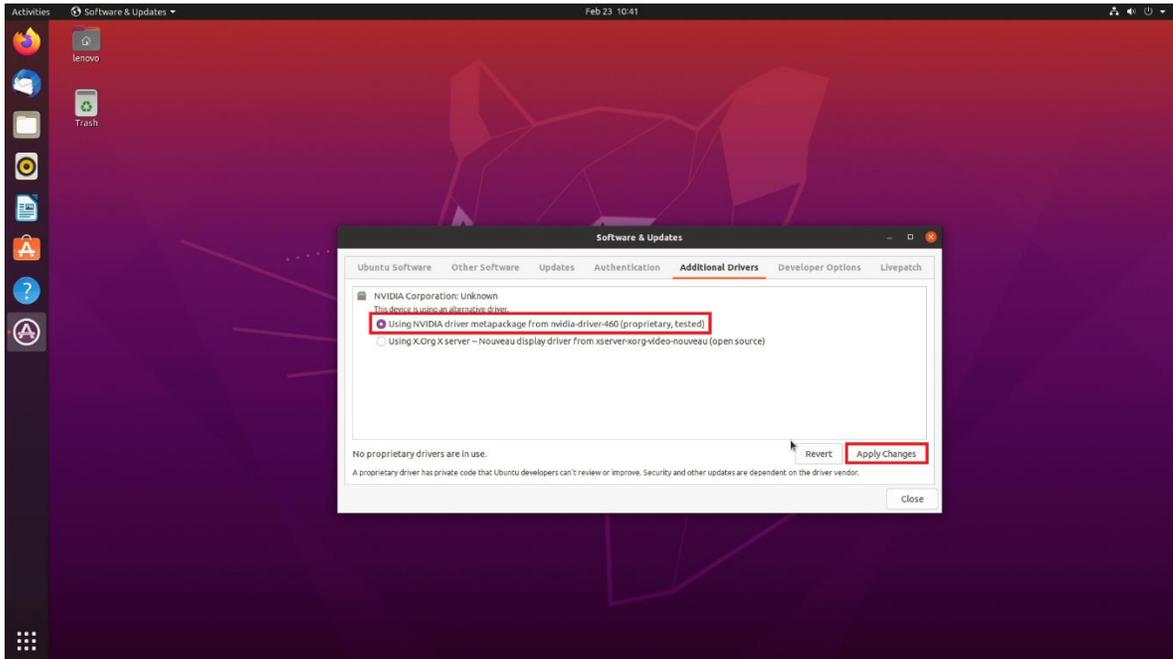
- Open Software & Updates.



- Click on Additional Drivers.



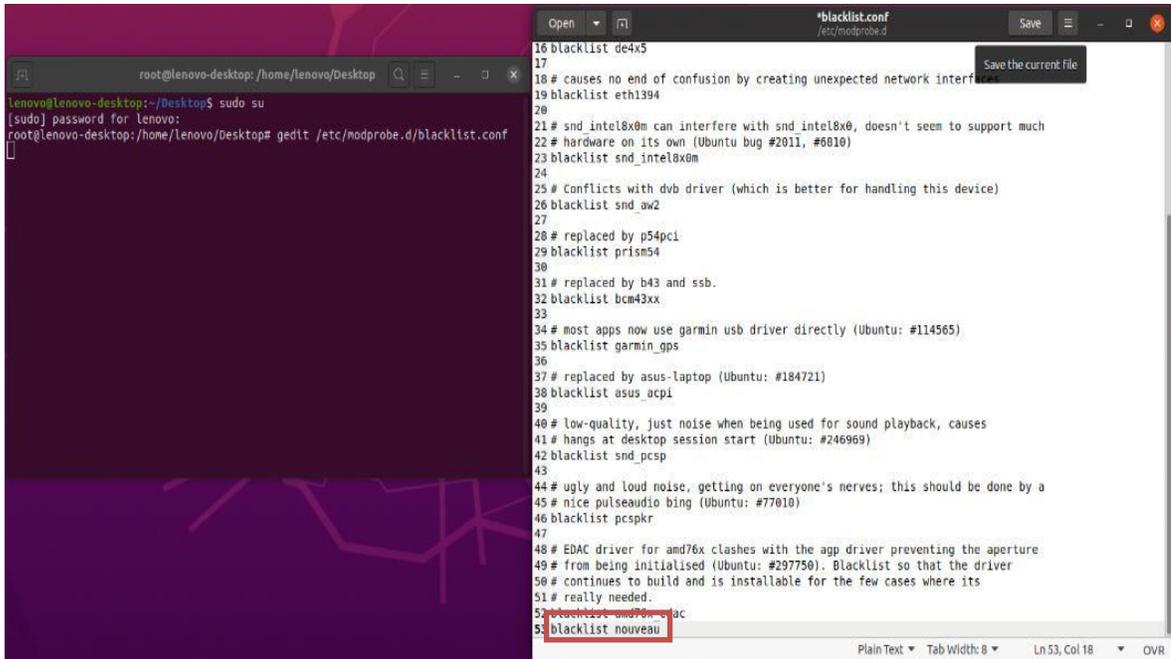
- Select the driver you would like to install and click Apply Changes.



- If the system will prompt to restart, click Restart.

In case if need to install a proprietary Nvidia driver outside of the upstream kernel releases please follow the next steps:

- Download the latest Nvidia graphics driver for the appropriate Nvidia GPU from www.nvidia.com/download
- To get the Nvidia driver running, we will need to blacklist the nouveau driver. Follow the steps below:
 - Log in as root: `sudo su`
 - Open blacklist.conf file: `gedit /etc/modprobe.d/blacklist.conf`
 - Blacklist nouveau driver by writing: `blacklist nouveau`



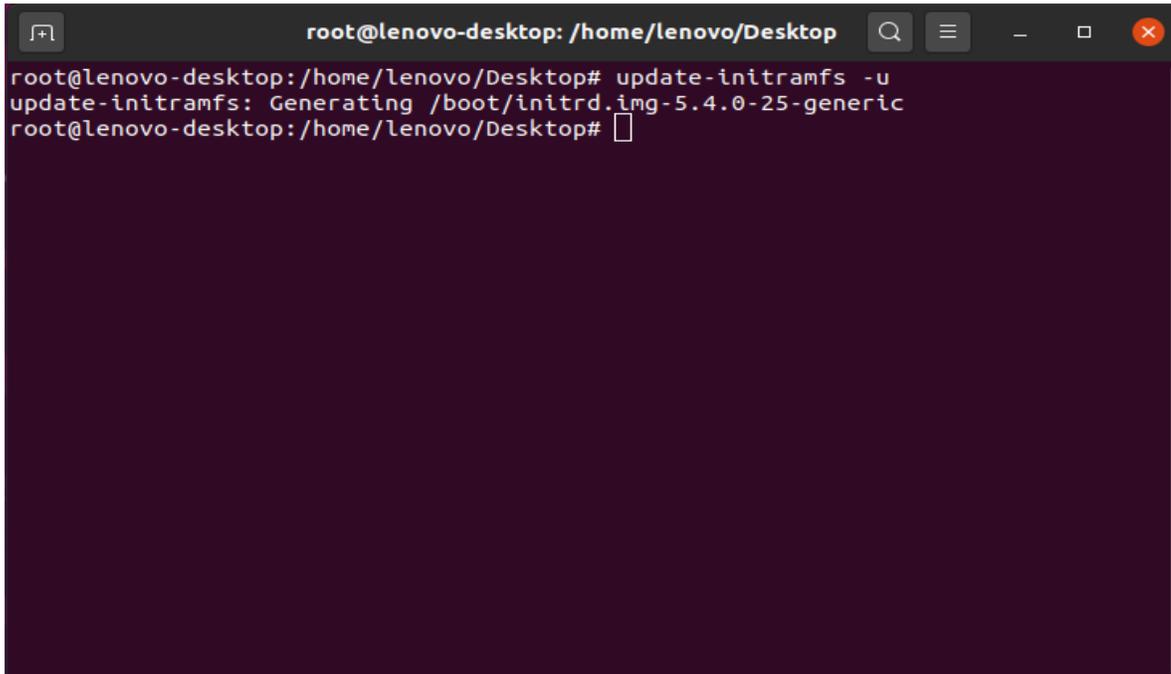
The screenshot shows a terminal window on the left and a gedit editor on the right. The terminal shows the user logging in as root and opening the blacklist.conf file. The gedit editor shows the contents of the file, with the line `blacklist nouveau` highlighted in red at the bottom.

```

root@lenovo-desktop: /home/lenovo/Desktop
lenovo@lenovo-desktop:~/Desktop$ sudo su
[sudo] password for lenovo:
root@lenovo-desktop: /home/lenovo/Desktop# gedit /etc/modprobe.d/blacklist.conf

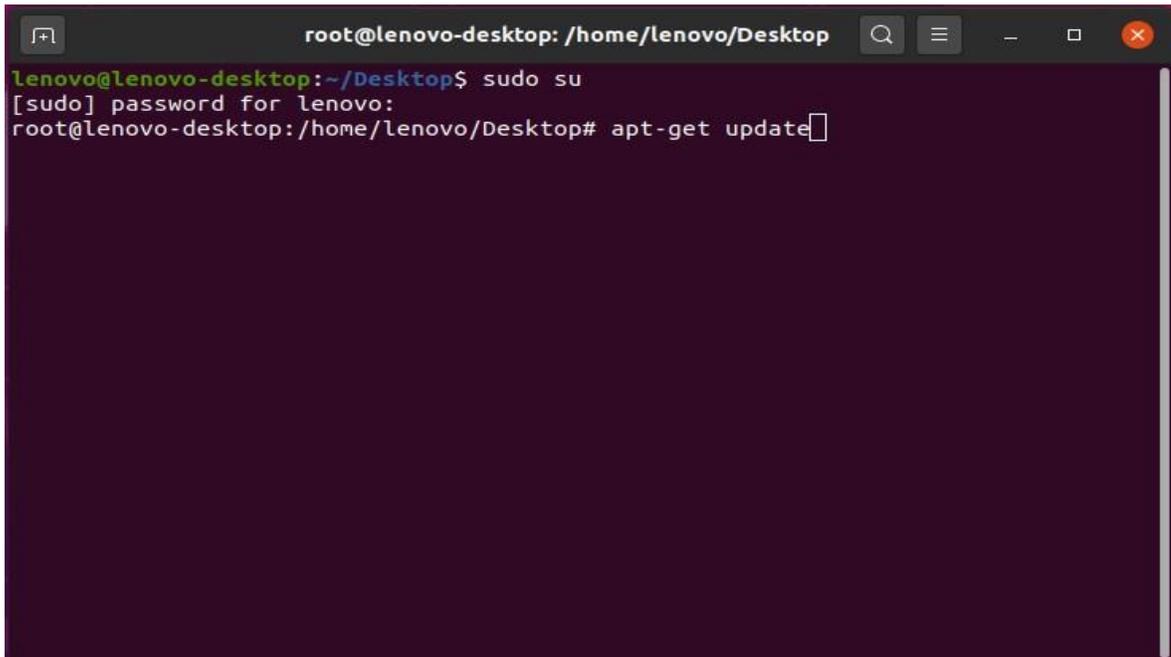
*blacklist.conf
/etc/modprobe.d
16 blacklist d4x5
17
18 # causes no end of confusion by creating unexpected network interf
19 blacklist eth1394
20
21 # snd_intel8x0m can interfere with snd intel8x0, doesn't seem to support much
22 # hardware on its own (Ubuntu bug #2011, #6810)
23 blacklist snd_intel8x0m
24
25 # Conflicts with dvb driver (which is better for handling this device)
26 blacklist snd_au2
27
28 # replaced by p54pci
29 blacklist prism54
30
31 # replaced by b43 and ssb.
32 blacklist bcm43xx
33
34 # most apps now use garmin usb driver directly (Ubuntu: #114565)
35 blacklist garmin_gps
36
37 # replaced by asus-laptop (Ubuntu: #184721)
38 blacklist asus_acpi
39
40 # low-quality, just noise when being used for sound playback, causes
41 # hangs at desktop session start (Ubuntu: #246969)
42 blacklist snd_pcsp
43
44 # ugly and loud noise, getting on everyone's nerves; this should be done by a
45 # nice pulseaudio bing (Ubuntu: #77010)
46 blacklist pcspkr
47
48 # EDAC driver for amd76x clashes with the agp driver preventing the aperture
49 # from being initialised (Ubuntu: #297750). Blacklist so that the driver
50 # continues to build and is installable for the few cases where its
51 # really needed.
52 blacklist amd76x_edac
53 blacklist nouveau
  
```

- Run the command: `update-initramfs -u`



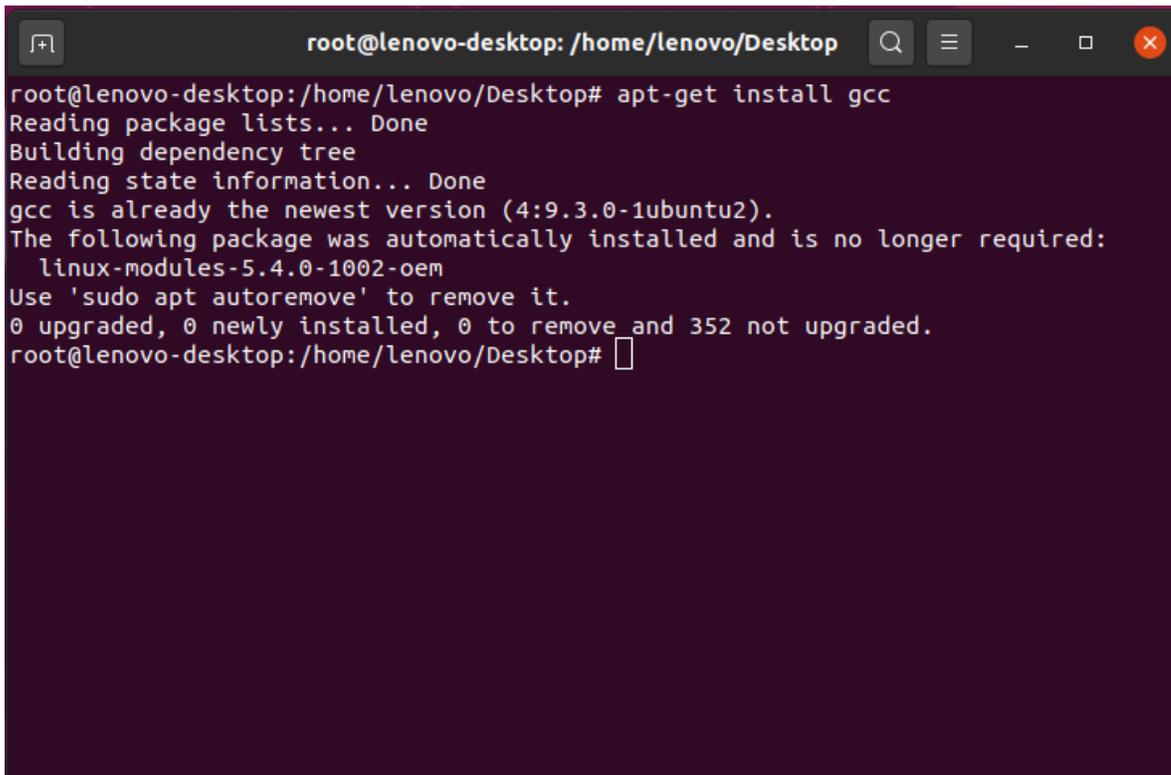
```
root@lenovo-desktop: /home/lenovo/Desktop
root@lenovo-desktop: /home/lenovo/Desktop# update-initramfs -u
update-initramfs: Generating /boot/initrd.img-5.4.0-25-generic
root@lenovo-desktop: /home/lenovo/Desktop#
```

- Reboot the system: `reboot`
 - Once your system reboots, open a terminal window and:
 - Log in as root: `sudo su`
 - Run the command: `apt-get update`



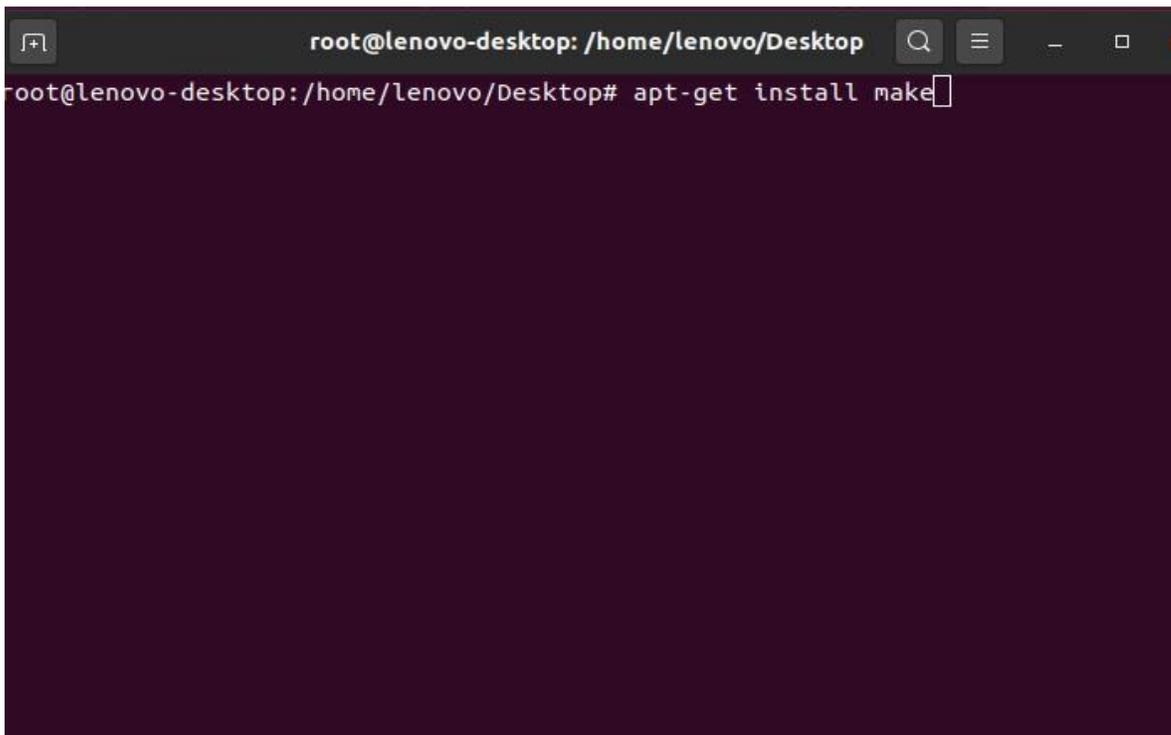
```
lenovo@lenovo-desktop:~/Desktop$ sudo su
[sudo] password for lenovo:
root@lenovo-desktop: /home/lenovo/Desktop# apt-get update
```

- Install gcc: apt-get install gcc



```
root@lenovo-desktop: /home/lenovo/Desktop
root@lenovo-desktop:/home/lenovo/Desktop# apt-get install gcc
Reading package lists... Done
Building dependency tree
Reading state information... Done
gcc is already the newest version (4:9.3.0-1ubuntu2).
The following package was automatically installed and is no longer required:
  linux-modules-5.4.0-1002-oem
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 352 not upgraded.
root@lenovo-desktop:/home/lenovo/Desktop#
```

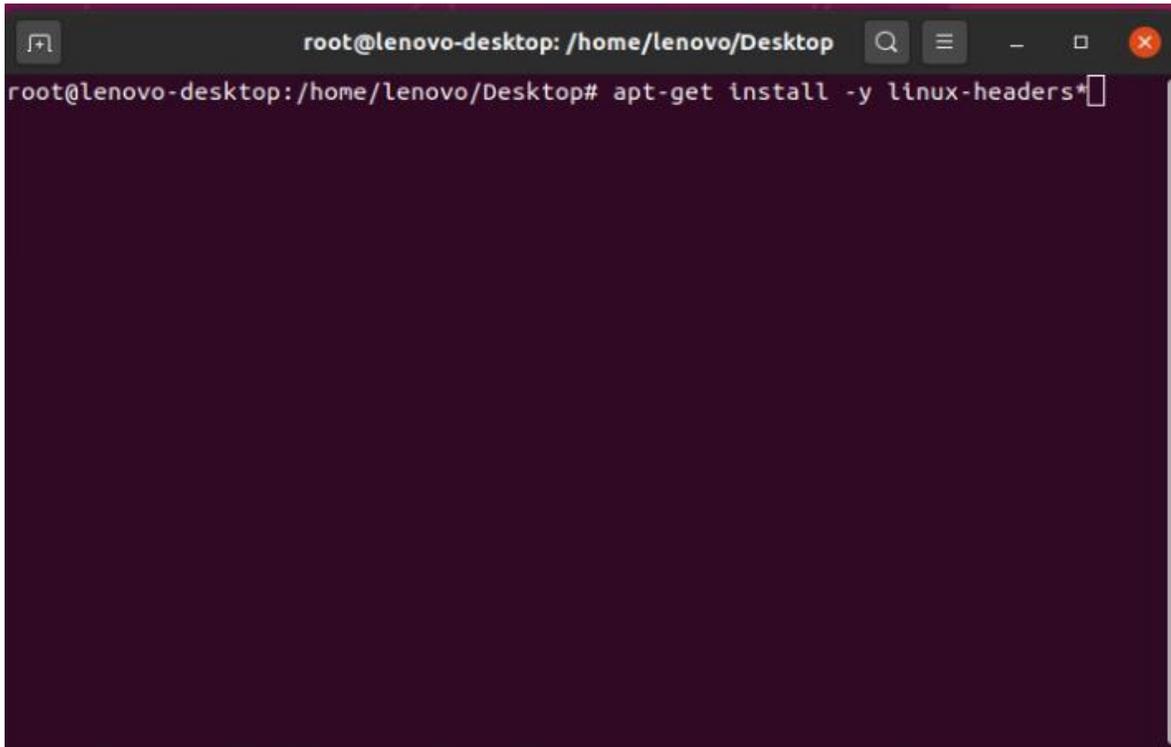
- Install make: apt-get install make



```
root@lenovo-desktop: /home/lenovo/Desktop
root@lenovo-desktop:/home/lenovo/Desktop# apt-get install make
```

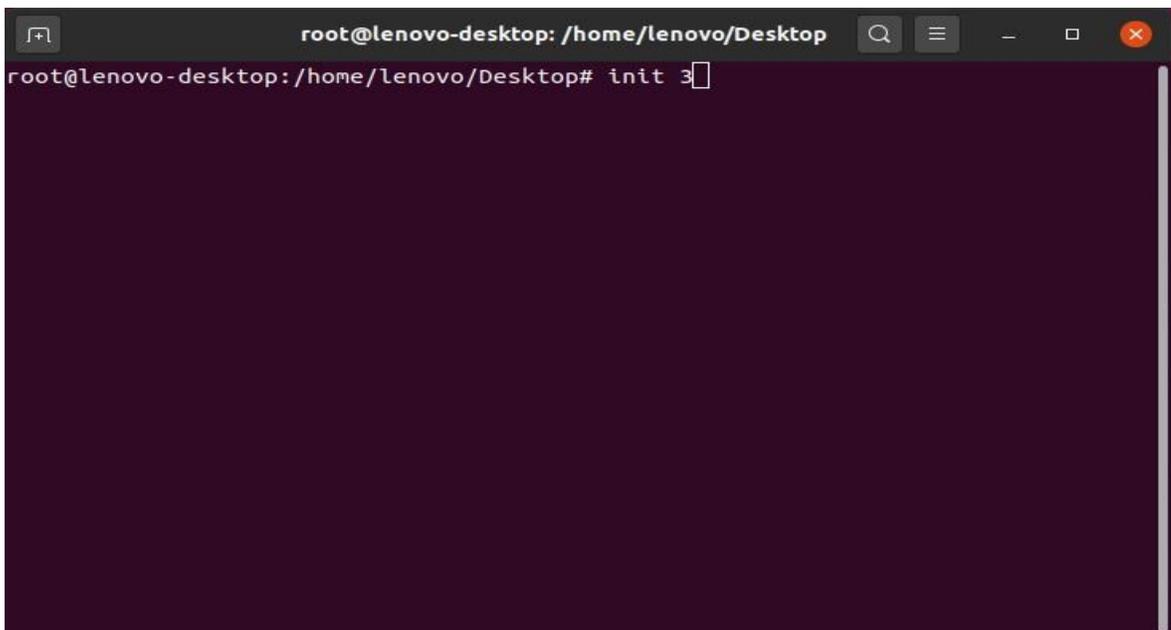


- Install linux-headers: apt-get install -y linux-headers*



```
root@lenovo-desktop: /home/lenovo/Desktop
root@lenovo-desktop:/home/lenovo/Desktop# apt-get install -y linux-headers*
```

- Stop x-windows by using the command: init 3.



```
root@lenovo-desktop: /home/lenovo/Desktop
root@lenovo-desktop:/home/lenovo/Desktop# init 3
```



- Log in as root and redirect to the directory where the Nvidia driver is located.

```
Ubuntu Focal Fossa (development branch) lenovo-desktop tty2
lenovo-desktop login: lenovo
Password:
Welcome to Ubuntu Focal Fossa (development branch) (GNU/Linux 5.4.0-25-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

466 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

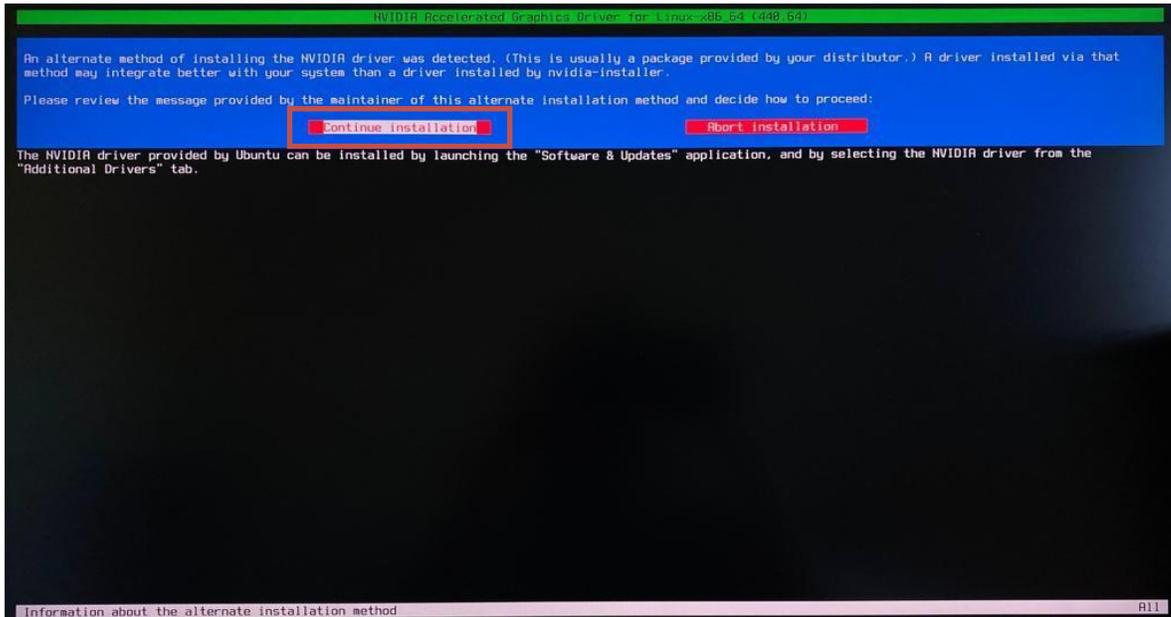
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

lenovo@lenovo-desktop:~$ sudo su
[sudo] password for lenovo:
root@lenovo-desktop:/home/lenovo#
```

- Make the Nvidia installer an executable by the command- `chmod +x NVIDIA-Linux-x86-64-*` And run the Nvidia driver by- `./NVIDIA-Linux-x86_64-430.50.run`

```
root@lenovo-desktop:/home/lenovo/Downloads# ls
NVIDIA-Linux-x86_64-440.64.run
root@lenovo-desktop:/home/lenovo/Downloads# chmod +x NVIDIA-Linux-x86_64-440.64.run
root@lenovo-desktop:/home/lenovo/Downloads# ls
NVIDIA-Linux-x86_64-440.64.run
root@lenovo-desktop:/home/lenovo/Downloads# ./NVIDIA-Linux-x86_64-440.64.run _
```

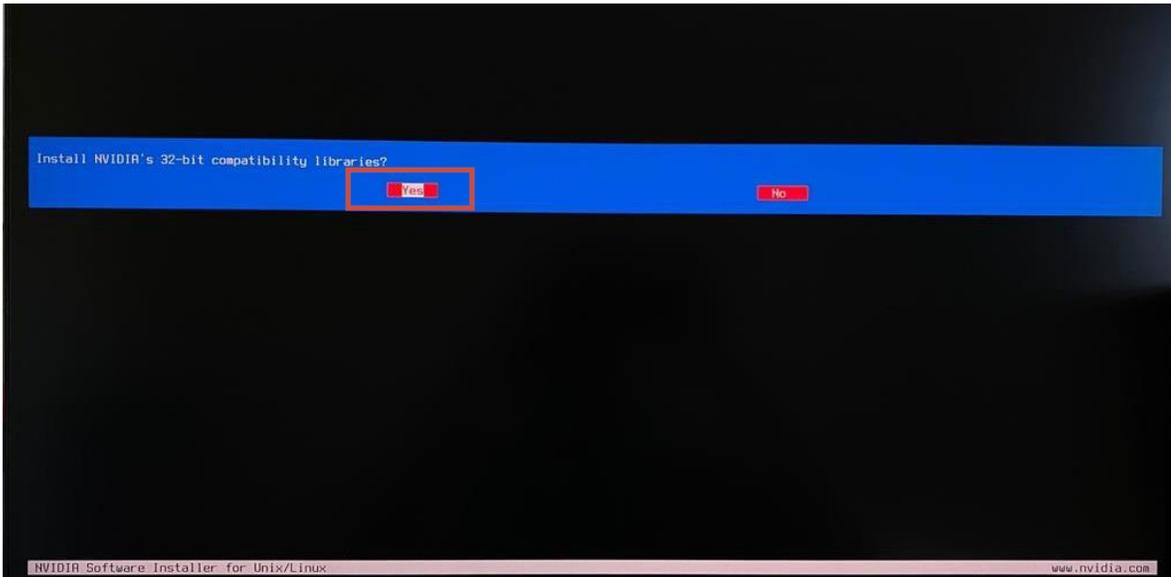
- Select Continue installation.



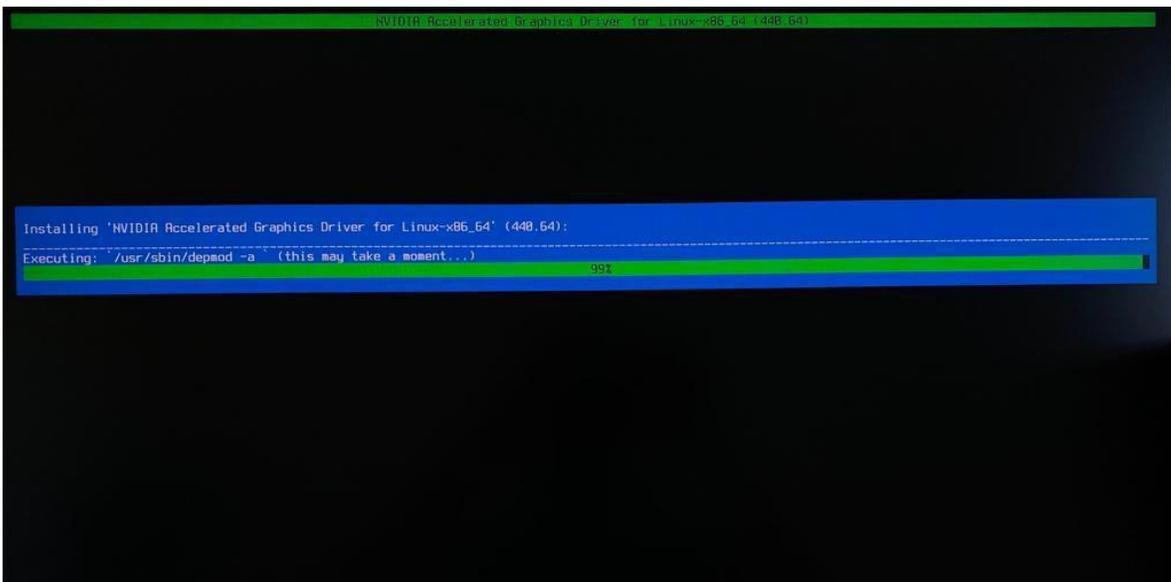
- Wait until the kernel modules are completely built.



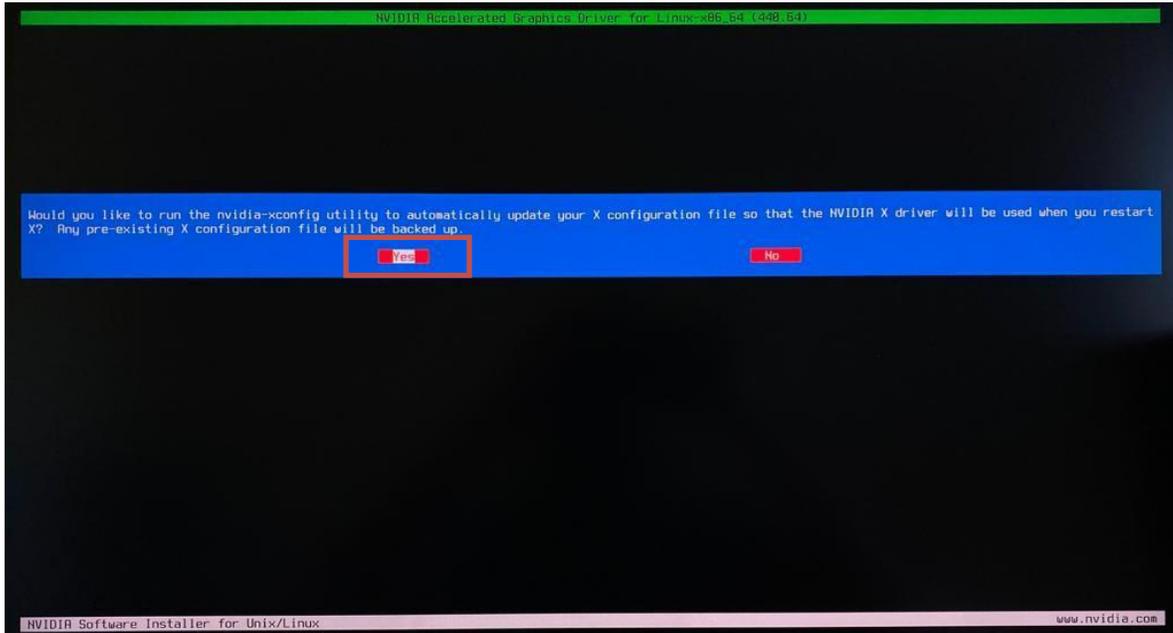
- Select Yes for installing 32-bit compatibility libraries.



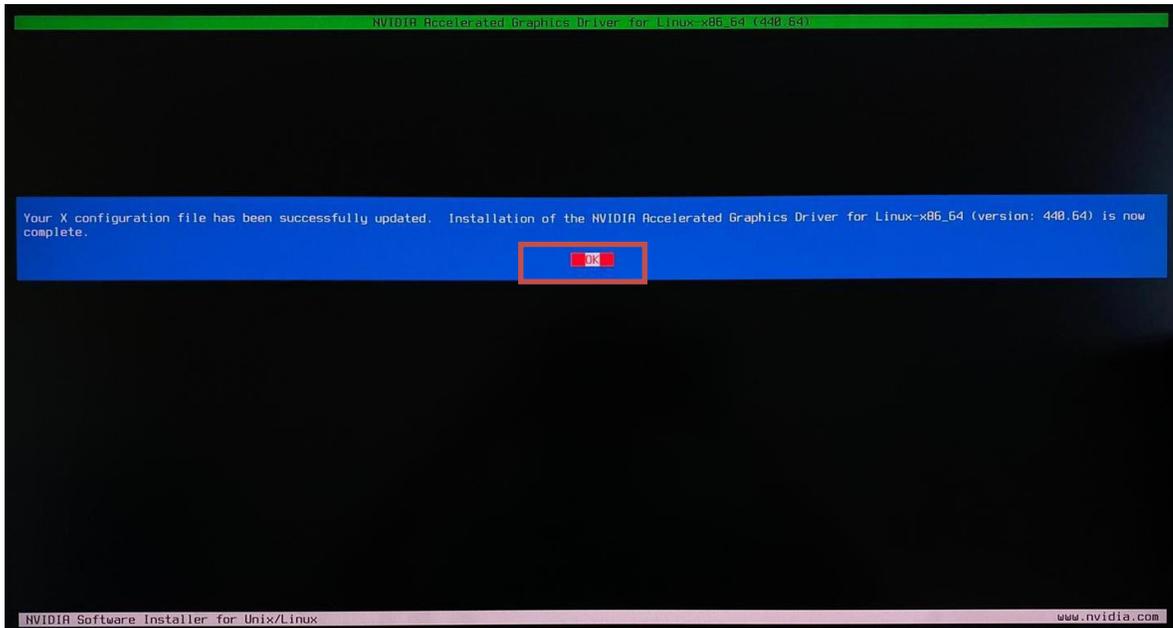
- Wait until the installation is complete.



- Select Yes to run nvidia-xconfig utility to automatically update your X configuration file.



- Select OK once the X configuration file gets updated successfully.



- Execute the following command to verify the Nvidia driver is loaded: nvidia-smi

```
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop# nvidia-smi
Wed Nov  6 16:39:08 2019
+-----+
| NVIDIA-SMI 440.31          Driver Version: 440.31          CUDA Version: 10.2     |
+-----+
| GPU  Name                   Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf    Pwr:Usage/Cap|      Memory-Usage | GPU-Util  Compute M. |
+-----+-----+
|   0   Quadro T1000             Off          | 00000000:01:00:0  Off |             N/A     |
| N/A   49C    P0              7W /  N/A |  0MiB /  3908MiB |           0%      Default |
+-----+-----+
+-----+
| Processes:                                                       GPU Memory |
|  GPU       PID    Type    Process name                               Usage      |
+-----+-----+
| No running processes found                                     |
+-----+
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop#
```

- Reboot the system.



Revision History

Version	Date	Author	Changes/Updates
1.0	1/22/2021	Hady Asad	Initial launch release
1.1	10/27/2022	Aleksandr Pantelev	Removed Storage configuration step.
1.2	11/9/2022	Aleksandr Pantelev	Added installation process for AMD and Nvidia drivers
1.3	11/9/2022	Aleksandr Pantelev	Added list of supported platforms