

Ubuntu Linux Setup Guide

For Lenovo ThinkPad P15, P17, P1 Gen 3

**** Official support of Ubuntu 20.04 LTS and later.*



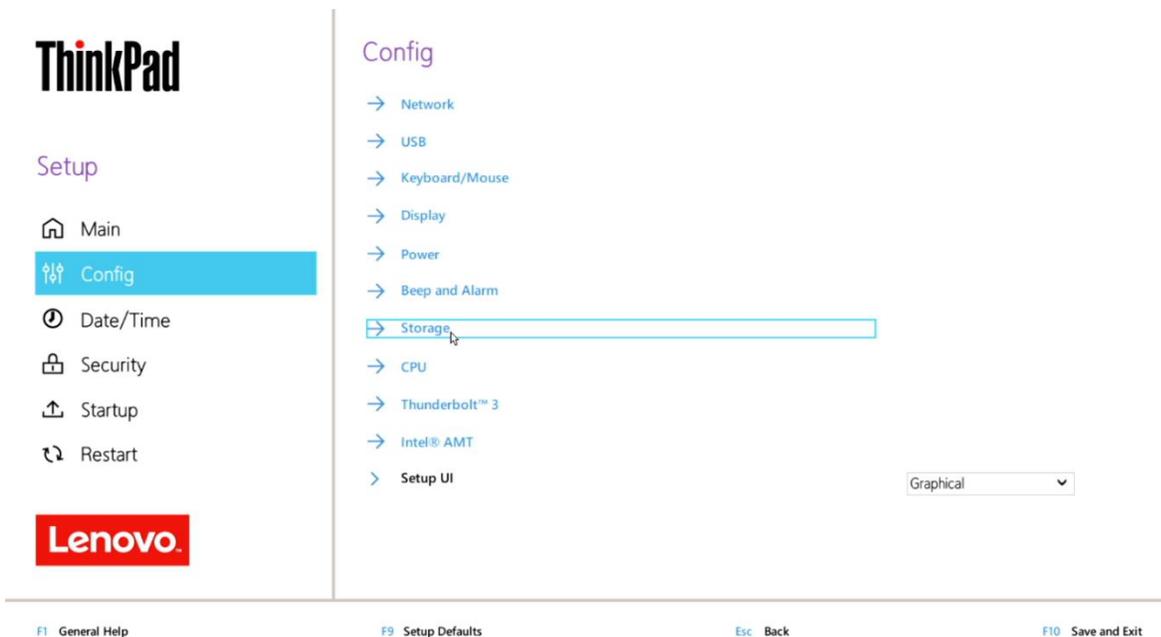
Section 1 – BIOS Setup and Pre-Installation Steps

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

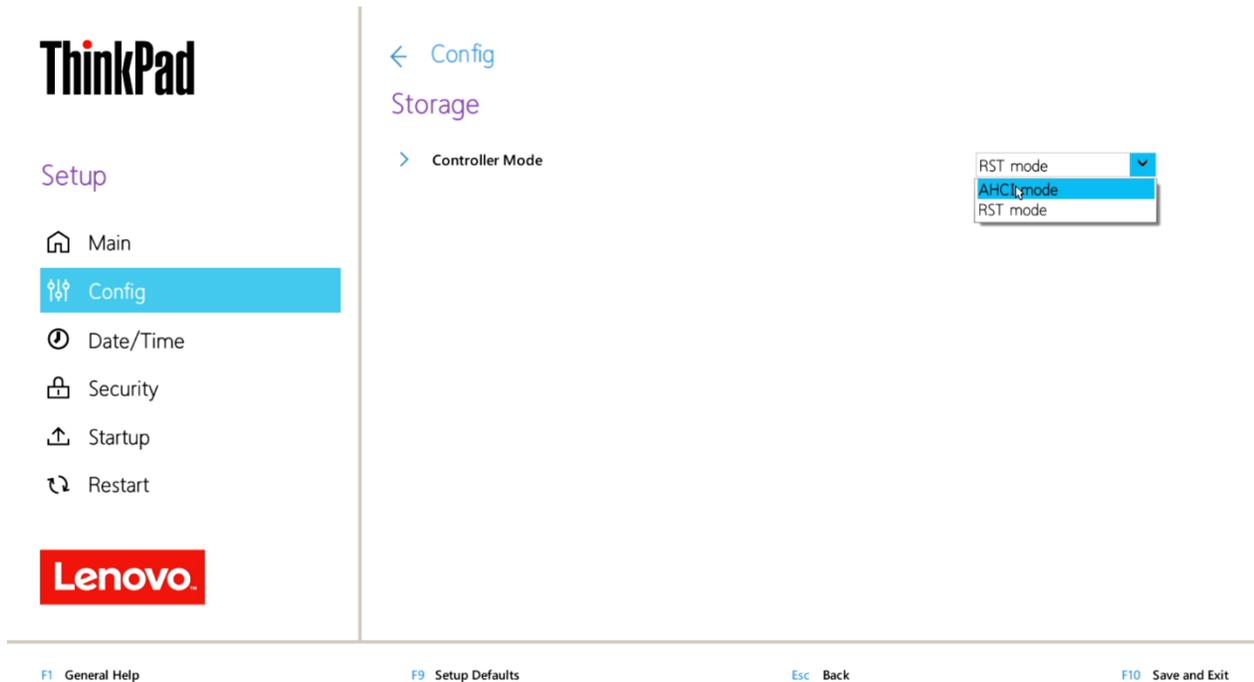
- Boot into BIOS by pressing the function F1 key at the “Lenovo” splash screen.



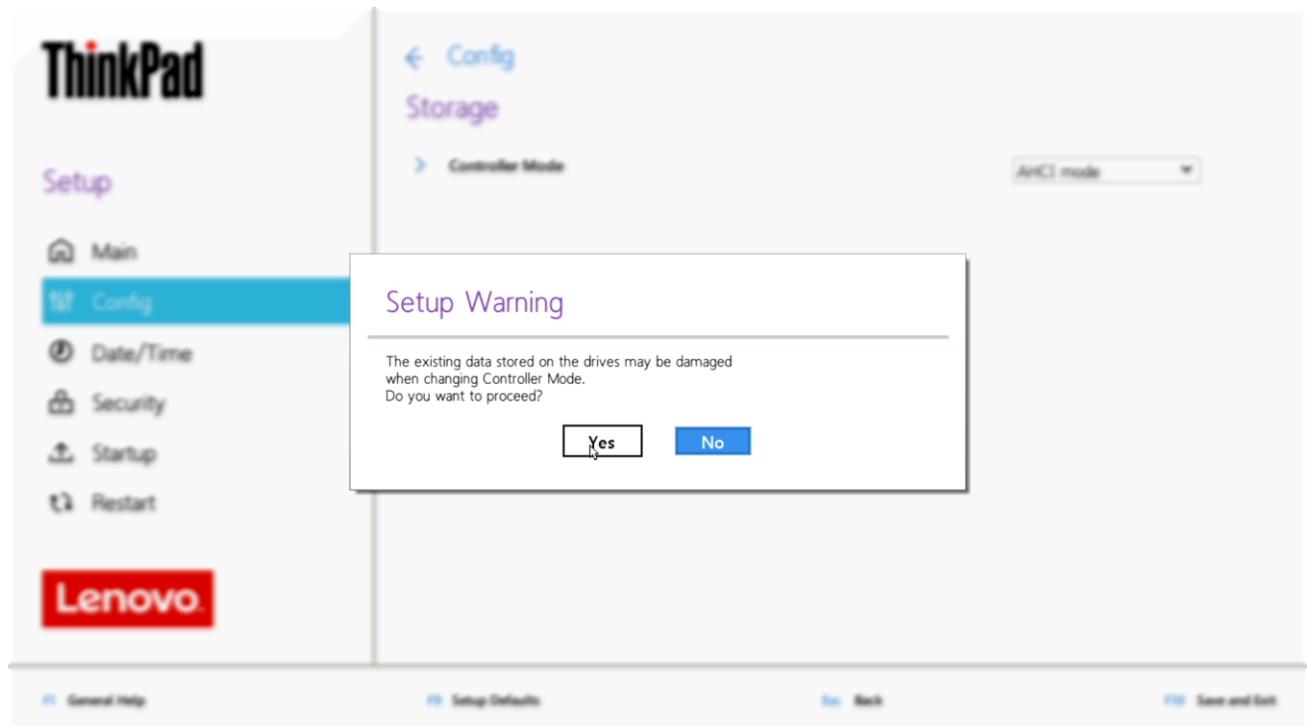
- Tab over to the “Config” menu tab



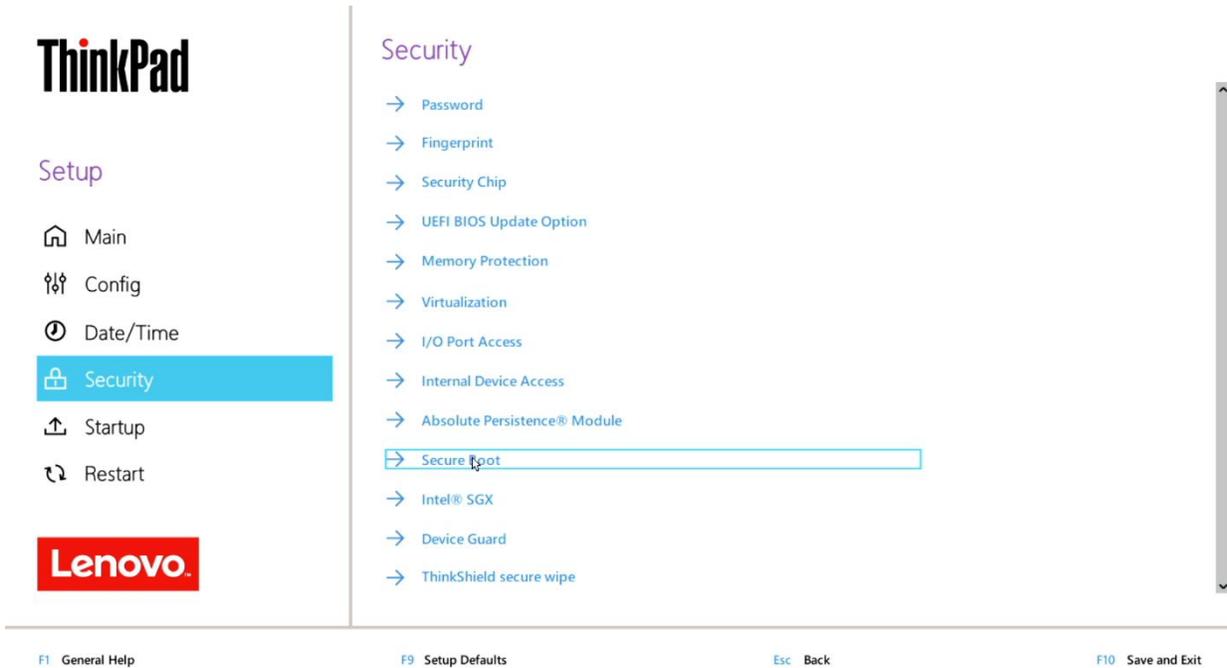
- Enter the “Storage” category and change the “Controller Mode” to “AHCI mode”



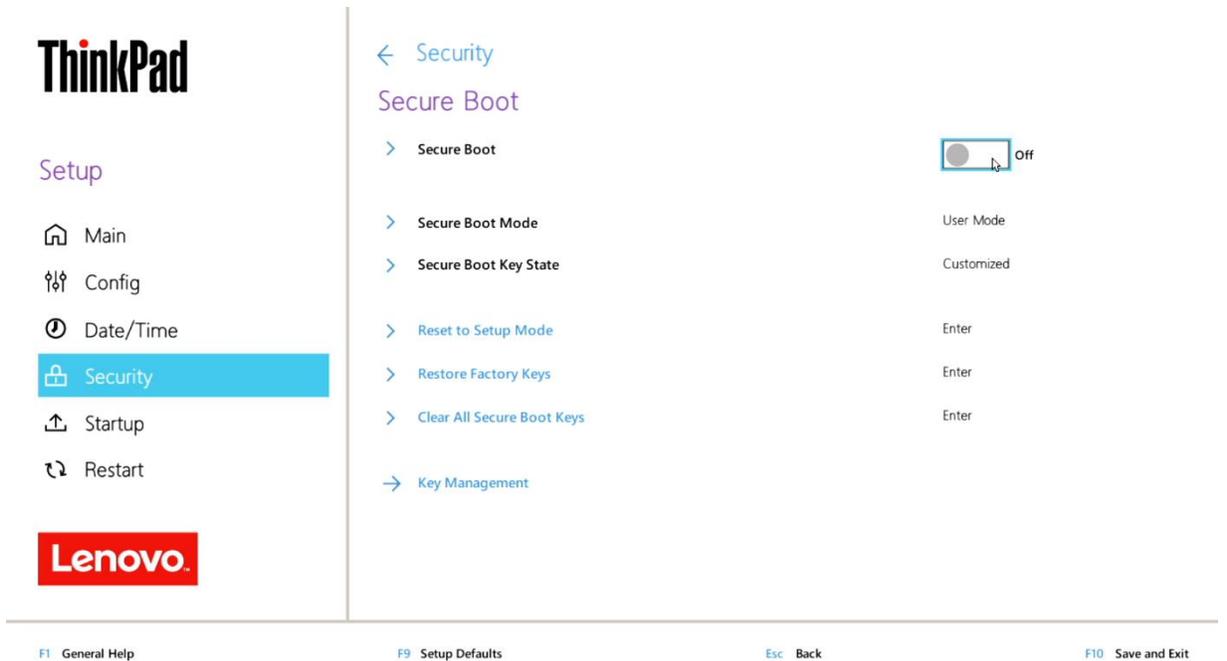
- Select “Yes” to proceed with changing the Controller Mode



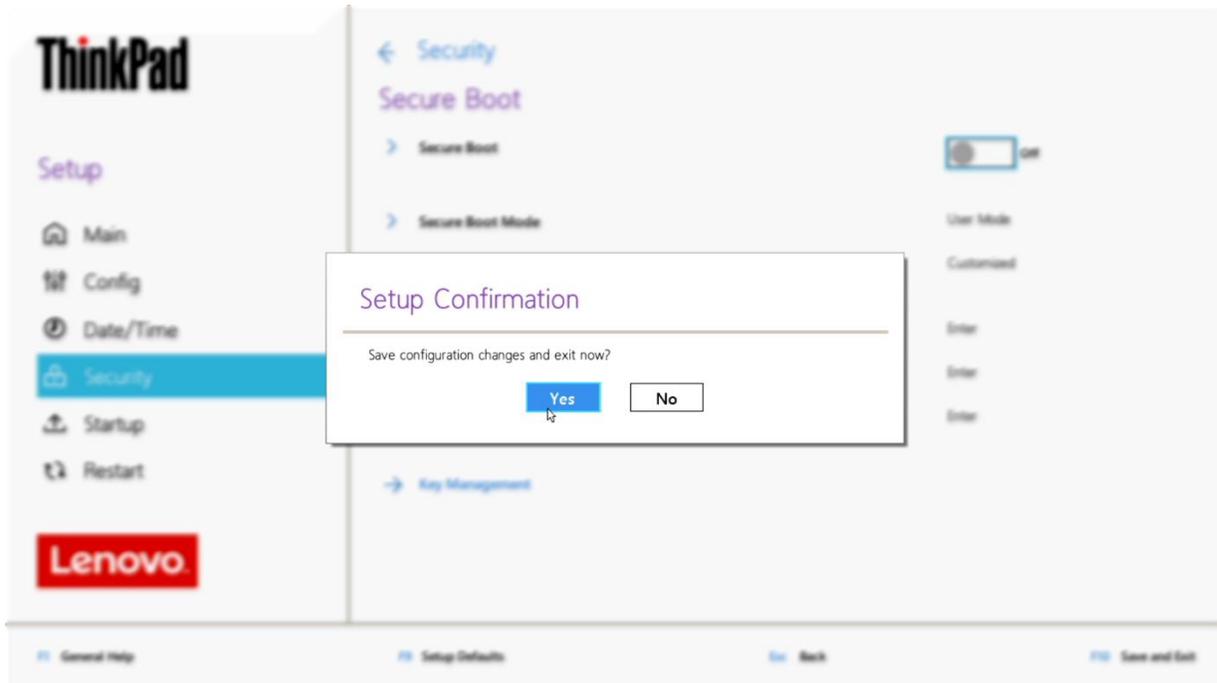
- Tab over to the “Security” menu tab and enter the “Secure Boot” category



- Set “Secure Boot” to “Off”



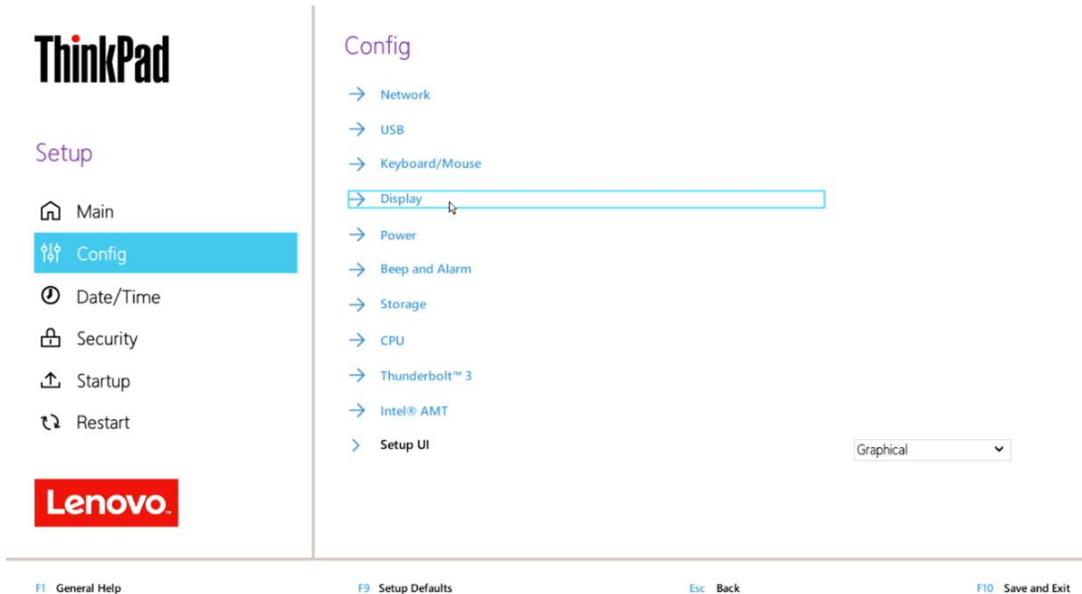
- Press function F10 key to save and exit BIOS setup.



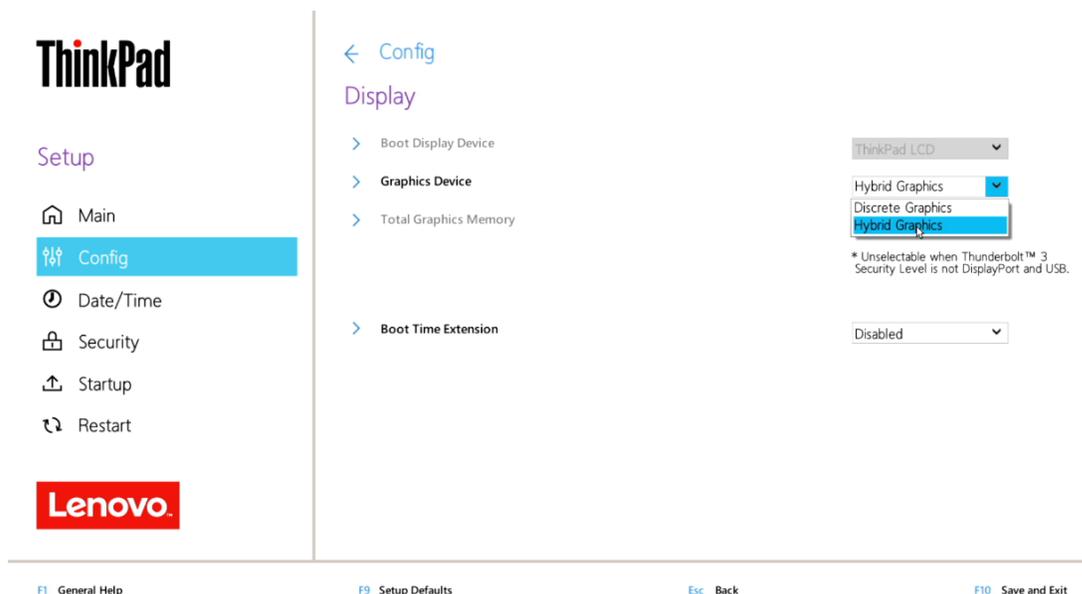
Section 2 – Discrete vs Hybrid Graphics

The Lenovo ThinkPad P15, P17, and P1 Gen 3 systems offer both Nvidia and Intel graphics.

- Note that it is necessary to switch the Graphics Device to “Hybrid Graphics” in order to avoid graphical issues during installation. After installing the NVIDIA graphics driver in Section 4, “Discrete Graphics” can be used. Alternatively, you can disable the Nouveau driver during installation if you would like to continue using “Discrete Graphics”.
- Boot into BIOS and tab over to the “Config” menu option, then select the “Display” option.



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



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 P15, P17, and P1 Gen 3.

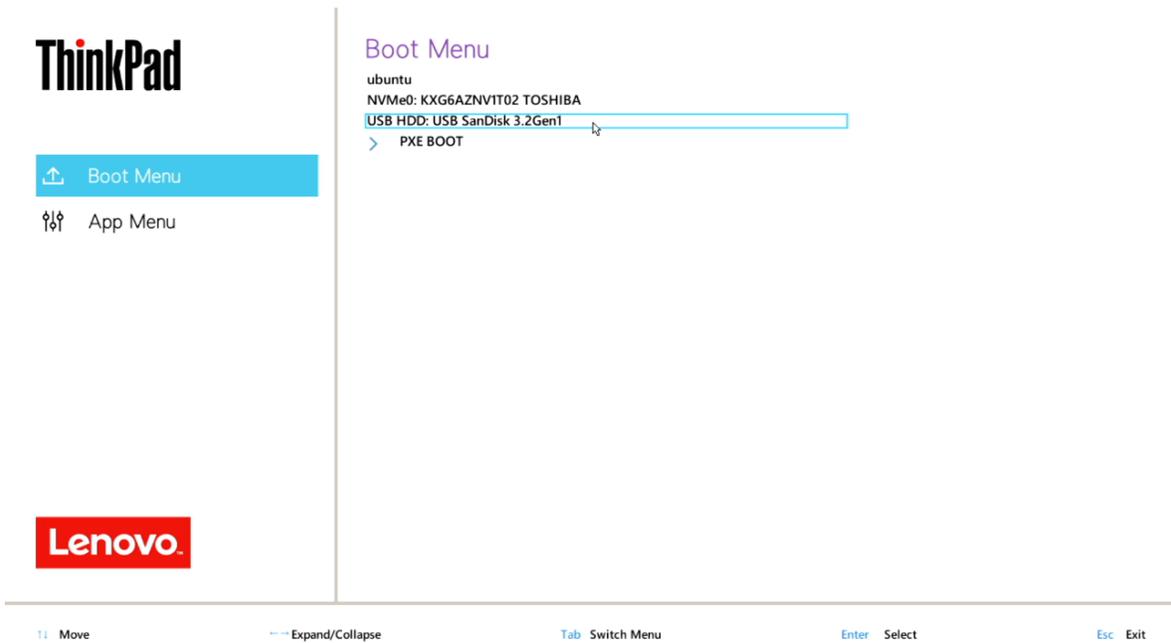
- Insert the Ubuntu 20.04 LTS installation media (either through USB or CD/DVD).
- Power on the system and press the F12 function key whenever the following Lenovo splash screen appears.



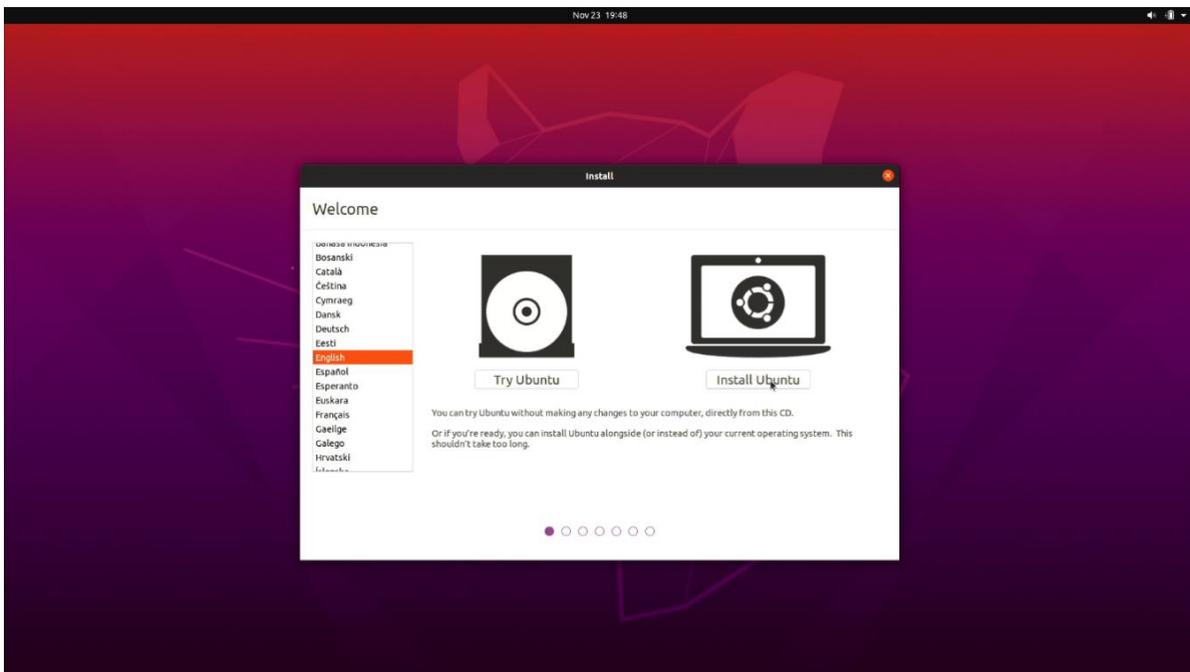
- Select the Linux bootable installation media from the F12 boot menu list.



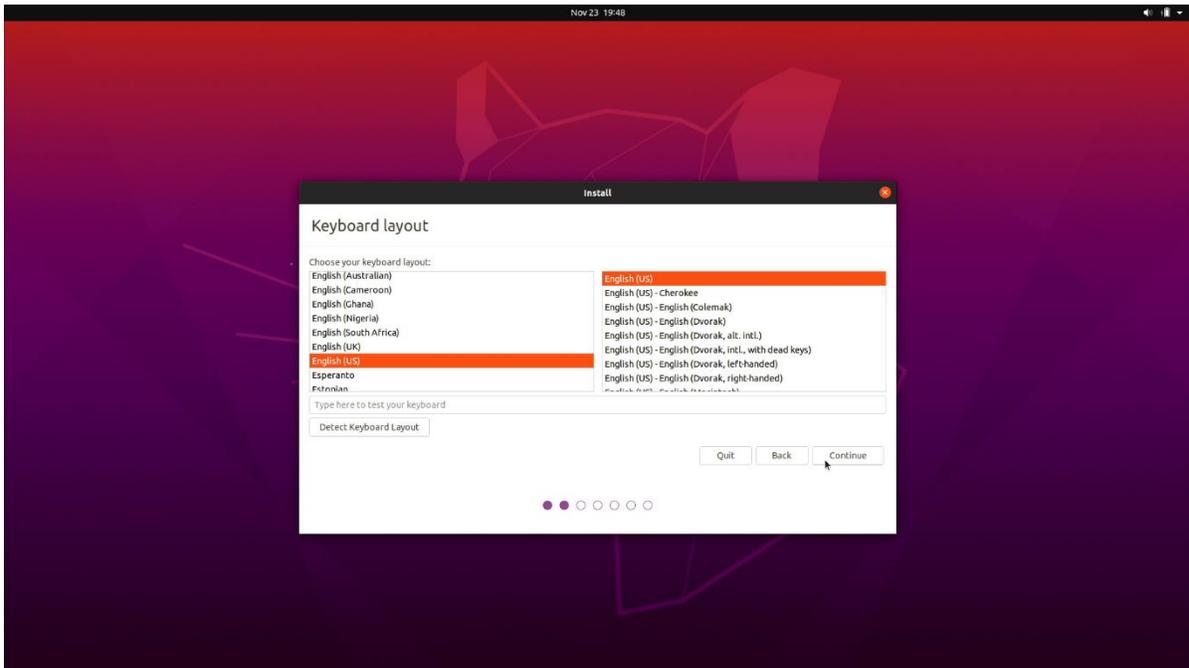
- Highlight “Install Ubuntu” from the GRUB boot menu and press ‘enter’.



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



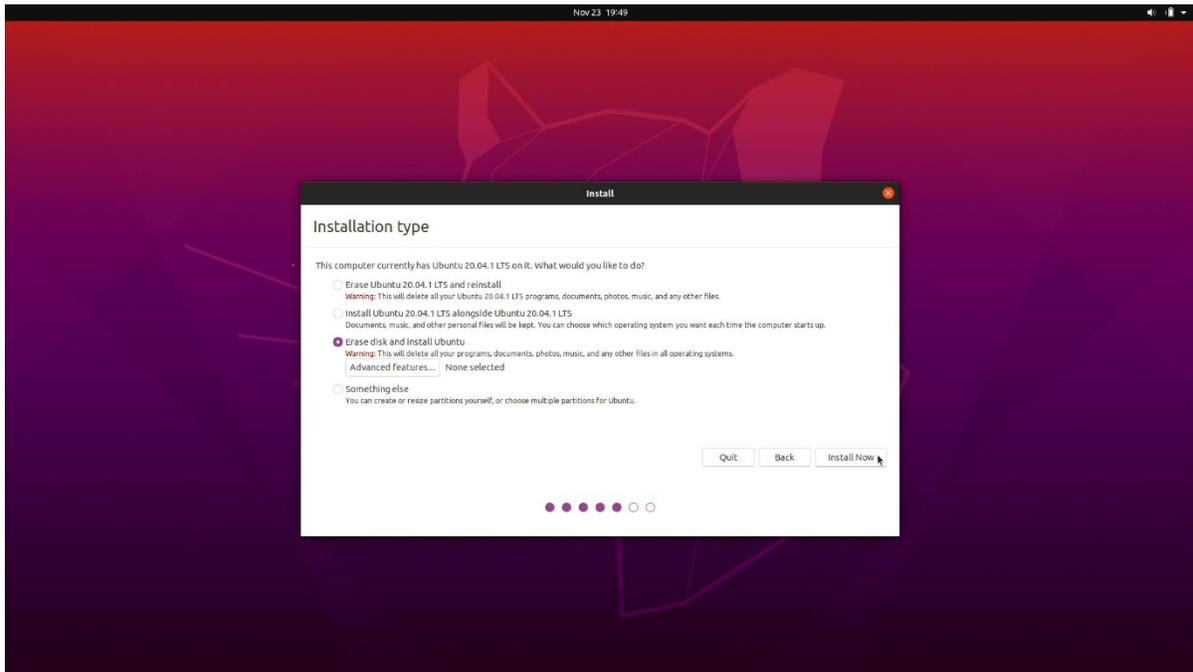
- Select the appropriate keyboard layout and language and “Continue”.



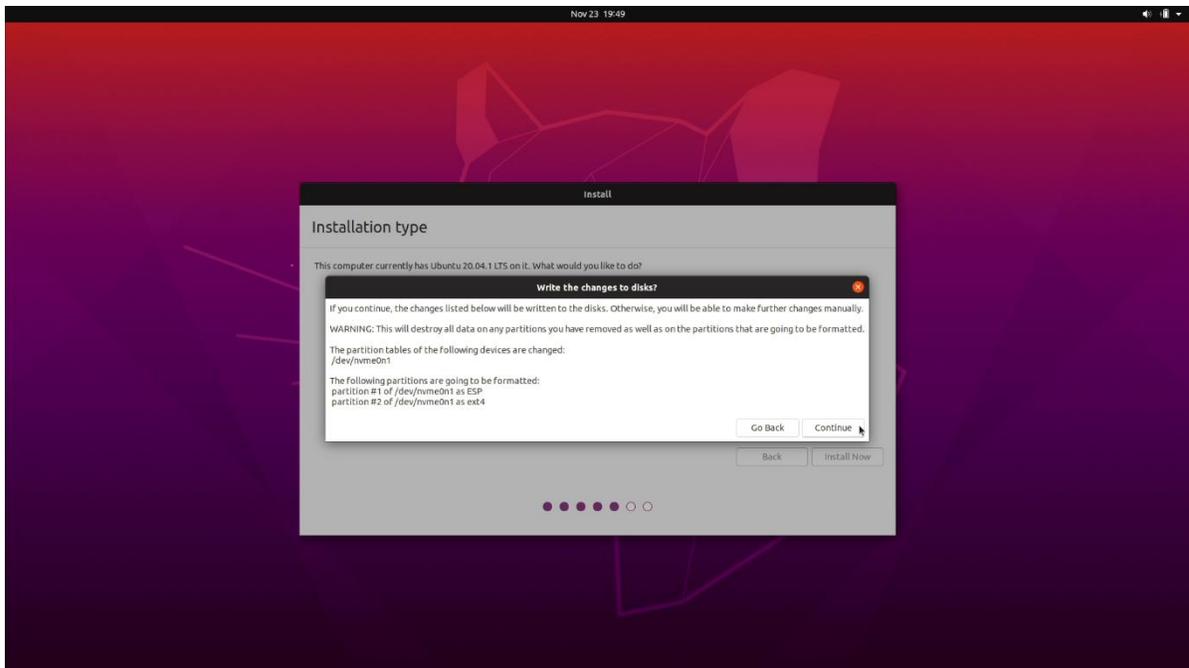
- Select “Normal Installation” as well as “Install third-party software...” then “Continue”.



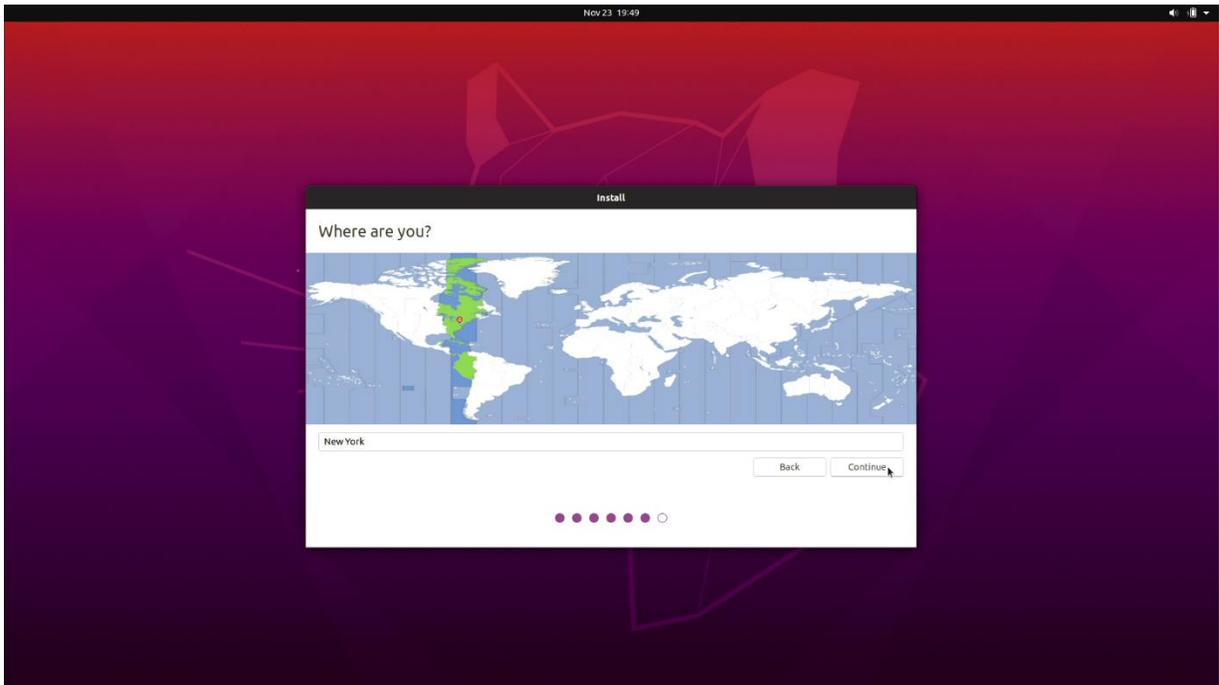
- Choose the installation type. For simplicity, this guide was done using “Erase disk and install Ubuntu”



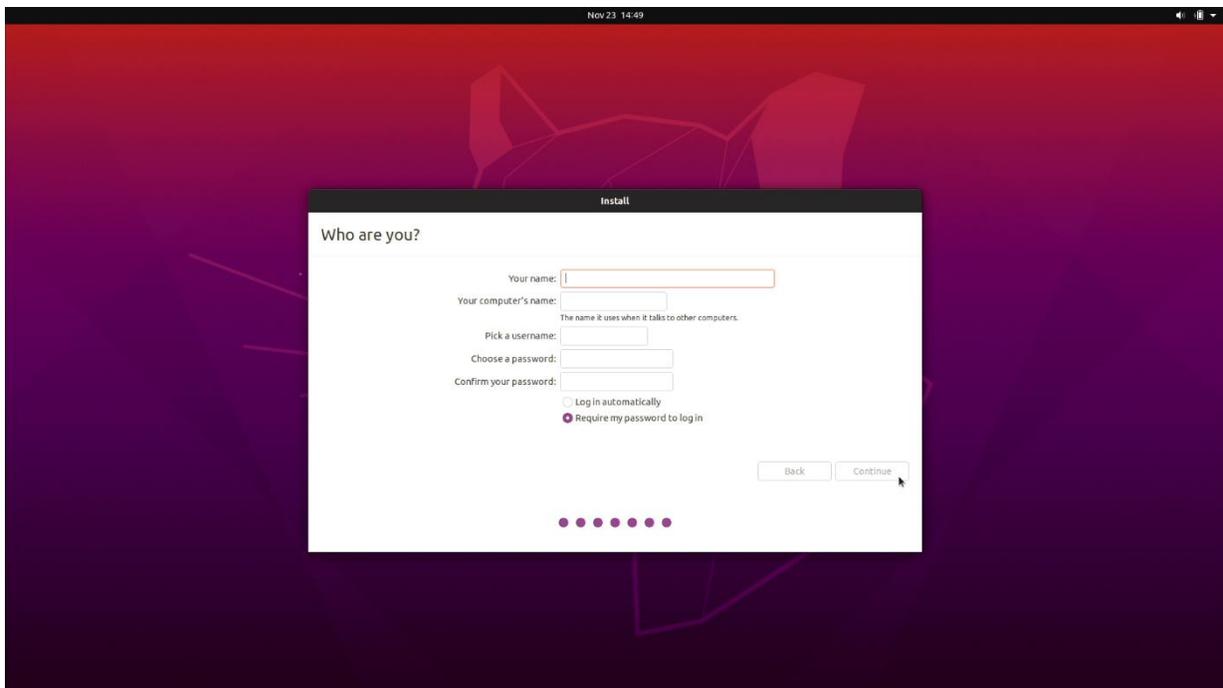
- Select “Continue” to confirm changes will be made to the disk.



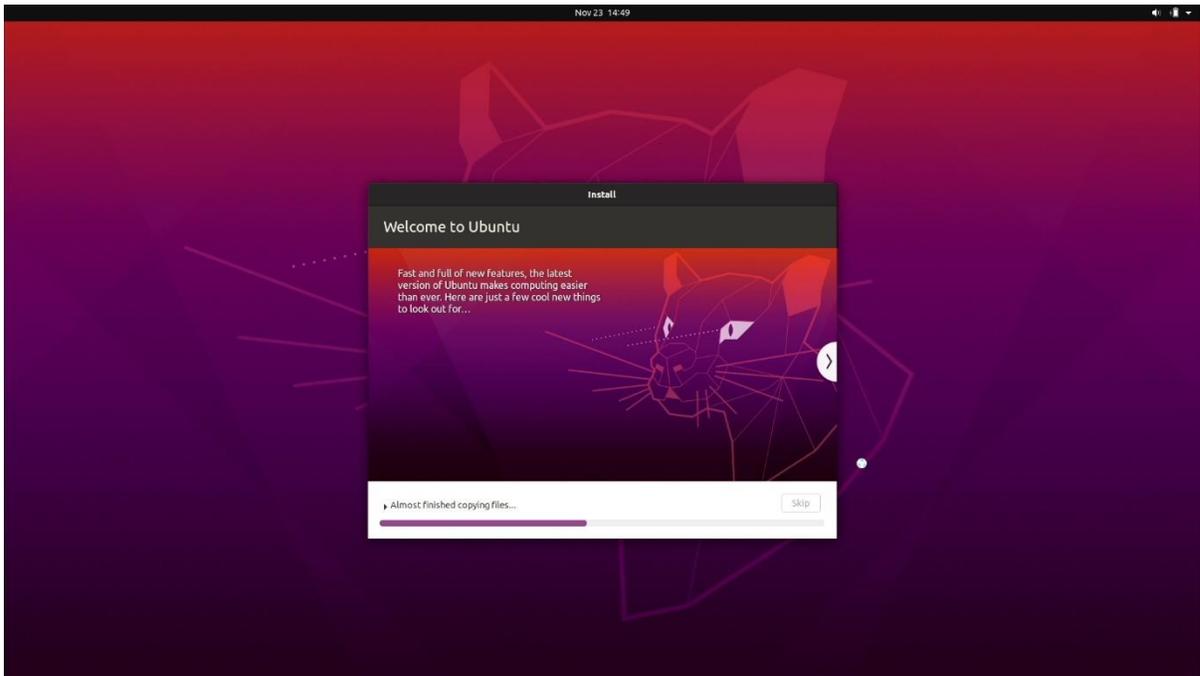
- Choose the appropriate geographical location and select “Continue”.



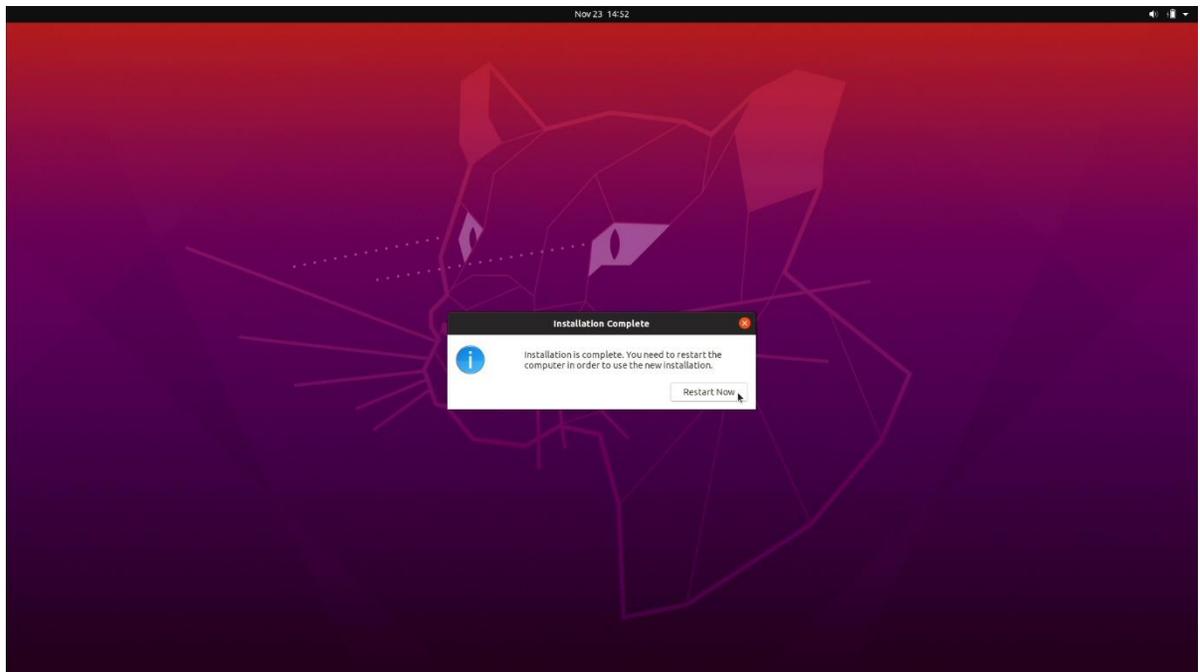
- Fill out the appropriate information and select “Continue”.



- Ubuntu installation progress bar will be shown.



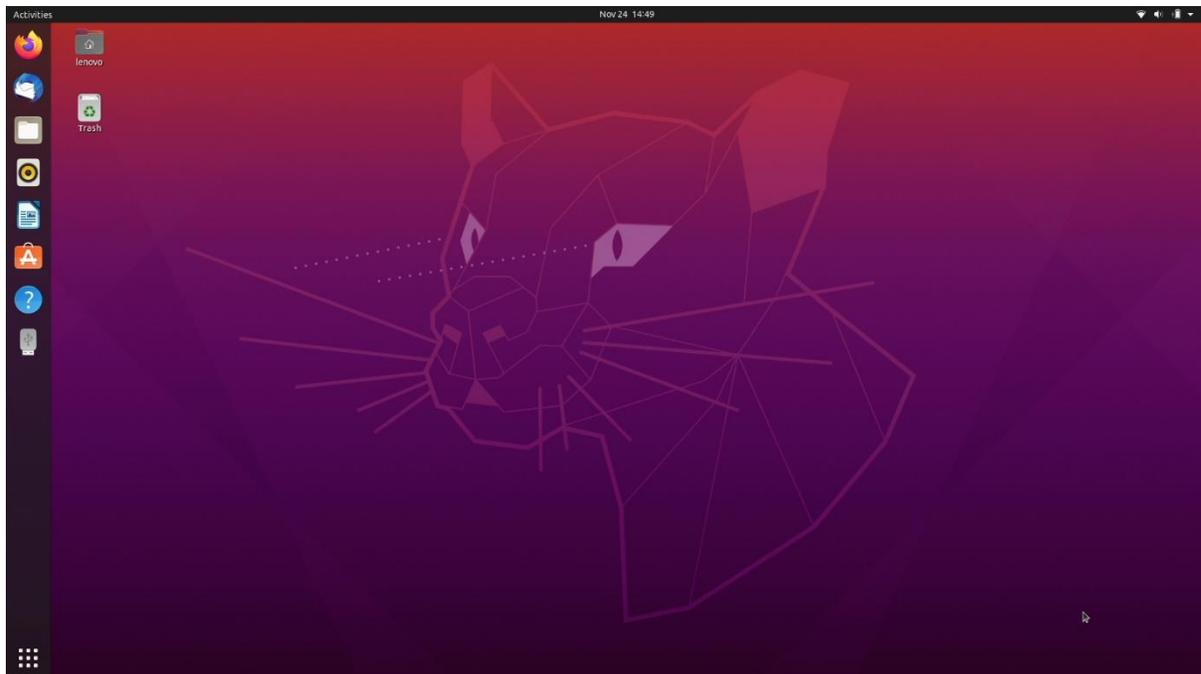
- Once the installation completes, select "Restart Now".



- Remove the installation media and press ENTER.



- Ubuntu Desktop Screen:



Section 4 – Installing the Nvidia Graphics Driver

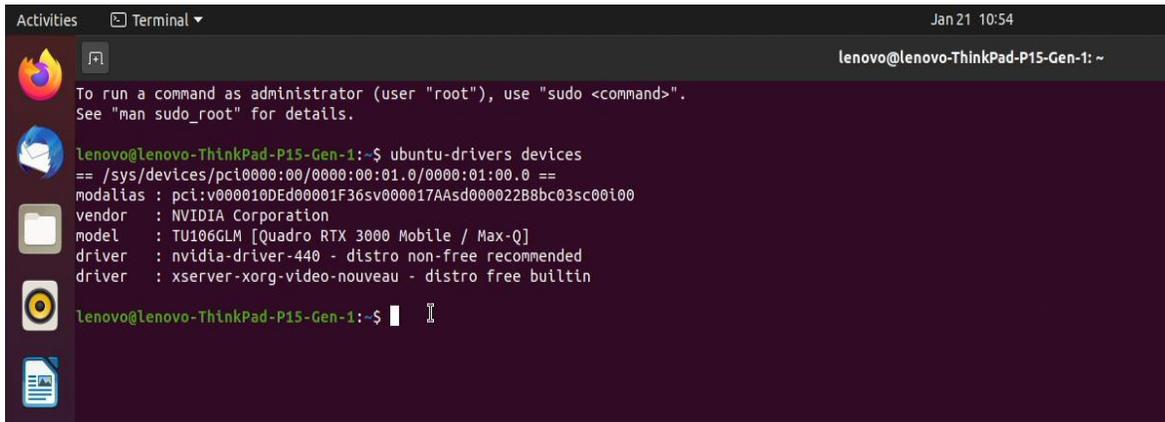
In order to get optimal performance out of the Nvidia GPU, it's a good idea to ensure the latest Nvidia graphics driver is installed.

- Note that by selecting “Install third-party software...” during the Ubuntu installation in Step 3, a compatible NVIDIA Driver should already be installed.

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

- Detect the model of your Nvidia GPU and the recommended driver using this command.

```
# ubuntu-drivers devices
```



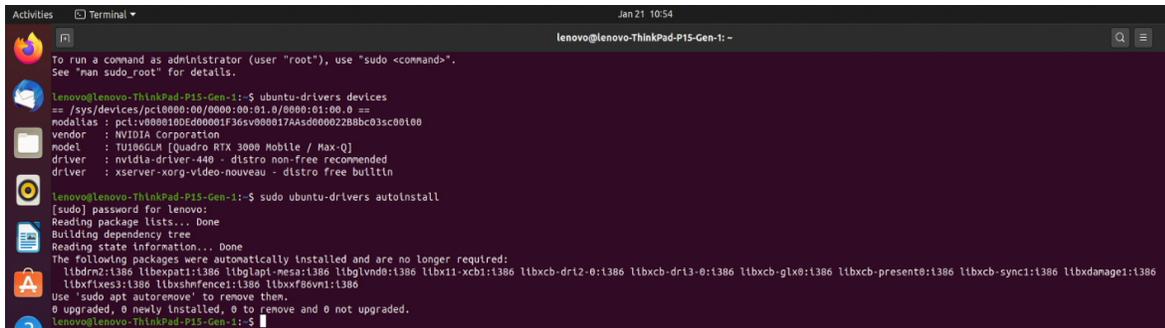
```
lenovo@lenovo-ThinkPad-P15-Gen-1: ~
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

lenovo@lenovo-ThinkPad-P15-Gen-1:~$ ubuntu-drivers devices
== /sys/devices/pci0000:00/0000:00:01.0/0000:01:00.0 ==
modalias : pci:v000010DEd00001F36sv000017AAsd000022B8bc03sc00i00
vendor   : NVIDIA Corporation
model    : TU106GLM [Quadro RTX 3000 Mobile / Max-Q]
driver   : nvidia-driver-440 - distro non-free recommended
driver   : xserver-xorg-video-nouveau - distro free builtin

lenovo@lenovo-ThinkPad-P15-Gen-1:~$
```

- You can then run the following command to auto install all recommended drivers.

```
# sudo ubuntu-drivers autoinstall
```



```
lenovo@lenovo-ThinkPad-P15-Gen-1:~$ sudo ubuntu-drivers autoinstall
(Sudo) password for lenovo:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libdrm2:1.3.86 libxop1:1.3.86 liblapack-resat:1.3.86 libglvnd0:1.386 libx11-xcb1:1.386 libxcb-dri2-0:1.386 libxcb-dri3-0:1.386 libxcb-glx0:1.386 libxcb-present0:1.386 libxcb-sync1:1.386
  libxfixes3:1.386 libxshmfence1:1.386 libxxf86vm1:1.386
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.

lenovo@lenovo-ThinkPad-P15-Gen-1:~$
```

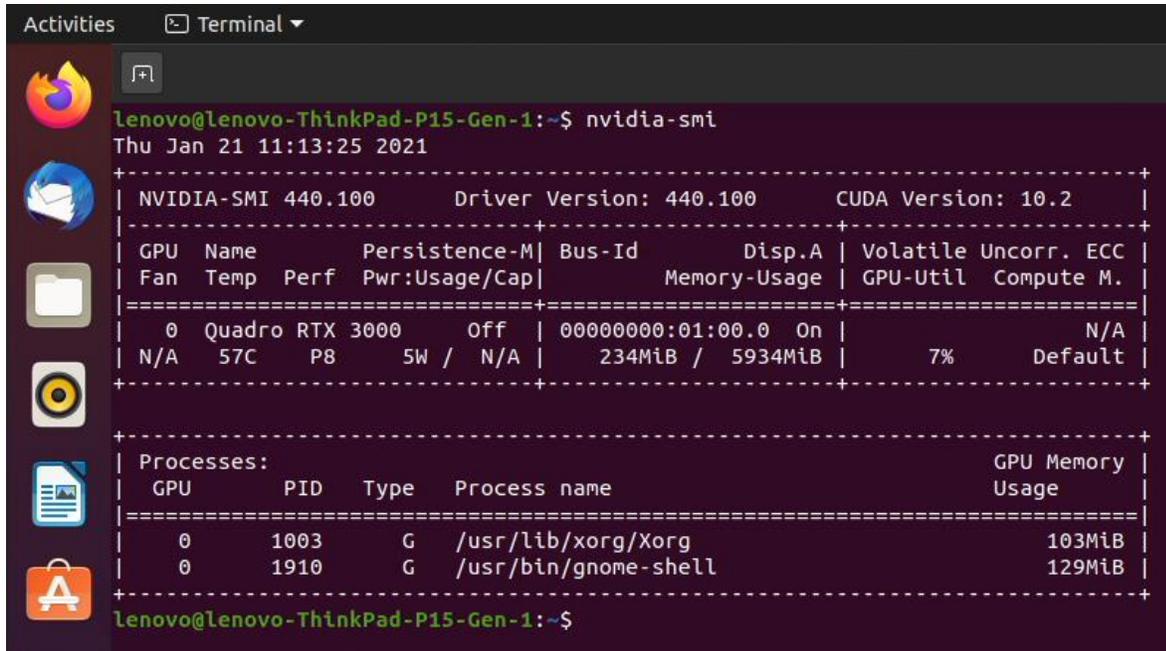
- In this case, the most recent driver was already installed by selecting “Install third-party software...” during the Ubuntu installation in Step 3.

- Once the installation is complete, reboot the system.

```
# sudo reboot
```

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

```
# nvidia-smi
```



```
Lenovo@Lenovo-ThinkPad-P15-Gen-1:~$ nvidia-smi
Thu Jan 21 11:13:25 2021
+-----+
| NVIDIA-SMI 440.100      Driver Version: 440.100      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 RTX 3000     Off      | 00000000:01:00.0 On |          N/A         |
| N/A   57C   P8      5W /  N/A   | 234MiB / 5934MiB |    7%      Default  |
+-----+-----+

Processes:
+-----+-----+
| GPU    PID    Type   Process name      GPU Memory |
|      |      |      |                  | Usage     |
+-----+-----+
| 0      1003   G     /usr/lib/xorg/Xorg 103MiB    |
| 0      1910   G     /usr/bin/gnome-shell 129MiB    |
+-----+-----+
Lenovo@Lenovo-ThinkPad-P15-Gen-1:~$
```

- The graphics device can now be set to “Discrete Graphics” in BIOS (see Section 2)

Section 5 – Revision History

Version	Date	Author	Changes/Updates
1.0	1/22/2021	Hady Asad	Initial launch release