

# Ubuntu Linux Setup Guide

For ThinkPad P1 Gen2

*\*\*\* Official support of Ubuntu 18.04 LTS and later*



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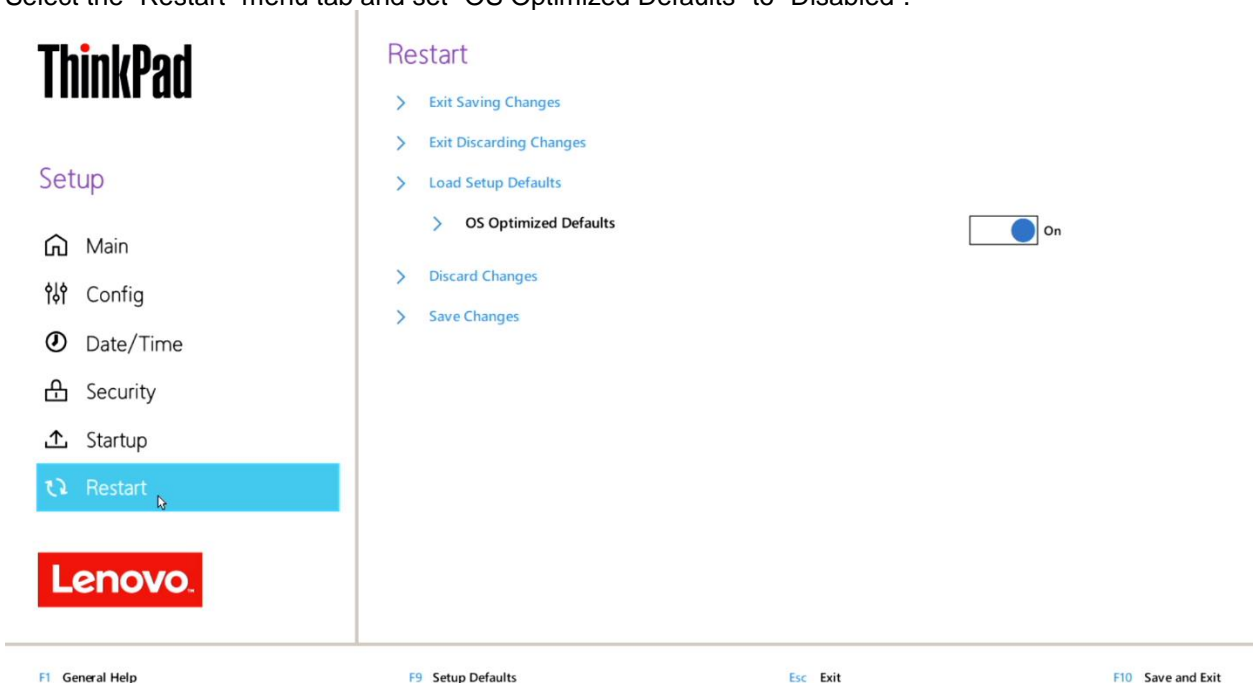
## Section 1 – BIOS Setup and Pre-Installation Steps

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

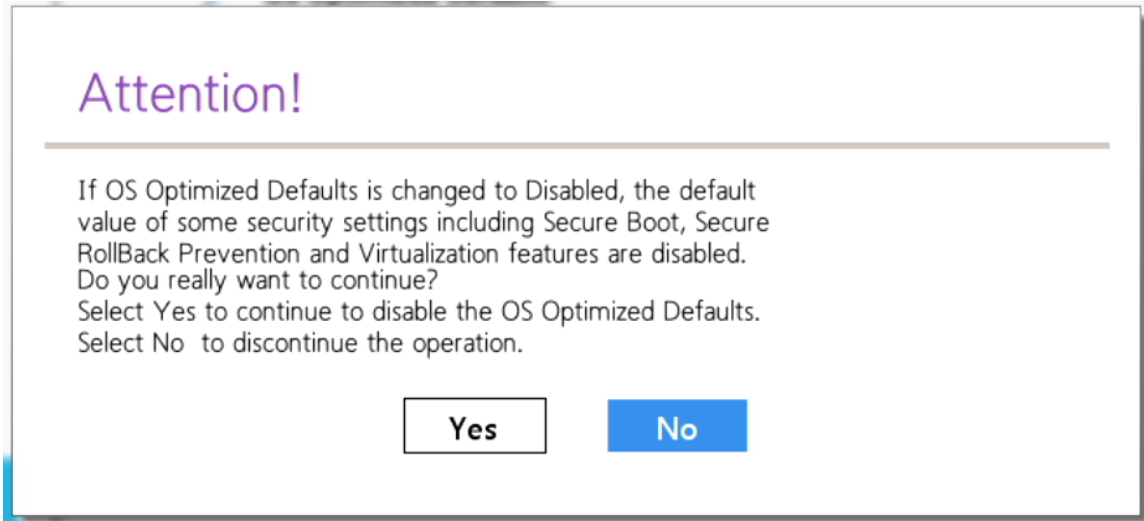
- Boot into BIOS by pressing the function F1 key at the “Lenovo” splash screen.



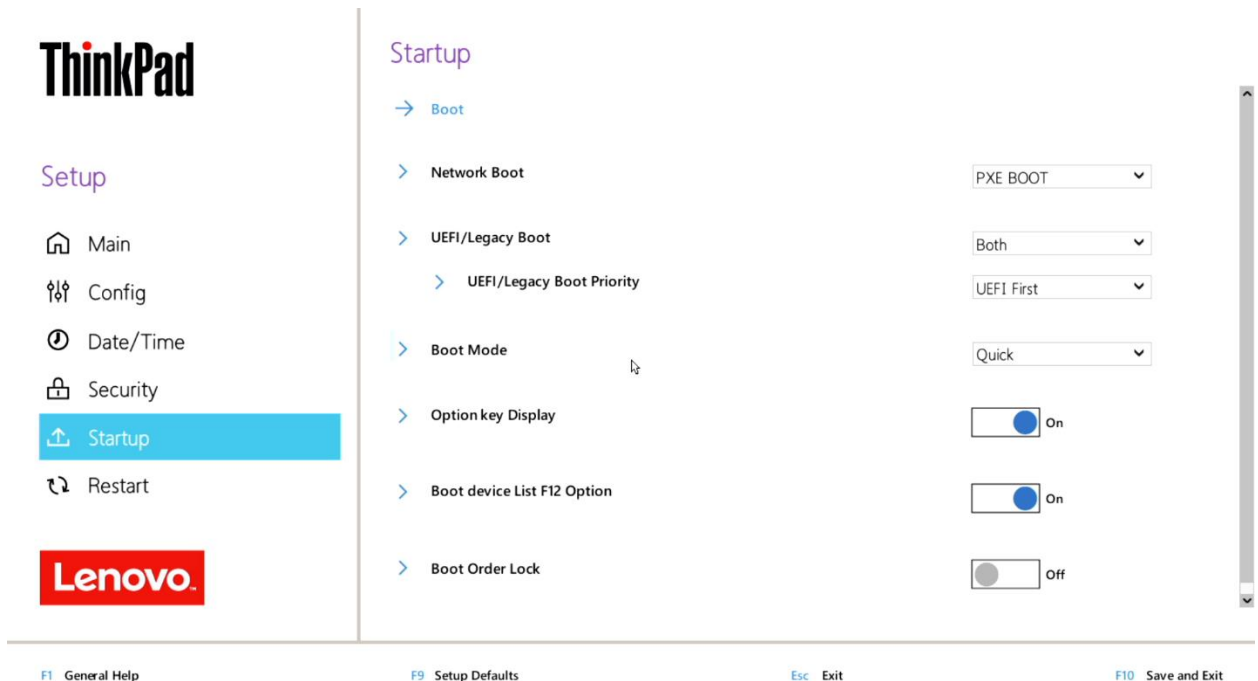
- Select the “Restart” menu tab and set “OS Optimized Defaults” to “Disabled”.



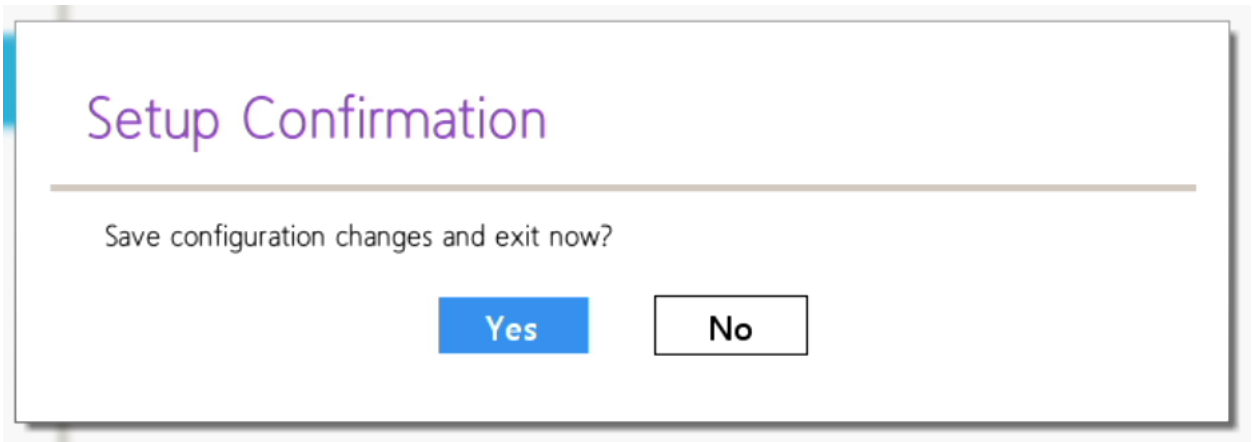
- Switching the “OS Optimized Defaults” settings may give a warning message. Select “Yes” to continue to disable OS Optimized Defaults.



- Select the “Startup” menu tab. Pressing F9 function key will allow Legacy and UEFI bootable devices by setting “UEFI/Legacy Boot” to “Both”; otherwise, it will be an unchangeable setting to “UEFI only”.



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

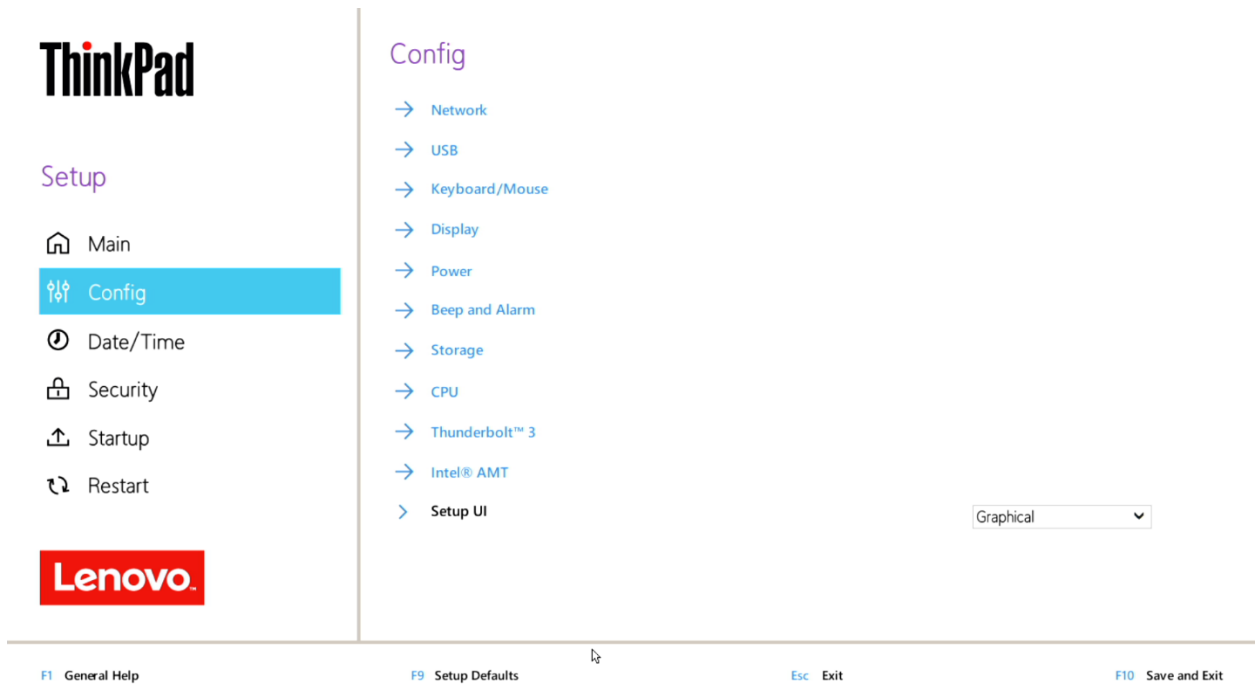


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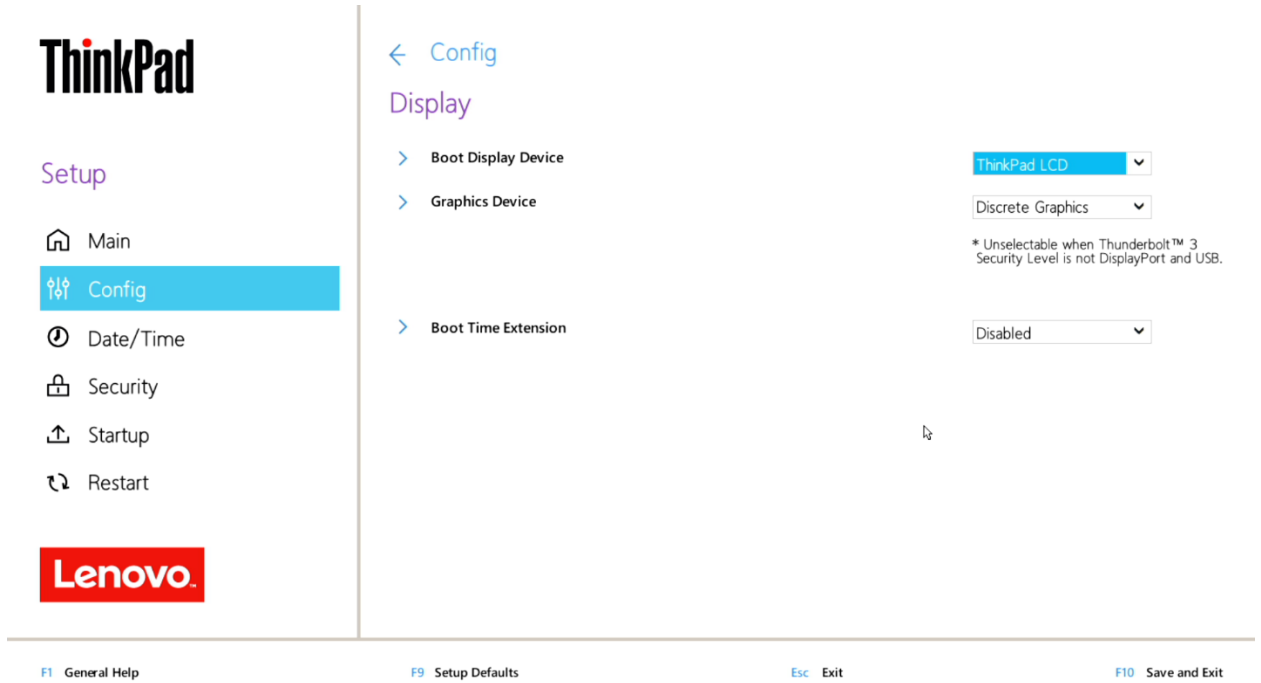
## Section 2 – Discrete vs Hybrid Graphics

The Thinkpad P1 Gen2 offers both Nvidia and Intel graphics. To run exclusively Nvidia graphics, use the discrete graphics mode highlighted below.

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



- By default, the “Graphics Device” will likely be set to “Hybrid Graphics”. To run exclusively Nvidia graphics, set the “Graphics Device” to “Discrete Graphics”.



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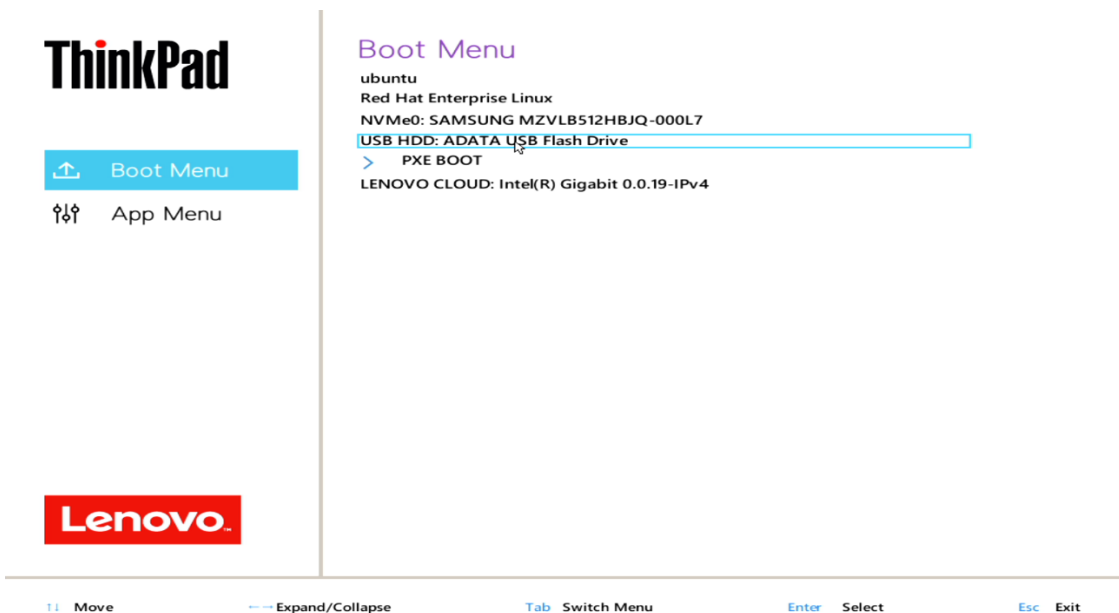
## Section 3 – Installing Ubuntu Linux 18.04 LTS

Please refer to the following instructions and screenshots on how to install Ubuntu 18.04 LTS on the Lenovo Thinkpad P1 Gen2.

- Insert the Ubuntu 18.04 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.



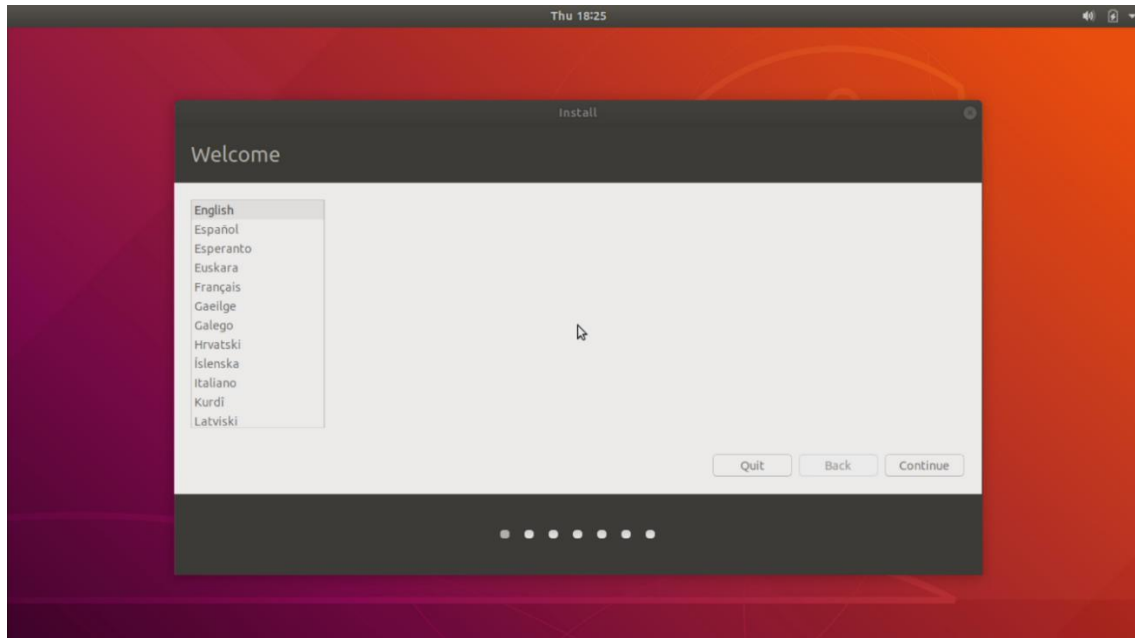
- Select the Linux bootable installation media from the F12 boot menu list.



- Highlight Install Ubuntu from the GRUB boot menu and hit enter.

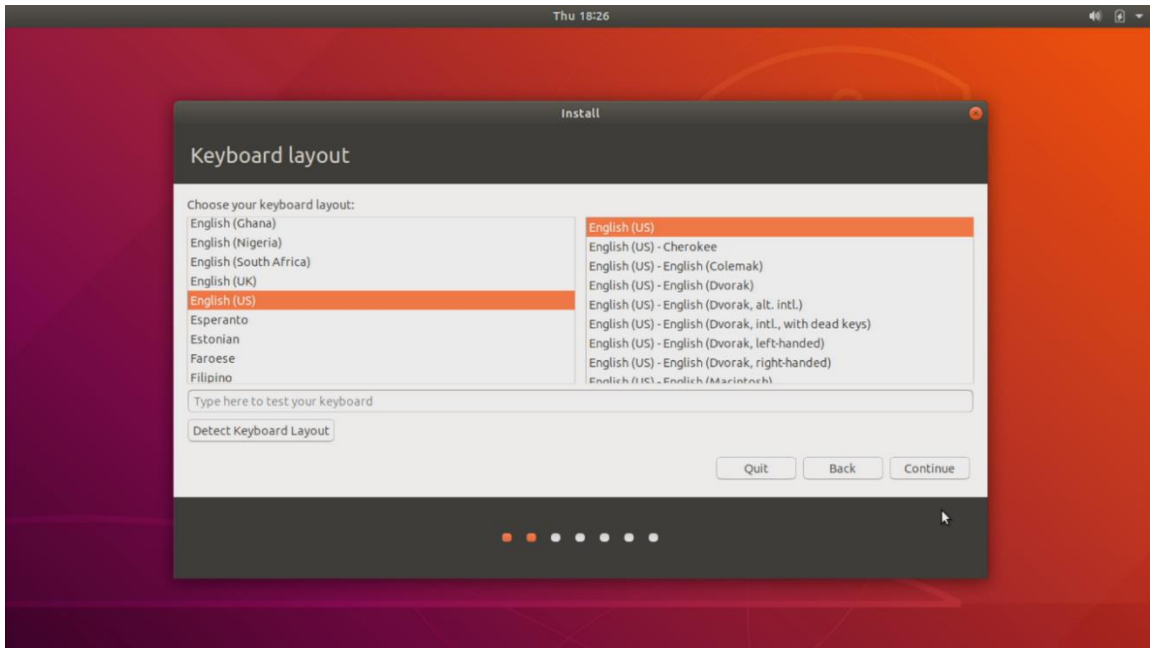


- The Ubuntu Linux Welcome Screen should appear. Select the appropriate language and “Continue”.

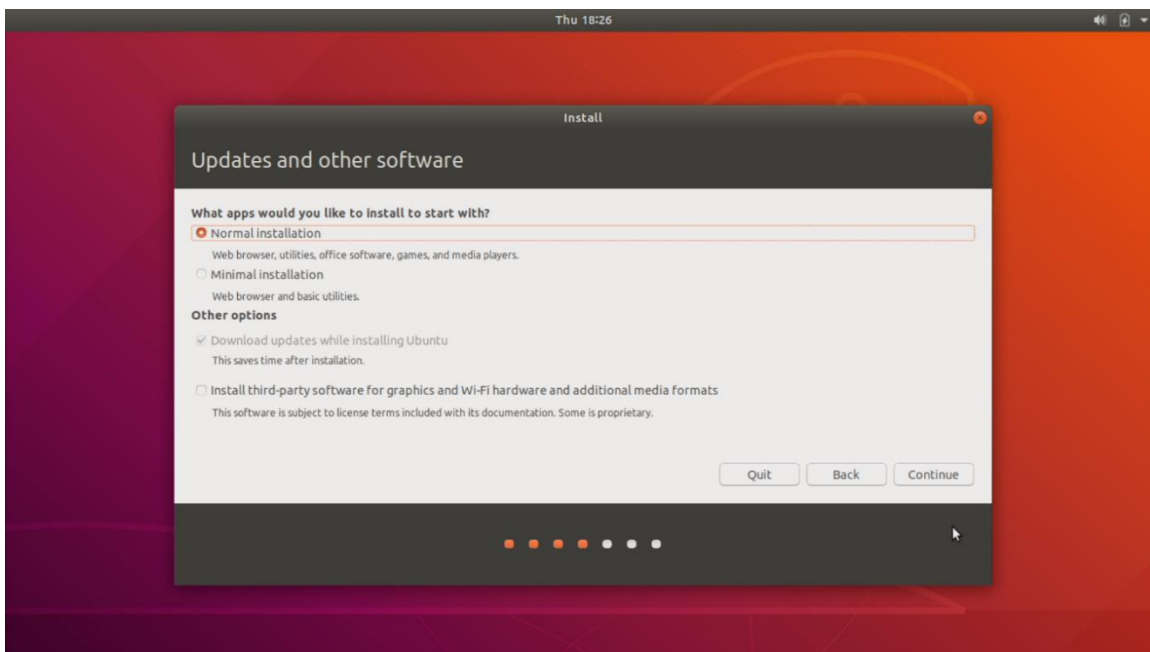




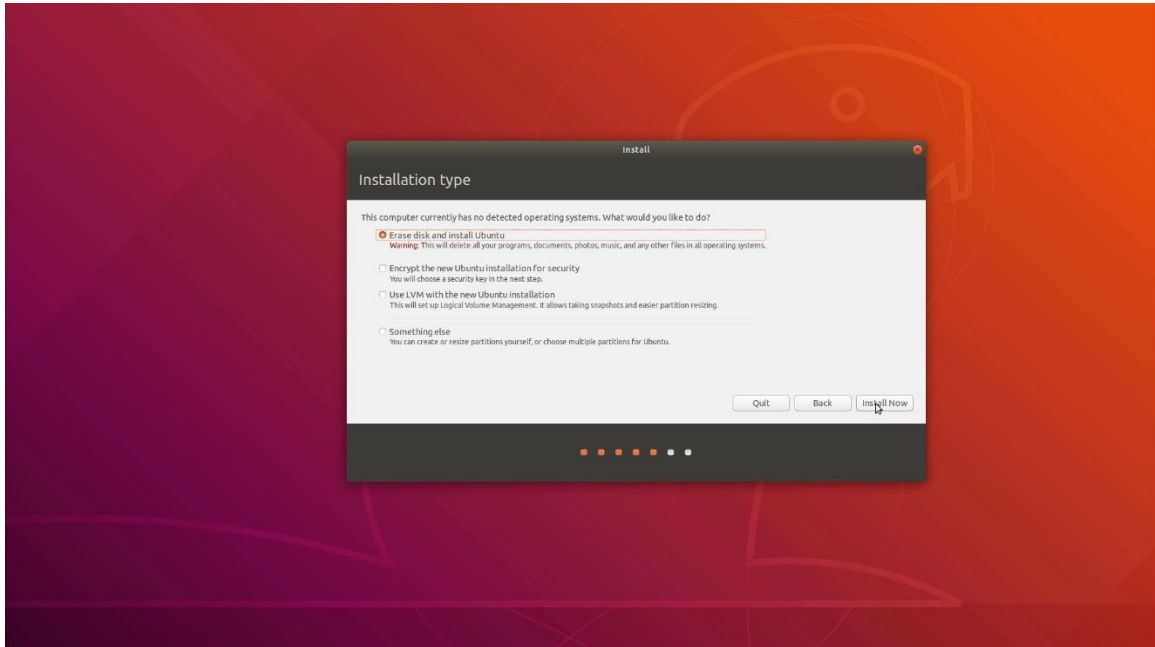
- Choose the keyboard layout and language accordingly by selecting each one.



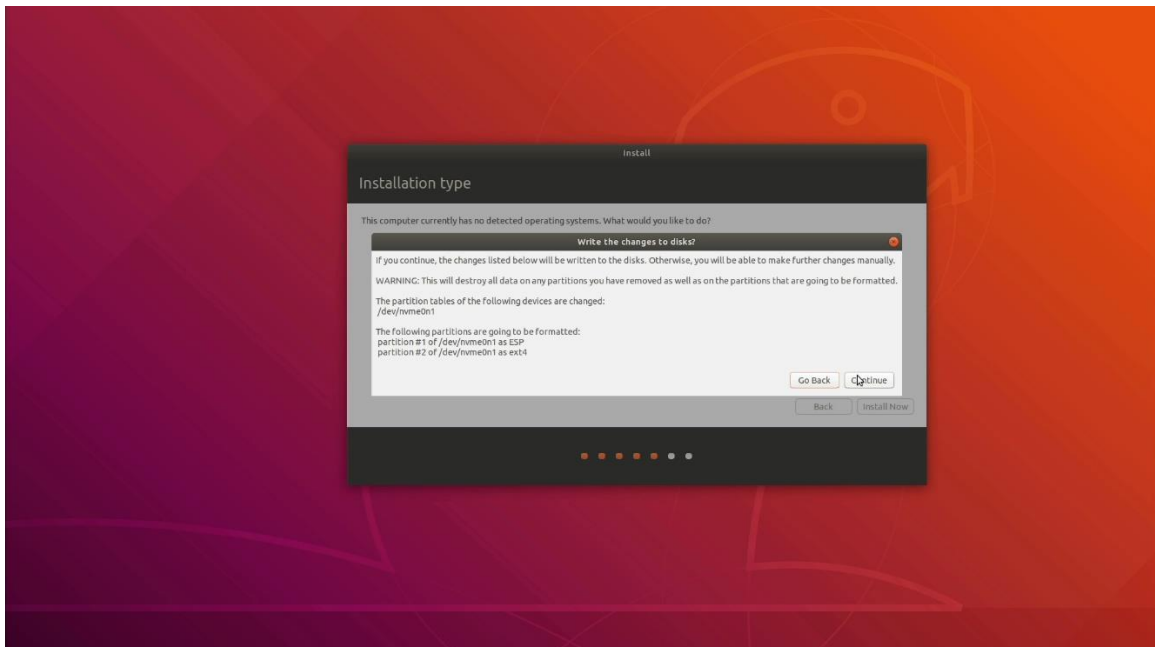
- Select "Normal Installation" and "Continue".



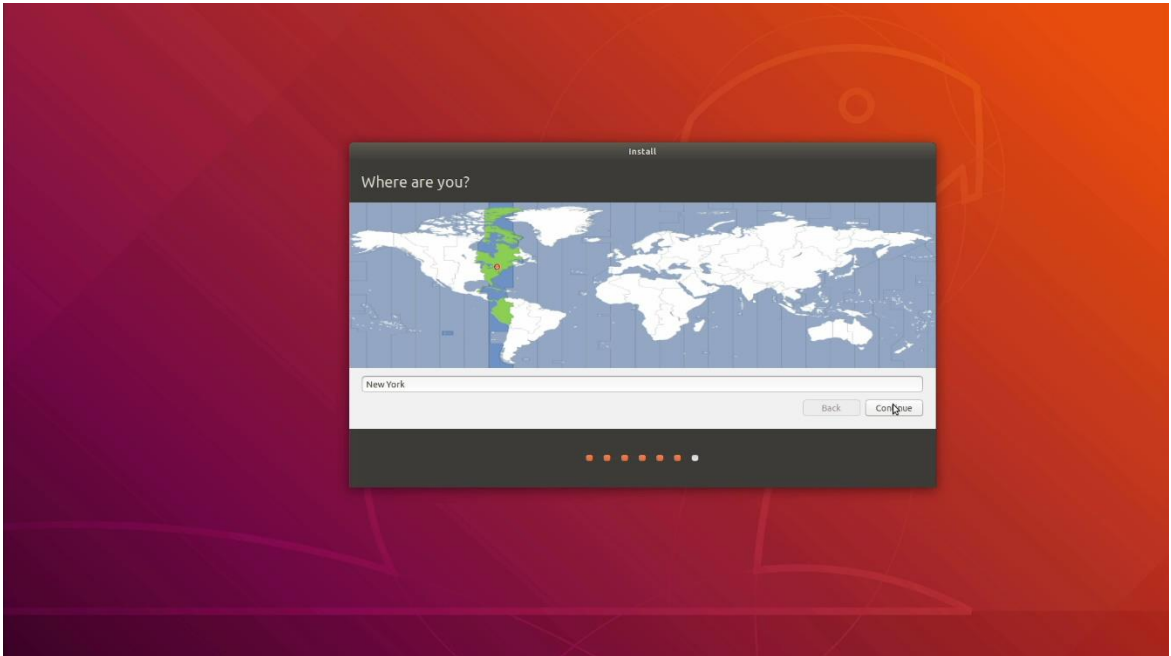
- Choose the installation type. For simplicity, this guide was done using “Erase disk and install Ubuntu”.



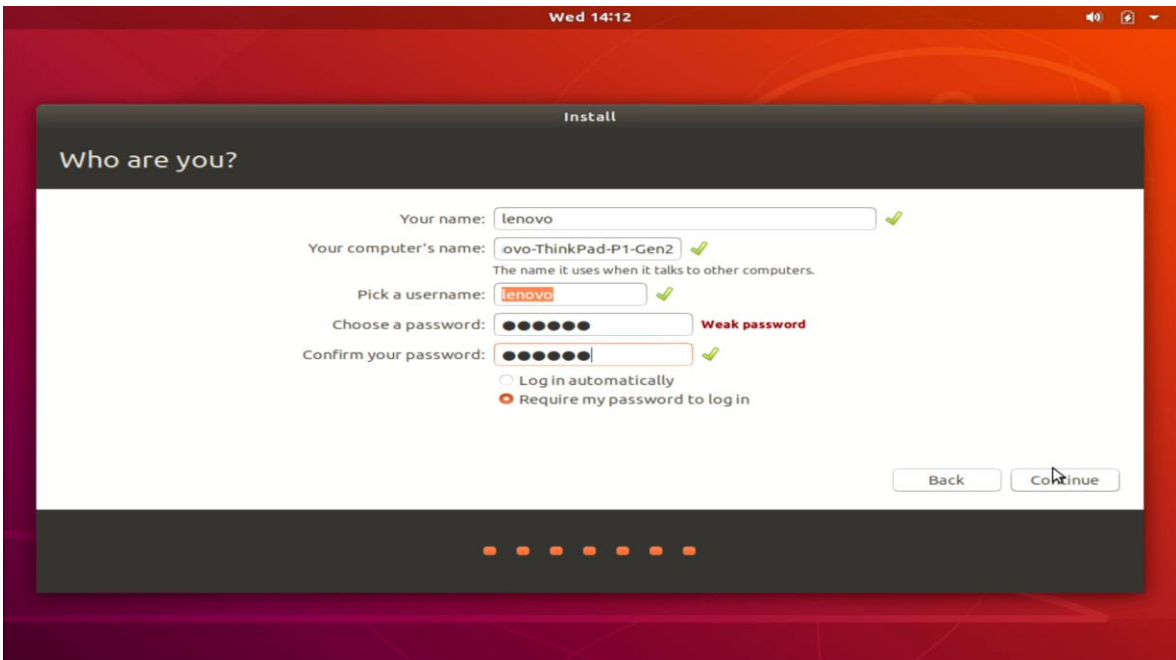
- Select “Continue” to confirm changes will be made to the disk.



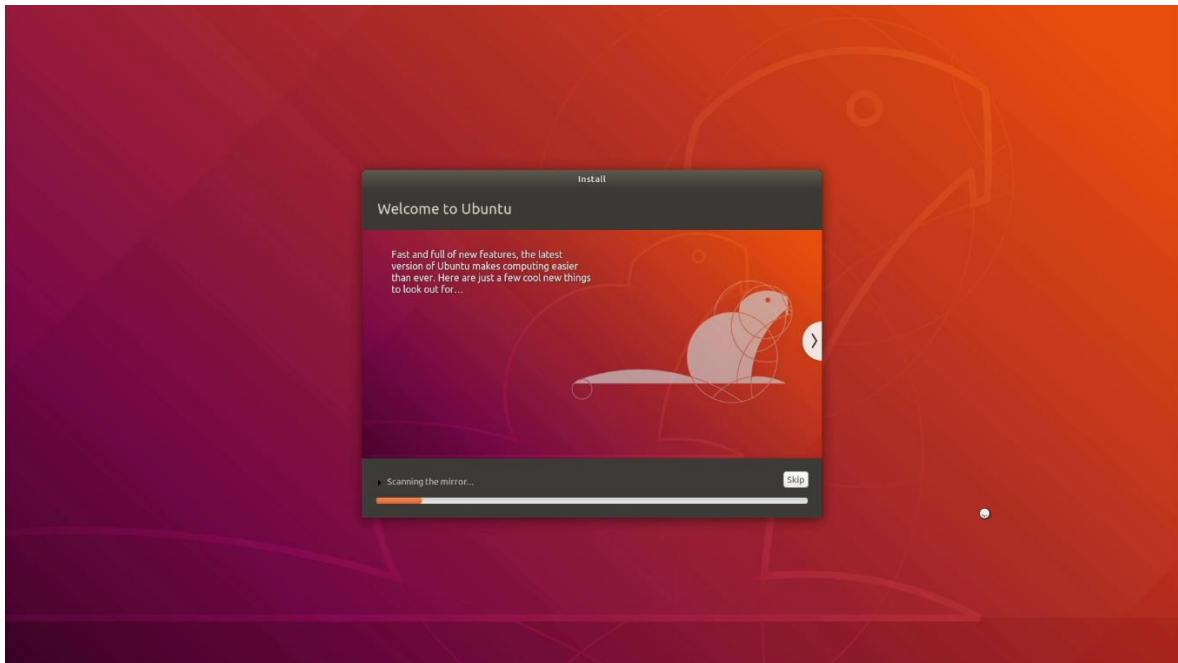
- Choose the appropriate geographical location and select “Continue”.



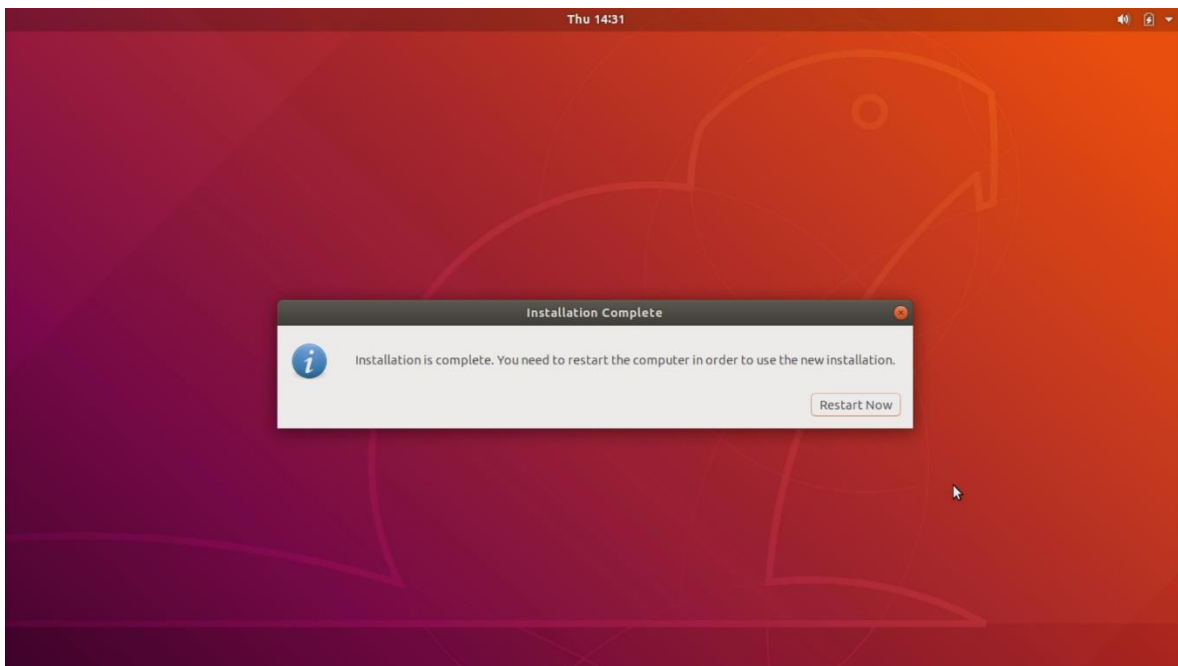
- Fill out the appropriate input boxes and select “Continue”.



- Ubuntu installation progress bar will be shown.



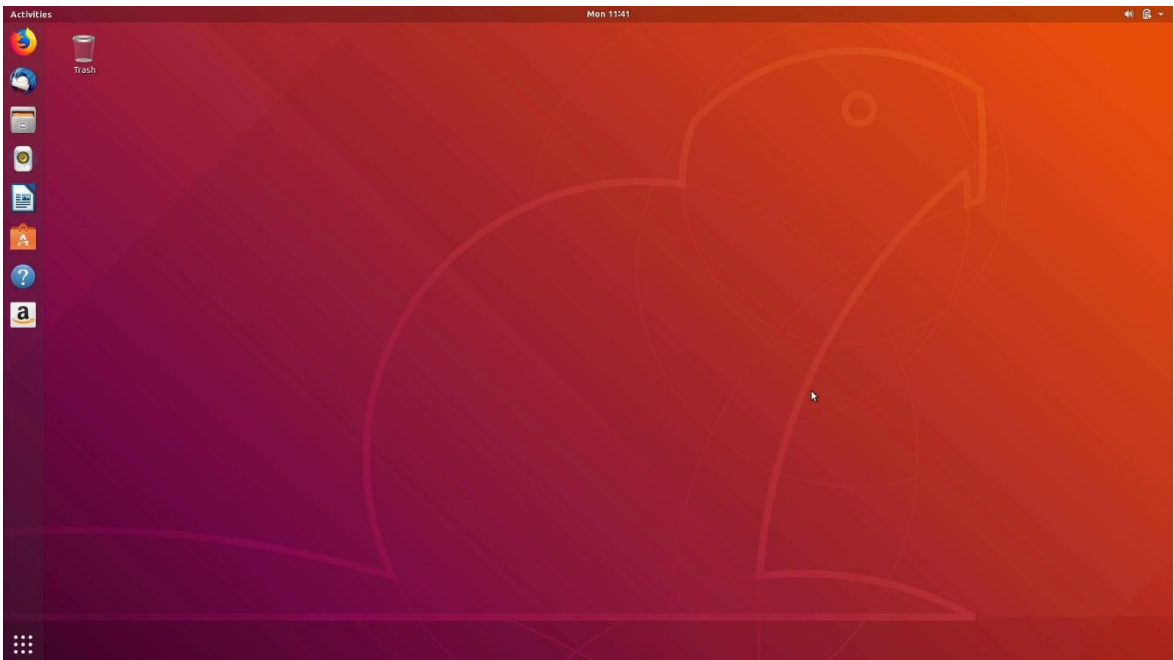
- Once the installation completes, select "Restart Now".



- Remove the installation media and hit enter.



- Ubuntu Desktop Screen.



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## Section 4 – Wireless Network Driver

The wireless network driver isn't native to the Ubuntu Linux 18.04 kernel. Therefore, the wireless device will not work following the Ubuntu 18.04 LTS installation by default. However, here are a couple of workarounds to get the wireless network working on the Thinkpad P1 Gen2.

### **Option 1:**

- Type the following commands into a terminal window.  

```
# sudo add-apt-repository ppa:canonical-hwe-team/pc-oem-dkms  
  
# sudo apt update  
  
# sudo apt install backport-iwlwifi-dkms  
  
# sudo modprobe iwlwifi  
  
# sudo reboot
```
- Download and extract the Linux driver for the Wireless Networking device from Intel's website.  

```
# wget https://wireless.wiki.kernel.org/\_media/en/users/drivers/iwlwifi/iwlwifi-cc-46.3cfab8da.0.tgz  
  
# tar xzf iwlwifi-cc-46.3cfab8da.0.tgz  
  
# cd iwlwifi-cc-46.3cfab8da.0.tgz  
  
# cp iwlwifi-cc-a0-46.ucode /lib/firmware/  
  
# cp LICENSE.iwlwifi-cc.ucode /lib/firmware/
```
- Load the driver module and reboot the system.  

```
# modprobe iwlwifi  
  
# reboot
```

### **Option 2:**

- Upgrade to the Linux kernel 5.0 and linux-firmware to the latest version by using the following commands:  

```
# sudo apt-get install linux-oem-osp1 linux-firmware  
  
# sudo reboot
```

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## Section 5 – Installing the Nvidia Graphics Driver

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

There are a couple of different ways to install the Nvidia driver; through the Ubuntu upstream repository or by downloading the Nvidia driver from Nvidia's website and installing manually.

**Option 1:** Install the Nvidia graphics driver from the Ubuntu Repository.

1. Update Ubuntu after the completion of the installation process.

```
# sudo apt update
```

2. Add the Nvidia repository using the following command.

```
# sudo add-apt-repository ppa:graphics-drivers
```

3. Update Ubuntu again to update the source list file.

```
# sudo apt update
```

4. Install the Nvidia driver.

```
# sudo apt install nvidia-driver-430
```

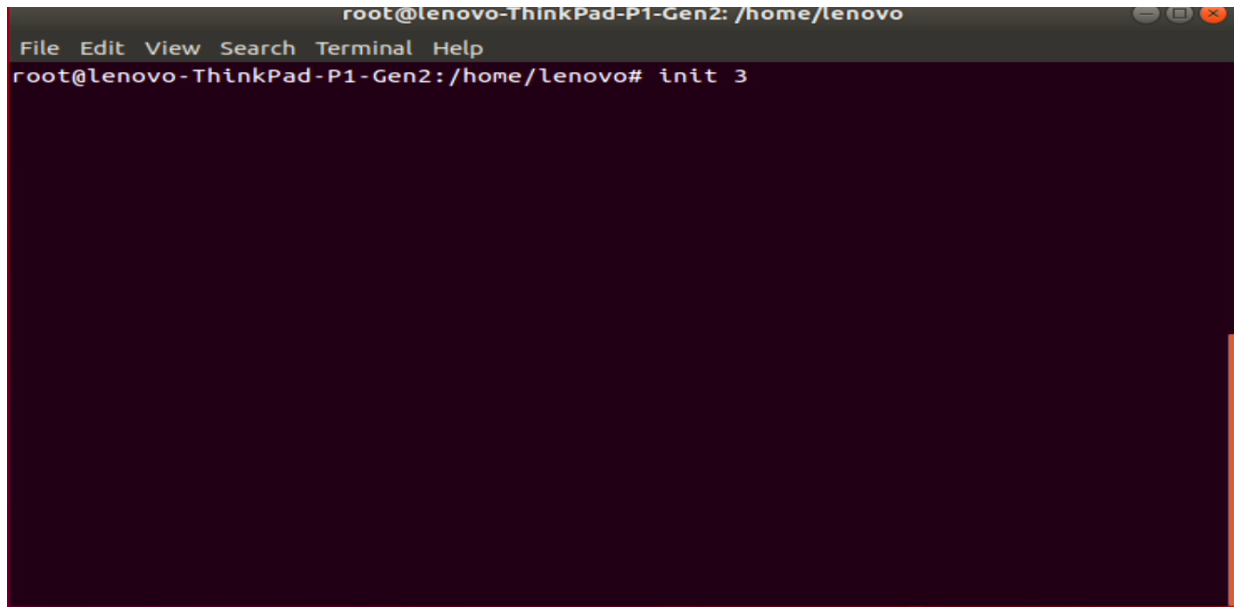
5. Reboot the system.

```
# sudo reboot
```

**Option 2:** Install the Nvidia graphics driver manually.

1. Download the latest Nvidia graphics driver for the appropriate Nvidia GPU from [nvidia.com/drivers](https://www.nvidia.com/drivers).
2. Open a terminal window and stop x-windows by using the following command.  

```
# sudo init 3
```

A terminal window titled 'root@lenovo-ThinkPad-P1-Gen2: /home/lenovo' with a menu bar containing 'File Edit View Search Terminal Help'. The terminal shows the command 'init 3' being entered at the prompt 'root@lenovo-ThinkPad-P1-Gen2:/home/lenovo#'. The terminal background is dark purple with a vertical orange bar on the right side.

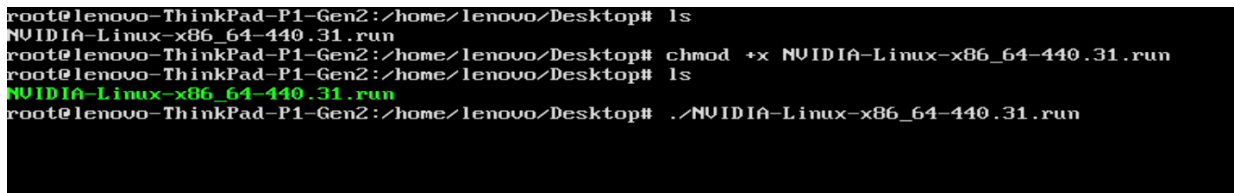
```
root@lenovo-ThinkPad-P1-Gen2: /home/lenovo
File Edit View Search Terminal Help
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo# init 3
```

3. Make the Nvidia installer an executable and run the executable by using the following commands.  

```
# sudo chmod +x NVIDIA-Linux-x86-64-*
```

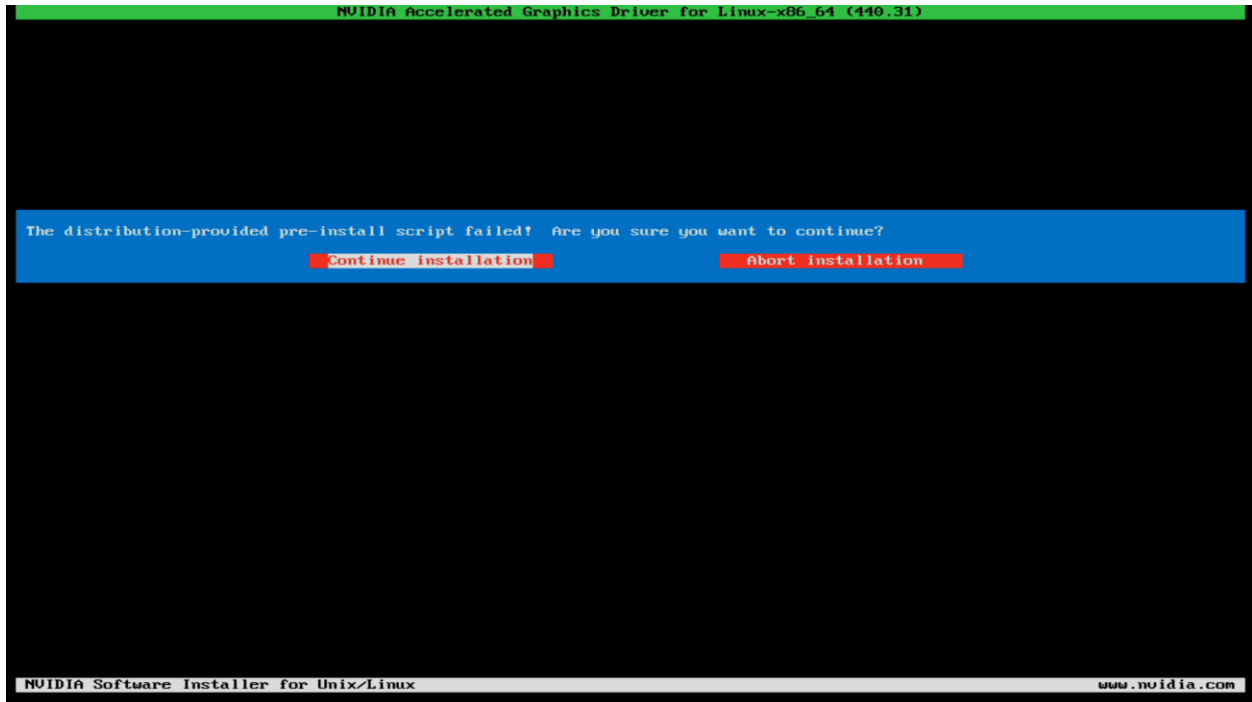
```
# sudo ./NVIDIA-Linux-x86_64*
```

A terminal window showing a sequence of commands and their outputs. The prompt is 'root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop#'. The commands and outputs are: 'ls' followed by 'NVIDIA-Linux-x86\_64-440.31.run', 'chmod +x NVIDIA-Linux-x86\_64-440.31.run', 'ls' followed by 'NVIDIA-Linux-x86\_64-440.31.run', and finally './NVIDIA-Linux-x86\_64-440.31.run'.

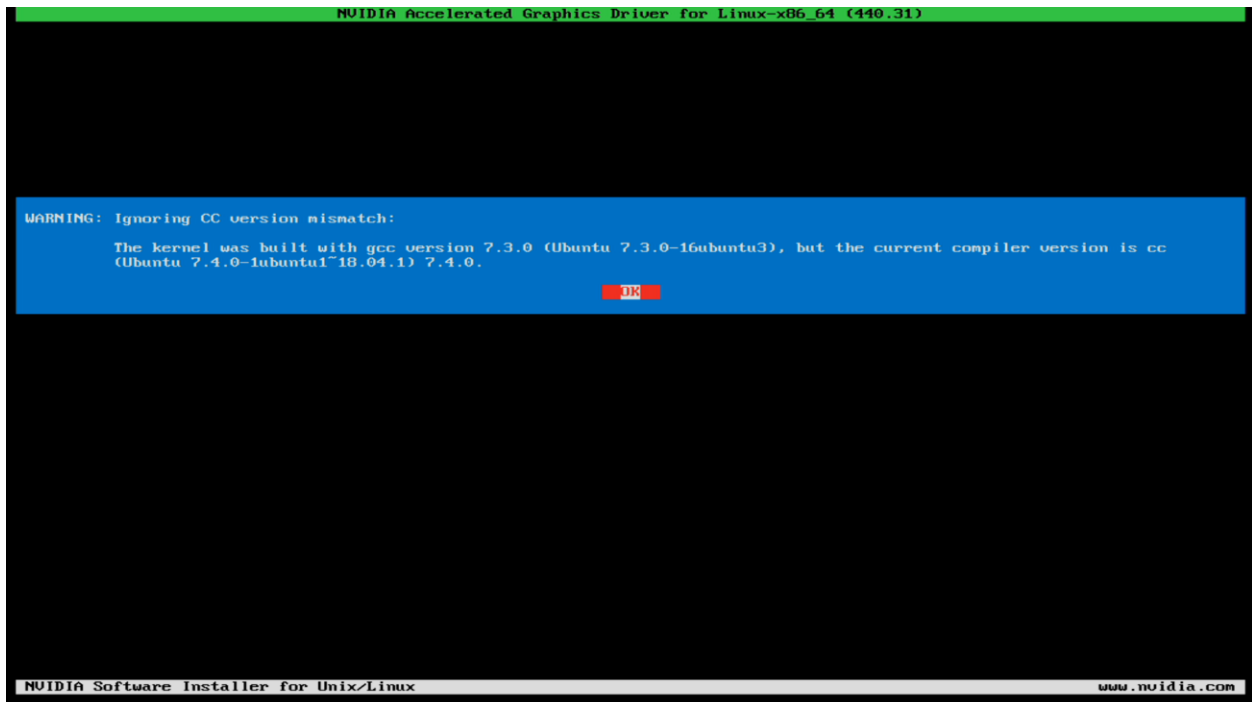
```
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop# ls
NVIDIA-Linux-x86_64-440.31.run
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop# chmod +x NVIDIA-Linux-x86_64-440.31.run
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop# ls
NVIDIA-Linux-x86_64-440.31.run
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop# ./NVIDIA-Linux-x86_64-440.31.run
```



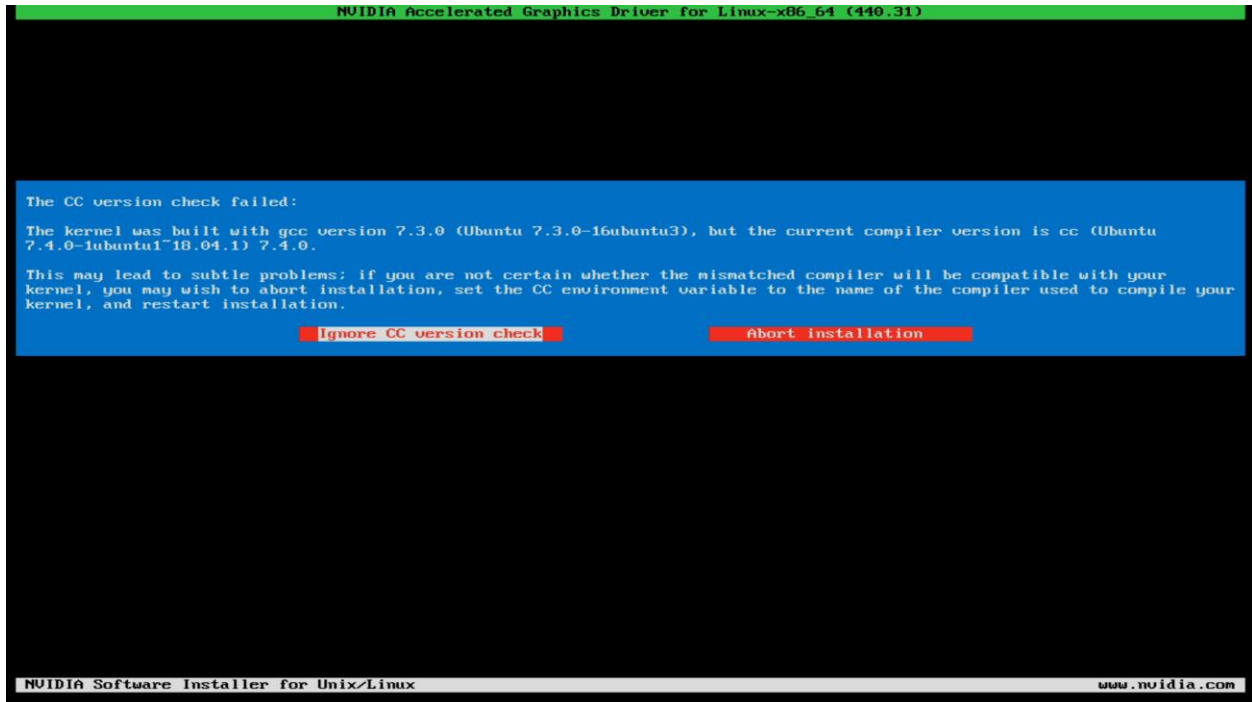
4. Select "Continue Installation".



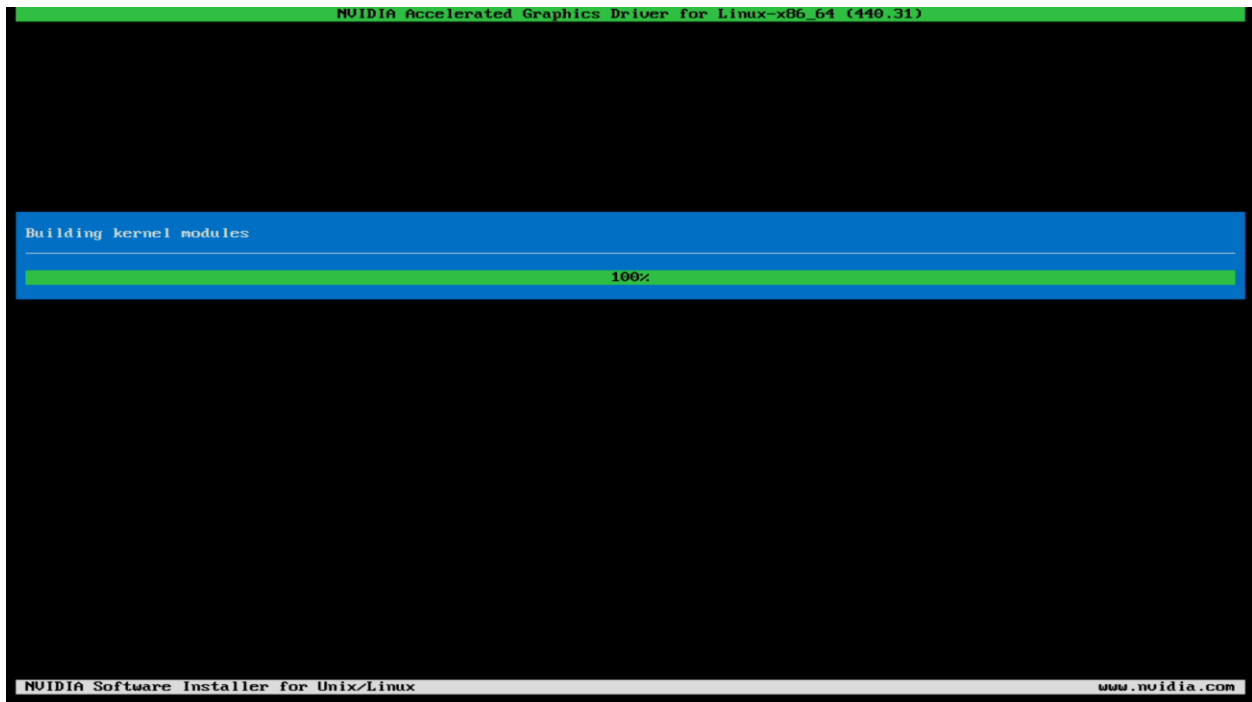
5. Select "OK".



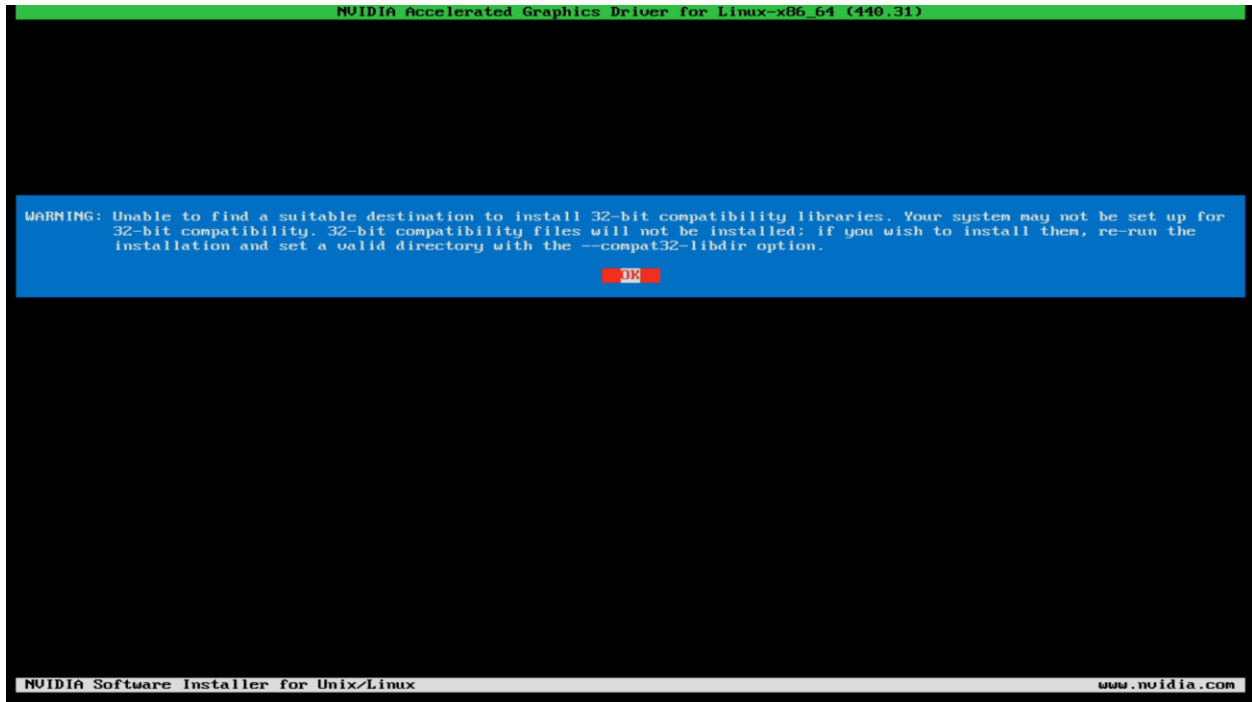
6. Select "Ignore CC version check".



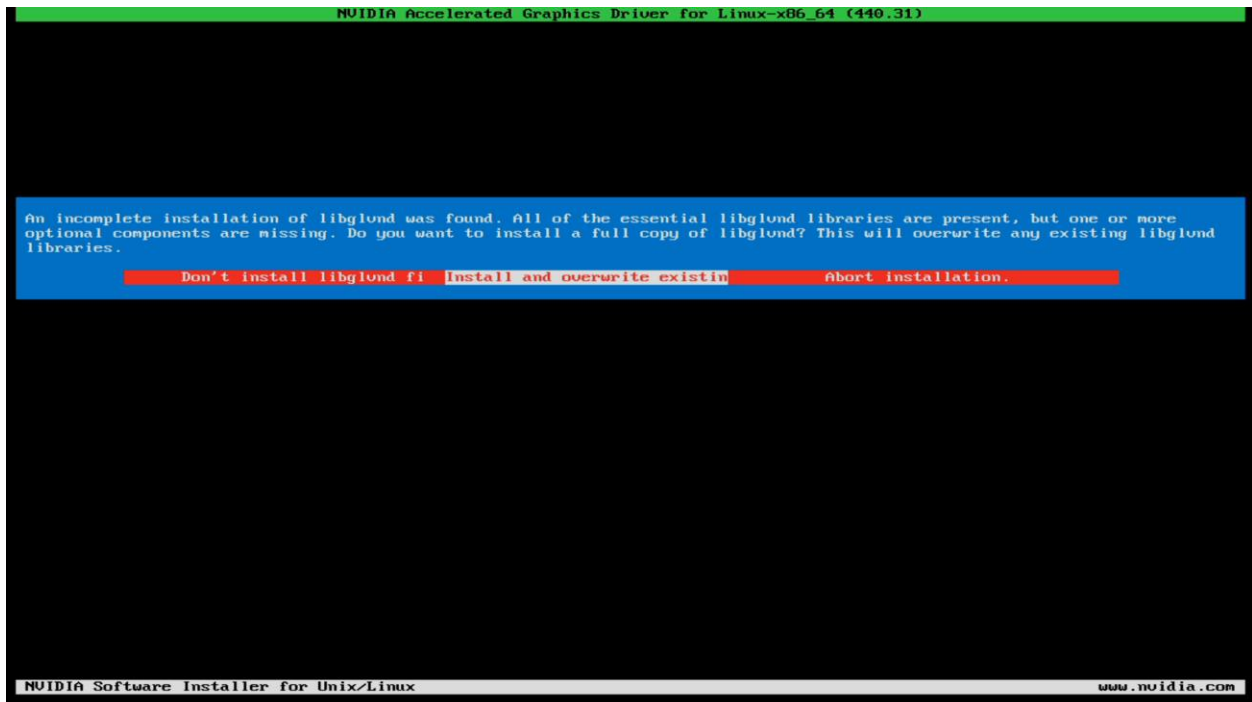
7. Let the system build kernel modules.



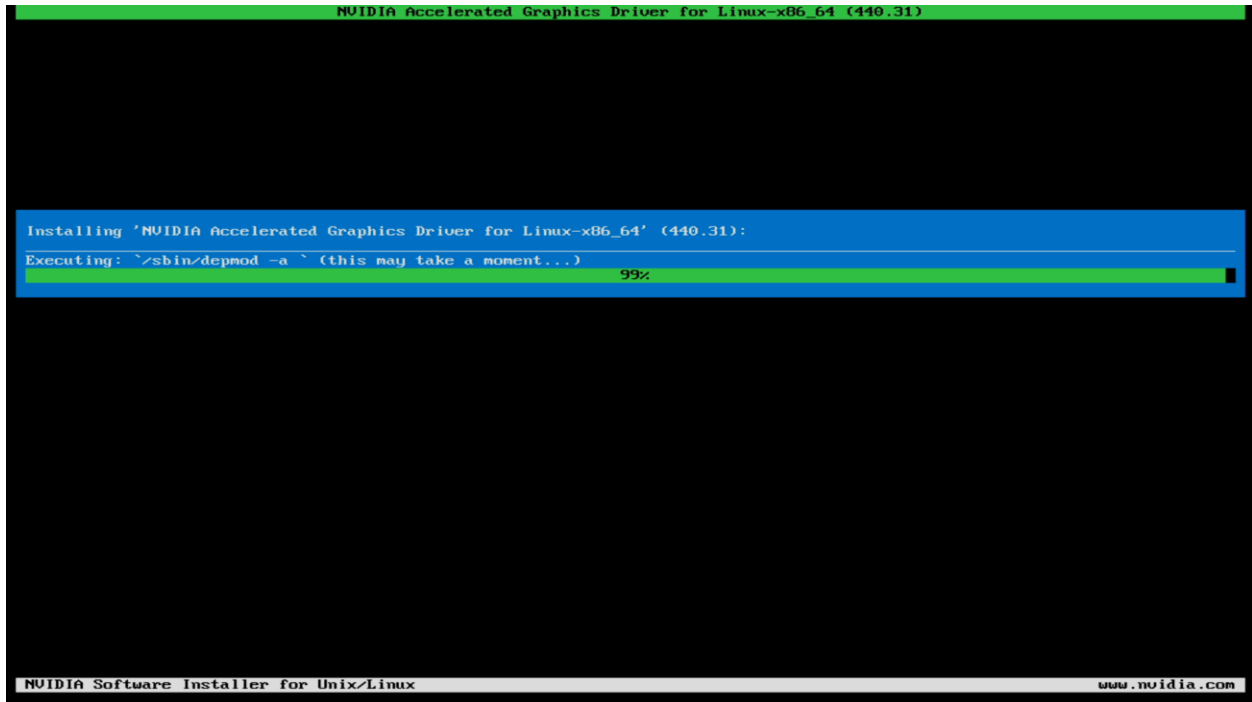
8. Select OK for the warning again.



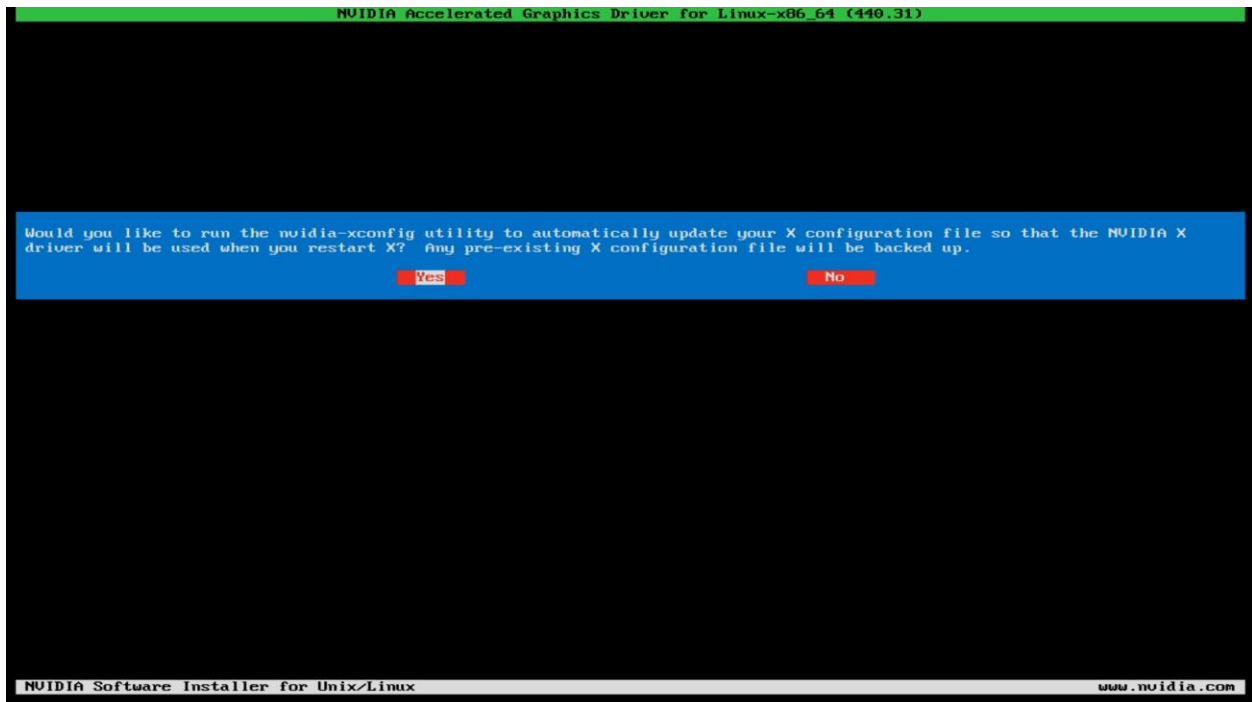
9. Select "Install and overwrite existing files" and hit enter.



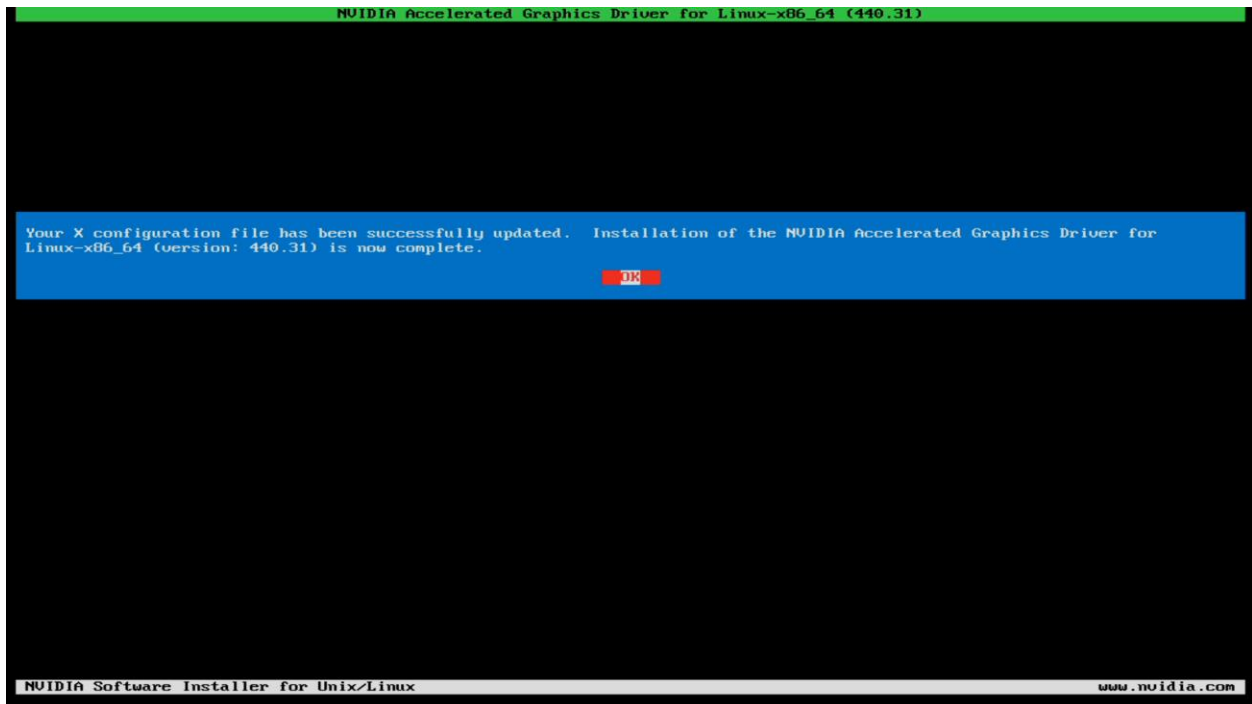
10. Nvidia driver installing progress bar may appear.



11. Select "Yes" to update the X-configuration file to use the Nvidia X driver.



12. Select "OK".



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

```
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      PID   Type   Process name                      GPU Memory |
|-----|
| No running processes found
+-----+
root@lenovo-ThinkPad-P1-Gen2:/home/lenovo/Desktop#
```

14. Reboot the system.

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## Section 6 – Revision History

Version	Date	Author	Changes/Updates
1.0	12/3/2019	Sayali Pawar	Initial launch release