

Ubuntu Linux Setup Guide

For ThinkPad P53, P73

**** Official support of Ubuntu 18.04 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 ‘Restart’ menu tab and set “OS Optimized Defaults” to “Disabled”.



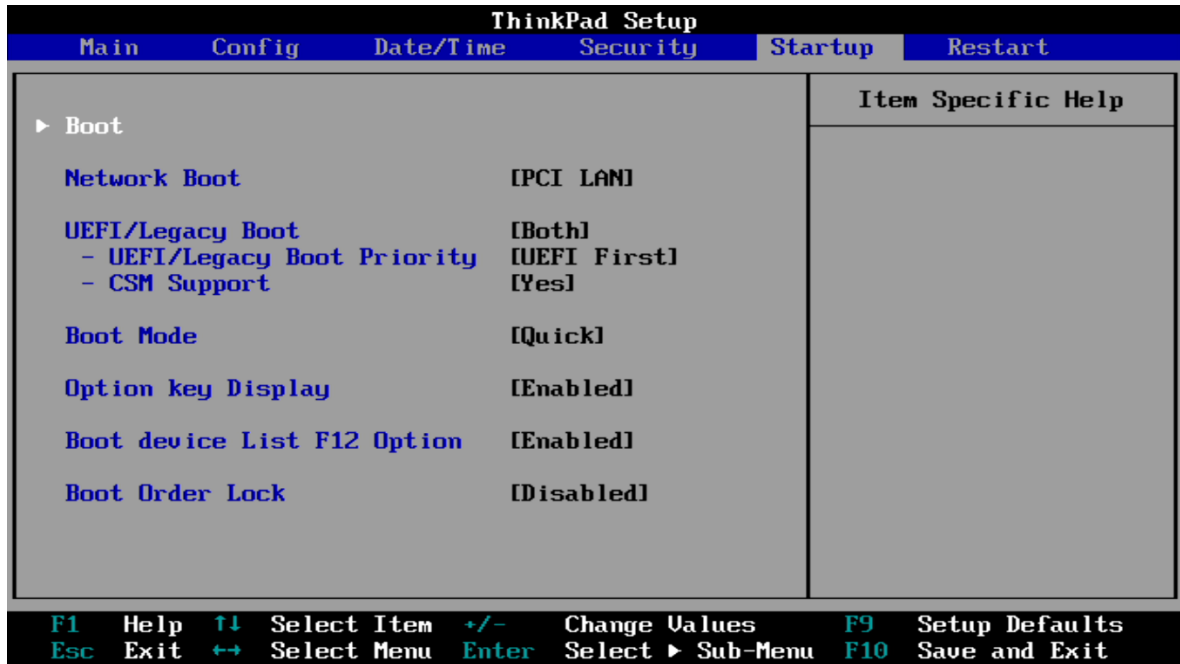
- Switching the “OS Optimized Defaults” settings may give a warning message. Select “Yes” to continue to disable OS Optimized Defaults.

ThinkPad Setup			
Main	Config	Date/Time	Security
Exit Saving Changes Exit Discarding Changes		Item Specific Help	
Attention!			
If OS Optimized Defaults is changed to Disabled, the default value of some security settings including Secure Boot, Secure RollBack Prevention and Virtualization features are disabled. Do you really want to continue? Select Yes to continue to disable the OS Optimized Defaults. Select No to discontinue the operation.			
[Yes]		[No]	
		Boot, Secure RollBack Prevention, and Virtualization features.	
F1	Help	↑↓	Select Item
Esc	Exit	↔	Select Menu
+/-	Change Values		
Enter	Select	▶	Sub-Menu
F9	Setup Defaults		
F10	Save and Exit		

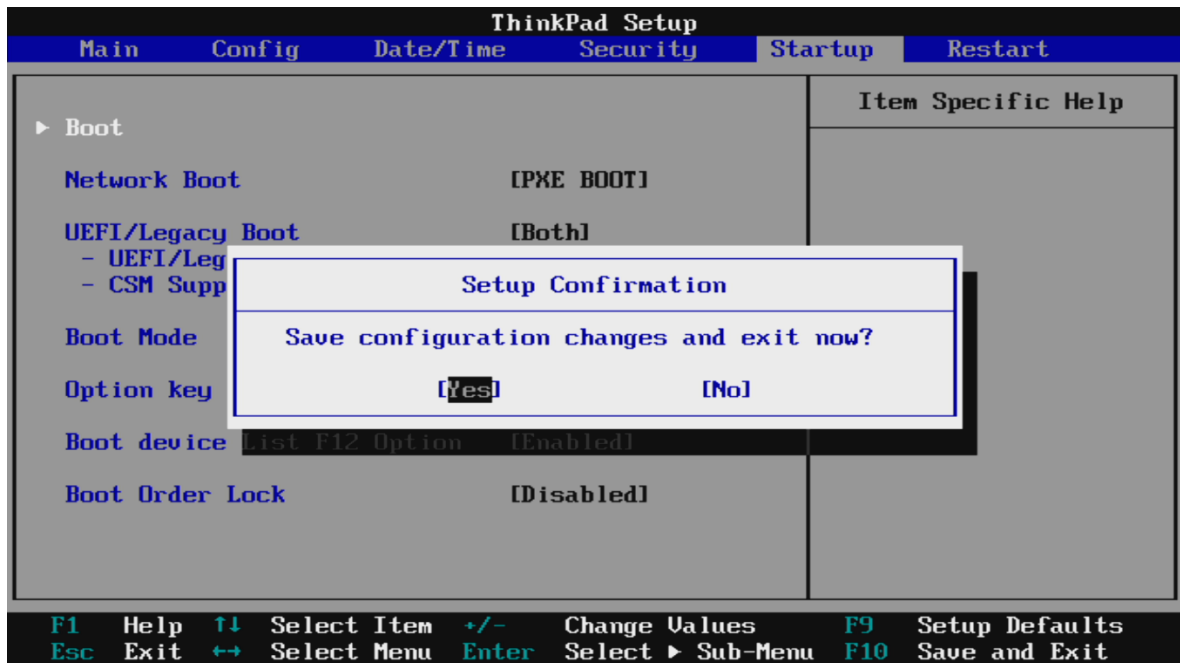
- Tab over to the “Startup” menu tab.

ThinkPad Setup			
Main	Config	Date/Time	Security
▶ Boot		Item Specific Help	
Network Boot		[PXE BOOT]	
UEFI/Legacy Boot - CSM Support		[UEFI Only] [No] * Unselectable for Secure Boot	
Boot Mode		[Quick]	
Option key Display		[Enabled]	
Boot device List F12 Option		[Enabled]	
Boot Order Lock		[Disabled]	
F1	Help	↑↓	Select Item
Esc	Exit	↔	Select Menu
+/-	Change Values		
Enter	Select	▶	Sub-Menu
F9	Setup Defaults		
F10	Save and Exit		

- 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”.



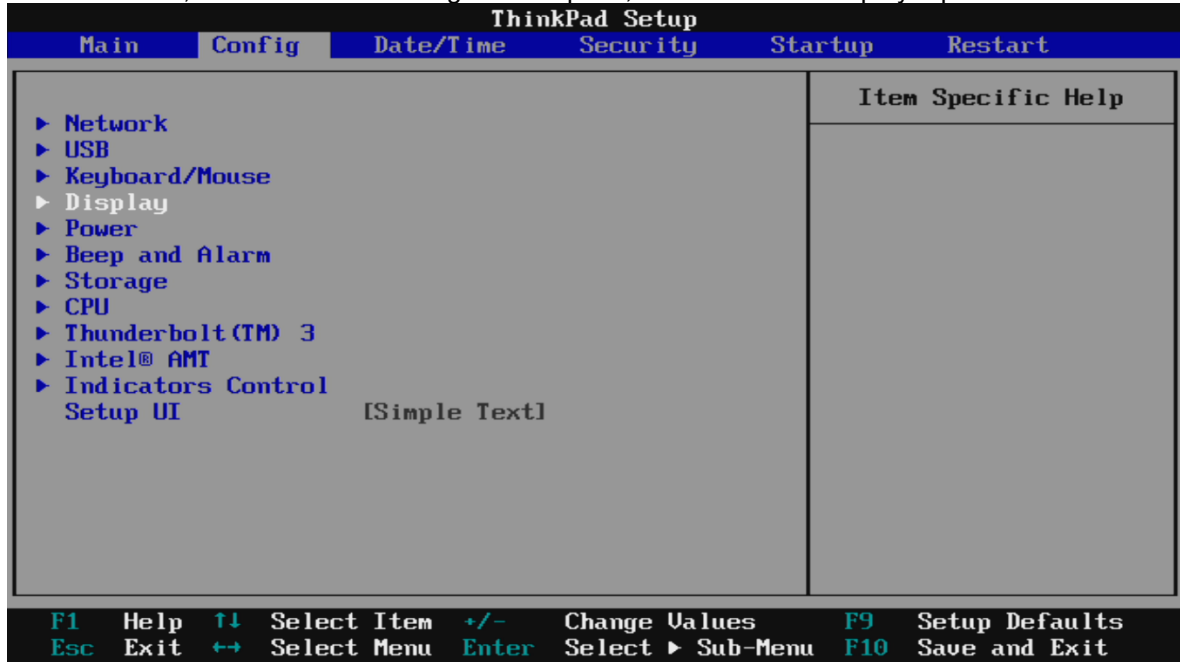
- Press function F10 key to save and exit BIOS setup.



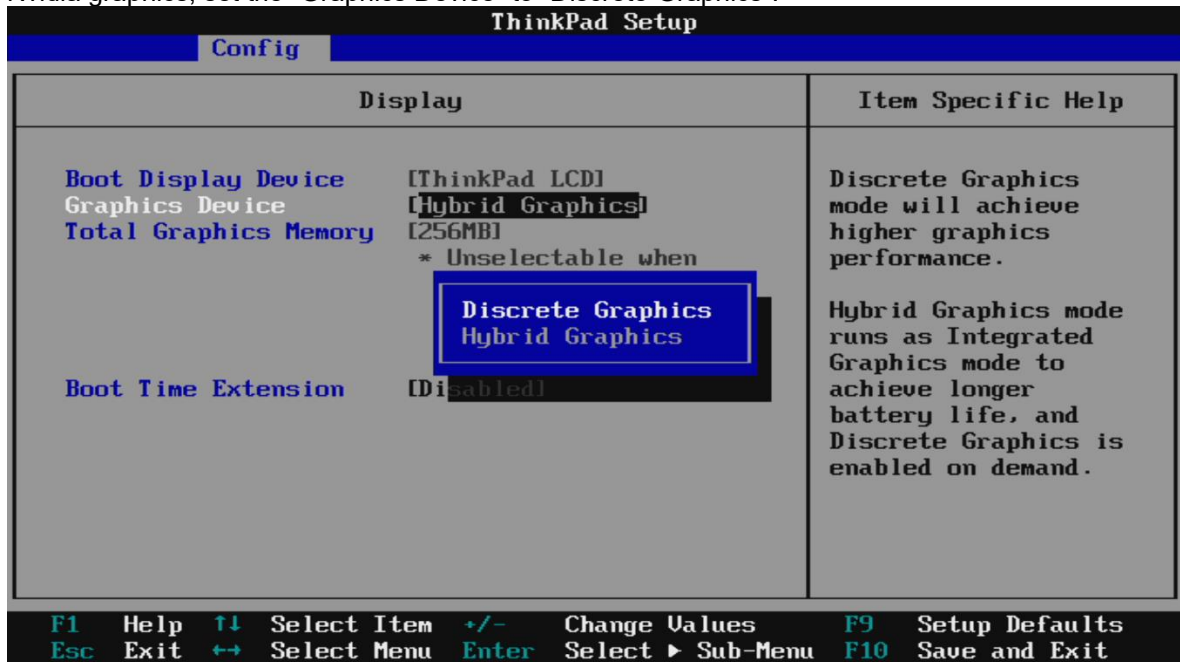
Section 2 – Discrete vs Hybrid Graphics

The Thinkpad P53 and P73 offer 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”.



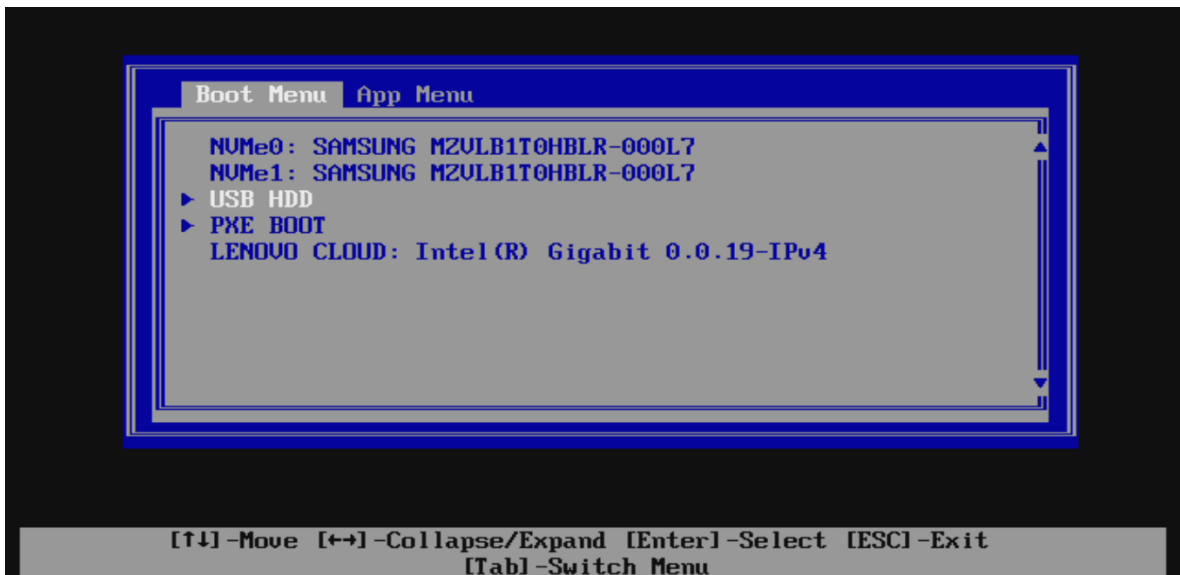
Section 3 – Installing Ubuntu Linux 18.04 LTS

Please refer to the following instructions and screenshots on how to install Ubuntu 18.04 LTS on the Lenovo Thinkpad P53 and P73.

- 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.



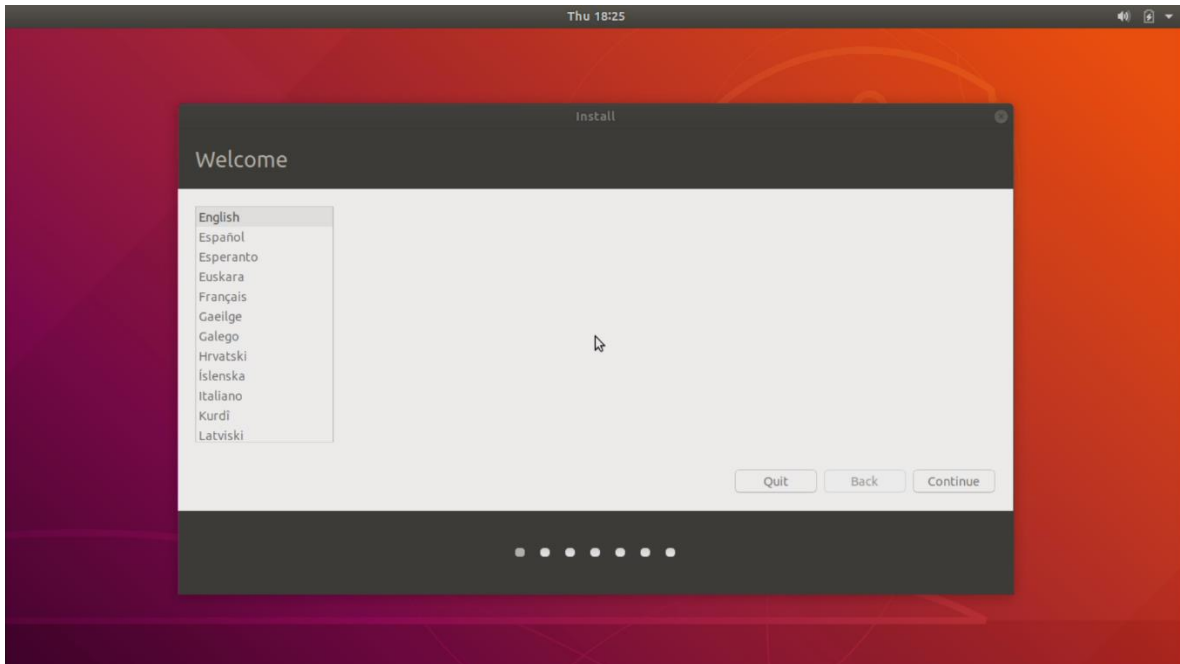
- Select the Linux bootable installation media from the F12 boot menu list.



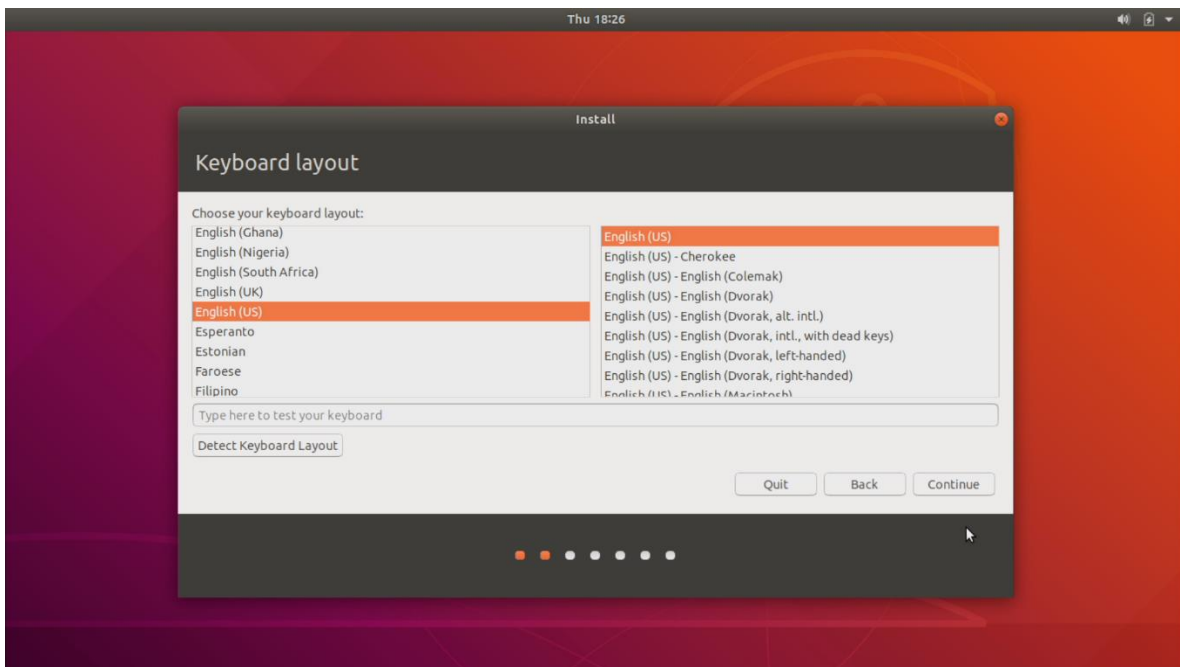
- Highlight “Install Ubuntu” from the GRUB boot menu and press ‘e’.



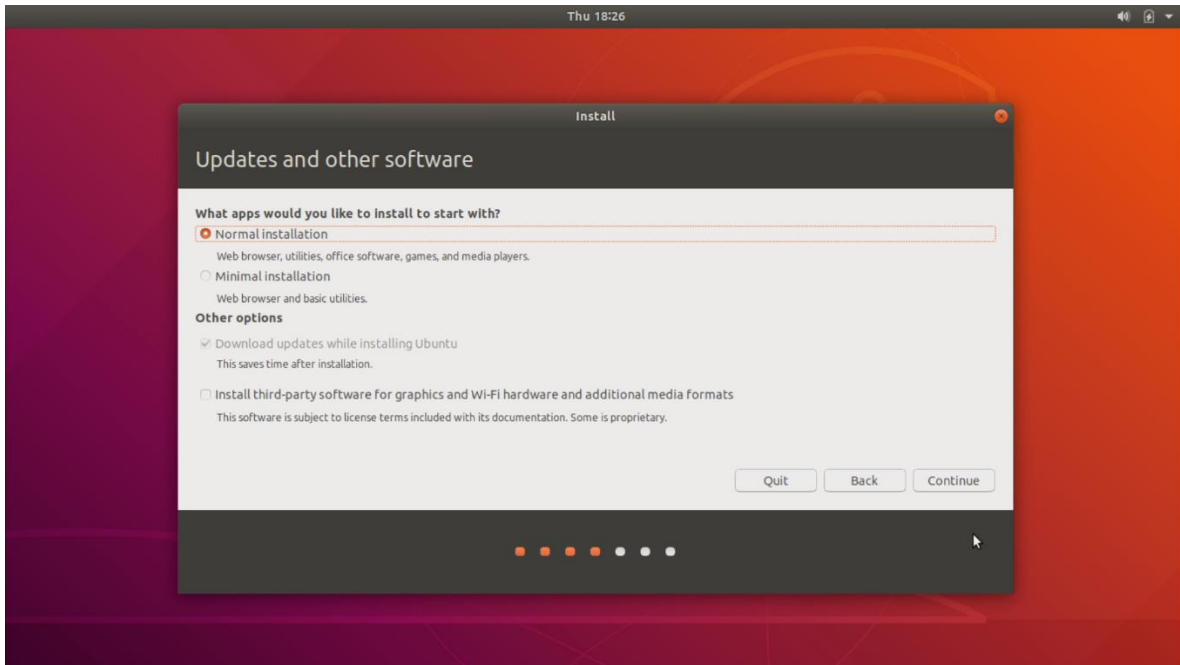
- The Ubuntu Linux Welcome Screen should appear. Select the appropriate language and “Continue”.



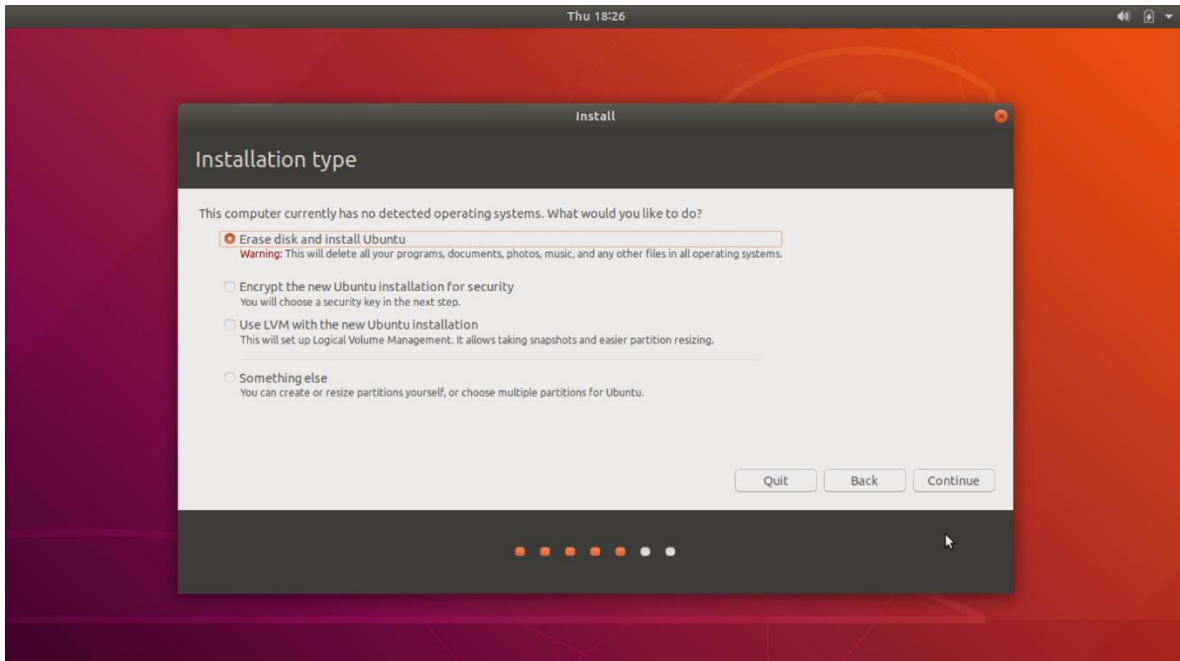
- Choose the keyboard layout and language accordingly by selecting each one.



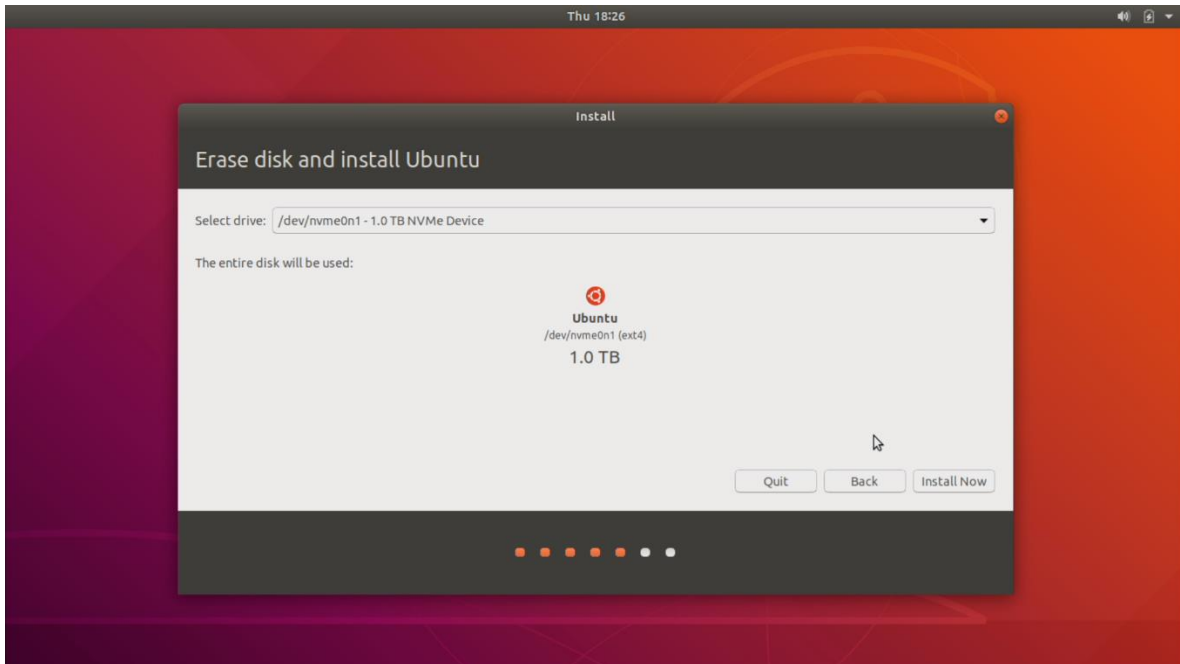
- Select “Normal Installation” and “Continue”.



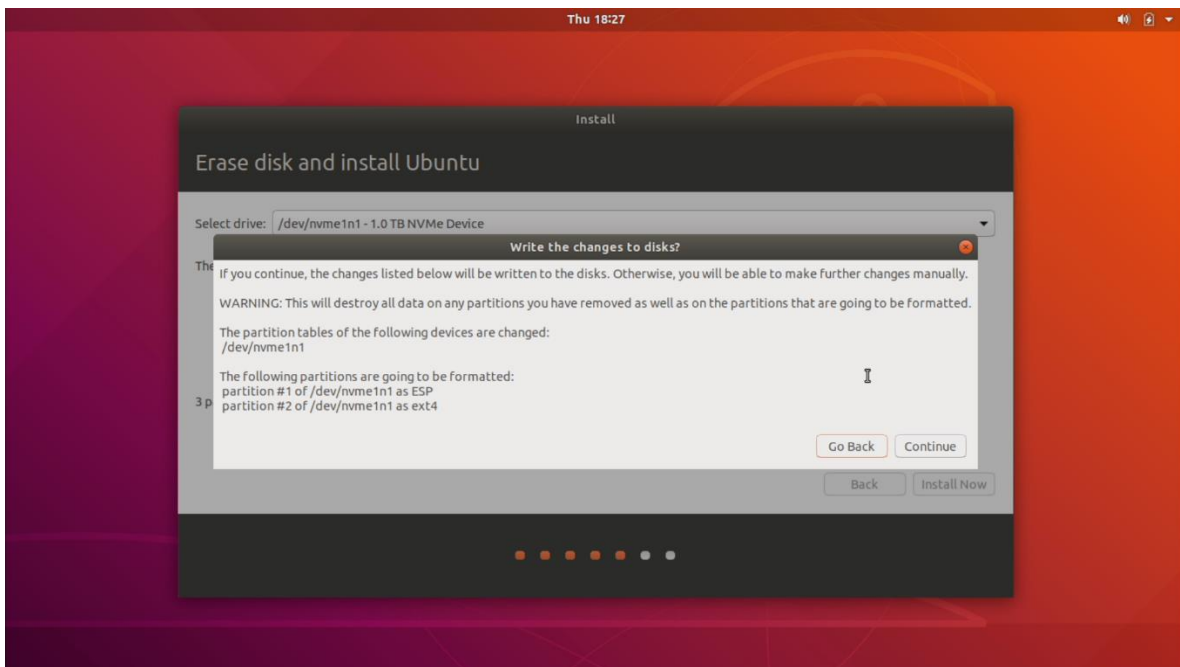
- Choose the installation type. For simplicity, this guide was done using “Erase disk and install Ubuntu”



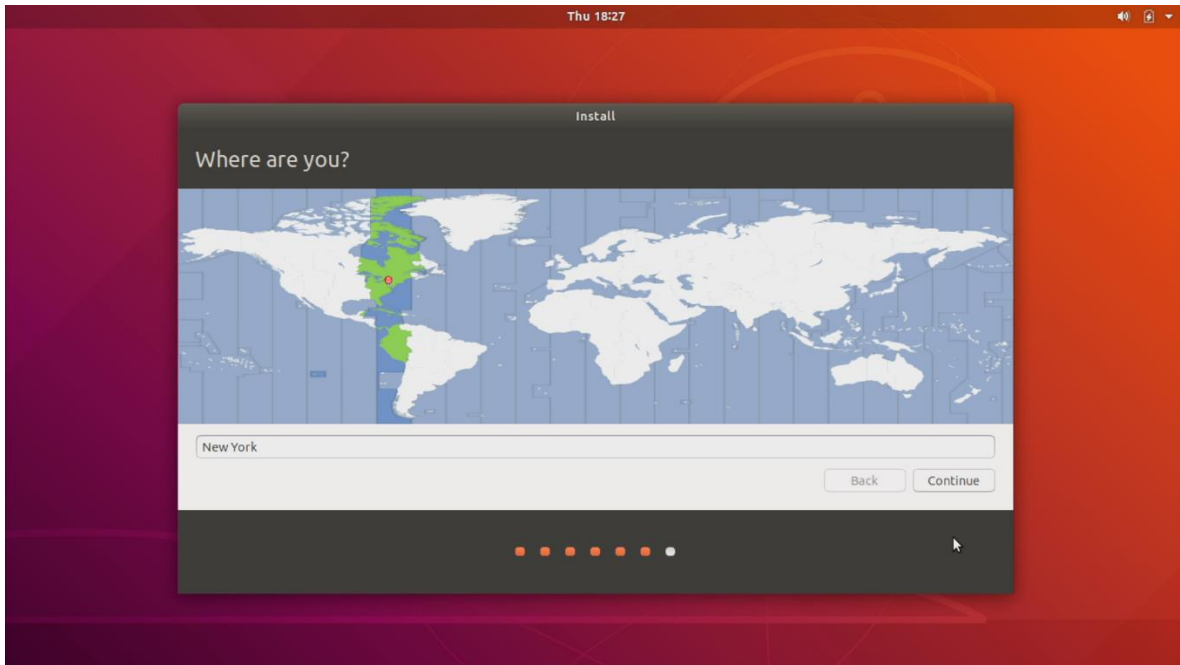
- If more than one drive is detected in the system, the installation will prompt which drive to use to install the operating system on.



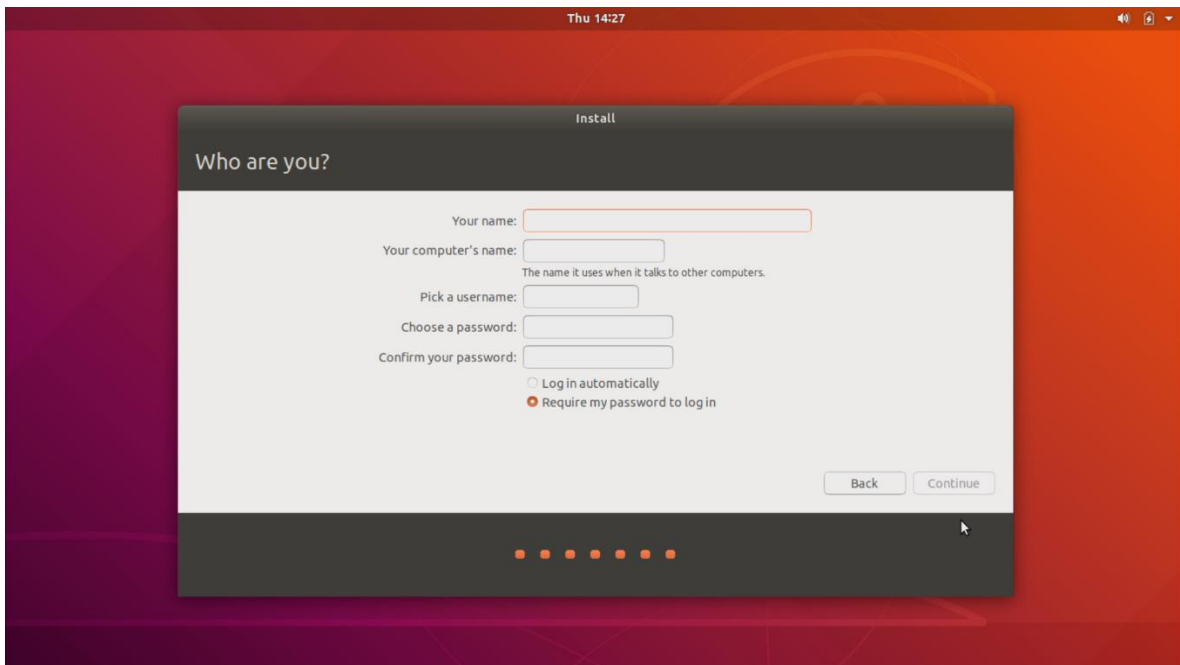
- Select "Continue" to confirm changes will be made to the disk.



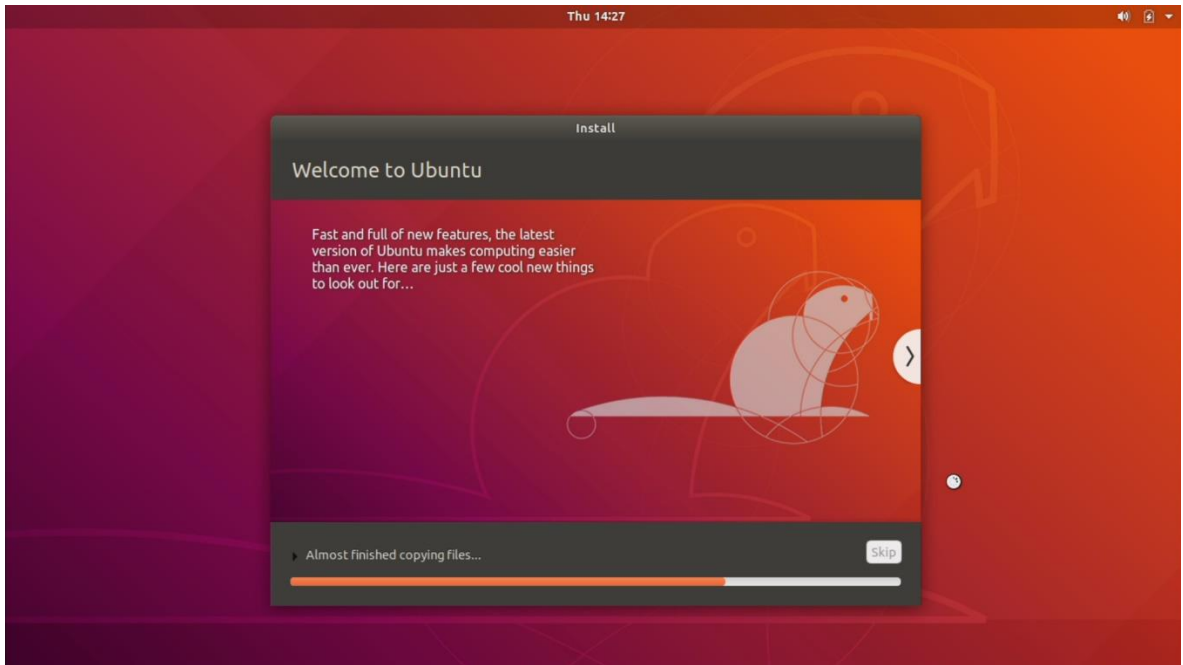
- Choose the appropriate geographical location and select “Continue”.



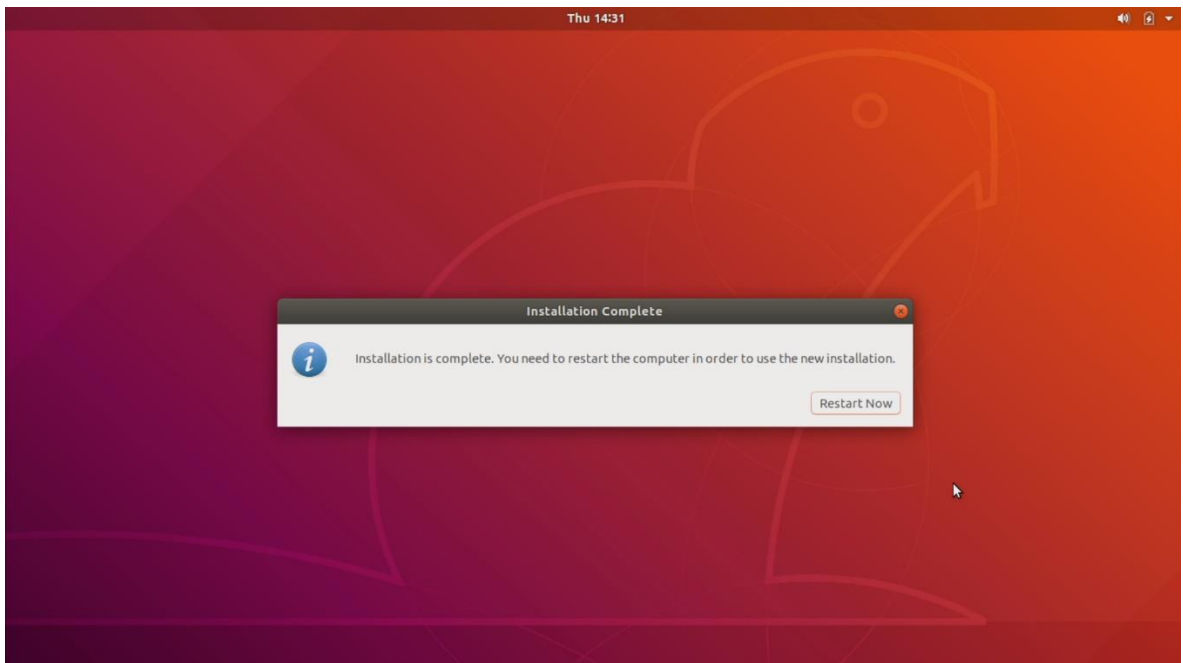
- Fill out the appropriate input boxes and select “Continue”.



- Ubuntu installation progress bar will be shown.



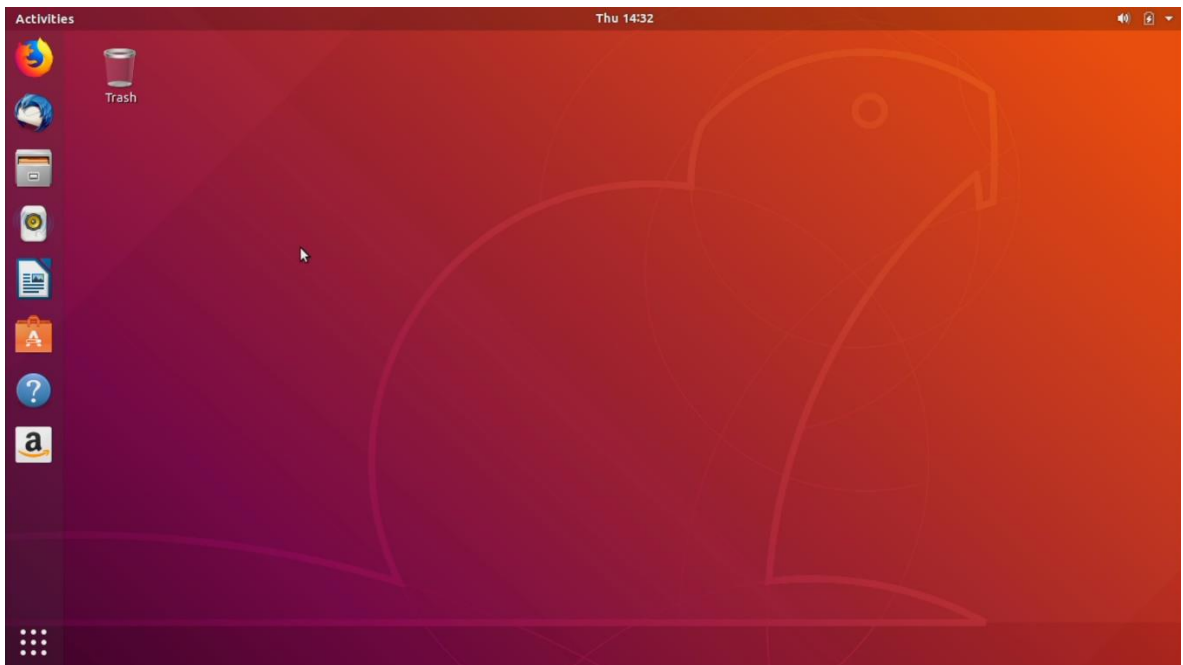
- Once the installation completes, select "Restart Now".



- Remove the installation media and press ENTER.



- Ubuntu Desktop Screen.



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 P53 and P73.

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
```

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
```

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.

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
```

```
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# init 3
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# █
```

3. Make the Nvidia installer an executable by using the following command.

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

```
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# init 3
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# ls
NVIDIA-Linux-x86_64-430.50.run
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# chmod +x NVIDIA-Linux-x86_64-430.50.run
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# ls
NVIDIA-Linux-x86_64-430.50.run
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# █
```


4. Run the Nvidia driver executable by using the following command.

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

```
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# init 3
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# ls
NVIDIA-Linux-x86_64-430.50.run
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# chmod +x NVIDIA-Linux-x86_64-430.50.run
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# ls
NVIDIA-Linux-x86_64-430.50.run
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# ./NVIDIA-Linux-x86_64-430.50.run
```

5. Select "Continue installation".

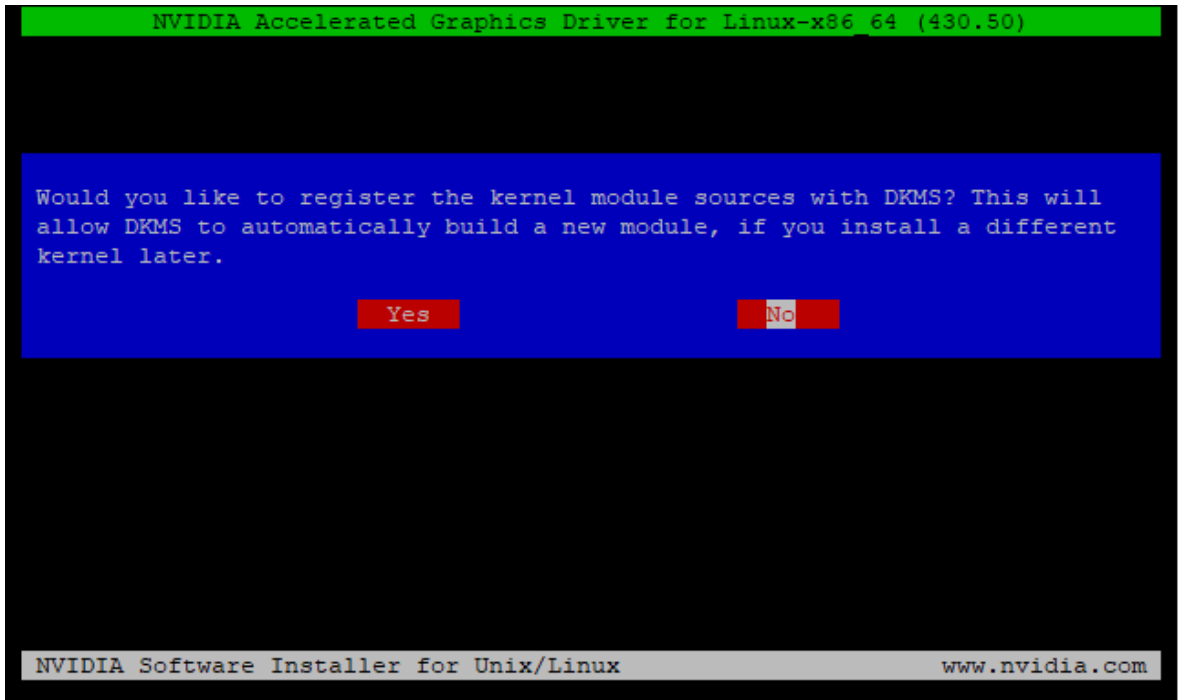
```
NVIDIA Accelerated Graphics Driver for Linux-x86_64 (430.50)

The distribution-provided pre-install script failed! Are you sure you want
to continue?

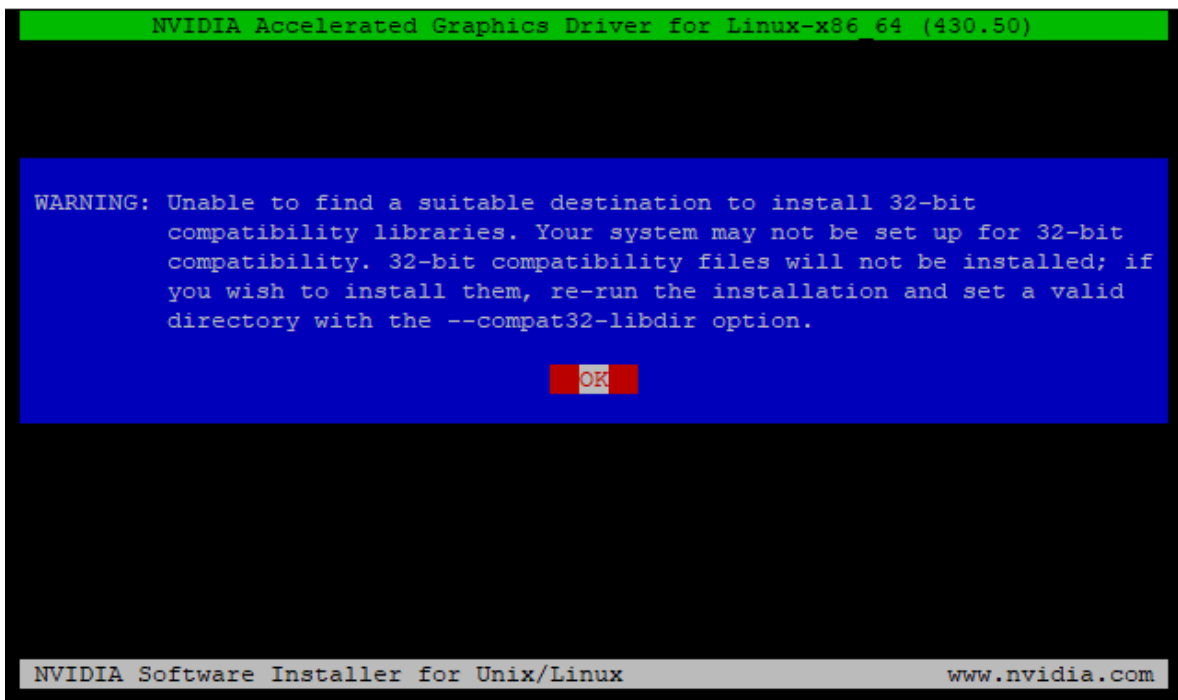
Continue installation Abort installation

NVIDIA Software Installer for Unix/Linux www.nvidia.com
```

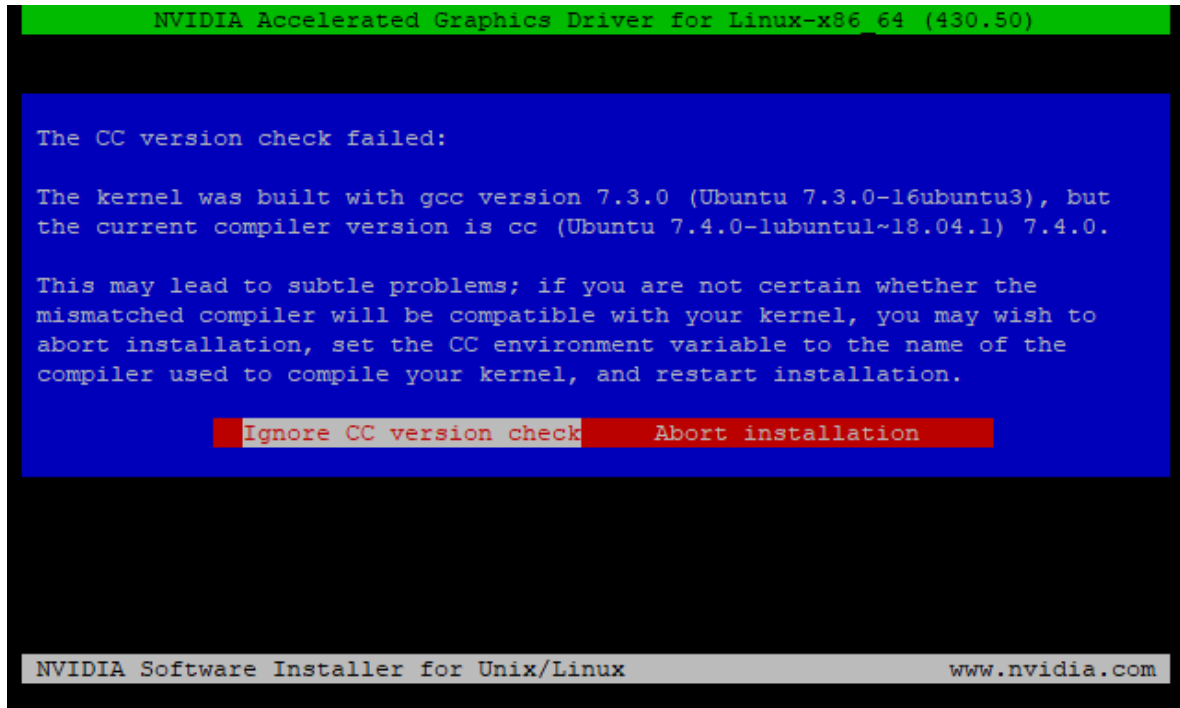
6. Select "No" to not register the kernel module with DKMS.



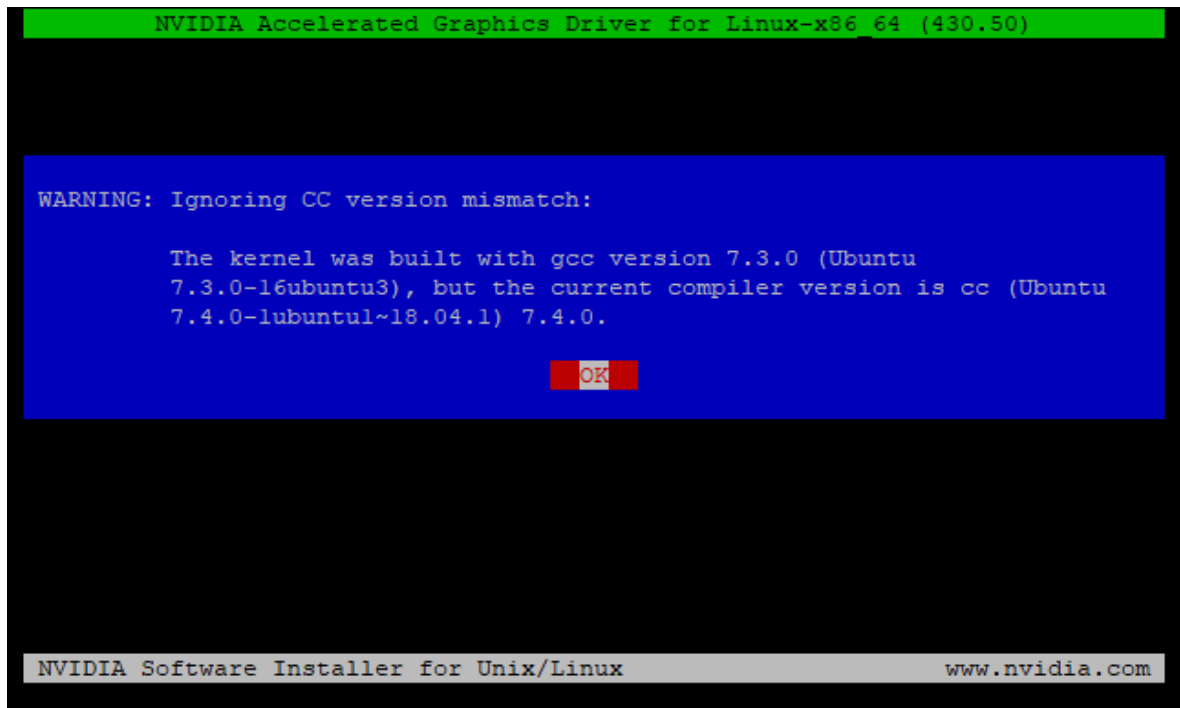
7. Select "OK".



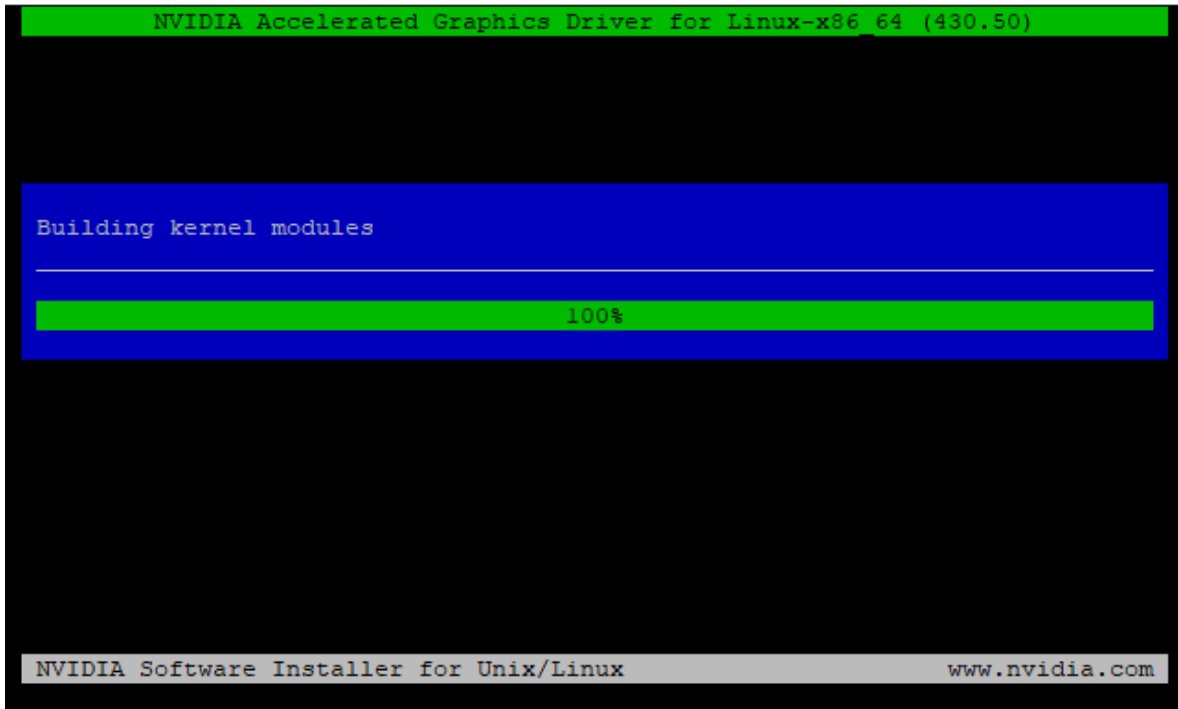
8. Select "Ignore CC version check".



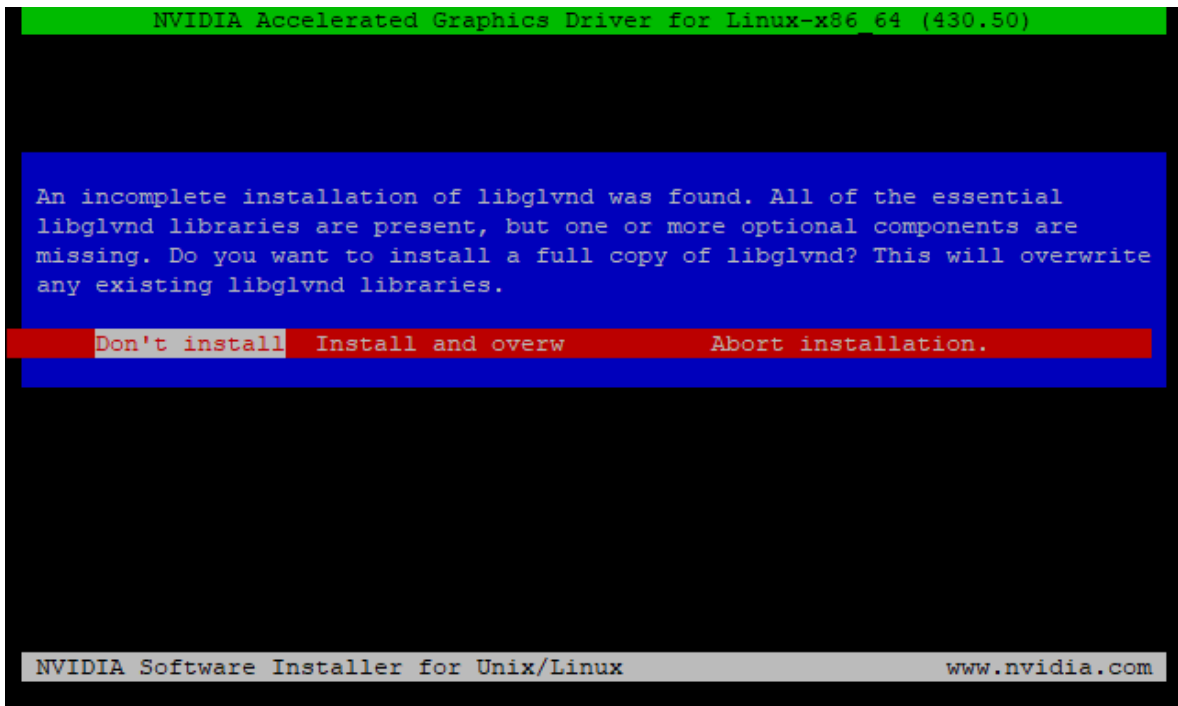
9. Select "OK".



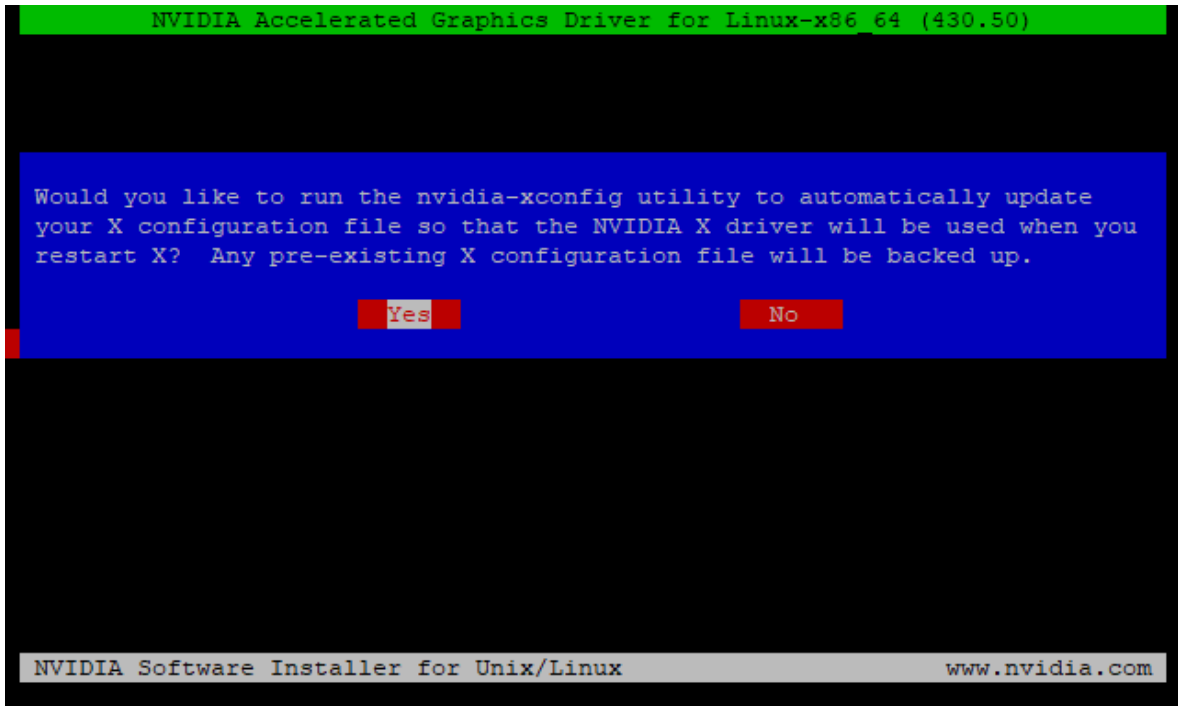
10. Nvidia driver installing progress bar may appear.



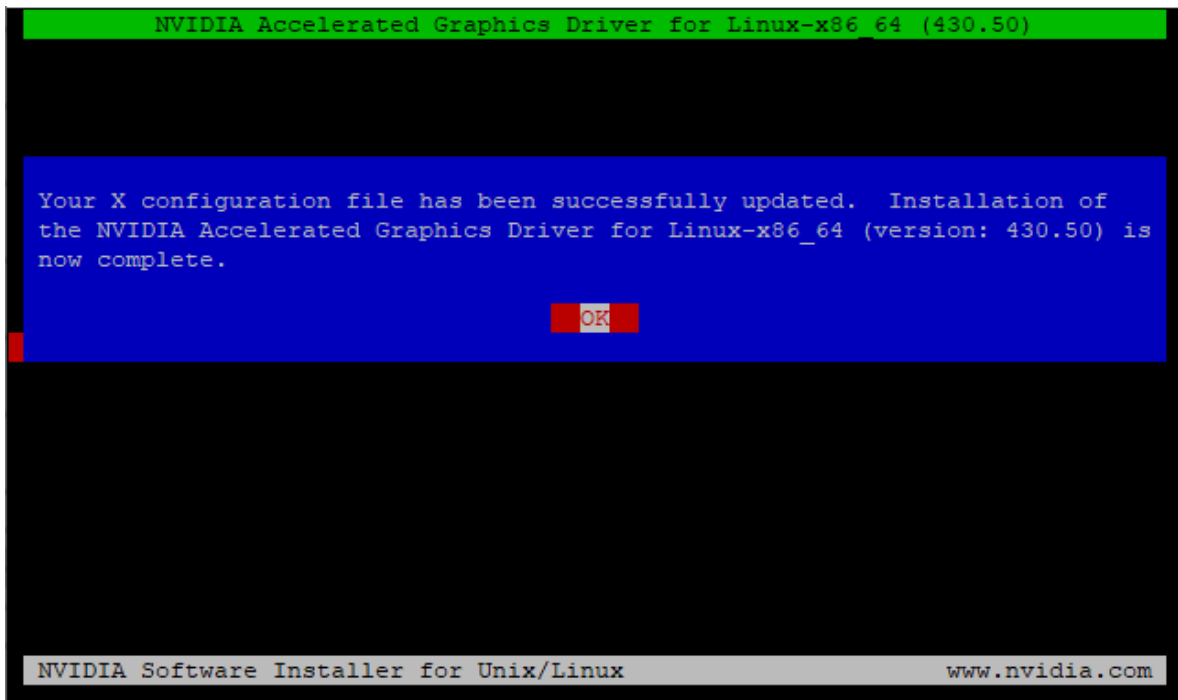
11. Select "Install and overw".



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



13. Select "OK" to acknowledge the driver installation is complete.



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

```
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# nvidia-smi
Fri Sep 27 11:51:41 2019
+-----+
| NVIDIA-SMI 430.50      Driver Version: 430.50      CUDA Version: 10.1      |
+-----+-----+-----+
| 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 5000      Off      | 00000000:01:00.0 Off  |          N/A         |
| N/A   56C    P0         3W /  N/A   |      0MiB / 16125MiB |          0%      Default  |
+-----+-----+-----+

+-----+
| Processes:                                                       GPU Memory |
|  GPU       PID    Type   Process name                               Usage      |
+-----+-----+-----+
| No running processes found                                     |
+-----+
root@lenovo-ThinkPad-P53:/home/lenovo/Desktop# █
```

15. Reboot the system.



Section 6 – Revision History

Version	Date	Author	Changes/Updates
1.0	10/21/2019	Jason Moebs	Initial launch release