Ubuntu Linux 22.04 LTS Installation

Lenovo ThinkStation PX, P8, P7, P5

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Overview

The purpose of this document is to provide high-level guidance for users to adequately install an Ubuntu Linux 22.04 LTS operating system on the ThinkStation PX, P8, P7, and P5 platforms.

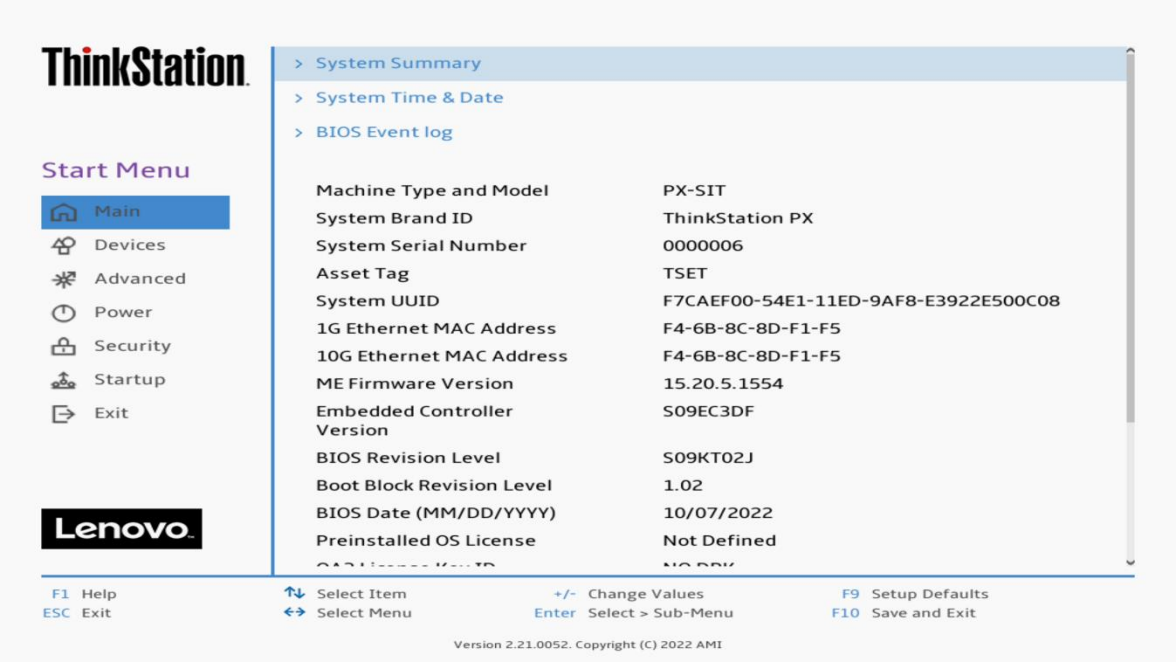
Section 1 – BIOS Setup

Prior to installing any operating system, it is important to make sure BIOS recognizes the storage devices appropriately.

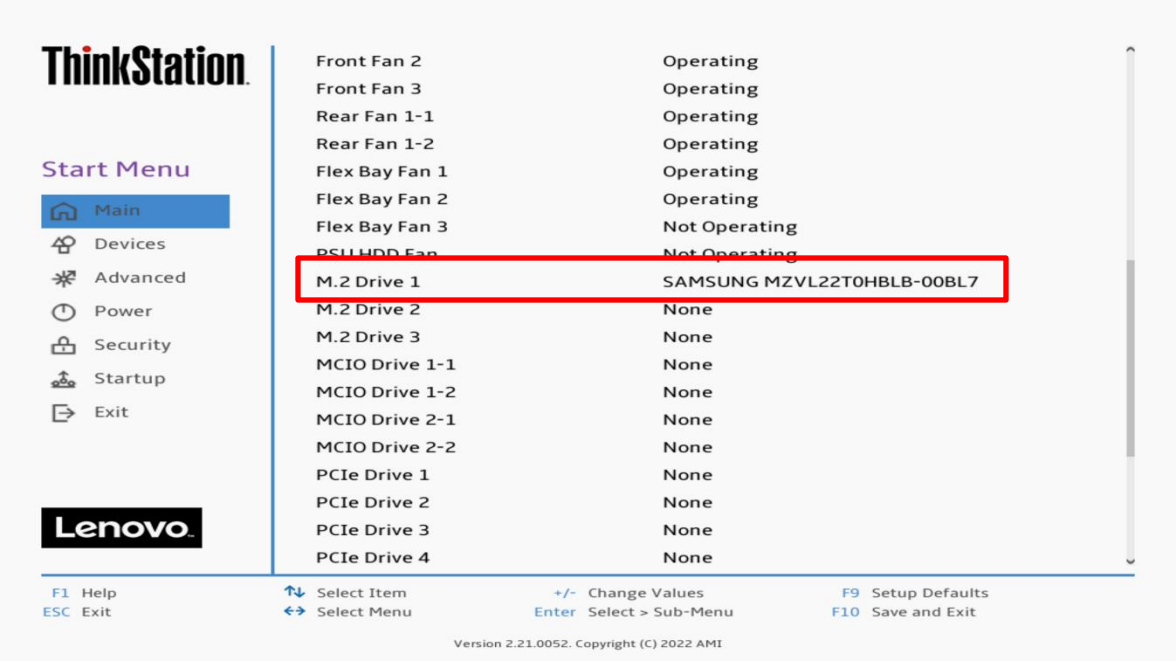
Here are some key items to look for within BIOS setup.

At the Lenovo splash screen, press the function key F1 to enter BIOS setup.

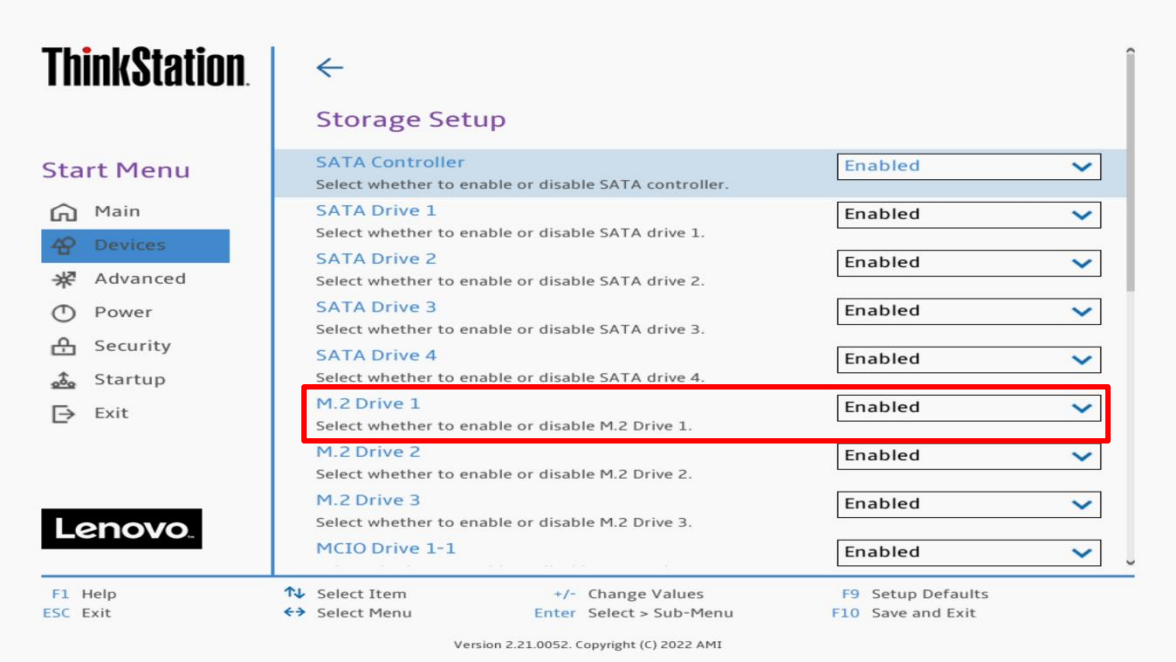
Select ‘System Summary’ from the main BIOS setup page.



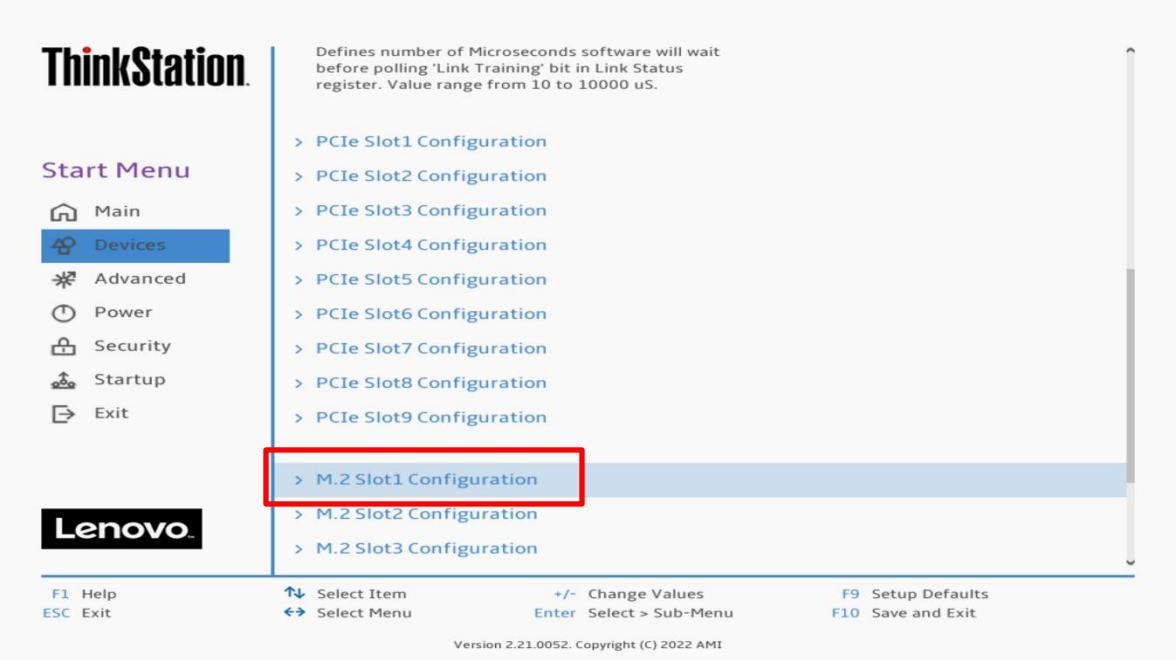
Scroll down through the list until you see the type of drive(s) you are intending to use. Note, drives may <u>not</u> show up here if drives are part of a RAID array.



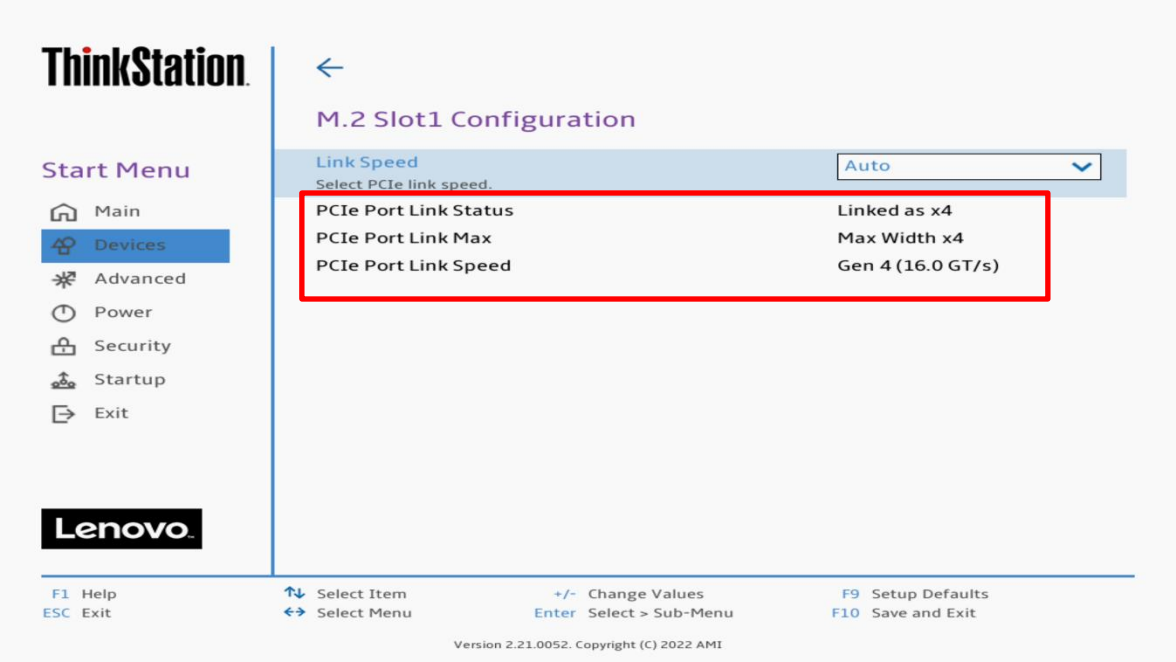
Select ‘Devices’ -> ‘Storage Setup’ to make sure the drive is enabled.



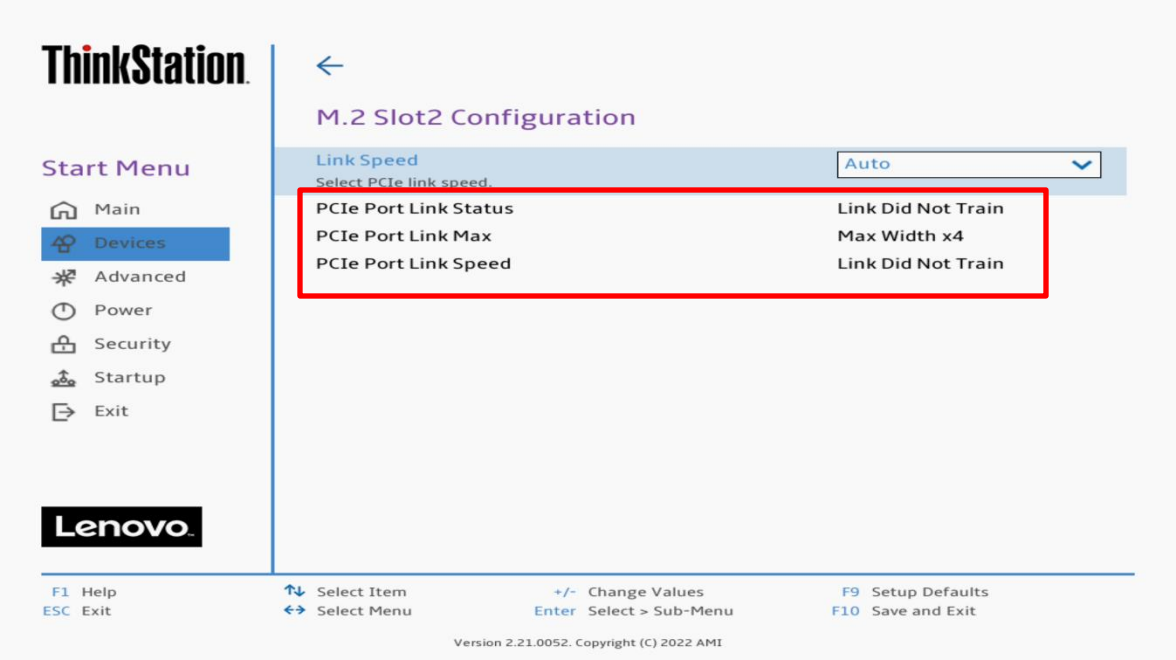
For PCIe drives, select ‘Devices’ -> ‘PCI Express Setup’ and select the slot for where the drive is physically installed. In this example, the M.2 drive is installed in Slot 1.



Make sure the drive is linking properly.



Here's an example of BIOS not recognizing a PCIe drive.



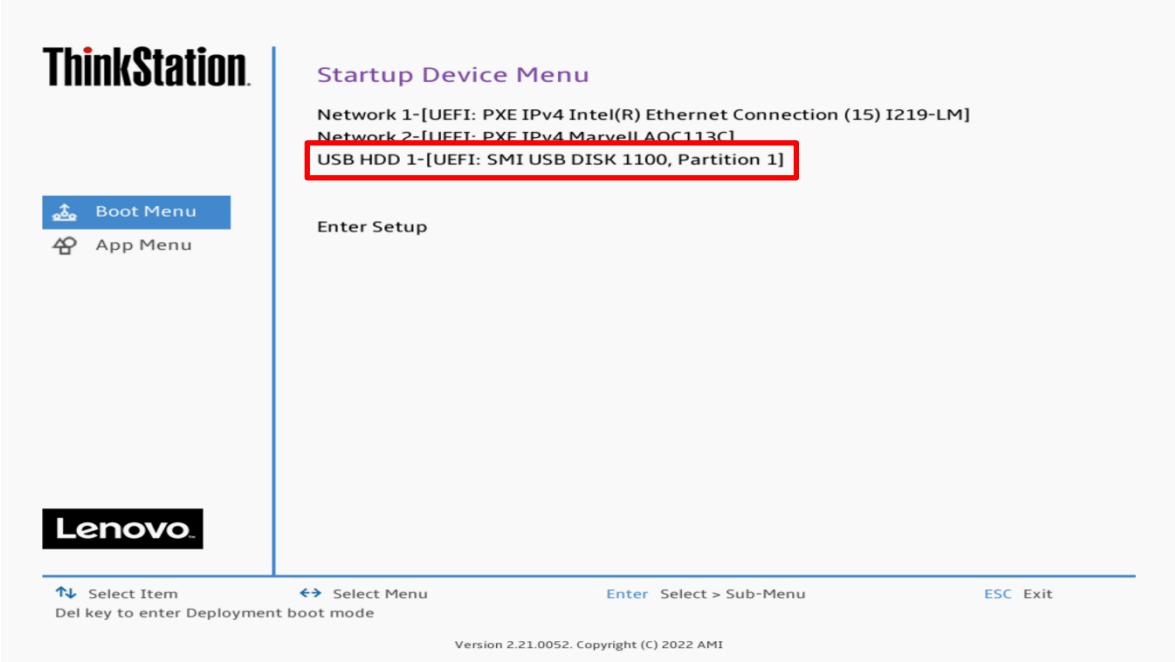
Section 2 – Ubuntu 22.04 Installation

Here are some step-by-step instructions on how to get an Ubuntu Linux 22.04 LTS operating system installed on the ThinkStation PX, P8, P7, and P5 systems.

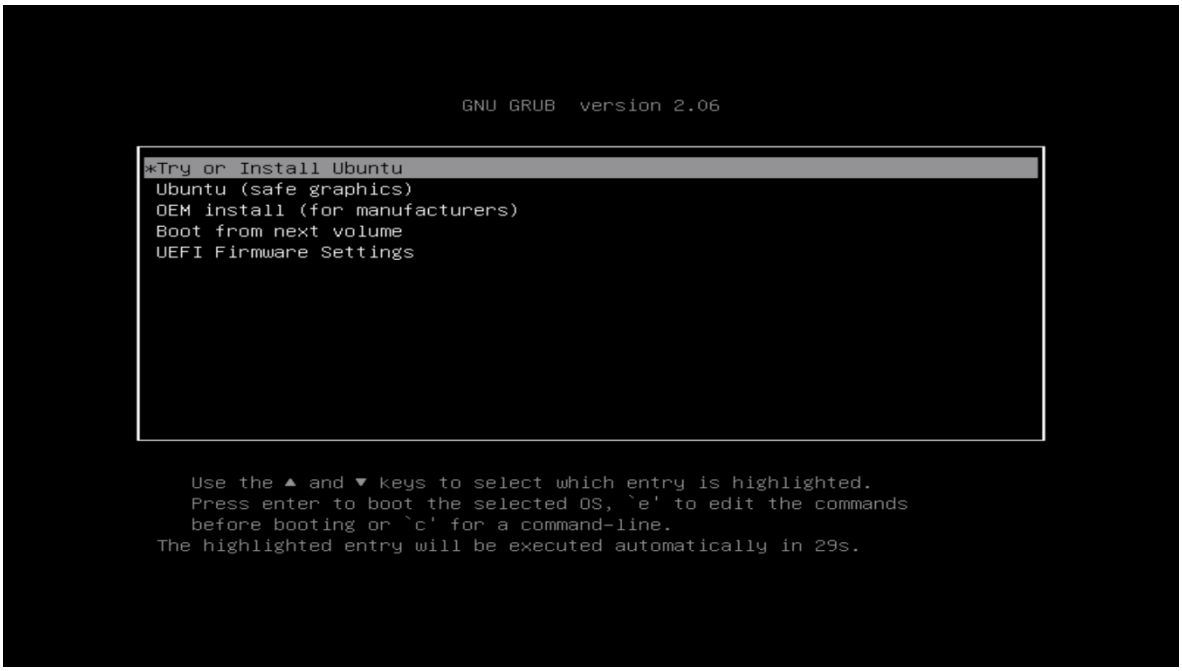
1. Obtain a copy of the Ubuntu 22.04 installation media. It is recommended to extract the Ubuntu 22.04 iso media to a USB.

2. Insert the USB memory key into one of the USB ports on the system and power on the system.

3. At the Lenovo splash screen, press the function F12 key to enter the BIOS startup menu and select the USB installation media from the list.

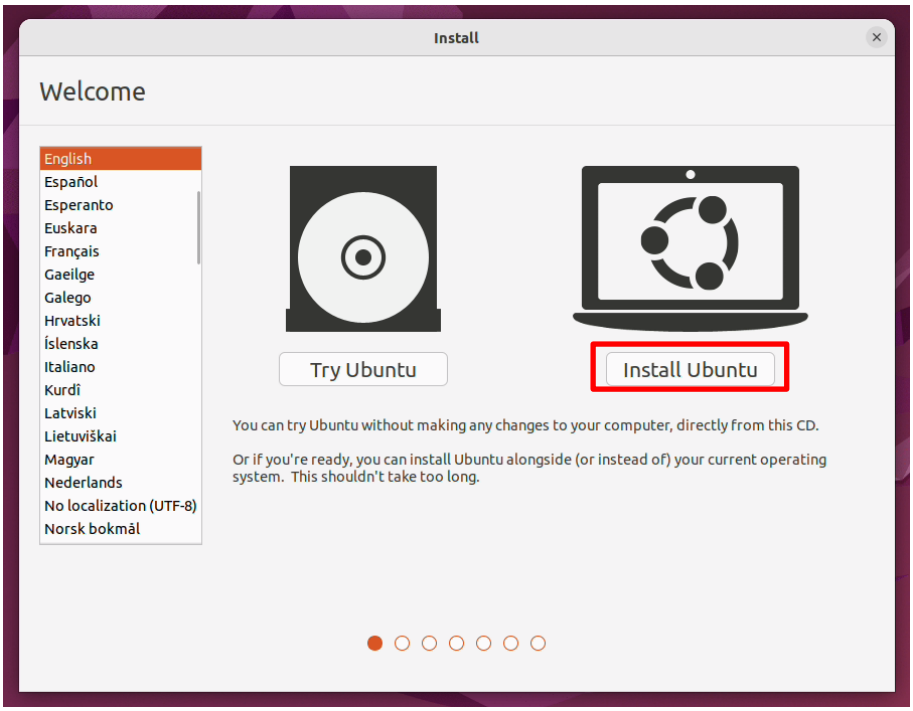


4. Select the ‘Try or Install Ubuntu’ option from the GRUB boot menu and press ‘Enter’.

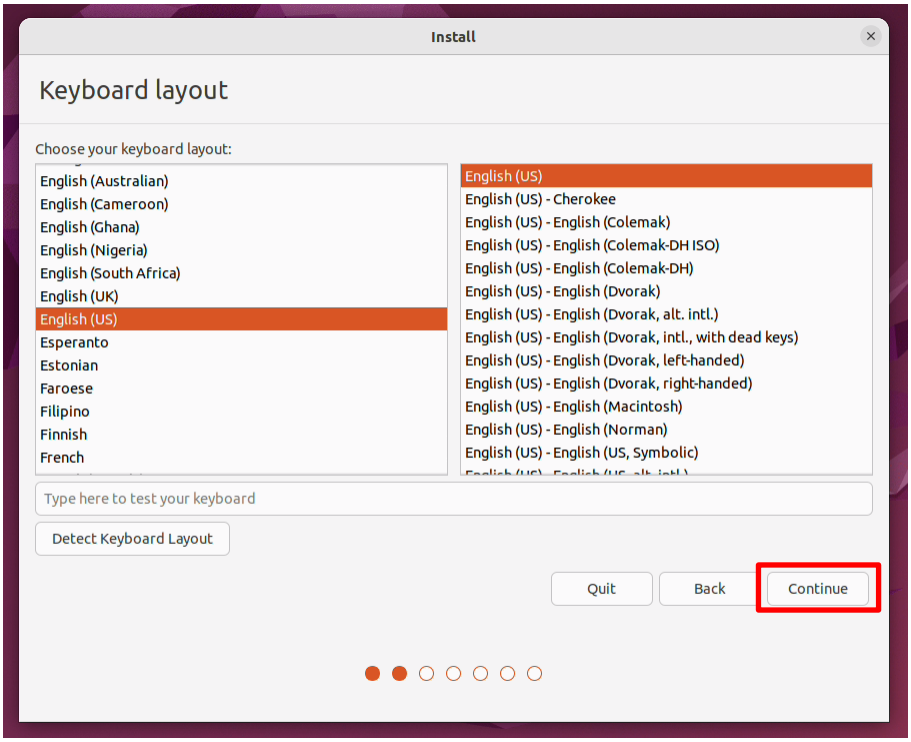


5. The Ubuntu installation media will begin to load.

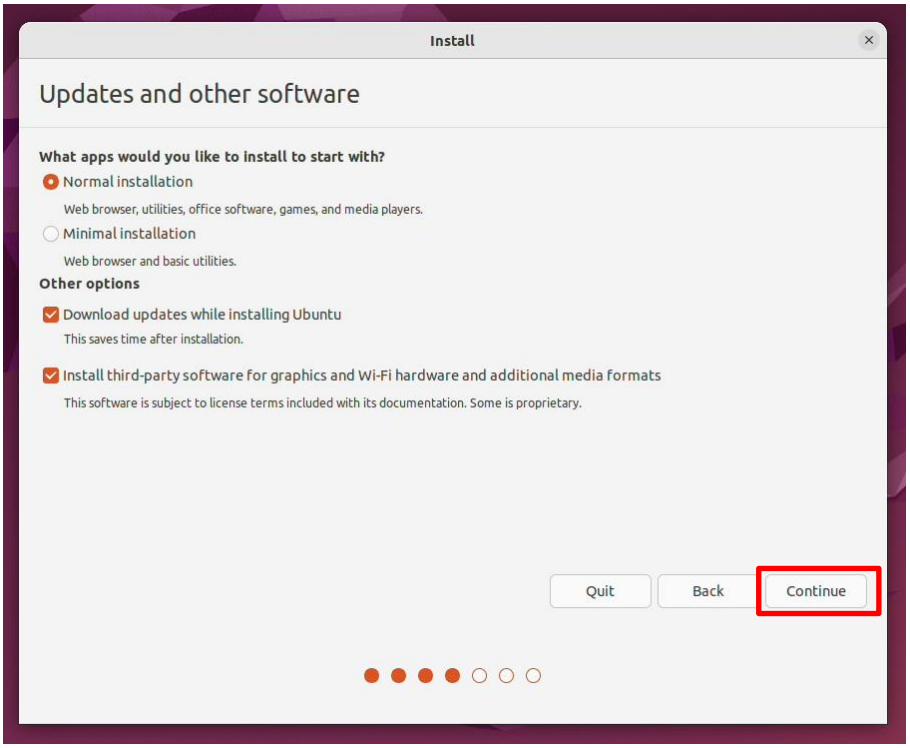
6. The Ubuntu Linux Welcome screen should eventually appear. Select the appropriate language and select ‘Install Ubuntu’.



7. Select the appropriate keyboard layout and ‘Continue’.



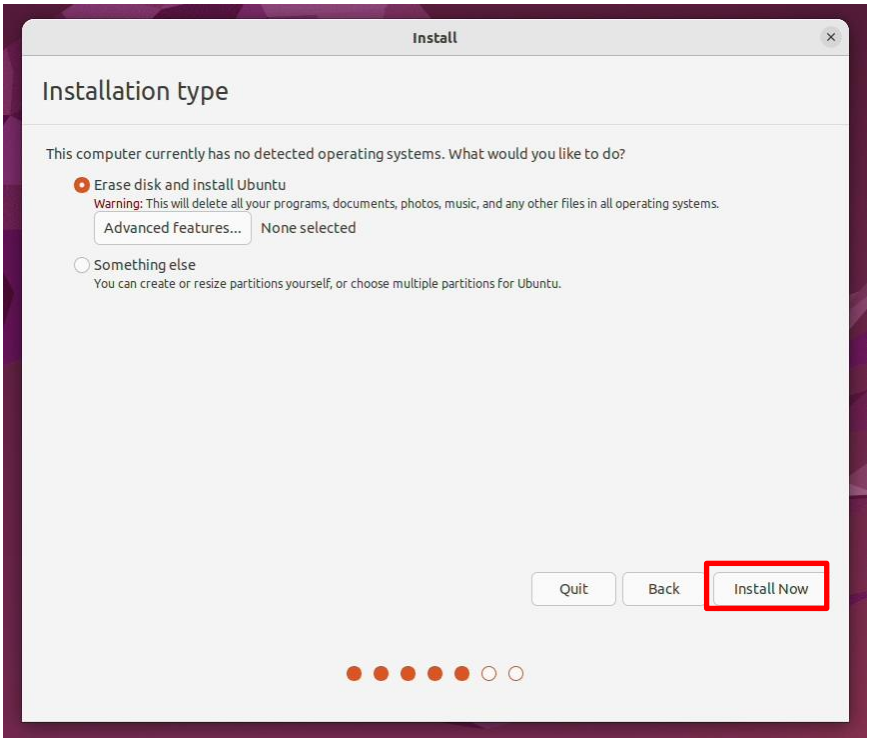
8. Select the type of installation and ‘Continue’.
Note, if there is a valid internet connection on the system, the ‘Other options’ will be selectable.



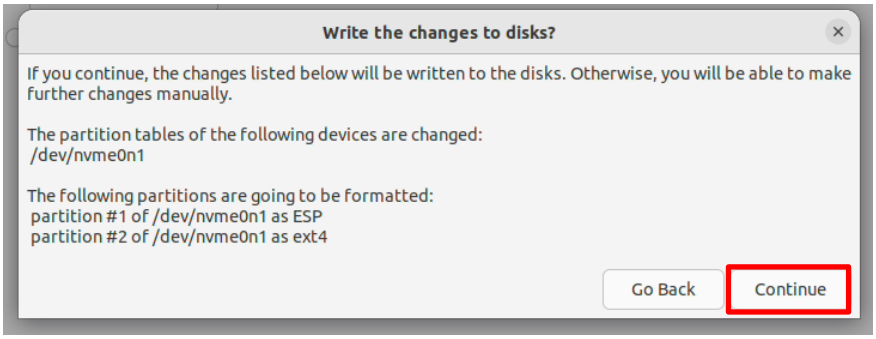
9. Select ‘Erase disk and install Ubuntu’ to automatically create the filesystem partitions and ‘Continue’.

   To manually create filesystem partitions, select ‘Something else’.

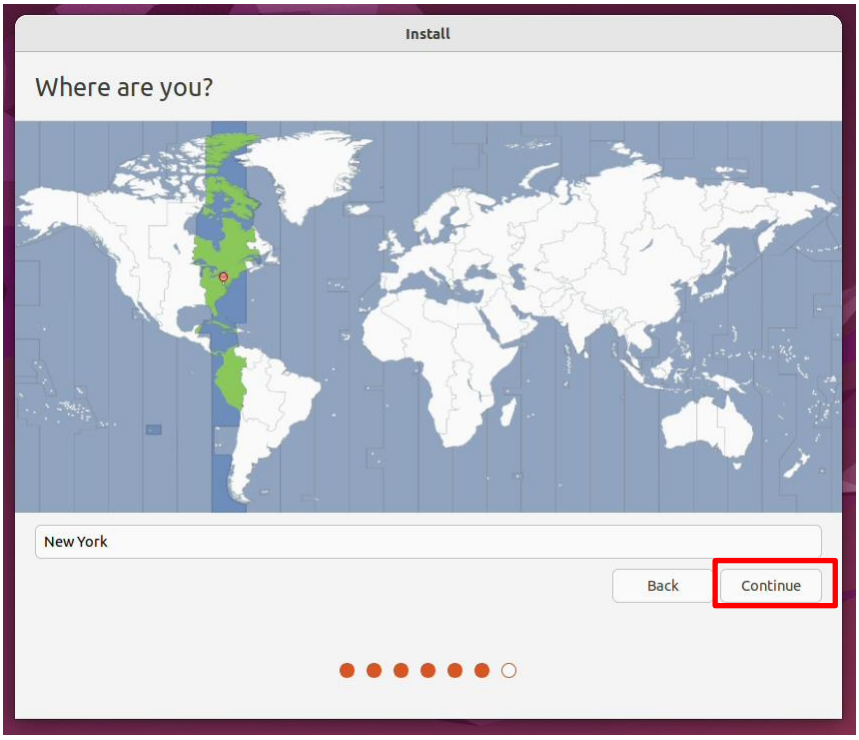
   In this document, ‘Erase disk and install Ubuntu’ has been selected.



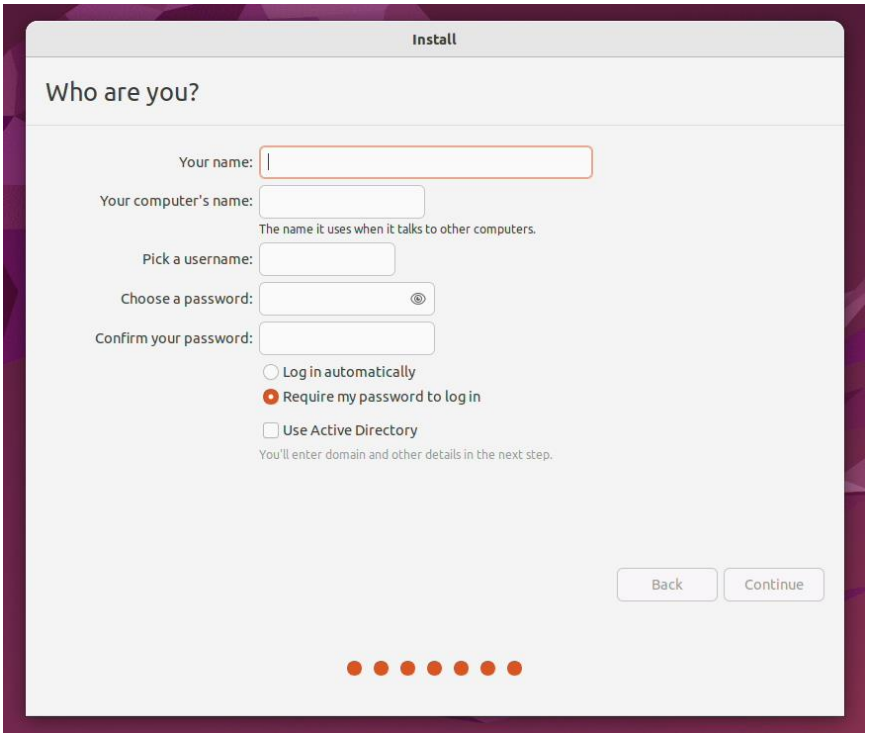
10. Select ‘Continue’ to confirm writing changes to the disk.



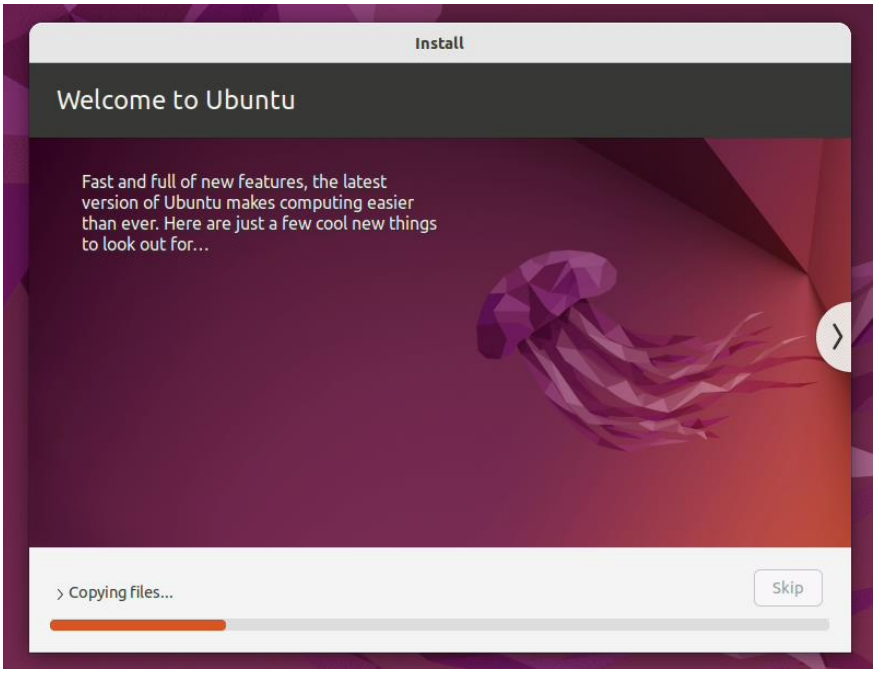
11. Select the appropriate geographical location and ‘Continue’.



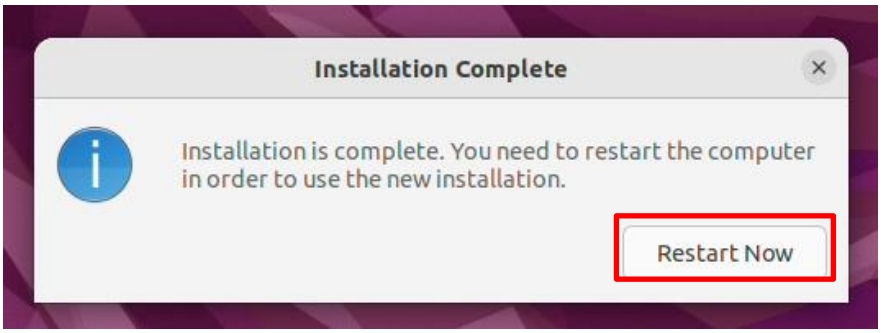
12. Fill in the appropriate boxes below and select ‘Continue’.



13. Let the system finish the installation.

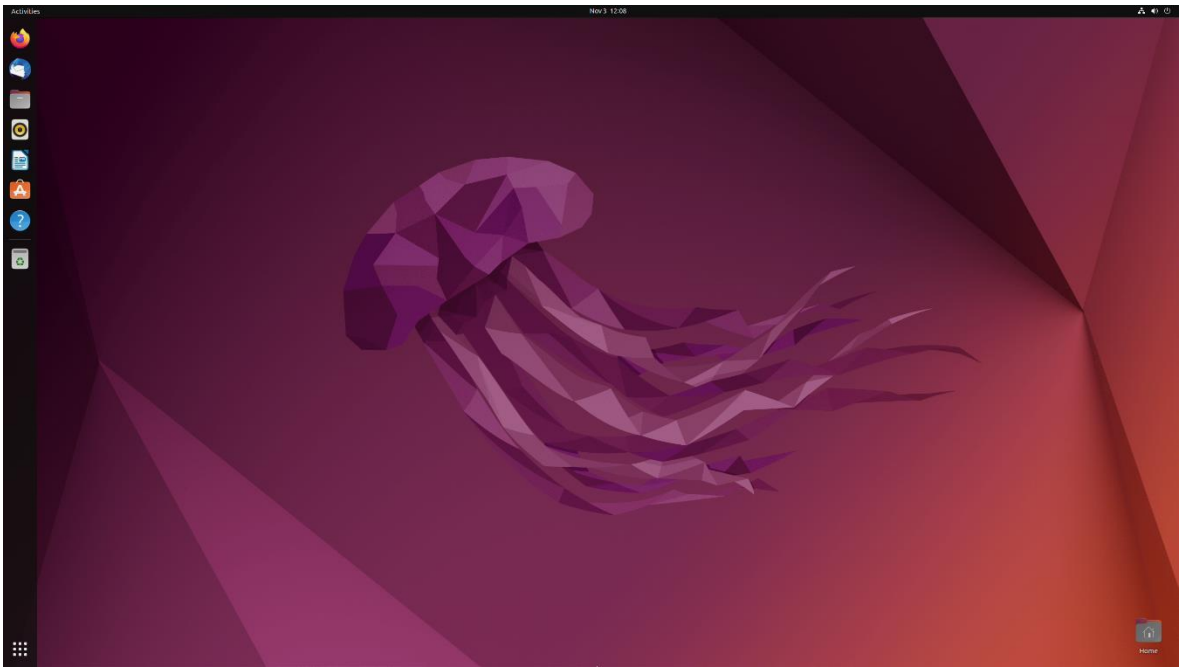


14. Once the installation completes, select ‘Reboot Now’.



15. Remove the installation media (USB/DVD) and press ‘Enter’.

16. Ubuntu 22.04 LTS Desktop screen.



Section 3 – Install Device Drivers

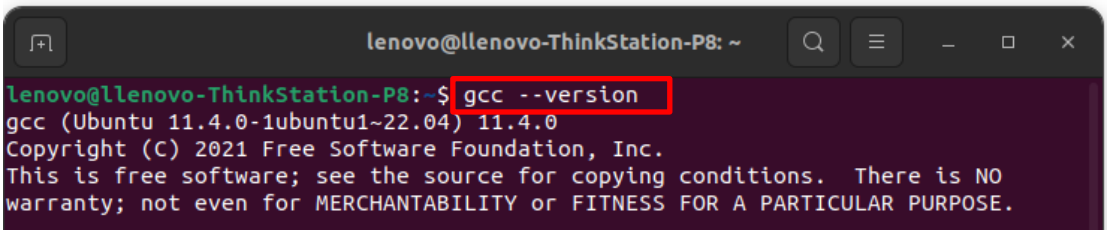
Most of the standard building blocks used in the ThinkStation PX, P8, P7, and P5 platforms are native to the Ubuntu Linux 22.04 LTS base kernel. It may be worth installing a proprietary graphics driver to get optimal performance from the graphics card. The next couple of sections provide some step-by-step instructions on how to install a proprietary Nvidia graphics driver in Ubuntu Linux.

Section 4 – Install Nvidia Proprietary Drivers

Newer versions of Nvidia driver require to have GCC version 12. Here are steps how to update the GCC version:

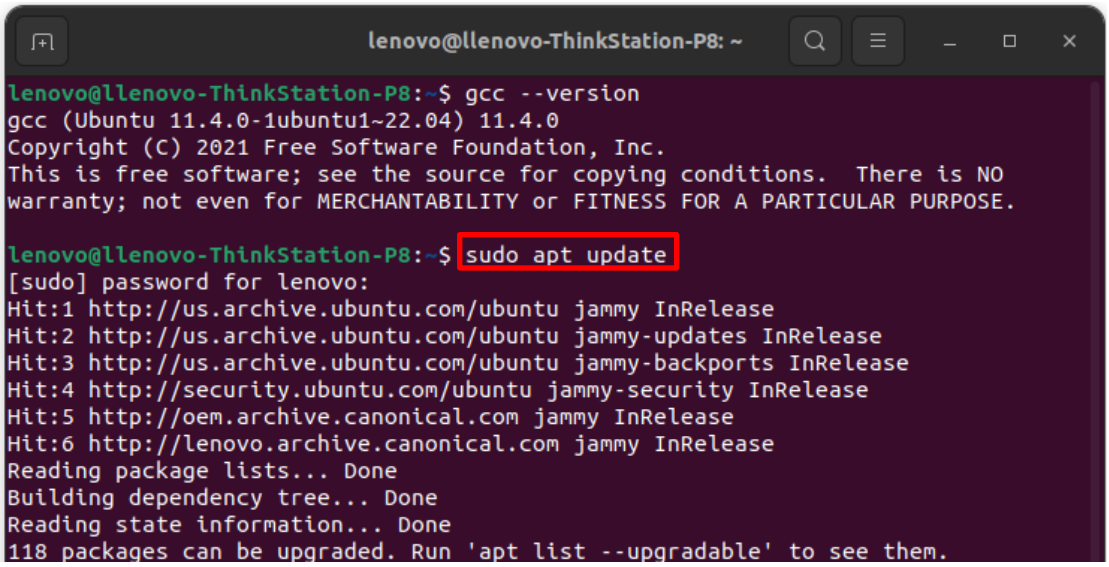
1. Check current GCC version.

   #gcc –version



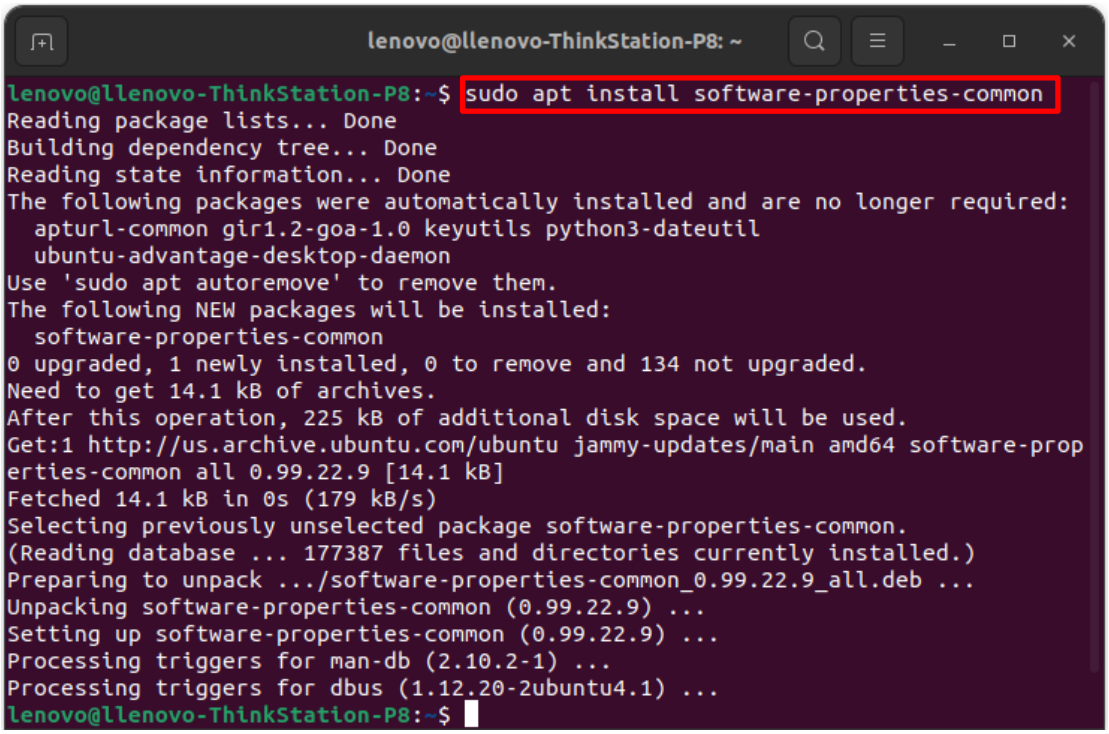
2. Update the repository information.

   #sudo apt update



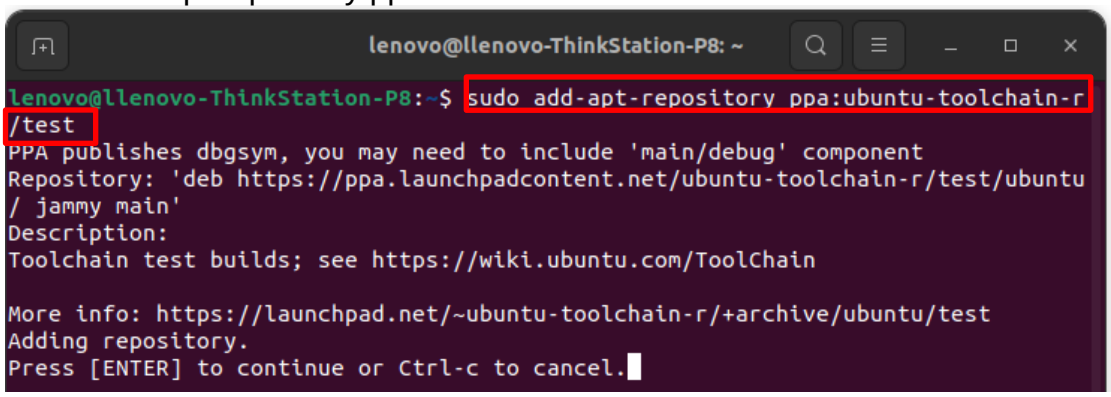
3. Install the software Properties Common Package.

   #sudo apt install software-properties-common



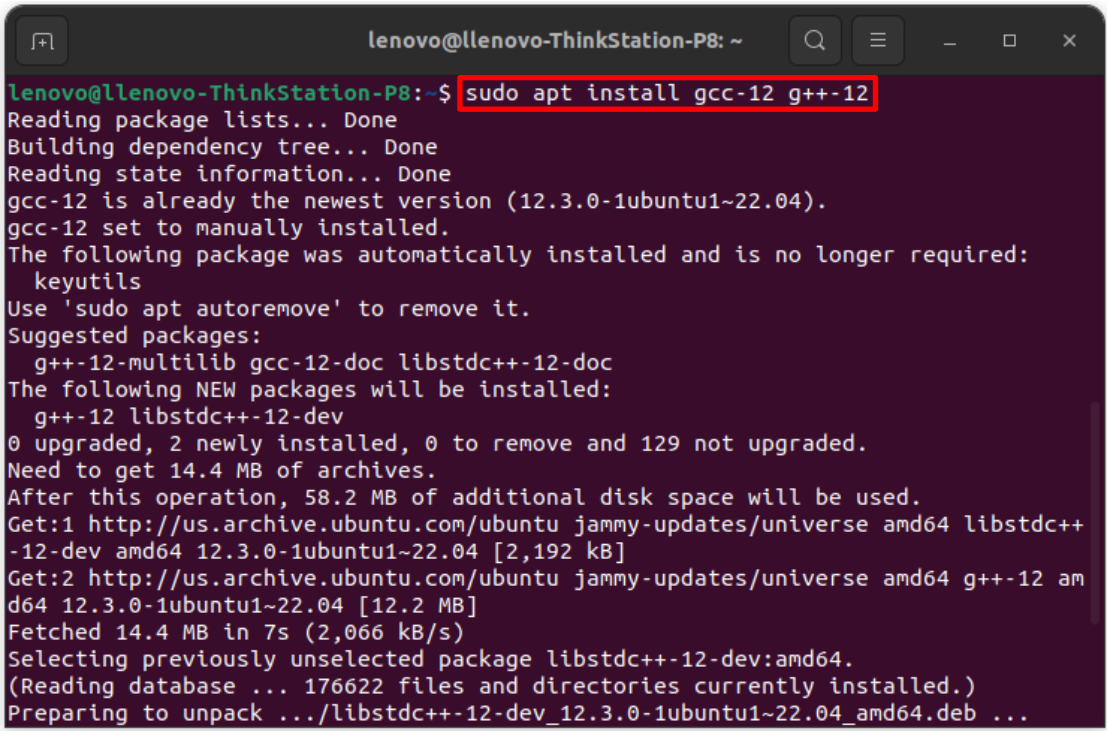
4. Add the GCC Repository.

   #sudo add-apt-repository ppa:ubuntu-toolchain-r/test



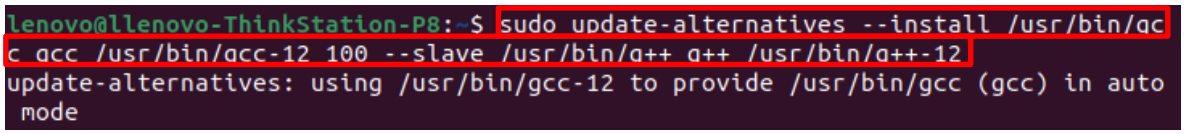
5. Install the desired GCC version.

   #sudo apt install gcc-12 g++-12



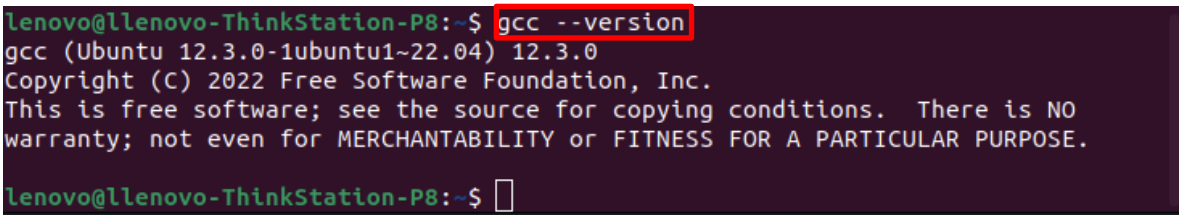
6. Configure the default GCC version.

   #sudo update-alternatives --install /usr/bin/gcc gcc /usr/bin/gcc-12 100 --slave /usr/bin/g++ g++ /usr/bin/g++-12



7. Verify updated version GCC.

   #gcc –version



Here are some step-by-step instructions on how to install Nvidia proprietary drivers.

1. Download the appropriate Nvidia graphics driver.
2. Blacklist the Linux Nouveau driver.

   # nano /etc/modprobe.d/blacklist.conf

   - Add the following line, ‘blacklist nouveau’, and save and exit the file.

3. Update the initramfs file and reboot the system.

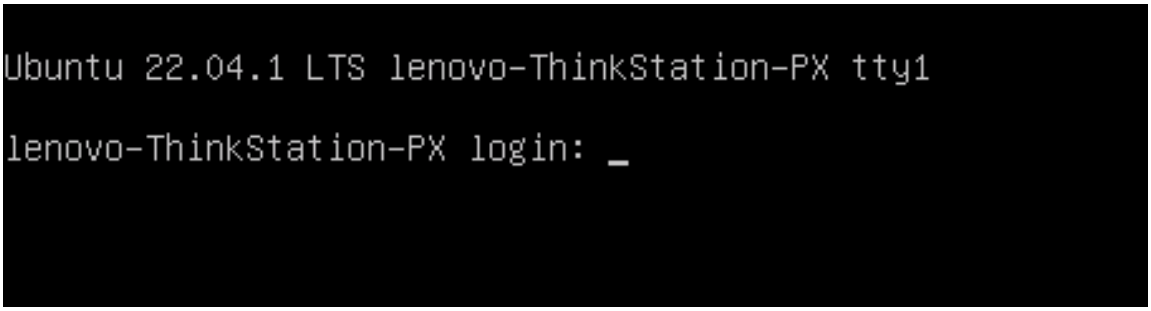
   # update-initramfs -u

   # reboot now

4. Once the system reboots to the Linux desktop screen, run the following command as superuser from a terminal window to exit X-windows.

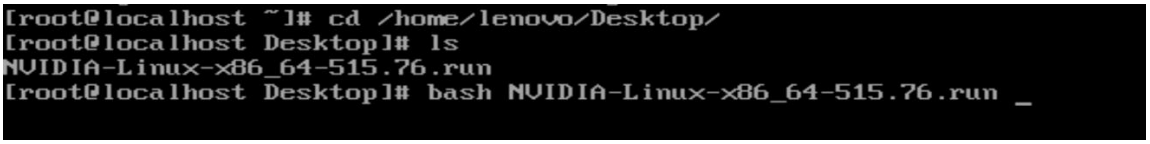
   # init 3

5. Login as root (superuser).

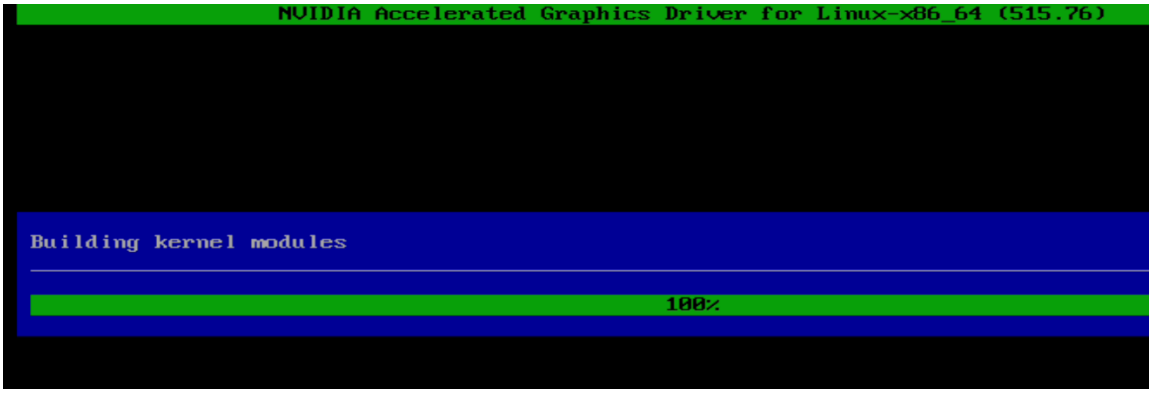


6. Browse to the directory to where the Nvidia driver installation file is located and run the following command. *In this example, it is on the Linux desktop.*

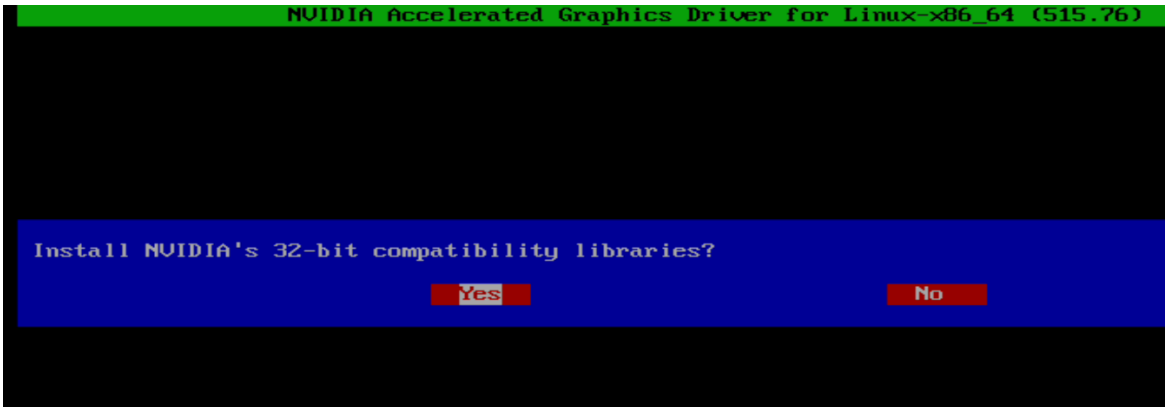
   # bash NVIDIA*



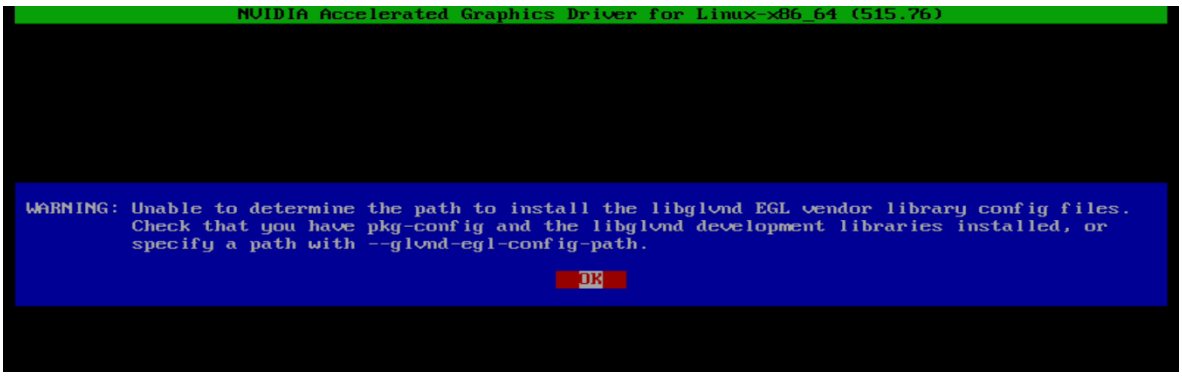
7. Note the driver should start to install.



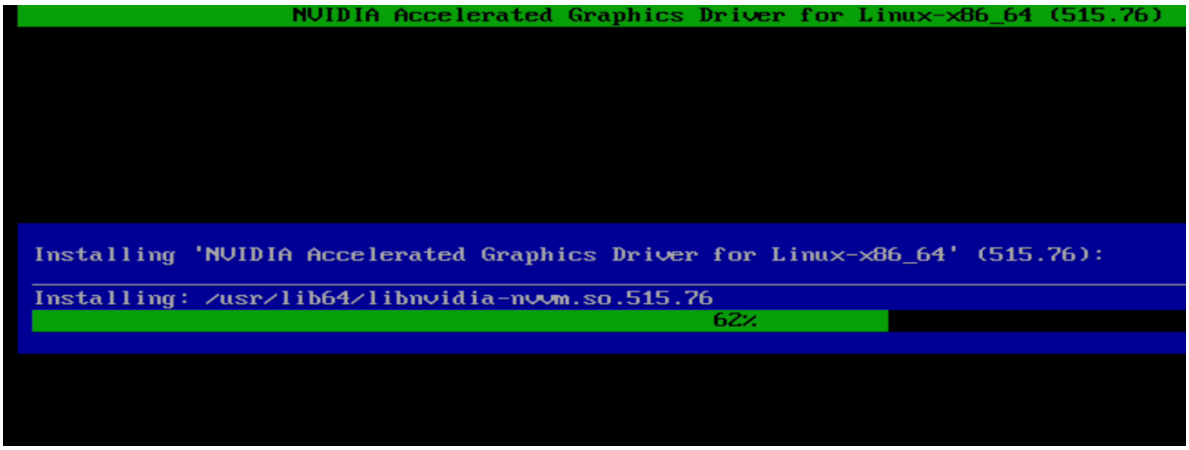
8. The driver will ask whether to install NVIDIA's 32-bit compatibility libraries.
   In this example, 'yes' was selected.



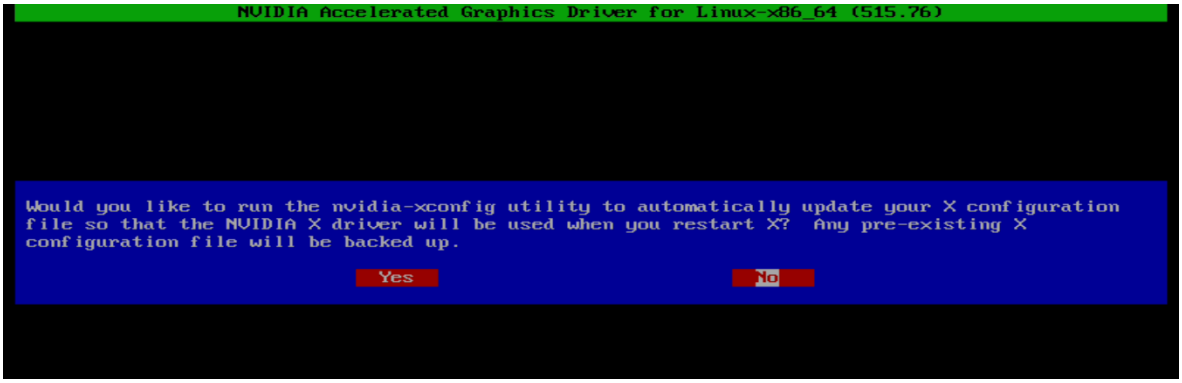
9. Select 'OK' on the following warning message.



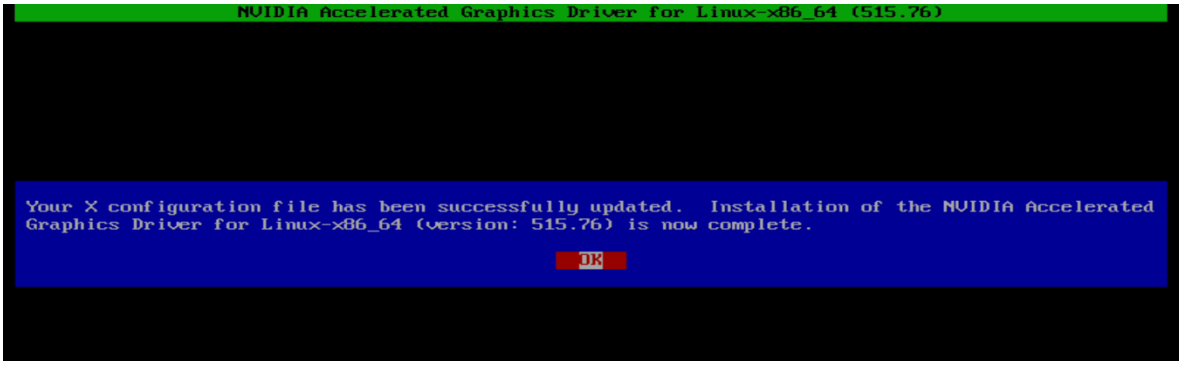
10. The driver should continue to install.



11. Select ‘Yes’ to update the x-configuration file.

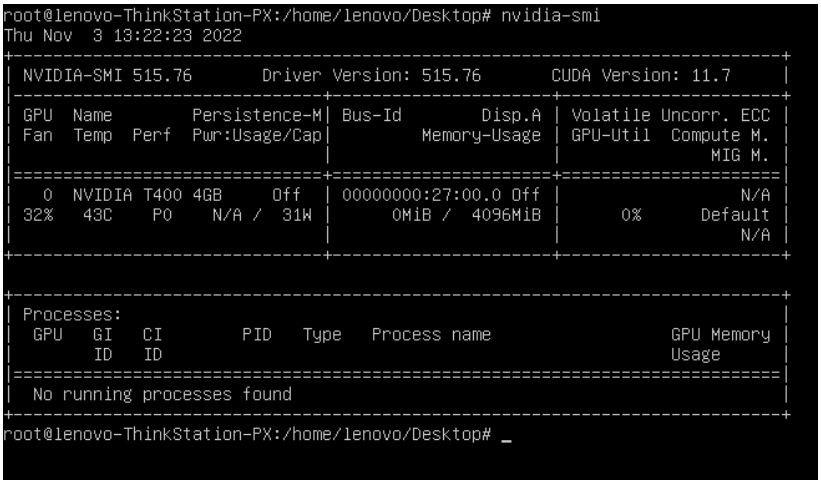


12. Select ‘OK’ to acknowledge that the x-configuration file has successfully been updated.



13. Run the following command to verify the Nvidia driver has been installed and loaded properly.

    # nvidia-smi



Revision History

Version	Date	Author	Changes/Updates
1.2	3/18/2024	A Panteleev	Updated Section 4
1.1	12/12/2023	A Panteleev	Added support for P8
1.0	4/19/2023	J Moebs	Initial launch release.