

# Ubuntu Linux 20.04 LTS Installation

Lenovo ThinkStation P620



---

## Contents

SECTION 1 – BIOS SETUP & PREINSTALLATION STEPS

SECTION 2 – INSTALLING UBUNTU LINUX 20.04 LTS

SECTION 3 – RAID ARRAY INSTALLATION

SECTION 4 – RAIDXPRT2 MANAGEMENT APPLICATION

SECTION 5 – INSTALLING THE AQUANTIA LAN DRIVER

SECTION 6 – INSTALLING THE NVIDIA GRAPHICS DRIVER

SECTION 7 – REVISION HISTORY

---

## Section 1 - BIOS Setup & Preinstallation Steps

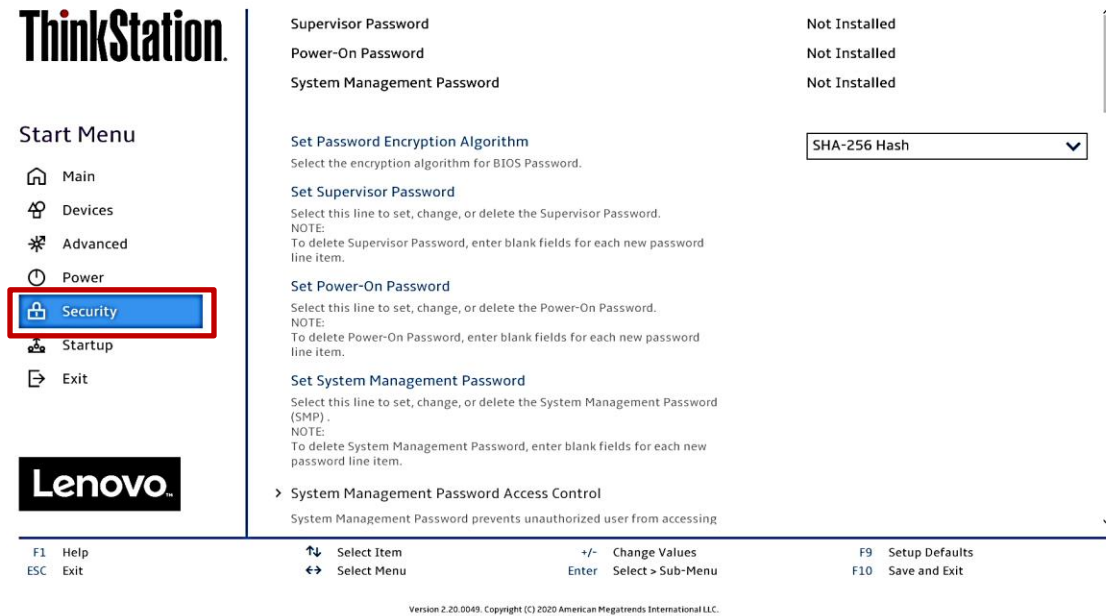
The first step before installing Linux is to make sure the system BIOS is setup correctly. Follow the steps below to ensure a few BIOS settings are set appropriately.

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

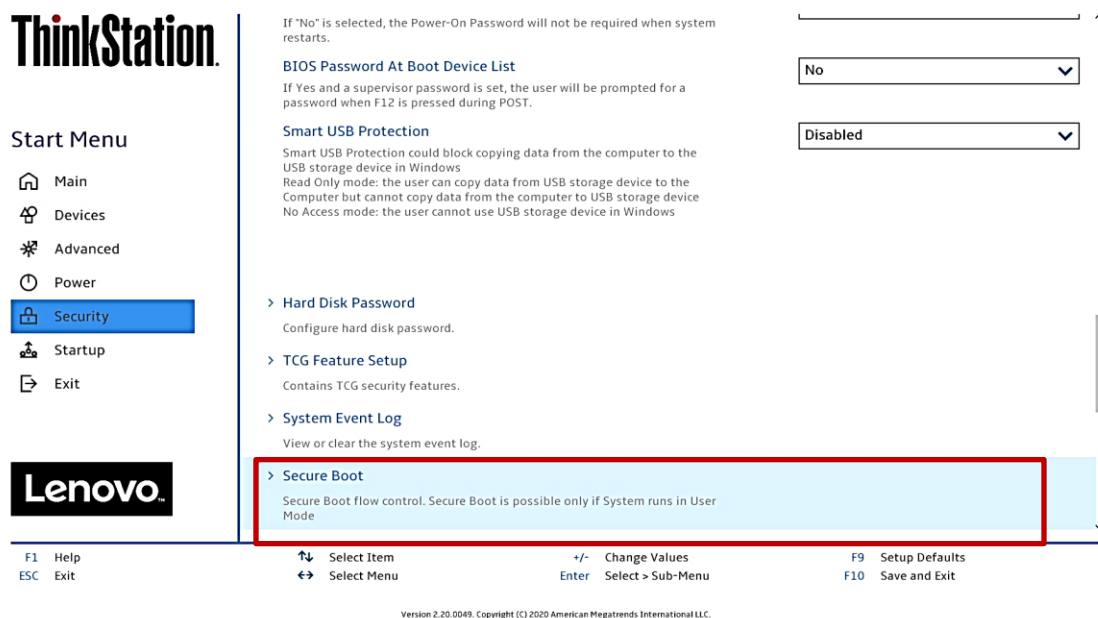
A black rectangular splash screen with the word "Lenovo" in white, sans-serif font, centered horizontally and vertically. A small trademark symbol (TM) is visible to the upper right of the word.

Lenovo™

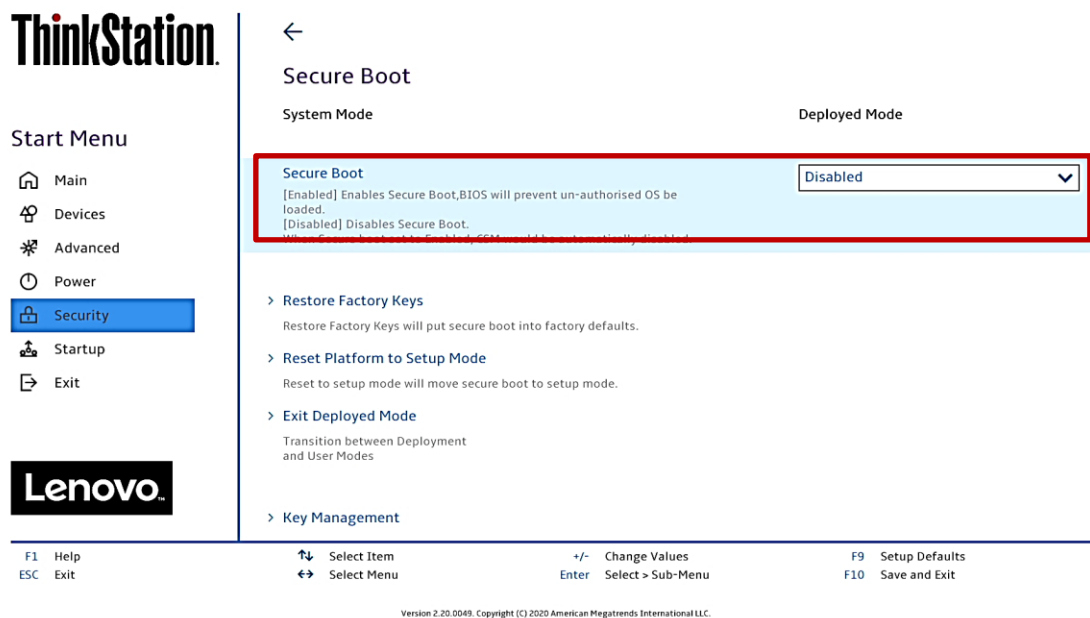
- On the main start menu within BIOS setup, select the “Security” option.



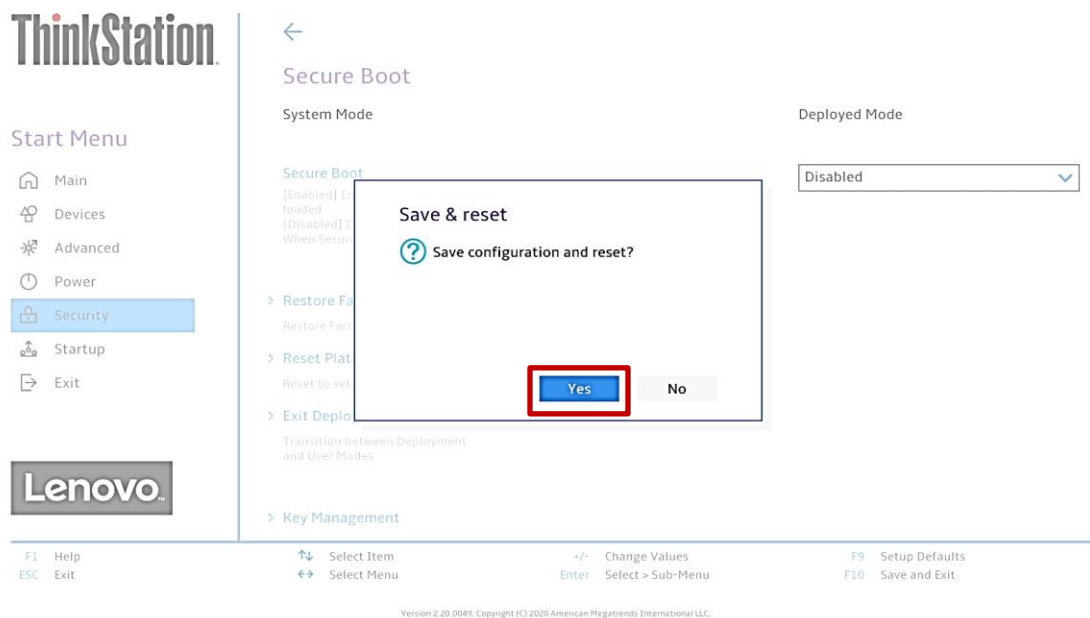
- On the “Security” menu tab, scroll down and select the “Secure Boot” option.



- Set the “Secure Boot” drop-down option to “Disabled”.



- Press the function F10 key to “Save & Exit” the BIOS setup menu and select “Yes” on the pop-up window that’ll appear.

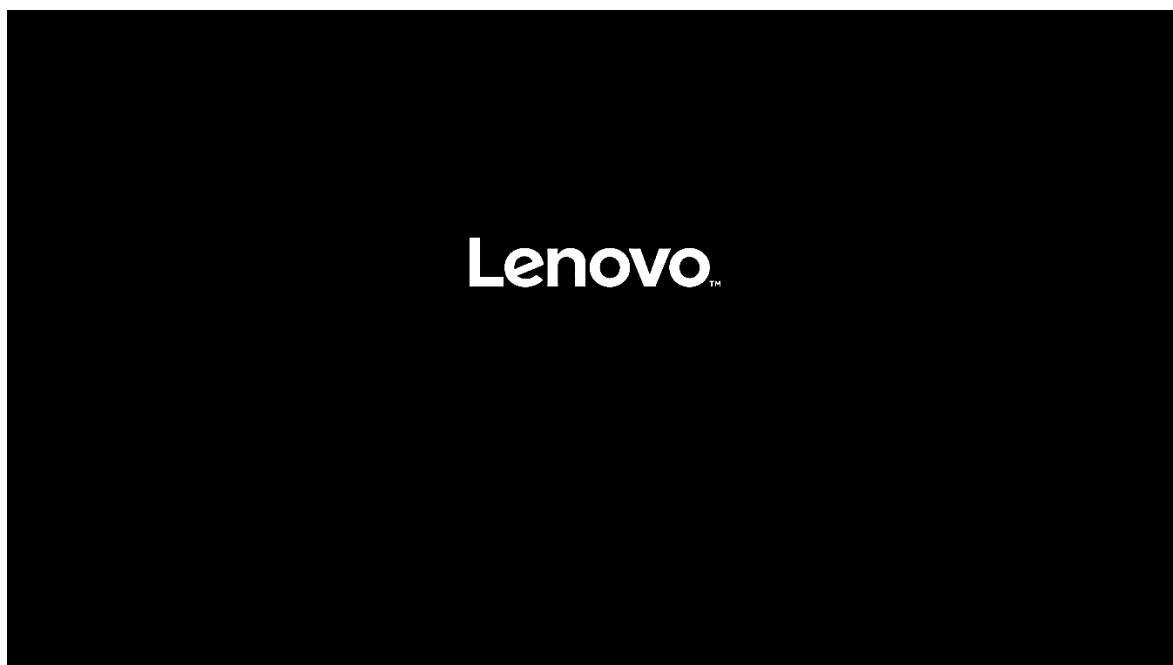


---

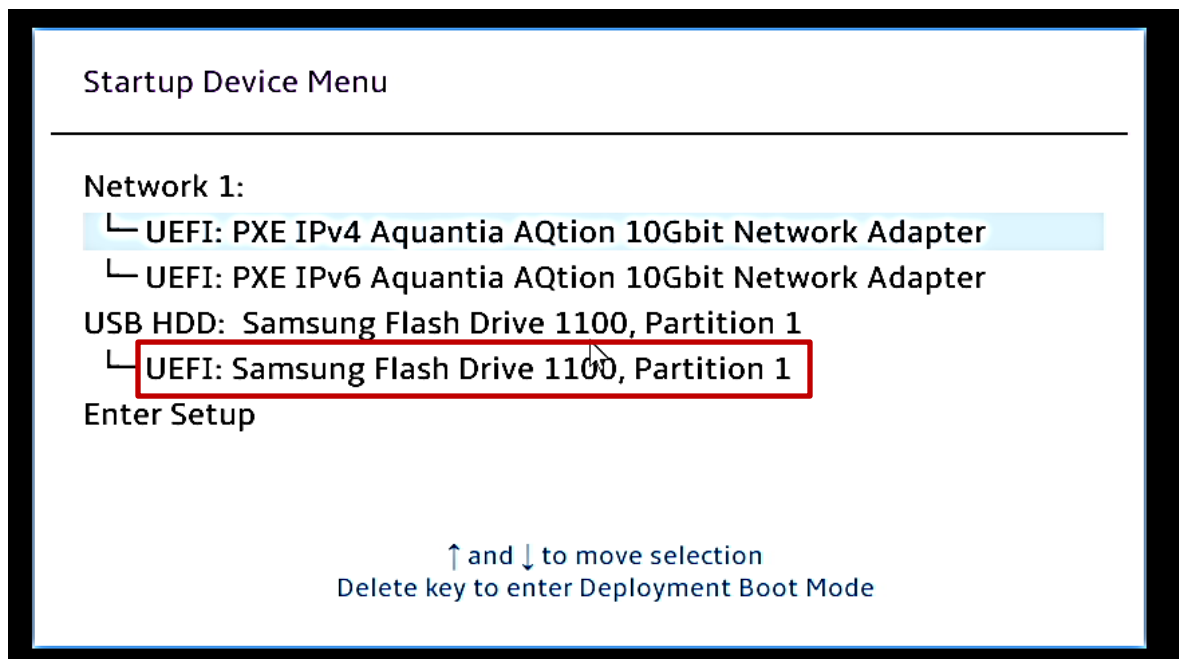
## Section 2 – Installing Ubuntu Linux 20.04 LTS

Please refer to the following instructions and screenshots on how to install Ubuntu Linux 20.04 LTS on the Lenovo ThinkStation P620.

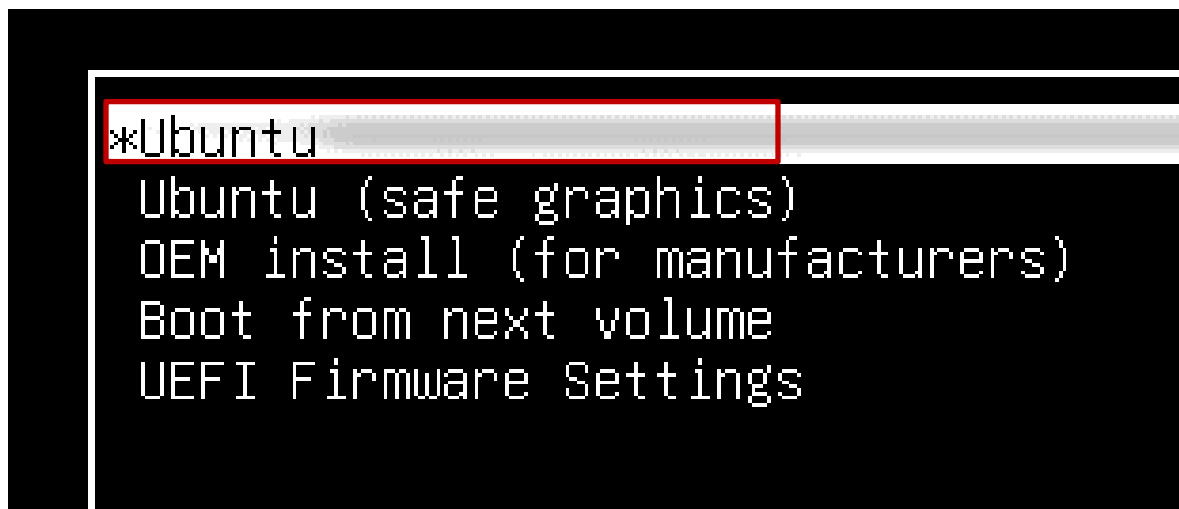
- Insert the Ubuntu 20.04 installation media either through USB or CD/DVD.
- Power on the system and press the function F12 key when the Lenovo splash screen appears.



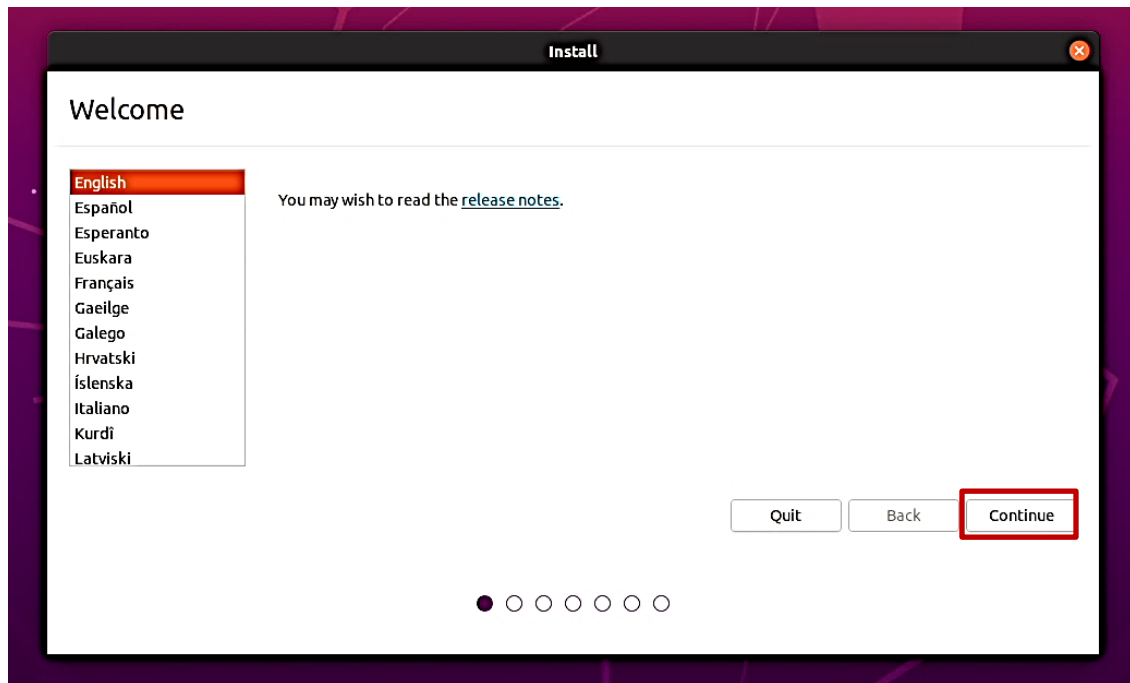
- Select the Linux bootable installation media from the Startup Device Menu.



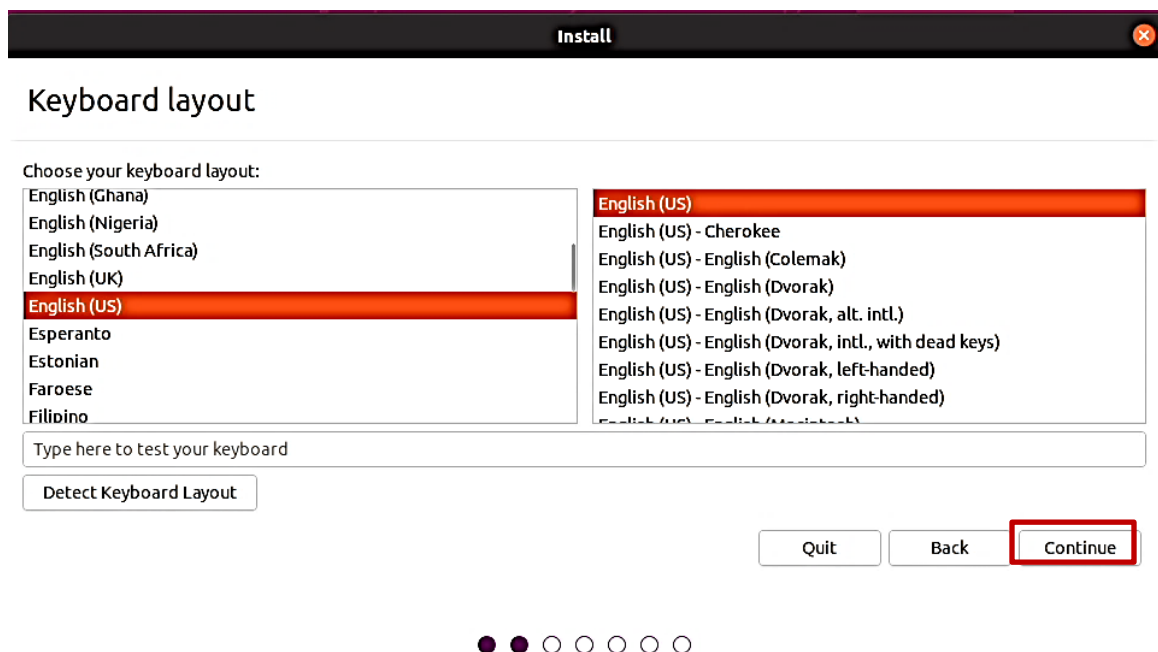
- Select the “Ubuntu” option from the GRUB boot menu, and press enter.



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

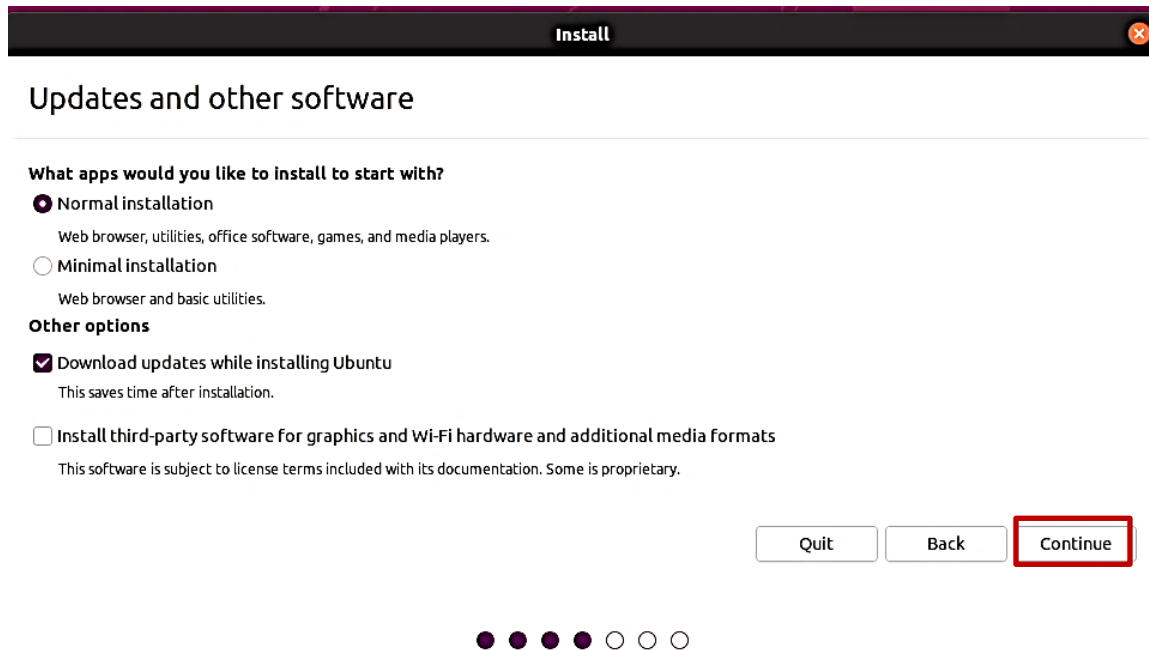


- Select the appropriate keyboard layout and “Continue”.





- Select the type of installation and whether to install updates and “Continue”.



**Install**

## Updates and other software

What apps would you like to install to start with?

☒ Normal installation  
Web browser, utilities, office software, games, and media players.

☐ Minimal installation  
Web browser and basic utilities.

**Other options**

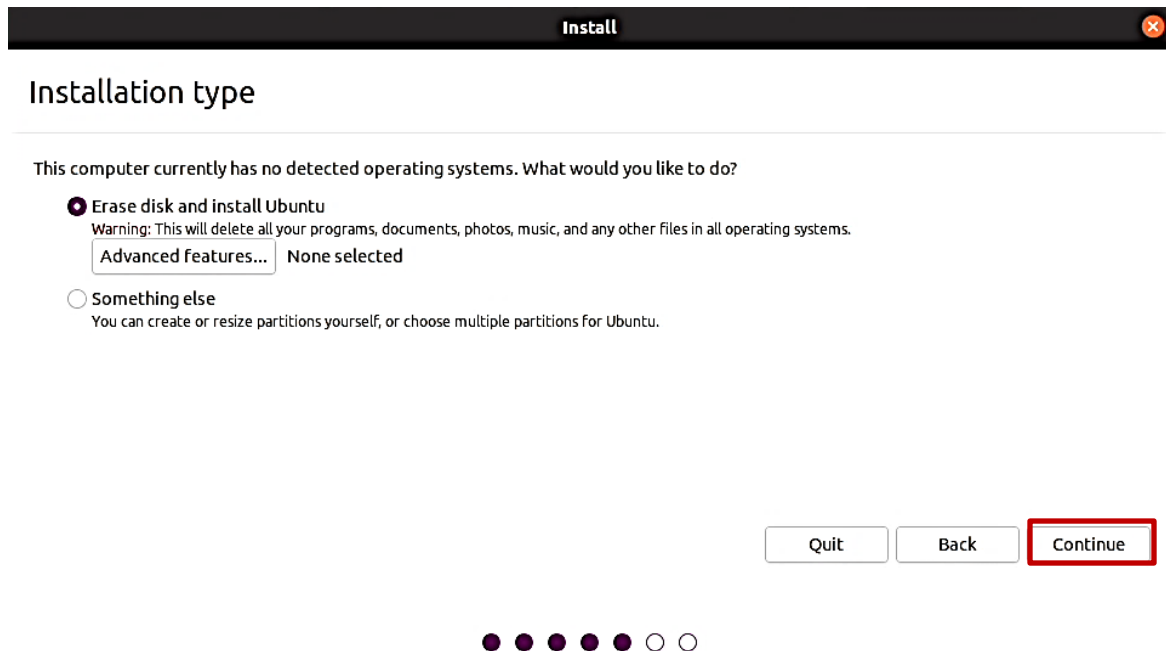
☒ Download updates while installing Ubuntu  
This saves time after installation.

☐ Install third-party software for graphics and Wi-Fi hardware and additional media formats  
This software is subject to license terms included with its documentation. Some is proprietary.

Quit Back **Continue**

● ● ● ● ○ ○ ○

- Select “Erase disk and install Ubuntu” to automatically create the filesystem partitions and “Continue”.



**Install**

## Installation type

This computer currently has no detected operating systems. What would you like to do?

☒ Erase disk and install Ubuntu  
Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.  
**Advanced features...** None selected

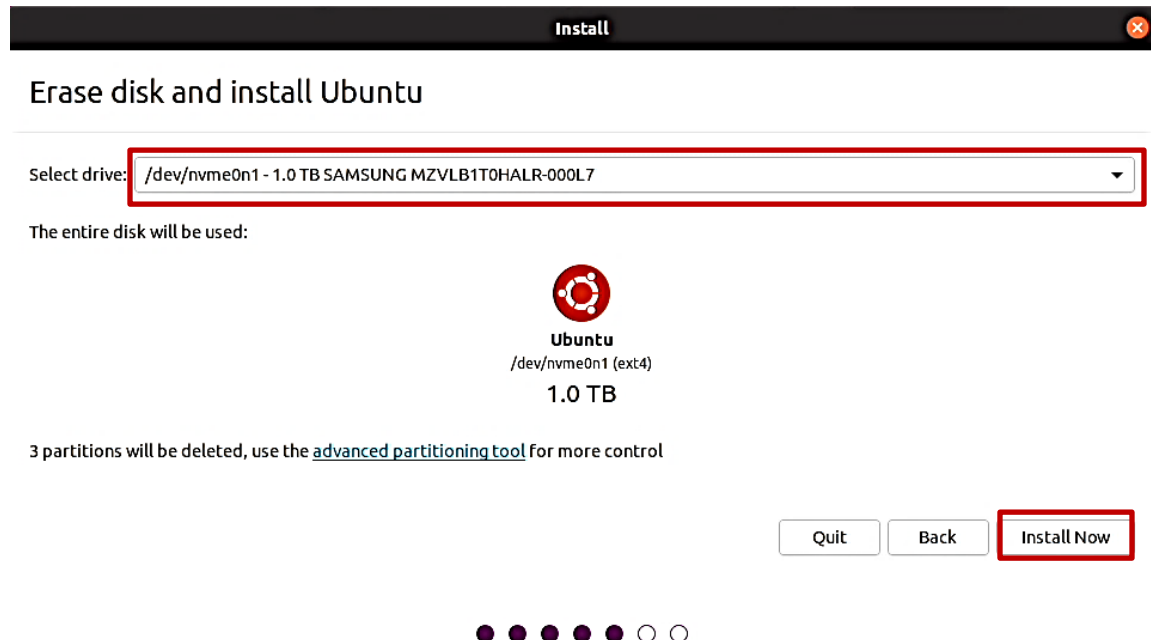
☐ Something else  
You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

Quit Back **Continue**

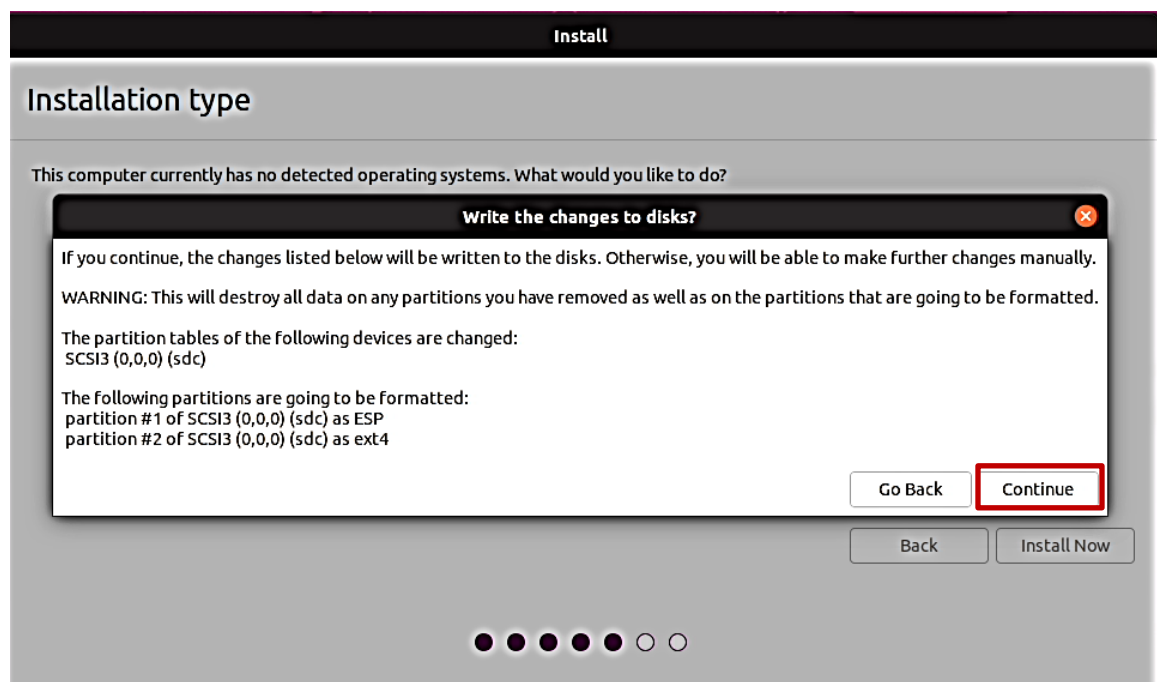
● ● ● ● ● ○ ○

- Select the drive from the dropdown menu on where to install the Ubuntu image and select “Install Now”.

*For AMD RAID arrays, see Section 3 below.*




- Select “Continue” to confirm writing changes to the disk.



- Select the appropriate geographical location and “Continue”.

**Install**

Where are you?



New York

- Fill in the appropriate boxes below and select “Continue”.

**Install**

Who are you?

Your name:

Your computer's name:   
The name it uses when it talks to other computers.

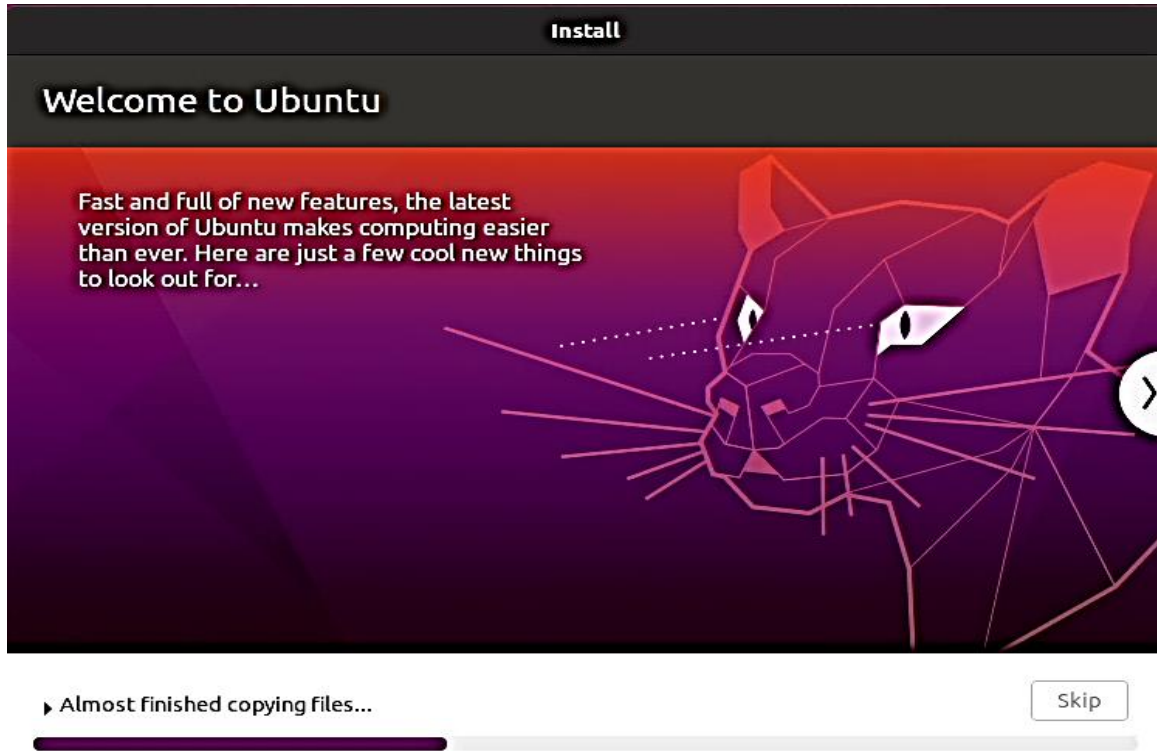
Pick a username:

Choose a password:

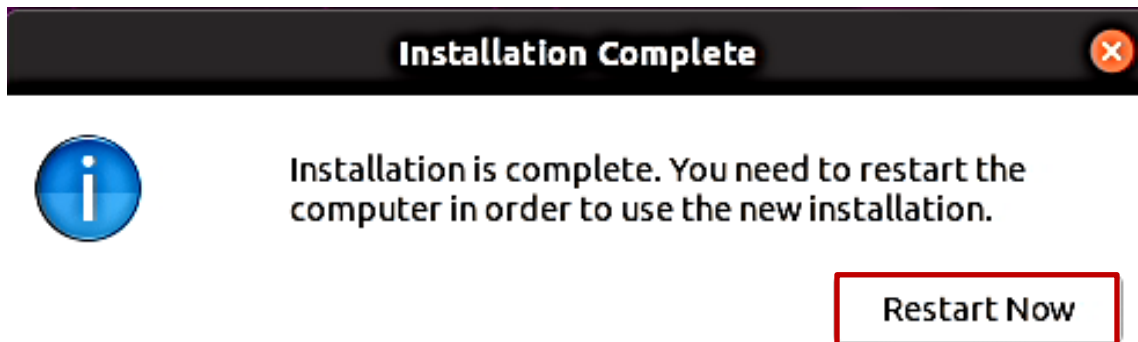
Confirm your password:

☐ Log in automatically  
☒ Require my password to log in

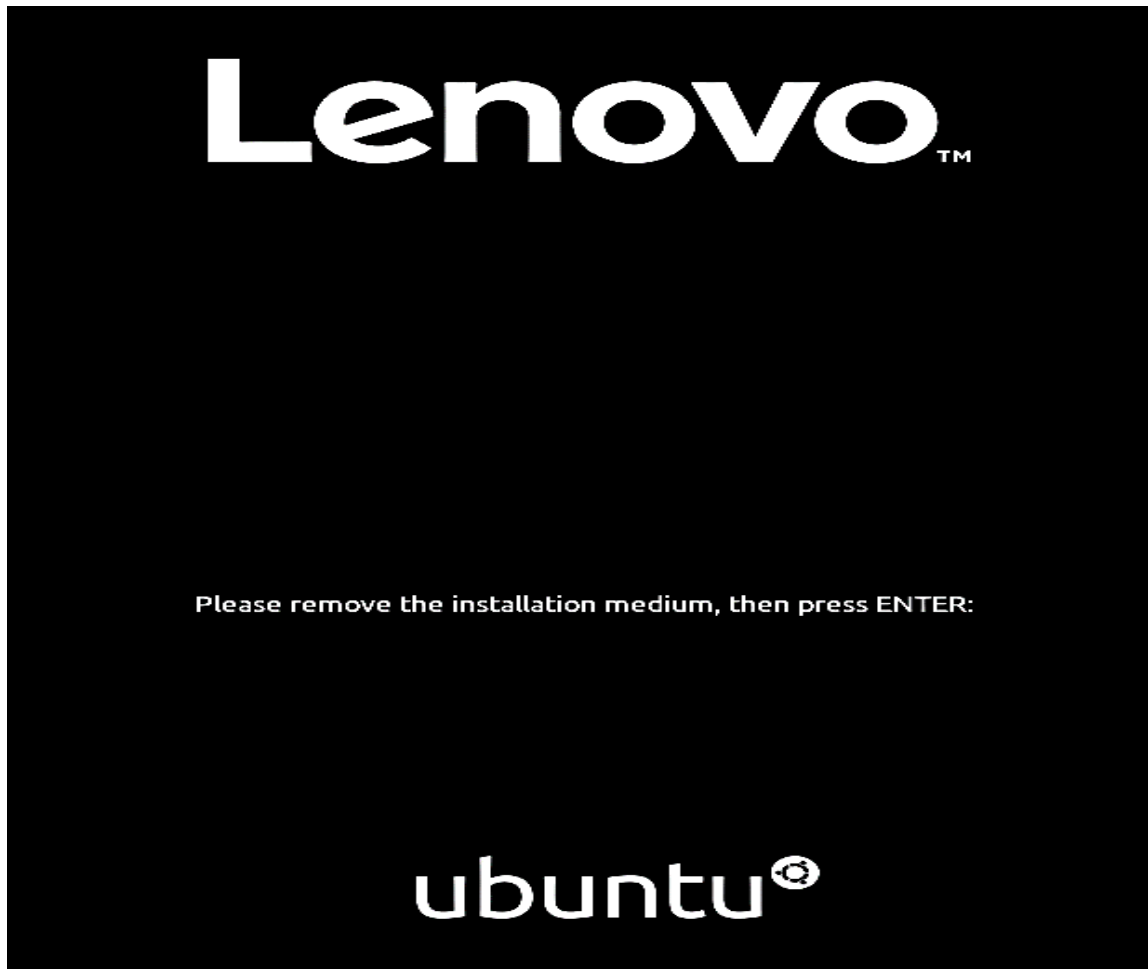
- Let the system finish the installation.



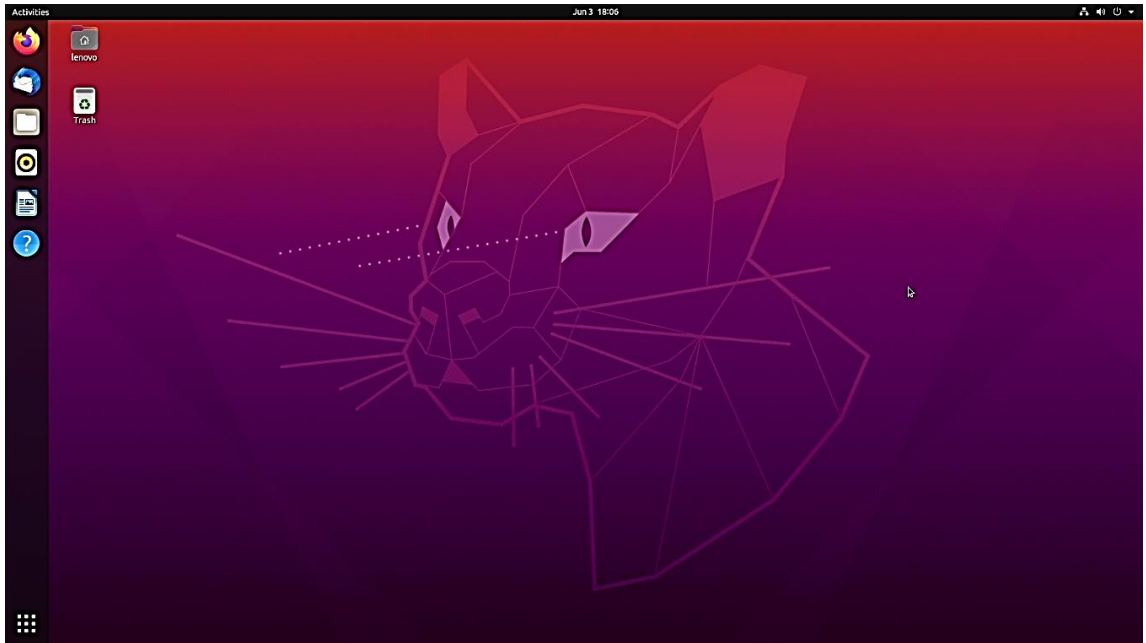
- Once the installation completes, select "Reboot Now".



- Remove the installation media (USB/DVD) and press ENTER.



- Ubuntu Linux 20.04 LTS Desktop screen.



---

## Section 3 – RAID Array Installation

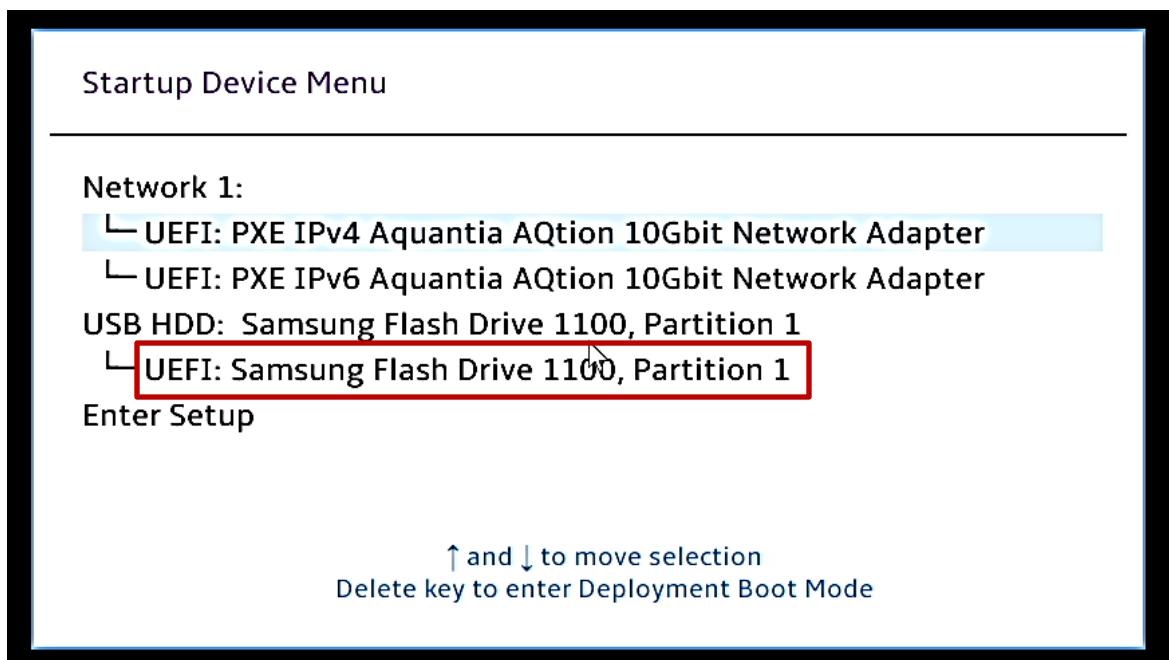
Please refer to the following instructions and screenshots on how to install Ubuntu Linux 20.04 LTS utilizing RAID arrays on the Lenovo ThinkStation P620.

**Note:** This is assuming storage RAID is already set up and configured in BIOS.

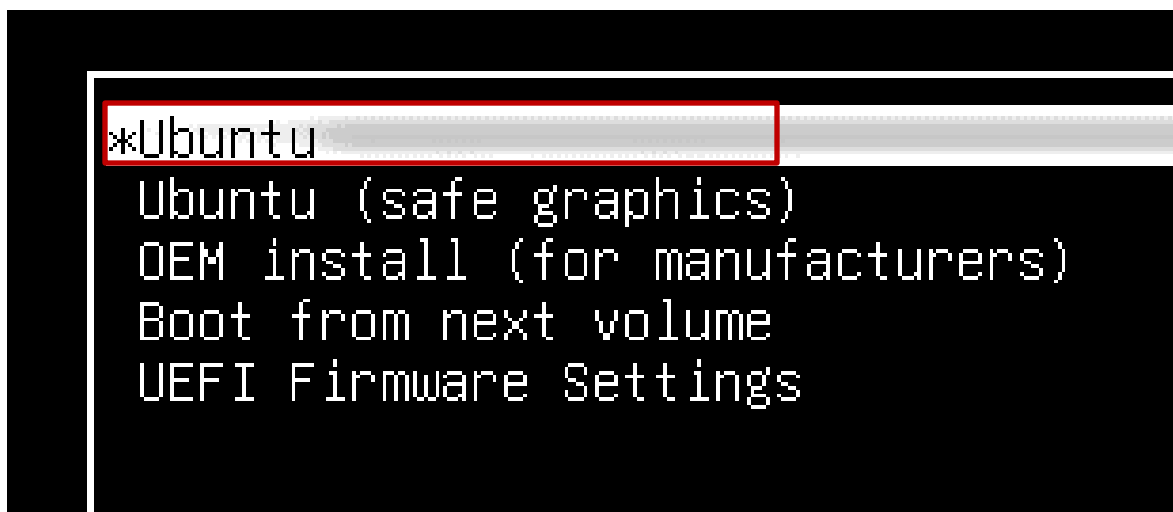
- Download the Linux AMD storage RAID driver from the Lenovo support site and copy the contents onto a directory labelled 'dd' from the root of a USB flash drive.
- Insert the Ubuntu 20.04 installation media either through USB or CD/DVD.
- Power on the system and press the function F12 key when the Lenovo splash screen appears.

A black rectangular splash screen with the white "Lenovo" logo centered in the middle.

- Select the Linux bootable installation media from the Startup Device Menu.



- Select the “Ubuntu” option from the GRUB boot menu, and press ‘e’.





- Add the following lines to the end of the Linux kernel command parameter and press CTRL-X.

*“break=mount modprobe.blacklist=ahci,nvme nomodeset”*

```

GNU GRUB version 2.04

setparams 'Ubuntu'

set gfxpayload=keep
linux /casper/vmlinuz file=/cdrom/preseed/ubuntu.seed maybe-ubiquity quiet splash --- break=mount modprobe.blacklist=ahci,nvme nomodeset_
initrd /casper/initrd

```

- At the “BusyBox” shell, insert the USB flash drive with the Linux AMD RAID driver into a USB port of the system and mount it using the following command:

*“mount -t vfat /dev/sdb1 /tmp”*

**Note:** /dev/sdb1 may need to be changed depending on the number of devices attached to the system.

```

BusyBox v1.30.1 (Ubuntu 1:1.30.1-4ubuntu6) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) mount -t vfat /dev/sdb1 /tmp

```

- Copy the contents of the driver to the root directory using the following command:

*“cp -ap /tmp/dd /”*

```

BusyBox v1.30.1 (Ubuntu 1:1.30.1-4ubuntu6) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) mount -t vfat /dev/sdb1 /tmp
(initramfs) cp -ap /tmp/dd /

```

- Install the driver by running the following command:

*“/dd/pre\_install”*

```
BusyBox v1.30.1 (Ubuntu 1:1.30.1-4ubuntu6) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) mount -t vfat /dev/sdb1 /tmp
(initramfs) cp -ap /tmp/dd /
(initramfs) /dd/pre_install
```

- Unmount and remove the USB flash drive by running the following command:

*“umount /tmp”*

```
BusyBox v1.30.1 (Ubuntu 1:1.30.1-4ubuntu6) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) mount -t vfat /dev/sdb1 /tmp
(initramfs) cp -ap /tmp/dd /
(initramfs) /dd/pre_install
Symbolically linking: /sbin/insmod
(initramfs)
(initramfs) umount /tmp
```

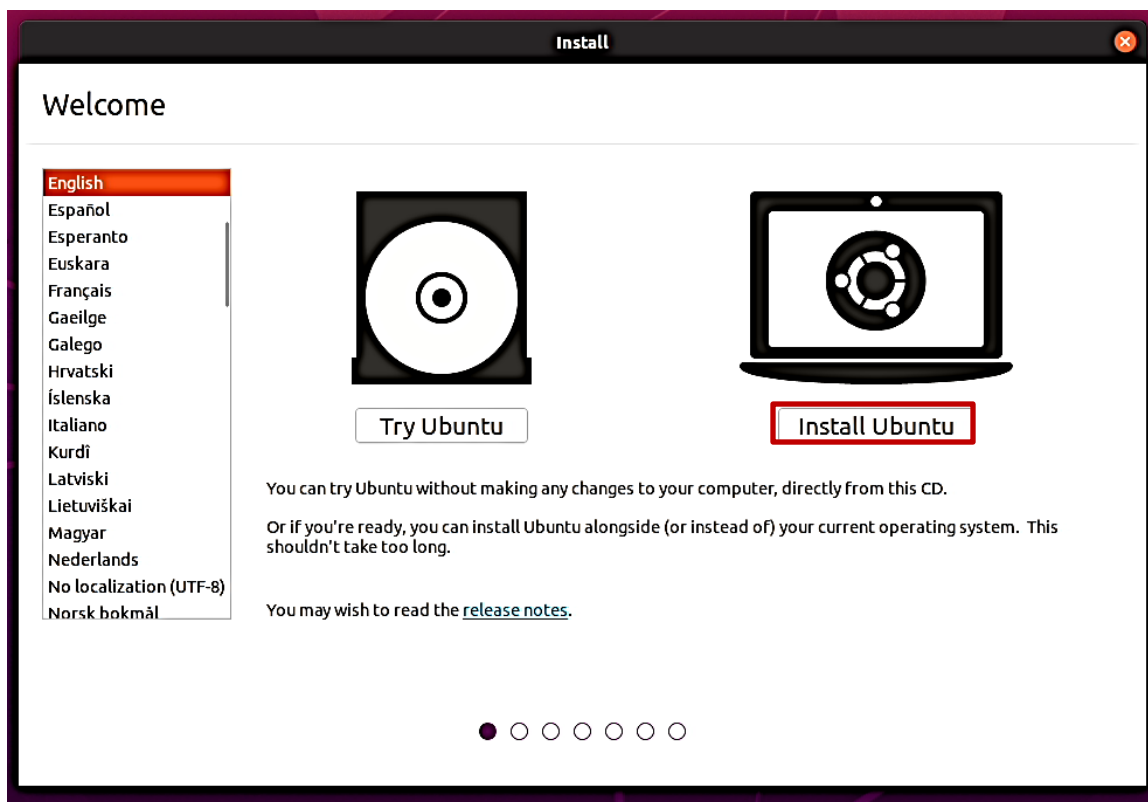
- Exit the busybox shell by running the following command:

*“exit”*

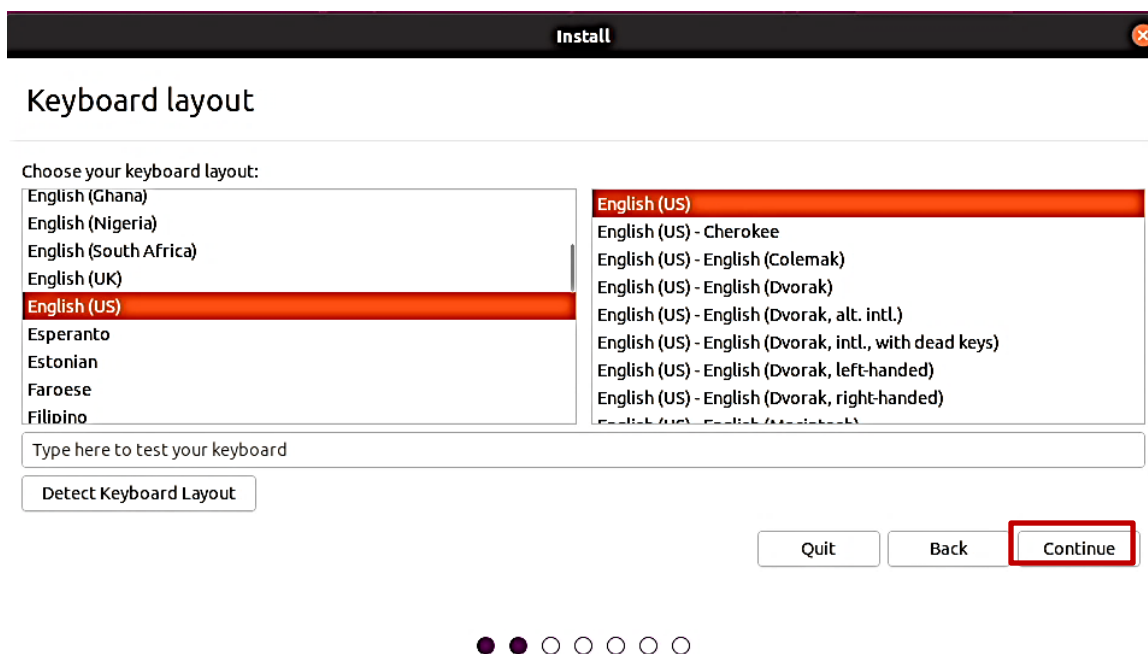
```
BusyBox v1.30.1 (Ubuntu 1:1.30.1-4ubuntu6) built-in shell (ash)
Enter 'help' for a list of built-in commands.

(initramfs) mount -t vfat /dev/sdb1 /tmp
(initramfs) cp -ap /tmp/dd /
(initramfs) /dd/pre_install
Symbolically linking: /sbin/insmod
(initramfs)
(initramfs) umount /tmp
(initramfs) exit
```

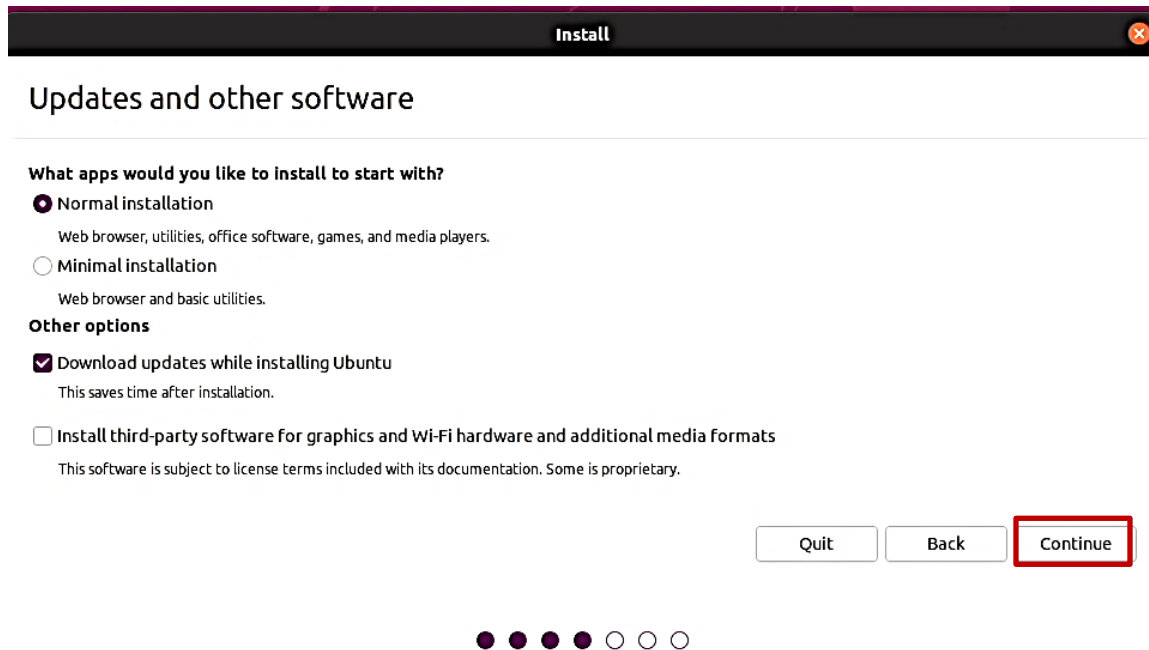
- The Ubuntu Linux Welcome Screen should appear. Select the appropriate language and select “Install Ubuntu”.



- Select the appropriate keyboard layout and “Continue”.



- Select the type of installation and whether or not to install updates and “Continue”.



Install

## Updates and other software

What apps would you like to install to start with?

☒ Normal installation  
Web browser, utilities, office software, games, and media players.

☐ Minimal installation  
Web browser and basic utilities.

Other options

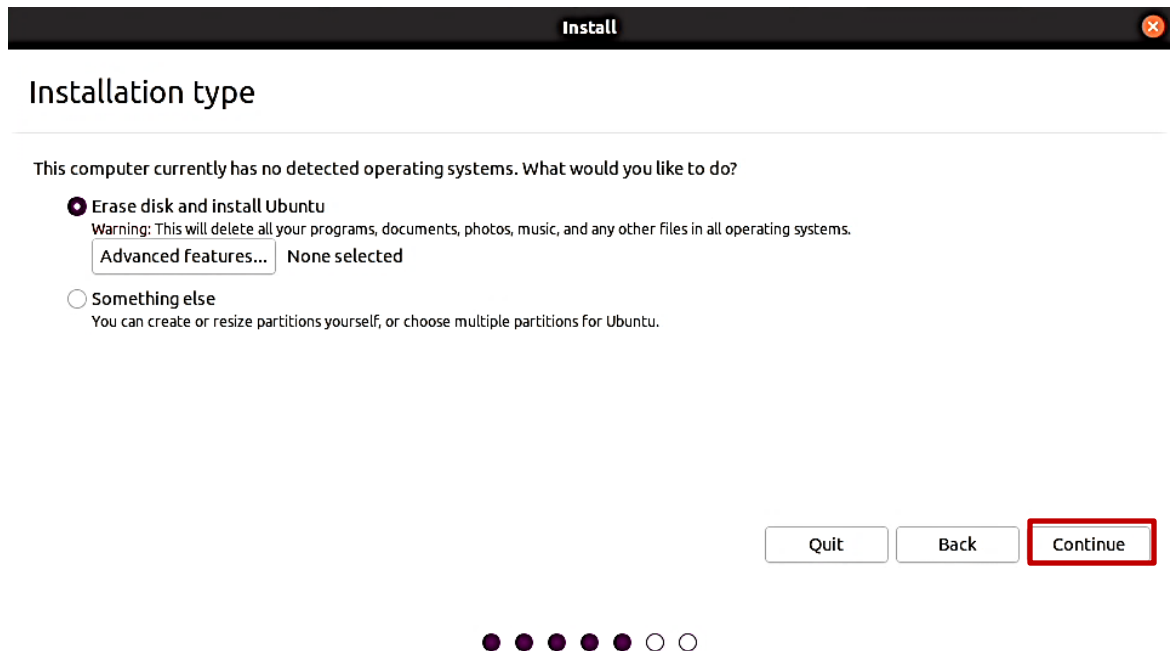
☒ Download updates while installing Ubuntu  
This saves time after installation.

☐ Install third-party software for graphics and Wi-Fi hardware and additional media formats  
This software is subject to license terms included with its documentation. Some is proprietary.

Quit Back Continue

● ● ● ● ○ ○ ○

- Select “Erase disk and install Ubuntu” to automatically create the filesystem partitions and “Continue”.



Install

## Installation type

This computer currently has no detected operating systems. What would you like to do?

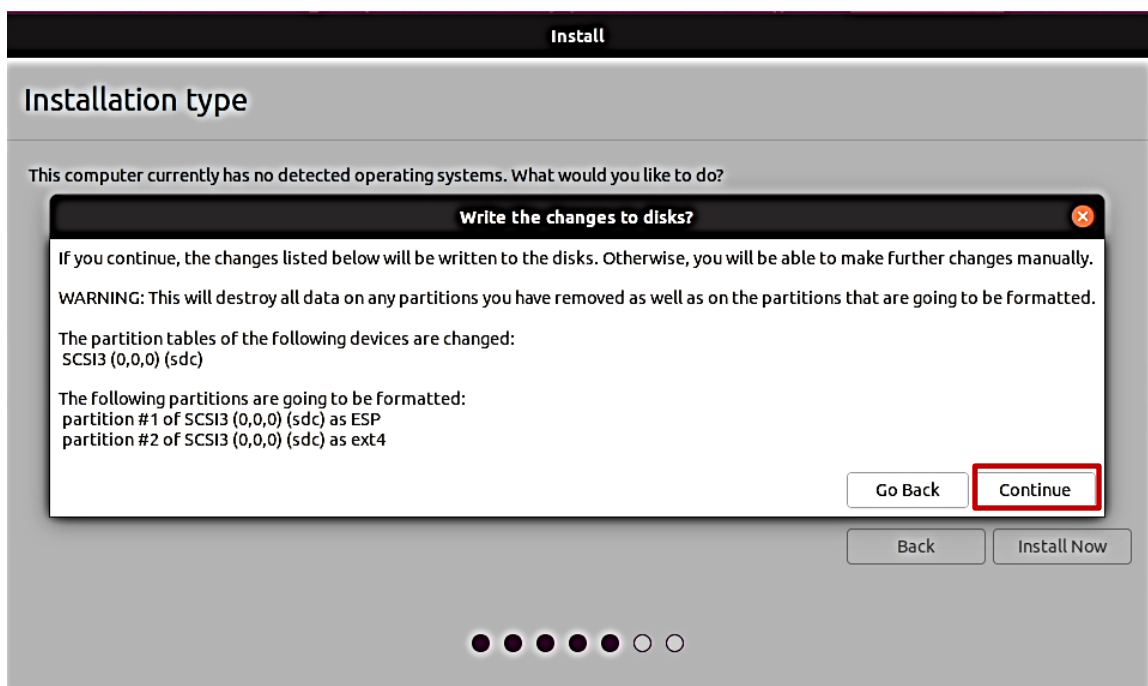
☒ Erase disk and install Ubuntu  
Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.  
Advanced features... None selected

☐ Something else  
You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

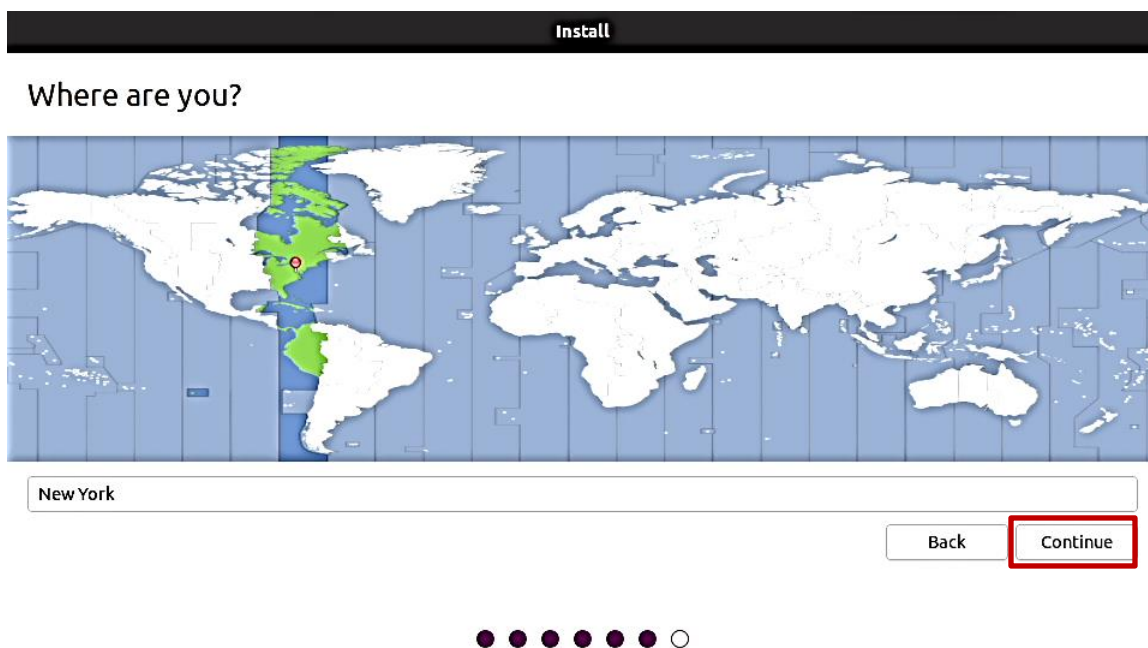
Quit Back Continue

● ● ● ● ○ ○ ○

- Select “Continue” to confirm writing changes to the disk.



- Select the appropriate geographical location and “Continue”.



- Fill in the appropriate boxes below and select “Continue”.

Install

Who are you?

Your name:

Your computer's name:

The name it uses when it talks to other computers.

Pick a username:

Choose a password:

Confirm your password:

☐ Log in automatically
 ☒ Require my password to log in

Back


Continue

- Let the system finish the installation.

Install

Welcome to Ubuntu

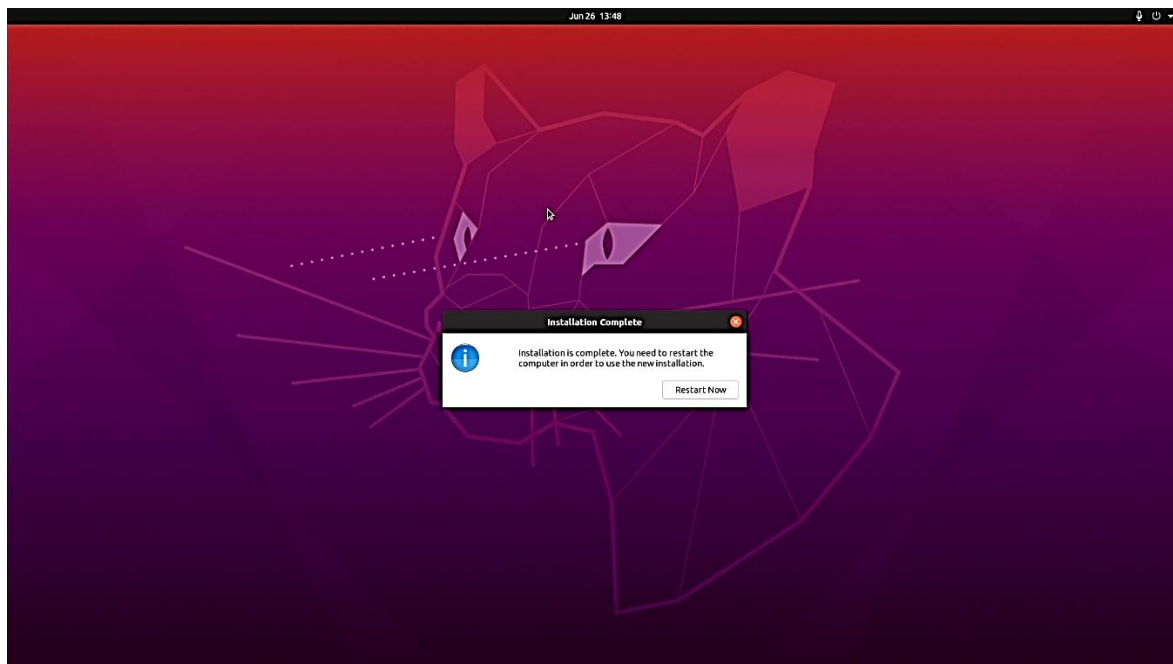
Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...



► Almost finished copying files...

Skip

- At the “Installation Complete” window, press CTRL+ALT+F2.



- At the Ubuntu Login prompt, login using the username ubuntu and no password.

```

Ubuntu 20.04 LTS ubuntu tty2
ubuntu login: ubuntu
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-26-generic x86_64)

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

Your Hardware Enablement Stack (HWE) is supported until April 2025.

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.

ubuntu@ubuntu:~$ _

```

- Insert the USB flash drive with the Linux AMD RAID driver into a USB port of the system and mount it using the following command:

*“sudo mount -t vfat /dev/sdb1 /mnt”*

**Note:** */dev/sdb1* may need to be changed depending on the number of devices attached to the system.

```
ubuntu@ubuntu:~$ sudo mount -t vfat /dev/sdb1 /mnt_
```

- Copy the contents of the driver to the root directory using the following command:

*“sudo cp -ap /mnt/dd /”*

```
ubuntu@ubuntu:~$ sudo mount -t vfat /dev/sdb1 /mnt
ubuntu@ubuntu:~$ sudo cp -ap /mnt/dd /
ubuntu@ubuntu:~$
```

- Install the driver by running the following command:

*“sudo /dd/post\_install”*

```
ubuntu@ubuntu:~$ sudo mount -t vfat /dev/sdb1 /mnt
ubuntu@ubuntu:~$ sudo cp -ap /mnt/dd /
ubuntu@ubuntu:~$ sudo /dd/post_install
```

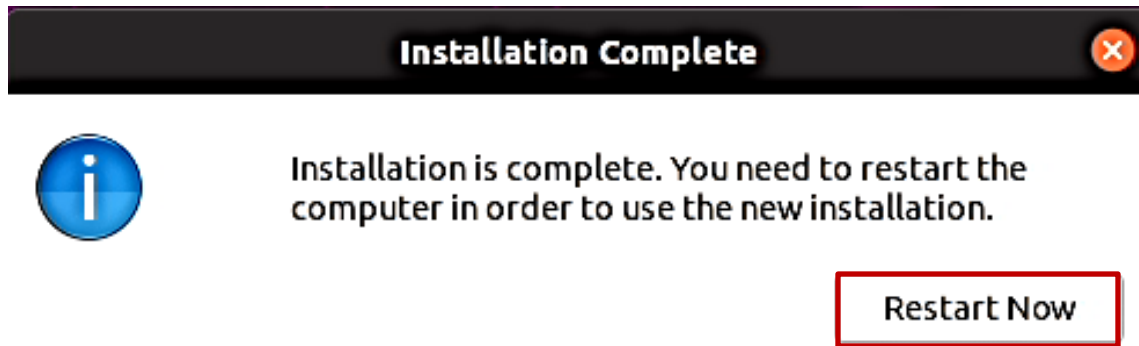
- Unmount and remove the USB flash drive by running the following command:

*“sudo umount /mnt”*

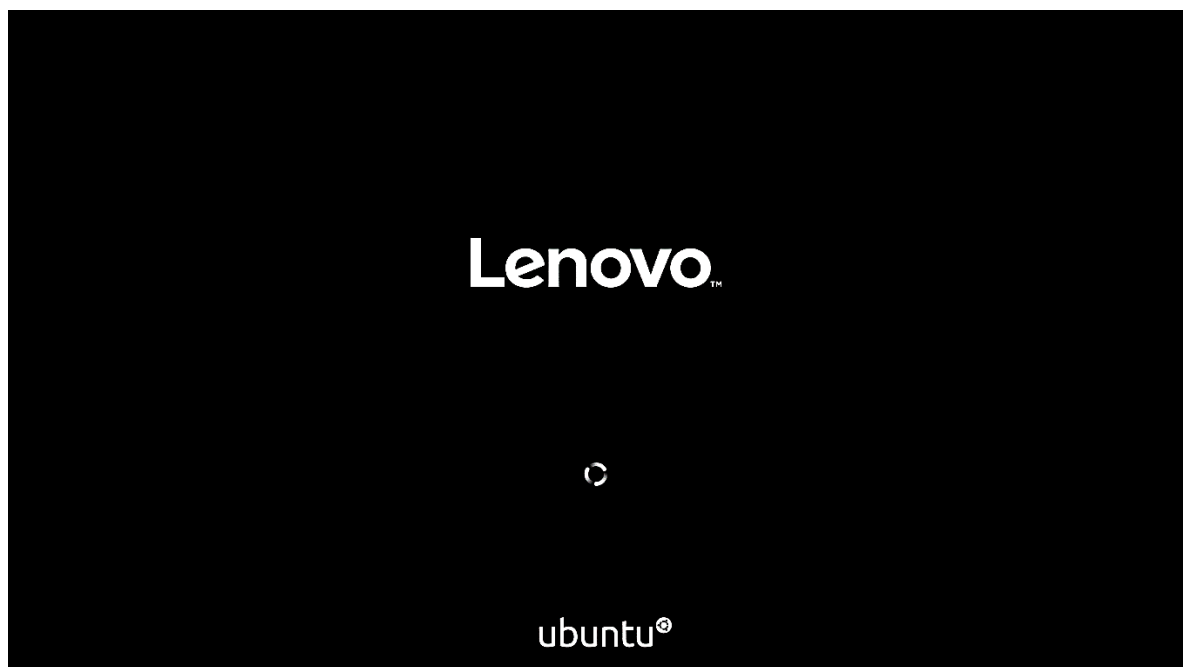
- Press CTRL+ALT+F1 to get back to the graphical interface.



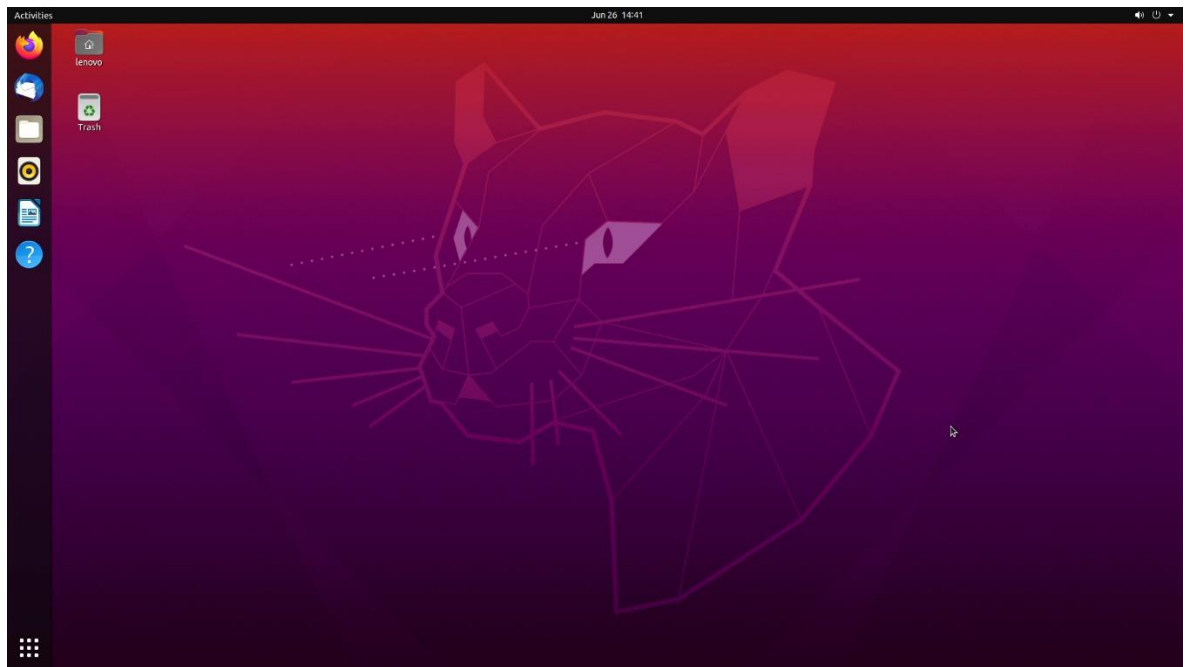
- Once the installation completes, select “Reboot Now”.



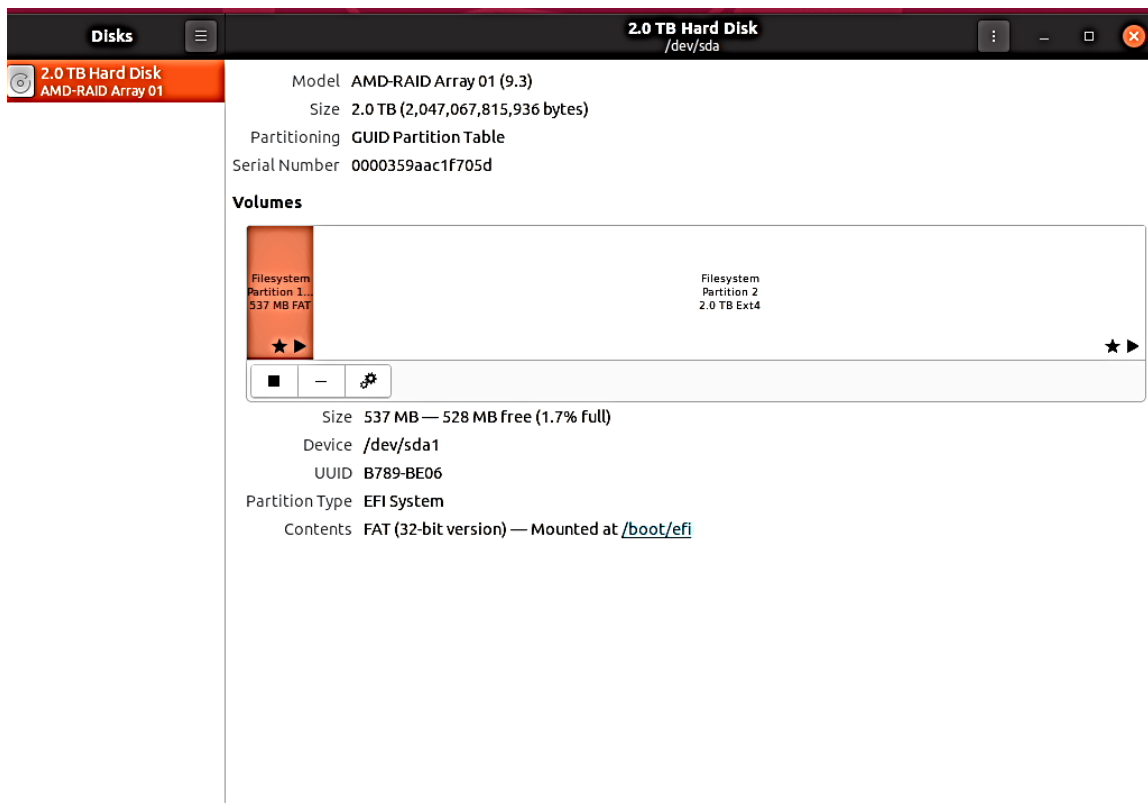
- Remove the installation media (USB/DVD) and press ENTER.



- Ubuntu Linux 20.04 LTS Desktop screen.



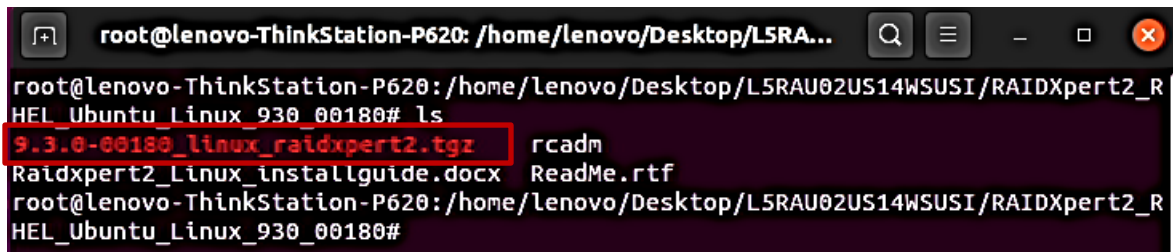
- Disk Configuration Utility.



## Section 4 – RAIDXpert2 Management Application

*Optional:* AMD has a RAIDXpert2 Management Application for AMD RAID arrays. Please refer to the following instructions and screenshots on how to install this AMD management utility on the Lenovo ThinkStation P620.

- Download the Linux AMD RAIDXpert2 Management Application from the Lenovo support site directly onto the Linux desktop.
- Open a terminal window from within the Linux desktop and browse to the correct location path for the driver package.

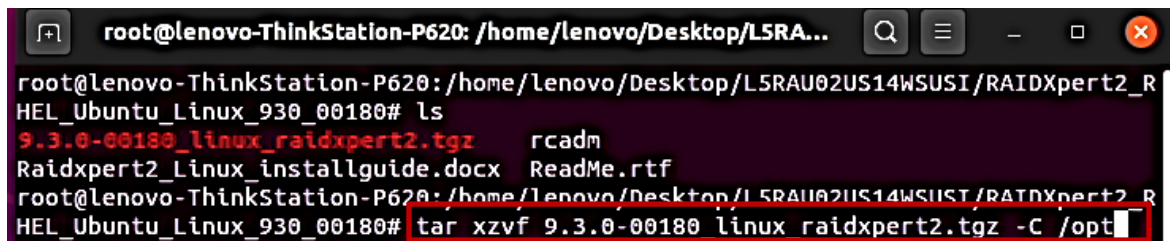


```

root@lenovo-ThinkStation-P620: /home/lenovo/Desktop/L5RAU02US14WSUSI/RAIDXpert2_RHEL_Ubuntu_Linux_930_00180# ls
9.3.0-00180_linux RAIDxpert2.tgz rcadm
RAIDXpert2_Linux_installguide.docx ReadMe.rtf
root@lenovo-ThinkStation-P620: /home/lenovo/Desktop/L5RAU02US14WSUSI/RAIDXpert2_RHEL_Ubuntu_Linux_930_00180#
  
```

- Extract the contents of the \*.tgz file using the following command:

*“tar xzvf 9.3.0-00180\_linux RAIDxpert2.tgz -C /opt”*

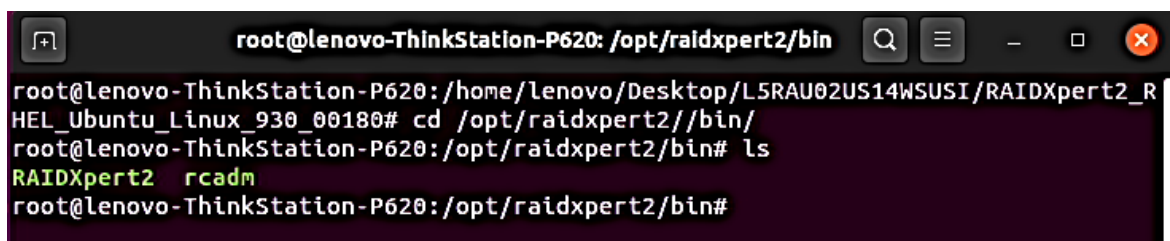


```

root@lenovo-ThinkStation-P620: /home/lenovo/Desktop/L5RAU02US14WSUSI/RAIDXpert2_RHEL_Ubuntu_Linux_930_00180# ls
9.3.0-00180_linux RAIDxpert2.tgz rcadm
RAIDXpert2_Linux_installguide.docx ReadMe.rtf
root@lenovo-ThinkStation-P620: /home/lenovo/Desktop/L5RAU02US14WSUSI/RAIDXpert2_RHEL_Ubuntu_Linux_930_00180# tar xzvf 9.3.0-00180_linux RAIDxpert2.tgz -C /opt
  
```

- Change directory path to where the package was extracted to from above:

*“cd /opt/raidxpert2/bin”*



```

root@lenovo-ThinkStation-P620: /opt/raidxpert2/bin
root@lenovo-ThinkStation-P620: /home/lenovo/Desktop/L5RAU02US14WSUSI/RAIDXpert2_RHEL_Ubuntu_Linux_930_00180# cd /opt/raidxpert2/bin/
root@lenovo-ThinkStation-P620: /opt/raidxpert2/bin# ls
RAIDXpert2 rcadm
root@lenovo-ThinkStation-P620: /opt/raidxpert2/bin#
  
```

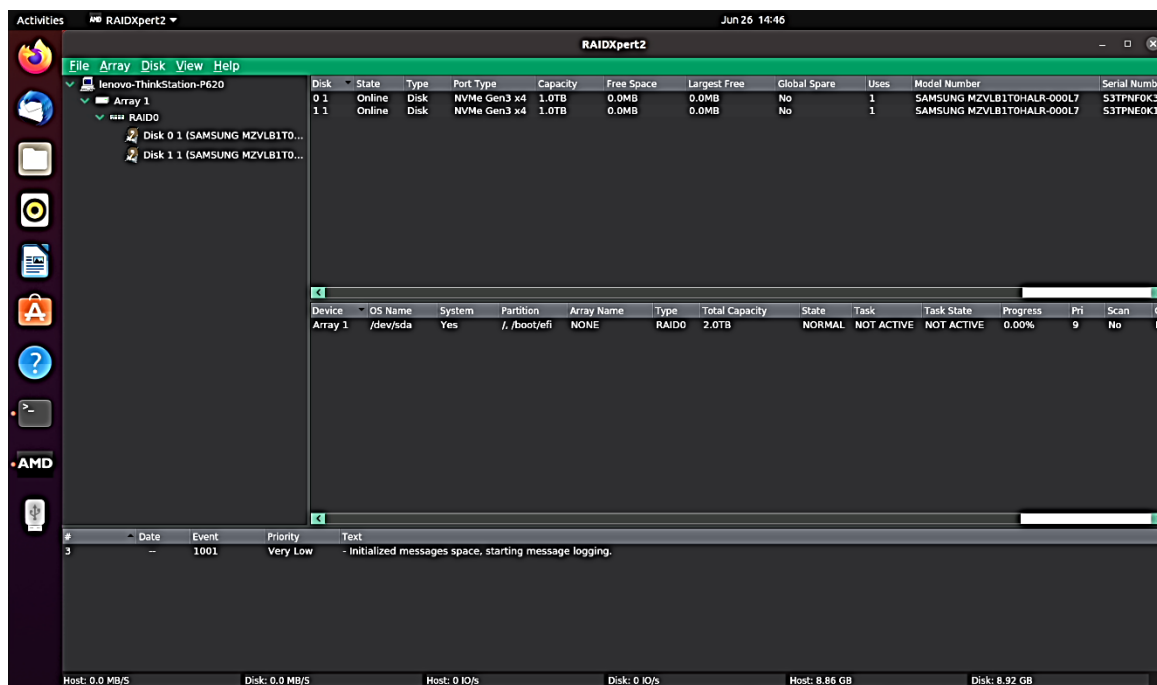
- To launch the AMD RAIDXpert2 Management Application, run the following command:

`“./RAIDXpert2 &”`

```

root@lenovo-ThinkStation-P620: /opt/raidxpert2/bin
root@lenovo-ThinkStation-P620:/home/lenovo/Desktop/L5RAU02US14WSUSI/RAIDXpert2_RHEL_Ubuntu_Linux_930_00180# cd /opt/raidxpert2//bin/
root@lenovo-ThinkStation-P620:/opt/raidxpert2/bin# ls
RAIDXpert2  rcadm
root@lenovo-ThinkStation-P620:/opt/raidxpert2/bin# ./RAIDXpert2 &
  
```

- RAIDXpert2 Management Application



## Section 5 – Installing the Aquantia LAN Driver

The onboard Aquantia LAN driver is not native to Ubuntu 20.04 on Lenovo P620 system. In order to make your LAN working, follow the steps below.

- Navigate to the directory where the Aquantia LAN driver is stored and unzip it.

```

root@lenovo-INVALID: /home/lenovo/Documents
root@lenovo-INVALID:/home/lenovo/Desktop# cd /home/lenovo/Documents/
root@lenovo-INVALID:/home/lenovo/Documents# ls
L6ETN02US14WSUSI.zip
root@lenovo-INVALID:/home/lenovo/Documents# unzip L6ETN02US14WSUSI.zip
Archive:  L6ETN02US14WSUSI.zip
  extracting: atlantic.tar.gz
    inflating: README.txt
  extracting: version.txt
root@lenovo-INVALID:/home/lenovo/Documents# ls
atlantic.tar.gz  L6ETN02US14WSUSI.zip  README.txt  version.txt

```

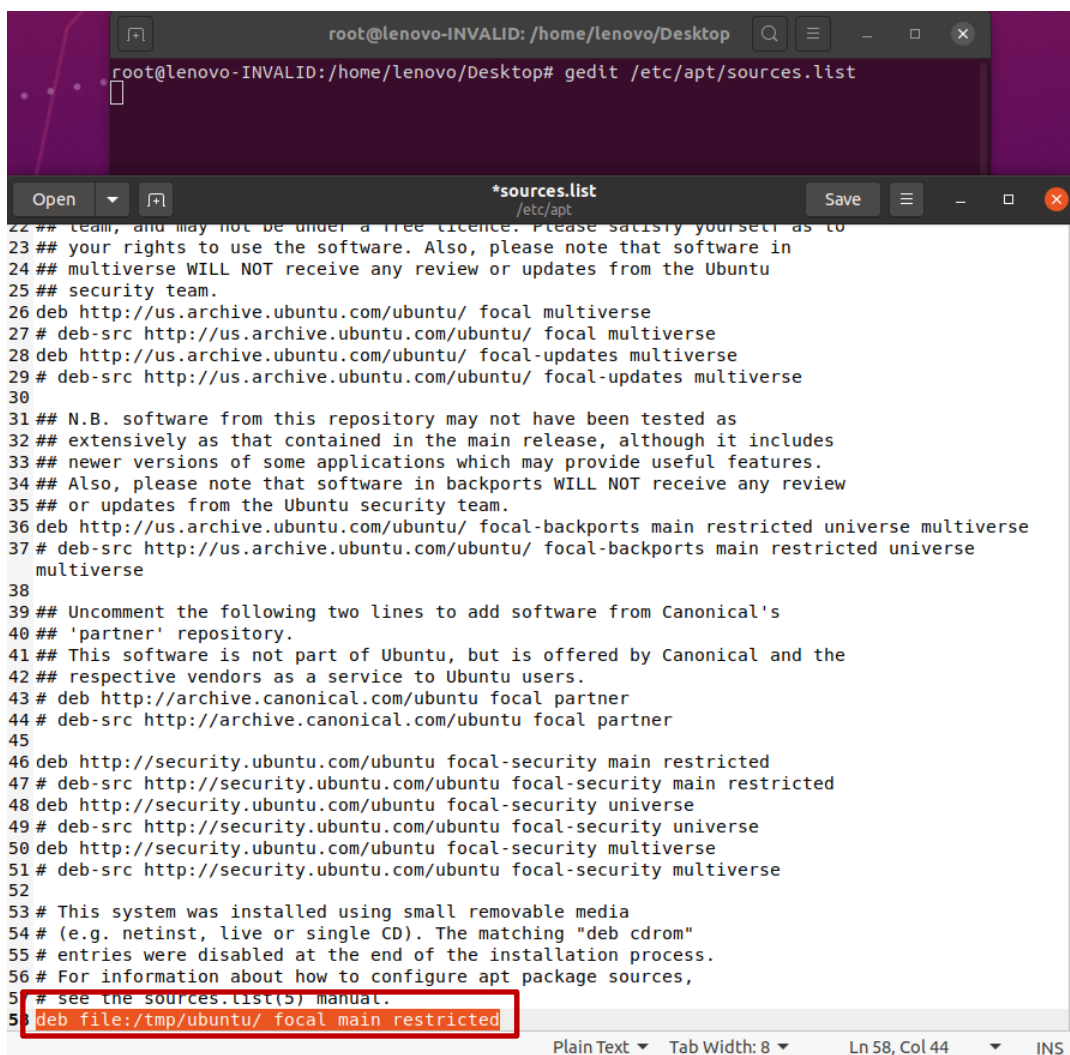
- Untar the “atlantic.tar.gz” file by using the following command.

```

root@lenovo-INVALID:/home/lenovo/Documents# tar xzf atlantic.tar.gz
root@lenovo-INVALID:/home/lenovo/Documents# ls
aquantia  atlantic.tar.gz  L6ETN02US14WSUSI.zip  Linux  README.txt  version.txt
root@lenovo-INVALID:/home/lenovo/Documents# cd L
L6ETN02US14WSUSI.zip  Linux/
root@lenovo-INVALID:/home/lenovo/Documents# cd Linux/
root@lenovo-INVALID:/home/lenovo/Documents/Linux# ls
aq_cfg.h      aq_hw.h      aq_pci_func.h  aq_trace.c    hw_atl2
aq_common.h   aq_hw_utils.c  aq_phy.c       aq_trace.h    Kconfig
aq_compat.c   aq_hw_utils.h  aq_phy.h       aq_tsn.c      macsec
aq_compat.h   aq_macsec.c    aq_ptp.c       aq_tsn.h      Makefile
aq_drvinfo.c  aq_macsec.h    aq_ptp.h       aq_utils.h    README.txt
aq_drvinfo.h  aq_main.c      aq_ring.c      aq_vec.c      release_notes.txt
aq_ethtool.c  aq_main.h      aq_ring.h      aq_vec.h      rpm-src.spec
aq_ethtool.h  aq_nic.c       aq_rss.h       build-deb.sh  ver.h
aq_filters.c  aq_nic.h       aq_sysfs.c     dkms.sh
aq_filters.h  aq_pci_func.c  aq_sysfs.h     hw_atl
root@lenovo-INVALID:/home/lenovo/Documents/Linux#

```

- Mount the Ubuntu 20.04 media key and copy its contents to the directory of your choice. Once done copying, edit the source.list file using an editor of your choosing and save the changes.



```


root@lenovo-INVALID: /home/lenovo/Desktop
root@lenovo-INVALID:/home/lenovo/Desktop# gedit /etc/apt/sources.list

*sources.list
/etc/apt
Save

22## team, and may not be under a free licence. Please satisfy yourself as to
23## your rights to use the software. Also, please note that software in
24## multiverse WILL NOT receive any review or updates from the Ubuntu
25## security team.
26deb http://us.archive.ubuntu.com/ubuntu/ focal multiverse
27# deb-src http://us.archive.ubuntu.com/ubuntu/ focal multiverse
28deb http://us.archive.ubuntu.com/ubuntu/ focal-updates multiverse
29# deb-src http://us.archive.ubuntu.com/ubuntu/ focal-updates multiverse
30
31## N.B. software from this repository may not have been tested as
32## extensively as that contained in the main release, although it includes
33## newer versions of some applications which may provide useful features.
34## Also, please note that software in backports WILL NOT receive any review
35## or updates from the Ubuntu security team.
36deb http://us.archive.ubuntu.com/ubuntu/ focal-backports main restricted universe multiverse
37# deb-src http://us.archive.ubuntu.com/ubuntu/ focal-backports main restricted universe
38# multiverse
39## Uncomment the following two lines to add software from Canonical's
40## 'partner' repository.
41## This software is not part of Ubuntu, but is offered by Canonical and the
42## respective vendors as a service to Ubuntu users.
43# deb http://archive.canonical.com/ubuntu focal partner
44# deb-src http://archive.canonical.com/ubuntu focal partner
45
46deb http://security.ubuntu.com/ubuntu focal-security main restricted
47# deb-src http://security.ubuntu.com/ubuntu focal-security main restricted
48deb http://security.ubuntu.com/ubuntu focal-security universe
49# deb-src http://security.ubuntu.com/ubuntu focal-security universe
50deb http://security.ubuntu.com/ubuntu focal-security multiverse
51# deb-src http://security.ubuntu.com/ubuntu focal-security multiverse
52
53# This system was installed using small removable media
54# (e.g. netinst, live or single CD). The matching "deb cdrom"
55# entries were disabled at the end of the installation process.
56# For information about how to configure apt package sources,
57# see the sources.list(5) manual.
58deb file:///tmp/ubuntu/ focal main restricted

```

- Update the package list with the “apt-get update” command.



```

root@lenovo-INVALID: /home/lenovo/Desktop
root@lenovo-INVALID:/home/lenovo/Desktop# gedit /etc/apt/sources.list

(gedit:5644): Tepl-WARNING **: 19:16:47.209: GVfs metadata is not supported. Fall
back to TeplMetadataManager. Either GVfs is not correctly installed or GVfs met
adata are not supported on this platform. In the latter case, you should configu
re Tepl with --disable-gvfs-metadata.
root@lenovo-INVALID:/home/lenovo/Desktop# apt-get update

```

- Install the make compiler with the “apt install make” command.

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

- Install the build-essential package with “apt-get install build-essential” command.

```
root@lenovo-INVALID: /home/lenovo/Desktop
root@lenovo-INVALID:/home/lenovo/Desktop# apt-get install build-essential
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu dpkg-dev fakeroot g++
  g++-9 gcc gcc-9 libalgorithm-diff-perl libalgorithm-diff-xs-perl
  libalgorithm-merge-perl libasan5 libatomic1 libbinutils libc-dev-bin
  libc6-dev libcrypt-dev libctf-nobfd0 libctf0 libfakeroot libgcc-9-dev
  libitm1 liblsan0 libquadmath0 libstdc++-9-dev libtsan0 libubsan1
  linux-libc-dev manpages-dev
Suggested packages:
  binutils-doc debian-keyring g++-multilib g++-9-multilib gcc-9-doc
  gcc-multilib autoconf automake libtool flex bison gcc-doc gcc-9-multilib
  gcc-9-locales glibc-doc libstdc++-9-doc
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dpkg-dev
  fakeroot g++ g++-9 gcc gcc-9 libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 libatomic1
  libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0 libctf0
  libfakeroot libgcc-9-dev libitm1 liblsan0 libquadmath0 libstdc++-9-dev
  libtsan0 libubsan1 linux-libc-dev manpages-dev
0 upgraded, 31 newly installed, 0 to remove and 0 not upgraded.
```



- Navigate to the Aquantia LAN driver directory and compile the modules inside the “Linux” folder using “make”.

```

root@lenovo-INVALID: /home/lenovo/Documents/Linux
root@lenovo-INVALID:/home/lenovo/Documents# ls
aquantia  atlantic.tar.gz  L6ETN02US14WSUSI.zip  Linux  README.txt  version.txt
root@lenovo-INVALID:/home/lenovo/Documents# cd Linux/
root@lenovo-INVALID:/home/lenovo/Documents/Linux# ls
aq_cfg.h      aq_hw.h      aq_pci_func.h  aq_trace.c    hw_atl2
aq_common.h   aq_hw_utils.c  aq_phy.c       aq_trace.h    Kconfig
aq_compat.c   aq_hw_utils.h  aq_phy.h       aq_tsn.c      macsec
aq_compat.h   aq_macsec.c    aq_ptp.c       aq_tsn.h      Makefile
aq_drvinfoc   aq_macsec.h    aq_ptp.h       aq_utils.h    README.txt
aq_drvinfoc.h aq_main.c      aq_ring.c      aq_vec.c      release_notes.txt
aq_ethtool.c  aq_main.h      aq_ring.h      aq_vec.h      rpm-src.spec
aq_ethtool.h  aq_nic.c       aq_rss.h       build-deb.sh  ver.h
aq_filters.c  aq_nic.h       aq_sysfs.c     dkms.sh
aq_filters.h  aq_pci_func.c  aq_sysfs.h     hw_atl
root@lenovo-INVALID:/home/lenovo/Documents/Linux# make

```

- Load the dependencies and the module using the following list of commands-  
modprobe ptp  
modprobe crc\_itu\_t  
insmod atlantic.ko

```

root@lenovo-INVALID: /home/lenovo/Documents/Linux
root@lenovo-INVALID:/home/lenovo/Documents/Linux# modprobe ptp
root@lenovo-INVALID:/home/lenovo/Documents/Linux# modprobe crc_itu_t
root@lenovo-INVALID:/home/lenovo/Documents/Linux# insmod atlantic.ko
insmod: ERROR: could not insert module atlantic.ko: File exists
root@lenovo-INVALID:/home/lenovo/Documents/Linux#

```



- Unload and install the driver in the system using “rmmod atlantic” and “make && make install” commands. Type “y” for yes for attempting initramfs update.

```

root@lenovo-INVALID: /home/lenovo/Documents/Linux
root@lenovo-INVALID: /home/lenovo/Documents/Linux# rmmod atlantic
root@lenovo-INVALID: /home/lenovo/Documents/Linux# make && make install
make -j4 -C /lib/modules/5.4.0-26-generic/build M="/home/lenovo/Documents/Linux"
modules
make[1]: Entering directory '/usr/src/linux-headers-5.4.0-26-generic'
Building modules, stage 2.
MODPOST 1 modules
make[1]: Leaving directory '/usr/src/linux-headers-5.4.0-26-generic'
make[1]: Entering directory '/home/lenovo/Documents/Linux'
atlantic.ko is in initramfs.
CAUTION! Updating initramfs is potentially dangerous.
Attempt initramfs update? [yN] y

```

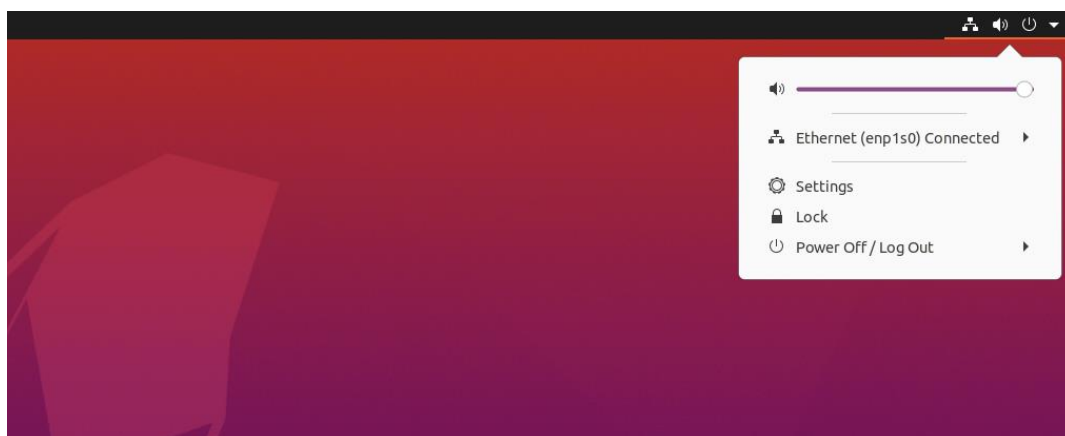
- Verify if the LAN driver is present in /lib/modules/`uname -r` atlantic.ko

```

root@lenovo-INVALID: /home/lenovo/Documents/Linux
root@lenovo-INVALID: /home/lenovo/Documents/Linux# find /lib/modules/`uname -r` -
name atlantic.ko
/lib/modules/5.4.0-26-generic/updates/drivers/net/ethernet/aquantia/atlantic/atla
ntic.ko
/lib/modules/5.4.0-26-generic/kernel/drivers/net/ethernet/aquantia/atlantic/atla
ntic.ko
root@lenovo-INVALID: /home/lenovo/Documents/Linux#

```

- Reboot the system or run the command “modprobe atlantic” and verify if the LAN is working.



---

## Section 6 – Installing the Nvidia Graphics Driver

In order to get optimal performance out of the Nvidia GPU, it is a good idea to install the proprietary Nvidia graphics driver. Follow the instructions below to do so.

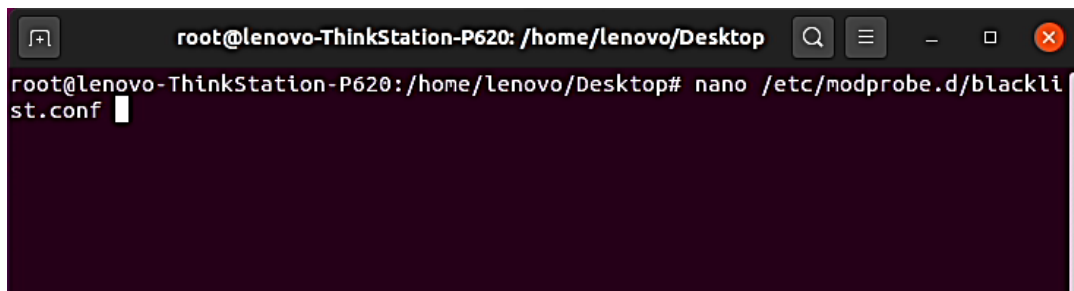
- Download the latest Nvidia graphics driver for the appropriate Nvidia GPU from [here](#).
- Blacklist the Linux Nouveau driver by following the steps below:

- From within Linux, open a terminal window and log in as root.

```
# sudo su -
```

- Using a text editor, create and modify the following file  
`/etc/modprobe.d/blacklist.conf`

```
# vi /etc/modprobe.d/blacklist.conf
```



```
root@lenovo-ThinkStation-P620: /home/lenovo/Desktop
root@lenovo-ThinkStation-P620:/home/lenovo/Desktop# nano /etc/modprobe.d/blacklist.conf
```

- Add the following line, “blacklist nouveau” and save and exit the file.

```

root@lenovo-ThinkStation-P620: /home/lenovo/Desktop
GNU nano 4.8 /etc/modprobe.d/blacklist.conf Modified
# most apps now use garmin usb driver directly (Ubuntu: #114565)
blacklist garmin_gps

# replaced by asus-laptop (Ubuntu: #184721)
blacklist asus_acpi

# low-quality, just noise when being used for sound playback, causes
# hangs at desktop session start (Ubuntu: #246969)
blacklist snd_pcsp

# ugly and loud noise, getting on everyone's nerves; this should be done by a
# nice pulseaudio bing (Ubuntu: #77010)
blacklist pcspkr

# EDAC driver for amd76x clashes with the agp driver preventing the aperture
# from being initialised (Ubuntu: #297750). Blacklist so that the driver
# continues to build and is installable for the few cases where its
# really needed.
blacklist amd76x_edac
blacklist nouveau

^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify ^C Cur Pos
^X Exit ^R Read File ^\ Replace ^U Paste Text ^T To Spell ^_ Go To Line

```

- Run the following command to update the initramfs file.

# update-initramfs -u

```

root@lenovo-ThinkStation-P620: /home/lenovo/Desktop
root@lenovo-ThinkStation-P620:/home/lenovo/Desktop# nano /etc/modprobe.d/blacklist.conf

```

- Reboot the system.

- Open a terminal window from within the Linux desktop, log in as root, and execute the command “init 3”.

```

root@lenovo-ThinkStation-P620: /home/lenovo/Desktop
lenovo@lenovo-ThinkStation-P620:~/Desktop$ sudo su
[sudo] password for lenovo:
root@lenovo-ThinkStation-P620: /home/lenovo/Desktop# init 3

```

- Install all prerequisites using the following commands:

# apt-get install 'build-essential'

```

root@lenovo-ThinkStation-P620: /home/lenovo/Downloads#
root@lenovo-ThinkStation-P620: /home/lenovo/Downloads# apt-get install 'build-essential'
Reading package lists... Done
Building dependency tree
Reading state information... Done
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.
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu cpp-9 dpkg-dev fakeroot g++ g++-9 gcc gcc-9
  libc6 libc6-dbg libc6-dev libcc1-0 libcrypt-dev libctf-nobfd0 libctf0 libdpkg-perl libfakeroot
Suggested packages:
  binutils-doc gcc-9-locales debian-keyring g++-multilib g++-9-multilib gcc-9-doc gcc-multilib
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dpkg-dev fakeroot g++ g++-9
  libcrypt-dev libctf-nobfd0 libctf0 libfakeroot libgcc-9-dev libitm1 liblsan0 libquadmath0
The following packages will be upgraded:
  cpp-9 gcc-10-base gcc-9-base libc6 libc6-dbg libcc1-0 libdpkg-perl libgcc-s1 libgomp1 libstdc++6
10 upgraded, 32 newly installed, 0 to remove and 397 not upgraded.
Need to get 31.3 MB/48.2 MB of archives.
After this operation, 143 MB of additional disk space will be used.
Do you want to continue? [Y/n]

```

Press “Y” to continue.

- Log in as root, change directory path to the download directory to where the Nvidia driver was downloaded.

```

[ lenovo@lenovo-ThinkStation-P620 ~ ]$ cd /home/lenovo/Downloads/
[ lenovo@lenovo-ThinkStation-P620 Downloads]$ ls
NVIDIA-Linux-x86_64-440.82.run
[ lenovo@lenovo-ThinkStation-P620 Downloads]$

```

- Make the Nvidia driver executable.

```
# chmod +x Nvidia-*
```

```
[lenovo@lenovo-ThinkStation-P620 Downloads]$ chmod +x NVIDIA-Linux-x86_64-440.82.run
[lenovo@lenovo-ThinkStation-P620 Downloads]$ ls
NVIDIA-Linux-x86_64-440.82.run
[lenovo@lenovo-ThinkStation-P620 Downloads]$
```

- Run the driver executable.

```
# ./Nvidia*
```

```
[lenovo@lenovo-ThinkStation-P620 Downloads]$ ./NVIDIA-Linux-x86_64-440.82.run
```

- Select “Continue Installation” and the driver installation should start.

```
NVIDIA Accelerated Graphics Driver

An alternate method of installing the NVIDIA driver was detected. (This is usually a package provided by your distributor
nvidia-installer.

Please review the message provided by the maintainer of this alternate installation method and decide how to proceed:

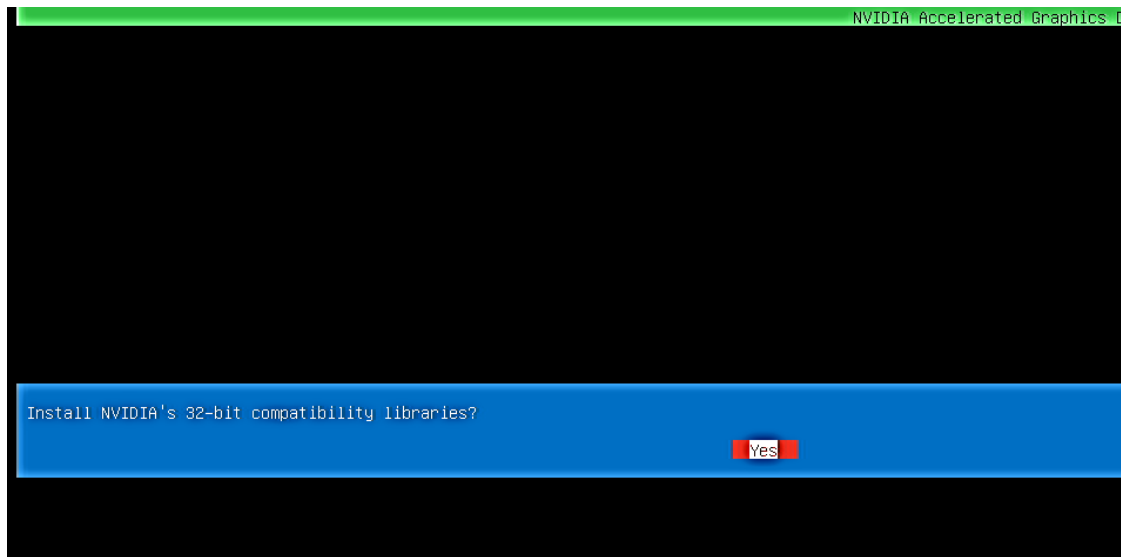
Continue installation

The NVIDIA driver provided by Ubuntu can be installed by launching the "Software & Updates" application, and by selecting
```

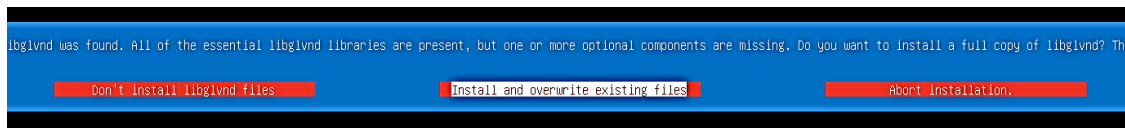
```
NVIDIA Accelerated Graphics Driver for Linux-

Building kernel modules
11%
```

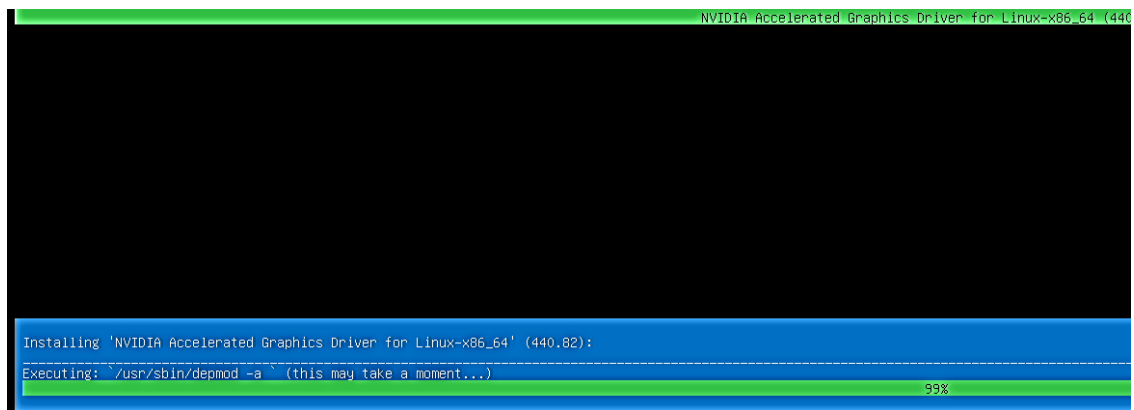
- Select “Yes” to install Nvidia’s 32-bit compatible libraries.



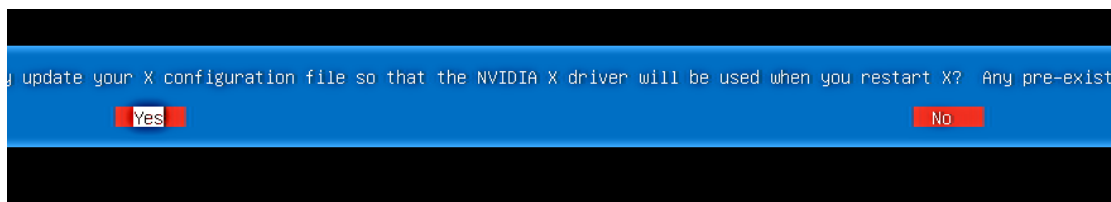
- Select “Install and overwrite existing files”.



- Driver installation continues.



- Select “Yes” update the X configuration file.



- Select “OK” to acknowledge driver installation is complete.



- Execute the following command to verify the Nvidia driver is installed and loaded.

# nvidia-smi

```
[root@lenovo-ThinkStation-P620 Downloads]# nvidia-smi
Wed Jun  3 17:40:26 2020

+-----+
| NVIDIA-SMI 440.82                Driver Version: 440.82                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 P620      Off          | 00000000:61:00:0 Off |                  N/A |
| 44%   51C    P0      N/A /  N/A |  0MiB / 1991MiB |      2%    Default  |
+-----+-----+

+-----+
| Processes:
| GPU      PID     Type    Process name                        GPU Memory
|=====+=====+
| No running processes found
+-----+

[root@lenovo-ThinkStation-P620 Downloads]#
```

---

## Section 7 – Revision History

Version	Date	Author	Changes/Updates
1.0	7/15/2020	Jason Moebs	Initial launch release