Debian Linux Setup Guide

For ThinkStation P520c, P520, P720, & P920

Section 1 - BIOS Setup and Preinstallation Steps

The first step before installing Linux is to make sure BIOS is setup correctly. By default, the system BIOS should be set up to handle both UEFI/GPT and Legacy/MBR partitions.

→ **For NVMe PCIe SSDs**, make sure these drives are set up in PCIE mode (not VMD mode).

- o Boot into BIOS by pressing the function F1 key at the "Lenovo" splash screen.

- o Select the "Advanced" menu option (left) and "Intel VMD technology" (right).

o Disable each "CPU **x** Port **y**".

Enable the VMD(Volume Management Device) technology to support configure PCIE storages to VROC(Virtual RAID on CPU) feature.
Note: Only on same PCIE x16 ports are supported to be configured as one VROC (Virtual Raid on CPU) in Intel(R) RSTe Raid Controller menu.
VMD: configure this slot as VMD (Intel Volume Management Device).
PCIE: configure this slot as general PCI Express port.

CPU 0 Port 1.	Disabled
CPU 0 Port 3.	Disabled
CPU 1 Port 1.	Disabled
CPU 1 Port 2.	Disabled
CPU 1 Port 3.	Disabled

Version 1.01.0040. Copyright (C) 2017 American Megatrends, Inc.

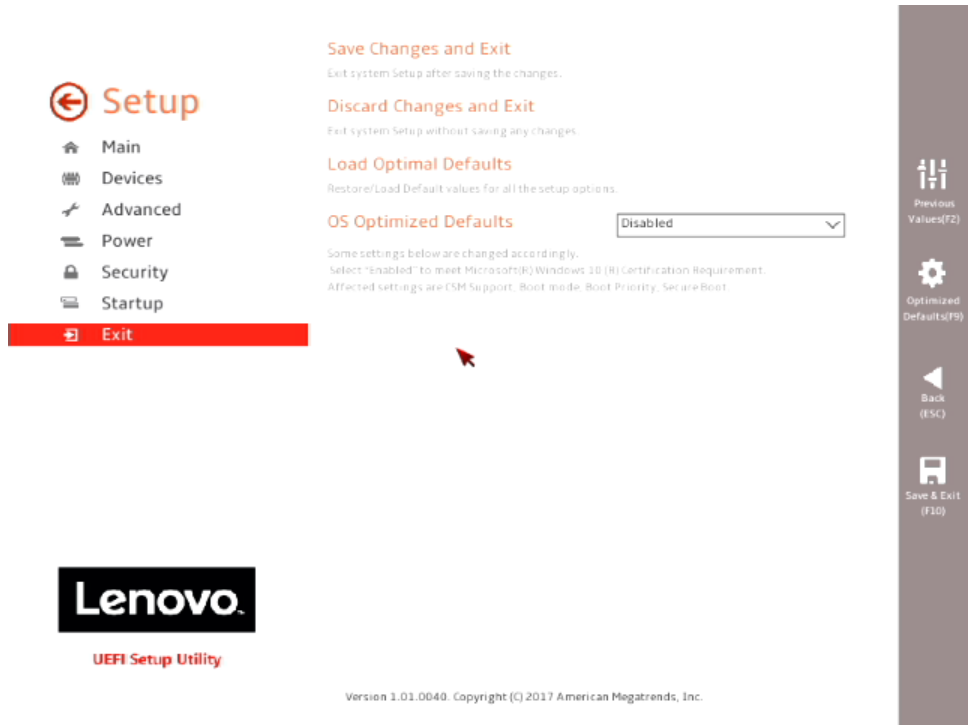o Select F10 to "Save and Exit" BIOS.

- **For UEFI/GPT installations (recommended)**:

  o Boot into BIOS by pressing the function F1 key at the "Lenovo" splash screen.

  o Select "Setup" from the screen indicated below.

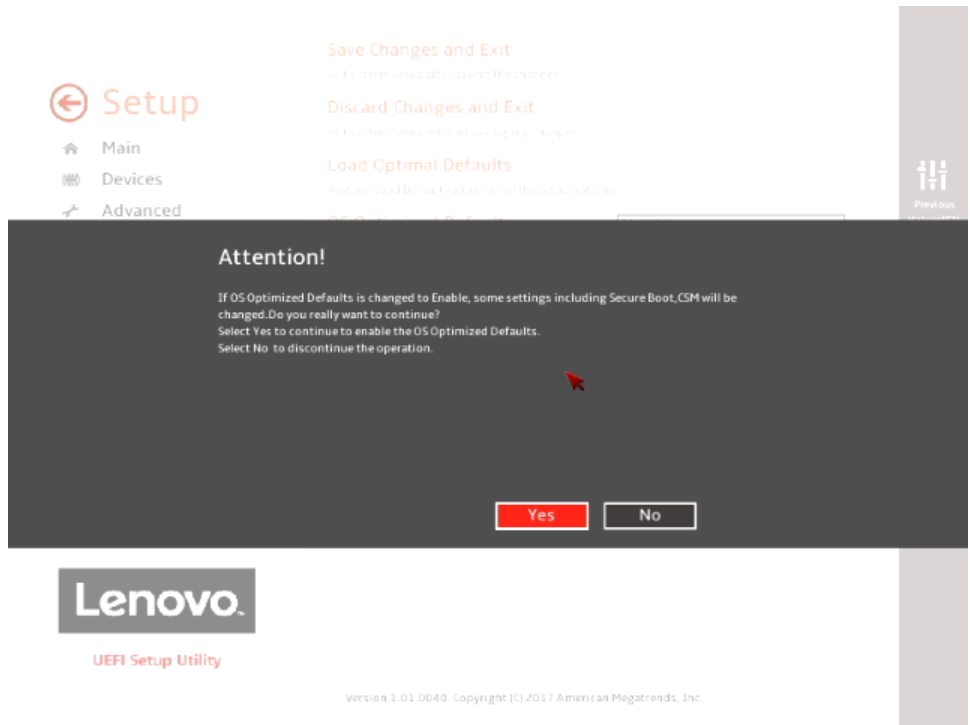
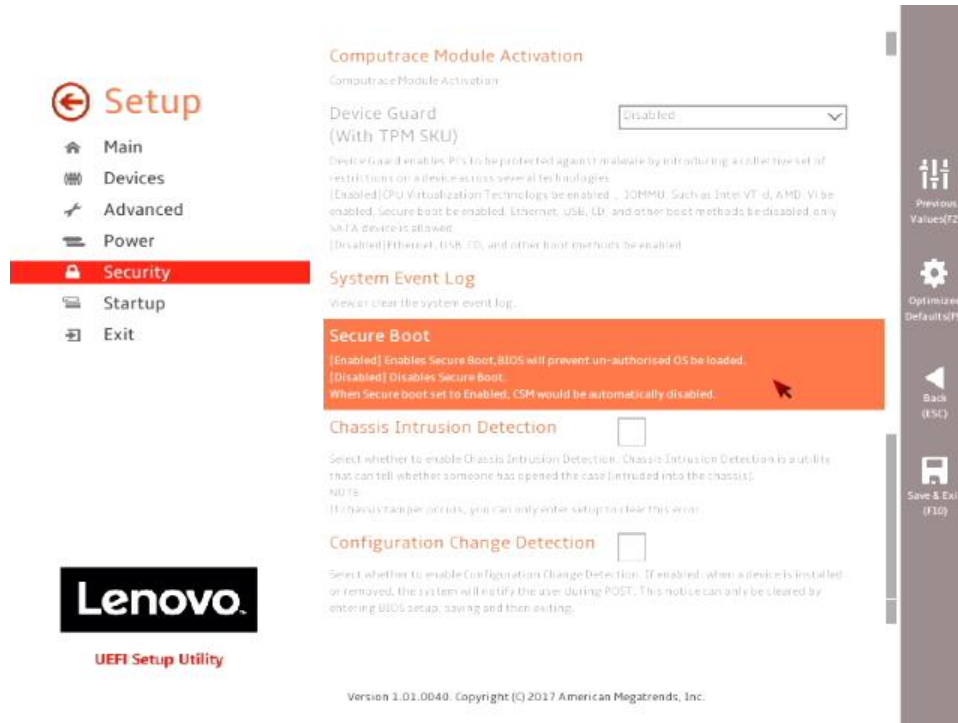Version 1.01.0040. Copyright (C) 2017 American Megatrends, Inc.

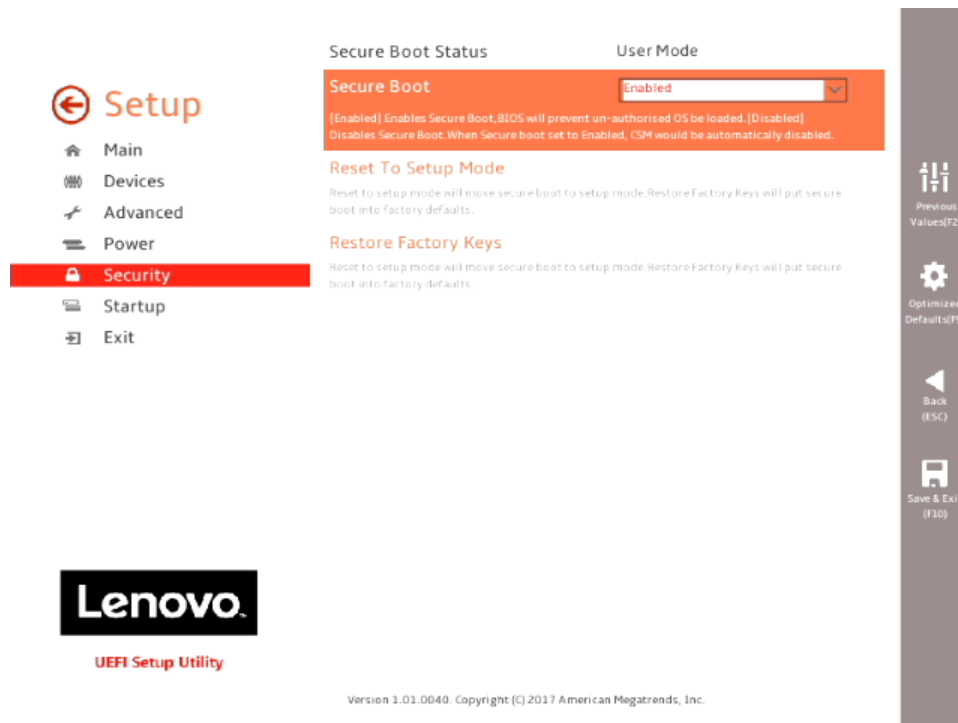o Select "Exit" menu option (left) and set "OS Optimized Defaults" (right) to "Enabled".

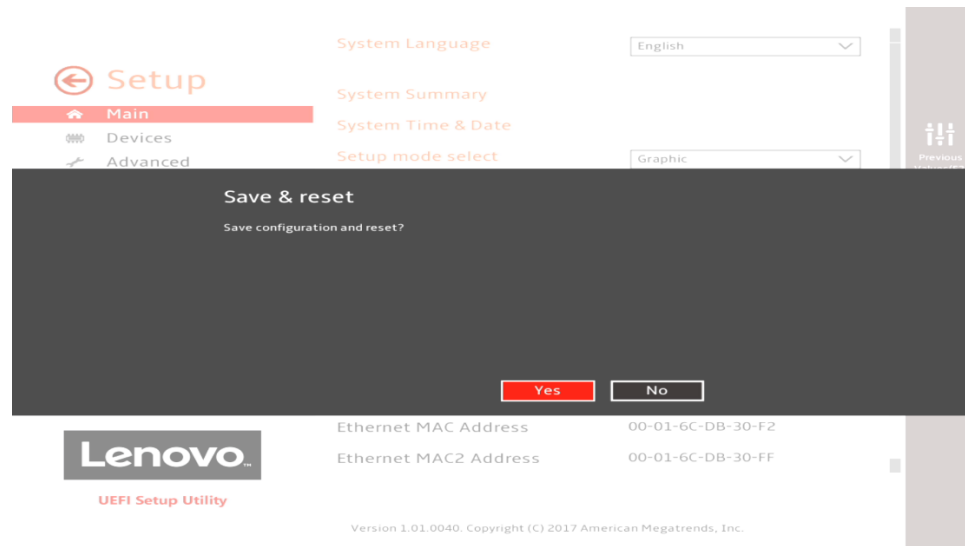
o Select "Yes" at the confirmation screen indicated below.

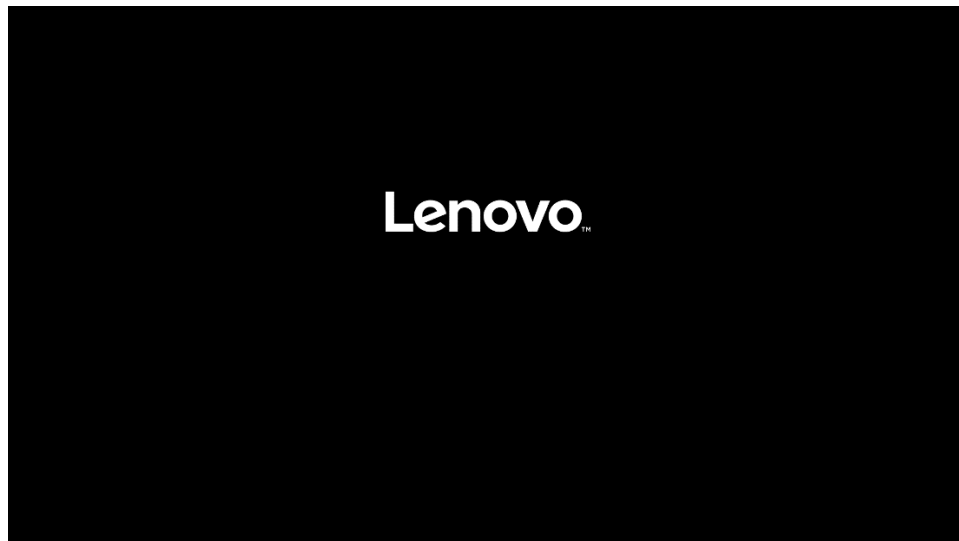o Select the "Security" menu option (left), then select "Secure Boot" option (right).

o Disable "Secure Boot".

o Select F10 to "Save and Exit" BIOS.

o Insert the Debian install media (either through USB or CD/DVD).

o Power on the system and press the F12 function key whenever the following Lenovo splash screen appears:

o   Select the Linux bootable installation media "UEFI" option from the F12 boot menu list.
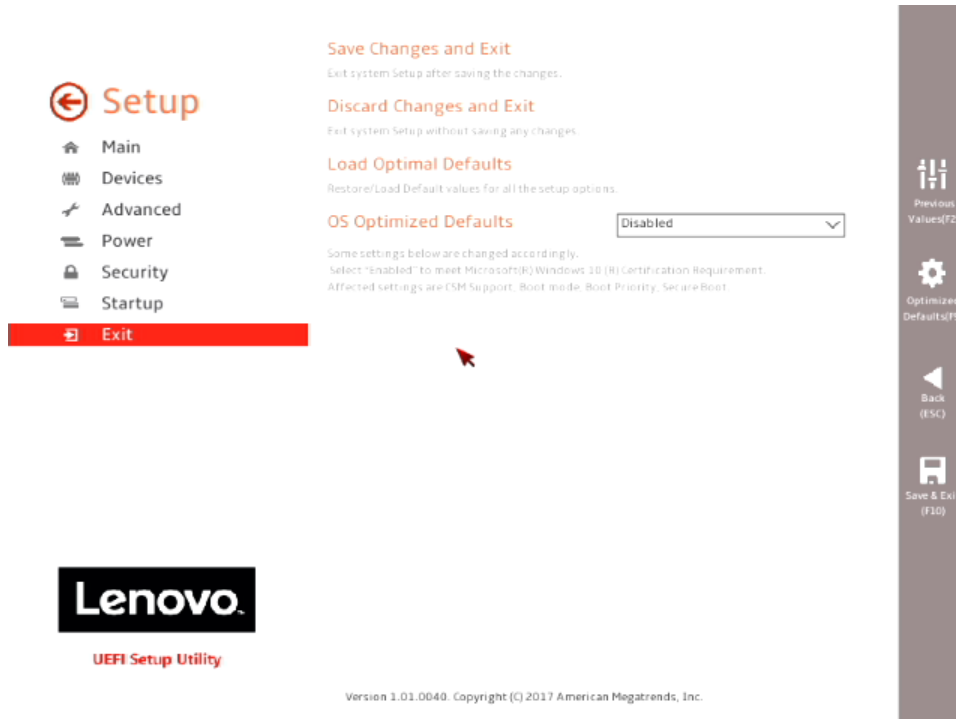
```
                    Startup Device Menu:

SATA 1: SanDisk SD7SB6S256G1001
   └ Legacy: SanDisk SD7SB6S256G1001
SATA 6: HL-DT-ST DVDROM DH60N
   └ Legacy: HL-DT-ST DVDROM DH60N
   └ UEFI: HL-DT-ST DVDROM DH60N
Network 1:
   └ Legacy: IBA CL Slot 00FE v0110
   └ UEFI: IPV4 Intel(R) Ethernet Connection (H) I219-LM
   └ UEFI: IPV6 Intel(R) Ethernet Connection (H) I219-LM
Network 2:
   └ Legacy: IBA GE Slot 0400 v1555
   └ UEFI: IPV4 Intel(R) I210 Gigabit  Network Connection
   └ UEFI: IPV6 Intel(R) I210 Gigabit  Network Connection
Enter Setup

            ↑ and ↓ to move selection
```

- **For Legacy/MBR installations (not recommended)**:

  o Boot into BIOS by pressing the function F1 key at the "Lenovo" splash screen.

  o Select "Setup" from the screen indicated below.

Version 1.01.0040. Copyright (C) 2017 American Megatrends, Inc.

  o Select "Exit" menu option (left) and set "OS Optimized Defaults" (right) to "Disabled".

Version 1.01.0040. Copyright (C) 2017 American Megatrends, Inc.

o   Select "Startup" menu option (left) and "CSM Configuration" (right).

o   Select the "Storage" option ROM and set the pull-down menu to "Legacy".

o   Select F10 to "Save and Exit" BIOS.

o   Insert the Debian install media (either through USB or CD/DVD).

o   Power on the system and press the F12 function key whenever the following Lenovo splash screen appears:

o   Select the Linux bootable installation media "Legacy" option from the F12 boot menu.

```
                    Startup Device Menu:

SATA 1: SanDisk SD7SB6S256G1001
    └ Legacy: SanDisk SD7SB6S256G1001
SATA 6: HL-DT-ST DVDROM DH60N
    └ Legacy: HL-DT-ST DVDROM DH60N
      └ UEFI: HL-DT-ST DVDROM DH60N
Network 1:
    └ Legacy: IBA CL Slot 00FE v0110
      └ UEFI: IPV4 Intel(R) Ethernet Connection (H) I219-LM
      └ UEFI: IPV6 Intel(R) Ethernet Connection (H) I219-LM
Network 2:
    └ Legacy: IBA GE Slot 0400 v1555
      └ UEFI: IPV4 Intel(R) I210 Gigabit  Network Connection
      └ UEFI: IPV6 Intel(R) I210 Gigabit  Network Connection
Enter Setup

            ↑ and ↓ to move selection
```

Section 2 – Installing Debian Linux 9 "Stretch"

Please refer to the following instructions and screenshots on how to install Debian on the ThinkStation P520c, P520, P720, and P920 workstations.
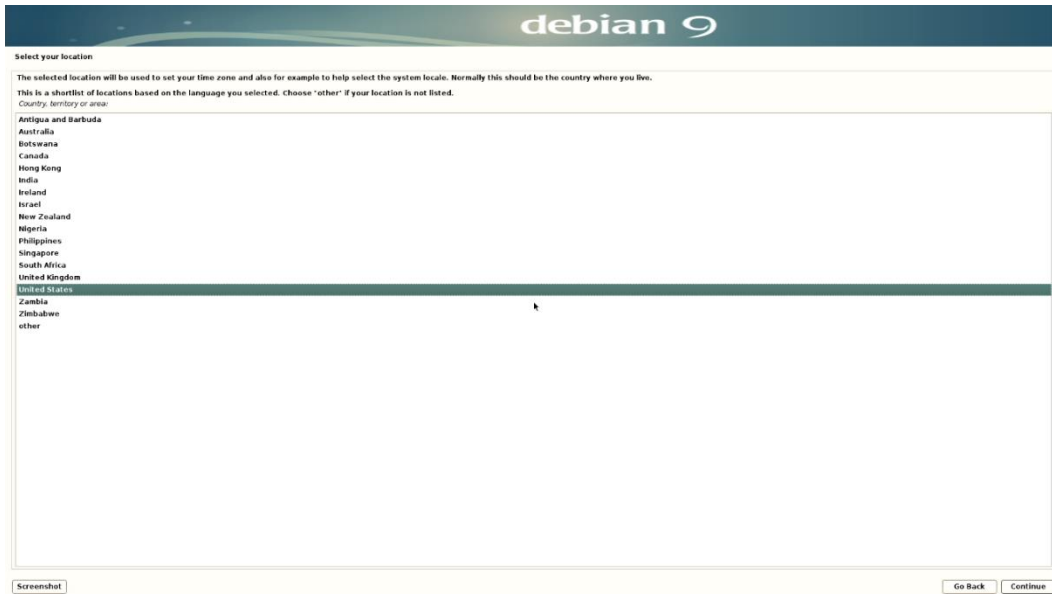
- Select "Graphical Install" from the Debian GNU/Linux UEFI Installer menu.

- Select a language.

- Select your location.

- Configure the keyboard.

- Configure the network by choosing the primary network interface.

- Configure the network by entering a hostname.

- *OPTIONAL*: Configure the network by entering a domain name.

- Set up a root password.

- Set up a user account and password.

- Set up a username.

- Set up a password for the username created above.

- Configure the clock.

- Partition the disk.

  o For simplicity sake, choose the following: "Guided – use entire disk"

- Select the disk to partition.

- Choose how to partition the disk.

- Confirm disk partitions.
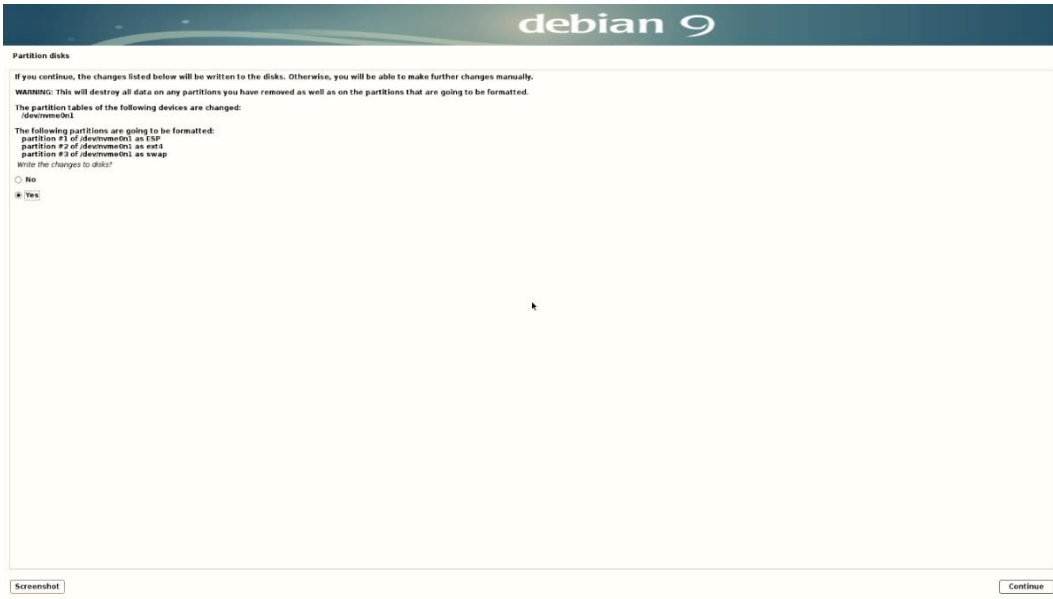
- Configure the package manager. Select "No" to avoid scanning another CD or DVD.

- Configure the package manger by selecting a debian archive mirror.

- Configuring popularity-contest.
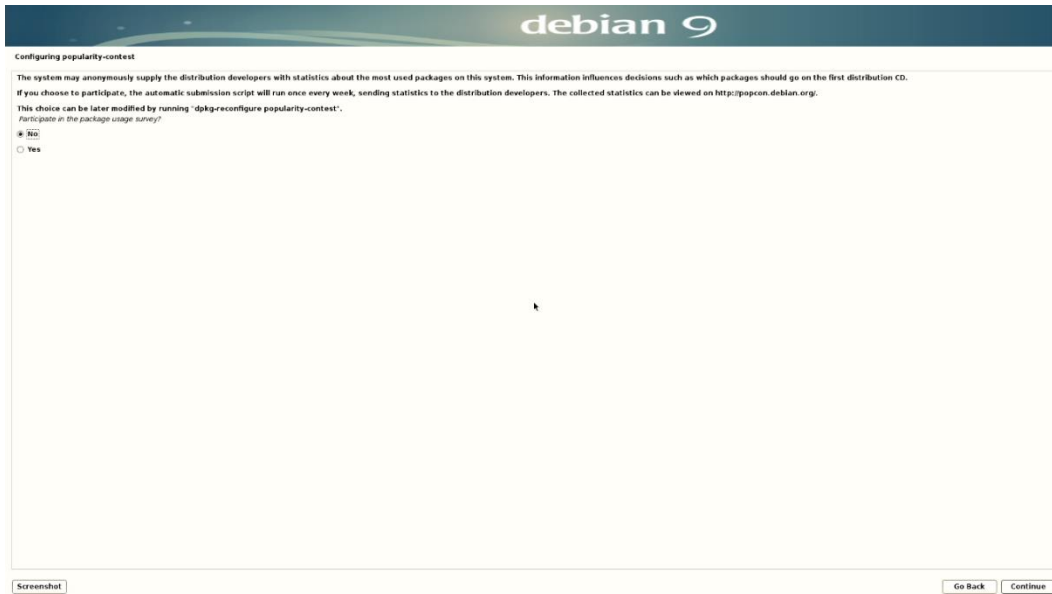
- Software selection.

- Let the installer start the installation.

- Select "Continue" at the "Installation complete" screen to reboot the system.

- At the grub boot menu screen, press "e" to edit the boot parameters.

- Add "nomodeset" at the end of the boot parameter line, then press F10 to boot.

- Log in to the Debian desktop screen by using the user credentials created above.
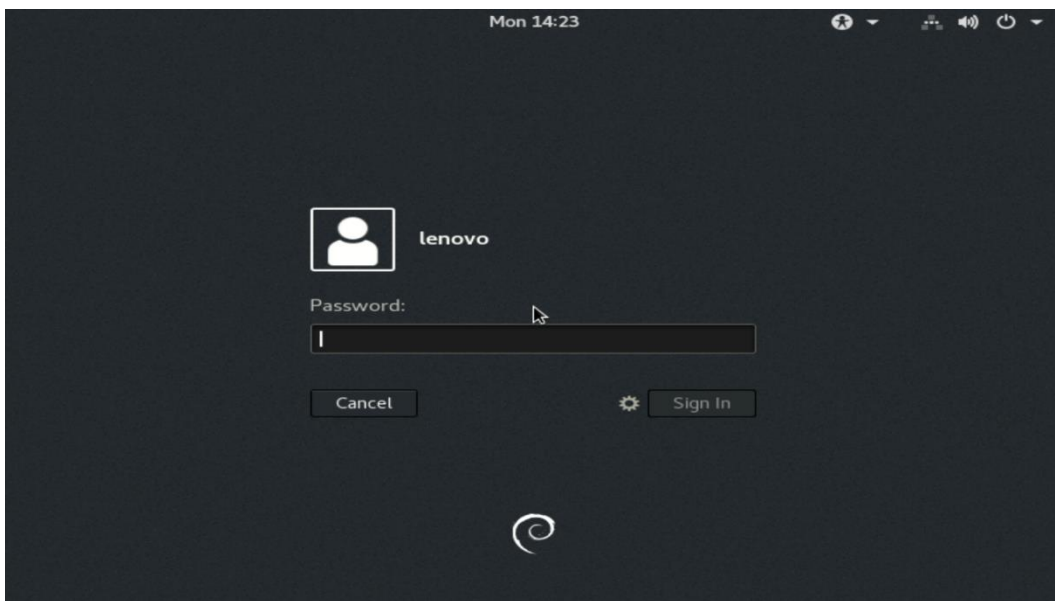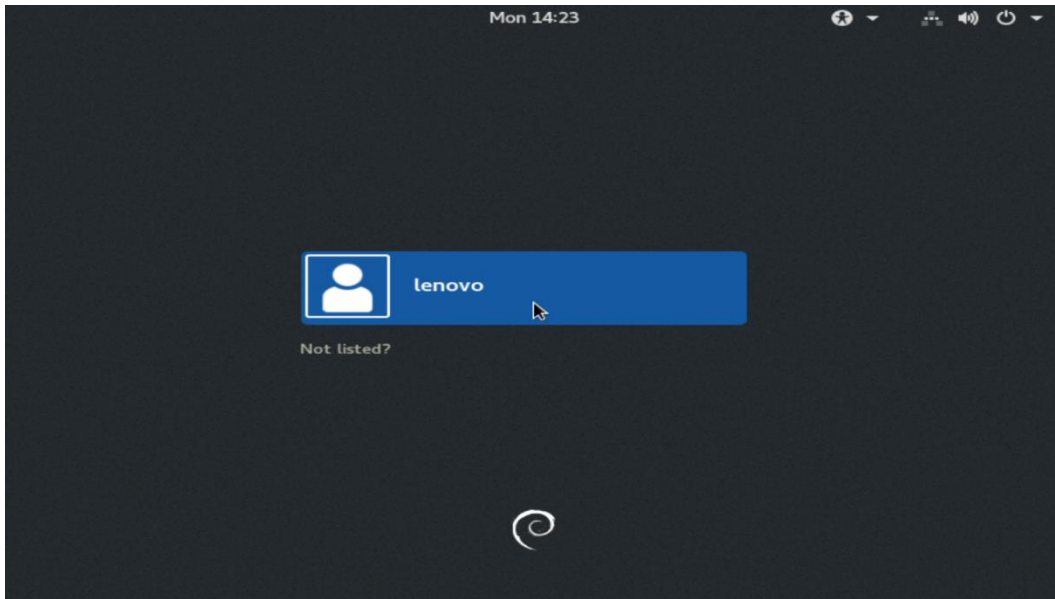
- Debian desktop screen.
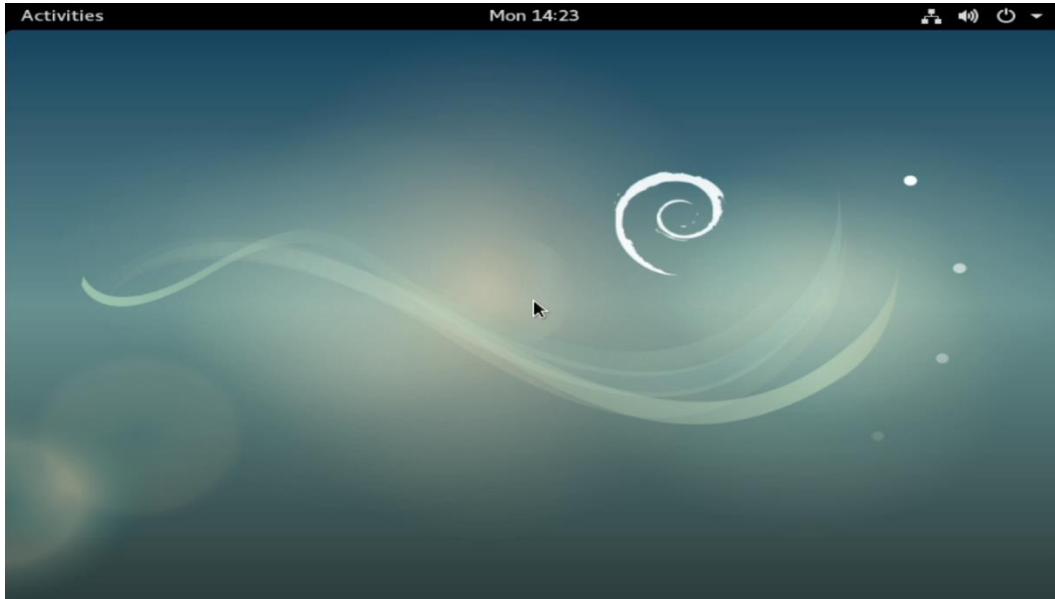
Section 3 – Updating the Source List to use the Debian Repositories

Use the debian repositories to download quick driver and/or software package releases.

Here's an example of what an /etc/apt/sources.list might look like:

Step 1:

- Edit the following file '/etc/apt/sources.list' and add the following lines:

  deb http://deb.debian.org/debian stretch main
  deb-src http://deb.debian.org/debian stretch main
  deb http://deb.debian.org/debian stretch-updates main
  deb-src http://deb.debian.org/debian stretch-updates main
  deb http://security.debian.org/ stretch/updates main
  deb-src http://security.debian.org/ stretch/updates main

  deb http://deb.debian.org/debian stretch main contrib non-free
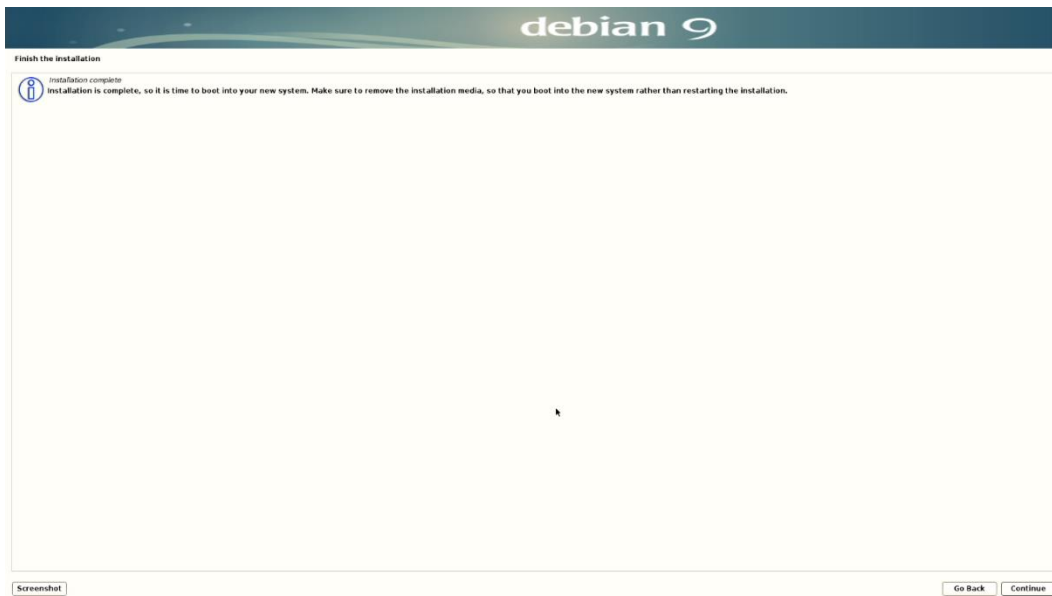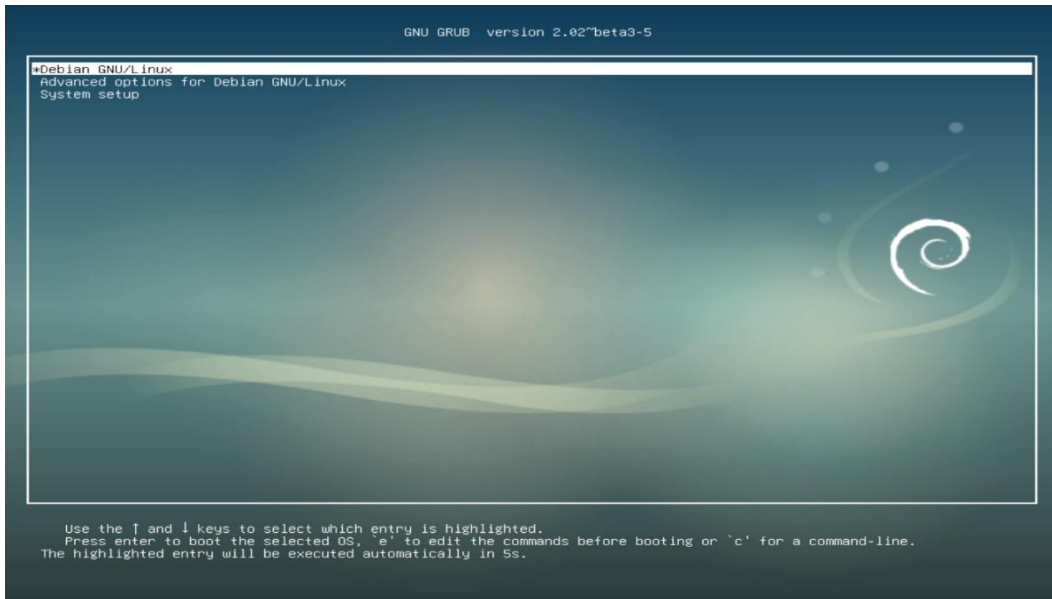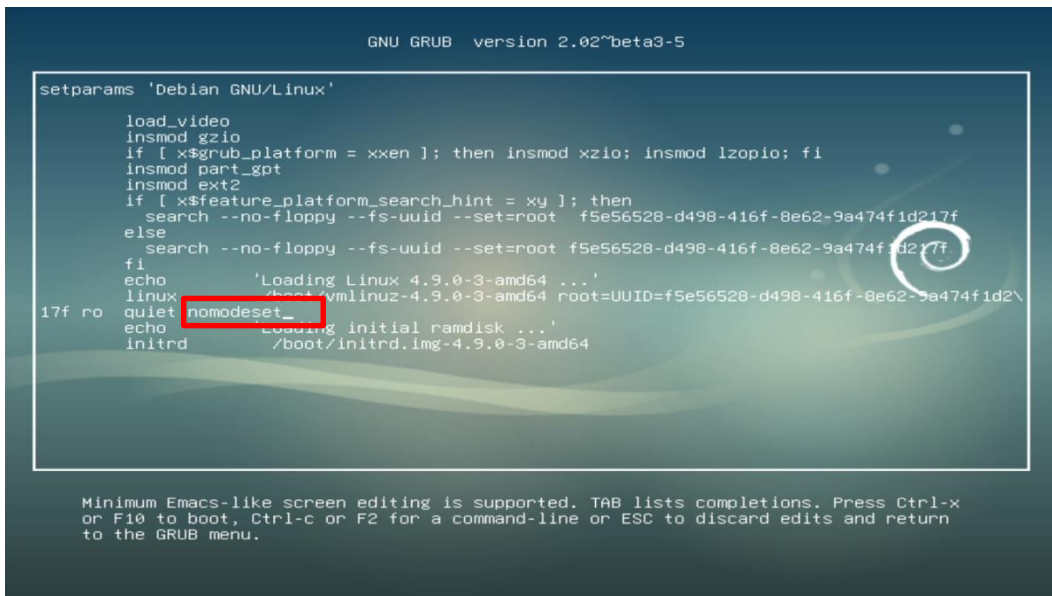 *deb-src http://deb.debian.org/debian stretch main contrib non-free*
  deb http://deb.debian.org/debian stretch-updates main contrib non-free
  deb-src http://deb.debian.org/debian stretch-updates main contrib non-free
  deb http://security.debian.org/ stretch/updates main contrib non-free
  deb-src http://security.debian.org/ stretch/updates main contrib non-free

Step 2:

- Run the following command: 'apt-get update'

Section 4 – 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.

To install the Nvidia driver from Debian repository, use the command: *apt-get install nvidia-driver*

To install the latest Nvidia driver, follow the steps below:

Prerequisites

- Make sure **gcc** is installed.
    - o # apt-get install gcc
- Make sure **make** is installed.
    - o # apt-get install make
- Make sure **linux-headers** are installed.
    - o # apt-get install linux-headers-"*uname –r*"

Step 1:

- Download the Nvidia graphics driver from Nvidia's website.

Step 2:

- Press "ALT-F2" on the keyboard.

Step 3:

- Login as root.
    - o # sudo su –

Step 4:

- Exit X-Windows/X-Server.
    - o # init 3

Step 5:

- Run the Nvidia installer.
    - o # sh Nvidia-*

Step 6:

- Accept the Nvidia driver license.

Step 7:

- Select "Yes" to update your X configuration file.

```
Would you like to run the nvidia-xconfig utility to automatically update your X configuration file so that the NVIDIA X
driver will be used when you restart X?  Any pre-existing X configuration file will be backed up.
                              Yes                                               No
```
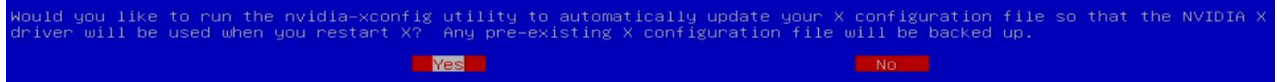
Step 8:

- Driver installation complete.

```
Your X configuration file has been successfully updated.  Installation of the NVIDIA Accelerated Graphics Driver for
Linux-x86_64 (version: 375.66) is now complete.
                                             OK
```
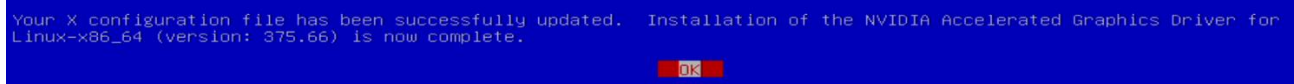
Step 9:

- Verify the Nvidia driver is loaded.

```
root@debian:/home/lenovo/Desktop# nvidia-smi
Wed May 24 15:53:10 2017
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 375.66                 Driver Version: 375.66                    |
|-------------------------------+----------------------+----------------------+
| 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 P600          Off | 0000:01:00.0     Off |                  N/A |
| 0%   54C    P0    13W /  N/A  |     0MiB /  1995MiB  |      0%      Default |
+-------------------------------+----------------------+----------------------+

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

Step 10:

- Reboot the system.

Section 5 – Installing the Network Wireless Driver

The wireless network device offered for P520c-P520-P720-P920 is native to Debian; therefore, you will not need to install any additional drivers separately.

Section 6 – Installing the Network LAN Driver

The wireless network device is native to Debian; therefore, you will not need to install any additional drivers separately.