# Ubuntu 18.04 LTS 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.

#### For UEFI/GPT installations (recommended):

- Boot into BIOS by pressing the function F1 key at the "Lenovo" splash screen.
- Select the "Exit" menu tab set "OS Optimized Defaults" to "Enabled" and select "Yes" at the confirmation screen.



 $\circ$  Select the "Security" menu tab, select "Secure Boot", and set the option to "Disabled".

		System Mode	Deployed Mode	
<b>()</b>	Setup Main	Secure Boot [Enabled] Enables Secure Boot,BIOS will preven loaded.[Disabled] Disables Secure Boot. When Secure boot set to Enabled, CSM would be	Enabled Disabled	411
# * •	Devices Advanced Power	Restore Factory Keys Restore Factory Keys will put secure boot into fa Reset Platform to Setup Mode	actory defaults.	Previous Values(Fi
9 11 12	Startup Exit	Reset to setup mode will move secure boot to se Exit Deployed Mode Transition between Deployment and User Modes Key Management	etup mode.	Optimize Defaults(F Back
C	LENOVO UEFI Setup Utility	Version 2.19.0045. Copyright (C) 2019 America	ables. an Megatrends, Inc.	(ESC) Save & Ex (F10)

• Press F10 to "Save and Exit" the BIOS setup menu.



• Insert the Ubuntu install 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 "UEFI" option from the F12 boot menu.

#### For Legacy/MBR installations (not recommended):

- Boot into BIOS by pressing the function F1 key at the "Lenovo" splash screen.
- Select the "Exit" menu tab, set "OS Optimized Defaults" to "Disabled", and select "Yes" at the confirmation screen.



• Select F10 to "Save and Exit" BIOS.

		and the second sec
Save & Reset		
Save configuration and reset?		
	Yes No	

• Insert the Ubuntu install 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 "Legacy" option from the F12 boot menu.

Startup Device Menu:
USB KEY: Samsung Flash Drive 1100
Legacy: Samsung Flash Drive 1100
└── UEFI: Samsung Flash Drive 1100, Partition 1
M.2 Drive 1: SAMSUNG MZVKW512HMJP-000L7
Legacy: SAMSUNG MZVKW512HMJP-000L7
SATA 5: HL-DT-ST DVDROM DH60N
Legacy: HL-DT-ST DVDROM_DH60N
Network 1:
🖵 Legacy: IBA CL Slot 00FE v0112
└── UEFI: IPV4 Intel(R) Ethernet Connection (2) I219–LM
└─ UEFI: IPV6 Intel(R) Ethernet Connection (2) I219–LM
Enter Setup
↑ and ↓ to move selection

## Section 2 – Installing Ubuntu 18.04 LTS

Please refer to the following instructions and screenshots on how to install Ubuntu 18.04 LTS on the ThinkStation P520c, P520, P720, and P920 workstations.

• Highlight the "Install Ubuntu" from the Installer menu and press Enter.

	GNU GRUB	version 2.02
Try Ubuntu without installing *Install Ubuntu OEM install (for manufacturers)		
CHECK GISC FOR GEFECTS		
Use the ↑ and ↓ keys to select Press enter to boot the select for a command-line. ESC to ret	: which ent ed OS, `e' urn previo	ry is highlighted. to edit the commands before booting or `c' us menu.

	ubuntu®	

• Select the language to use during the installation process and "Continue".

Mon 19:25	+ 0 +
Intell	
Welcome	
English Español Español Euskara Prançais Gaelge Gaelge Hivatski Kilonska Italiano Kurdi Labviski	
Quit Back Continue	

• Select your keyboard layout and "Continue".

	Mon 18:25				- ڭ 🕪
	Install				
Keyboard layout					
Choose your keyboard layout: English (Ichana) English (Icouth Africa) English (Icouth Africa) English (Icouth Africa) Esperanto Esperanto Estorian Faroese Filipino Type here to test your keyboard Detect Keyboard Layout	English (US) English (US) - Cheroke English (US) - English English (US) - English	e Colemak) Dvorak) Dvorak, alt. int Dvorak, intl., w Dvorak, left-ha Dvorak, right-h Macintoch)	l.) ith dead keys) nded) anded)		
		Quit	Back	Continue	
	•••••			k	

• Select "Normal Installation" and "Continue".

Mon 1825	<del>م</del> الله الله الله الله الله الله الله الل
install O	
Updates and other software	
What apps would you like to install to start with?         • Normal installation         Whet provery utilities, sifter structure, games, and media players.         • Minimal installation         • We browner and back stilles.         • Obsering and back stilles.         • Downhold to goddes: while installing (Jbuntu         • Tasses line 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 progrietary.         Quit       Back	
•••••••	

• Select "Erase disk and install Ubuntu" option and "Install Now".

Mon 18:26	e) 🕪 🕹 -
install O	
Installation type This computer currently has no detected operating systems. What would you like to do?	
Quit Back Install Now	
••••••	

Lenovo

• Select "Continue" to confirm making changes to the disk.

Mon 18/26	+ ڭ 🕫
0	
Install	
Installation type This computer currently has no detected operating systems. What would you like to do? Prove disk and install Ubuntu Write the changes to disk? If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make Further changes manually. The partition able to the following doubter are changed: [/dev/mmedin] The following partition #1 of /dev/mmedin] as ESP partition #1 of /dev/mmedin] as exid Continue	
BACK INSUITYOW	

• Select your location from the map and "Continue".

Mon 19/26	•» ٿ-
Install	
Where are you?	
New York Back Continue	
••••••	

• Enter a Username and Password and select "Continue".

Men 14:26	•0 - 0
install	
Who are you?	

• Installing Ubuntu.

Men 14:26	<del>•</del> ال ا
Install Welcome to Ubuntu Fisca and full of new features, the latest, wristion of Libritut makes compiling easier than ever, live are just a few cool new things to look out for	* 0 -
Almost finished copying files	

Lenovo

• Installation Complete. Select "Restart Now".



• Ubuntu desktop screen.



### Section 3 – 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 latest Nvidia graphics driver, follow the steps below:

- <u>Step 1</u>:
  - Download the Nvidia graphics driver from the Lenovo Support Website. <u>https://download.lenovo.com/pccbbs/thinkcentre\_drivers/1l3vdo204fxn.zip</u>
- <u>Step 2:</u>
  - Blacklist the Linux Nouveau driver.
    - Edit /etc/modprobe.d/blacklist.conf and add the line "<u>blacklist nouveau</u>".
    - Run the command from a terminal window: <u>update-initramfs –u</u>
    - Reboot the system.
- <u>Step 3</u>:
  - During a system reboot, press the "ESC" button on the keyboard to enter the Ubuntu grub boot menu.

• Press 'e' to edit the kernel boot parameter and add "*nomodeset*" to the Linux boot command line.

re lc gt ir ir ir if c48d34 rd	ecordfail pad_video fxmode \$linux_gfx_mode nsmod gzio f [ x\$grub_platform = xxen ]; then insmod xzio; insmod lzopio; fi nsmod part_gpt nsmod ext2 f [ x\$feature_platform_search_hint = xy ]; then searchno-floppyfs-uuidset=root 50a94072-5b91-4e90-b3a5-0d7c65c48d34 lse searchno-floppyfs-uuidset=root 50a94072-5b91-4e90-b3a5-0d7c65c48d34 i searchno-floppyfs-uuidset=root 50a94072-5b91-4e90-b3a5-0d7c65c48d34 i nomodeset_quiet splash \$vt_handoff >trod /boot/initrd.img-5.0.0-25-generic
-48034 ru	nomodeset_quiet splash \$vt_handoff /boot/initrd.img-5.0.0-25-generic

• Press CTRL-X or F10 to boot the system.

#### • <u>Step 4</u>:

• At the Ubuntu desktop screen, open a terminal window and stop X-windows by using the following command:

# init 3

#### <u>Step 5</u>:

• Log in as superuser using the credentials created above.

Ubuntu 18.04.2 LTS	lenovo-ThinkStation-P330 tty1
lenovo-ThinkStation Password:	n-P330 login: lenovo
Last login: Fri Aug Welcome to Ubuntu :	g 16 10:10:12 EDT 2019 on tty1 18.04.2 LTS (GNU/Linux 5.0.0–25-generic x86_64)
* Documentation:	https://help.ubuntu.com
* Management:	https://landscape.canonical.com
* Support:	https://ubuntu.com/advantage
* Canonical Livepa - Reduce system https://ubuntu	atch is available for installation. reboots and improve kernel security. Activate at: a.com/livepatch
479 packages can bo 234 updates are seo	e updated. curity updates.
Your Hardware Enab lenovo@lenovo-Thin] [sudo] password fo root@lenovo-ThinkS	lement Stack (HWE) is supported until April 2023. kStation-P330:~\$ sudo su r lenovo: tation-P330:/home/lenovo# _

#### • <u>Step 6</u>:

o Connect the system to the internet and install the "Development Tools" libraries.

# sudo apt-get update

# sudo apt-get install build-essential

root@lenovo-ThinkStation-P330:/home/lenovo/Desktop/L3VD062WS14# apt-get update
Get:1 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Hit:2 http://us.archive.ubuntu.com/ubuntu bionic InRelease
Get:3 http://us.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:4 http://us.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:5 http://security.ubuntu.com/ubuntu bionic-security/main amd64 DEP-11 Metadata [22.7 kB]
Get:6 http://security.ubuntu.com/ubuntu bionic-security/main DEP-11 64x64 Icons [31.7 kB]
Get:7 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [589 kB]
Get:8 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [709 kB]
Get:9 http://security.ubuntu.com/ubuntu bionic-security/universe i386 Packages [579 kB]
Get:10 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [195 kB]
Get:11 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 DEP-11 Metadata [42.0 kB]
Get:12 http://security.ubuntu.com/ubuntu bionic-security/universe DEP-11 48x48 Icons [16.4 kB]
Get:13 http://security.ubuntu.com/ubuntu bionic-security/universe DEP-11 64x64 Icons [111 kB]
Get:14 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 DEP-11 Metadata [2,464 B]
Get:15 http://us.archive.ubuntu.com/ubuntu bionic-updates/main i386 Packages [571 kB]
Get:16 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 DEP-11 Metadata [282 kB]
Get:17 http://us.archive.ubuntu.com/ubuntu bionic-updates/main DEP-11 48x48 Icons [66.6 kB]
Get:18 http://us.archive.ubuntu.com/ubuntu bionic-updates/main DEP-11 64x64 Icons [124 kB]
Get:19 http://us.archive.ubuntu.com/ubuntu bionic-updates/universe i386 Packages [974 kB]
Get:20 http://us.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [997 kB]
Get:21 http://us.archive.ubuntu.com/ubuntu bionic-updates/universe Translation-en [305 kB]
Get:22 http://us.archive.ubuntu.com/ubuntu bionic-updates/universe amd64 DEP-11 Metadata [252 kB]
Get:23 http://us.archive.ubuntu.com/ubuntu bionic-updates/universe DEP-11 48x48 Icons [207 kB]
Get:24 http://us.archive.ubuntu.com/ubuntu bionic-updates/universe DEP-11 64x64 Icons [448 kB]
Get:25 http://us.archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 DEP-11 Metadata [2,468 B]
Get:26 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages [4,000 B]
Get:27 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe i386 Packages [4,008 B]
Get:28 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en [1,856 B]
Get:29 http://us.archive.ubuntu.com/ubuntu bionic-backports/universe amd64 DEP-11 Metadata [7,712 B]
Fetched 6,797 kB in 1s (4,625 kB/s)
Reading package lists Done
root@lenovo-ThinkStation-P330:/home/lenovo/Desktop/L3VD062WS14# apt-get install build-essential

- <u>Step 7</u>:
  - Browse to the directory location to where the Nvidia driver was downloaded and run the following commands to unzip and install the driver.

# sudo unzip 1l3vdo204fxn.zip

# sudo sh NVIDIA-Linux-x86\_64-410.104.run

#### <u>Step 8</u>:

• Select "Continue Installation" at the pre-install script failed message.

NVIDIA Accelerated Graphics Driver for Linux-x86_64 (410.104)	
The distribution-provided pre-install script failed! Are you sure you want to o	continue?
Continue in the letter All of the	
NUIDIA Software Installer for Unix/Linux	www.nuidia.com
NVIDIA Accelerated Graphics Driver for Linux-x86_64 (410.104)	
Building kernel modules	
Building kernel modules	
Building kernel modules 	

#### <u>Step 9</u>:

 Select "OK" at the warning message where the installer couldn't find 32-bit compatible libraries.



- Step 10:
  - Select "Install and overwrite" for the libglvnd libraries.



#### • <u>Step 11</u>:

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

NVIDIA Accelerated G	raphics Driver	for Linux-x86_64	(430.50)
Would you like to run the nv	idia-xconfig ut	ility to automati	cally update
your x configuration file so restart X2 Any pre-existing	X configuration	A A driver will b on file will be ba	e usea wnen you cked up.
restart at any pre carsting	A configuration	n iiic wiii oc oa	okcu up.
Yes		No	
NVIDIA Software Installer fo	r Unix/Linux		www.nvidia.com

- <u>Step 12</u>:
  - Select "OK" at the completion of the driver installation process.

NVIDIA	Accelerated Graphi	ics Driver for I	linux-x86_64 (	(410.104)	
Your X configuration fil	le has been success	sfully updated.	Installation	n of the NVIDIA	Accelerated
Graphics Driver for Linu	x-x86_64 (version)	: 410.104) is no	ow complete.		
		OK			
NVIDIA Software Installe	er for Unix/Linux			աս	w.nvidia.com

- <u>Step 13</u>:
  - Verify the Nvidia driver has been installed successfully and is loaded properly by running the following command:

# nvidia-smi

NVIDIA-SI	II 410.1	04	Driver !	Jersion:	410.104	C	UDA Versi	on: 10.0
GPU Name Fan Temj	e D Perf	Persis Pwr:Us	tence-MI age/CapI	Bus-Id	Disp Memory-Usa	.AI gel	Volatile GPU-Util	Uncorr. EC Compute M
0 Quad 43% 490	lro P620 C P0	<b>N</b> ∕A	1 ft0 / N/A /	0000000 0M	0:01:00.0 D iB / 1997M	+ ff   iB   +	2%.	N∕ Defaul
Processes GPU	: PID	 Туре	Process	name				GPU Memor Usage

- <u>Step 13</u>:
  - o Reboot the system.

## Section 4 – Installing the Network Wireless Driver

The wireless network device offered for the P520c, P520, P720, and P920 is native to Ubuntu 18.04 LTS; therefore, you will not need to install any additional drivers separately.

### Section 5 – Installing the Network LAN Driver

The network LAN device is native to Ubuntu 18.04 LTS; therefore, you will not need to install any additional drivers separately.

## Section 6 – Revision History

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