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".

			Thi	nkPad Set	tup		
Ma	in Cor	ıfig	Date/Time 👘	Secur	ity Sta	artup 👘	Restart
Exi Exi Loa Dis Sau	t Saving (t Discardi d Setup De OS Optimiz card Chang e Changes	Changes ng Chang faults red Defau res	es lts [<u>Enabl</u> []	ed] isabled nabled		Item The des setting changed Select Meet M Windows Certif Require setting Suppor Boot, D Boot, D Boot, S Preven Virtua feature	Specific Help fault value of gs below are d accordingly. "Enabled" to icrosoft" s 10 ® ication ement. Affected gs are CSM t, UEFI/Legacy UEFI/Legacy riority, Secure Secure RollBack tion, and lization es.
F1 Esc	Help †↓ Exit ↔	Select Select	Item +/- Menu Enter	Change Select	Values ▶ Sub-Mem	F9 1 F10	Setup Defaults Save and Exit

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

					Thim	kPad Set	tup			
Ma	in	Con	fig	Date/	Time	Secur	ity S	Startup	Restart	
Exi Exi	t Savi t Disc	ing C ardi	hanges ng Chan	ges				Ite	em Specific Help	
	Attention!									
Selec	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.									
				res						
								Boot Preve Virtu featu	Secure RollBack ention, and ualization ures.	K
F1 Esc	Help Exit	†↓ +→	Select Select	Item Menu	+/- Enter	Change Select	Values ► Sub-Me	F9 enu F10	Setup Defaults Save and Exit	

• Tab over to the "Startup" menu tab.

					Thin	kPad Set	tup			
Ma	in	Con	fig	Date/	[ime	Secur	ity	Sta	rtup	Restart
► Boo	ıt								Ite	m Specific Help
Net	work Bo	oot			EPXE	BOOTI				
UEF -	T∕Legaa CSM Suj	cy Bo ppor	oot t		EUEF ENoJ * Un: Sec	[Only] selectal cure Boo	ole for ot			
Boo	t Mode				[Qu i	ck]				
Opt	ion ke	y Di:	splay		[Ena]	bled]				
Boo	t devia	ce L	ist F12	Option	n [Enal	bled]				
Boo	t Order	r Lo	ck		Dis	abled]				
F1 Esc	Help Exit	†↓ ↔	Select Select	Item Menu	+/- Enter	Change Select	Values ► Sub-	: Menu	F9 F10	Setup Defaults 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".

		1	hinkPad Setup			
Main	Config	Date/Time	e Security	Star	·tup	Restart
					Ite	m Specific Help
▶ Boot						
Network	Boot		[PCI LAN]			
UEFI/Leg - UEFI/ - CSM S	_{lacy} Boot 'Legacy Boot Support	Priority	[Both] [UEFI First] [Yes]			
Boot Mod	le		[Quick]			
Option k	ey Display		[Enabled]			
Boot dev	ice List F1	2 Option	[Enabled]			
Boot Ord	ler Lock		[Disabled]			
F1 Help Esc Exit	o <mark>†↓</mark> Selec : ←→ Selec	t Item +/- t Menu Ent	- Change Va er Select⊦	lues Sub-Menu	F9 F10	Setup Defaults Save and Exit

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

		Thi	nkPad Setup		
Main (Config	Date/Time	Security	Startup	Restart
▶ Boot				Ite	m Specific Help
Network Boo	ot	(P)	XE BOOTJ		
UEFI/Legacy	J Boot	EB	oth]		_
- CSM Supp	6	Setup	Confirmation		
Boot Mode	Save	configuratio	n changes and e	exit now?	
Option key		[Yes]	[No]	l	
Boot device	e List F12	Option [E	nabledl		
Boot Order	Lock	[D	isabled]		
F1 Help 1 Esc Exit +	<mark>t∔</mark> Select → Select	Item +/- Menu Enter	Change Values Select ► Sub-	s F9 -Menu F10	Setup Defaults Save and Exit

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.

					Thin	kPad Set	եսթ		
Ma	in	Con	fig	Date/	Time	Secur	ity Sta	ırtup 👘	Restart
 Net USB Key Dis Pow Bee Sto CPU Thu Int Ind Set 	work play er p and rage nderbo el® AM icator up UI	Mous Alar It(T S Co	e m M) 3 ntrol	[Simple	e Text]	Change	llalues	Ite	Setum Defaults
Esc	Exit	++	Select	Menu	Enter	Select	▶ Sub-Menu	i F10	Save and Exit

• By default, the "Graphics Device" will likely be set to "Hybrid Graphics". To run exclusively Nvidia graphics, set the "Graphics Device" to "Discrete Graphics".

ThinkPad Setup	
Config	
Display	Item Specific Help
Boot Display Device Graphics Device Total Graphics Memory[ThinkPad LCD] [Hybrid Graphics] [256MB] * Unselectable when* Unselectable whenDiscrete Graphics Hybrid GraphicsBoot Time ExtensionDisabled	Discrete Graphics mode will achieve higher graphics performance. Hybrid Graphics mode runs as Integrated Graphics mode to achieve longer battery life, and Discrete Graphics is enabled on demand.
F1 Help ↑↓ Select Item +/- Change Values Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu	F9 Setup Defaults F10 Save and Exit

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'.

	GNU GRUB version 2.02
Try Ubuntu without installing	
*Install Ubuntu	
Check disc for defects	

• The Ubuntu Linux Welcome Screen should appear. Select the appropriate language and "Continue".

	Thu 18:25		40 9 -
Welcome		°	
English Español Esperanto Euskara Français Gaelge Galego Hrvatski İslenska İtaliano Kurdî Latviski	ß	Quit Back Continue	

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

	Thu 18:26
	Install
Keyboard layout	
Choose your keyboard layout: English (Chana) English (Nigeria) English (South Africa) English (UK) English (UK) Esperanto Estonian Faroese Filipino Type here to test your keyboard	English (US) English (US) - Cherokee English (US) - English (Colemak) English (US) - English (Dvorak, English (US) - English (Dvorak, alt. intl.) English (US) - English (Dvorak, intl., with dead keys) English (US) - English (Dvorak, right-handed) English (US) - English (Dvorak, right-handed) English (US) - English (Maciotoch)
Detect Keyboard Layout	Quit Back Continue
	* • • • • •

Select "Normal Installation" and "Continue". ٠

	Thu 18:26		
	Install		
Updates and other software	2		
What apps would you like to install to start	with?		
 Normal installation Web browser, utilities, office software, games, and m 	nedia players.		J
O 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 This software is subject to license terms included with 	Wi-Fi hardware and additional me	dia formats	
This soleware is subject to intense terms included wit	and socialiteiration, some is proprietary.		
		Quit Bar	k Continue
		- Quir Bar	concilde
		•	Ň

Choose the installation type. For simplicity, this guide was done using "Erase disk and • install Ubuntu"

Thu 18:26	40 F -
Install	
Installation type	
This computer currently has no detected operating systems. What would you like to do?	
Quit Back Continue	
••••	

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

	Thu 18:26	40 🗲 🕶
	install O	
	Erase disk and install Ubuntu	
	Select drive: /dev/nvme0n1 - 1.0 TB NVMe Device	
	The entire disk will be used:	
6	Ubuntu /dev/nvme6n1 (ext4) 1.0 TB	
	Quit Back Install Now	
	• • • • • •	

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

	Thu 18:27		• و ا
	Install		
Erase disk and install Ubuntu	Instatt		
Select drive: /dev/nvme1n1 - 1.0 TB NVMe Device	Write the changes to disks?		
The IF you continue, the changes listed below will be WARNING: This will destroy all data on any part The partition tables of the following devices an /dev/nyme11	e written to the disks. Otherwise, y titions you have removed as well a e changed:	you will be able to make further changes manually as on the partitions that are going to be formatted	
The following partitions are going to be format partition #1 of /dev/nvme1n1 as ESP partition #2 of /dev/nvme1n1 as ext4	ted:	I	
		Go Back Continue	
	_	Back	

• Choose the appropriate geographical location and select "Continue".



• Fill out the appropriate input boxes and select "Continue".

Thu 14:27	40) 🗲 🔻
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	
•••••	

• Ubuntu installation progress bar will be shown.



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

Thu 14:31	40) 🗲 🔻
Installation Complete	
<i>i</i> Installation is complete. You need to restart the computer in order to use the new installation. 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.

- 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.
- 2. Open a terminal window and stop x-windows by using the following command.

sudo init 3



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

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



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

./NVIDIA-Linux-x86_64*



5. Select "Continue installation".



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

NVIDIA Accelerated Graphic	s Driver for Linux-x86_64 (430.50)
Would you like to register the ker allow DKMS to automatically build kernel later.	nel module sources with DKMS? This will a new module, if you install a different
Yes	
NVIDIA Software Installer for Unix	/Linux www.nvidia.com

7. Select "OK".



8. Select "Ignore CC version check".



9. Select "OK".



Lenovo

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.

NVIDIA Accelerated Gr	aphics Driver :	for Linux-x86_6	64 (430.50)
Would you like to run the nvi your X configuration file so restart X? Any pre-existing	dia-xconfig ut: that the NVIDIA X configuration	ility to automa A X driver will n file will be	tically update be used when you backed up.
Yes		No	
NVIDIA Software Installer for	Unix/Linux		www.nvidia.com

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

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

15. Reboot the system.

Section 6 – Revision History

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