Red Hat Enterprise Linux 9 Installation

Lenovo ThinkStation P3 Tower, Ultra, Tiny



Lenovo

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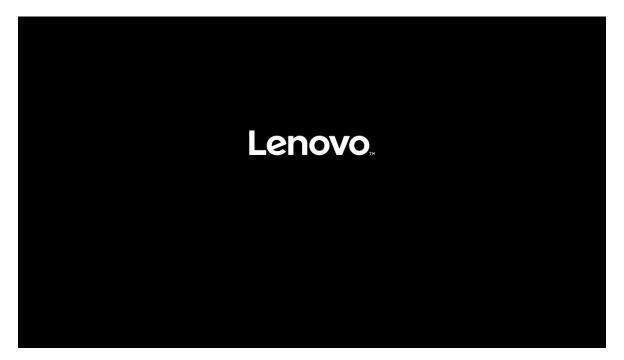
Overview

The purpose of this document is to provide high-level guidance for users to adequately install a Red Hat Enterprise Linux 9 operating system on the new ThinkStation P3 Family platforms.

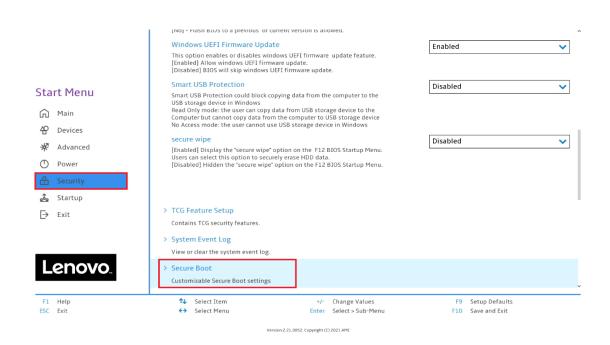
Section 1 – BIOS Setup

The first step before installing Linux is to make sure the system BIOS is setup correctly.

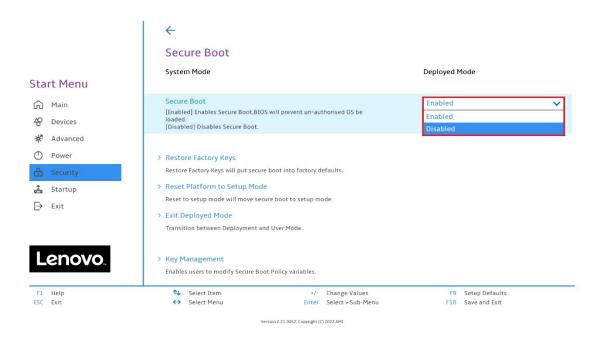
• Boot into BIOS by pressing the function F1 key at the "Lenovo" splash screen.



• Tab over to the Security tab and select "Secure Boot".



• Ensure that Secure Boot option is set to "Disabled".



• Save changes by pressing F10 function key.

	Secure Boot			
art Menu	System Mode		Deployed Mode	
 Main Devices Advanced Power Security Startup Exit 	Secure Boot [Enabled] E loaded. [Disabled] D Restore Fa Restore Fa Restore Fat Reset Plat Reset to set Secure Deploymencement	figuration and reset? Yes No	Disabled	~
Lenovo	Key Management Enables users to modify Secure Boot			
	↑↓ Select Item ↔ Select Menu	+/- Change Values Enter Select > Sub-Menu	F9 Setup Defaults F10 Save and Exit	

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Section 2 – RHEL 9 Installation

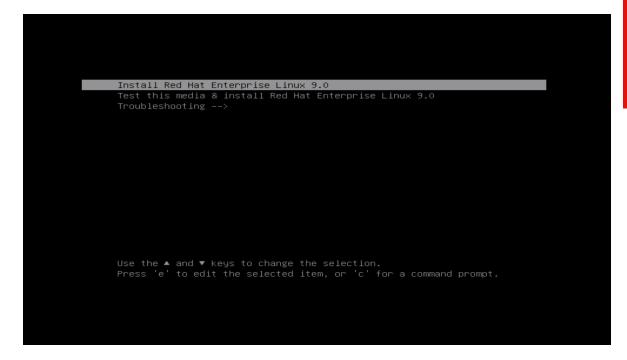
Here are some step-by-step instructions on how to get a Red Hat Enterprise Linux 9 operating system installed on the new ThinkStation P3 Family platforms.

- Obtain a copy of the RHEL 9 installation media. It is recommended to use Fedora Media Writer to make an installation USB with the appropriate RHEL 9 installation media.
- 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.

ThinkStation.	Startup Device Me Uefi Boot Options: Network 1-[UEFI: BYE IBud Inte USB HDD 1-[UEFI: Samsung Fla	el(R) Ethernet Connection (22) [219-LM]	
App Menu	Enter Setup		
Lenovo. N Select Item Delete key to enter Deployment Boot N	€→ Select Menu tode	Enter Select > Sub-Menu	ESC Exit

<u>Note:</u> Legacy boot is not supported on P3 platforms. Only UEFI bootable options will be available.

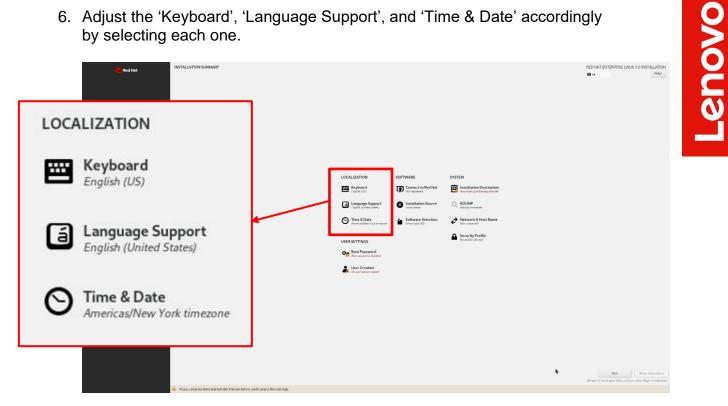
4. Select the 'Install Red Hat Enterprise Linux 9.0' option from the GRUB boot menu and press 'Enter'.



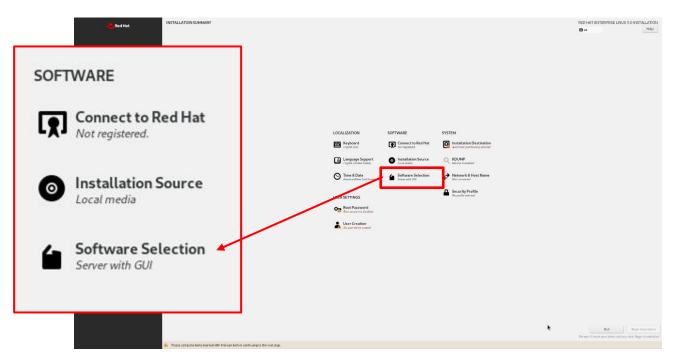
5. The Red Hat Enterprise Linux Welcome screen should appear. Select the appropriate language from the list of options, and select 'Continue'.

		RED HAT ENTERPRISE LINUX 5.0 IN
WELCOME TO RED HAT ENTERPRISE LINUX 9.0.		
What language would you like to use during the installation process?		
English	English > English (United States)	
العربية	Arabic English (United Kingdom)	
Français	Econch English (India)	
Deutsch	English (Australia)	
日本語	German English (Canada) Japanese English (Denmark)	
中文	Mandarin Chinese English (reland)	
Руссний	Russian English (New Zealand)	
Español	Spanish English (Nigeria)	
Arikaans	Afrikaans English (Hong Kong SAR China)	
जनपिय		
	Assamese English (Singapore)	
Asturianu	Asturian English (South Africa)	
Беларуская	Belarusian English (Zambia)	
Български	Bulgarian English (Zimbabwe)	
ৰাংলা	Bangla English (Botswana)	
Català	Catalan English (Antigua & Barbuda) English (Israel)	
Čeština	Czech	
Dansk	Danish	
Ελληνικά	Greek	
Esperanto	Esperanto	
Eesti	Estonian	
Euskara	Basque	
فارس	Persian	
Supmi	Finnish	
Filipino	Filipino	
Futan	Fridian	
Gaelge	Irish	
Galego	Galician	
gwid	Gujarati	
341.1	Hebrew	
1-10 1-10	Hindi	
Hrvatski	Croatian	
Mogyar	Hungarian	
Interlingua	Interlingua	
Indonesia	Indonesian	
Italiano	Italian	
ອູ່ລະກະຫາງຫຼາຍ	Georgian	
Қазақ тілі	Kazakh	
1	D	h
		Guit

6. Adjust the 'Keyboard', 'Language Support', and 'Time & Date' accordingly by selecting each one.



7. Select the 'Software Selection' and choose the type of software to install.

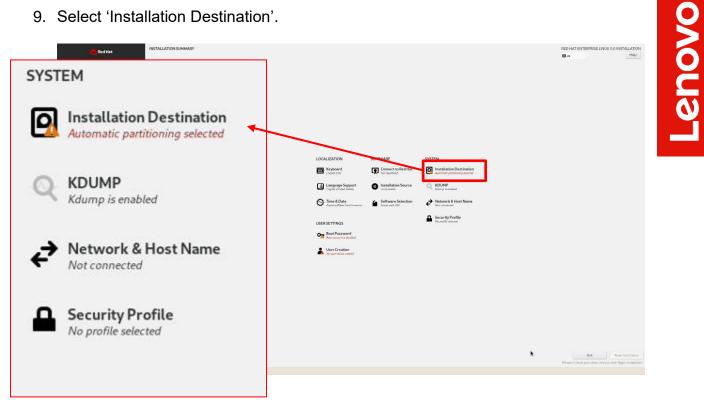


8. Select the type of 'Base Environment' as well as each additional software packages to install.

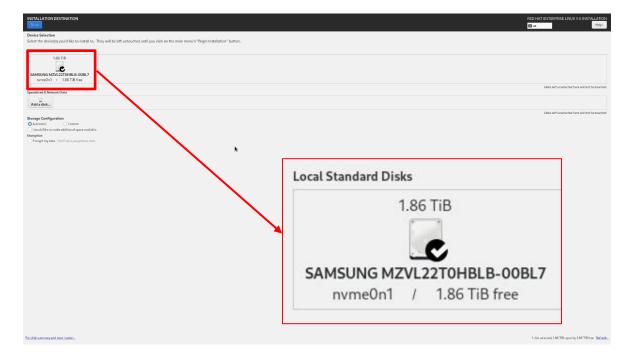
In this example, 'Workstation' was selected for the 'Base Environment' and all additional software tools were selected.

SOFTWARE SELECTION	
Base Environment Description Base Environment Base Enviro	Additional software for Selected Environment
An interprotect, sage-to-enange awar with a prophical interface. General An energy of the sage-to-enange aware, Methods Hubbl.	Initia Class Class Solution Classes Class Solution Terranneling to abulang server and dring Sociups Class Solution Terranneling Solutions And or Classes Solution and CCIES & Applications
Constant i Maria Anno 19 Anno	Industry Marganet Industry Marganet Trainformage Marganet Industry Marganet Industry Marganet Industry Marganet Industry Industr
Boid: Dalling Boid: for auxtern RHEL gotan. Virtualization Neal Minutal current auxon Neal	C Offer Safara et Anderland Alle Safara et An
	Source Card Support Support for legislam Card adult France and Card Support (France Support France Support France Support France Support France Support (France Support Support France Support Suppor
	Consule internet arcess tools, often used by administrators.
Base Environment	Catalation Margoment Table for marging line constances Analis Company marging line constances Analis Company marging marging line constances.
	SHIT Development Totski to development Tots
Server with GUI An integrated, easy-to-manage server with a graphical interface.	Network Servers These particular internet-basis derives such as CINCP, Kerberus and NIS. EMD Development Texts These particular internets These particular internets
Server	Scientific Support
An integrated, easy-to-manage server.	Conception C
O Minimal Install	
Basic functionality.	
Workstation Workstation	
Workstation is a user-friendly desktop system for laptops and PCs.	
Custom Operating System Basic building block for a custom RHEL system.	
O Virtualization Host	
Minimal virtualization host.	
Additional software for Selected Environment	, the second sec
Backup Client	
Client tools for connecting to a backup server and doing backups.	
GNOME Applications	
A set of commonly used GNOME Applications.	
Headless Management Tools for managing the system without an attached graphical conso	ale.
✓ Internet Applications	
Email, chat, and video conferencing software.	
Office Suite and Productivity A full-purpose office suite, and other productivity tools.	
Remote Desktop Clients	
Smart Card Support	
Support for using smart card authentication.	
Legacy UNIX Compatibility Compatibility programs for migration from or working with legacy l	JNIX environments.
Console Internet Tools	
Console internet access tools, often used by administrators.	
Container Management Tools for managing Linux containers	
Z Development Tools	
A basic development environment.	
 .NET Development Tools to develop and/or run .NET applications 	
Graphical Administration Tools	
Graphical system administration tools for managing many aspects of	of a system.
Network Servers These packages include network-based servers such as DHCP, Kerbe	area and NIS
RPM Development Tools	nos anu mis.
Tools used for building RPMs, such as rpmbuild.	
Scientific Support	mouting
Tools for mathematical and scientific computations, and parallel con Security Tools	mputing.
Security tools for integrity and trust verification.	
System Tools	
This group is a collection of various tools for the system, such as the	client for connecting to SMB shares and tools to monitor network traffic.

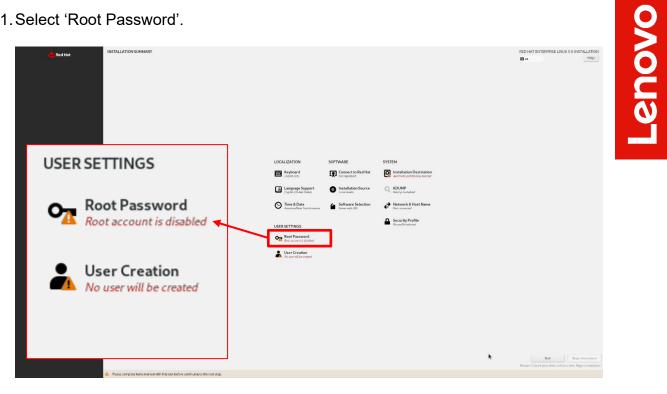
9. Select 'Installation Destination'.



10. Select the device on where to install the operating system.



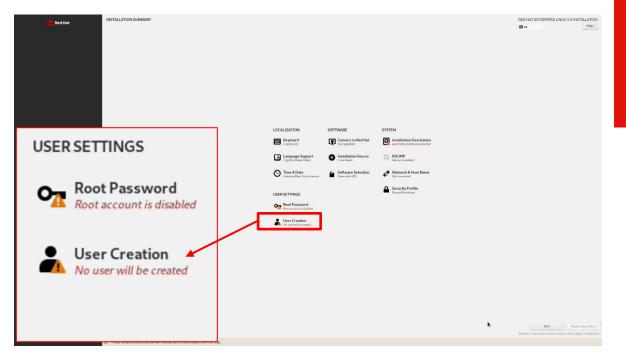
11. Select 'Root Password'.



12. Enter a root password in both boxes below and select 'Done' in the upper left.

ROOTPASSWORD		RED HAT ENTERPRISE LINUX 9.0 INSTALLATIO
	The set of action 1 seedfor advantule ing the spenner. This is assumed for the total term Gard Promoted: Confirm:	
The root account is use	ed for administering the system. Enter a password for the root user.	
Root Password:	Ś	
	empty password	
Confirm:	®	
🛃 Lock root account		
Allow root SSH log	jin with password	

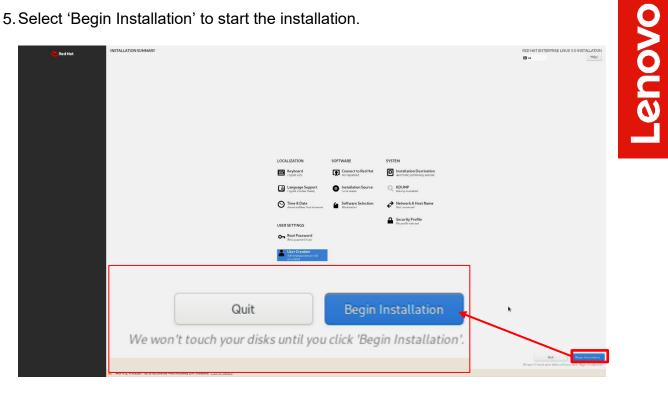
13. Select 'User Creation'.



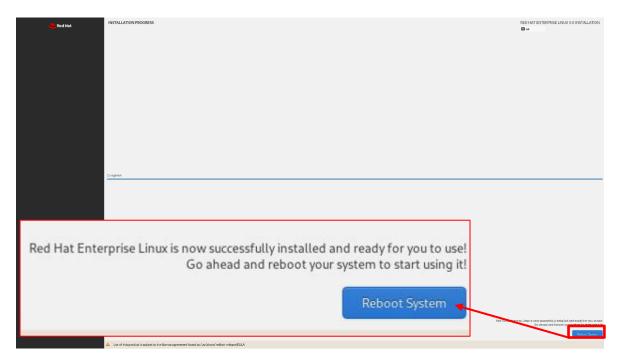
14. Fill in the appropriate boxes below and select 'Done' in the upper left.

	CREATE USER		RED HAT ENTERPRISE LINUX 9.0 INSTALLAT
		Full same User name Instant the user admost state Reparts passed to use this scored. Passed Confirm passed Advanced.	
	Full name]
	User name]
		Make this user administrator	
		Require a password to use this account	
	Password	©)
		empty password	、
Confir	m password	<u>۳</u>	
		Advanced	

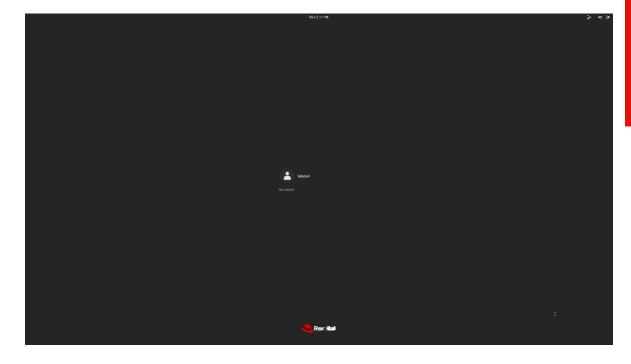
15. Select 'Begin Installation' to start the installation.



16. Once the installation completes, select 'Reboot System' at the bottom right.



17. Select the user icon and log in using the user credentials created above.



18. Red Hat Enterprise Linux 9 Desktop screen.



Section 3 – Install Device Drivers

Most of the standard building blocks used in the ThinkStation P3 platform are native to the Red Hat Enterprise Linux 9 base kernel. Users may consider installing a proprietary graphics driver to get optimal performance from the graphics card. This section provides step-by-step instructions on how to install a proprietary Nvidia graphics driver in Red Hat Enterprise Linux.

<u>Note 1:</u> Most commands need to be executed with superuser privileges in the following sections. All commands that require superuser privileges, start with the # sign in this document.

<u>Note 2:</u> Non-native drivers need to be manually installed. Refer to the vendor's documentation for a detailed process of obtaining and installing drivers.

<u>Note 3:</u> Registering the system to the Red Hat subscription will allow for easy Linux updates. The commands below will allow users to easily register and subscribe to the Red Hat subscription repositories. Registering the system to the Red Hat subscription requires a network connection.

From within the Linux desktop, open a terminal window and run the following Linux commands:

subscription-manager register

• This will require a valid Red Hat username and password.

subscription-manager attach

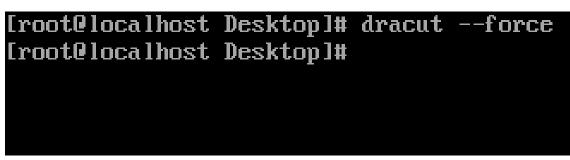
Section 4 – Install Nvidia Proprietary Drivers

The step-by-step instructions below show how to install Nvidia proprietary drivers.

- 1. Download the appropriate Nvidia graphics driver from the Lenovo support portal.
- 2. Blacklist the Linux Nouveau driver.
 - # nano /etc/modprobe.d/blacklist.conf
 - Add the following line, 'blacklist nouveau', save and exit the file.



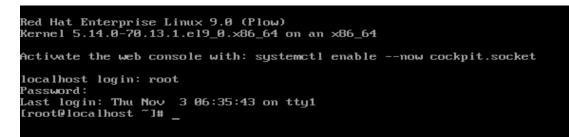
- 3. Update the initramfs file and reboot the system.
 - # dracut --force
 - # reboot now



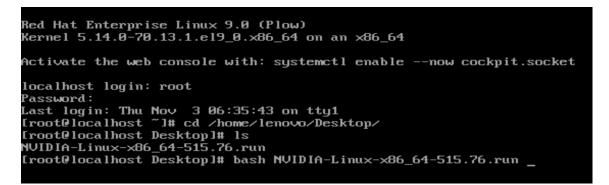
- 4. Once the system reboots to the Linux desktop screen, run the following command as superuser from a terminal window to exit X-windows.
 - # init 3

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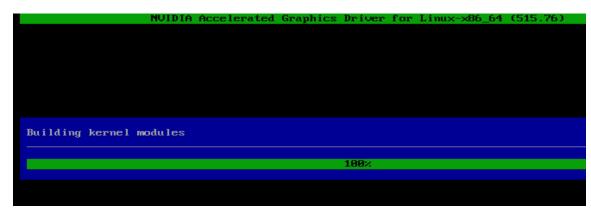
5. Login as root (superuser).



- 6. Browse to the directory to where the Nvidia driver installation file is located and run the following command. *In this example, the driver file is in the Linux desktop directory.*
 - # bash NVIDIA*



7. Note the driver should start to install.



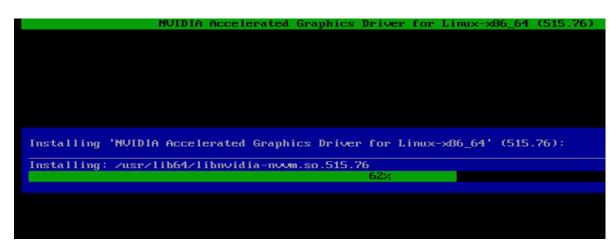
8. The driver will ask whether to install NVIDIA's 32-bit compatibility libraries. *In this example, 'yes' was selected.*

NVIDIA	Accelerated	Graphics	Driver	for	Linux-x86	_64	(515.	76)
Install NVIDIA's 32-bit	compatibilit	y librarie	es?					
		-						
	Yes				No			

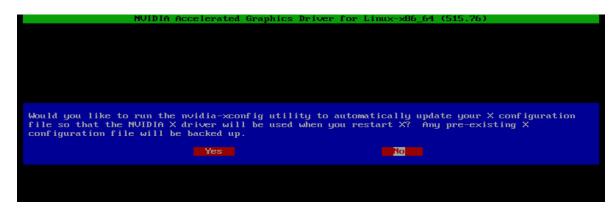
9. Select 'OK' on the following warning message.



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.

NVIDIA Accelerated Graphics Driver for Linux-x86_64 (515.76)
Your X configuration file has been successfully updated. Installation of the NVIDIA Accelerated Graphics Driver for Linux-x86_64 (version: 515.76) is now complete.

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

nvidia-smi

NVID			5 Driver			CUDA Versio	on: 11.7
GPU Fan	Name		Persistence-M Pwr:Usage/Cap	Bus-Id	Disp.A	GPU-Util	
			4GB Off N∕A ∕ 31W			+ 61% +	N⁄f Default N⁄f
Proce	esses:						
	GI ID	CI ID	PID Tyj	pe Process	name		GPU Memor <u>u</u> Usage
No	essesses running	r proce	esses found		=========	===========	

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Revision	Historv
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Č	
9	

Version	Date	Author	Changes/Updates
1.0	5/23/2023	A. Panteleev	Initial launch release.