Red Hat Enterprise Linux 9 Installation

Lenovo ThinkStation P2 Tower

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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 P2 platforms.

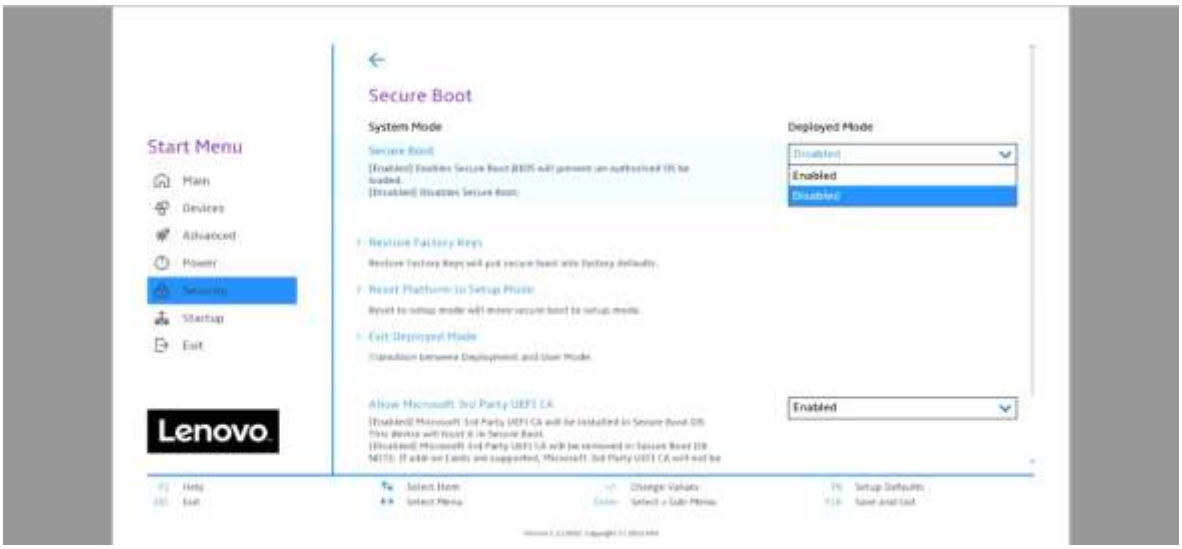
Section 1 – BIOS Setup

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

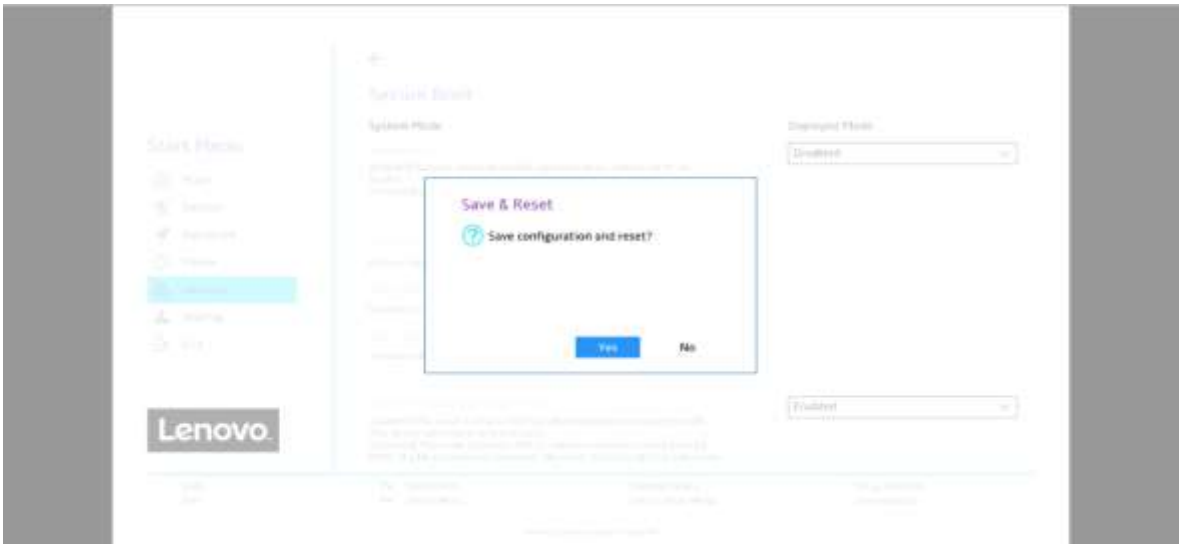
- Boot into BIOS by pressing the function F1 key at the “Lenovo” splash screen.

- 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.



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 P2 platforms.

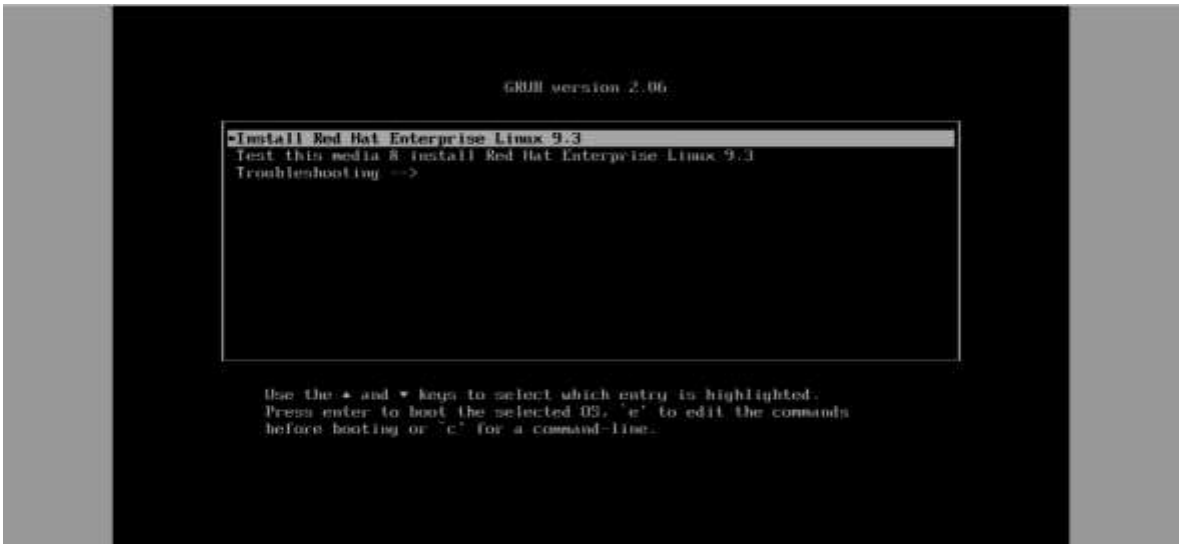
1. Obtain a copy of the RHEL 9 installation media. It is recommended to use Fedora Media Writer to make an installation USB with the appropriate RHEL 9 installation media.

2. Insert the USB memory key into one of the USB ports on the system and power on the system.

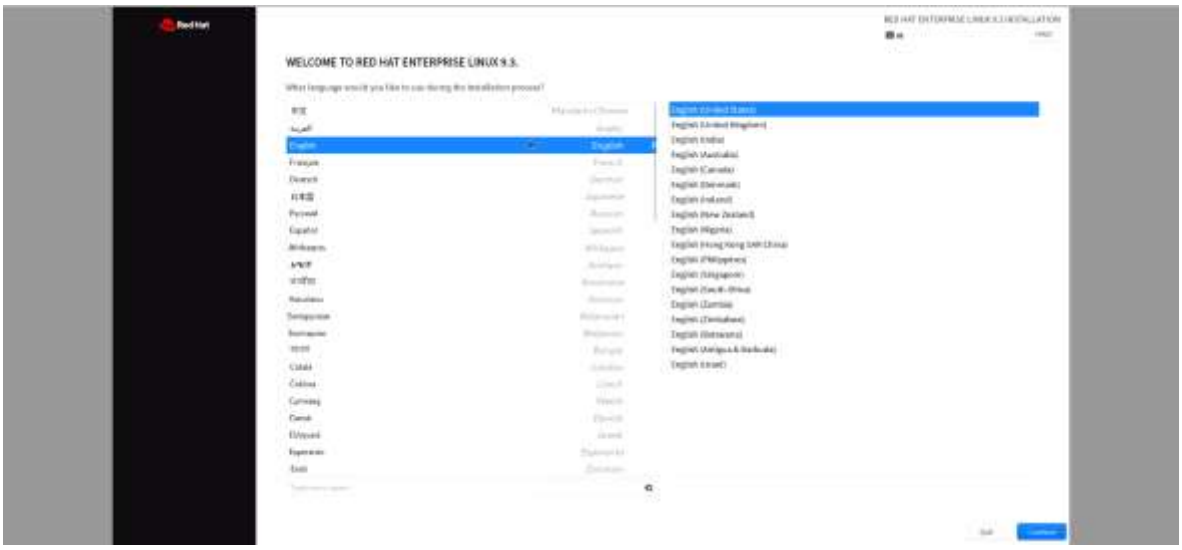
3. At the Lenovo splash screen, press the function F12 key to enter the BIOS startup menu and select the USB installation media from the list.

Note: Legacy boot is not supported on P2 platforms. Only UEFI bootable options will be available.

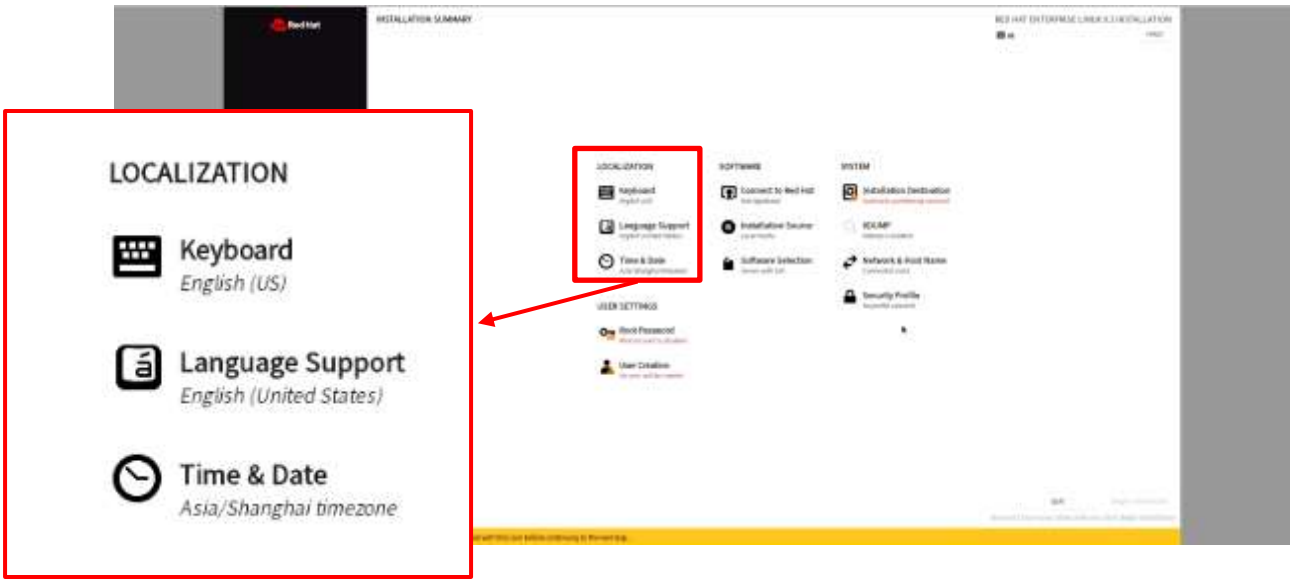
4. Select the ‘Install Red Hat Enterprise Linux 9.0’ option from the GRUB boot menu and press ‘Enter’.



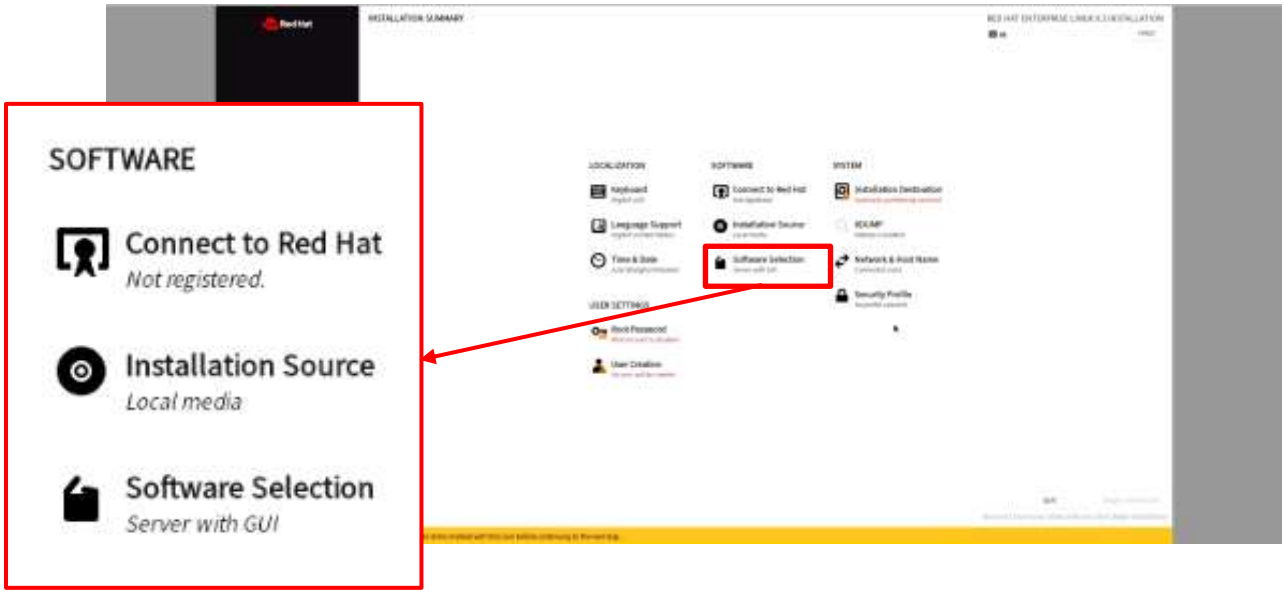
5. The Red Hat Enterprise Linux Welcome screen should appear. Select the appropriate language from the list of options, and select ‘Continue’.



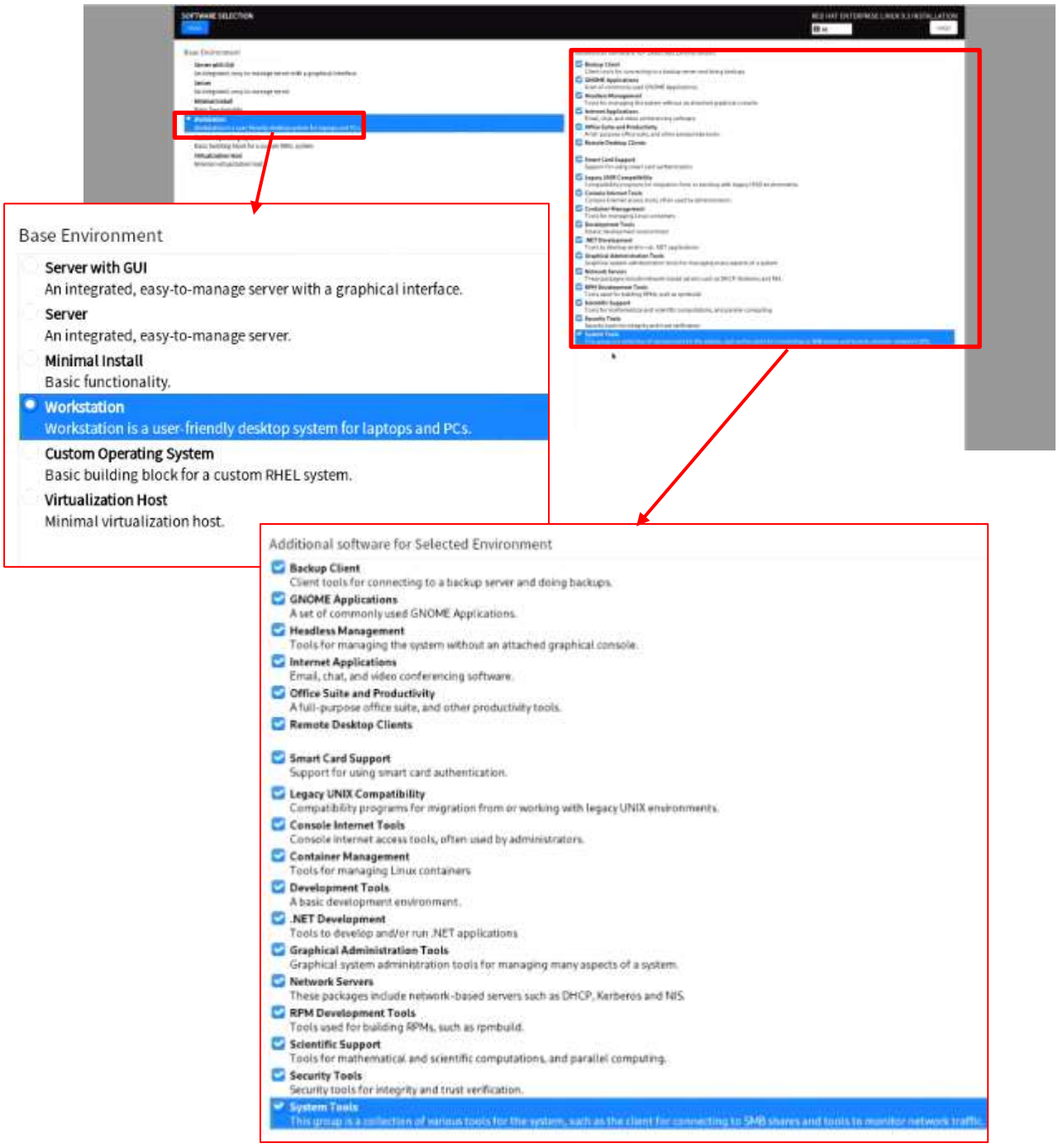
6. Adjust the ‘Keyboard’, ‘Language Support’, and ‘Time & Date’ accordingly by selecting each one.



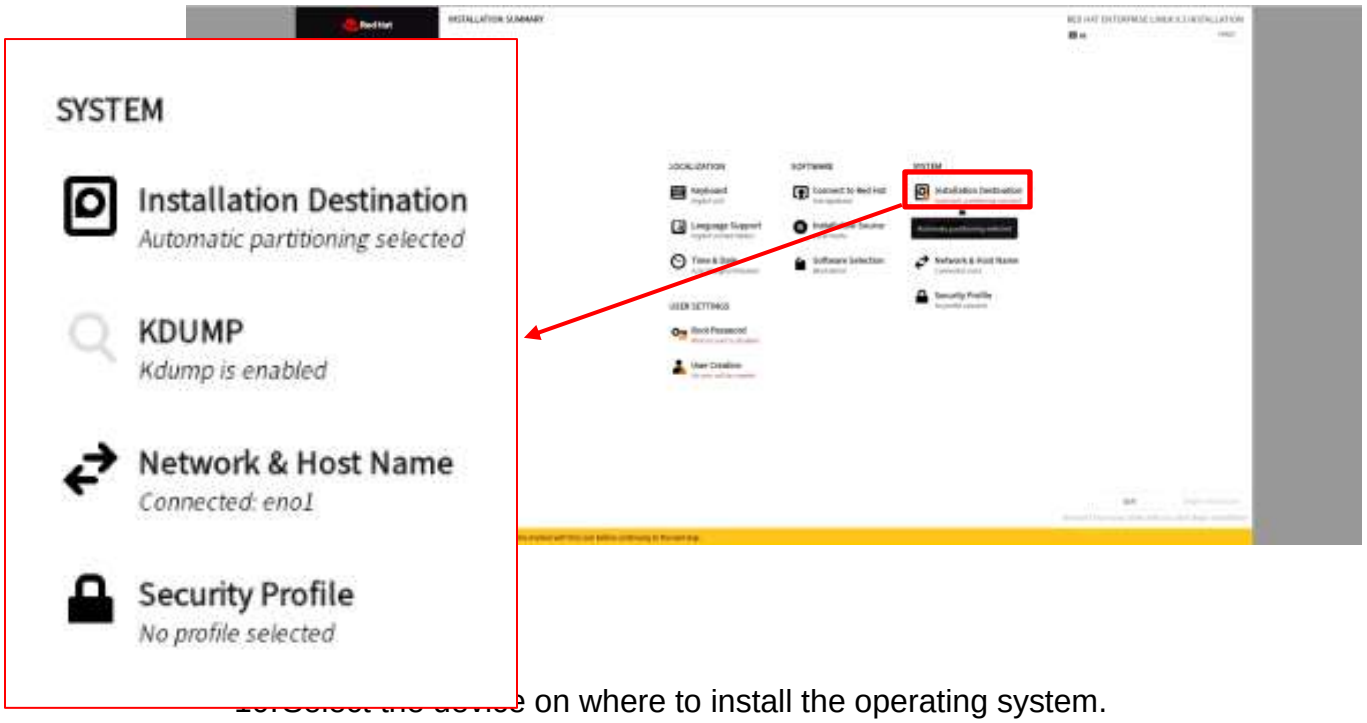
7. Select the ‘Software Selection’ and choose the type of software to install.



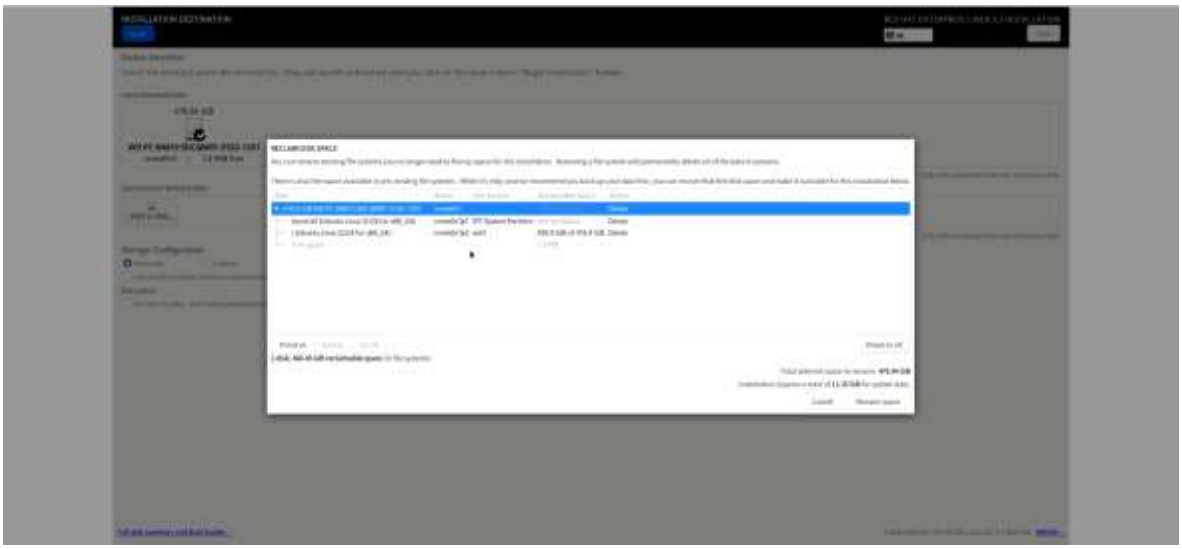
8. Select the type of ‘Base Environment’ as well as each additional software packages to install.
   In this example, ‘Workstation’ was selected for the ‘Base Environment’ and all additional software tools were selected.



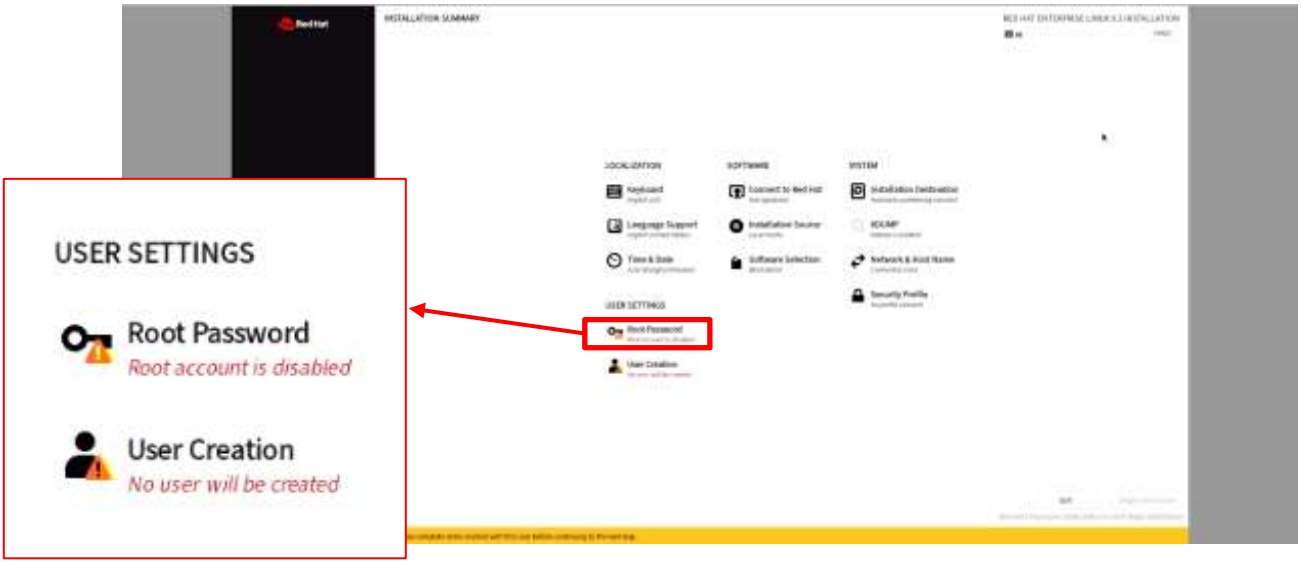
9. Select ‘Installation Destination’.



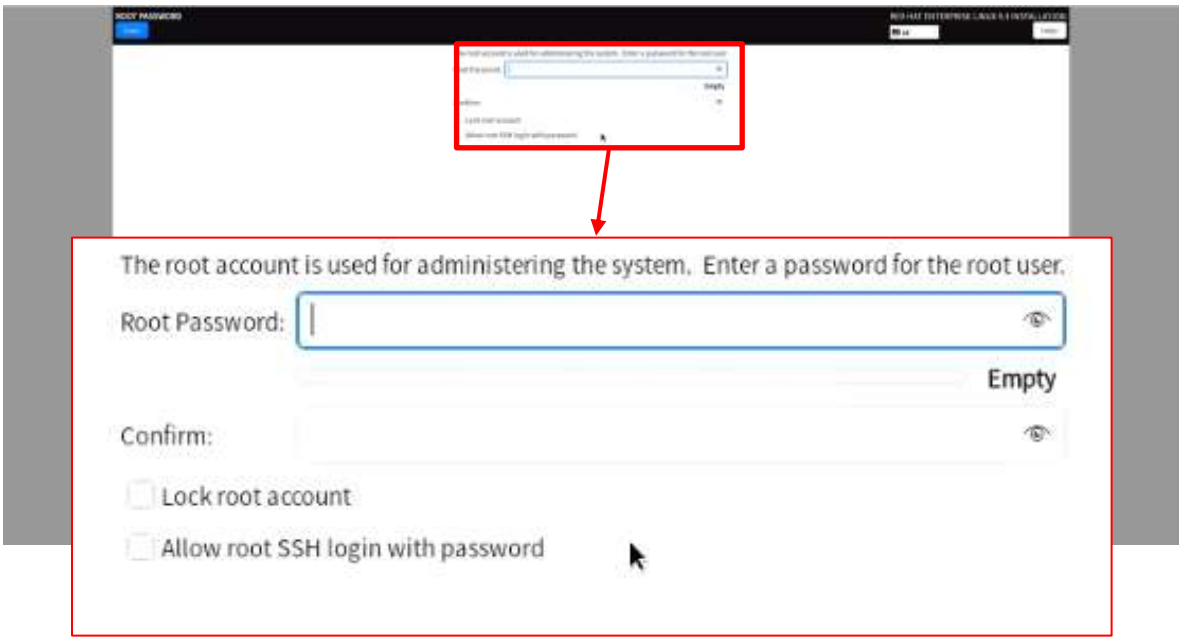
on where to install the operating system.



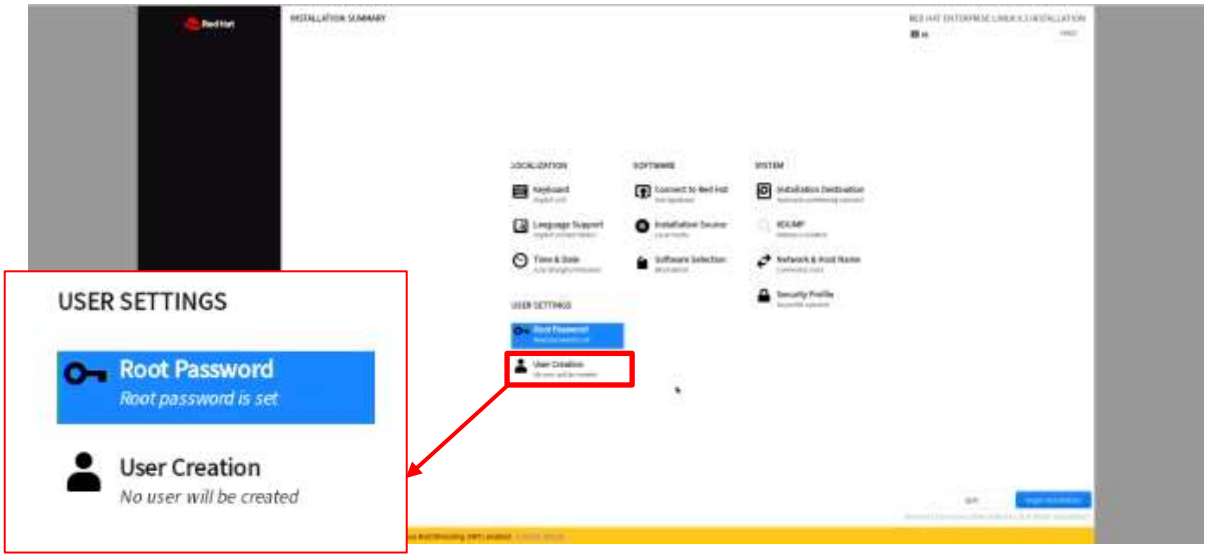
11. Select ‘Root Password’.



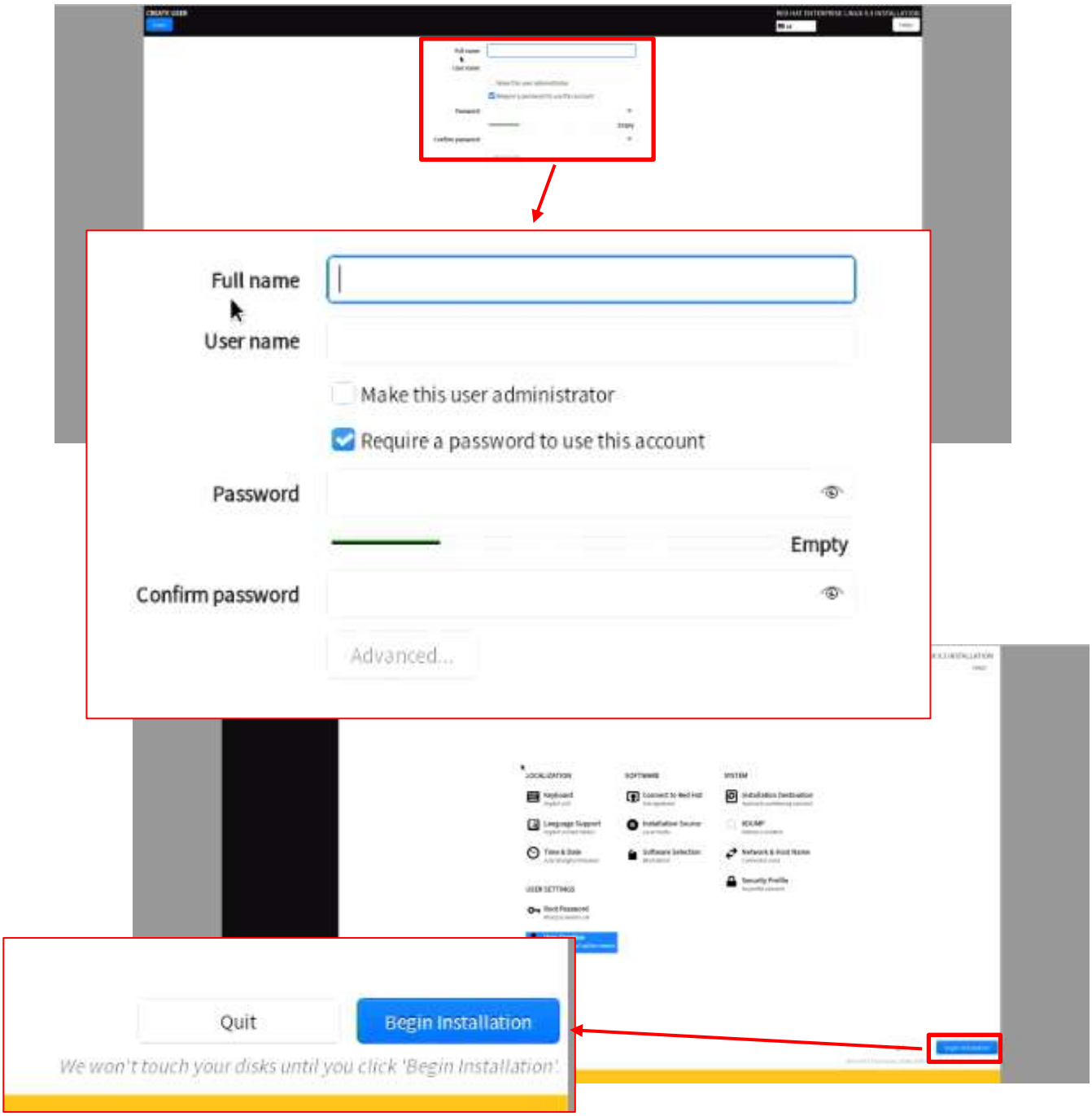
12. Enter a root password in both boxes below and select ‘Done’ in the upper left.



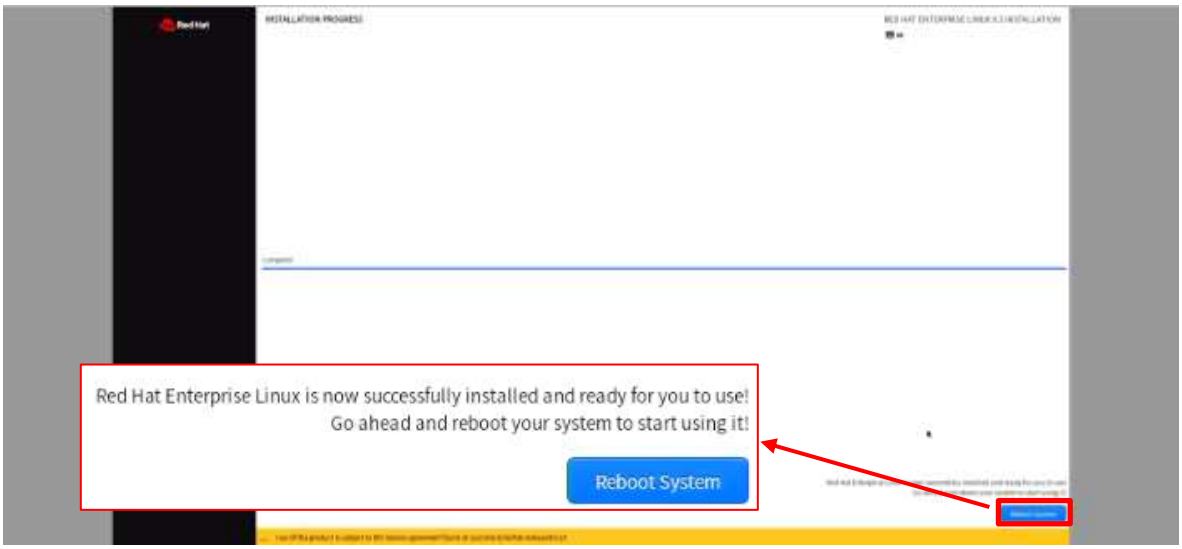
13. Select ‘User Creation’.



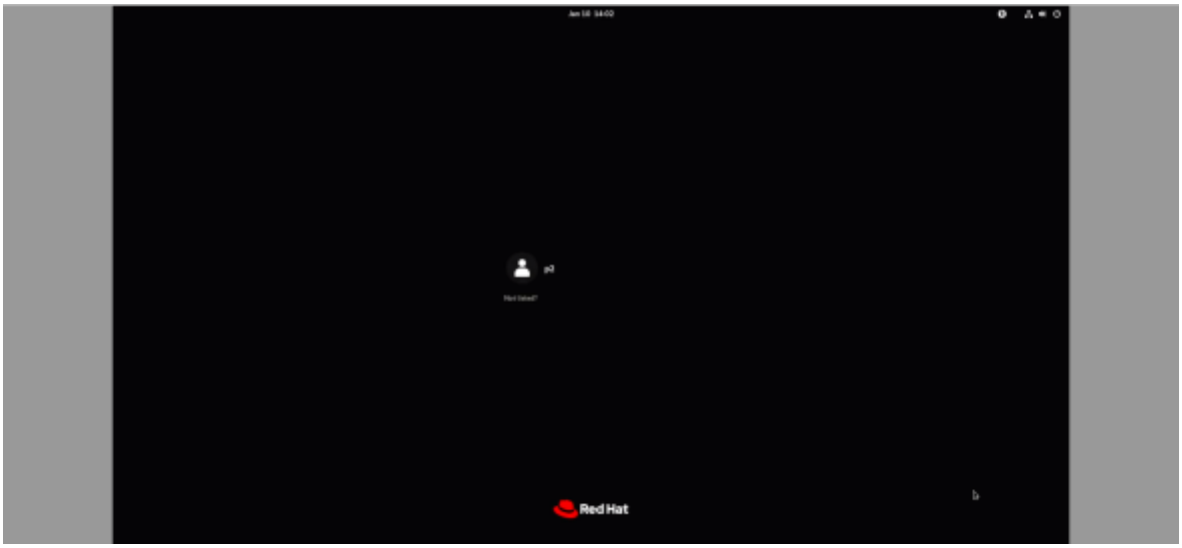
14. Fill in the appropriate boxes below and select ‘Done’ in the upper left.



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.


Red Hat
Enterprise Linux

Section 3 – Install Device Drivers

Most of the standard building blocks used in the ThinkStation P2 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.

Note 1: 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.

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

Note 3: 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.

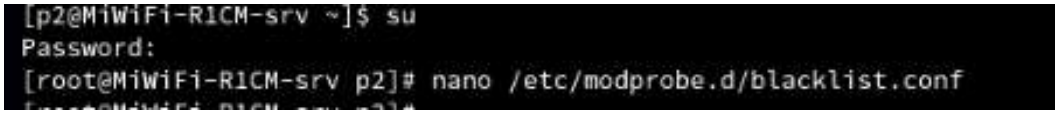
subscription-manager attach

Section 4 – Install Nvidia Proprietary Drivers

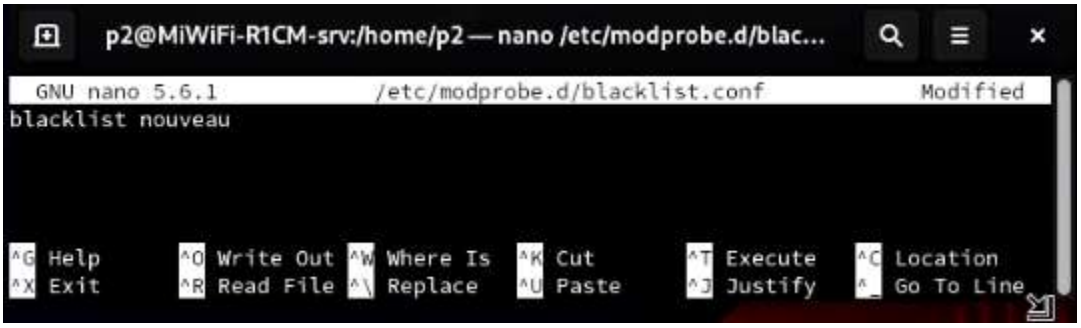
The step-by-step instructions below show how to install Nvidia proprietary drivers.

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

5. Login as root (superuser).

```
Red Hat Enterprise Linux 9.3 (Plow)
Kernel 5.14.0-362.8.1.el9_3.x86_64 on an x86_64

Activate the web console with: systemctl enable --now cockpit.socket

MiWiFi-R1CM-srv login: root
Password:
Last login: Wed Jan 10 14:15:55 on pts/0
[root@MiWiFi-R1CM-srv ~]#
```

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.*

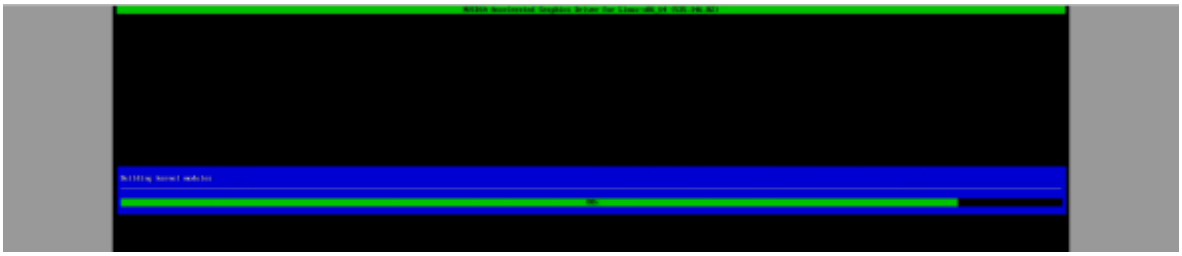
   - # bash NVIDIA*

```
Red Hat Enterprise Linux 9.3 (Plow)
Kernel 5.14.0-362.8.1.el9_3.x86_64 on an x86_64

Activate the web console with: systemctl enable --now cockpit.socket

MiWiFi-R1CM-srv login: root
Password:
Last login: Wed Jan 10 14:15:55 on pts/0
[root@MiWiFi-R1CM-srv ~]# cd /home/p2/Downloads/
[root@MiWiFi-R1CM-srv Downloads]# ls
NVIDIA-Linux-x86_64-535.146.02.run
[root@MiWiFi-R1CM-srv Downloads]# chmod a+x NVIDIA-Linux-x86_64-535.146.02.run
[root@MiWiFi-R1CM-srv Downloads]# ./NVIDIA-Linux-x86_64-535.146.02.run
```

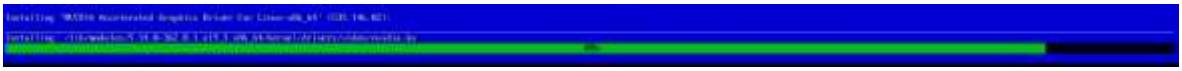
7. Note the driver should start to install.



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

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.

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

    # nvidia-smi

```
[p2@MiWiFi-R1CM-srv ~]$ nvidia-smi
Wed Jan 10 14:29:26 2024
+---------------------------------------------------------------------------------------+
| NVIDIA-SMI 535.146.02             Driver Version: 535.146.02   CUDA Version: 12.2     |
|-----------------------------------------+----------------------+----------------------+
| GPU  Name                 Persistence-M | Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp   Perf          Pwr:Usage/Cap |         Memory-Usage | GPU-Util  Compute M. |
|                                         |                      |               MIG M. |
|=========================================+======================+======================|
|   0  NVIDIA T1000                   Off | 00000000:01:00.0  On |                  N/A |
| 33%   42C    P8              N/A /  50W |    175MiB /  4096MiB |      1%      Default |
|                                         |                      |                  N/A |
+-----------------------------------------+----------------------+----------------------+

+---------------------------------------------------------------------------------------+
| Processes:                                                                            |
|  GPU   GI   CI        PID   Type   Process name                            GPU Memory |
|        ID   ID                                                             Usage      |
|=======================================================================================|
|    0   N/A  N/A      2475      G   /usr/libexec/Xorg                            46MiB |
|    0   N/A  N/A      2589      G   /usr/bin/gnome-shell                        126MiB |
+---------------------------------------------------------------------------------------+
```

Revision History

Version	Date	Author	Changes/Updates
0.1	1/10/2024	Zhu Zheng	Initial Draft
1.0	10/30/2024	Zhu Zheng	Initial Release