WIPRO NGA Program – DC DWS Batch 7

Capstone Project Presentation – 4th and 5th Sept 2024

Project Title Here - LINUX INSTALLATION (CENTOS)

Presented by - MUKESH YADAV

LINUX INSTALLATION

(IN CENTOS)

BY MUKESH YADAV

BATCH NAME : DATA CENTRE - BATCH 7

CLOUD USERNAME : 24NAG2180_U07

GIT USERNAME : b166user05

Contents

- Introduction to Linux
- Objectives
- Project Scope
- Prerequisites , Project Requirements
- Deliverables

Introduction to Linux

Overview of Linux as an open-source operating system

Brief history and key features.

Importance and uses of Linux in various environments.

Overview of Linux as an open-source operating system

- Linux is an open-source operating system created by Linus Torvalds in 1991. It is renowned for its stability, security, and flexibility. As an open-source project, its source code is freely available for anyone to use, modify, and distribute. Linux has become a critical component in modern computing, powering a wide range of devices from servers to smartphones.

- In Linux, two popular distributions are CentOS, a stable and free version based on Red Hat Enterprise Linux, and Ubuntu, a user-friendly, frequently updated distribution based on Debian with strong community support.

Brief History and Key Features

- **History:** Linus Torvalds began developing Linux in 1991 as a free alternative to Unix. Initially a personal project, it rapidly grew with contributions from developers worldwide, becoming a robust, open-source operating system.

- **Key Features:** Linux is known for its multi-user capabilities, which allow multiple users to operate the system simultaneously without interfering with each other. It boasts strong security features, including permissions and access controls that protect against unauthorized access. The operating system's modular architecture supports extensive customization, letting users configure it to suit their needs, and its broad hardware compatibility ensures it can run on a wide variety of devices, from servers to embedded systems.

Importance and Uses

- **Importance:** Linux's open-source nature drives innovation and collaboration, allowing developers to contribute and adapt the system freely. Its reliability and robust security make it ideal for servers and mission-critical applications.

- **Uses:** Linux is versatile, powering servers, desktops, embedded systems (such as routers and smart devices), and supercomputers. It is crucial in web hosting, software development, and scientific research due to its stability and flexibility.

OBJECTIVES

- Understand the minimum requirement to Linux Operating system.
- Create partition while installing the Linux Operating system.
- Create user while installing the Linux Operating System

Understand the minimum requirement to Linux Operating system.

1. Ubuntu:

- Processor: 2 GHz dual-core processor.

- RAM: 4 GB of RAM (8 GB recommended for better performance).

- Storage: 20 GB of free disk space (32 GB recommended).

- Graphics: Graphics card capable of 1024x768 resolution.

- Network: Internet access is recommended for updates and additional software.

- Additional Notes: For specific server roles, additional resources may be required.

2. CentOS:

- Processor: 1 GHz or faster processor (64-bit recommended).

- RAM: 1 GB of RAM (4 GB or more recommended for server applications).

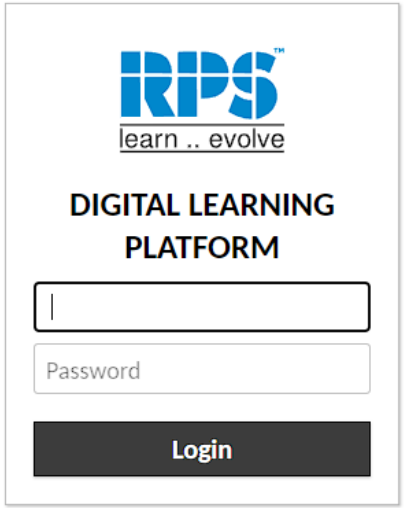
- Storage: 20 GB of free disk space (minimum); more space may be needed based on server role.

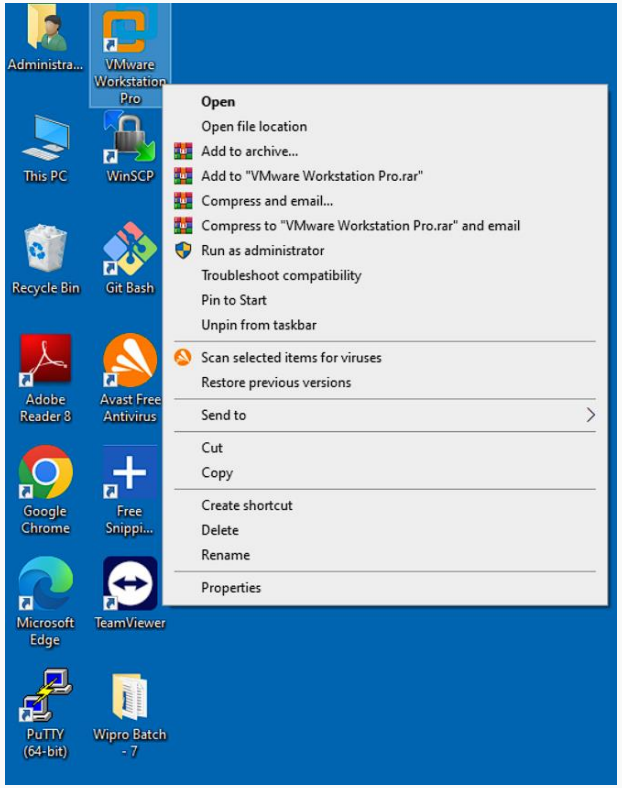
- Graphics: Basic graphics capabilities, as CentOS is often used on servers with minimal graphical requirements.

- Network: Network access is recommended for updates and network services.

- Additional Notes: For specific server roles, additional resources may be required.

Installation Of CentOs





1. CentOS Installation Options:

- Install CentOS in a Virtual Machine or Directly from a Drive.

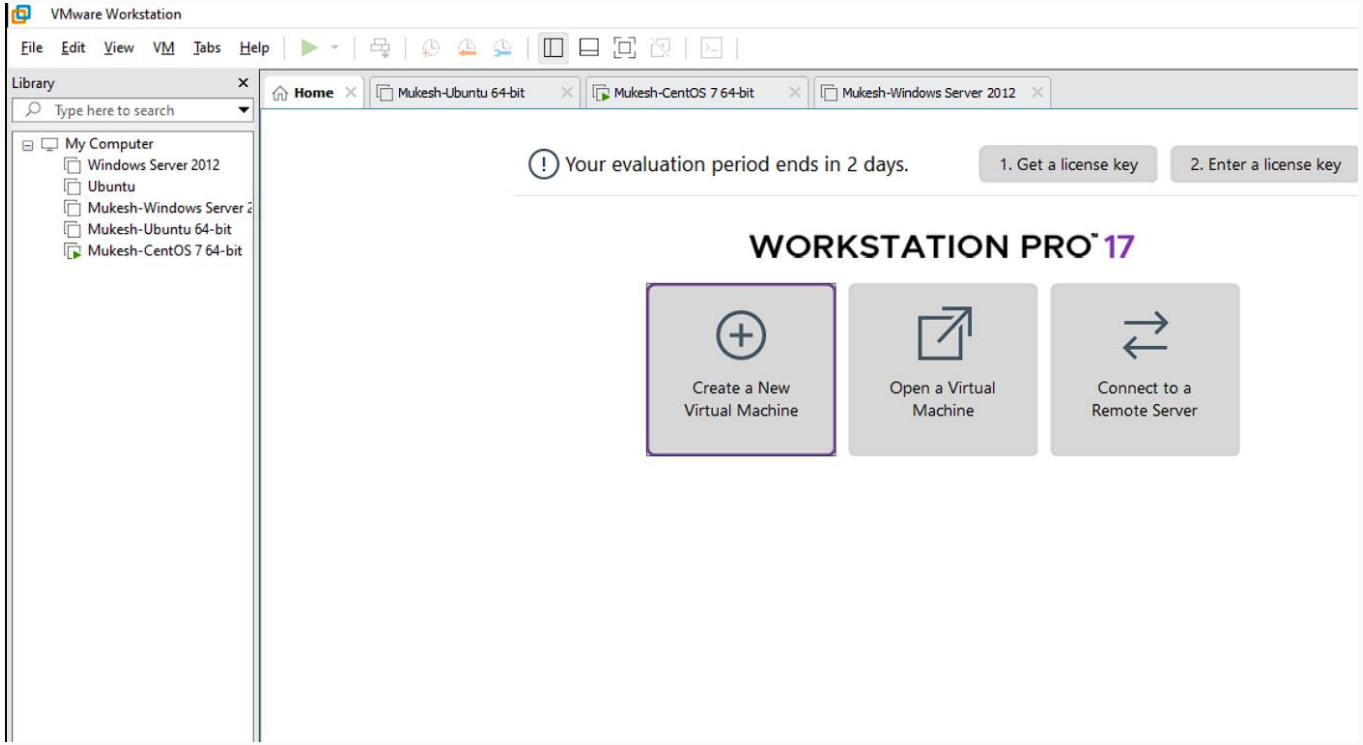
2. I used Cloud Lab:

- Log in to the **Cloud Lab**.

- **Right-click** on VMware Workstation Pro.

- Select **"Open"** to launch VMware Workstation Pro.

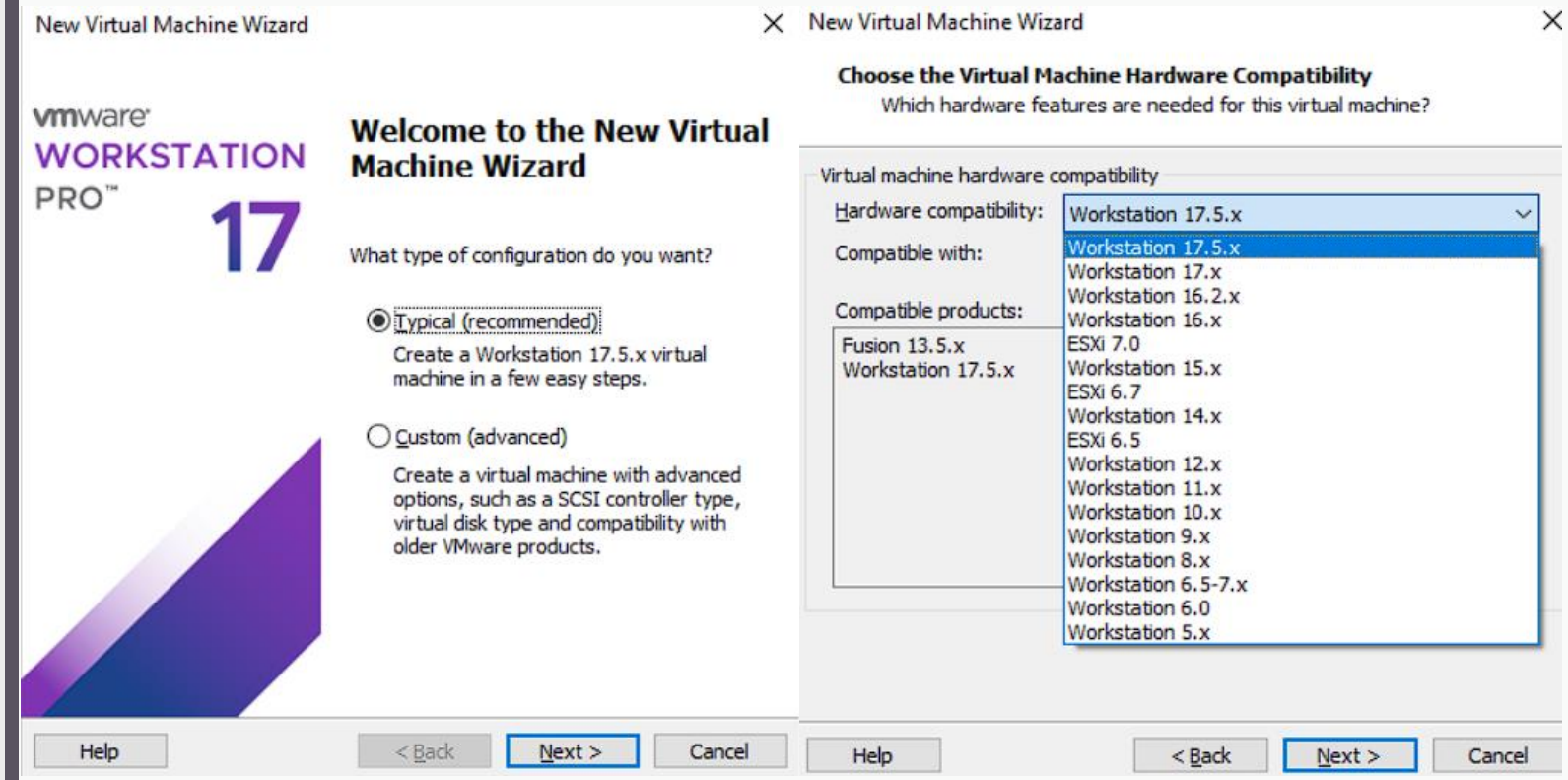
Step 1



1. Click on **"Create a New Virtual Machine"** to start the CentOS installation process.

2. Wait for the next steps in the process.

Step 2

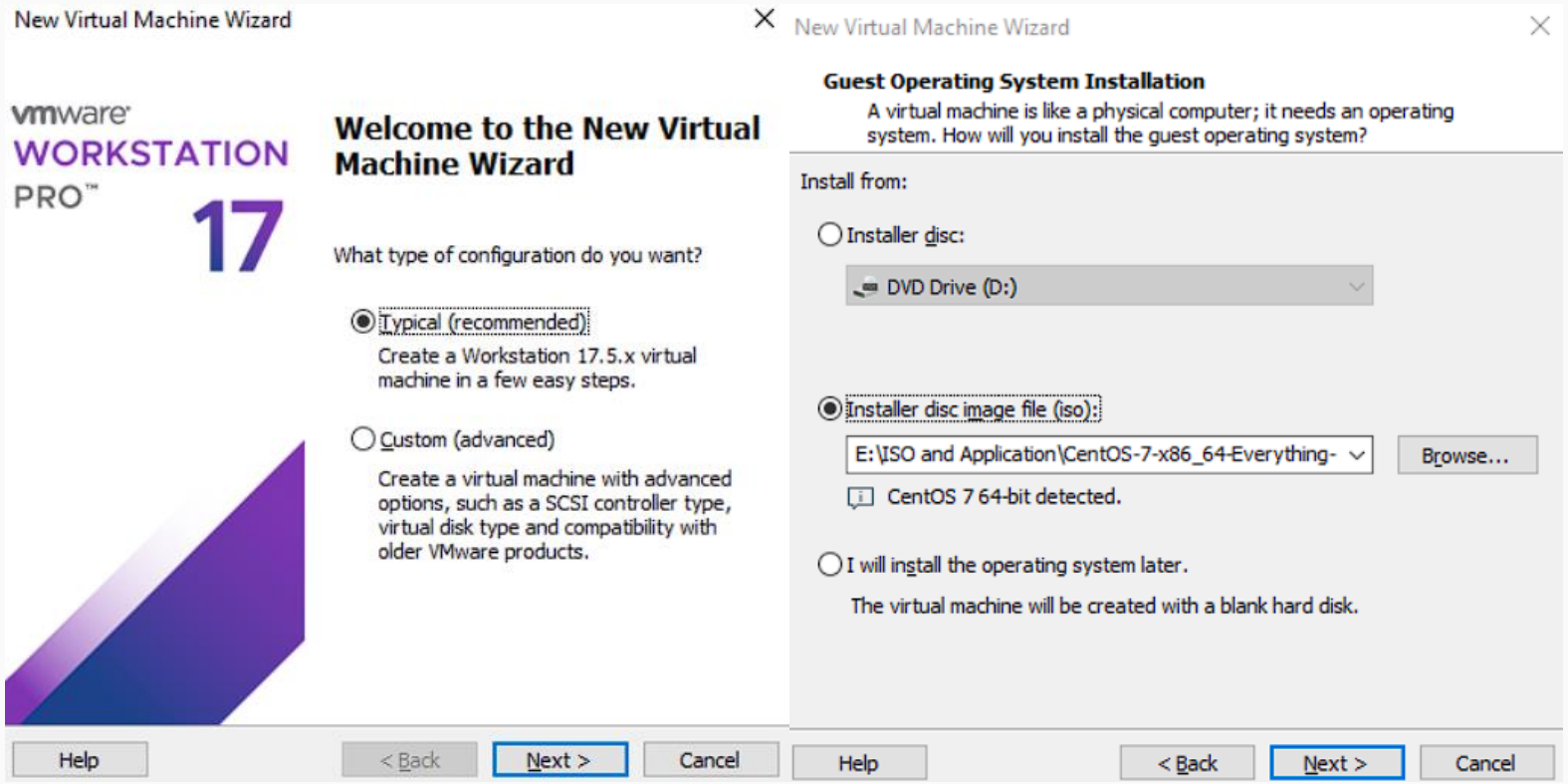


We have two configuration options :

1. Typical (Recommended): This is the default and simplest option, which I used.

2. Custom (Advanced): This option allows you to view hardware compatibility, compatible products, and select the VMware Workstation Pro version according to your needs.

Step 3



After selecting **"Typical,"** click on **"Next."** You will then see three options:

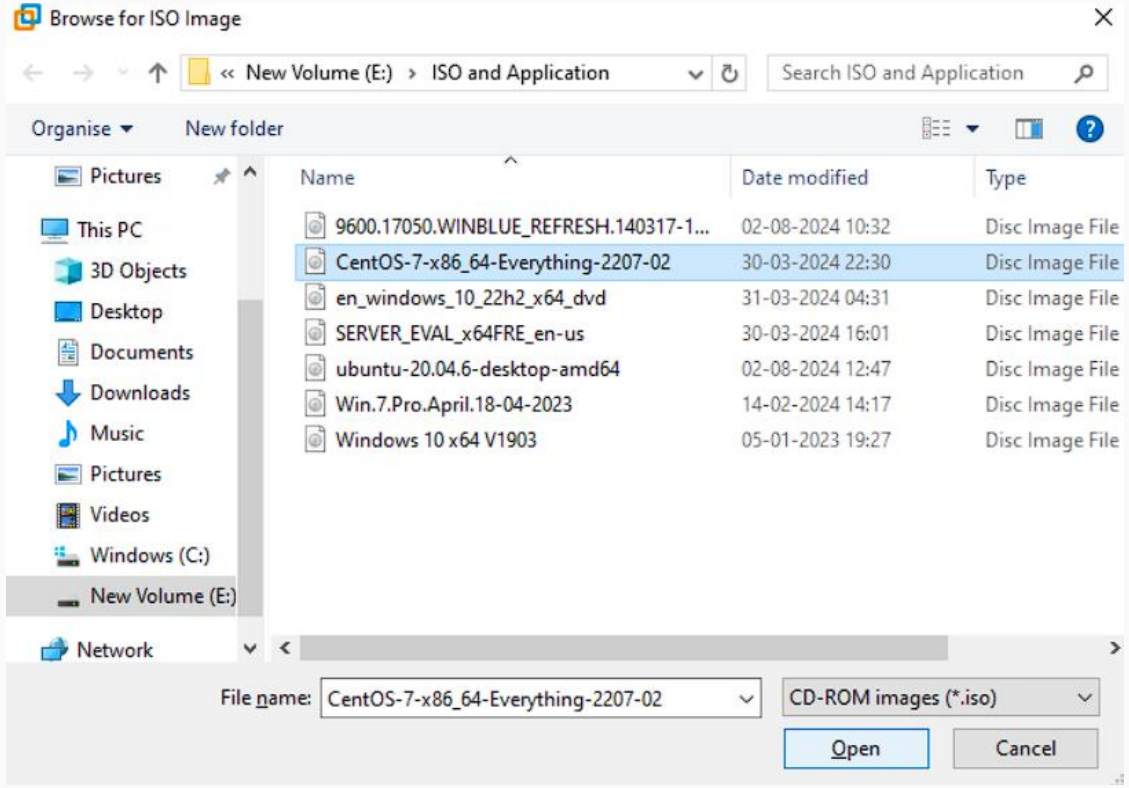
1. Install CentOS using an Installer Disc.

2. Install CentOS using an Installer Disc Image (ISO).

3. Install CentOS from a USB Drive.

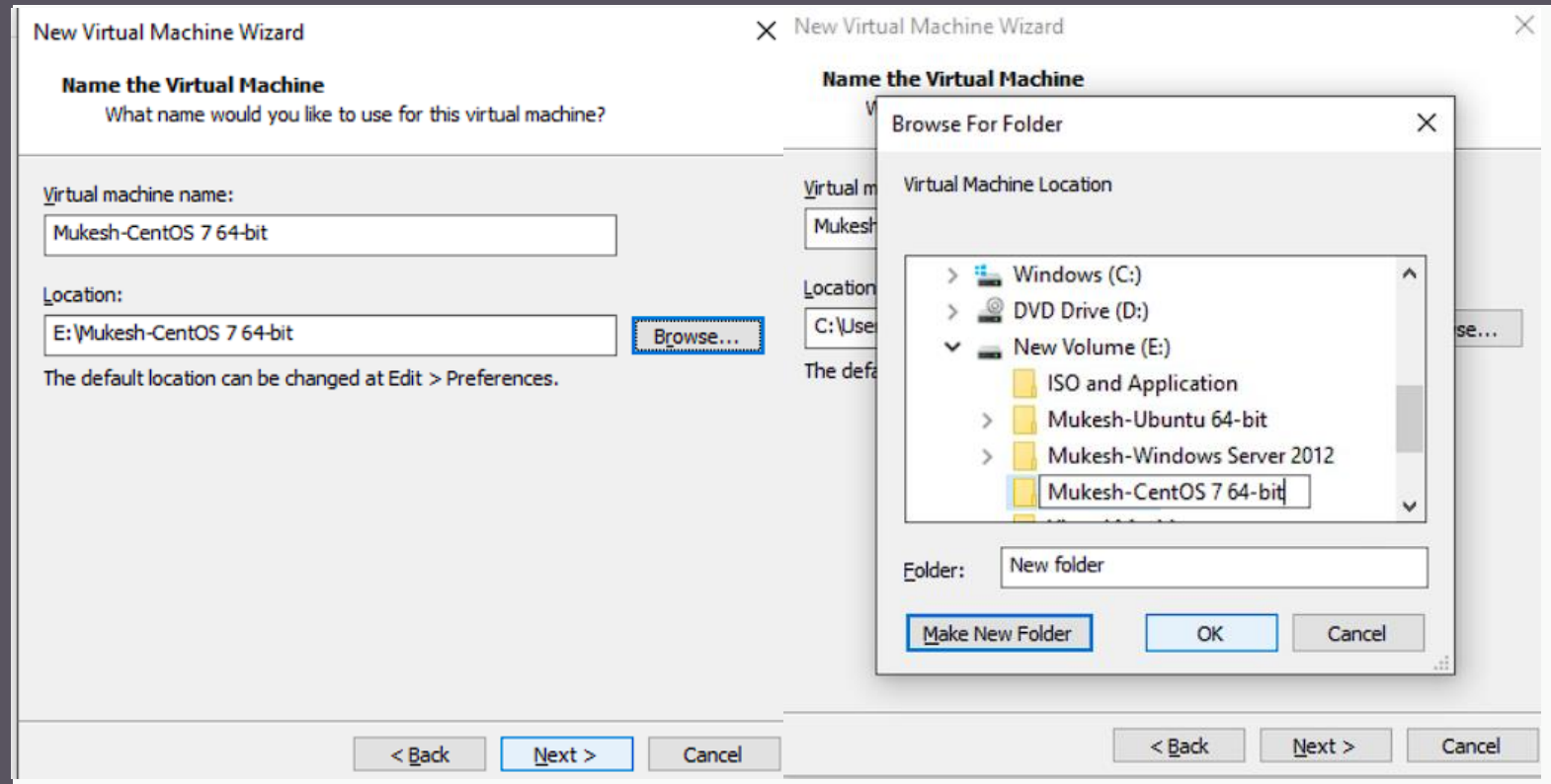
I selected **"Installer Disc Image (ISO)"** and clicked the **"Browse"** option to choose the CentOS ISO image.

Step 4



Then, I selected the **"centos-7-x86_64-Everything-2207-02"** ISO image and clicked "Open" to proceed to the next step.

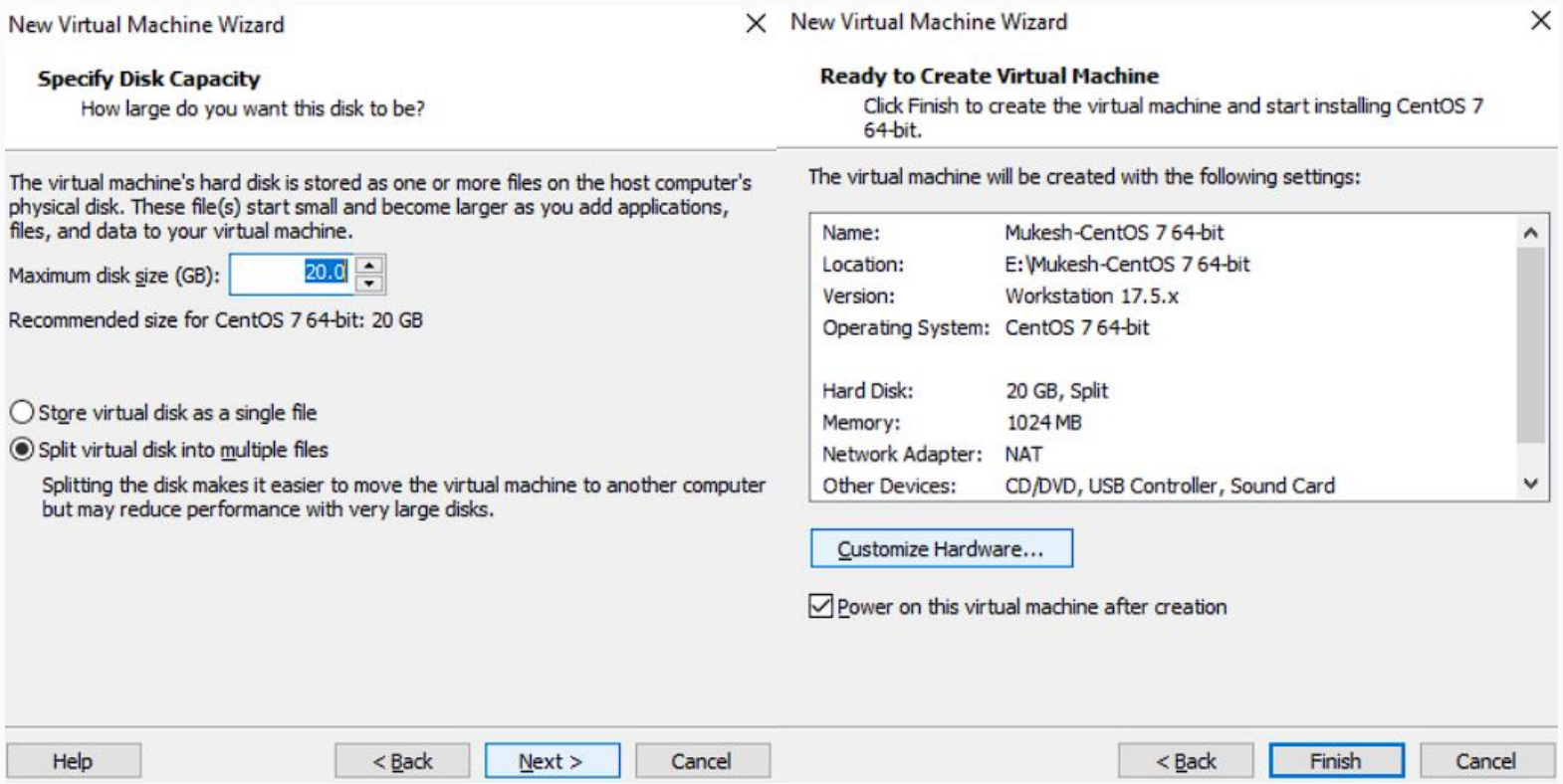
Step 5



- After selecting the ISO image, provide a name for the virtual machine and specify the installation location.

- 1. Click on the **"Browse"** option to choose the disk path.
- 2. Select the E drive and click on **"Make New Folder."**
- 3. Create a folder named **“UserName - CentOS 64-bit."**
- 4. Click **"OK"** and proceed to the next steps.

Step 6



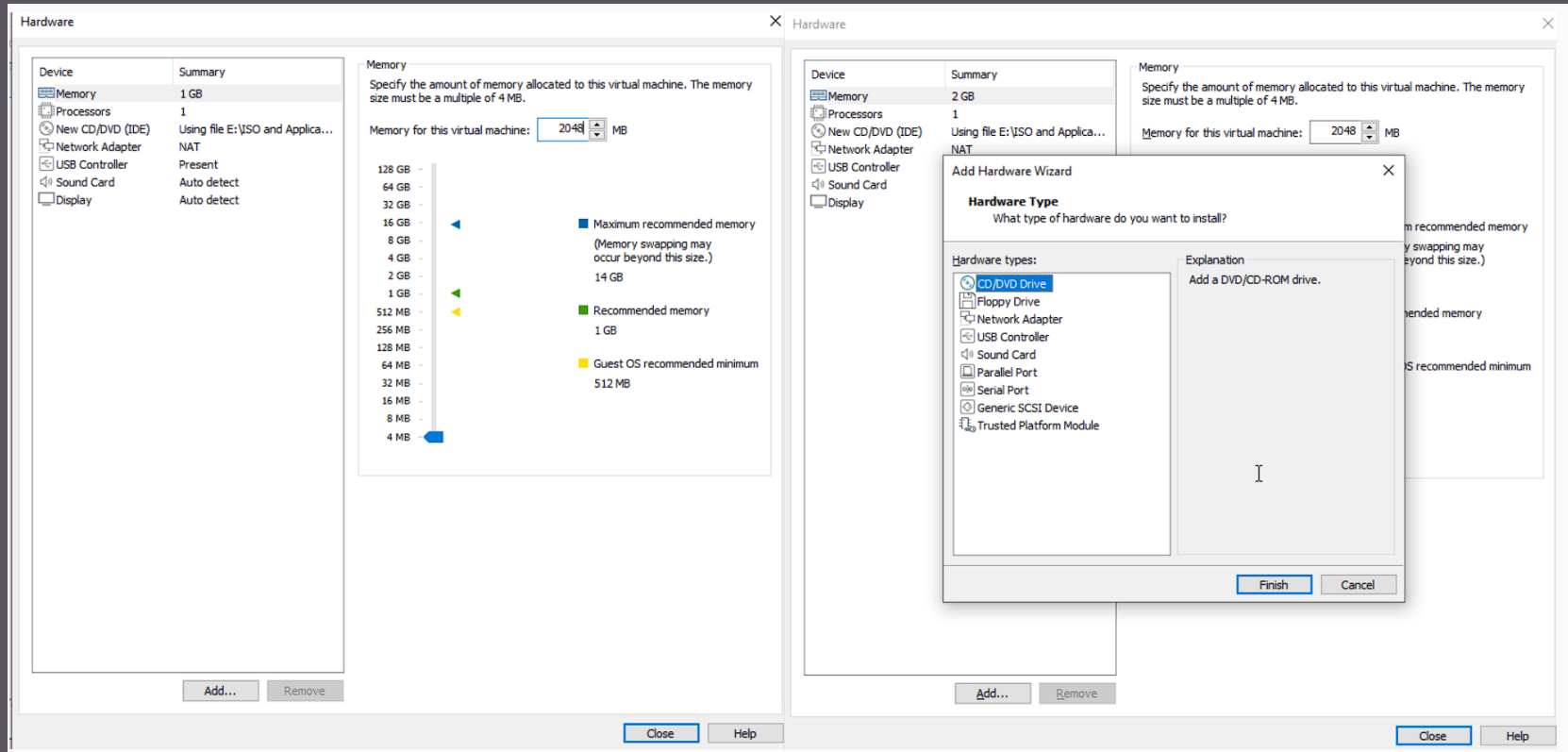
1. Specify the maximum **disk size** (recommended is 20 GB).

2. Select **"Split virtual disk into multiple files"** (this is the default option).

3. Click **"Next."**

4. We will then have the option to customize hardware settings. Click on **“Customize Hardware"** to proceed next for customization .

Step 7



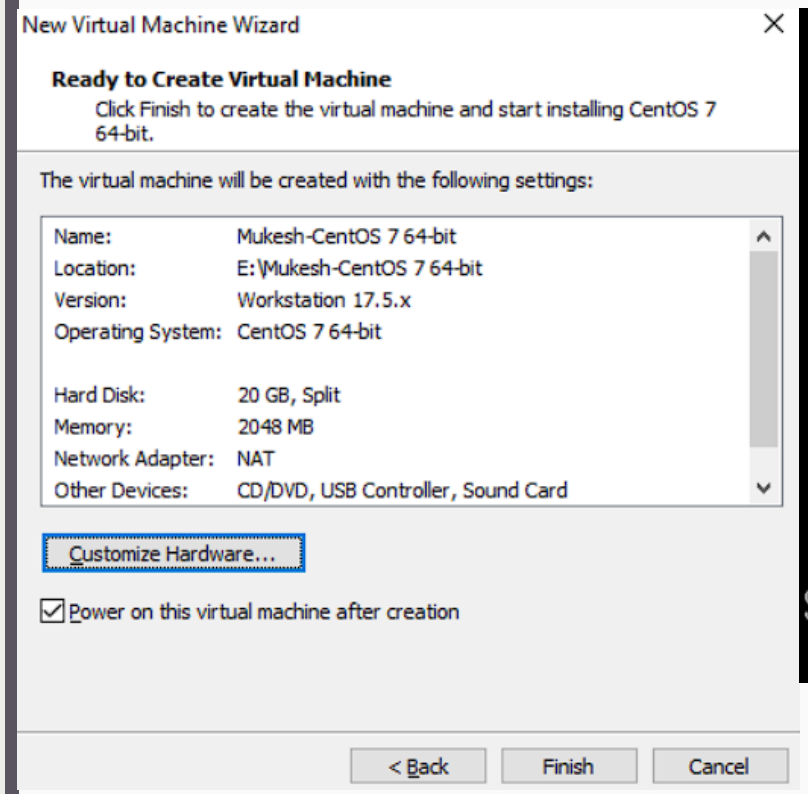
- In this step, you can adjust the memory size, processor settings, and add external CD/DVD drives or other devices.

1. Increase the **memory size** to **2048 MB**.

2. Since no external devices are added, click "Cancel" on the external device options.

3. Proceed with the updated settings.

Step 8



1. Complete Customization:

- Check **"Power on this VM"** and click **"Finish."**

2. Boot Options:

- Use F2 to enter setup.

- Use F12 for network boot.

- Use Esc to access the boot menu.

3. Wait for the next process.

Step 9

1. Options Available:

- 1. Install CentOS 7

- 2. Test this media & install CentOS 7

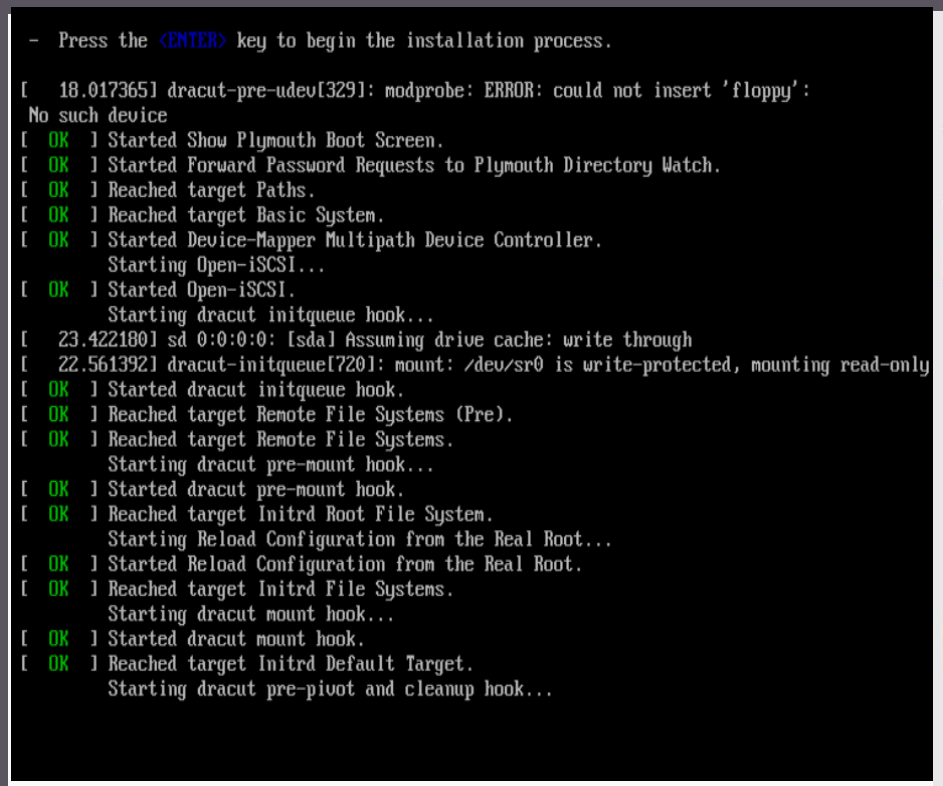
- 3. Troubleshooting

2. Choose **"Install CentOS 7"** from the options.

3. Press **“Enter”** to proceed.

4. **Skip** "Test this media & install CentOS 7" and "Troubleshooting" for installation.

Step 10

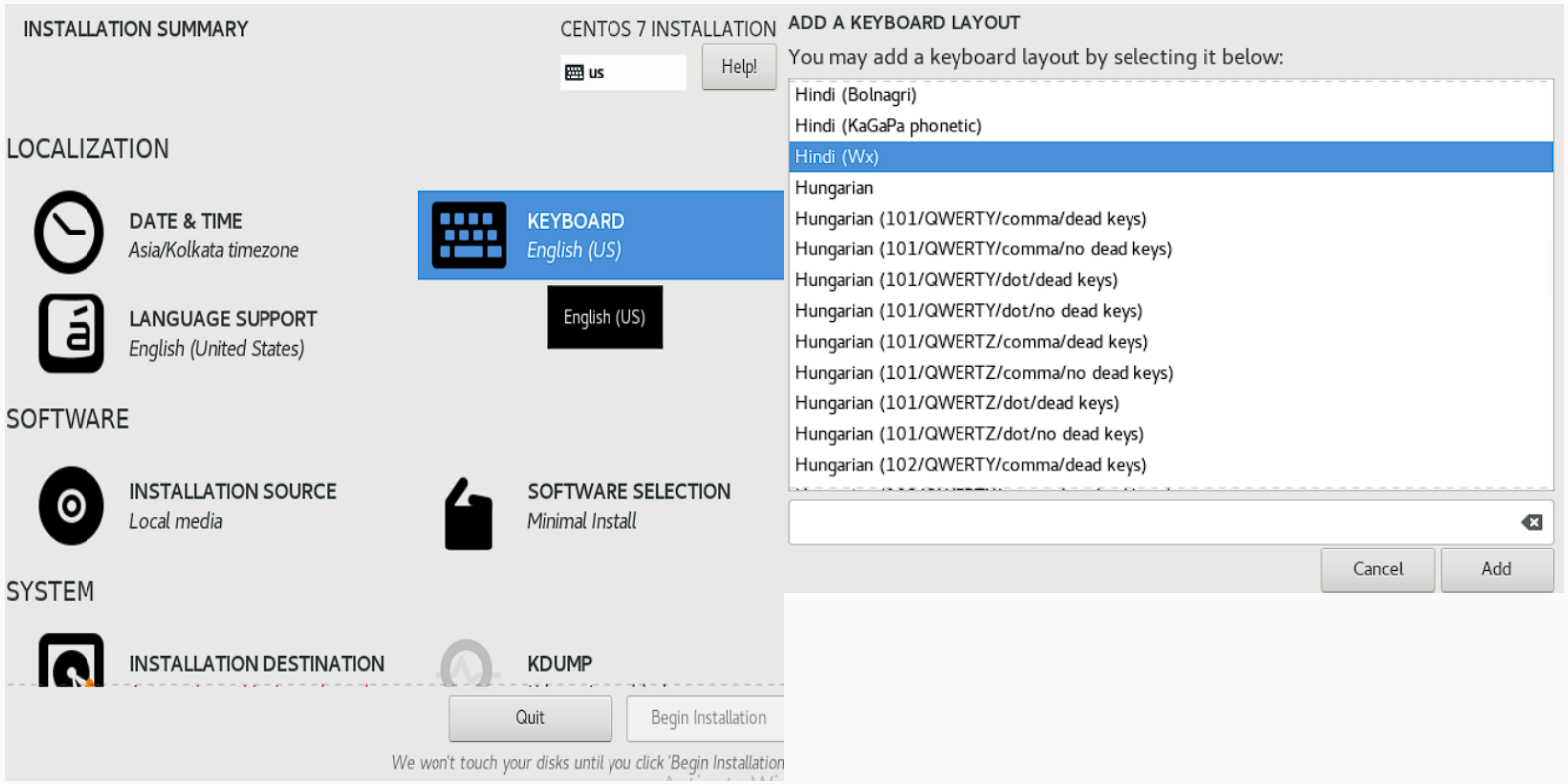


- **Press Enter** to begin the installation process
- Then select the **language** to be used during the installation.

Step 11

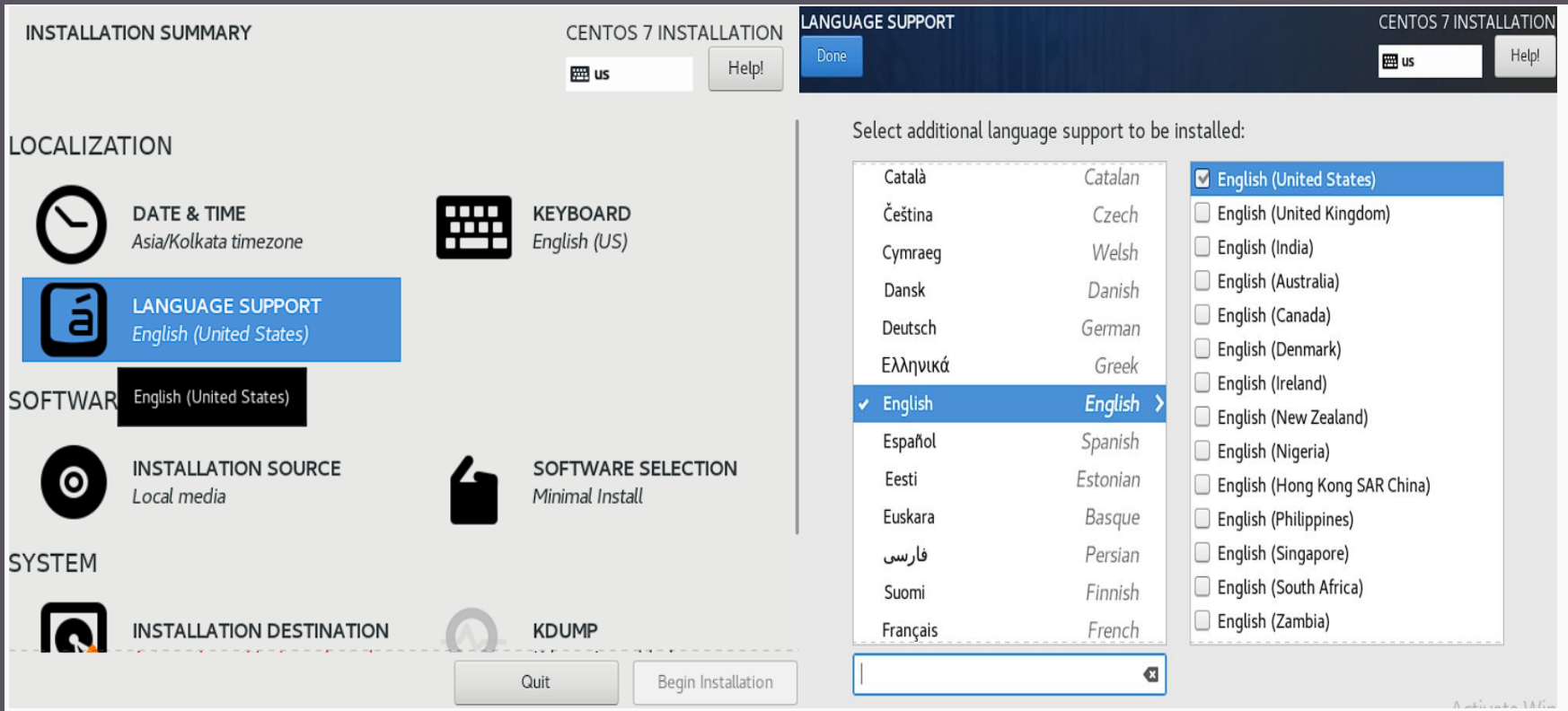
- Click on **"Date and Time,".**
- Then select the time zone. I selected "Asia" for the **region** and "Kolkata" for the **city**.
- Set the **time format** to 12-hour and click "Done."

Step 12



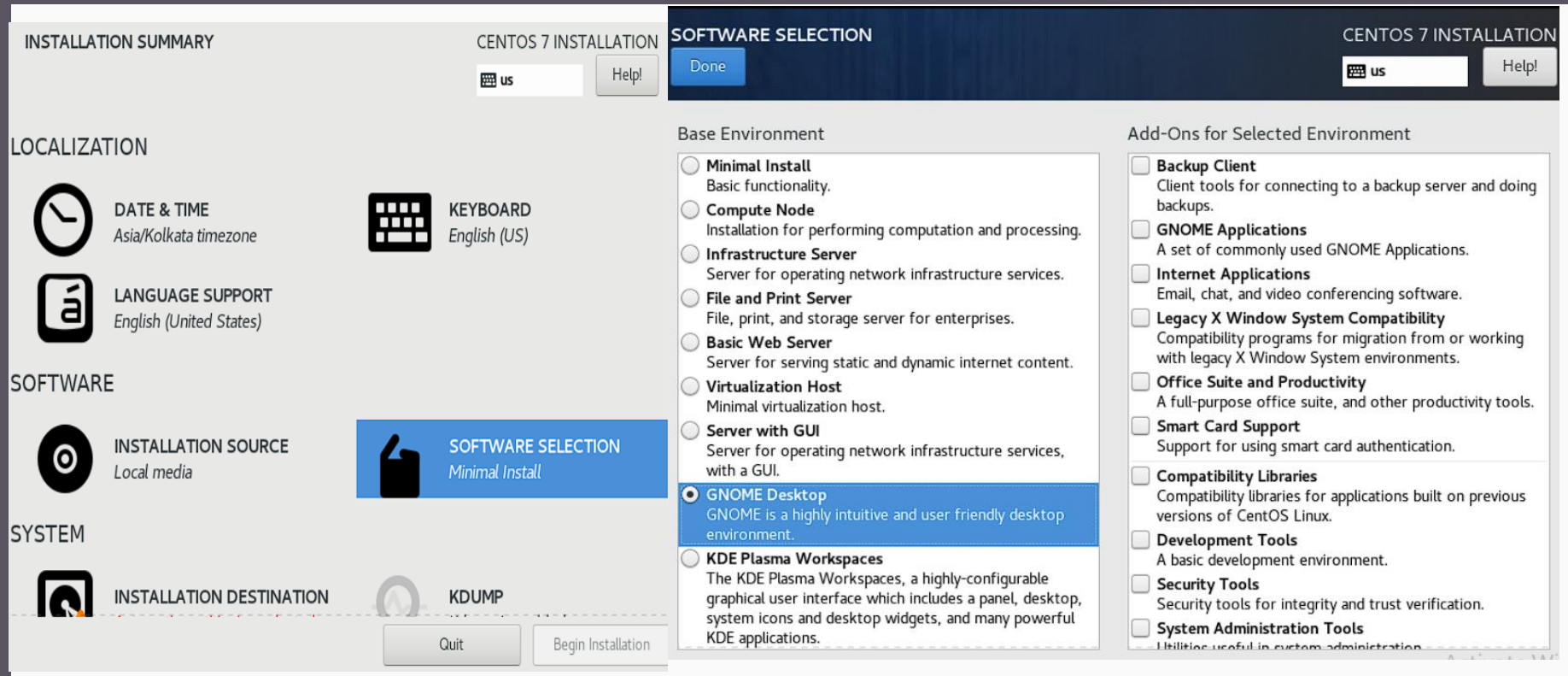
- Click on **"Keyboard,"** then choose the keyboard layout that is comfortable for you.
- Click on **"Add"**
- Then click **"Done."** Wait for the next process to begin.

Step 13



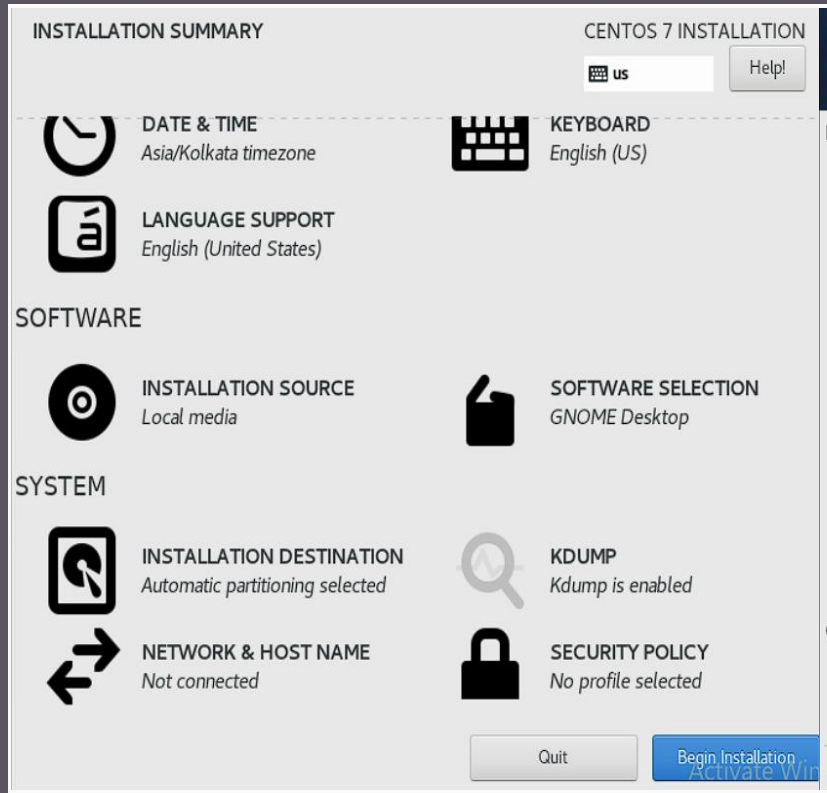
- Click on **"Language and Support,"**
- Then choose the language. Click **"Done"** and wait for the next process.

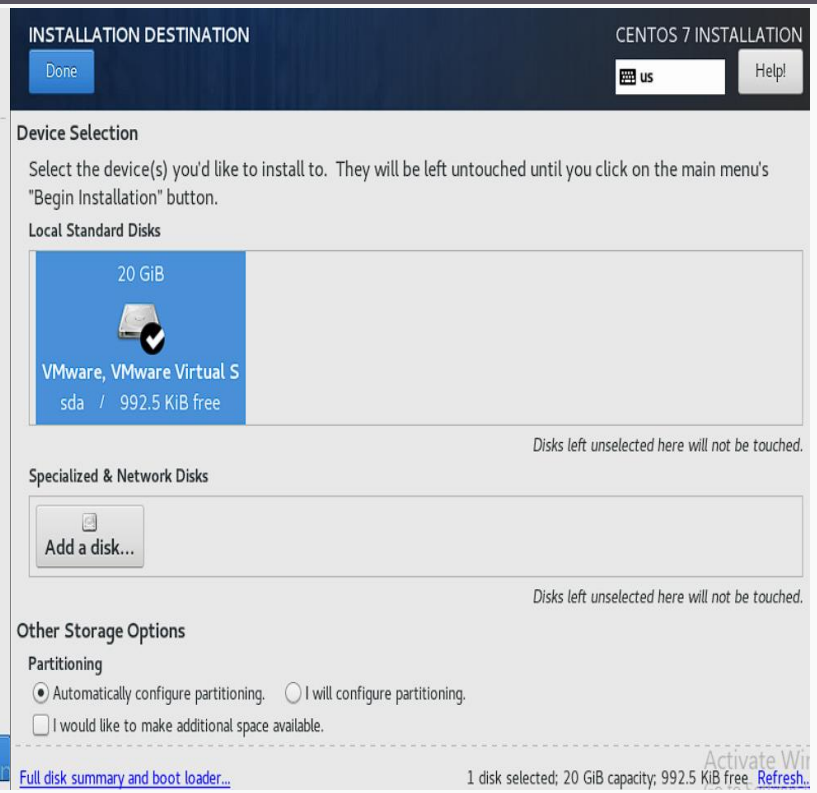
Step 14



- Click on **"Software Selection,"** then:
- By default **"Minimal Install"** is selected.
- Select **"GNOME Desktop"** for a graphical user interface.
- **Click "Done."**
- **Reason:** "GNOME Desktop" provides a user-friendly graphical environment, while "Minimal Install" ensures a lightweight base system.

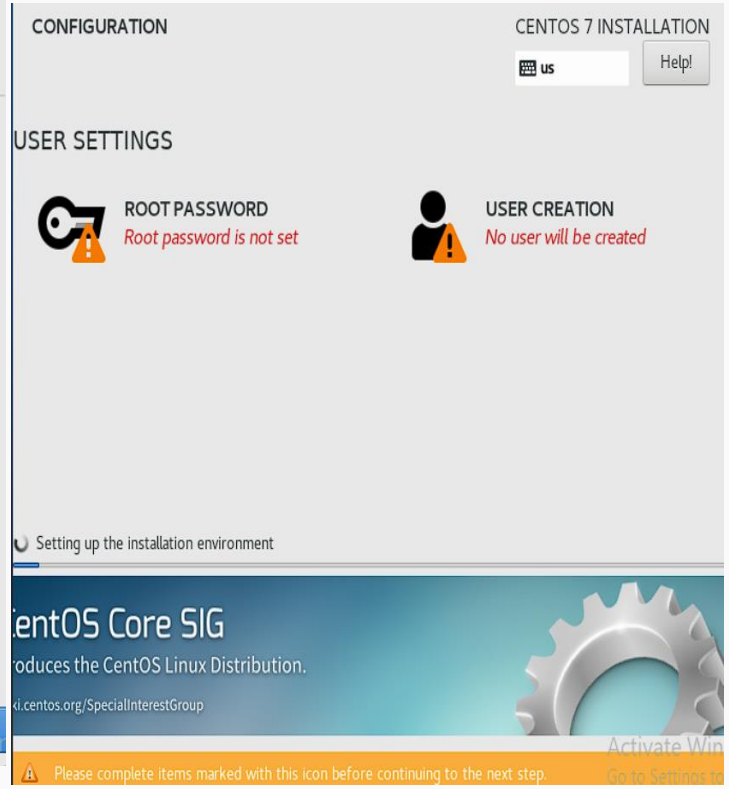
Step 15





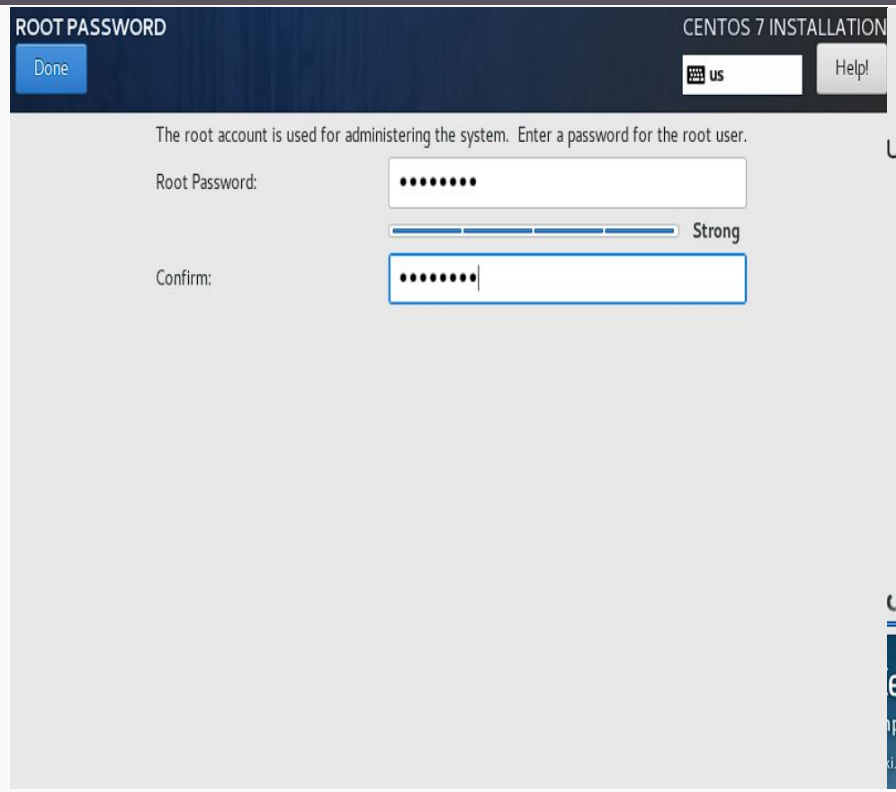
- Click on **"Installation Destination,"** then:
- Select the VMware virtual drive.
- Click **"Done"** to proceed to the next step.

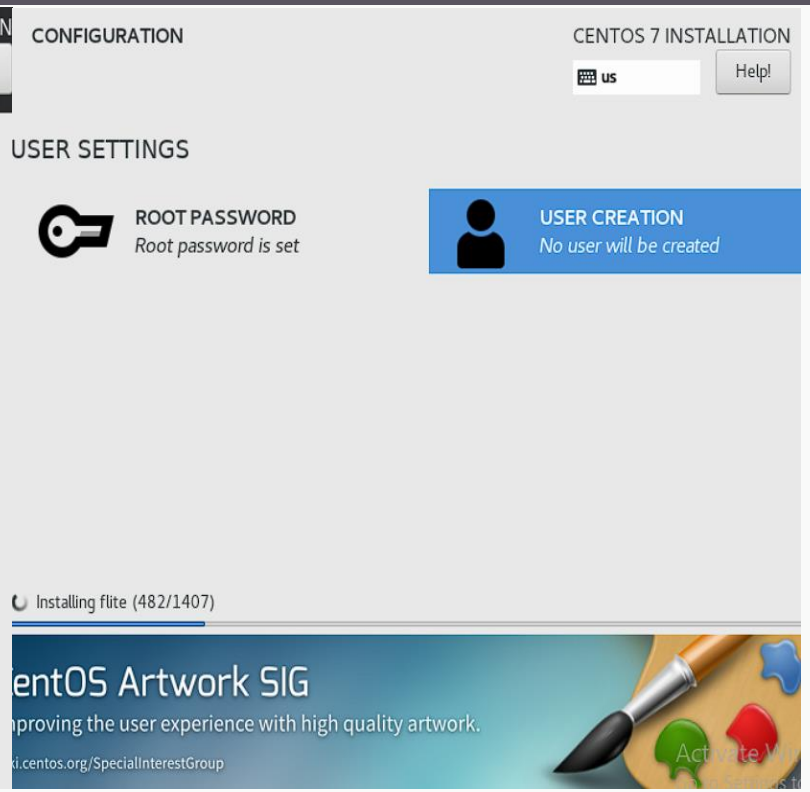
Step 16



- After confirming all details, click **"Begin Installation."** This will redirect you to the configuration page where you can:
- Set the root password.
- Create a user account.

Step 17

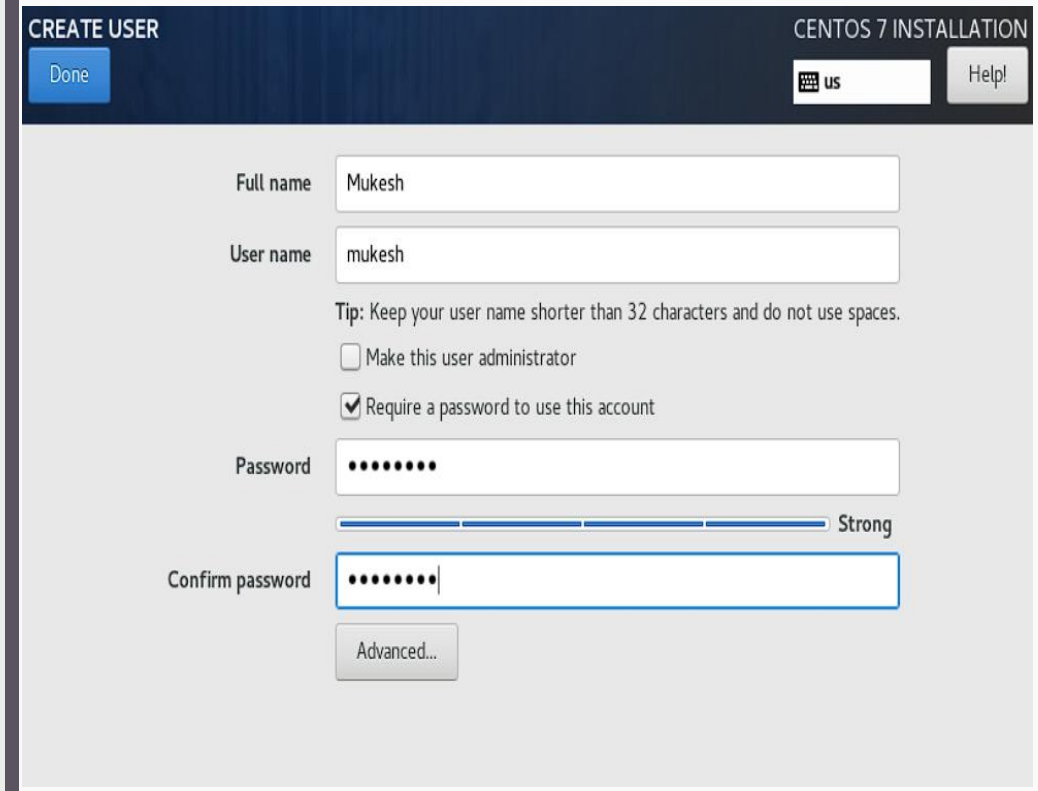


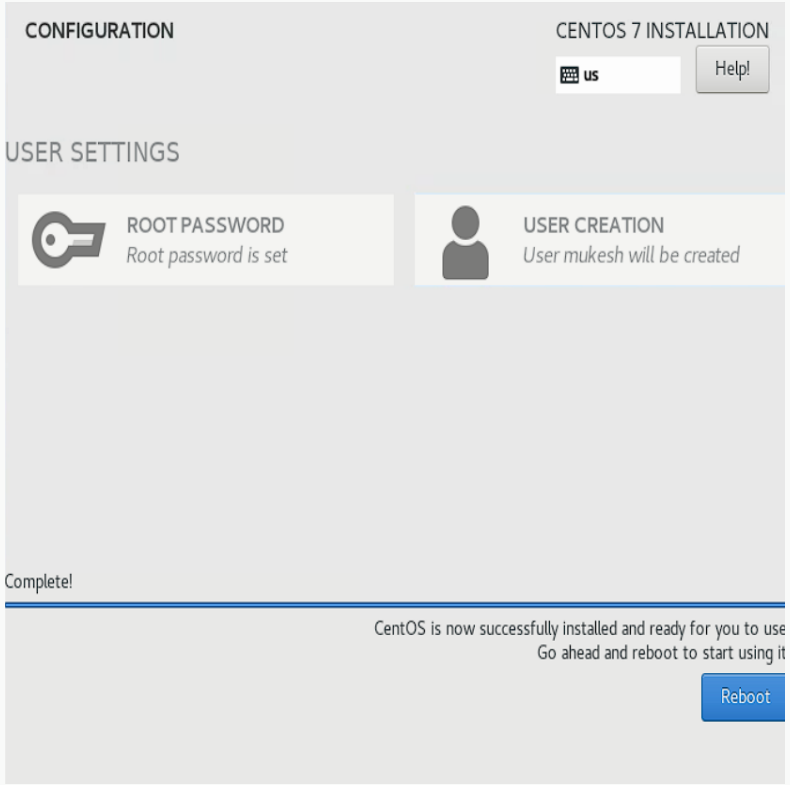


- Set the root password with the following criteria:
- **Uppercase letters**
- **Lowercase letters**
- **Special characters**
- **Numbers**
- **Minimum length of 8 characters**

- Click **"Done"** to finalize the password and proceed.

Step 18



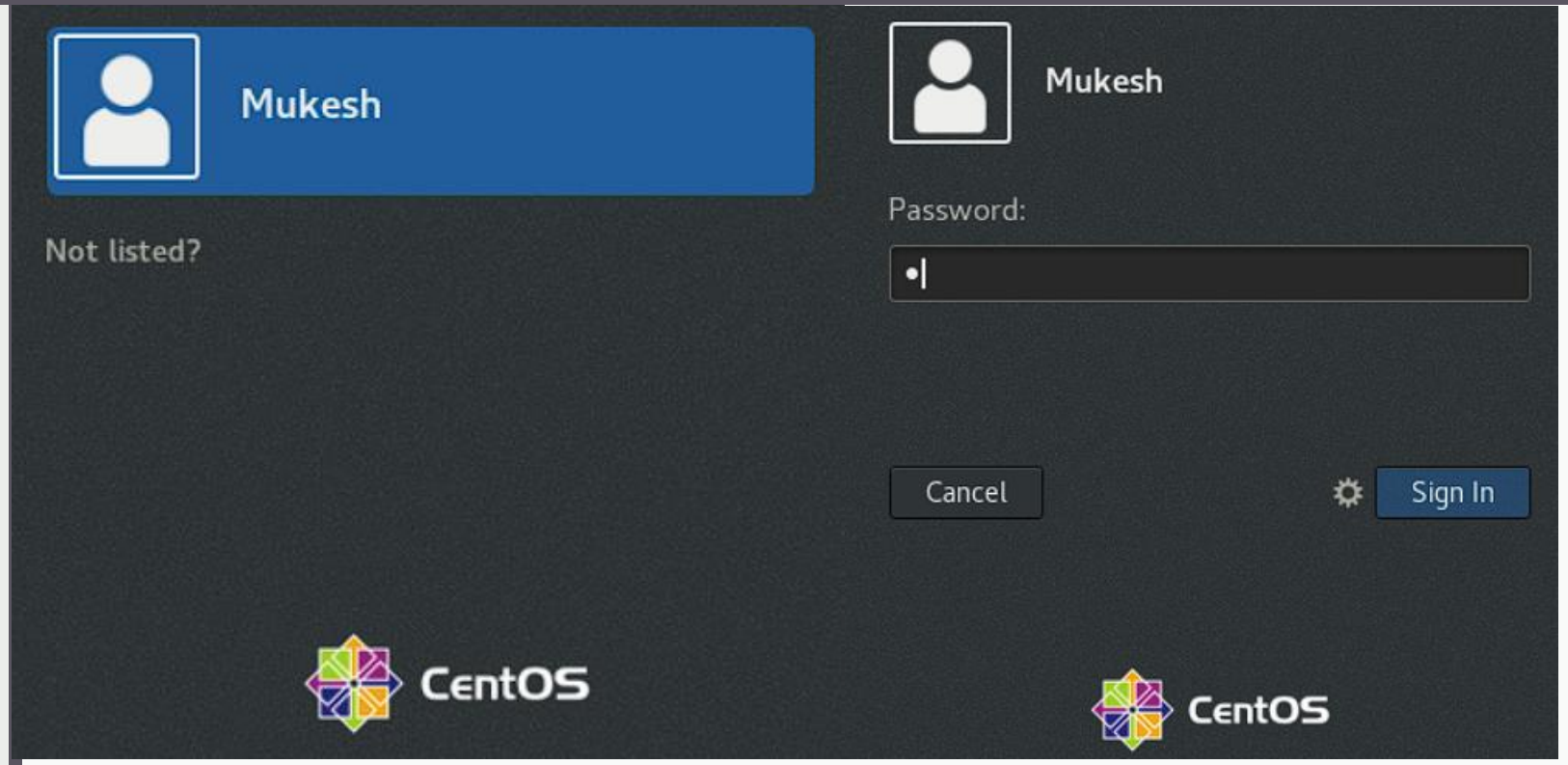


- Set up the root user:
- Enter the full name.
- Specify the username.
- Set the password following all criteria.
- Click "Done."
- Once the installation completes in the background, click "Reboot" to restart the system.

Step 19

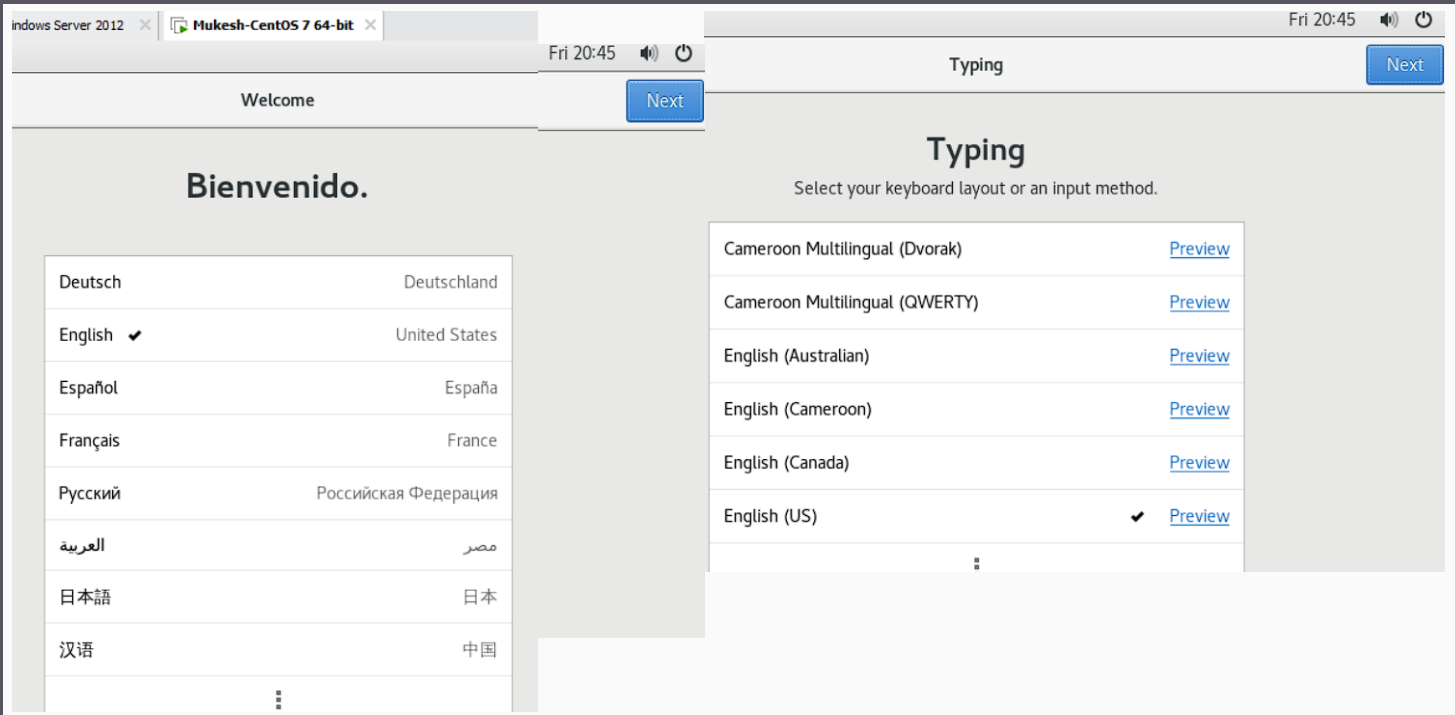
- **After clicking "Reboot":**
- The VM will redirect to the VMware starting page.
- Select CentOS Linux with the Linux version.
- Leave the rescue option.
- Wait for the next option to appear.

Step 20



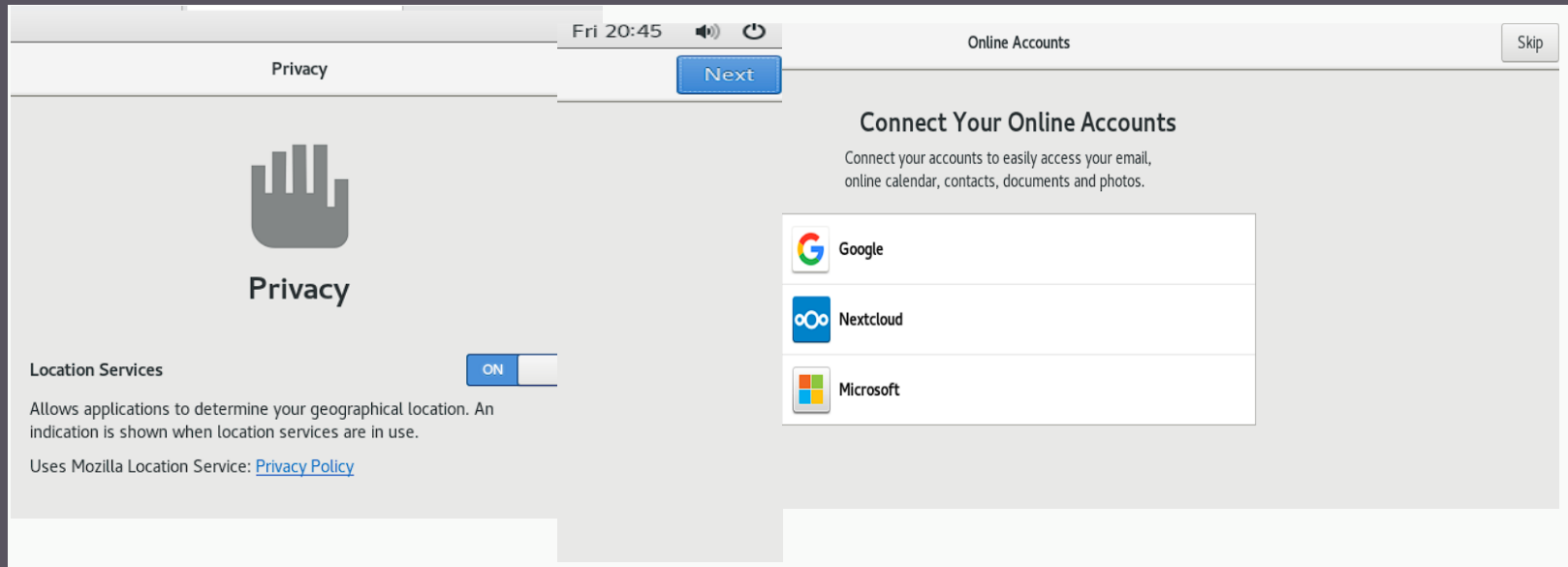
- **After rebooting:**
- The VM will redirect to the OS login page.
- **Enter your username and password.**
- Click **"Sign In"** to log in to CentOS.

Step 21



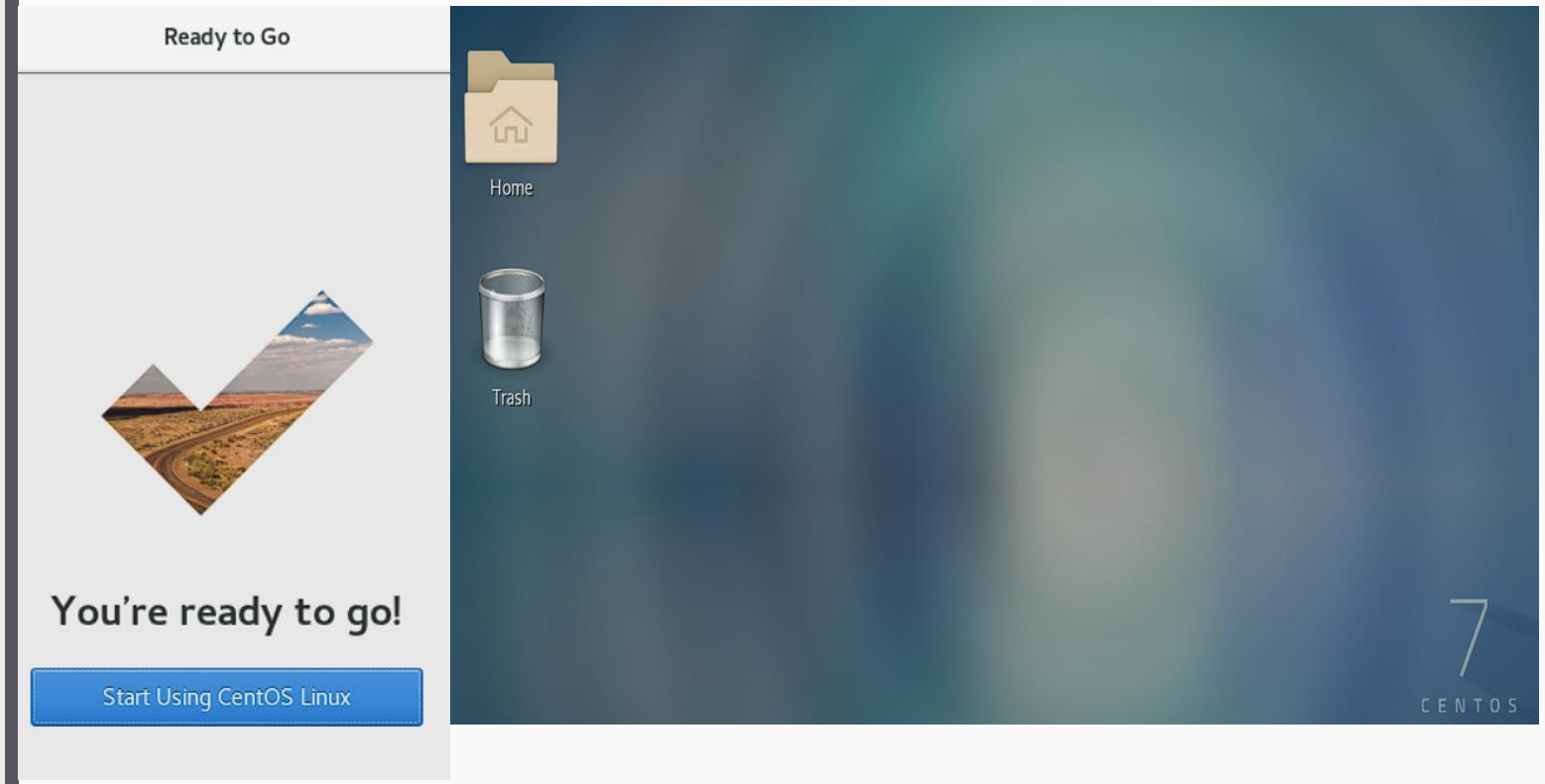
- **After logging in:**
- 1. Select your language and click **"Next."**
- 2. Choose the keyboard layout and click **"Next."**

Step 22



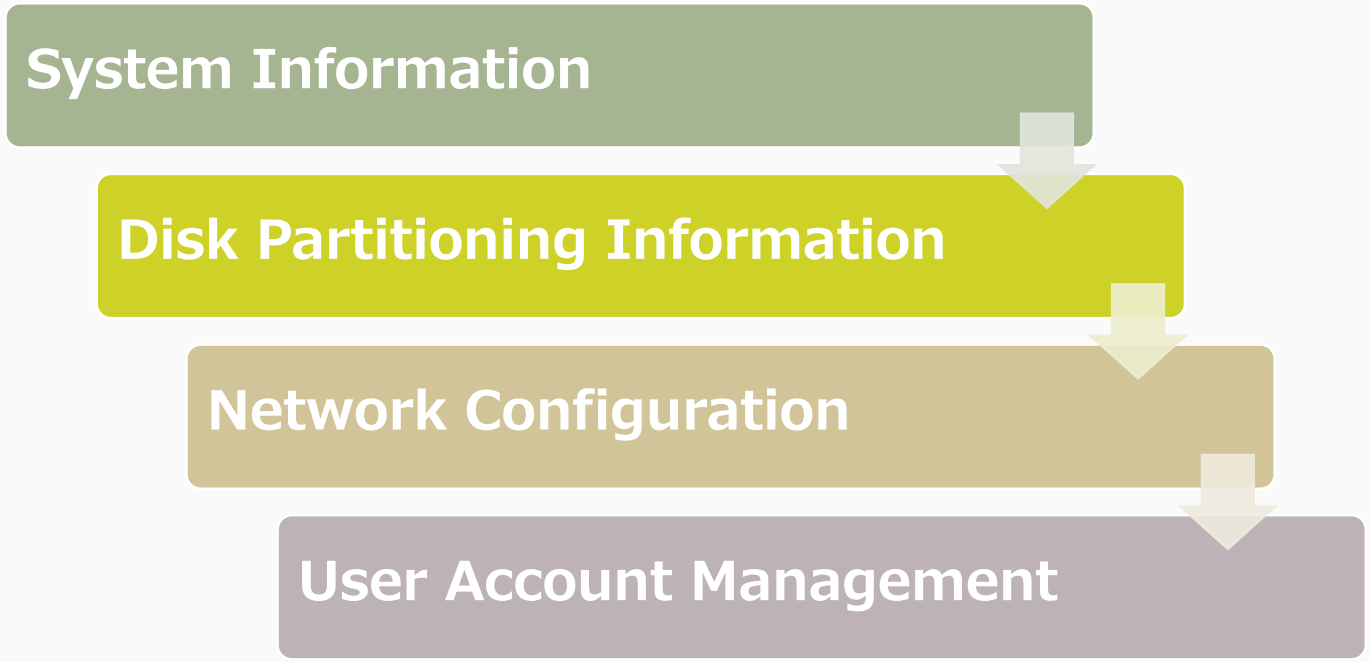
- **After selecting language and keyboard layout:**
- Click on "Location Services" and then **"Next."**
- 2. Connect your online account or click **"Skip"** to proceed without connecting.

Step 23

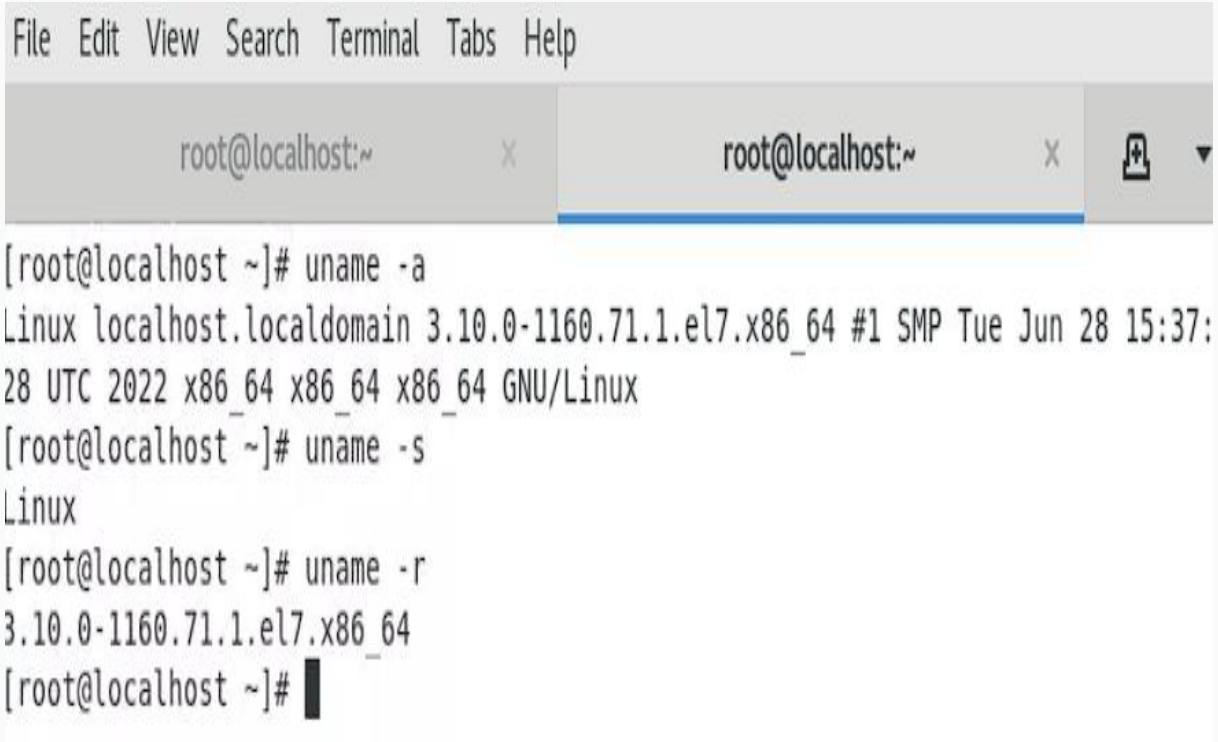


- Click on **"Start Using CentOS Linux**" to begin using the OS.
- CentOS installation is now **successfully installed and ready to use.**

Post-Installation configuration in CentOS



System Information



- **For System Information we can use these commands** :

- **`uname -a`:**

  - Displays: All system information including kernel name, network node hostname, kernel release, kernel version, machine hardware name, processor type, and operating system.

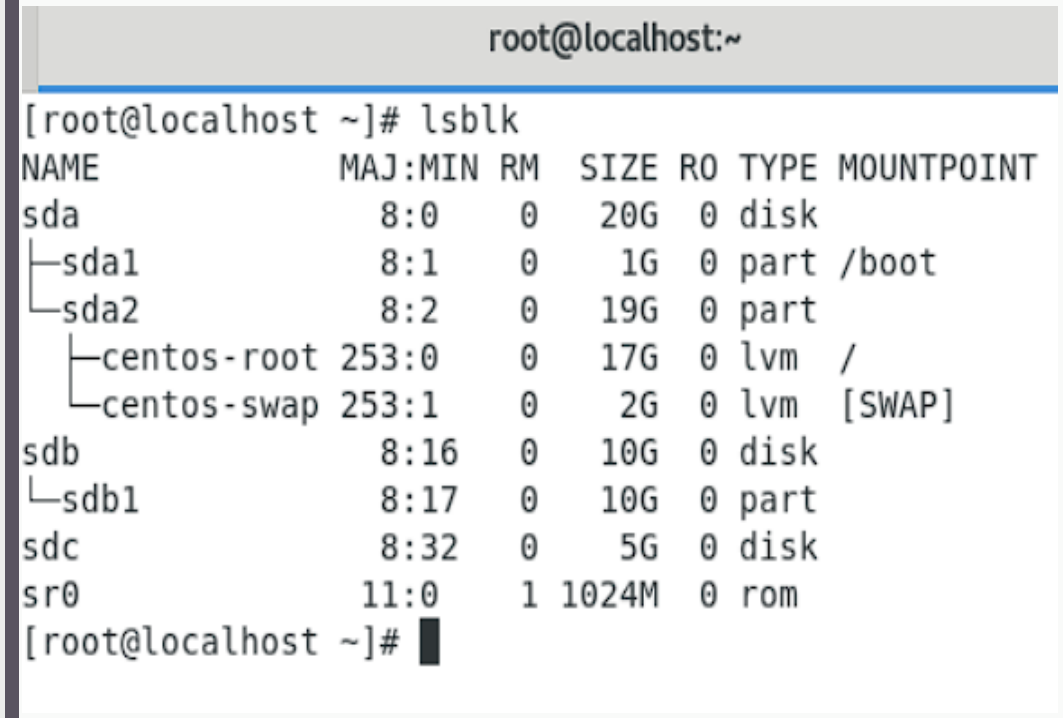
- **`uname -s` :**

  - Displays: The kernel name (e.g., `Linux`).

- **`uname -r` :**

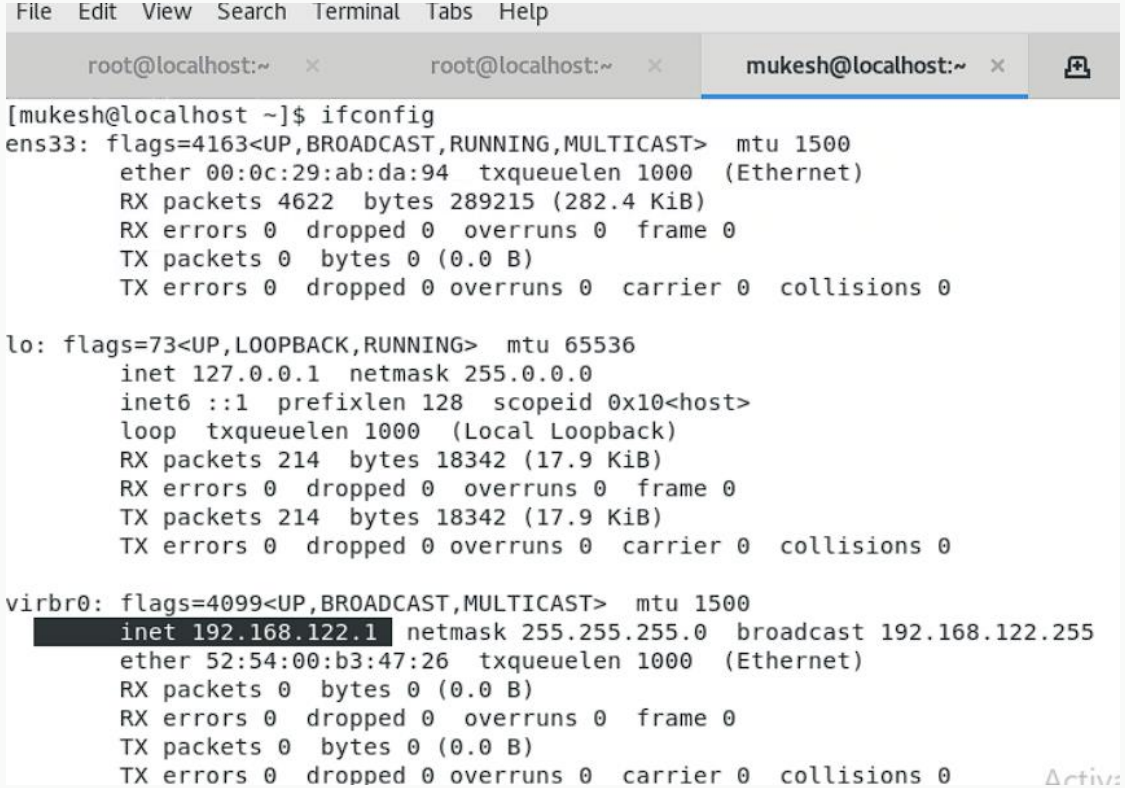
  - Displays: The kernel release version (e.g., `5.10.0-8-amd64`).

Disk Partitioning Information



- **command for disk partitioning information:**
- **`fdisk -l`-** Displays: Detailed partition table information for all disks.
- **`lsblk`** - Displays: List of all block devices (e.g., disks, partitions) with basic information like size and mount points.
- **`lsblk -f`** - Displays: Detailed block device information including filesystem type, label, and UUID.

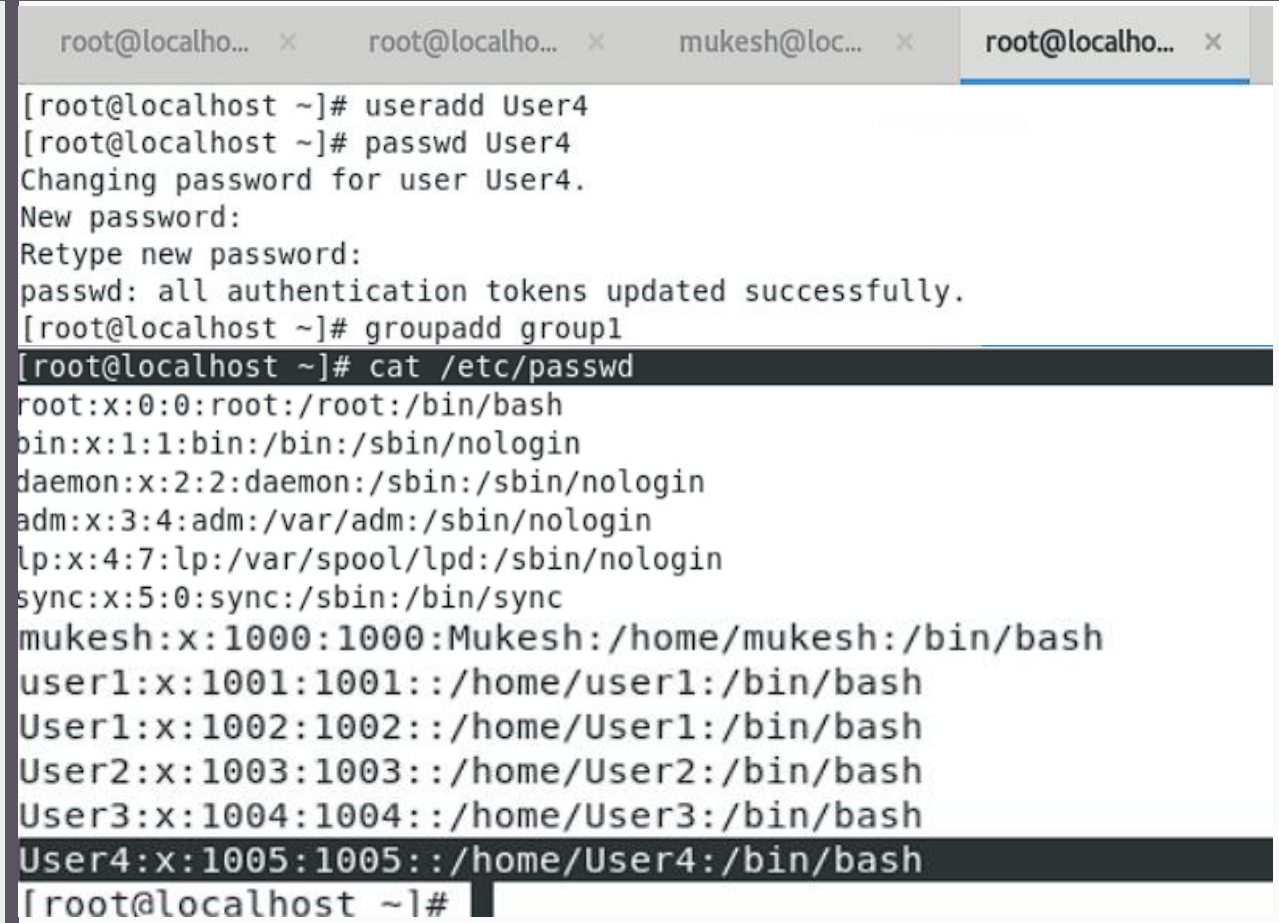
Network Configuration



- **For network configuration, we can use the following commands:**

- **`ifconfig`-** Displays: Network interfaces and their current configurations, including IP addresses and network statistics.
- **`ip addr`-** Displays: Detailed information about IP addresses assigned to network interfaces.
- **`ip link` -** Displays: Information about network interfaces, including their status and MAC addresses.

User Account Management



- **Point-wise guide for user account management:**

- Create a User Account: Use `**useradd username**` to add a new user.
- Set User Password: Use `**passwd username**` to set or change the user's password.
- Create a User Group: Use `**groupadd groupname**` to create a new user group.
- Verify User Information: Use `**cat /etc/passwd**` to view user account details.

```
[root@localhost ~]# cat /etc/group
root:x:0:
bin:x:1:
daemon:x:2:
sys:x:3:
adm:x:4:
tty:x:5:
disk:x:6:
lp:x:7:
mem:x:8:
kmem:x:9:
wheel:x:10:
mukesh:x:1000:mukesh
user1:x:1001:
User1:x:1002:
User2:x:1003:
User3:x:1004:
User4:x:1005:
group1:x:1006:
[root@localhost ~]#
```

- **Point-wise guide including the group information:**

- **Check Group Information:**

  - Use `cat /etc/group` to view group details, including the created group (e.g., `group1` with GID 1006).

Project Scope

Understand the Linux Boot Process: Learn how Linux starts up, from powering on to loading the OS.

Ensure the System Boots Up with Linux: Confirm that the system successfully starts and operates with the Linux OS.

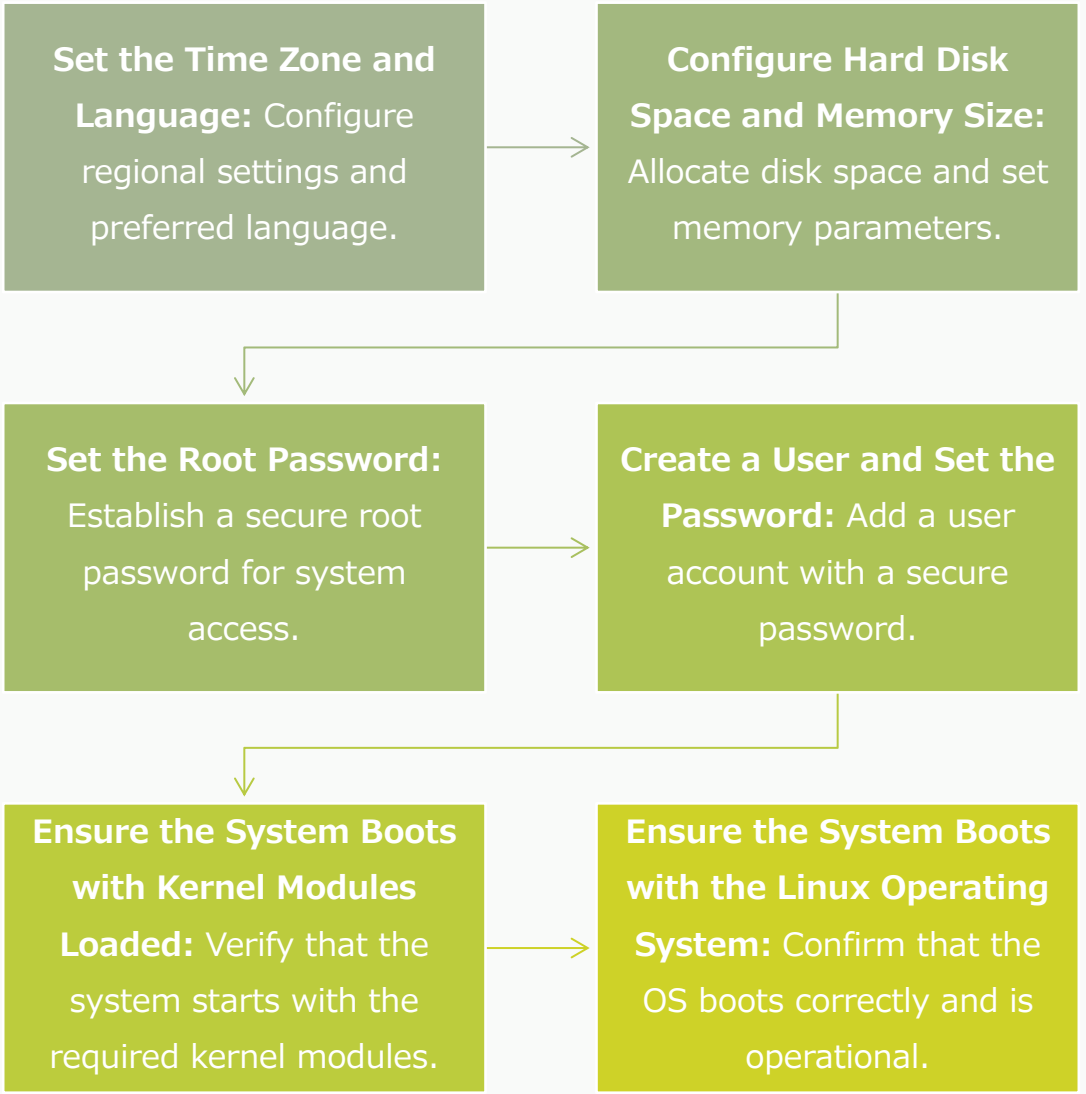
Prerequisites and Project Requirements

Knowledge of Hardware Components: Basic understanding of computer hardware essential for installation.

Basic Understanding of Linux and Command-Line Tools: Familiarity with Linux basics and commands needed for setup

Understanding of Kernel and Boot Process: Insight into how the Linux kernel and boot sequence function.

Deliverables



Summary

Project Objective: This project aimed to provide practical experience in installing and configuring a Linux operating system, focusing on understanding the boot process and ensuring proper system setup.

Scope Covered: Included learning the boot sequence, configuring essential system settings, and verifying system functionality.

Key Achievements: Successful setup of time zones, disk space, user accounts, and kernel modules, ensuring a fully operational Linux system.

Conclusion

Completion: All project goals were achieved, including correct installation and configuration of Linux with all specified settings.

Outcome: The Linux system is fully functional and configured as required, demonstrating successful implementation and readiness for use.

THANK YOU

Mukesh Yadav

Batch name : Data Centre - Batch 7
cloud username : 24NAG2180_U07

Git username : b166user05