BAHIR DAR UNIVERSITY

BAHIR DAR INSTITUTE OF TECHNOLOGY (BiT)

FACUITY OF computing

OPERATING SYSTEM INDIVIDUAL ASSIGNMENT

Sec. B

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|. CentOS Stream Installation in VirtualBox

Introduction (Background & Motivation)

CentOS Stream is a Linux distribution that serves as a rolling-release preview of the next minor version of Red Hat Enterprise Linux (RHEL). Installing it in a virtualized environment like VirtualBox allows learners and developers to safely experiment with a stable enterprise-grade OS. This setup is ideal for software testing, system administration training, and learning Linux environments without risking your physical machine.

Objectives

To install CentOS Stream successfully in a VirtualBox virtual environment.

To create a user named “kidestkibertie”.

To become familiar with Linux installation procedures and virtualization.

To identify and resolve potential installation issues.

To explore file system options supported by CentOS Stream.

Requirements

Hardware:

Processor: Dual-core 2.0 GHz or higher

RAM: Minimum 2 GB (4 GB recommended)

Storage: Minimum 20 GB free space

Virtualization support enabled in BIOS/UEFI

Software:

Oracle VirtualBox (latest version)

CentOS Stream ISO file (DVD ISO)

Host Operating System (e.g., Windows/Linux/macOS)

Installation steps ,using the username kidestkibertie.

Step 1: Download CentOS Stream ISO

Go to the official CentOS Stream download page.

Download the CentOS Stream DVD ISO.

Step 2: Create a New Virtual Machine in VirtualBox

Open VirtualBox, click New.

Name: CentOS Stream

Type: Linux

Version: Red Hat (64-bit)

Click Next.

Step 2_Create VM

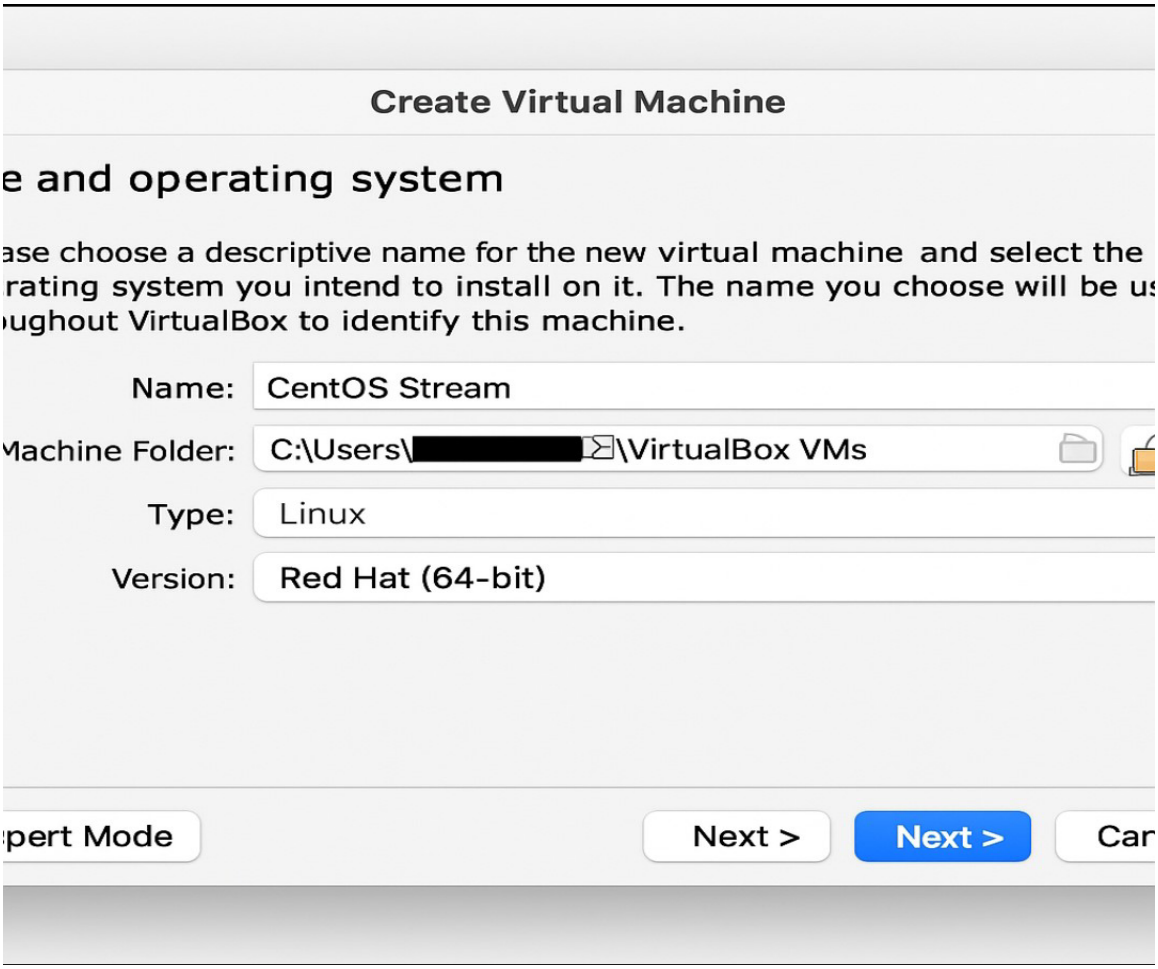
3. Allocate RAM (Recommended: 2048 MB or more).

4. Create a Virtual Hard Disk:

Type: VDI (VirtualBox Disk Image)

Storage: Dynamically allocated

Size: 20 GB or more



Step 3: Mount the CentOS Stream ISO

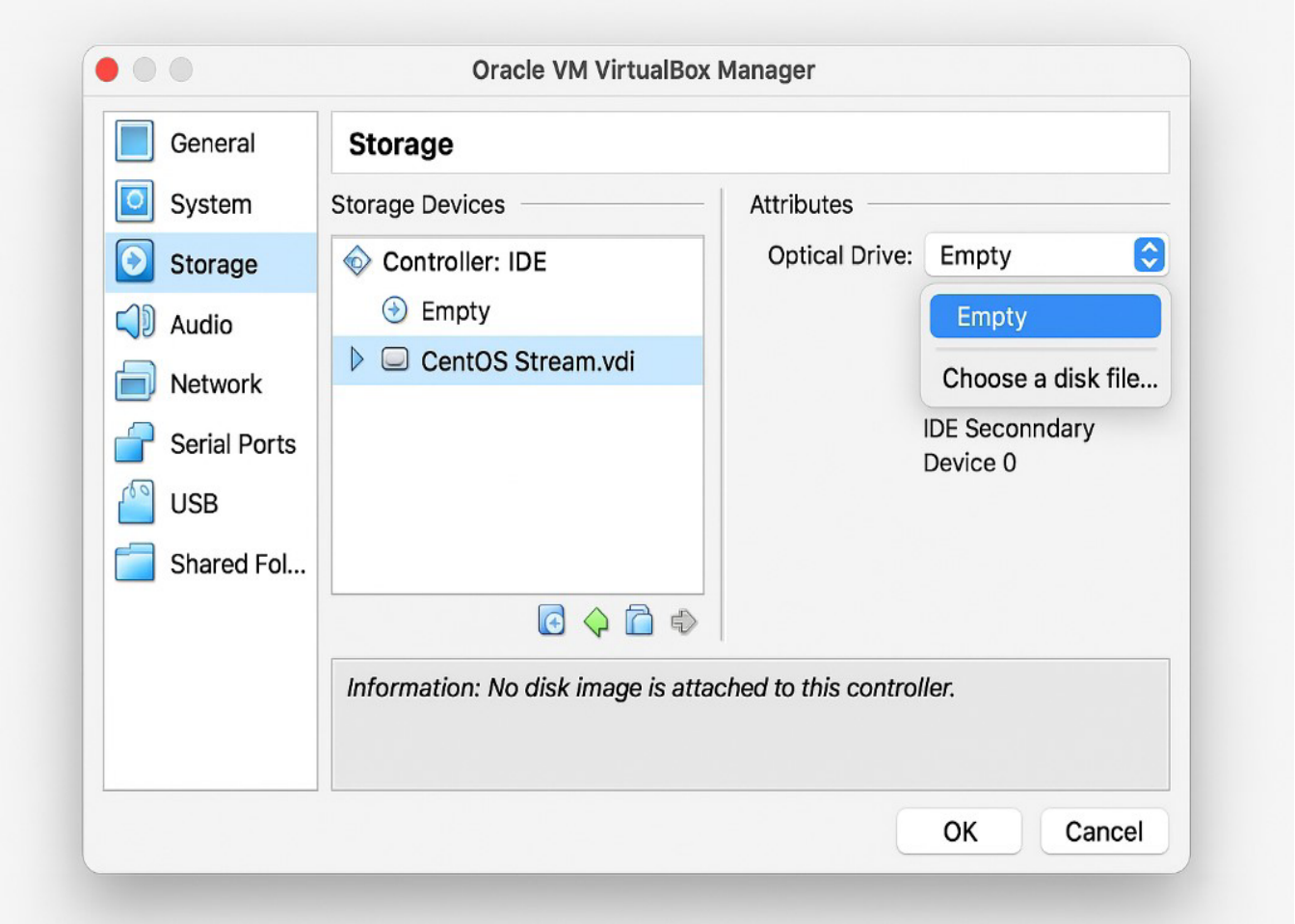
Go to Settings > Storage.

Under Controller: IDE, click the empty disk icon.

Click the disk icon on the right side, choose “Choose a disk file…”

Select your downloaded CentOS Stream ISO.

Step 3_Mount ISOp



Step 4: Start the Virtual Machine

Click Start to boot the VM.

On the boot menu, choose Install CentOS Stream.

Step 5: Install CentOS Stream

Select your language and region, click Continue.

Set:

Installation Destination: Select your virtual hard disk.

Network & Host Name: Enable the network.

Software Selection: Choose Server with GUI for a graphical interface.

Step 5_Installation Settings

3. Begin installation.

4. Set the following:

Root password: Choose a strong one.

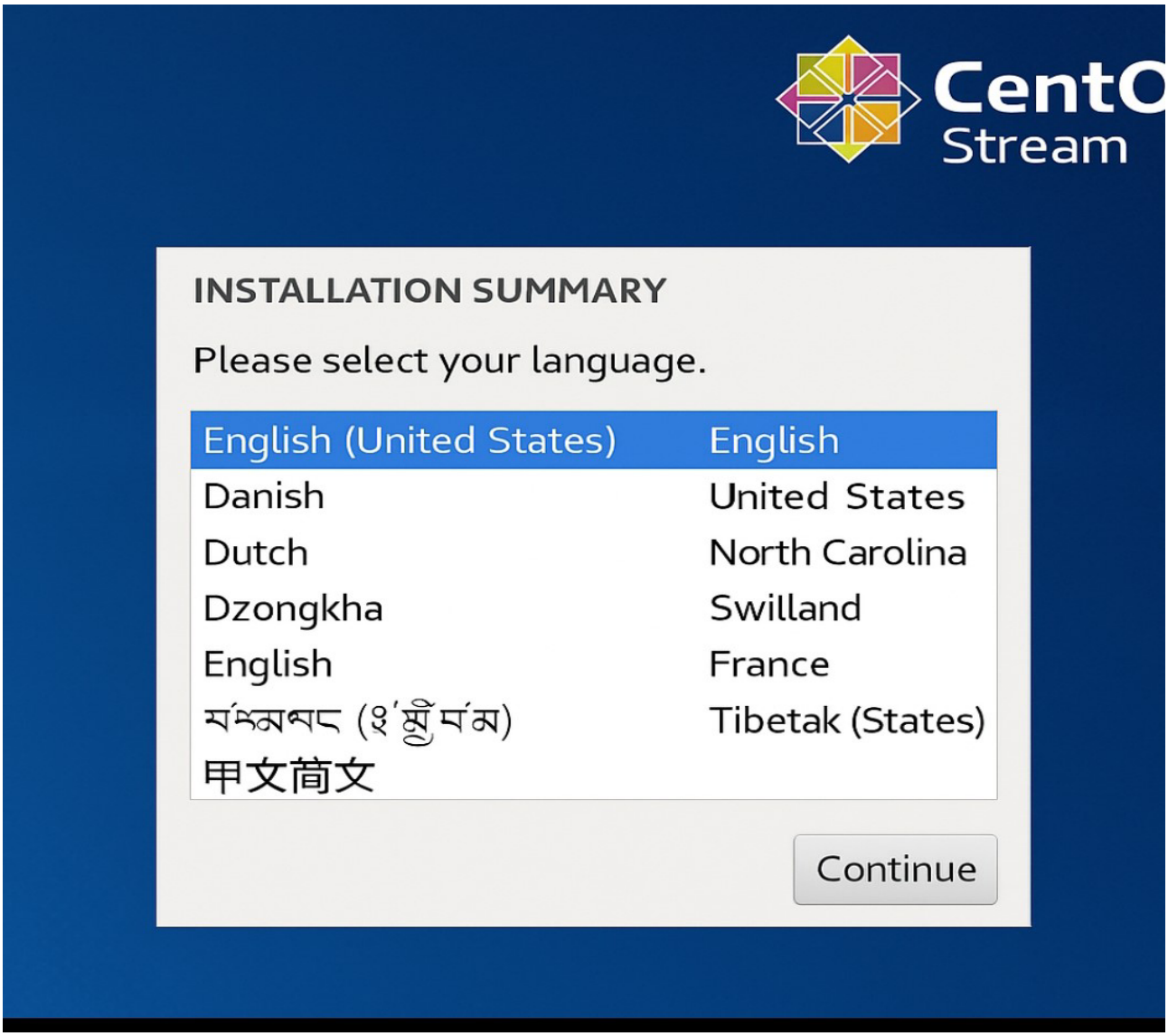
Create user:

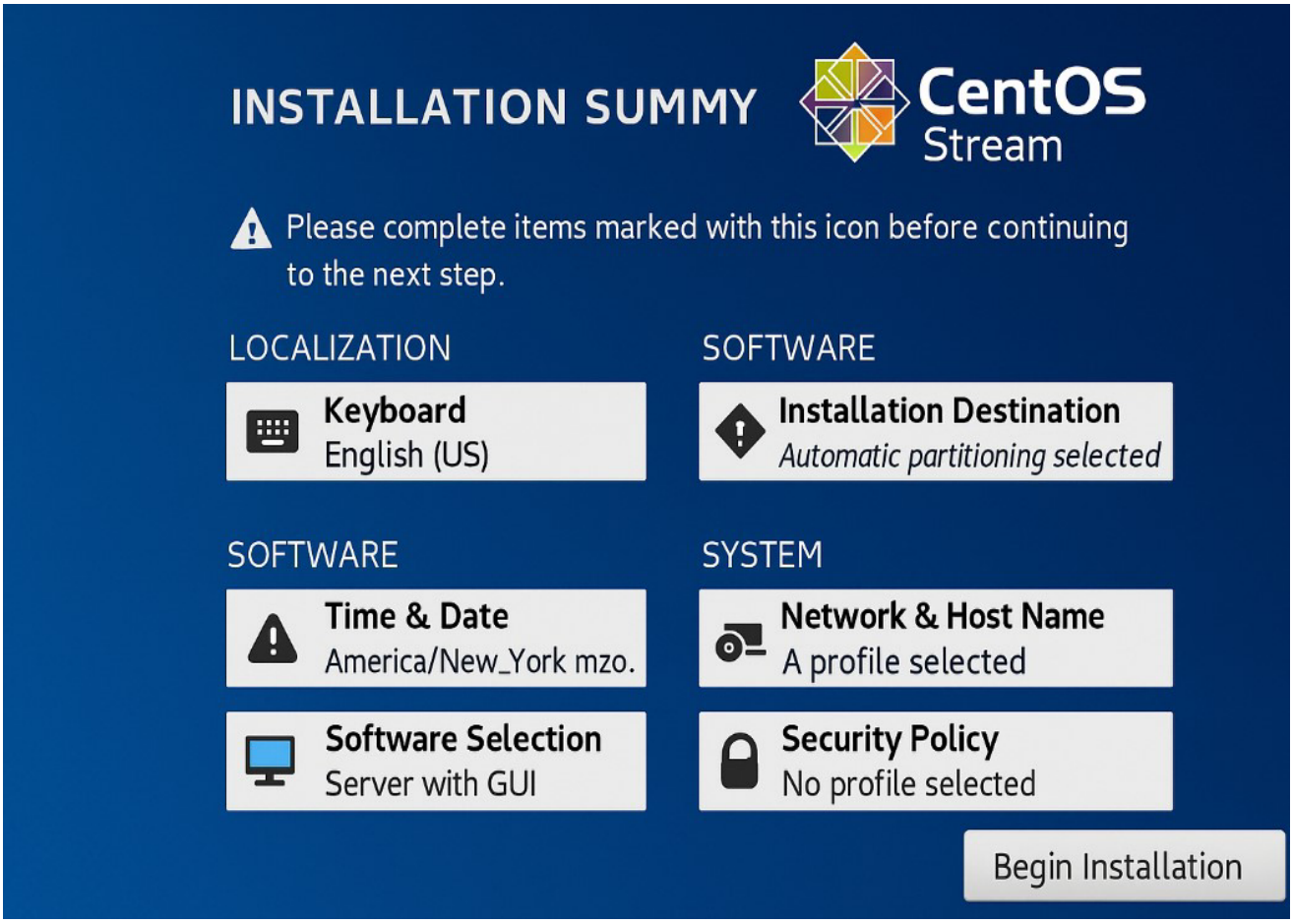
Full Name: kidestkibertie

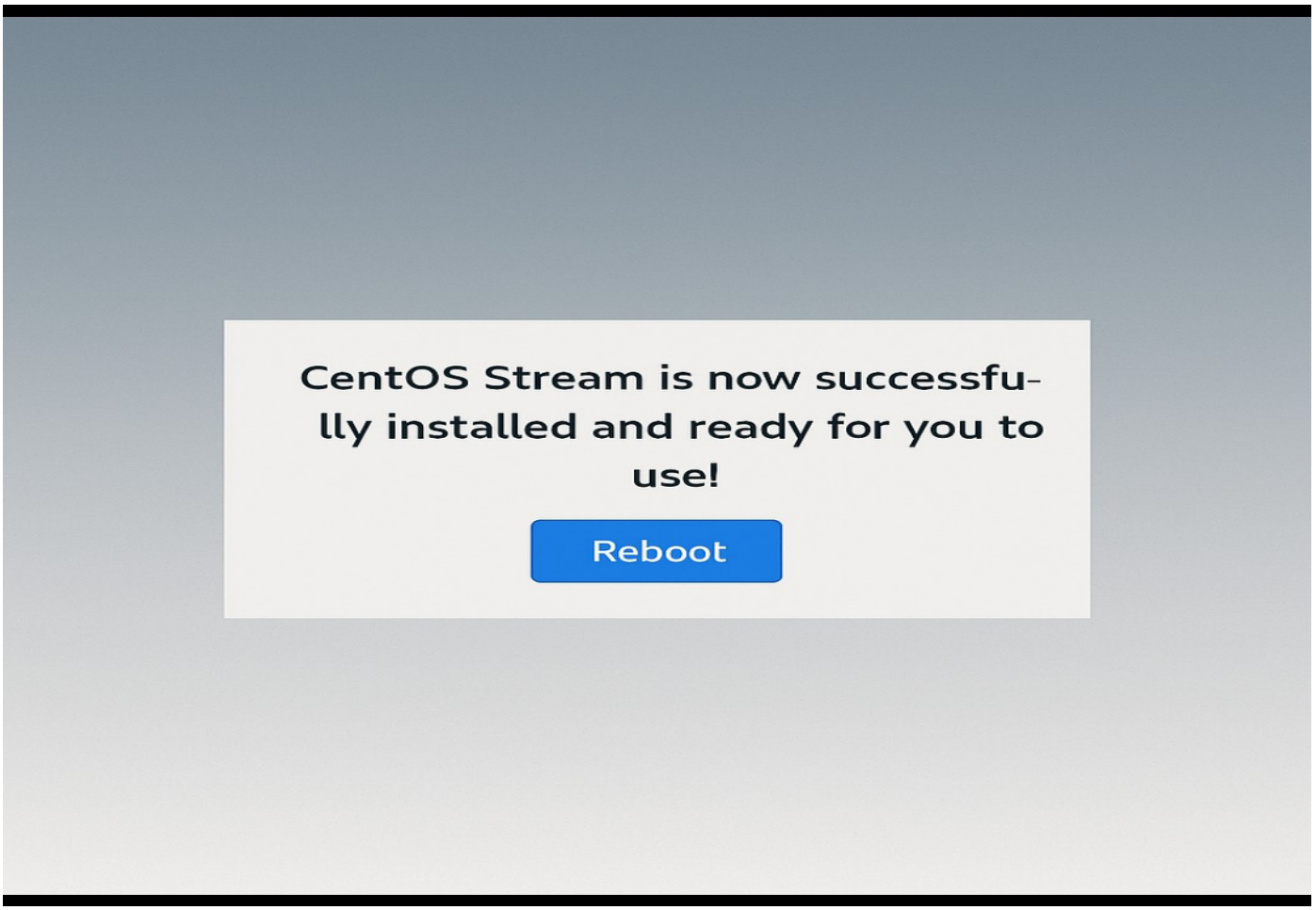
Username: kidest

Step 5_Create User

5. Once done, reboot the VM.


CentO
Stream
INSTALLATION SUMMARY
Please select your language.
English (United States)
English
Danish
United States
Dutch
North Carolina
Dzongkha
Swilland
English
France
Tibetak (States)
甲文简文
Continue


INSTALLATION SUMMY
CentOS Stream
Please complete items marked with this icon before continuing to the next step.
LOCALIZATION
Keyboard
English (US)
SOFTWARE
Installation Destination
Automatic partitioning selected
SOFTWARE
Time & Date
America/New_York mzo.
Software Selection
Server with GUI
SYSTEM
Network & Host Name
A profile selected
Security Policy
No profile selected
Begin Installation


CentOS Stream is now successfu-
lly installed and ready for you to
use!
Reboot

Issues (Problems Faced)

Stuck on Boot: The system might freeze at boot if VirtualBox settings (like EFI or graphics controller) aren't set correctly.

Mouse or Keyboard Not Captured: Input devices might not work smoothly without VirtualBox Guest Additions.

Network Not Detected: Default NAT settings might block internet access inside the VM."No Disk Selected" Warning: If you don't choose a storage disk in the Installation Destination, installation will not proceed.

Solution

Stuck Boot Fix: Disable "Enable EFI" in VM Settings > System > Motherboard.

Input Issues: Install VirtualBox Guest Additions after CentOS installation to enable smooth mouse integration.

Network Fix: Go to Settings > Network > Adapter 1 and make sure "Attached to" is set to "Bridged Adapter" or "NAT".

Disk Selection Issue: Click Installation Destination, select the hard disk, and confirm.

Filesystem Support

CentOS Stream primarily supports:

ext4 (Default & recommended): Stable and widely supported.

XFS: Supported and used by default for newer systems. Better scalability and performance.

Others (less common): Btrfs, NTFS (read-only with packages), FAT32 (limited use), exFAT (requires extra package).

Why ext4/XFS?

ext4 is simple and reliable for general use.

XFS is high-performance and better suited for enterprise-grade workloads.

Advantage and disadvantages

Advantages:

Free and open-source with RHEL compatibility.

Rolling release ensures newer features.

Good community support.

Great for enterprise-level simulations and development.

Disadvantages:

Might be less stable than RHEL for critical deployments.

Requires manual updates more frequently.

Initial setup complexity for beginners.

Conclusion

Installing CentOS Stream on VirtualBox allows users to explore a cutting-edge Linux environment safely. The process teaches virtualization, OS installation, and Linux system configuration. Despite minor challenges, it offers a strong foundation for further Linux-based learning and development.

Future Outlook/Recommendation

Keep CentOS Stream updated for security and stability.

Learn how to install LAMP/LEMP stacks for web development.

Explore tools like Cockpit for GUI-based server management.

Use snapshots in VirtualBox before experimenting with new changes.

||. Virtualization in Modern Operating Systems

Virtualization specifically in the context of CentOS (Community ENTerprise Operating System):

What is Virtualization in CentOS?

In CentOS, virtualization refers to running multiple isolated virtual environments (virtual machines or VMs) on a single physical server. This is typically done using KVM (Kernel-based Virtual Machine), which is built into the CentOS Linux kernel.

Why Use Virtualization in CentOS?

Efficient Resource Usage: CentOS allows multiple VMs to share CPU, memory, and storage, maximizing hardware usage.

Cost Savings: No need for separate physical servers for each task.

Testing and Development: Developers can test new applications or configurations on virtual machines without risking the host system.

Security and Isolation: Each VM runs independently, reducing the risk of cross-application vulnerabilities.

Flexibility and Scalability: VMs can be created, cloned, or removed as needed, making deployment and scaling easier.

How Virtualization Works in CentOS

Hypervisor (Type 1 or Type 2):

CentOS mainly uses KVM, a Type 1 hypervisor integrated into the Linux kernel. Other tools like VirtualBox (Type 2) can also be used, especially for desktop testing.

libvirt and virt-manager:

CentOS uses the libvirt API and virt-manager GUI for managing VMs. These tools make it easy to create, configure, and control VMs from a user-friendly interface or command line.

Creating a Virtual Machine:

You can create a VM using:

virt-install (command line)

virt-manager (graphical interface)

VirtualBox (alternative GUI for general virtualization)

VM Configuration:

VMs can be configured with different OS images, CPU cores, RAM, disk space, and networking options—all managed from CentOS.

References

Google

https://www.centos.org/centos-stream/

https://docs.centos.org/en-US/

https://man7.org/linux/man-pages/man2/brk.2.html

https://github.com/torvalds/linux