Experiment No 3: Installing Linux with Partitioning on a Virtual Machine

Aim

To demonstrate the process of installing a Linux operating system on a virtual machine (VM) with custom partitioning.

Theory

Operating system installation involves setting up the OS on a computer's hardware or virtual environment. Custom partitioning during installation allows for optimal organization of the filesystem and efficient use of storage. Virtual machines, created using hypervisor software like VirtualBox or VMware, provide a convenient platform for installing and experimenting with different operating systems without affecting the host system.

Linux Installation:

- Installing Linux involves copying the OS files to the target storage, configuring system settings, and setting up user accounts.
- Custom partitioning allows for dividing the storage into different sections, such as root (/), home (/home), and swap, enhancing performance and organization.

Virtual Machine:

- A virtual machine is a software emulation of a physical computer, created using hypervisor software.
- Hypervisors like VirtualBox, VMware, and Hyper-V enable the creation and management of VMs, allowing multiple OS instances to run on a single physical machine.

Materials

- A computer with virtualization support.
- Hypervisor software (e.g., VirtualBox, VMware).
- Linux distribution ISO image (e.g., Ubuntu, Fedora).
- Sufficient disk space and memory for the virtual machine.

Procedure

Setting Up the Virtual Machine:

Install Hypervisor Software:

1. Download and install VirtualBox or VMware on your host machine.

Create a New Virtual Machine:

1. Open the hypervisor software and create a new VM.
2. Configure the VM settings:

   - Name the VM and select the type and version of the Linux distribution.
   - Allocate memory (RAM) to the VM (e.g., 2 GB).
   - Create a new virtual hard disk and allocate storage (e.g., 20 GB).

Configuring the Installation Medium:

1. Attach the Linux ISO image to the VM as a virtual optical drive.
2. Configure the VM to boot from the virtual optical drive.

Booting the Installer:

1. Start the VM and boot from the attached ISO image.
2. The Linux installer should launch automatically.

Partitioning the Disk:

1. Proceed through the installer until you reach the disk partitioning section.
2. Choose the option for custom or manual partitioning.
3. Create the necessary partitions:

   - Root (/): Primary partition for the OS (e.g., 10 GB).
   - Home (/home): Separate partition for user data (e.g., 8 GB).
   - Swap: Swap space for virtual memory (e.g., 2 GB).

Completing the Installation:

1. Continue with the installation, configuring user accounts, timezone, and other settings.
2. Start the installation process and wait for it to complete.
3. Once the installation is finished, reboot the VM.

Post-Installation Verification:

1. Remove the ISO image from the virtual optical drive to prevent booting into the installer again.
2. Start the VM and boot into the newly installed Linux OS.
3. Open a terminal and verify the partition setup using commands like `lsblk`, `fdisk -l`, or `df -h`.

Conclusion

This experiment demonstrates the process of installing Linux on a virtual machine with custom partitioning. Using a virtual machine provides a safe and flexible environment to experiment with OS installations without affecting the host system.