

Linux Notes for Preparation

Introduction to Linux

Linux is a family of open-source Unix-like operating systems based on the Linux kernel. It was originally developed by Linus Torvalds in 1991.

Linux is widely used in servers, desktops, mobile devices, and embedded systems due to its stability, security, and flexibility.

Key Concepts:

- Open Source: Anyone can view, modify, and distribute the source code.
- Kernel: The core of the operating system that manages hardware.
- Distributions: Variants of Linux like Ubuntu, Fedora, Debian, and CentOS, each tailored for different use cases.

Basic Linux Commands

Linux commands are used to interact with the system through the terminal. These commands help perform file operations, manage processes, and navigate directories.

Important Commands:

- pwd: Displays the current directory you're in.
- ls: Lists the contents of a directory.
- cd: Changes the directory.
- mkdir: Creates a new directory.
- rm: Deletes files or directories.

Linux Notes for Preparation

- cp: Copies files or directories.
- mv: Moves or renames files.
- touch: Creates an empty file.
- cat: Displays the contents of a file.
- man: Opens the manual for a command.

File Permissions

Linux is a multiuser system with a powerful permission model to secure files and directories.

Each file has:

- Owner
- Group
- Others

Permissions:

- Read (r): View file content.
- Write (w): Modify file content.
- Execute (x): Run as a program.

Example: -rwxr-xr--

- Owner: rwx (read, write, execute)
- Group: r-x (read, execute)
- Others: r-- (read only)

Linux Notes for Preparation

Commands:

- chmod: Change permissions (e.g., chmod 755 filename)
- chown: Change ownership (e.g., chown user:group filename)

Package Management

Package managers help install, update, and remove software in Linux.

Common Tools:

- Debian-based systems (Ubuntu, etc.): apt, dpkg
- RedHat-based systems (CentOS, Fedora): yum, dnf, rpm

Examples:

- sudo apt update: Refresh package index.
- sudo apt install vim: Install a package.
- sudo dpkg -i package.deb: Install a .deb file directly.

These tools handle dependencies and keep systems consistent.

Shell Scripting

Shell scripts automate tasks and run multiple commands in sequence.

A script starts with a shebang (!), followed by commands:

Linux Notes for Preparation

Example:

```
#!/bin/bash
```

```
echo "System Info"
```

```
uname -a
```

Key Concepts:

- Variables: name="value"
- Loops: for, while
- Conditions: if, else
- Functions: group commands together

Make it executable: `chmod +x script.sh`

Run it: `./script.sh`

System Monitoring

System monitoring helps in understanding resource usage and detecting issues.

Useful Commands:

- top/htop: Real-time process monitoring.
- df -h: Displays disk space usage.
- free -m: Shows memory usage.
- ps aux: Lists all running processes.
- kill PID: Stops a process using its PID.

Linux Notes for Preparation

These tools help maintain system performance and stability.

Networking

Linux has built-in tools for network configuration and troubleshooting.

Common Commands:

- ifconfig / ip a: View or configure network interfaces.
- ping: Test connectivity to a host.
- netstat -tuln: Shows active ports and services.
- ssh user@host: Connect to a remote system securely.
- scp: Secure file transfer between systems.

These tools are essential for managing servers and troubleshooting network issues.