Linux

Linux

- Free, open-source, and Unix-like operating system based on the Linux kernel.

- Widely used in servers

- Linux is known for its stability, security, and flexibility

Linux

- Linux Basic Commands
- Linux File Permissions
- Basic System Administration
- Process Management
- Archival

Linux Basic Commands

- echo - outputs a message or the contents of a file
- ls - lists the contents of a directory
  - ls -l
  - ls -a
- cd - changes the current working directory
- pwd - prints the current working directory
- man – opens manual

Linux Basic Commands

- mkdir: Makes a new directory.
- rmdir: Removes an empty directory.
- touch: Creates a new file.
- cp: Copies files or directories.
- mv: Moves or renames files or directories.
- rm: Deletes files or directories.
- cat: Displays the contents of a file.

Linux Basic Commands

- less: Pages through a file one screen at a time.
- head: Displays the first few lines of a file.
- tail: Displays the last few lines of a file.
- clear: clears the terminal

Linux Basic Commands

- grep: Searches for a pattern in a file and displays the matching lines
- find: Searches for files or directories that match specified

Linux File Permissions

- It determines who can access and perform actions on a file or directory.
- Represented by a series of letters and/or symbols, grouped into sets of three for each file.
  - Owner of the file
  - Group associated with the file
  - Everyone else (others)
- Each set of permissions is represented by a three-digit code.
  - First digit represents read (r) permission,
  - Second digit represents write (w) permission,
  - Third digit represents execute (x) permission.
- If a permission is granted, the corresponding digit is set to r, w, or x; otherwise, it's set to -.

Example

- rwxr-xr-x
  - owner has read, write, and execute permissions
  - group has read and execute permissions
  - others have read and execute permissions.

To change the Permissions

- Use the chmod command to change the permissions of a file or directory.
- Example
  - chmod 755 file.txt will set read, write, and execute permissions for the owner, and read and execute permissions for everyone else.
- First number -permissions for the owner,
- Second number -permissions for the group
- Third number -permissions for others.

- Read permission: represented by the digit 4
- Write permission: represented by the digit 2
- Execute permission: represented by the digit 1

Basic System Administration

- User and Group Management
- Package Management
- File System Management
- Process Management
- Network Configuration
- Security
- Log Management
- Backup and Recovery
- Performance Monitoring
- System Updates and Upgrades

Basic System Administration

- User and Group Management: Creating and managing users and groups, setting password policies, and assigning permissions.
- Package Management: Installing, updating, and removing software packages using package managers like apt, yum, or pacman.
- File System Management: Creating and formatting partitions, mounting and unmounting file systems, and managing disk usage.

Basic System Administration

- Process Management: Monitoring system processes, killing processes, setting process priorities, and managing system load.
- Network Configuration: Configuring IP addresses, subnet masks, gateway addresses, and DNS servers

Basic System Administration

- Security: Configuring firewalls, applying security patches and updates, and implementing best practices for secure server administration.
- Log Management: Monitoring system logs, rotating log files, and setting up log monitoring and alerting systems.
- Backup and Recovery: Creating and managing backups of system data, configuring disaster recovery procedures, and restoring data from backups.

Basic System Administration

- Performance Monitoring: Monitoring system performance, analyzing resource utilization, and tuning system parameters to optimize performance.

- System Updates and Upgrades: Installing system updates, upgrading the operating system, and keeping the system up-to-date with the latest security patches and software versions.

Process Management

- ps: Displays information about running processes, including the process ID, status, and name.
- top: Shows real-time information about system processes, including the CPU and memory utilization.
- kill: Sends a signal to a process, causing it to terminate.
- killall: Sends a signal to all processes with a specified name.
- pkill: Sends a signal to a process matching a specified pattern.
- fg: Brings a background process to the foreground, allowing it to receive keyboard input.
  - To run processes in the background append an ampersand (&) to the end of a command

Scheduling processes

- Schedule a processes to run automatically at a specific time or at regular intervals using the cron daemon.

- The cron daemon is a system service that runs in the background and is used to execute scheduled tasks, also known as cron jobs.

- A cron job is defined in a special file, called a crontab, that lists the command to be executed and the schedule for when it should be executed.

cron job format

```
* * * * * command-to-be-executed
```

- The first field is for minutes (0-59).
- The second field is for hours (0-23).
- The third field is for days of the month (1-31).
- The fourth field is for months (1-12).
- The fifth field is for days of the week (0-7, with both 0 and 7 representing Sunday).

Archival

- It is a process of creating and storing backups of important data and system configurations.
- tar: A commonly used tool for creating archive files. tar combines multiple files into a single archive file, preserving the original file and directory structure.
- gzip and bzip2: Tools for compressing tar archive files. gzip and bzip2 reduce the size of the archive file, making it easier to store and transfer.
- dd: A low-level tool for copying data from one location to another. dd can be used to create a raw image of a disk or partition, which can then be compressed and stored as a backup.
- rsync: A tool for synchronizing files and directories between two locations. rsync can be used to create incremental backups, only transferring the changes made since the last backup.
- rsnapshot: A filesystem snapshot utility based on rsync. It allows to take snapshots of specified directories, preserving the file structure and metadata, and store them in a space-efficient manner.