

Linux Fundamentals and Essential Administration

Duration: 3 days

Day 1 – Linux Fundamentals & File System

Module 1: Introduction to Linux

- Linux overview and common use cases
- Linux distributions: Ubuntu, Red Hat, CentOS Stream, Debian
- Linux architecture overview
- Kernel, shell, utilities, and applications
- GUI vs command-line interface
- Understanding the terminal and shell

Module 2: Linux File System

- Linux directory structure
- Root directory and important directories
- /home, /etc, /var, /tmp, /usr, /bin
- Absolute and relative paths
- Working directory and home directory

Module 3: Essential Linux Commands

- pwd, ls, cd
- mkdir, rmdir
- touch, cp, mv, rm
- cat, less, head, tail
- Command history
- Tab completion
- Getting help with man, --help, and info

Hands-on Labs

- Navigate through the Linux directory structure
- Create a project directory structure using commands
- Create, copy, move, rename, view, and delete files

Outcome: Participants can navigate Linux and perform routine file and directory operations using the command line.

Day 2 – File Management, Permissions & Users

Module 4: Working with Files and Text

- File types in Linux
- Viewing and inspecting files

- Searching files using find
- Searching text using grep
- Wildcards and pattern matching
- Input/output redirection
- Pipes
- Basic text utilities: sort, wc, cut

Module 5: Linux File Permissions

- Understanding owner, group, and others
- Read, write, and execute permissions
- Viewing permissions using ls -l
- Changing permissions using chmod
- Numeric and symbolic permission modes
- Changing ownership using chown
- Changing group ownership using chgrp

Module 6: Users and Groups

- Linux users and groups overview
- Root user and regular users
- User and group information
- id, who, whoami
- Basic user and group management
- sudo fundamentals
- Password management

Hands-on Labs

- Search files and extract information using grep
- Combine Linux commands using pipes and redirection
- Configure permissions for shared files and directories
- Create users/groups and assign appropriate access

Outcome: Participants can search and manipulate information, understand Linux permissions, and perform basic user administration.

Day 3 – Processes, Services, Packages & Basic Administration

Module 7: Process Management

- Understanding Linux processes
- Foreground and background processes
- ps, top
- Process IDs
- Starting background jobs
- jobs, bg, fg
- Terminating processes using kill
- Basic system resource monitoring

Module 8: Services and System Management

- Introduction to services and daemons
- Understanding systemd
- systemctl basics
- Check, start, stop, and restart services
- Viewing basic system information
- hostname, uname, uptime
- Disk usage using df and du
- Memory information using free

Module 9: Package Management & Networking Basics

- Linux software packages
- Repository concept
- Basic apt commands for Debian/Ubuntu
- Introduction to dnf for Red Hat-based systems
- Installing, updating, and removing packages
- Basic networking concepts
- IP address and interface information
- ip, ping, hostname
- Basic connectivity troubleshooting

Module 10: Archives and Basic Troubleshooting

- Creating archives with tar
- Compression and decompression
- Reading basic system logs
- Introduction to /var/log
- Basic Linux troubleshooting approach

Hands-on Labs

- Monitor and terminate processes
- Start, stop, and verify a Linux service
- Install and remove a software package
- Check disk, memory, and network status
- Create and extract a compressed backup arch