

# Linux Essentials (Red Hat, Ubuntu, Kali Linux)

This course will introduce and teach the basic concepts and components of the Linux operating system. This customized Linux Essentials training is a great first step for those looking to make a career in Linux systems administration, DevOps Engineer, Security Professional, Software Developer, Server Administrator, Cloud engineer or for those that want to expand their IT knowledge. By the end of this course, you will gain knowledge on several Linux distributions like **Red Hat Enterprise Linux (RHEL), Ubuntu, Debian, Kali Linux, Fedora, Rocky Linux** and **CentOS**.

## Target Audience

This course is Designed for :

- System administrators
- DevOps Engineer
- Software Developers
- Server Administrator
- Cloud Engineer
- Security Engineer

## Course Prerequisites

We recommend that attendees of this course have:

- Operating System Concepts
- Networking fundamental
- TCP/IP Protocol concepts
- Computer Hardware concepts
- System troubleshooting skill

## Course Duration:

- **48 Hours**, 2 Hours per sessions (weekly 2 Days)

### Details Course Outline

#### Module 01: Introduction to UNIX & LINUX

- Introduction to Operating Systems
- Parts of Operating System
- Familiar with User Interface, Shell, and Kernel
- What is UNIX? (And a little bit of history)
- Familiar with Linux and GNU Project
- Why use Linux Operating System
- Linux vs Windows Operating systems

#### Module 02: Familiar with Linux Distribution

- Familiar with various Linux distributions
- Choosing a Linux distribution
- Concept of OS Architecture (x86, ARM, PPC)
- Desktop edition vs Server edition
- Introducing Fedora, CentOS and Red Hat
- Features of RHEL Distribution
- Features of Ubuntu Distribution
- Features of Kali Linux Distribution

#### Module 03: Download (RHEL, Ubuntu, Kali OS)

- Choose your Linux OS based on Architecture
- Minimal version vs full version OS
- Create account on Red Hat Portal
- Download Red Hat Enterprise Linux (ISO)
- Download CentOS & Rocky Linux (ISO)
- Download Ubuntu Desktop & Server edition
- Download Kali Linux ISO & VM Edition

#### Module 04: Preparing Linux Install & Lab Setup

- Why build a Linux lab
- Physical Lab vs Virtual Lab
- Planning a Linux Installation (Physical/VM/Cloud)
- Partitioning Requirements for Linux Installation
- BIOS vs EFI Based Installation
- Limitation of Standard Partitions
- Linux Installation Method (USB, ISO, PXE)
- Linux Dual Booting concepts with Windows OS

## Module 05: Create VMs for (RHEL, Ubuntu, Kali)

- Introduction Virtualization Technology
- Why need virtualization platform
- Introduction to VMware Workstation
- Download and Install VMware Workstation
- Create VMs for RHEL, Ubuntu, and Kali Linux
- Cloud Computing Introduction
- Working with AWS & Digital Ocean cloud provider
- Create EC2 Instance (VPS) on AWS cloud
- Create Droplet (VPS) on Digital Ocean Cloud

## Module 06: Install RHEL/CentOS/Rocky Linux

- Choose RHEL Version (RHEL, CentOS, Rocky Linux)
- Required Hardware Resources for RHEL
- Required Partitions for RHEL Installation
- Configure BIOS/UEFI options for OS booting
- Start RHEL Installation on VMware Workstation
- Details discussion about OS booting options
- Details discussion about Installation Summary
- MBR and GPT based partitioning
- Configure Post installation for RHEL/CentOS/Rocky
- Install RHEL EC2 instance of AWS cloud

## Module 07: Install Ubuntu Operating System

- Choose Ubuntu Version (Desktop or Server Edition)
- Required Hardware Resources for Ubuntu Installation
- Partition requirements for Ubuntu Installation
- Ubuntu Installation Method (BIOS and EFI)
- Install Ubuntu using manual partitioning
- Configure Post installation for Ubuntu
- Login Ubuntu system (root & local user)

## Module 08: Install Kali Linux Operating System

- Choose Kali Version (VM, Live, Bare Metal)
- System Requirements for Kali Installation
- Preparing for the Kali Linux Installation
- Partition requirements for Kali Linux Installation
- Choose Kali Linux desktop environment
- Configure Post installation for Kali Linux
- Login Kali Linux (root & local user)

## Module 09: Linux Desktop Environment

- The GNOME Desktop Environment
- Different types of Desktop Environment
- Introducing about GNOME Desktop Environment
- Switching Linux Desktop Environment
- Familiar with RHEL Desktop Environment
- Familiar with Ubuntu Desktop Environment
- Familiar with Kali Linux Desktop Environment
- Familiar with Linux Graphical tools and features

## Module 10: Getting started with Linux CLI

- Introduction to Linux Command Line Interface (CLI)
- Working with Linux terminal, shells and Kernel
- Linux Virtual Console/Terminal concepts
- Switching between GUI and Command Console
- Logging remote Linux system using SSH
- Linux Command Syntax, Options, Argument
- Commonly use Linux commands
- Powering Off, Reboot and Logout System

## Module 11: Working with Files & Directories

- Linux Directory Structure Introduction
- Explore Linux File System
- Navigating Linux Directory Paths
- Command-line File & Directory Management
- Files & Directory handling commands

## Module 12: Linux Text Processing Tools

- Why Need Linux Text Processing Tools
- Different types of Linux Text Processing tools
- Redirecting Output to a File using **'echo'**
- Working with **tail, head, cat, less, wc**
- Working with Regular Expressions **'grep'**
- Constructing and Using Pipelines
- Familiar with Linux **'find'** commands
- Documentation for Commands

## Module 13: Linux Text Editors (vi/vim/nano)

- Why need text editor
- Different types of Linux based text editors
- Introducing to vim, gedit, nano editors
- Working with **'nano'** editor
- Working with **'vi/vim'** editor
- Working with different 'vi/vim' Modes
- Editing, Replacing, Searching with **'vi/vim'**
- Working with **'vim'** advanced features

## Module 14: User and Group Administration

- Users and Groups Introduction
- Linux User Types and Database
- Primary Groups and Supplementary Groups
- Gaining Super user Access
- Running commands as root with SUDO
- Managing Local User Accounts
- Managing Local Group Accounts
- Managing User Passwords

## Module 15: Linux File Permissions

- Explore Linux File & Directory Types
- Linux standard file permissions concepts
- Viewing File/Directory Permission and Ownership
- Linux file permission vs directory permission
- Linux User, Group and Other permission Concept
- Linux permission types: **read, write** and **execute**
- Change permission using **'chmod'**
- Change ownership using **'chown/chgrp'**
- Concepts of ACL based permission

## Module 16: Linux Boot, Process and Services

- Step by step Linux booting procedures
- Working with GRUB2 Boot loader
- Working with Linux Kernel
- Working with Linux services & daemons
- Linux service management using **'systemd'**
- Working with Linux **systemd** targets
- Linux process management introduction
- Details explain of **"TOP"** command
- Graphical process monitoring system

## Module 17: Linux File System Management

- Identifying File Systems and Devices
- Understanding Linux file system features
- Managing MBR Partitions with **'fdisk'**
- Managing GPT Partitions with **'gdisk'**
- Creating and format partition using xfs/ext4
- Mounting and Un-mounting File System
- Mount Points and **"/etc/fstab"** - Details
- Working with USB, DVD, ISO, NTFS disk
- Working with Linux Swap partition

## Module 18: Linux Network Management (IPv4)

- Understand Network Device Recognition
- Working with **NetworkManager** Services
- Introducing Network Manager tools (nmcli & nmtui)
- Configuring Host Name and Name Resolution
- Configure Static and dynamic IP (DHCP Client)
- Working with gateway and route table
- Configuring IPv4 Networking using **'nmtui'**
- Configuring IPv4 Networking using GUI Interface
- Working with Linux **'traceoute'** & **'netstat'** utilities

## Module 19: Linux Package Management System

- Introduction to Linux package management system
- Software Packages in Linux Distributions
- Linux software (package) architecture
- Package queries, install and verifying
- Dependency problems and resolution
- Concept of package repositories
- Packages Management using YUM & DNF
- Package management using apt & apt-get
- Enable Third-party Software Repositories (EPEL)

## Module 20: Configuring OpenSSH Service

- Introduction to Secure Shell (SSH)?
- SSH Server and Client Concepts
- Install and configure OpenSSH Server
- Familiar with SSH Clients (Windows, Linux, Mac)
- Access Remote Server using SSH Clients
- SSH Keys (Public and Private) Concept
- Login Linux systems using private key
- Change default SSH port (22)
- Restricting SSH Logins (root and local user)

## Module 21: Web Server with PHP & MySQL - LAMP

- Introduction to Web Server
- Apache **HTTP** vs **NGINX** Web Server
- Public DNS configuration for Web Server
- Install and configure apache **HTTPD**
- **Apache** (httpd) Configuration files details
- Configure HTML Based Hosting
- Install **LAMP** stack (Linux, Apache, PHP & MySQL)
- Install & configure PhpMyAdmin
- Install SSL Certificate on Web Server

## Module 22: Linux FTP Server and Client Configure

- Introduction to FTP Server
- How FTP Server Works
- Install and Configure FTP Server (vsFTPD)
- Access FTP with Filezilla & WinSCP
- Disable Anonymous login
- Authentication based FTP Server
- User restriction in FTP Server
- Advanced Configuration of FTP

## Module 23: Working with Kali Linux Tools

- Kali Linux features
- Why use kali Linux for Penetration testing
- Working with Kali Linux default tools
- Working with '**Wireshark**' for Packet capturing
- Working with '**Nmap**' Network scanning tool
- Working with '**tcpdump**' packet analyzer tool
- Use additional Kali Linux Framework

## Module 24: Linux Security & Troubleshooting

- Different types of Linux Security level
- Working with Linux Firewall Services
- Working with SELinux Services
- Recovering root Password for RHEL
- Recovering root Password for Ubuntu/Kali
- Common System Hardening
- Common System Troubleshooting



