

Linux Syllabus

RH124 - Red Hat System Administration - I

1. Getting Started with Red Hat Enterprise Linux

Introduction and History of UNIX & Linux

- Overview of UNIX and Linux history and development.
- Key differences between UNIX and Linux operating systems.

Comparing CentOS, Red Hat Enterprise Linux, and Fedora

- Overview of each distribution and its intended use cases.
- Major differences in support, stability, and target audience.

Difference between UNIX and Linux

- Fundamental technical and philosophical differences between UNIX and Linux.

Defining Open Source, Linux Distributions, and Red Hat Enterprise Linux

- Explanation of open-source software and community-driven development.
- Overview of different Linux distributions and their purposes.
- Specific features and strengths of Red Hat Enterprise Linux (RHEL).

2. Downloading, Installing, and Understanding the Booting Process of Red Hat Linux

Downloading and Installing VirtualBox

- Step-by-step guide to downloading VirtualBox for virtualization.
- Installation steps for VirtualBox on various platforms.

Downloading and Installing Red Hat Linux

- Instructions on downloading RHEL from Red Hat's official website.
- Installing RHEL on a virtual machine via VirtualBox.

- POST (Power-On Self Test): Initial hardware checks and diagnostics.
- BIOS/UEFI (Basic Input/Output System/ Unified Extensible Firmware Interface): Roles and differences.
- MBR (Master Boot Record): Legacy partitioning and booting process.
- GRUB/GRUB2 (Grand Unified Bootloader): Importance in multi-boot environments.
- Systemd/Initd: Role in managing services and system initialization.

Runlevels (Targets): Different targets for various system states.

Linux Architecture, Kernel, and Shells

- Linux Architecture Overview: Layers of the Linux system.
- Kernel: Core of the OS, handling hardware interaction.
- Interpreter and Shells: Bash, Zsh, and other popular shells.
- Memory Management: Virtual memory, caching, and processes.

3. Linux FHS (Filesystem Hierarchy Standard)

Understanding and Deep Dive into FHS

- Overview of Linux directory structure and purpose of each directory (e.g., /bin, /home, /etc).
- Importance of the FHS for organizing system files and ensuring compatibility.

4. Accessing the Command Line

Logging into a Linux System

- Steps for logging into Linux through the console or SSH.
- Running basic commands using the terminal.

Understanding Terminals (TTYs) and Shells

- What is TTY and how it differs from GUI terminals.
- Overview of different types of shells (Bash, Zsh, Fish).
- Basic commands and navigating through the shell environment.

- Creating, copying, moving, deleting, and organizing files.
- Overview of recursive and forced operations on directories and files.

File Content Commands

- Using commands to view and manipulate file contents:
 - head, tail, cat, more, less for displaying contents.
 - sort, uniq for organizing and filtering data within files.

Input-Output Redirection

- Understanding >, >>, and < for directing output and input.

5. Manage files from the command line

- Copy, move, create, delete, and organize files while working from the bash Shell
- understanding the commands to create, move, create, delete, sorting with
- commands by recursively and forcefully head, more, less, tail, cat commands
- Use input-output redirection

6. Get Help in Red Hat Enterprise Linux

- Resolve problems by using local help systems
- Overview of available local help resources and guides.
- Using `help` and `man` Commands
- Detailed use of the `help` command for built-in shell commands.
- Using the `man` command to access manual pages for various Linux commands.
- Technical Support for Enterprise Linux
- How to access and utilize support from Linux enterprise solutions.

7. Create, View, and Edit Text Files

- Managing Text Files
- Creating, viewing, and editing text files directly from command output or using text editors.
- Using Text Editors: vi, vim, gedit, nano
- Introduction to editors and their editing modes.
- Basics of `vi`, `vim`, `gedit`, and `nano` editors.

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- Understanding the Inode Structure
- Explanation of inodes, file metadata, and file storage.

8. Symbolic Links or Backup Methods

- Understanding Hard Links and Soft Links
- Differences between hard links and symbolic (soft) links.
- Commands to create and manage links.

9. Manage Local Users and Groups

- User and Group Management
- Creating, managing, and deleting local users and groups.
- Understanding Commands: useradd, userdel, usermod, groupadd, groupdel, groupmod, passwd, gshadow
- Command syntax and implementation of local password policies.
- Switching users and accessing different shell environments.

10. Control Access to Files

- Setting File System Permissions
 - Understanding Linux permissions for files and folders.
 - Using `chmod`, `chown`, `setfacl`, and `getfacl` to manage permissions.
- Applying Special Permissions
- Explanation and use of sticky bits for directories.

11. Monitor and Manage Linux Processes

- Process Management
 - Evaluating and controlling processes on a Red Hat system.
- Key Commands: top, ps, lscpu
 - Monitoring system processes and analyzing CPU information.

12. Control Services and Daemons

- Using systemd for Service Management
 - Controlling and monitoring network services and system daemons.
- Key Commands: systemctl, service
 - Understanding different service modes (status, start, stop, restart, enable).

13. Configure and Secure SSH

- Setting Up Secure Remote Access with SSH
 - Configuring OpenSSH for secure remote access.
- SSH Authentication Modes
 - Setting up SSH authentication using asymmetric keys (public/private key pairs) for password-less login.
 - Enabling and managing password authentication.

14. File and Folder Transfer and Downloading

- Transferring Files Across Systems
 - Methods for transferring files between Linux-Linux, Linux-Windows, and Linux-Mac systems.
- Understanding SFTP, SCP, and Rsync Commands
 - Secure file transfer and remote copy techniques.
- Using WinSCP and FileZilla
 - GUI tools for file transfer between systems.
- Downloading with wget and curl
 - Command-line utilities for downloading files from the internet.

15. Analyze and Store Logs

- System and User Logs for Troubleshooting
 - Locating and interpreting logs to troubleshoot system issues.
- Types of Logs
 - Overview of system logs, user logs, and their locations.

16. Manage Networking

- Network Configuration on RHEL Servers
 - Configuring network interfaces and IP settings.
- Networking Commands: iptables, netstat, telnet, ss, ifconfig, nslookup, dig
 - Overview of networking commands for configuration and troubleshooting.

17. Archive and Transfer Files

- Archiving and Copying Files
 - Techniques for archiving and transferring files between systems.
- Archiving Commands: zip, gunzip, bzip2, tar
 - Command syntax and usage for compressing and archiving files.

18. Searching the Contents in Linux

- Content Search Utilities
 - Using `grep`, `locate`, and `find` commands to search file contents and locations.

19. Install and Update Software Packages

- Package Management in RHEL
 - Installing, updating, and managing software with package repositories.
- Commands: rpm, yum, wget
 - Using `rpm` and `yum` for package management; downloading packages with `wget`.

20. Access Linux File Systems

- Accessing and Managing File Systems
- Inspecting and working with mounted file systems.
- Commands: fstab, mtab, blkid
 - Using system files and commands to manage file system mounting and identification.

21. Analyze Servers and Get Support

- Investigating Issues and Getting Support
- Troubleshooting using the web-based management interface.
- Accessing Red Hat support for server-related issues.

22. Comprehensive Review

- Hands-on Exercises
- Review and apply course concepts through practical exercises.

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1 : Schedule Future Tasks

- Understanding cron jobs, crons, anacron, and crontab.

2 : Tune System Performance

- Understanding system memory, IOstat, and Network.
- Overview of /proc, top, and ps commands.
- Understanding virtual memory, system activity reporting, and iostat.

3: Manage SELinux Security

- Importance of SELinux in Linux.
- Implementing SELinux modes: targeted, permissive, enabled, disabled, and enforcing.

4: Maintain and Manage Basic Storage

- Understanding file systems and file system types: ext2, ext3, ext4, xfs, btrfs, etc.
- Hard disk storage partitioning and formatting.
- Working with LVM (Logical Volume Management): creating, resizing, and extending LVM.

5: Network-Attached Storage or File Server

- Configuring NFS (Network File System): creating, accessing, and deleting NFS shares.

6 : Control the Boot Process

- Understanding run levels to control the boot process.

7: Manage Network Security

- Configuring IP tables.
- Working with Ethernet cards

AWS Syllabus

Course Content for AWS Cloud Training

Amazon Web Services-Essentials

Course Objectives:

- ❖ Recognize terminology and concepts as they relate to the AWS platform
 - ❖ Navigate the AWS Management Console Understand the security measures AWS provides
 - ❖ Differentiate AWS Storage options and create an Amazon Simple Storage Service (S3) bucket
 - ❖ Recognize AWS Compute and Networking options and use Amazon Elastic Compute Cloud (EC2) and Amazon Elastic Block Storage (EBS)
 - ❖ Identify Deployment and Management options
 - ❖ Load balance and Auto-Scaling with EC2
 - ❖ Use EC2 APIs
- Debug AWS EC2 instance

Why Choose Apponix for AWS Cloud Training?

- Apponix has excellent qualified AWS Trainers
- 100% student satisfaction rate, we will continue that in future.
- 5000+ satisfied students overall till now.
- Excellent Lab facility for AWS Training
- There are no hard & fast rules for timings.
- All our trainers are min 7+ years of AWS cloud experience

1: Introduction to AWS

- Navigate the AWS Management Console
- Recognise AWS Global Infrastructure
- Describe the security measures AWS provides
- Create an Amazon EC2instance
- Remotely connecting to an EC2instance
- Setting up Amazon Linux and Apachewebserver
- Browsing Amazon Machine Images(AMI)
- Specifying security groups and keypairs
- Creating new images off of running instances.

2: AWS Storage

- Identify key AWS storage options
- Describe Amazon EBS
- Use Amazon EBS with AmazonEC2
- Working with Volumes and snapshots
- Transmitting data in/out of the Amazon cloud

3: Installing Software in your Amazon Instance

- Implementing a Web server in an Amazon Linux/Windows Instance
- Configure the firewall to access a Web server

4: Security in Public Cloud

- Security issues in PublicCloud
- Securing the Access : Creating a RSA Public/Private Keyfor VMs

- Creating a software firewall
- Configuring firewall rules
- Securing the access with an Elastic IPs
- Managing users with Identity Access Management(IAM)

5: Alternate access

- Using EC2 Command Line APIs [from Windows/Linuxmachines]

6: Load-balancing with EC2 and Auto Scaling

- Creating and using LoadBalancers
- Distributing incoming traffic with elastic loadbalancing
- Dynamically adding and removing instances with AutoScaling

7: Cloud Watch to be seen along with Auto Scaling

- Overview of Monitoring and Setting Alarms
- Visualising utilization metrics withCloudWatch
- Setting alarms to send and receive notifications

8: Simple Notification Services [to be seen along with AutoScaling]

- Using SNS to send Notifications

9: Amazon S3 Basics

- Creating Buckets
- Creating Folders
- Uploading Objects
- Making Objects Public
- Creating Buckets
- Securing Bucket/Object access
- Configuring a Bucket as Static Web Page
- Controlling Life Cycle of a Bucket
- Accessing Amazon Buckets from Windows/Linuxdesktops/Servers

10: Virtual Private Cloud

- Create a VPC [VPC with a Single PublicSubnet]
- Create and attach an Internet gateway
- Create an Amazon VPCsubnet
- Set up routing in the VPC
- Set up a security group to control the inbound and out bound traffic
- Launch an instance into the subnet
- VPC console to allocate an Elastic IP address and assign it to theinstance
- Amazon EC2 console to terminate your instance and the Amazon VPC console to delete your VPC

11: AWS-RDS

- Overview of AWS RDS
- Launching a My SQL Database in RDS
- Creating Backups/Snapshots and Read OnlyDBs
- Connecting to RDS-DB using localDB-Clients
- Terminating a DB instance

12: AWS-IAM

- Creating Groups and Defining access policy
- Creating Users
- Login to AWS account using new users

13: Installing Software in your Amazon Instance

- Implementing a Web server in an AmazonLinux/Windows Instance
- Configure the firewall to access a Web server

14: AWS-Cloud Formation

- Introduction to Cloud Formation
- Launching instances in EC2 using Templates

15: AWS-Cloud Front

- Concepts of AWS-Cloud Front
- Host a Website with Cloud Front

16: AWS-Route53

- Creating a Failover setup for Load Balancers running in different AWS regions[users need to have a registered Domain]
- Health Check a private website

17 : AWS-Cloud Trial

- Using Cloud Trial to trail the API Calls

18: Hosting Applications with Elastic Beanstalk

- Improving application delivery with Platform as a Service(PaaS)
- Deploying scalable applications on the AWS cloud
- Selecting and launching an application environment (sample application in PHP and My SQL)

19 : Dynamo DB

- Overview of AWS Dynamo DB
- Dynamo DB Tables and Naming Conventions
- Data Types in Dynamo DB
- Dynamo DB Capacity Units
- Configuring Alarms
- Tacking Backup and Restore

20 : Lambda Function

- Overview of AWS Lambda
- Creating a Lambda Function with Node.js
- Lambda Pricing & Uploading Code
- Connecting Lambda Functions to API Gateway Endpoints
- Accessing Lambda Logs

- Getting Started with Body Mapping Templates

21: API Gateway

- Overview of API Gateway
- Create a RESTAPI
- Create Resource
- Create HTTP Methods
- Deploy API
- Integrating with Lambda function

22: Simple QueueService

- Overview ofSQS
- Create Standardqueue
- Create FIFO queue
- With Timer or Delay to a Standard queue

23: End user Computing, Organization setup and Resource Sharingwith(SSO)

- Directory services (Launching AWS managed AD)
- SSO integration with AD users
- Work Email
- Work docks
- Workspaces
- AWS management SSO login

24: AWS System Manager

- Run command
- Content De-duplication
- Delete the queue

25: Compute

- 2 and 3 tier web architecture running in EC2 (windows and Linux)
- Multiple Child application Running in EC2 (windows and Linux)
- Light sail implementation
- ECS and ECR launching Docker images
- Understanding of launching On Demand Instances, Reserved, spot, Dedicated Hostsand Dedicated Instance

26: AWS-Automation with Python Boto3module

- Complete In Depth understanding and implantation AWS-Automation by usingBoto3 Module
- Launching EC2 and Entire VPC creation by using Pythoncode.
- Creation S3 Buckets by writing pythonboto3module
- Creating IAM users and Roles and Polices by using Python boto3module

27: Security, Identity and Compliance Management

- Securing the web application by using the WAF
- AWS Inspector
- AWS security Manager (SSL/TLS Certificates)
- AWS Shield
- AWS Artifact
- AWS Key Management Service
- Compliance
- Patch Manager

28: AWS Cost Management

- AWS Cost Explorer
- AWS Budgets
- AWS Market place Subscriptions

DevOps Syllabus

DevOps Overview

- Devops roles have increased from 10% to 45% in 2018 and Nearly 70% of the system administrators are replaced with roles in devops.
- In short Devops is definitely a promising career for all IT professionals. In next few years 90% of the companies will adopt devops culture.
- In India average salary for a devops professionals is Rs.13,34,890 per year.
- Devops professionals have Huge demand and potential in near future. To become a devops professional you should learn few automation tools like Chef, Puppet, Ansible, Jenkins and few other very useful tools like GIT, Nagios, Dockers.
- Apponix is dedicated to provide best learning experience for its students since 6 years. We offer the best DevOps training in Bangalore, we are proud to say we are the top DevOps training provider in Bangalore, we make sure all our students will get good training experience.
- All our DevOps instructors are working in MNC and have min 7 years of experience.
- Apponix DevOps Training course is designed by industry experts and to cover latest market cloud requirements.
- DevOps Certification Training Course which will prepare you for a career in a DevOps environment, the fast-growing field that bridges the gap between software developers and operations.
- You will become an expert in deployment, automation of configuration management tools such as GIT, Docker, Jenkins, Puppet and Nagios.
- DevOps Training from Apponix will help you gain skills on tools which are used in devops environment.
- In DevOps training course you will be equipped with latest technologies used in the DevOps environment. The topics covered are very up to date and very much relevant to the devops, The skills you gain will be very helpful to work in either production support team, projects team or BAU Team.

DevOps Training course objectives:

- In-depth knowledge on Continuous Development, Continuous Integration, and Continuous Testing by performing hands-on on GIT, Jenkins and Selenium
- Comprehensive knowledge on Configuration Management, and Continuous Deployment using Puppet, Ansible Working on Continuous Deployment stage by performing hands-on on popular tools like Docker and Kubernetes
- The exposure to the stage of continuous monitoring using Nagios
- The ability to automate all aspects of a modern code delivery and deployment pipeline using: Source code management tools

- Build & monitoring tools
- Test automation tools
- Containerization through
- Docker Configuration management tools

Why choose Apponix as a Top DevOps Training institute in Bangalore?

- Apponix has excellent trainers for Devops with rich experience in industry.
- 100% student satisfaction rate in DevOps training
- More than 1000 students completed training in devops since 2013
- Excellent Lab facility for DevOps Training
- We have excellent rating till date, overall 4.9 Rating in Google & Facebook.

Course Duration: 40 Hours

DevOps Training Course Content

1: Devops Lab Setup tools for Linux and windows Environment

- GitBash installation and Github account setup
- Tomcat installation and Configuration
- Jfrog Artifactory installation and Configuration
- Maven Installation and Configuration
- Jenkins installation and Configuration
- Ansible Installation and Configuration
- Sonarqube installation and Configuration
- Docker Installation and configuration
- Java installation and Configuration
- Environmental variable setup for both windows and Linux

2: Introduction to Devops and Dev secops

- Introduction to DevOps
- What is DevOps?
- SDLC models, Lean, ITIL, Agile
- Why DevOps?
- History of DevOps
- DevOps Stakeholders
- DevOps Goals
- Important terminology
- DevOps perspective
- DevOps and Agile
- DevOps Tools
- Configuration management
- Continuous Integration and Deployment

3: Introduction to SDLC, Software testing, Agile: Software testing lifecycle

- Working with Blockbox testing
- Working with Whitebox testing
- Working Greybox testing
- Working with Function testing
- Working with Regressing testing, smoke testing, System testing, Integration testing etc.

4: Agile Methodologies:

- Process flow of Scrum Methodologies
- Project planning, scrum testing, sprint Planning and Release management
- Analysis
- Design, Execution and wrapping closure

5: LINUX Administration

- Introduction to Linux Families(ex: Redhat & Debian Family)
- Working with APT and YUM and Dnf
- Working with AWK and SED commands

6: Installation and Initialization:

- Installation, Package Selection
- Anatomy of a Kick start File, Command line
- Introduction to BashShell
- System Initialization, Starting the BootProcess : GRUB.

7: Boot and Package Management:

- Securing single-user mode(sulogin)
- Shutting down and rebooting the system
- RPM Package Manager, Installing and Removing Software, Updating a Kernel RPM
- Yum Command set, Install packages by using yum.
- Apt-get command set, Apt-cache package management.

8: User Administration:

- Understanding different types of groups and creation of groups
- Creation of users in different groups
- Understanding Passwd, Shadow Files
- Understanding passwd aging
- Creation of quotas for users, groups and file systems
- Understanding users security files
- The different commands for Monitoring the users
- TROUBLESHOOTING
- Automation of jobs–Cron, at
- Working with command star, find, grep, etc.

9: Run levels:

- Understanding the different types of run-levels
- Understanding different types of shutdown commands
- Understanding run control scripts
- Understanding the different types

Version Control/SCM (Git)

1: Introduction to Git

- Overview of SVN, GIT, Clear case, perforce & Comparison
- Introduction of Git
- Selecting Git Client
- Creating Repository
- Working with Tag
- Creating and Merging Branches
- Executing Git Commands
- Git Logs, Git stash, Git rebase
- Merge conflict issues resolving
- Git pull, clone, fetch

Ansible Modules

1: Introduction to Ansible

- What is Ansible
- Change Management
- Provisioning with Ansible
- Benefits of using Ansible

2: Ansible Building blocks and Processflow

- Introduction to Ansible Anatomy
- Ansible Requirements Specification
- Overview of Ansible Components
- Overview of Ansible Strategy

3: Ansible Playbook Modules and directory structure

- Introduction to Ansible Playbook
- Introduction to Ansible Modules
- Lab(Docs, setup, service, yum...etc)

4: Variable, Facts and Jinja 2 templates

- Working with Ansible Variable
- Working with Facts
- Working with Jinja2 Template

5: Play and Playbooks

- Overview of Ansible Playbooks
- Playbook Language Example
- Working on Ansible Handlers
- Executing a Playbook.

Docker Modules

1: Getting Started with Docker

- Introduction to Docker.
- What's under the hood-Namespaces, C groups and Overlay FS
- Understanding Virtualization
- Virtualization vs Container

2: Docker Installation

- Creating a Virtual Docker Host(CentOS)by using Vagrant
- Installing Docker on CentOS
- Introduction to Docker namespaces

3: Docker Images

- Introduction to Docker Images
- Building a Docker Image with a Docker file
- Sharing Data in Your Docker Host with Containers
- Sharing Data Between Containers
- Copying Data to and from Containers
- Creating Docker Hub Account.
- Building Images using Docker File.
- Pull and Push Images From/To Docker Hub.

4: Docker Networking

- Introduction to Docker Networking
- Finding the IP Address of a Container
- Setting Up a Custom Bridge Network for Docker

5: Container Operations

- Port Mapping for Docker
- Creating, Starting, Stopping, Renaming, Removing Containers
- Inspecting Containers
- Limiting R resources Memory and CPU
- Prioritizing CPU Utilization

6: Docker Compose

- Introduction to Docker compose
- Creating Docker compose file
- Executing Docker Compose file

Jenkins Modules

1: Introduction to Continuous Integration and Jenkins-CI/CD

- What is Continuous Integration
- Jenkins Continuous Integration
- What is Continuous Deployment
- Jenkins Vs Jenkins Enterprise

2: Jenkins Installation

- Downloading and Installing Jenkins using Tom Cat
- Creating Jenkins as a Service.
- Starting and Stopping Jenkins

3: Configure Jenkins and User Management.

- Secure Jenkins
- Create a new user
- Generates sh key for Jenkins user
- Plug-in management

4: Jenkins jobs setup

- Setting up a Jenkins job(Freestyle, Pipeline, maven, MS Build, Py build)
- Jenkins parameterized jobs setup(choice params, boolean params etc)
- Email notification jobs
- Parallel jobs configuration
- nodes(slaves) configuration

5: Jenkins Integration

- Git integration with Jenkins
- Maven Integration with Jenkins
- Ansible, Artifactory integration
- Docker and scanning tool integration
- AWS and code review tool

6: Jenkins User administration

- Role based administration
- Project based administration
- Metric based administration
- Slaves configuration
- Users and groups creation

Maven Modules

1: Build Tools overview

- What is maven and Msbuild, Pybuild, gradle and ant
- Maven Evolution
- Maven Objective and Environment setup
- Maven project creation
- What is POM. Xml and superPOM
- Maven build lifecycle creation and Default Build lifecycle

2: Customized Project and plugin setup

- Maven Project setup
- Maven plugin download and setup
- Maven Build automation with CI service

3: Maven Repositories and GAV snapshots.

- What is GAV and project and Snapshots, version
- Maven Web application creation with pom.xml
- What is Maven repository
- Local repo
- Central repo and Remote repo
- Maven Dependencies and plugin

Complete guide to Kubernetes

1: Introduction to Kubernetes

- The need for a Container Orchestration Engine
- Battles of COEs, which one to choose
- Key Features of a COE.
- What makes Kubernetes the defac to COE choice.
- Negatives of using Kubernetes

2: Key Concepts of Kubernetes

- Namespaces
- Pods
- Replica Sets and Deployments
- Service Discovery and Load Balancing
- Config maps, Storage, Network, RBAC
- Stateful sets, Crons and Jobs
- Kubernetes Architecture

3: Setting up Environment

- Provisioning and configuring on AWS
- Initialize Cluster with Kubeadm
- Setting up Weave CNI
- Launching Kubernetes Dashboard
- Setting up a Kubernetes Visualizer
- Resetting cluster created with kubeadm

4: Building blocks of Pods

- Introduction to pod
- Writing pod Specification
- Launching and Operating Pods(Logintothepod,browsingthewebUIofthepod)
- Attaching a volume to a Pod
- Launching Multi-Container Pods
- Connecting to Individual Containers
- Launching Replica Set and Fault Tolerance
- Solution part-Deploying a worker app

5: Managing Application Configurations with Config Maps and Secrets

- Introduction to Config Maps and Secrets
- Creating Config Map for Vote app
- Setting up Environment Specific Configs
- Adding Configs from Files
- Creating Secrets to Encrypt Database
- Setting Environment vars using Secrets.

6: Setting up Fire wall with Network Policies

- Creating default network policy for namespace
- Exposing public facing app and allowing inter namespace communication