Red Hat Certified Engineer
Linux System and Networking Administration: Level 1

Nature of the Course: Theory + Practical
Total Hours per Day: 2 Hours
Course Duration: 5 Days

Course Summary

The Red Hat Certified Engineer course will help you prepare for the Red Hat certification exam. A current Red Hat Certified System Administrator is eligible to achieve this certification (RHCSA). This course will prepare you for the Red Hat performance-based certification exam, which will demonstrate your knowledge, skills, and experience as a senior system administrator in charge of Red Hat Enterprise Linux systems. The course aims to make students fully understand the most important and fundamental concepts of Linux server administration, and guide how to apply those concepts to use in real-world situations. This is a core basic level course that is essential for anyone who has no prior programming experience but wishes to be a professional Java engineer in future. This course is best suited for anyone who has worked as a user (not necessarily as an administrator) on any variety of UNIX (Linux, Solaris, HP-UX, AIX, etc.) or has done some system administration on Windows.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

1. Has attended 90% of all classes held
2. Has received an average grade of 80% on all assignments
3. Has received an average of 60% in assessments
4. The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

Required Text Books

1. William E. Shotts Jr., "The Linux Command Line", No Starch Press.
2. Daniel J. Barrett, "Linux Pocket Guide", O'Reilly.

Course Details

UNDERSTAND AND USE ESSENTIAL TOOLS

- Access a shell prompt and issue commands with correct syntax
- Use input-output redirection (>, >>, |, 2>, etc.)
- Use grep and regular expressions to analyze text
- Access remote systems using ssh
- Log in and switch users in multiuser targets
- Archive, compress, unpack, and uncompress files using tar, star, gzip, and bzip2
- Create and edit text files
- Create, delete, copy, and move files and directories
- Create hard and soft links
- List, set, and change standard ugo/rwx permissions
- Locate, read, and use system documentation including man, info, and files in /usr/share/doc

OPERATE RUNNING SYSTEMS

- Boot, reboot, and shut down a system normally
- Boot systems into different targets manually
- Interrupt the boot process in order to gain access to a system
- Identify CPU/memory intensive processes, adjust process priority with renice, and kill processes
- Locate and interpret system log files and journals
- Access a virtual machine's console
- Start and stop virtual machines
- Start, stop, and check the status of network services
- Securely transfer files between systems

CONFIGURE LOCAL STORAGE

- List, create, delete partitions on MBR and GPT disks
- Create and remove physical volumes, assign physical volumes to volume groups, and create and delete logical volumes
- Configure systems to mount file systems at boot by Universally Unique ID (UUID) or label

- Add new partitions and logical volumes, and swap to a system non-destructively.

LABS

Lab assignments will focus on the practice and mastery of contents covered in the lectures; and introduce critical and fundamental problem-solving techniques to the students.

Intermediate Linux System and Networking Administration: Level 2

Nature of the Course: Theory + Practical
Total Hours per Day: 2 Hours
Course Duration: 3 Weeks

Course Summary

The goal of the DTC – Linux System and Networking Administration course is to ensure that students fully comprehend the most significant and fundamental ideas of Linux server administration, as well as how to apply those concepts in real-world scenarios. This is a core basic level course that is essential for anyone who has no prior programming experience but wishes to be a professional Red Hat Certified engineer in future.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

1. Has attended 90% of all classes held
2. Has received an average grade of 80% on all assignments
3. Has received an average of 60% in assessments
4. The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

Required Text Books

1. Daniel J. Barrett, "Linux Pocket Guide", O'Reilly.
2. Brian Ward, "How Linux Works", No Starch Press.

Prerequisites

- Successfully complete the entrance test with score of at least 40% (for trainees directly applying to this level).
- Successfully complete the DWIT Training - RHCSA – Level 1 course (not applicable to trainees directly applying to this level).
- Successfully complete the interview.
- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to self-study and practice.

Course Details

WEEK 1

CREATE AND CONFIGURE FILE SYSTEMS

- Create, mount, unmount, and use vfat, ext4, and xfs file systems
- Mount and unmount CIFS and NFS network file systems
- Extend existing logical volumes
- Create and configure set-GID directories for collaboration
- Create and manage Access Control Lists (ACLs)
- Diagnose and correct file permission problems

WEEK 2

DEPLOY, CONFIGURE, AND MAINTAIN SYSTEMS

- Configure networking and hostname resolution statically or dynamically
- Schedule tasks using at and cron
- Start and stop services and configure services to start automatically at boot
- Configure systems to boot into a specific target automatically
- Install Linux systems as virtual guests
- Configure systems to launch virtual machines at boot
- Configure network services to start automatically at boot
- Configure a system to use time services
- Install and update software packages from Network, a remote repository, or from the local file system
- Update the kernel package appropriately to ensure a bootable system
- Modify the system bootloader

WEEK 3

MANAGE USERS AND GROUPS

- Create, delete, and modify local user accounts
- Change passwords and adjust password aging for local user accounts
- Create, delete, and modify local groups and group memberships
- Configure a system to use an existing authentication service for user and group information

MANAGE SECURITY

- Configure firewall settings using firewall-config, firewall-cmd, or iptables
- Configure key-based authentication for SSH
- Set enforcing and permissive modes for SELinux
- List and identify SELinux file and process context
- Restore default file contexts
- Use boolean settings to modify system SELinux settings
- Diagnose and address routine SELinux policy violations

LABS

Lab assignments will focus on the practice and mastery of contents covered in the lectures and introduce critical and fundamental problem-solving techniques to the students.

Advanced Linux System and Networking Administration: Level 3

Nature of the Course: Theory + Practical
Total Hours per Day: 2 Hours
Course Duration: 3 Weeks

Course Summary

The goal of the DTC – Linux System and Networking Administration course is to ensure that students fully comprehend the most significant and fundamental ideas of Linux server administration, as well as how to apply those concepts in real-world scenarios. This is a core basic level course that is essential for anyone who has no prior programming experience but wishes to be a professional Red Hat Certified engineer in future.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

1. Has attended 90% of all classes held
2. Has received an average grade of 80% on all assignments
3. Has received an average of 60% in assessments
4. The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

Required Text Books

1. Roderick W. Smith, "Advanced Linux Networking", Addison-Wesley Professional.
2. Daniel J. Barrett, "Linux Pocket Guide", O'Reilly.

Prerequisites

- Successfully completed the DWIT Training – RHCSA – Level 2 or obtained at least 40% score on the entrance exam.
- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to read/write codes in RHCSA (self-study and practice).
- Please note that this is a lab intensive course where the students will be expected to work on lab exercises for approximately half the duration of the session.

Course Details
WEEK 1
SYSTEM CONFIGURATION AND MANAGEMENT
- Route IP traffic and create static routes.
- Use iptables to implement packet filtering and configure network address translation (NAT).
- Use /proc/sys and sysctl to modify and set kernel runtime parameters.
- Produce and deliver reports on system utilization (processor, memory, disk, and network).
- Use shell scripting to automate system maintenance tasks.
- Configure a system to log to a remote system.
- Configure a system to accept logging from a remote system.

WEEK 2
NETWORK SERVICES
- Install the packages needed to provide the service.
- Configure SELinux to support the service.
- Configure the service to start when the system is booted.
- Configure the service for basic operation.
- Configure host-based and user-based security for the service.

WEEK 3
HTTP/HTTPS, DNS, FTP NFS, SMB, SMTP, SSH & NTP
- Configure a virtual host
- Configure private directories.
- Deploy a basic CGI application.
- Configure group-managed content.
- Configure a caching-only name server
- Configure a caching-only name server to forward DNS queries.
- Provide network shares to specific clients.
- Provide network shares suitable for group collaboration.
- Configure a mail transfer agent (MTA) to accept inbound email from other systems.
- Configure an MTA to forward (relay) email through a smart host.
- Configure key-based authentication.
- Configure additional options described in documentation.

- Synchronize time using other NTP peers.

LABS
Lab assignments will focus on the practice and mastery of contents covered in the lectures and introduce critical and fundamental problem-solving techniques to the students.

Learning Outcomes
- Learn how to install and manage Linux distributions and packages.
- Explain how to set up and use Linux's networking capabilities.
- Explain the concept of Linux Network Security
- Determine how to backup data on a Linux system and how to set up a Web, NFS, SAMBA, and print server.
- Create shell scripts and modify them to handle server management.
- Capable of performing the duties of a Unix system administrator Students will learn how to process files, manage processes, manage IO, manage queues, and network.