



## **DTC - RED HAT CERTIFIED ENGINEER**

# Linux System and Networking Administration: LEVEL 1

## OBJECTIVES

The DTC – Linux System and Networking Administration course is targeted for beginners who want to:

- The course aims to make students will fully understand the most important and fundamental concepts of Linux server administration, and will be able to put those concepts to use in real-world situations.
- This is a core basic level course that is essential for anyone who have no prior programming experience but wish to be a professional Linux engineer in future

## TARGET GROUP

- Anyone who have worked on any flavor of UNIX (Linux, Solaris, HP-UX, AIX etc.) as a user (not necessarily as an administrator), or have done some system administration on Windows NT, you will find the course to be accessible.

## TRAINING METHOD

The course is spread over 40 hours that consists of lecture and lab work. There will be approximately 10 hours of lectures and 30 hours of hands-on lab work.

- Lab exercises are mandatory, have a fixed deadline, and are graded. The course puts heavy emphasis on lab exercises because software programming can only be learnt well by explicitly putting into practice the principles that have been taught (i.e. in simpler terms – by doing lots and lots of coding). Late submission (past the deadline) of exercises incur some penalty from total points.
- Instructors may provide relevant lecture/lab notes to students as (and when necessary in the form of printed handouts and or via emails.
- Instructors may provide supplementary code snippets to students via email or in lab class to support the theory and or lab material that is being taught.
- At the end of the course, students may have to give an exam (which will be optional), that will test their knowledge on the material covered during the course. This exam may be practical and/or theoretical and is mandatory for any student wishing to join a higher level.
- Students are graded on the basis of attendance, lab exercises and exam in the increasing order of importance.

## COURSE DURATION

- 40 hours
- Classes
  - ✓ Morning/Evening

## Course content summary

- Introduction to the command line
- Managing physical storage
- Learning how to install and configure software components and services
- Establishing network connections and firewall access
- Monitoring and managing processes
- Managing and securing files
- Administering users and groups
- Accessing Linux file systems
- Installing and using virtualized systems
- Reviewing the system log files and journal

## COURSE BREAKDOWN

### Theory:

1. 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
  
2. 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

3. 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.

## DISCLAIMER

Please note that Deerwalk Training Center reserves the right to change the course syllabus of DTC - Linux System and Networking Administration – Level 1 course at any time without prior notification.

# Linux System and Networking Administration: LEVEL 2

## OBJECTIVES

The DTC – Linux System and Networking Administration – Level 2 course is targeted for trainees:

- The course aims to make students will fully understand the most important and fundamental concepts of Linux server administration, and will be able to put those concepts to use in real-world situations.
- This is a core basic level course that is essential for anyone who have no prior programming experience but wish to be a professional Linux engineer in future

## TARGET GROUP

- Anyone who have worked on any flavor of UNIX (Linux, Solaris, HP-UX, AIX etc.) as a user (not necessarily as an administrator), or have done some system administration on Windows NT, you will find the course to be accessible.

## TRAINING METHOD

The course is spread over 40 hours that consists of approximately 15 hours of lecture and 25 hours of hands-on lab work.

- Lab exercises are mandatory, have a fixed deadline, and are graded. The course puts heavy emphasis on lab exercises because software programming can only be learnt well by explicitly putting into practice the principles that have been taught (i.e. in simpler terms – by doing lots and lots of coding). Late submission (past the deadline) of exercises incur some penalty from total points.
- Instructors may provide relevant lecture/lab notes to students as (and when) necessary in the form of printed handouts and or via emails.
- Instructors may provide supplementary code snippets to students via email or in lab class to support the theory and or lab material that is being taught.
- At the end of the course, students may have to give an exam (which will be optional), that will test their knowledge on the material covered during the course. This exam may be practical and/or theoretical and is mandatory for any student wishing to join a higher level.
- Students are graded on the basis of attendance, lab exercises and exam in the increasing order of importance.

## COURSE DURATION

- 40 hours
- Classes
  - ✓ Morning/Evening

## COURSE BREAKDOWN

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
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
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
4. 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.

## DISCLAIMER

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# Linux System and Networking Administration: LEVEL 3

## OBJECTIVES

The DTC – Linux System and Networking Administration – Level 3 course is targeted for trainees:

- The course aims to make students will fully understand the most important and fundamental concepts of Linux server administration, and will be able to put those concepts to use in real-world situations.
- This is a core basic level course that is essential for anyone who have no prior programming experience but wish to be a professional Linux engineer in future

## TARGET GROUP

- Anyone who have worked on any flavor of UNIX (Linux, Solaris, HP-UX, AIX etc.) as a user (not necessarily as an administrator), or have done some system administration on Windows NT, you will find the course to be accessible.

## TRAINING METHOD

- The course is spread over 40 hours that consists of approximately 15 hours of lecture and 25 hours of hands-on lab work.
- Lab exercises are mandatory, have a fixed deadline, and are graded. The course puts heavy emphasis on lab exercises because software programming can only be learnt well by explicitly putting into practice the principles that have been taught (i.e. in simpler terms – by doing lots and lots of coding). Late submission (past the deadline) of exercises incur some penalty from total points.
- Instructors may provide relevant lecture/lab notes to students as (and when) necessary in the form of printed handouts and or via emails.
- Instructors may provide supplementary code snippets to students via email or in lab class to support the theory and or lab material that is being taught.
- At the end of the course, students may have to give an exam (which will be optional), that will test their knowledge on the material covered during the course. This exam may be practical and/or theoretical and is mandatory for any student wishing to join a higher level.

## COURSE DURATION

- 40 hours
- Classes
  - ✓ Morning/Evening



## COURSE BREAKDOWN

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.
  - Configure a system to authenticate using Kerberos.
  - Configure a system as an iSCSI initiator that persistently mounts an iSCSI target.
  - 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.
  
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.
  
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.

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A Red Hat® Certified Engineer (RHCE®) is a Red Hat Certified System Administrator (RHCSA) who possesses additional skills, knowledge, and abilities required of a senior system administrator responsible for Red Hat Enterprise Linux® systems. An RHCE is capable of Configuring static routes, packet filtering, and network address translation. Setting kernel runtime parameters. Configuring an Internet Small Computer System Interface (iSCSI) initiator. Producing and delivering reports on system utilization. Using shell scripting to automate system maintenance tasks. Configuring system logging, including remote logging. Configuring a system to provide networking services, including HTTP/HTTPS, File Transfer Protocol (FTP), network file system (NFS), server message block (SMB), Simple Mail Transfer Protocol (SMTP), secure shell (SSH) and Network Time Protocol (NTP).