

Course Catalog  
2012-2013

# L I N U X



# Advanced System & Network Administration using Linux

This course will cover all aspects of RHCE (Red Hat Certified Engineer) Certification and the basics of Linux in detail. This course is also designed for those new bees in Linux, Technocrats, Linux Administrator, Windows Administrator, who want to make the best of Linux capabilities in IT organizations. This course is completely targeted for industrial Environment with In Detailed Practical Approach to LINUX. During this course you will be exposed to Such Linux Capabilities Which are an essential for building great secured Linux Corporate Server Environment.

## Course Objectives

Upon knowledge and skills that you must have before attending this course are as follows:

- Linux System Administration
- Linux Network Administration
- Linux Security Administration
- Advanced Linux System & Network Administration

## Who Should Attend

The knowledge and skills that you must have before attending this course are as follows:

- Basic computer literacy
- Windows navigation skills
- Basic Internet usage skills
- Fundamental understanding of data networking and IP addressing

## Prerequisite

This course is intended for the following audience:

- Network Administrator
- Network Engineer
- Systems Engineer
- RHCE Exam Candidates

## Course Duration

60 Hours, 20 Classes, 3 Hours per class

# Course Details

## Lesson 01: Introduction to UNIX & LINUX

- History of UNIX and LINUX
- Linux and GNU Project
- Operating System Concept, Kernel, Shell & File
- Basic concepts of Linux
- Identification of various Linux distributors
- Planning a Linux Installation
- Partitioning Requirements
- Linux Installation Method
- Dual Booting with Windows Operating System
- installation of Linux with VMware
- The User Interfaces

## Lesson 02: Getting started with Linux

- Linux Command line syntax
- Linux Directory & File System introduction
- Files, directories and paths
- Files & Directory handling commands
- Useful text & shell filters
- Linking files with Hard link & soft link
- Redirection and Pipes
- Introduction to the Linux Text Editor
- Searching and Replacing Text
- Using sed for search and replace
- Searching for text with grep
- Documentation for commands

## Lesson 03: Linux Boot Process

- System startup procedure
- Startup & Shutdown Scripts
- Configuring a boot loader: GRUB
- Securing single-user mode
- Explain Linux Boot process
- Explained Linux Runlevel (0 - 6)
- The /etc/rc.d/rc.sysinit Program
- Determining and changing run level
- Demonstrate Daemon/Service management
- Control Services using chkconfig, ntsysv etc.
- Identify Inetd & Xinetd based services

## Lesson 04: User and Group Administration

- User Administration and Management
- Adding a new user and group
- Managing user profile files
- Password management using passwd, chage etc
- Authentication policies and User Private Groups
- User Login Activity: Whoami, Who, w, lastb
- Switching to another user
- Simple Sudo user, Sudo Examples
- Granting All Access to Specific Users
- Extended file permissions including suid, sgid

# Course Details

## Lesson 05: Advanced File Permissions

- Explain UNIX/Linux file security & permissions
- Setting Permissions with chmod
- Changing User and Group Ownership: chown, chgrp
- Advance File Permissions: set user id (suid bit), set group id (sgid bit) and sticky bit
- Creating, modifying and deleting ACL's

## Lesson 06: File System Management

- The unified Unix file system
- The Filesystem Hierarchy Standard
- Understanding linux file systems
- Inodes and Directories
- Managing Partitions: fdisk, parted, partprobe
- Making File systems: mkfs, mkfs.ext3
- Adjusting Filesystem parameters: tune2fs
- Mount Points and /etc/fstab - explore File System
- Mounting File systems with mount and Unmount
- Additional swap space using swapon & swapoff

## Lesson07: Network Management

- Understand network device recognition
- Configuring Network Interfaces
- Controlling Network Devices: ifup/ifdown
- Network Tools mii-tool, ifconfig, ethtool etc
- Static and Dynamic IPV4 Configuration
- Networking tools: ping, mtr, tcpdump, netstat
- Network IP aliasing (Device Aliases)
- Understand IP route configuration
- Enabling IP Forwarding
- IPV6 Addressing Overview
- Local Resolver entry: /etc/hosts
- Global Resolver entry: /etc/resolv.conf

## Lesson 08: System Monitoring & Process Management

- Demonstrate usage of system monitoring tools
- What is a process?
- Parent processes and child processes
- System and user processes
- Job control (fg, bg, jobs)
- Running programs in the background
- Suspending processes (Ctrl+Z)
- Monitoring & Killing processes
- Killing processes and sending signals a process
- Process niceness/priority

## Lesson 09: Backup, Archive & Recovery

- Backup concepts
- Compressing Files with gzip
- Other Compression Tools
- Archiving Files with tar
- Listing and extracting the Files in tar Archives
- Backup Media
- Types of Backup and Strategy
- Controlling Tape Drives with mt
- Other Backup Software

# Course Details

## Lesson 10: CRON Process Scheduling

- Controlling access to the 'cron' and 'at' facilities
- Using 'at' to manage one-off jobs
- Using the cron system
- System crontab files
- Monitoring cron access
- Using anacron
- Running commands at particular times
- Identify various CRON entries and schedules

## Lesson 11: Linux Software Management

- The Red Hat Package Management system
- Install & remove package manually using rpm
- RPM queries and verifying packages
- Dependency problems and resolution
- Other RPM features
- The YUM management tool
- Configure YUM repositories
- Accessing repositories from a client
- Build a simple package

## Lesson 12: Remote Administration

- Secure SHELL (SSH)
- Putty
- Telnet
- VNC server/viewer

## Lesson 13: NFS Server

- NFS Server Configuration and NFS Clients
- Setup an NFS server and export directories
- Configure NIS client as part of a domain
- Review /etc/exports parameters and options
- Evaluate access to NFS exports

## Lesson 14: Samba Server

- Implement Linux & Windows Integration via Samba
- Explore Samba Configuration files
- Mount Windows shares seamlessly using Samba File System (SMBFS)
- Samba Client Tools: smbclient, mounts
- Install Web-based Administration Tool (SWAT)

## Lesson 15: DHCP Server

- Explain the various steps of the DHCP process
- Configure global & scope-level DHCP options
- Configure IP reservations based on MAC addresses
- Enable Linux DHCP services

## Lesson 16: DNS Server with BIND 9

- Configure BIND as a primary DNS server
- Test primary name resolution from Linux hosts
- Configure BIND as a secondary(slave) DNS server
- Configure DNS zones
- Zone Database File Syntax: SOA, A, PTR, NS,CNAME, Alias, and MX-Mail Host

## Lesson 17: Mail Server (SMTP, POP3, IMAP)

- SMTP theory
- MTA, MDA, MUA Concept
- Configure Sendmail server to accept internet mail
- Relay access to my network through access database
- Mail Forwarding
- Implement POP3/IMAP services
- Implement webmail using Squirrel Mail



# Course Details

## Lesson 18: Web Server Implementation

- Discuss Apache server's features and concepts
- Examine Apache - Red Hat HTTPD CONF hierarchy
- Examine various configuration files
- Configure IP-based Virtual Hosts
- Configure Name-based Virtual Hosts
- Configure .htaccess file with directives
- Implement Apache logging system per virtual host

## Lesson 19: FTP Server

- Implement Very Secure VSFTPD File Transfer Protocol (FTP) services
- Implement anonymous FTPD
- Allow or deny for specific FTP Users
- Disable anonymous access

## Lesson 20: Proxy Server (Squid)

- Configure web browser to utilize proxy services
- Grant permissions to permit local hosts to utilize proxy services
- Configure SQUID Define an ACL for authorized IP networks
- Apply the ACL using http\_access and Test multiple HTTP-based ACLs
- Configure transparent proxy services
- Password Authentication based Proxy Server

## Lesson 21: IPTABLES (Firewall)

- Introduction to Firewalls
- NAT, SNAT, DNAT, PREROUTE and POSTROUTE
- Implement IP Forwarding between disparate subnets
- Discuss IPTABLES/Netfilter Concepts
- Explore default tables and chains

## Lesson 23: Troubleshooting your system

- Recovering the super user password
- The Rescue Environment
- Recovering the boot loader (GRUB)
- Common boot problems and their resolution
- Troubleshooting Xserver problems
- Troubleshooting network related problems

## Lesson 24: RAID, LVM and Quota

- Understanding different RAID Levels(0,1,5 and 10)
- Software RAID Configuration
- Software RAID Testing and Recovery
- Discuss Logical Volume Manager (LVM)
- Creating Logical Volumes
- Resizing Logical Volumes
- Logical Volume Manager Snapshots
- Using LVM Snapshots
- Quota management - user-based, group-based and disk-based quota implementation
- Enable file system quota
- Setting Quotas for users: setquota, edquota, quotaon, quotaoff, quotacheck
- Quota Concept:Soft Limit, Hard Limit and Grace Period
- Reporting Quota Status: quota, repquota and warnquota

## Lesson 25: Web based Administration

- Installing Webmin on Linux
- Administrating Linux machine remotely

