

This five-day course provides the student with the knowledge to perform system administrator tasks relating to the administration of filesystems, including set uid bit for permissions, partition management, mounting and unmounting, disk diagnostics, RAID, LVM and NFS disk types, and disk quotas. The course finishes with administration of hardware devices, basic networking, including TCP/IP, and system troubleshooting.

Course Objectives:

- Set permissions using the chmod and umask commands.
- Configure advanced permissions in Linux with the setuid and getuid commands.
- Administer partitions with the fdisk and parted utilities.
- Create, label, and mount filesystems.
- Describe the organization structure of ext2 and ext3 filesystem.
- Administer the filesystem with the mke2fs and fsck commands.
- Use RAID to provide redundancy across disks in an array.
- Use Logical Volume Manager to provide more flexibility and functionality than traditional partitioning schemes.
- Make filesystems of one machine available to other machines using Network Filesystems.
- Limit disk space usage by individual users or members of groups with disk quotas.
- Configure X Window System components.
- Automate repetitive system tasks with bash shell scripts.
- Describe the essentials of TCP/IP theory.
- Perform basic network setup and administration.
- Configure the print spooler and manage the print queue.
- Effectively troubleshoot a Linux system.

Audience: Entry level system administrators who want to move into more practical, in-depth Linux administration.

Prerequisites: *Linux Level I* or equivalent experience.

Number of Days: 5 days

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| <p>1. Advanced Permissions
 Special Permission: setuid
 Special Permission: setgid
 Special Permission: sticky bit
 Access Control Lists</p> | <p>Creating and modifying partitions with fdisk
 Creating and modifying partitions with parted
 The mkfs command</p> |
| <p>2. Administering Partitions
 Device names
 Virtual filesystems vs. physical filesystems
 Why have partitions?
 Which partitions should you create?</p> | <p>The mke2fs command
 Create a partition label</p> |
| | <p>3. Mounting filesystems
 What is mounting?
 The mount command
 Mount rules</p> |

- The umount command
- umount rules
- Mounting automatically at boot
- The mount -a command
- The umount -a command
- Review: the df command
- Mounting CDs and floppy disks
- Swap partitions and files
- 4. Administering the Filesystem**
- Filesystem details
- The mke2fs command
- The ext2 and ext3 filesystems
- Why filesystems break
- Fixing filesystems with fsck
- fsck examples
- Displaying filesystem attributes
- Modifying filesystem attributes
- 5. RAID**
- RAID basics
- Hardware & software RAIDs
- RAID levels
- The mdadm command
- RAID disk recovery
- 6. Logical Volumes**
- What is LVM?
- LVM terms
- Initializing hard disks or partitions
- Creating a Volume Group
- Activating and deactivating a Volume Group
- Deleting a Volume Group
- Deleting a Physical Volume from a Volume Group
- Adding a Physical Volume to a Volume Group
- Displaying Volume Group information
- Displaying Physical Volume information
- Creating a Logical Volume
- Displaying Logical Volume information
- Using a Logical Volume
- Extending a Logical Volume
- Reducing a Logical Volume
- Making backups using snapshot
- Deleting a Logical Volume
- 7. Network Filesystems**
- What is NFS?
- NFS benefits
- NFS daemons
- Starting server daemons
- Setting up a NFS server
- Setting up a NFS client
- Using automount
- 8. Disk Quotas**
- Introduction to disk quotas
- Configuring a filesystem to support disk quotas
- Initializing the disk quota database
- Assigning quotas to user accounts
- Assigning quotas to group accounts
- Working with soft limits
- Displaying quota information
- Issuing warnings
- Turning quota checking on and off
- 9. Hardware Management**
- Hardware Overview
- Compatibility
- Device Nodes
- Displaying hardware information
- Configuring hardware
- 10. Advanced X Configuration**
- X Window System components
- The process of starting X Window Server
- X Window security with xhost
- X Window security with xauth
- X Window security with ssh
- X Font Server
- 11. Shell Scripting**
- Scripting basics
- Review of Variable Usage
- Review of Quoting Arguments
- if statements
- Test conditions
- while loops
- until loops
- The break statement
- The continue statement

- The case statement
- for loops
- Exit Status
- Functions
- Advanced Input/Output
- Signals
- Debugging
- 12. Fundamentals of TCP/IP**
- TCP/IP-based protocols
- IP addresses
- Subnetting
- IP routing
- DNS
- DHCP
- 13. TCP/IP Configuration**
- Configuring a network interface
- Global network settings
- DNS client settings
- The Name Service Switch configuration file
- Network configuration utilities
- 14. Printer Management**
- CUPS
- LPD and LPRng
- Setting up a CUPS printer
- Printing Files
- Monitoring the print queue
- Canceling print jobs
- Specifying a default printer
- Printer classes
- Checking printer status
- Managing the print queue
- Printing with different priorities
- Controlling printer status
- Moving print jobs
- Recovering from printer problems
- Removing a printer
- 15. Troubleshooting**
- Introduction to Troubleshooting
- User Access Problems
- System Boot Problems
- Problems with the X Window System
- Networking Problems
- Filesystem Problems
- Using the Troubleshooting Steps
- Using Recovery Run Levels
- The Rescue Environment
- 16. Appendix A – Preparing for Certification Exams**
- 17. Appendix B – Preparing for RHCE and RHCT Exams**
- 18. Appendix C – Preparing for the LPI Exams**
- 19. Appendix D – Preparing for the Linux+ Exam**