UNIX System Administration

This four-day course introduces Linux and Unix users to the tasks needed to administer their own system. The course begins with administering user accounts and groups, then moves into file, file system, and disk management. Various archiving commands are shown along with backup strategies. Students will learn about process and job scheduling as well as startup and shutdown procedures. The course finishes with security, system tuning, and networking topics. Generic system administration concepts are covered and related to specific vendors' systems.

Course Objectives:

- Explain the responsibilities of a UNIX system administrator and perform many of the "hands-on" tasks required to manage a UNIX system.
- Describe the design and operation of UNIX file systems.
- Manage user accounts, including adding and deleting users, changing user account attributes, and controlling password requirements.
- Communicate with users using standard mail and interactive dialogue utilities.
- Manage UNIX processes, including starting and killing jobs in the background, and scheduling jobs to run once or repeatedly at selected times.
- Administer disks and file systems.
- Startup and shutdown UNIX systems.
- Administer the print spooling system.
- Give details of UNIX security issues and implement techniques for secure system software and hardware.
- Reconfigure the UNIX kernel to handle new peripherals or add-on software packages.
- Monitor the performance of a multi-user UNIX system and do simple performance tuning operations.

Audience: UNIX administrators and anyone involved with the UNIX System V, Release 4 operating system.

Prerequisites: *Fundamentals of UNIX* and some system administration experience recommended.

Number of Days: 4 days

1. Course Introduction
Course Objectives
Overview
Suggested References

2. Overview of System Administration
System Administrator Responsibilities
A Brief History of UNIX
Evolving Standards
Navigating the Documentation

3. User Administration
What is a "user" in UNIX?
The /etc/passwd File
Groups
The /etc/group File
Passwords
Adding Users
Deleting Users
Modifying User Attributes
The Login Process
/etc/profile and .profile
Communicating with Users: /etc/motd
Communicating with Users: The wall Command

4. File System Basics
The Hierarchy
Files
Directories
Device Files
Character and Block Devices
The/dev Directory
Links
Symbolic Links
A File System Tour
The df Command
The du Command
The find Command

5. Advanced File System Concepts
The Physical File System
The Inode File
File Storage in Disk Blocks
The Superblock
The Free List
Slices and File Systems
File System Types

6. Disk Management
Making a File System
The mkfs Command
Sharing Filesystems
The mount Command
The fstab File
The fsck Command
The lost+found Directory
The prtvtoc Command

7. Backups
Backup Strategies
Backup Tools
The tar Command
The cpio Command
The dump Command
Network Backup Strategies

8. UNIX Processes
Overview of Processes
Process Space
Process Table
The fork/exec Mechanism
The ps Command
Background Processes
The kill Command
Scheduling Jobs
The cron Daemon
The at Command
The crontab Command
Format of cron Files
Access to Scheduling Facilities

9. System Startup and Shutdown
Run States
The init Daemon
/etc/inittab
The inittab Actions
The init Command
The rc Scripts
Single-User Mode
The shutdown Command

10. UNIX System Security
Security Overview
Physical Security
Account Security
SUID and SGID Settings
File and Directory Permissions
Software Security

11. Performance Monitoring and Tuning
Performance Issues
Methods of Improving Performance
Swapping and Paging
The sar Utility
Using sar
The truss Command

12. IP Addressing
Basic Network Needs
Ethernet Addresses
IP Addresses
DNS vs /etc/hosts to Resolve IP Addresses
Network Addresses
Network Classes
Broadcast Addresses
Subnet Masks

13. Configuring TCP/IP
The /etc/hosts File
The ifconfig Command
The /etc/services File
The inetd Daemon
The /etc/inetd.conf File

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Simple TCP/IP Troubleshooting:
The ping and netstat Commands

14. The LP Print Service
Printing Overview
The lp, lpstat, and cancel Commands
Adding a Printer
The lpadmin Command
The accept and reject Commands
The enable and disable Commands
Adding a Networked Printer
Other Administrative Commands

15. Network Utilities
Network Services
telnet - Terminal Emulator
ftp - File Transfer
rcp - Remote Copy
rlogin - Remote Login
rsh - Remote Commands

16. Kernel Reconfiguration
Overview of Reconfiguration
Kernel Parameters
Steps to Reconfigure a Kernel
Specific Steps for SVR4

17. Overview of NIS
What is NIS?
Why Use NIS?
NIS Design and Implementation
NIS Maps
Configuring NIS

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