Linux for Unix Administrators v6

Course Summary

Description

This accelerated fast track course concentrates on the popular Red Hat Enterprise Linux distribution, and covers subjects ranging from initial installation of Linux to day-to-day administrative tasks such as management of user accounts and disk space. Also covered is setup and maintenance of many of the most popular network services available for Linux, including servers for DNS, SMB, e-mail servers, FTP, web, and caching proxy. Special attention is paid to the concepts needed to implement these services securely, and to the trouble-shooting skills which will be necessary for real-world administration of network and system services.

Topics

- Linux Hardware Discovery, Interaction, and Control
- Boot Process and SysV Init
- Software Maintenance
- Filesystem Administration
- LVM & RAID
- Remote Storage Administration
- User/Group Administration
- Security Administration
- Process Administration
- Networking
- The X Window System
- BIND Concepts and Configuration
- OpenLDAP
- Using vsFTPd and Apache
- Apache Security
- The SQUID Proxy Server
- Samba Concepts and Configuration
- Postfix
- Mail Services and Retrieval
- Monitoring & Troubleshooting
- Installing RHEL6
- Installing SLES11

Audience

This course is intended for administrators proficient in UNIX environments, this course helps administrators transition their UNIX skills to the Linux environment.

Prerequisites

Students should already be experienced Unix administrators. Fundamentals such as the Unix command line and how to edit files will not be covered in class. A good understanding of network concepts, the TCP/IP protocol suite, and basic Unix security is also assumed. The accelerated pace of this class makes it more difficult for unprepared students to keep up.

Duration

Five days

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Course Outline

I. Linux Hardware Discovery, Interaction, and Control
- A. Hardware Discovery Tools
- B. Configuring New Hardware with hwinfo
- C. Hardware and System Clock
- D. Console
- E. Virtual Terminals
- F. Serial Ports
- G. SCSI Devices
- H. USB Configuration
- I. Defining a Printer
- J. Tape Drives
- K. Tape Libraries
- L. Managing Linux Device Files
- M. Kernel Hardware Info - /sys/
- N. /sys/ Structure
- O. udev
- P. Kernel Modules
- Q. Configuring Kernel Components and Modules
- R. Handling Module Dependencies
- S. Configuring the Kernel via /proc/
- T. System Tools

II. Boot Process and SysV Init
- A. Booting Linux on PCs
- B. GRUB Configuration
- C. Boot Parameters
- D. /sbin/init
- E. /etc/inittab
- F. /etc/rc.d/rc.sysinit
- G. SUSE /etc/init.d/boot
- H. Runlevel Implementation
- I. System Configuration Files
- J. Configuration Utilities
- K. Novell's Configuration Utilities
- L. Typical SysV Init Script
- M. The /etc/rc.local File
- N. The /etc/init.d/*.local Files
- O. Managing Daemons
- P. Controlling Service Startup
- Q. Shutdown and Reboot
- R. Run Level and Kernel Information

III. Software Maintenance
- A. RPM Features
- B. RPM Architecture
- C. Working With RPMs
- D. Querying and Verifying with rpm
- E. Updating the Kernel RPM
- F. Using the YUM command
- G. YUM package groups
- H. Configuring YUM
- I. YUM Repositories
- J. Installing Source RPM Packages
- K. Software Tools Comparison Matrix

IV. Filesystem Administration
- A. Partitioning Disks with fdisk
- B. Partitioning Disks with parted
- C. Filesystem Creation
- D. Mounting Filesystems
- E. Filesystem Maintenance
- F. Resizing Filesystems
- G. Swap
- H. Configuring Disk Quotas
- I. Setting Quotas
- J. Viewing and Monitoring Quotas
- K. Filesystem Attributes
- L. Backup Software
- M. Backup Examples
- N. Filesystem Creation and Management

V. LVM & RAID
- A. Logical Volume Management
- B. Implementing LVM
- C. Creating Logical Volumes
- D. Manipulating VGs & LVs
- E. Advanced LVM Concepts
- F. system-config-lvm
- G. SLES Graphical Disk Tool
- H. RAID Concepts
- I. Array Creation with mdadm
- J. Software RAID Monitoring
- K. Software RAID Control and Display
- L. LVM and RAID: Unix Tool Comparison

VI. Remote Storage Administration
- A. Remote Storage Overview
- B. Remote Filesystem Protocols
- C. Remote Block Device Protocols
- D. File Sharing via NFS
- E. NFSv4
- F. NFS Clients
- G. NFS Server Configuration

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Course Outline

H. Implementing NFSv4
I. AutoFS
J. AutoFS Configuration
K. Accessing Windows/Samba Shares from Linux
L. SAN Multipathing
M. Multipath Configuration
N. Multipathing Best Practices
O. iSCSI Architecture
P. Open-iSCSI Initiator Implementation
Q. iSCSI Initiator Discovery
R. iSCSI Initiator Node Administration
S. Mounting iSCSI Targets at Boot
T. iSCSI Multipathing Considerations

VII. User/Group Administration
A. User and Group Concepts
B. User Administration
C. Modifying Accounts
D. Group Administration
E. Password Aging
F. Default User Files
G. Controlling Logins
H. Manual DS Client Configuration
I. system-config-authentication
J. SLES Graphical DS Client Configuration
K. PAM Overview
L. PAM Module Types
M. PAM Order of Processing
N. PAM Control Statements
O. pam_wheel.so
P. pam_limits.so
Q. User/Group Administration Comparison Matrix

VIII. Security Administration
A. Security Concepts
B. Tightening Default Security
C. Security Advisories
D. File Access Control Lists
E. Manipulating FACLs
F. Viewing FACLs
G. Backing Up FACLs
H. File Creation Permissions with umask
I. User Private Group Scheme
J. Alternatives to UPG
K. TCP Wrappers Concepts
L. TCP Wrappers Concepts
M. Xinetd
N. Basic Firewall Activation
O. Netfilter Concepts
P. Using the iptables Command
Q. Common match_specs
R. Connection Tracking
S. AppArmor
T. SELinux Security Framework
U. SELinux Modes
V. SELinux Commands
W. Choosing an SELinux Policy
X. SELinux Booleans
Y. Graphical SELinux Policy Tools
Z. (X)INETD and Firewalls

IX. Process Administration
A. Automating Tasks
B. at & cron Usage
C. anacron
D. Viewing Processes
E. Managing Processes
F. Tuning Process Scheduling
G. Process Accounting
H. Enabling Process Accounting
I. Setting Resource Limits via ulimit

X. Networking
A. Linux Network Interfaces
B. Ethernet Hardware Tools
C. Network Configuration with ip Command
D. Configuring Routing Tables
E. IP to MAC Address Mapping with ARP
F. Starting and Stopping Interfaces
G. NetworkManager
H. DNS Clients
I. DHCP Clients
J. Network Diagnostics
K. Information from netstat
L. Managing Network-Wide Time
M. Continual Time Sync with NTP
N. Configuring NTP Clients
O. Multiple IP Addresses
P. Enabling IPv6
Q. Interface Bonding
R. Interface Bridging
S. 802.1q VLANS
T. Tuning Kernel Network Settings
U. Network Configuration Tools

XI. The X Window System
A. X Modularity
B. X.Org Drivers
C. Configuring X Manually
D. Automatic X Configuration
E. Automatic X Configuration - SLES

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Course Outline (cont'd)

F. The X11 Protocol and Display Names
G. Display Managers and Graphical Login
H. Starting X Apps Automatically
I. X Access Control
J. Remote X Access (historical/insecure approach)
K. Remote X Access (modern/secure approach)
L. XDMCP
M. Remote Graphical Access With VNC and RDP
N. Specialized X Servers
O. Enabling the Graphical User Interface

XII. BIND Concepts and Configuration
A. The Domain Name Space
B. Delegation and Zones
C. Server Roles
D. Resolving Names
E. Resolving IP Addresses
F. Basic BIND Administration
G. Configuring the Resolver
H. Testing Resolution
I. rndc Key Configuration
J. BIND Configuration Files
K. named.conf Syntax
L. named.conf Options Block
M. Creating a Site-Wide Cache
N. Zones In named.conf
O. Zone Database File Syntax
P. SOA - Start of Authority
Q. A & PTR - Address & Pointer Records
R. NS - Name Server
S. CNAME & MX - Alias & Mail Host
T. Abbreviations and Gotchas
U. $ORIGIN and $GENERATE

XIII. OpenLDAP
A. OpenLDAP: Server Architecture
B. OpenLDAP: Backends
C. OpenLDAP: Replication
D. OpenLDAP: Configuration Options
E. OpenLDAP: Configuration Sections
F. OpenLDAP: Global Parameters
G. OpenLDAP: Database Parameters
H. OpenLDAP Server Tools
I. OpenLDAP Client Tools
J. LDIF: LDAP Data Interchange Format
K. Enabling LDAP-based Login
L. System Security Services Daemon (SSSD)

XIV. Using vsFTPd and Apache
A. vsftpd
B. Configuring vsftpd
C. Anonymous FTP with vsftpd
D. HTTP Operation
E. Apache Architecture
F. Apache Configuration Files
G. httpd.conf - Server Settings
H. httpd.conf - Main Configuration
I. httpd.conf - VirtualHost Configuration
J. Virtual Hosting DNS Implications
K. Dynamic Shared Objects
L. Adding Modules to Apache
M. Apache Logging
N. Log Analysis

XV. Apache Security
A. Delegating Administration
B. Directory Protection
C. Directory Protection with AllowOverride
D. Common Uses for .htaccess
E. Symmetric Encryption Algorithms
F. Asymmetric Encryption Algorithms
G. Digital Certificates
H. SSL Using mod_ssl.so

XVI. The SQUID Proxy Server
A. Squid Overview
B. Squid File Layout
C. Squid Access Control Lists
D. Applying Squid ACLs
E. Tuning Squid & Configuring Cache Hierarchies
F. Bandwidth Metering
G. Monitoring Squid
H. Proxy Client Configuration

XVII. Samba Concepts and Configuration
A. Introducing Samba
B. Samba Daemons
C. NetBIOS and NetBEUI
D. Accessing Windows/Samba Shares from Linux
E. Samba Utilities
F. Samba Configuration Files
G. The smb.conf File
H. Mapping Permissions and ACLs
I. Mapping Linux Concepts
J. Mapping Case Sensitivity
K. Sharing Home Directories
L. Sharing Printers

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Course Outline (cont'd)

M. Share Authentication
N. Share-Level Access
O. User-Level Access
P. Mapping Users
Q. SMB and Passwords
R. Samba Account Database
S. User Share Restrictions

XVIII. Postfix
A. Postfix Features
B. Postfix Components
C. Postfix Configuration
D. master.cf
E. main.cf
F. Postfix Map Types
G. Postfix Pattern Matching
H. Virtual Domains
I. Postfix Mail Filtering
J. Configuration Commands
K. Management Commands
L. Postfix Logging
M. SMTP AUTH Server
N. SMTP AUTH Clients
O. TLS Server Configuration
P. Postfix Client Configuration for TLS
Q. Ensuring TLS Security

XIX. Mail Services and Retrieval
A. Procmail
B. SpamAssassin
C. amavisd-new Mail Filtering
D. Accessing Email
E. The IMAP4 Protocol
F. Cyrus IMAP/POP3 Server
G. Cyrus IMAP MTA Integration
H. Cyrus Mailbox Administration

XX. Monitoring & Troubleshooting
A. System Status - Memory
B. System Status - I/O
C. System Status - CPU
D. Performance Trending with sar
E. Troubleshooting Basics: The Process
F. Troubleshooting Basics: The Tools
G. System Logging
H. Syslog-ng
I. Rsyslog
J. /etc/rsyslog.conf
K. Log Management
L. Log Anomaly Detector
M. strace and ltrace
N. Common Problems
O. Incorrect File Permissions
P. Inability to Boot
Q. Typos in Configuration Files
R. Corrupt Filesystems
S. Rescue Environment
T. SUSE Rescue Environment
U. Process Tools

XXI. Installing RHEL6
A. Anaconda: An Overview
B. Anaconda: Booting the System
C. Anaconda: Common Boot Options
D. Anaconda: Loading Anaconda and Packages
E. Anaconda: Storage Options
F. Anaconda: Troubleshooting
G. FirstBoot
H. Kickstart
I. A Typical Install

XXII. Installing SLES11
A. Installation Choices
B. DVD-ROM Install Media
C. Network Installation
D. SLP for SUSE Linux Installation
E. Local Hard Drive Installation
F. The linuxrc Program
G. Install Program Interface
H. Installation Diagnostics
I. Language/Keyboard Selection and EULA
J. Installation Mode
K. Clock and Time Zone
L. Desktop Selection
M. Server Base Scenario
N. The YaST Installer Design
O. Disk Partitioning
P. Boot Loader Configuration
Q. Software Package Selection
R. Kernel Crash Dump Configuration
S. Confirmation and File Installation
T. Setting the Root Password
U. Hostname and Domain Name
V. Network Configuration
W. SLES Services Configuration
X. Adding a User Account
Y. Release Notes
Z. Final Installation Hub
AA. Installation Complete and AutoYaST2 "Cloning"
BB. Using AutoYaST2 files
CC. Creating AutoYaST2 Files

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