

UNIX and LINUX Systems Basics II

Course Summary

Description

This course serves to further expose students to the UNIX operating system. By providing a detailed look at additional aspects of the UNIX operating environment, it builds on the foundation of UNIX system structure and commands and is designed to further develop the student's understanding of UNIX. At the completion of this course, the student will have a proficiency in additional commands necessary to fully utilize the power of the UNIX operating system.

Lab Environment

This course uses a continuous lab environment where the student stays logged on to both a Linux and a UNIX system, interacting with it constantly, in parallel with the lecture.

Objectives

By the end of this course, students will be able to:

- Use scheduling commands to execute other UNIX commands at a future time
- Understand the various UNIX commands that allow for session management
- Understand how UNIX provides networking services such as FTP, ssh, dns
- Understand how to work with ACLs to provide additional security flexibility
- Understand the graphical UNIX desktop environment
- Understand virtualization concepts
- Understand basic Linux Installation and software management issues
- Communicate effectively with System Administrators
- Understand UNIX network file sharing
- Use printer commands

Topics

- Networking in UNIX and Linux
- Extended Permissions
- Scheduling Commands
- Process and Session Management
- Introduction the the Linux graphical desktop
- Overview of virtualization via VMWare
- Walk-thru of a Linux install
- Walk-thru of Linux software installation and maintenance
- Printing

Audience

This course is designed for personnel interested in furthering their skills in the UNIX environment.

Prerequisites

The student should have completed the UNIX Systems Basics I course or possess equivalent knowledge such as an understanding of the UNIX file system, permission, basic file management command, use of the vi editor and familiarity with using a UNIX shell interactively.

Duration

Two days

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Course Outline

- I. Networking in UNIX and Linux (2 hours)**
 - A. TCP/IP Functionality in UNIX
 - B. Two Similar Packet Delivery Systems
 - C. Packet Routing
 - D. Network Physical Layer, IP Layer
 - E. TCP/IP Sockets
 - F. Well Known UDP & TCP Ports
 - G. TCP/IP Services
 - H. DNS Domains
 - I. TCP/IP Applications
 - J. Telnet Access
 - K. SSH Features
 - L. SSH Host and User keys
 - M. Using ssh for Remote Access
 - N. TCP/IP Applications: rsh, rexec
 - O. Using ssh for Remote execution
 - P. FTP (File Transfer Protocol)
 - Q. FTP HELP
 - R. SFTP (Secure FTP)
 - S. SCP (Secure Copy Protocol)
 - T. TCP/IP Diagnostic Commands
- II. Extended File Permissions (1/2 hour)**
 - A. UNIX File Permissions review
 - B. UNIX Special Permissions
 - C. Changing Permissions
 - D. Access Control Lists - examples
 - E. Access Control List Lab
- III. Scheduling Commands (1 hour)**
 - A. Scheduling Work w/ cron & at
 - B. Scheduling Work: at
 - C. at exercises
 - D. Scheduling Work: cron
 - E. Scheduling Work: crontab Examples
 - F. Scheduling Work: cron table
 - G. cron exercise
- IV. UNIX Process Management (1/2 hour)**
 - A. Basic UNIX Session Management
 - B. What is a Process?
 - C. The ps Command
 - D. Killing a Process
 - E. Signaling from Std. Input
 - F. Viewing Processes and Usage
 - G. top: Options
 - H. top: User Commands
- I. Job Control from the Shell**
- V. Using the Gnome Linux Desktop (1 hour)**
 - A. Overview of the Linux Desktop
 - B. X System client/server architecture
 - C. The GNOME Desktop Environment
 - D. Log In
 - E. Log Out and Shut Down
 - F. GNOME Desktop Components
 - G. Manage Icons in GNOME
 - H. Use GNOME File Manager (Nautilus)
 - I. Access Command-Line Interface from Desktop
- VI. VMWare ESXi Overview (45 minutes)**
 - A. Benefits Of Virtualization
 - B. ESXi Server
 - C. ESX Overview (Components)
 - D. P2V (Physical to Virtual) migration
 - E. When To Create Virtual Systems
 - F. Virtual Infrastructure Client
 - G. VI Client Logon To ESXi Host
 - H. VI Client Creating A Virtual Machine
 - I. Invoking The Wizard
 - J. Name The Virtual Machine
 - K. Select The DataStore For The VM
 - L. Select The Guest Operating System
 - M. How Many VCPUs
 - N. How Much Virtual RAM
 - O. How Many Virtual NICs?
 - P. Disk Image Size
 - Q. Summary Screen
 - R. A New VM!
 - S. Installing A Guest Operating System
 - T. Edit Settings
 - U. Choices Of Where To Get CD From
 - V. Virtual Machine Console
 - W. Console View
 - X. Log In!
 - Y. Once The VM Is Powered Up
 - Z. Power Off
 - AA. VMware Tools
 - BB. What Is VMotion?

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- CC. Information To Be Moved
- DD. Requirements Of VMotion
- EE. VMotion – Cold Migration
- FF. Choose Host
- GG. Choose Cluster
- HH. Where Do I Put The VM Files?
- II. Review/Finish
- JJ. Migration Complete
- KK. VMotion – System Powered On
- LL. Select The VM To Move
- MM. Select Host
- NN. Cluster Resource Validation
- OO. Select Priority
- PP. Review And Finish
- QQ. VMotion Complete

VII. CentOS Installation (1 hour)

- A. Language Selection
- B. Install KeyBoard Selection
- C. Partitioning Hard Disk
- D. Install Network Configuration
- E. Clock Setup
- F. Installing Packages

VIII. Linux Package Management (1/2 hour)

- A. Package Management Features
- B. Major Linux Packaging Systems
- C. RPM File Format
- D. RPM Tools
- E. RPM Commands
- F. yum
- G. Debian Tools
- H. apt-get

IX. NFS and Samba Overview (1 hour, Optional)

- A. NFS Setup
- B. NFS Export Rules
- C. Mounting an NFS Filesystem
- D. SMB – Server Message Block
- E. NetBIOS Naming Service
- F. NetBIOS Naming Service - WINS
- G. What is Samba?
- H. SAMBA Daemons
- I. SAMBA Command line tools
- J. Example: Installing Samba on Centos
- K. Testing & Troubleshooting Samba
- L. Accessing Samba Shares from Windows

- M. Accessing Windows Shares from Linux

X. Perl Overview (15 minutes)

- A. What is Perl ?
- B. A perl script
- C. perl data types
- D. Example perl program with looping

XI. Printing in UNIX and Linux Environments (1/2 hour, optional)

- A. General Print Queue Concepts
- B. Printing: SVR4 vs BSD
- C. Using the lp Command
- D. Specifying Printer Destinations
- E. The Print Job-Id
- F. Using lpstat
- G. Canceling Print Jobs
- H. Printer Administration

XII. Miscellaneous Q & A Notes (1/2 hour)

- A. How do I know what kernel or Linux Distro?
- B. How do I rm or mv a file that begins with a dash?
- C. How to turn off, restart, and shut down Linux?
- D. How to Display Installed Hardware?
- E. How to Create PDF Documents?
- F. What is Asterisk?
- G. How do you set your IP address in Asterisk?
- H. How to get an IP address from a DHCP server?
- I. How Do I switch Linux Desktops?
- J. How Do I Control Services from the command line?
- K. Control service startup from command line?
- L. How do I use a DLT tape drive with Linux?
- M. How do I Create a new UNIX Group?
- N. How do I Review Boot Messages?
- O. How do I Find setuid and setgid files?
- P. Setting up ssh to work w/o requiring password
- Q. What is a zombie process?
- R. How To Kill A Ton Of Processes Quickly?
- S. Example .profile with intelligent PATH updating
- T. Linux Basic Runlevels