

UNIX Level 3 System Administrator

Prerequisites

To ensure students' success with this course, we recommend that they first take the following courses or have equivalent knowledge: Internet Explorer 6.0: Introduction, Netscape 6: Introduction, Introduction to Personal Computing using Windows XP, and Introduction to Networks and the Internet, A+ Certification: Core Hardware, A+ Certification: Operating Systems, Network+ Certification, Linux Workstation: Red Hat 7.0

Description

In today's organizational environments, almost every job role involves working with computers in some manner. Recent news events indicate that security breaches can happen to almost any computer user, on home systems or in corporate or organizational environments. This course is intended to provide you with an introduction to common security threats and issues, as well as ways that you can counteract them. Linux Professional System Administration is a hands-on course. It will introduce students to the basics of administering a server running the Linux operating system. The objective of this course is to provide students with the instruction necessary to prepare them for the Linux Professional Institute (LPI) Level 1 certification or the Level 1 Sair Linux

and GNU certification. Topics provide the theory you need to master the Linux operating system; activities allow you to apply this theory to practical hands-on examples.

Objectives

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

- ✓ Access a computer and a private network, and you will compare the security measures that are in place for each type of access.
- ✓ Access the Internet, and identify several technologies that enhance information security on the Internet.
- ✓ Share and transfer files, apply security updates, back up data, and encrypt and decrypt a file.
- ✓ Identify and protect yourself and your information against risks associated with using email and email attachments.
- ✓ Examine and use several software implementations that help protect your computer while you are working on the World Wide Web.
- ✓ Identify common social engineering exploits, and how to counteract their effectiveness.
- ✓ Determine when security has been compromised and what you should do

- in the event of a possible security breach.
- ✓ Examine the history of Linux and review the basic architecture of the Linux operating system.
- ✓ Install Red Hat Linux using custom options.
- ✓ Use the bash shell and understand essential system navigation.
- ✓ Use various text editors and understand their effective uses.
- ✓ Configure and use the X Window server.
- ✓ Configure and use a Linux printer.
- ✓ Configure and administer system users and groups, and administer basic password management.
- ✓ Investigate Linux filesystem basics and the details of the ext2 filesystem.
- ✓ Configure and recompile the Linux kernel.
- ✓ Automate system administration tasks by creating basic shell scripts.
- ✓ Use RPM to install, verify, query, erase, and update packages to manage applications on a server.
- ✓ Manage server processes and daemons and identify the basics of system performance tuning

Detailed Outline

Gaining Computer and Network Access in a Secure Manner

- Implement Physical Security Measures
- Develop a Strong Password
- Implement a Strong Password
- Adjust Desktop Settings Related to Security
- Access a Network Securely

Accessing the Internet in a Secure Manner

- Adjust Internet Settings Related to Security
- Identify Protective Technologies
- Implement a Firewall Solution

Maintaining File Security

- Share Files Securely
- Transfer Files Securely
- Apply Software Security Updates
- Back Up and Restore Data
- Encrypt and Decrypt Files

Using Email and Attachments in a Secure Manner

- Identify Email Security Risks
- Defend Against Email Security Risks
- Use Updated Definitions to Scan for Viruses

Promoting Web Security

- Adjust Cookies Settings

Identify Uses for Digital Certificates

Counteracting Social Engineering Exploits

Identify Social Engineering Exploits
Counteract Social Engineering Exploits

Handling Security Breaches

Identify Incidents

Respond to Incidents

Linux History and Operation

The Evolution of Linux

Discussing the History of Linux

The GNU Movement and the GPL

Discussing the Open Source Movement

Linux Operations as a Server

Examining Linux Operations as a Server

The Architecture and Structure of Linux

Reviewing the Architectural Structure of Linux

Installing and Configuring Linux

Introduction to Installation and Media Types

Creating an Installation Boot Disk with Rawrite

Performing a Custom Linux Server Installation

Run Levels and the Startup/Shutdown Sequence

Examining Run Levels and the Startup/Shutdown Sequence

Examining the Shutdown Process

Logging In and Out of a Linux System

Securing the root Account Access

Shells, Commands, and Navigation

Introduction to Linux Shells, Commands, and Navigation

Discussing Linux Shells and Commands

Navigating the Linux Filesystem

Listing Files

Copying, Moving, and Deleting Files

Changing Directories

Navigating the Filesystem

Examining Symbolic Links

Using Shell Variables in Bash

Viewing Environment Variables

Creating and Assigning a Value to a Variable and then Exporting It

Creating Variable Values Containing Spaces

Creating a Variable Containing Another Variable

Removing Variables

The Bash Shell

Using Shell Metacharacters with Is

Commands for Obtaining System Information

Obtaining System Information

Using the find Command

Examining File Contents

Examining the Contents of a File

Customizing your Shell Environment

Working with Shell Aliases

Customizing the Command Prompt

Configuring a Directory for Temporary Files

Setting a Default Text Editor

Manipulating Commands and Their Input/Output

Piping Commands

Running a Process in the Background

Moving Processes Between the Background and Foreground

Using Virtual Terminals

Getting Help

Viewing the System Manual

Using the --help Parameter

Discussing the Linux Documentation Project

Common Text Editors

Using the Emacs Editor

Creating a File Using Emacs

Moving Around a Document in Emacs

Searching for Text in Emacs

Searching for and Replacing Text in Emacs

Editing Multiple Files in Emacs

Using the vi Editor

Creating a File Using vi

Moving Around in a Document
Editing an Existing Document
Searching Within a File
Searching and Replacing Text
Using the Pico Editor
Creating a File Using Pico
Moving Around a Document in Pico
Searching for Text in Pico
Cutting and Pasting Text in Pico
Manipulating Text Files From the Command Line
Examining the Results of Redirection
Creating Files with Cat and Echo
Appending to Files
Using Awk
Using Awk to Print Selected Fields
Including Text in Your Output
Searching for Patterns and Displaying the Results
Declaring a New Awk Field Delimiter
Using Awk to Search for Patterns in a Single Field
Including an Awk Command File in Your Awk Statement
Using Sed
Using Sed to Delete a Line from a File
Using Grep and Sed to Locate and Change a Text Field

Configuring and Using X Windows

Introduction to X Windows
Examining X Windows
Configuring XFree86
Window Managers and Desktop Environments
Using Window Managers
Examining Desktop Environments
Enabling Multiple X Servers

Linux Printing

The Line Printer Daemon (lpd)
Creating a Printer Spool using Printtool
Editing a Printer Spool Using Printtool

Examining the /etc/printcap File
Printing
Printing a File
Formatting Text for Printing
Administering a Linux Printer Queue
Viewing the Contents of a Print Queue
Cancelling a Print Job
Using the lpc Command

Users and Groups

Introduction to Users and Groups
Discussing Users and Groups
Creating Users and Groups
Creating Groups
Managing Passwords
Essentials of Effective User, Group, and Password Management
Using su
Examining the Essentials of Effective Account Management
Using urandom

The Ext2 Filesystem

Introduction to the Second Extended (Ext2) Filesystem
The Ext2 Filesystem
Partitioning and Formatting
Exploring Disk Partitions
Formatting a Partition for the Ext2 Filesystem
Mounting and Configuring Filesystems
Mounting and Unmounting Filesystems
Administering Ext2 Filesystems
Using stat to Examining an Inode
Using sync to Flush Filesystem Buffers
Checking and Repairing an Ext2 Filesystem
Understanding Filesystem Fragmentation
Understanding Permissions
Setting Ownership of Files
Viewing File Permissions

Setting File Permissions

Changing the Default Permissions with umask

The Linux Kernel

Introduction to the Linux Kernel

Discussing the Kernel

Using Kernel Modules

Discussing Monolithic and Modular Kernels

Working with Kernel Modules

Examining the /etc/modules.conf File

Compiling the Linux Kernel

Downloading and Installing the Kernel Source

Configure the Linux Kernel Sources

Compiling the Linux Kernel and Linux Kernel Modules

Installing the Linux Kernel

Copying the Kernel and Modules to the System and Creating an Initial Ramdisk

Understanding LILO

Configuring LILO to Boot the New Kernel

Shell Scripting

Introduction to Shell Scripting

Variables

Getting User Input

Performing Simple Arithmetic

Basic Control Structures

Using If-Then-Else

Loops

Using For Loops

Using While Loops

Command-line Arguments

Getting Arguments from the Command Line

Linux Software Management

The Software Life Cycle

Using the Internet for Locating Software

Querying Installation

Querying Software

Installing a Software Package

Upgrading Software Packages

Removing a Software Package

Building from Source

Linux System Management

Choosing a Server

Discussing Server Choices

Examining Linux Services

Starting Jobs and Processes

The /proc Filesystem

Tuning a Linux System for Optimal Performance

Using Performance Maintenance Utilities

The Swap Partition

Creating Additional Swap Space

The sudo Command

Configuring sudo

Using sudo