Course contents for L-120 Linux Fundamentals

Section 1 - What is Linux?

- UNIX Origins, Design Principles and Timeline
- FSF, GNU, and GPL - General Public License
- The Linux Kernel and Linux Features
- What is a Distribution?
- SLS, Slackware, Mandriva, and Debian
- SUSE Linux Products
- Role Specific Distros
- Standardization

Section 2 - Multi-User Concepts

- Multi-User Concepts
- got root?
- Switching User Contexts
- Gathering Login Session Info
- Getting Help

Lab 2 - Login and Discovery

- Login to the workstation using a virtual console and GUI interface.
- Use commands to gather information about the current login and the other users on the system.
- Use a variety of help tools to discover more information about the commands.
- Use and explore the use of the su command.
- Observe the operation differences between su and su -.

Section 3 - The Linux Filesystem

- LINUX Filesystem Features
- Filesystem Hierarchy Standard

- Navigating the Filesystem
- Displaying Directory Contents
- Determining Disk Usage
- Disk Usage with Quotas
- File Ownership
- File and Directory Permissions
- File Creation Permissions
- Changing File Permissions
- SUID and SGID on files
- SGID and Sticky Bit - Directories
- User Private Group Scheme

Lab 3 - Files and Directories

- Use the various commands to navigate the directories on the workstation.
- Display the characteristics of some files and directories.
- Use df to see how much hard drive space is being used by the filesystem(s)
- Use du to show disk usage of all files in a certain directory
- Display, then change , the ownership of some of the files and directories on the workstation
- Use commands to display, change, and set permissions for the different files and directories on the workstation

Section 4 - Manipulating Files

- Directory Manipulation
- File Manipulation
- File Creation and Removal
- Physical Unix File Structure
- Filesystem Links
- File extensions and content
- Displaying Files
- Previewing Files
- Searching the filesystem
- Alternate Search Method
- Producing File Statistics

Lab 4 - File Management

- Explore commands that are useful when doing file and directory management
- Use commands to display the contents of text files
- Use find and locate to search for files

Section 5 - Text Processing

- Searching Inside Files
- The Streaming Editor
- Text Processing with Awk
- Replacing Text characters
- Text Sorting
- Duplicate Removal Utility
- Extracting Columns of Text
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Lab 5 - Text Processing

- Using standard UNIX filters to modify and sort text

Section 6 - Shell Basics

- Role of Command Shell
- Communication Channels
- File Redirection
- Piping Commands Together
- Filename Matching
- Wildcard Patterns/Globbing
- Brace Expansion
- Shell/Environment Variables
- Environment Variables
- General Quoting Rules
- Nesting Commands

Lab 6 - Shell Basics

- Use I/O redirection commands
- Use | (pipe) to chain commands
- Glob using wildcard patterns
- Configure a shell variable
- Use the export command to create an environment variable
- Escaping shell meta-characters
- Command substitution using backquotes and the $(command) form

Section 7 - Regular Expressions

- Regular Expression Overview
- Regular Expressions

Lab 7 - Regular Expressions

- Use regular expressions with grep to search for character patterns
- Practice some advanced RegEx?s with egrep
- Use sed to perform text editing on a file using regular expressions

Section 8 - Archiving and Compression

- Directory Archive with tar and cpio
- The compress utility
- The gzip and bzip2 compression utilities

Lab 8 - Archiving and Compression

- Use archiving and compression commands

Section 9 Text Editing

- Text editing
- Pico/GNU Nano
- Pico/Nano Interface and Commands
- Vi: Basic and Advanced Vi
- Advanced Vi Commands
- Emacs and Emacs Interface
- Basic and Advanced Emacs Commands

Lab 9 - Text Editing

- Use the pico or nano editor to create and efficiently modify text files
- Use the vim editor: motion, editing
- Use the Emacs editor: motions, kill, yank, undo, search and search-query commands

Section 10 - Command Shells

- Shells
- Identifying and Changing the Shell
- sh: Configuration Files
- sh: Script Execution
- sh: Prompts
- bash: Bourne Again Shell
- bash: Configuration Files
- bash: Command Line History, Editing and Completion
- Bash: "shortcuts"
- bash: prompt

Lab 10 - Unix Shells

- Identify the current shell
- Examine symbolic links of listed shells
- Invoke shell directly and change login shell
- Explore the functions available through command line history
- Display all aliases, create a new alias, and remove an alias
- Add aliases to .bashrc file to make aliases persistent across login shells and system reboots
- Customize the bash shell
- Run the Z shell
- Explore prompt options including a right hand prompt

Section 11 - Shell Scripting

- Shell Scripting
- Example Shell Script

- Positional Parameters
- Input & Output
- Doing Math
- Comparisons with test
- Conditional Statements
- The for Loop
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Lab 11 - Shell Scripting

- Create a shell script to permit "safe" deletion of files
- Install new shell script

Section 12 - Process Management and Job Control

- What is a Process?
- Process Creation and States
- Viewing Processes
- Signals
- Tools to Send Signals
- Job Control Basics
- Jobs
- Screen
- Using screen
- Advanced Screen

Lab 12 - Job Control

- Create several jobs to multi-task at the shell prompt
- Job control
- Use a "fork bomb" to create additional processes
- Use process management tools to examine the current state of the system
- Clean up using kill, killall, pgrep and pkill on the command line and KDE System Guard and the
- Gnome System Monitor GUI programs
- Create a screen session

- Detach from your session and re-attach to your neighbor? screen session
- Create a split screen session

Section 13 - Messaging

- Command Line Messaging
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- The mesg utility
- Internet Relay Chat
- Instant Messenger Clients
- Electronic Mail
- Sending Mail with sendmail
- Sending Email with mail
- Overview of PINE
- Sending Email with Pine
- Evolution

Lab 13 - Messaging

- Use mesg, write, and talk to communicate between users.
- Send mail using mail and pine.

Section 14 - The Secure Shell (SSH)

- Secure Shell
- Accessing Remote Shells
- Transferring Files
- Alternative sftp Clients
- SSH Key Management
- ssh-agent

Lab 14 - SSH

- Establish a secure session to a remote host using ssh
- Copy files securely from one host to another using scp
- Generate and use RSA and DSA user keys
- Use ssh-agent to cache the decrypted private key

Section 15 - Managing Software

- Downloading Software
- FTP, NcFTP, and lftp
- wget, lynx, and links
- Installing Software
- Installing Binary Packages - rpm
- Querying and Verifying with rpm
- Installing Debian Packages
- Compiling / Installing from Source
- Installing Source RPM Packages

Lab 15 - Managing Software

- Practice using the ftp, ncftp, and wget commands to download software