

Course Description:

This is the first in a series of courses focusing on the Linux Operating System. It is vendor neutral with an emphasis on the latest version of RedHat Linux. A comprehensive study of Linux is undertaken. Topics include Linux evolution, graphical environments, terminal interfaces and bash, file system, file manipulation commands, data manipulation commands, editors, software tools, networking tools, and system administration tools. The course is supplemented with many hands-on exercises that reinforce the lectures.

Who Should Attend:

This course is intended for programmers, end users, managers, and future system administrators.

Prerequisites:

Students are required to have some familiarity with an operating system such as DOS or Windows.

Benefits of Attendance:

Upon completion of this course, students will be able to:

- Understand the relationship between UNIX and LINUX.
- Log in and out of the system.
- Use the various components of the GNOME desktop.
- Perform work using terminal shell windows.
- Navigate through the file system.
- Get help using the on-line manual.
- Use the bash shell for a wide variety of functions.
- Edit files using the 'vi' editor.
- Use various file manipulation utilities.
- Use the rich set of common Linux filters.
- Locate important network configuration files.
- Use the rich set of LINUX file management utilities.
- Use network utilities including ssh, scp, and ftp.
- Write fundamental bash scripts.
- Kill processes through knowledge of the process tree.
- Modify bash startup files.
- Launch and control jobs.
- Understand the role of the system administrator.
- Be able to perform simple system administration functions.
- Use the robust set of software tools including ar and make.
- Launch applications graphically.

Course Outline:**An Introduction**

Operating Systems
History of UNIX/Linux
UNIX History
Richard Stallman and the GNU Project
Linus Torvalds and Linux
GNU, FSF, and the GPL
Commercialization of Linux

Getting Started

Logging in to Linux
Working in Linux
The X Server
The Gnome Display
Terminal Windows
Nautilus
Gnome Applications
Terminal Window Interface
Shell Command Lines
Getting Help
The man Command
The info Command
Linux Architecture

The Linux Filesystem

Filesystems
Top Level Directories
Home Directories
Complete vs. Relative Path Names
Directory Commands
The /etc/passwd File
The /etc/group File
The newgrp Command
The su Command
File and Directory Permissions
chmod
umask
passwd
Special Permissions
sudo

Shell Fundamentals

Shell Functionality
Shell Variables

The PATH Variable
The Command Line
Command History
Command Line Shortcuts
Command Substitution
Filename Expansion Characters
The Standard Output
The Standard Error
The Standard Input
Pipes
Aliases
Functions
Quoting
Control Sequences
Other Special Characters
Other Shell Features

File Manipulation Commands

cat
ls
cp
mv
ln
rm
wc
find
Linux Editors
vi Commands
aspell

Linux Filters

Perspective
grep
sort
head and tail
tr
cut
od
paste
split
uniq
sed
gawk
more and less

tee
lp

Processes

What is a Process?
Characteristics of a Process
Process Creation
ps
Job Control
Signals
kill
nohup

Shell Programming

Shells
Scripting Rationale
Scripting Prerequisites
Creating a bash Script
bash Startup Scripts
A Script's Environment
Exporting Variables
Exit Status
Programming the Shell
Parameter Passing
Operators
Decision Making - if
Complex Decisions
Arithmetic
Looping Constructs - for
Input and Output
Looping Constructs - while
Interrupts

Networking Applications

TCP/IP
IP Addresses
Network Configuration Files
Client/Server Computing
telnet
ping
ftp
ssh
scp

Software Tools

Building a Linux Utility
Creating a Utility
The C Compiler
Libraries
Static vs. Shared Libraries
make
Software Configuration Management
Revision Control
Data Compression

System Administration

Duties of the System Administrator
Bringing Up the System
Setting the Date
Shutting Down the System
Adding Users
Ownerships
The /dev Directory
mount File Systems
df - Free Disk Space
du - Disk Usage
find - Find Files
tar - Backup Files
Managing Services
at - Schedule Command
crontab - Schedule Commands
Managing Software
rpm - Managing Software
yum - Managing Software