

UNIX

Revised 11/10/2011

/training/etc

The Art of Knowledge.

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Course Description: This course teaches students how to use fundamental UNIX commands and basic Solaris commands. This course is intended for students new to Sun's Solaris operating system. Students will learn functions of the shell, file system navigation, Solaris editors, file commands (including ls, cat, rm, mv, cp and ln), additional commonly used commands (including grep, od and pr) as well as learning user communication tools such as mailx.

Who Should Attend: This course is intended for programmers and end users who are new to the Sun Microsystems Solaris Operating System.

Prerequisites: Some familiarity with an operating system such as DOS is required.

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

- Log in and out of the system.
- Navigate through the UNIX file system.
- Manipulate files.
- File permissions.
- Use basic network commands.
- Search for file names and strings.
- Edit files using the 'vi' editor.
- Use shell productivity features.
- Use shell productivity features.
- Use the 'vi' editor.
- Use mailx to send mail.

Course Outline:

Brief History Of Operating Systems

Operating system concepts
Operating system features
UNIX history
Major UNIX flavors
Solaris features
Solaris components
Solaris characteristics
Standards
Application areas

Getting Started

Logging in and logging out
Using the shell
Command line formats
How to get help-man
The stty command

Getting To Know The Shell

The shell as a user interface
The standard output file
Appending of the standard output file
The standard input file
Pipes
The standard error file
Summary of special I/O characters
Shell variables
Quoting mechanisms
Command substitution
The shell prompt variables
File name generation characters
Alias
Functions
The History Mechanism
Editing the command line

The File System

User view of the file system
File types
File system concepts
The /etc/passwd file
Directory commands
File access permissions
Groups
The chmod command
Using the umask

Solaris Editors

Solaris editors
Starting ed
Simple ed session
Format of ed commands
Another ed session
Summary of ed commands
Searching with ed
Substituting with ed
The vi editor

Editing an existing file
Adding text
Cursor movement commands
vi modes
Deleting text
Changing text
Copying and moving text
Searching for text
Last line mode
vi customization
Odds and ends

File Commands

Relative vs complete pathnames
The shell's search algorithm
The ls command - directory listing
The cat command - concatenate files
The rm command - remove files
The mv command - rename a file
The cp command - copy a file
The ln command - give file additional name
The cmp, diff commands - compare two files
The file command - determine file type
The pg command - page through a file
The find command - locate a file

Commonly Used Commands

The grep command - pattern matching
The wc command - word count
The sort command - sort lines of a file
The head command - display first few lines
The tail command - display last few lines
The tr command - translate characters
The cut command - cut fields (or chars)
The od command - octal dump a file
The paste command - paste lines together
The split command - split a file
The uniq command - report repeated lines
The lp command - print a file

The Mailx Command

The mailx command
Sending mail
Reading your mail
Commands within mail
Replying to mail
Tilde commands
mailx customization
Sending binary files
Decoding binary files
Sending directories

Course Description: Students are prepared to install and maintain a local-area network of Sun workstations running the Solaris operating system. Students learn how to install software for a server, how to add devices, how to configure the client server environment, how to add terminals, and how to configure name services.

Who Should Attend: This course is for those Solaris users who are tasked with System Administration responsibilities or anybody who wishes to gain an in depth practical knowledge of Solaris System Administration.

Prerequisites: Students should be able to use the desktop, edit files with either vi or another text editor, use fundamental UNIX commands, and have had three months or more experience with a Solaris 10 system.

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

- Custom install a Solaris server.
- Use the Solaris device naming conventions.
- Use the format utility to display partition information.
- Administer the contract file system.
- Add startup files for customized services.
- Install and remove software packages.
- Add peripheral devices, such as printers.
- Administer disks and file systems.
- Configure the NFS.
- Use the automounter.
- Add and remove JumpStart clients.
- Backup and restore file systems.
- Perform basic recovery and troubleshooting procedures.
- Configure and administer the LDAP service.

Course Outline:

Introduction to UNIX

The history of UNIX
Kernel
Shell
File System
The network
Distributed processing

Client/Server Model

Time sharing vs. Central vs. Distributed
Configurations

Installing the Operating System

Introduction
Client/Server relationship
Solaris Installation Options
Hardware Requirements
Installation
Booting with the DVD
Configuring the workstation
File Systems
The final states
The root password

The Boot Process

SPARC bootstrap procedure
/sbin/init Process

The Contract Filesystem

shutdown command
init command
halt command
reboot command

Reconfiguring the Kernel

The kernel
/kernel directory
/platform directory
/usr/kernel directory
/etc/system file
Kernel parameters

Device Configuration and Naming

About device drivers
physical device names
logical device names
instance device names
dmesg command
format command
prtconf command

Configuring a Local File System

Disk terminology
Disk slices
format Utility

partition menu
Viewing the VTOC
mounting a file system

Configuring a Network File System

About NFS
NFS Server tasks
sharing and unsharing the file system
NFS Server daemons
NFS Client tasks
mounting and unmounting
NFS Client daemons

Configuring the Automounter

The Automounter
The automount command
The autofs filesystem
The automountd daemon
Master map
Direct map
Indirect map

Volume Manager

Volume management
Access to diskettes
Access to DVDs and CDs
The vold daemon
The /etc/vold.conf file

Backup and Recovery

Backups
The ufsdump command
Incremental backups
The ufsrestore command
Other archiving commands

Software Administration

Software administration
How is a package added?
Verification of a package
How to remove a package

Device Administration

Peripherals
Adding a new device
Setting up terminals
Setting up terminals with Solstice AdminSuite
The sacadm command
The ttyadm command
The pmadm command

User Administration

Structure of a user account
Where user accounts live
Managing user and group accounts with the shell command

line
Managing user and group accounts With the SMC CGI
Shell initialization files

Security

Common sense rules to security
Restricted shells
User status
Restricted root access
The /etc/default/su file
Automated Security Enhancement Tool
ASET security
ASET tasks
ASET reports
ASET master files
The aset command

Name Services

The Domain Name Service
What is the Network Information Service?
NIS maps
What is NIS?

Setting up NIS

Setting up the NIS root master
Setting up a NIS client
Setting up an LDAP client

Course Description: This is the first in a series of courses focusing on the Unix Operating System, including Linux, Solaris, AIX, HP-UX, etc. A comprehensive study is given, including its evolution, structure, programming environment, and user interface. Topics include user interfaces, the shell (Korn, Bourne, C, etc), file system commands, data manipulation commands, editors (vi and ed), 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 and end users that are new to the Unix operating system.

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 underlying philosophy of Unix
- Login and log out of a Unix system
- Navigate through the Unix file system
- Use the productivity features of the Unix shell
- Create and modify files using Unix editors
- Copy, rename, and display files
- Fluently use the Unix command set to solve standard computer related problems
- Write simple shell scripts
- Use job control features of the shell
- Effectively use the Unix software tools
- Perform backups and restores
- Understand the responsibilities and the tools of the system administrator
- Use awk and sed to solve system administration tasks
- Use internetworking tools such as telnet and ftp

Course Outline:

Getting Started

Introduction
Features
History
Command Names
Philosophy
Characteristics
Logging In and Logging Out
Terminating a Session
Parts of the Unix Operating System
Functions of the Shell
Shell as a Command Line Interpreter
Command Characteristics
Command Line Formats
How to Get Help - man
stty - Display Terminal Options

Getting to Know the Shell

The Shell as a User Interface
The Standard Output File
Redirection of the Standard Output File
Appending to the Standard Output File
Redirection of the Standard Input File
Standard Input Examples
Pipes
The Standard Error File
Standard Error Examples
Special I/O Symbols Interpreted by the Shell
Shell Variables
Quoting Mechanisms
Command Substitution
The Shell Prompt Variables - PS1, PS2
File Name Generation Characters
Aliases
Functions
The History Mechanism
Command Line Shortcuts

The File System

File System Picture
User View of the File System
File Types
File System Concepts
The /etc/passwd File
Directory Commands
File Access Permissions
Groups
The chmod Command
Using chmod

The vi Editor

The ed Editor
Sample ed Session
Searching and Substituting with ed
The vi Editor
The vi Editor - Editing an Existing File
The vi Editor - Adding Text
Cursor Movement Commands
Deleting Text
Changing Text
Copying and Moving Text
Searching for Text
Last Line Mode
vi Customization
Odds and Ends

File Commands

Relative vs. Complete Pathnames
The Shell's Search Algorithm
ls Command
cat Command
cat Examples
The rm Command
mv Command
cp Command
ln Command
ln Examples
cmp and diff Commands
Exit Codes
Examples of Exit Codes
file Command
pg Command

Commonly Used Commands

grep - Print Lines Matching a Pattern
grep Examples
grep - Special Pattern Matching Characters
grep - Other Considerations
wc - The Word Count Command
sort - Sort Lines of a File
head(tail) - Display Beginning/End of a File
tail - Display Last Few Lines
tr - Translate Characters
tr Options
cut
od - Octal Dump
paste
paste Examples
split
uniq

lp Command

Shell Programming
Shells
Scripting Rationale
Creating a bash Script
bash Startup Files
A Script's Environment
Exporting Variables
Exit Status
Programming the Shell
Parameter Passing
Operators
if
Arithmetic
Looping Constructs
Input and Output
Interrupts

Job Control

Processes
Parent and Child Processes
System Startup
Shell Initialization
Foreground vs. Background
ps Command
The kill Command
Suspending Jobs
jobs Command
fg and bg Commands

Software Tools

C Language and UNIX
Creating Programs in C
Creating a Library
Using the Library
Static vs. Shared Libraries
make
Revision Control
Concurrent Versioning System (CVS)
Other Languages

System Administration

Duties of the System Administrator
Bringing up the System
Multi-User Mode
Shutting Down the System
Adding Users
The /dev Directory
The awk Language
awk Scripts

awk Odds and Ends
The sed Command
Special sed Characters
The find Command
Backing up Files
cpio
tar
File System Commands
The at Command
The crontab Command

Networking Applications

TCP/IP
Client/Server Model
Ports
DNS
NFS
ping
ftp
telnet
ssh

Course Description: This course describes the Korn Shell. The shell as a programming language is featured. The course also thoroughly treats other shell functions such as the shell as the user interface, the shell as a customization tool for the user environment, and the shell as a front end for command customization. Labs are given throughout the course to reinforce the lectures.

Who Should Attend: The course is intended for UNIX users who wish to increase their productivity.

Prerequisites: Students must have completed the Introduction to UNIX, Introduction to Solaris, or Introduction to LINUX course or have equivalent knowledge.

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

- Understand process creation.
- Recognize and use shell metacharacters.
- Recall commands for automatic execution (Korn and C Shell).
- Launch and control jobs (Korn and C Shell).
- Provide front ends to well known commands.
- Create and use shell environment variables.
- Customize your environment using many shell productivity aids.
- Write non-trivial shell scripts.
- Write shell functions (Korn and Bourne).

Course Outline:

Shell Initialization

User Interfaces
 Functions of the Shell
 History of the Shell
 Which Shell Am I Using?
 How is My Shell Started?
 Shell Startup Files
 Korn Shell Logic
 Spawning Processes
 Background Processing
 The kill and jobs command
 Suspending Jobs

Shell Variables

Standard Files
 Korn Shell Variables
 The typeset Command
 Arrays
 Built-in Shell Variables
 Creating Your Own Variables
 Special Shell Variables
 More on Arrays
 Variable Expansions
 Variable Substitutions
 Quoting
 File Name Generation Character

Productivity Aids

Command Line Editing
 Aliases
 The history Command
 Functions
 The set Command
 The User Environment

Programming The Shell

Perspective
 Creating a Script
 Sending Arguments to a Script
 Front Ends
 Decision Making
 The if Statement
 Operators
 if Variations
 Loops
 The for Loop
 The while Loop
 The until Loop
 The read Statement
 The case Statement
 break and continue

Miscellaneous

Korn Shell Arithmetic
 here Documents
 The getopts Command

The trap Command
 File I/O
 Debugging a Script

Examples Of Scripts

A Front End Example
 Swapping Two Files
 Count Files in Path Directories
 Frequency Count of Words in a File
 Add Values From Field n of a File
 Prototyping a Large Project

Tables

Built-in Shell Variables
 Built-in Shell Commands
 Control Flow Constructs
 Operators
 Variable Substitution
 Other Shells
 Comparison with C and Bourne Shells
 C Shell Control Flow Constructs
 Differences Between sh & ksh

Review Of Common Unix Filters

grep Command - Find Lines Matching a Pattern
 wc command - Count Words, Lines
 sort command - Sort Lines of a File
 head Command - Show First Few Lines of a File
 tail command - Show Last Few Lines of a File
 tr command - Translate Characters
 cut command - Cut chars or Fields
 od - Octal Dump a File
 paste Command - Paste Lines
 awk command - Data Retrieval Language
 sed Command - Stream Editor