UNIX Shell Programming

Course Summary

Description

This course is designed to help technical staff gain a complete mastery of writing, debugging and maintaining UNIX shell scripts, using the Bourne, Korn, and POSIX shells, along with key UNIX utilities such as grep, sed, and awk. Topics 2 (Review of UNIX Essentials) and 3 (Review of the vi editor) are covered on-demand if the attendees UNIX skills are rusty. This course contains both simple and more complex hands-on programming labs to deepen the students understanding of presented concepts and facilities and to gain experience in program design, testing and debugging. This course is an accelerated combination of the ProTech Bourne Shell Programming, Korn Shell Programming Essentials and Advanced Korn Shell Programming courses.

Topics

- Introduction to Shell Programming
- Review of UNIX Essentials
- Review of the vi editor
- Using the Bourne Shell
- Korn Shell Programming Essentials
- Advanced Korn Shell Programming

Audience

This course is intended for technical staff that develops and maintains UNIX Korn and/or Bourne shell programs either for personal productivity, as an aid to application development or for advanced UNIX system monitoring and maintenance.

Prerequisites

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

Duration

Five days

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Course Outline

I. Intro to the UNIX Shell

A. The UNIX Shell
B. Key Shell Features
C. Different Shell Flavors
D. The Shell Prompt
E. Intro to Shell Variables
F. Creating & Using Shell Variables
G. The Environment & Shell Variables
H. Exporting Shell Variables
I. Useful Shell Variables
J. Understanding Shell Quote Usage
K. Command-line Editing
L. Shell Initialization: Startup Scripts
M. Shell Initialization Variables: Lab
N. Shell Scripts
O. Shell Scripts - Example
P. Languages: Compiled vs. Scripting
Q. Viewing Exit Status in the Shell
R. Using Exit Status in a Shell Script
S. Shell: Redirection to & from Files
T. Shell: Pipes
U. Shell: Wildcards
V. Shell: Command Alias
W. UNIX Process Management
X. UNIX Process Mgmt: the ps cmd
Y. UNIX Process Mgmt: Background
Z. Shell Job Control Commands
AA. UNIX Process Mgmt: Kill
BB. UNIX Process Management Lab

II. Review of UNIX Essentials

A. Review of UNIX Essentials
B. UNIX Command Overview
C. Logging In
D. Changing your Password
E. Logging Out
F. Commands, Switches, and Arguments
G. Reading the Manual: the man cmd
H. Userid, UID, Group, GID
I. Understanding UNIX Permissions
J. The UNIX File System
K. Home and Working Directory
L. Commands to List Contents of A File
M. head and tail Commands
N. Copying and Moving Files
O. Deleting Files
P. Summary Slide (cont.)
Q. UNIX Filenames
R. File Management Lab
S. Creating Directories
T. Removing Directories
U. Copying Files Between Directories
V. UNIX File Security: Permissions
W. Working with Permissions
X. chmod Examples
Y. UNIX Directory Permissions
Z. Lab: chmod
AA. File/Dir Permissions - umask
BB. Changing File Ownership
CC. Under the covers of the File System
DD. File Systems, inodes, vnodes
EE. Linking files
FF. Hard vs. Symbolic Links
GG. Linking to a file - ln
HH. UNIX Power Tools
II. Finding Files
JJ. UNIX Power Tools: sort
KK. Archiving Files
LL. Compressing files
MM. TCP/IP Networking
NN. TCP/IP Diagnostic Commands
OO. TCP/IP Applications: rsh, rexec, ftp, mail
PP. Example FTP Session
QQ. TCP/IP Applications: write
RR. TCP/IP Applications: wall
SS. TCP/IP Applications: talk
TT. Scheduling Work w/ cron & at

III. Review of the vi Editor

A. UNIX Text Editors
B. Editing Files with vi - Modes
C. Editing Files with vi - Scrolling
D. Editing Files with vi - Editing
E. Editing Files with vi - File cmds
F. Editing Files with vi - .exrc
G. vi: Lab
H. vi: Regular Expressions
I. vi: Regular Expression Examples
J. vi: Searching for Text
K. vi: Search Lab
L. vi: Text Substitution
M. vi: Text Substitution Lab

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Course Outline

IV. Using the Bourne Shell

A. Why learn & Use the Bourne Shell?
B. Bourne Shell Syntax Example
C. Using Bourne Shell Variables
D. Using Null Variable Error Messages
E. Reading User Input
F. Bourne Shell Arithmetic: expr, bc, and awk
G. Command Line Arguments
H. Condition Testing: if/then/elif/else
I. Condition Testing: if/then/fi example
J. Condition Testing: test command
K. Compound Condition Testing
L. Condition Testing: Optional Lab
M. Conditional Execution
N. Exiting from a script
O. File Validation & Exit: Optional Lab
P. Condition Testing: case/esac
Q. Here Documents
R. Looping Overview: for and while
S. for Loop: Examples
T. for Loop: Batch e-mail Example
U. for Loop: Filename Expansion
V. while Loop
W. while Loop: Handling Parameters
X. while Loop: Using getopts
Y. Nested while Loops
Z. Infinite Loops with while
AA. Infinite Loops: Optional Lab
BB. while Loops: Optional Lab
CC. File I/O Overview
DD. Shell Statement Redirection Syntax
EE. Redirecting the Shell with exec
FF. File I/O: Optional Lab
GG. Multitasking in a Shell Program
HH. Shell Functions
II. Shell Functions: Usage Rules
JJ. Trapping Signals in Shell Programs
KK. Overview of Useful Signals
LL. trap Command: Syntax
MM. Signal Trapping to a Shell Function
NN. Determining Signal Type & Status
OO. Type Technique: read w/ Timeout

V. Korn Shell Programming Essentials

A. What are the Korn Shell Versions?
B. Korn Shell Syntax Example
C. Using the print Command
D. Using Korn Shell Variables
E. KornShell Variable Types
F. typeset Command
G. typeset for Mathematics
H. Defining and Using Array Variables
I. Reading User Input: Ksh88 & Ksh93 Examples
J. Korn Shell Arithmetic
K. Korn Shell Arithmetic Operators
L. Korn Shell Arithmetic: Lab
M. Command Line Arguments
N. Command Line Arguments: Example
O. Condition Testing: if/then/elif/else
P. Condition Testing: [[ ]] command
Q. String Condition Testing: Example
R. String Testing: Pattern Example
S. Compound Condition Testing
T. Condition Testing: Optional Lab
U. Conditional Execution
V. Exiting from a script
W. File Validation & Exit: Optional Lab
X. Condition Testing: case/esac
Y. Looping Overview: for
Z. Looping Overview: while and until
AA. for Loop: User List Example
BB. for Loop: Filename Expansion
CC. for Loop: Counting…
DD. while Loop
EE. Nested while Loops
FF. Infinite Loops with while
GG. Infinite Loops: Optional Lab
HH. while Loops: Optional Lab
II. File I/O Overview
JJ. Shell Statement Redirection Syntax
KK. Redirecting the Shell with exec
LL. File I/O: Optional Lab
MM. Shell Statement Piping Syntax
NN. Shell Statement Piping: Example
OO. Multitasking in a Shell Program

VI. Advanced Korn Shell Programming

A. Validating Korn Shell Variables
B. String Variable Manipulation
C. Defining and Using Associative Array Variables
D. Korn Shell bit manipulation & math functions
E. Here Documents
F. Handling Parameters (with and without getopts)
G. Numbered Menu Loops: select
H. Shell Functions: Usage Rules
I. Shell Functions: Local Variables
J. Shell Functions: Call by Reference
K. KornShell 93 Discipline Functions
L. Trapping Signals in Shell Programs