Advanced UNIX / Linux and Shell Scripting

Duration: 30 Hours
Prerequisites
- Knowledge of any Programming Language & Operating System

Course Content

Module I: Basic UNIX

1. **Fundamentals of UNIX**
   - Overview of Operating System
   - Introduction to Unix Operating System
   - Features of UNIX
   - Flavors of UNIX
   - Unix vs Windows/DOS Operating System
   - File System Layout in Unix
   - Unix System Architecture
   - Unix Directory Structure
   - Relative and Absolute Paths
   - Advantages and Disadvantages of Unix OS

2. **Unix Command Usage**
   - What is Command?
   - Rules of Unix Commands
   - Types of Unix Commands
   - Internal v/s External Command
   - Accessing Unix Server through Putty
   - MS-DOS and Unix equivalent Commands

3. **General Purpose Utilities**
   - Login Commands
   - Terminal Commands
   - Online Manual
   - Displaying Message
   - Disk related Commands
   - Unix System details Command
   - Basic Useful Commands
   - Control Terminal Color and Cursor

4. **Managing Files and Directories**
   - Files, Directories and Sub-directories
   - File Types
   - Naming convention of Files / Directories
   - Directory related terms
   - Wildcard Character
   - Create and delete Directories
   - Create, display and delete Files
   - Listing Files and Directories
   - Concatenate Files
   - Copy and Move
   - Compress and Archive
   - Linking Files and Directories
   - Files Comparison Commands
   - Essential Commands for File operation

Module II: Advanced UNIX

1. **File Attributes/Permissions**
   - Categories of Permission and Users
   - Changing File Permission and Ownership
   - Super User
   - Change Default Permission

2. **Redirection and Piping**
   - What is Redirection ?
   - Types of Redirection
   - Redirection Operator
   - What is Piping in Unix/Linux ?
   - Re-direction vs Piping
   - Unix Pipe Flow
   - Multiple Command Pipelines

3. **Filter**
   - What is Filter ?
   - Special Filter Commands
   - Splitting File Horizontally
   - Splitting File Vertically
   - Searching Files and Directories
   - Searching Pattern

4. **Networking**
   - Communication within Network
   - Networking related Commands
   - Transfer Files from Local to Server and vice versa via FTP
   - Copy files from Server to Server
   - Connect Database from Unix Network
   - Fetch Database data from Linux Server

5. **Process**
   - What is Process ?
   - Some terms of Process
   - Process related Commands
   - Destroy/Terminate Process
   - Mechanism of Process creation

6. **Job Scheduling**
   - Job Control Command
   - Running jobs in background and foreground
   - One time and Periodically Job Run
   - Assign Priority for Multiple Job Schedule

Module – III : Editor

1. **Screen Editor : vi**
   - Different modes of vi editor
   - Screen Control and Navigation
   - Cursor Movement
   - Saving and Exit
   - Insert and Delete operation
   - Forward and Backward Search
   - Replace/Substitute of Pattern/String
   - Joining Lines
   - Copy and Paste
   - Block Copy, Move and Delete
   - Vim and Macro
2. **Stream Editor : sed**
   - Working with Sources
   - Working with Flat Files
   - Working with Targets
   - Data Transformation Source and Target
   - Mapping Parameters and Variables
   - Uses of Mapping Wizards
3. **Other Useful Editor**
   - Different types of Editors
   - Special features of vim editor
   - gedit : Graphical editor
   - emacs
   - nano
   - ed, ex

Module IV: Shell Script

1. **Entering to Shell Script**
   - What is Shell ?
   - Different types of Shell
   - What is Shell Scripting ?
   - Scripting vs Programming Language
   - Batch Scripting vs Shell Scripting
   - Advantages and Disadvantages
   - Writing convention of Shell Program
   - Types of Execution and Debugging
2. **Advance Filter uses in Scripting**
   - Translate : tr
   - Argument Convert : xargs
   - Sorting : sort
   - Reverse : rev
3. **Shell Variable**
   - What is Variable ?
   - User defined vs System Variables
   - Local and Global Variables
   - Environment Variable and Uses
   - Positional Parameter
   - Shift Operator
4. **Shell Arithmetic**
   - Escape Mechanism
   - Quoting Mechanism

- bc : Basic Calculator
- expr : Expression
- eval : Evaluation
- test : Check Condition
- File Descriptor

5. **Shell Script Operators**
   - Arithmetic Operators
   - Relational Operators
   - Boolean Operators
   - String Operators
   - File Test Operators
6. **AWK Utility**
   - Introduction to AWK
   - Types of AWK
   - AWK Working Methodology
   - AWK - Generic Uses
   - Built-in Variables
   - String built-in Functions
   - AWK Programs

Module – V : Shell Program

1. **Arrays**
   - Declaring an Array
   - Assigning values
   - Initializing an Array
   - Print/Display the Array Element
   - Length of Array and Element
   - Extraction by offset
   - Search and Replace Array Element
   - Add and Remove Element in Array
   - Copy and Concatenate
2. **Functions**
   - Creating Functions
   - Pass Parameters to a Function
   - Returning Values from Functions
   - Nested Functions
3. **Conditional Statements**
   - if … elif … else … fi
   - Nested if
   - case … esac
4. **Loop Statements**
   - while
   - until
   - for
   - select
   - Loop Control flow
   - Nested Loops