UNIX/LINUX

(Includes commands, Advanced Shell scripting and common administration operations)

Module-1: UNIX/LINUX USER LEVEL

1. **Understanding Unix/Linux Operating System**
   About Unix/Linux, Who should use Unix/Linux System, The history of Unix/Linux System, Flavors of Unix, Versions of Unix, Comparison between UNIX and Linux, Comparison between UNIX and Windows, Applications for Unix System, Main features of UNIX/LINUX.

2. **Architecture of Unix/Linux**
   Layers of UNIX Operating System, Kernel Internals, Different Types of Shells, Users and Tools, Internal Architecture of UNIX.

3. **Installation of Unix/Linux**
   Prerequisites for the UNIX/Linux Installation, Installation Models, Step by Step Installation of UNIX/Linux, Troubleshooting.

4. **Logging In/out & Working with Environment**
   Logging in into UNIX, Changing password, working around in the UNIX environment, Environment details, working methodologies, Logging Out.

5. **File System Hierarchy of Unix/Linux**
   UNIX File System, File System features, File System Hierarchy, Different types of File Systems, Some key important files of UNIX Operating System.

6. **UNIX Basic Commands**
   Pwd, uname, logname, whoami, finger, exit, date, cal, banner, history, id, man, ls, dir

7. **Working with Files**
   Types of UNIX Files, Creating files, duplicating a file, Appending content to a file, Standard input and output redirection, monitoring the details of files, understanding internal representation of files, creating links to files, hard links, soft links, creating links for directories between the users, removing files, changing time stamp of the file with touch command, nl command, tr command, terminal files, encryption/decryption of files, creating directories, removing directories.

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8. **Moving around in the file System**
   Different notations of navigating in the file system, tree command, searching for the files with whereis, which, locate, find etc.
9. **Copying and Moving Files**
   cp command and its options, mv command and its options, using cp and mv commands with different file navigation techniques.

10. **File Permissions**
    File permission string format, knowing the file types, changing file permissions of a file with different methods, umask.

11. **Working with Line oriented editors**
    ex editor, ed editor, sed editor, changing current position in the buffer, Appending text to the buffer, Locating a text pattern, Search and substitute operation, Undo operations, Meta Characters, Escape characters, Regular expressions, Removing lines, Moving Lines, Adding Lines, Joining and splitting Lines etc.

12. **Working with Visual Editors vi & vim**
    Vi editor modes, Moving the display window, moving the cursor, entering text into the editor, making corrections to the editor text, Search pattern commands, operators and text objects, Deleting text, undoing a change, Repeating a change, Rearranging Text, Duplicating Text, Changing Text etc.

13. **Handling Long files**
    Viewing data with head, tail, pg, more, wc commands.

14. **Comparison of Files**
    Comparing files with cmp, comm, diff, sdiff, zdiff, zcmp commands

15. **Sorting File Data**
    Simple sorting, sort command options, sorting on primary key, secondary key, Numerical sorting, and column based sorting, misc. sorting issues. Usage of uniq command on sorted data.
16. **Filtering File Data**
    Using grep command, fgrep, egrep, regular expressions, different types of patterns, cut command, options of cut command, paste command, join command, tee command etc.
17. **Compressing Utilities**
    Compress and uncompress, zip and unzip, gzip and gunzip, bzip2 and bunzip2 commands.
18. **Creating Archives**
    Tar command and its options

19. **Printing Files**
    Pr and lpr commands and their options

Module-2: UNIX/LINUX COMMON ADMINISTRATION TASKS

20. Communication with Other users

Wall command, write command, mesg command, mail command, web mail

21. Managing Users and Groups

Creating users with useradd, modifying user options with usermod, removing a user, creating groups with groupadd, modifying group options with groupmod, removing group with groupdel, primary groups, secondary groups, listing users and groups. chown command, chgrp command.

22. Monitoring Processes

Ps command, nice command and their options

23. Managing Jobs

Creating a job, scheduling a job, monitoring jobs, foreground jobs, background jobs, killing jobs, nohup, at command, crontab, batch command.

24. Unix Networking concepts

How UNIX systems are connected, UNIX terminals, handling terminals, network communication techniques, IP Addressing, ifconfig, uptime, tty, top commands.

25. Transferring Files with File Transfer Protocol

FTP concepts, managing ftp service, connecting to remote system with ftp, obtaining files from remote computer, transferring files to remote system, ftp commands. telnet concepts, scp utility for uploading files from login to login server to server.

26. Calling Remote Computer Desktop

Login to remote computer with ssh tool, calling remote desktop with rlogin, rsh tools.

27. Managing Disk Space

Disk partitions, Partition types, viewing disk space details with df and du commands.

28. System Startup and Shutdown

Runlevels of UNIX, init command, halt command, reboot command, power off command.

29. Installation of Third Party Software

Installing and working with applications of c, java etc.

30. Handling Devices

Types of devices, How UNIX handle devices? , Device files.

Module-3: ADVANCED SHELL SCRIPTING

31. Shell scripting basic concepts
What is shell scripting?, Benefits of writing shell scripts. Echo command, environment variables.

32. Writing a simple shell script
Writing simple shell script, compiling and running shell script, declaration of variables, readonly options, handling different types of data, reading data from keyboard, special characters, and comments.

33. Operators
Arithmetic operators, relations operators, Logical operators, String operators, expressions, evaluation of expressions, Numerical calculations, Assignment operators

34. Conditional statements
If statement, else clause, elif clause, case statement

35. Iterative Statements
While loop, break and continue, until loop, for loop

36. File Testing operations
File operators, handling file operators to process the files.

37. Handling command Line arguments
Using command line arguments, using shift, using set using IFS

38. Functions
Creating functions, calling functions, calling functions from other functions, handling parameters of functions, .mainfunc.sh usage.

39. Text Processing
Processing text with the help of grep and cut utility, awk programming, operators in awk, built-in variables in awk, using awk commands from the shell prompt, usage of regular expressions

40. Advance Scripting
Debugging a shell script, working with arrays, scheduling jobs, executing jobs in batch queues (batch), running jobs periodically (cron)