

VERSION





EAPL/PROF/PRTC22

COURSE CODE

EAPEL

SUB CATEGORY

CYBER SECURITY AND NETWORKING







ELYSIUM ACADEMY



ESSENTIALS

ELYSIUM ACADEMY

ELYNUX
ESSENTIALS

ELYSIUM
ACADEMY
ELYNUX

ESSENTIALS
ELYSIUM
ANABELIA





COURSE DESCRIPTION



The Linux course is designed to provide a comprehensive understanding of the Linux operating system, covering topics such as file system management, user administration, networking, security, and shell scripting.

COURSE GOALS



By completion, students will proficiently navigate Linux environments, execute commands, configure network services, and automate tasks using shell scripts. They will develop the skills necessary to deploy and maintain Linux servers, ensuring optimal performance, security, and reliability.

FUTURE SCOPE



Graduates of the Linux course will find diverse career opportunities as Linux system administrators, DevOps engineers, cybersecurity specialists, and cloud architects. With the increasing adoption of Linux in enterprise environments and cloud computing platforms, demand for Linux professionals continues to grow, offering promising career





CHAPTER CHAPTER

INTRODUCTION TO LINUX

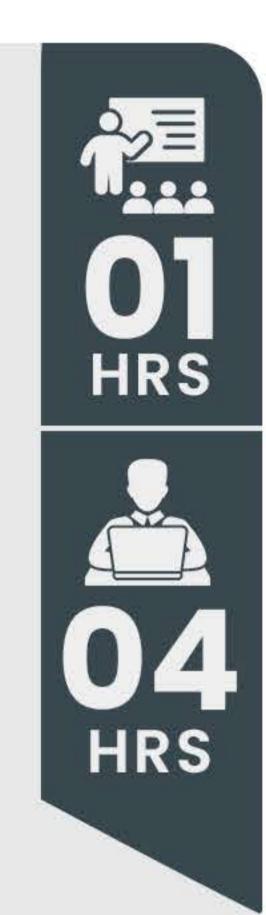
- 1. What Is Operating System?
- 2. What is Linux OS?
- 3. History of Linux
- 4. Linux vs. Unix
- 5. Linux Flavors / Distributions
- 6. Linux Users
- 7. Linux vs. Windows



CHAPTER

DOWNLOAD, INSTALL & CONFIGURE

- 1. What is Virtual Box?
- 2. Downloading and installing Oracle Virtual-Box
- 3. Ubuntu Server vs. Ubuntu Desktop
- 4. Creating VM in Virtual-Box
- 5. Download and install Linux (Ubuntu / CentOS server)
- 6. Download and Install Linux (Ubuntu / CentOS Desktop)



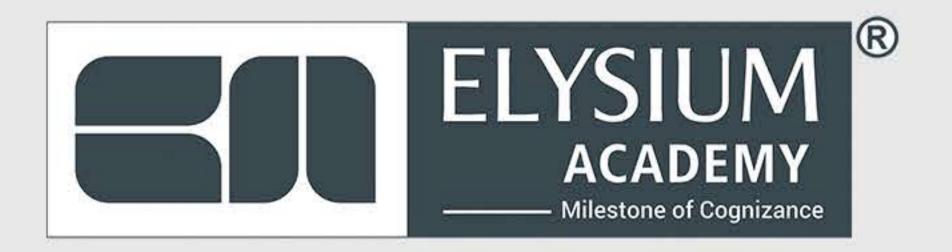
CHAPTER

SYSTEM ACCESS & FILE SYSTEM

01.Real time Access Linux System:

- 1. Installing Putty or any Other SSH Client
- 2. Comparison of other OS Clients







O2.Linux Command Prompts & Getting Prompts Back

O3. Introduction to Linux File System:

- 1. What is File System?
- 2. Different Type of File System
- 3. How to find file system type in Linux and Windows

O4.File System Structure & Description

O5.File System Navigation Commands (CD,LS and PWD)

- 1. Cd
- 2. Pwd
- **3.Ls**

O6. Linux File or Directory Properties

07. Linux File Types

- 1. Regular Files ('-')
- 2. Directory Files ('d')
- 3. Special Files (Actually, this one has 5 types in it.)
 - a.Block File('b')
 - b. Character Device File ('c')
 - c. Names pipe file or just a pipe file ('p')
 - d.Symbolic link file ('l')
 - e. Socket file('s')

08. What is Root?

- 1. What is root user / super user
- 2. What is root / directory
- 3. What is /root home directory





09.Change Password in Linux

- 1. Change Password for Root User
- 2. Change password for Standard User

10. Absolute and Relative Paths

- 1. Absolute path
- 2. Relative Path
- 3. Navigating to File system Using Both Paths

11.Creating Files and Directories

- a.Touch
- b.Cp
- c. Vi
- d.mkdir
- 12. Copying Directories
- 13. Finding Files and Directories (Find, Locate)
- 14.Difference Between Find and Locate Commands
- 15.Linux Wild Cards Commands (*,?,^,[])
- 16.Soft and Hard Links (In) in Linux





LINUX FUNDAMENTALS:







- 1. -=First dash or bit identifies the file type
- 2.---= 2nd 3 bits defines the permission for user (file or dir owner)
- 3.---= 3rd 3 bits defines the permission for group
- 4.--- 4th 3 bits defines the permission for everyone else
- 5. File Permissions Using Numeric Mode (Chmod 777 file)
- 6. File Ownership Commands (Chown, chgrp)

O3.Linux Access Control List (ACL) O4.Help Commands in Linux

- 1. Man
- 2. Whatis
- 3. Command --help
- O5. TAB Completion and Up Arrow Keys in Linux
- 06. Adding Text to Files
 - 1. Echo
 - 2. Redirects > and >>
 - 3. vi
- O7.Input and Output Redirects
 (>, >>, < , stdin ,Stdout and stderr)
- O8.Standard Output to a File (tee command) in Linux





O9.Linux Pipes (I) 10.File Maintenance Commands

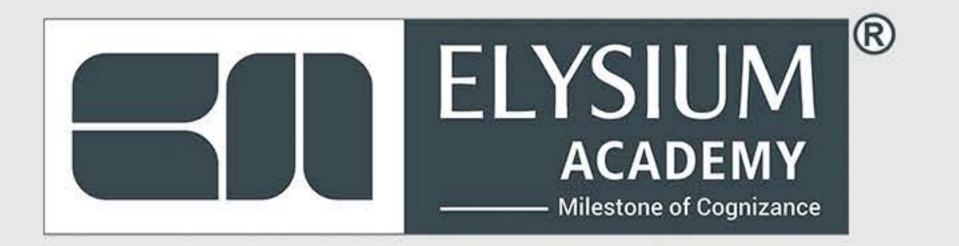
- 1. Cp
- 2. Rm
- 3.Mv
- 4. Mkdir
- 5. Rmdir or rm -f
- 6. Chgrp
- 7. chown

11. Files Display commands

- 1.Cat
- 2. More
- 3. Less
- 4. Head
- 5. Tail
- 6. vi

12. Filters / Text Processing Commands

- 1. Cut Text Processors Commands
- 2. Awk Text Processors Commands
- 3. Grep and egrep Text Processors Commands
- 4. Sort / Uniq Text Processors Commands
- 5. Wc Text Processors Commands
- 13. Compare Files (Diff and cmp)
- 14.Compress and uncompress (tar, gzip, gunzip)
- 15. Truncate File Size (truncate)
- 16. Combining and Splitting Files
- 17. Linux Vs. Windows Commands





SYSTEM ADMINISTRATION IN LINUX

O1.Linux File Editor (vi)

- 1. Vi
- 2. l= Insert mode
- 3. a= Insert and move cursor
- 4.zz or :wq! = save file and quit vi editor
- 5.:q! = quit vi editor without saving
- 6. Up , down, left and right keys = to navigate within vi editor
- 7. O= to start inserting form a new line
- 8. Shift g= Takes you to the end of a file while in vi
- 9./ = searches fr a pattern while in vi mode

02. Different between vi and vim editor

03."sed" Command

04.User Account Management

- 1. Useradd
- 2. Userdel
- 3. Groupdel
- 4. Usermod
 - 4.1.User Files
 - a) /etc/passwd
 - b) /etc/shadow
 - c) /etc/group

05. Enable Password Aging







06.Switch Users and sudo Access

- 1. Su or su -
- 2. Sudo commands

07.Monitor User

- 1. Who
- 2. Last
- 3. W
- 4.id

08.Talking to Users

- 1. Users
- 2. Wall
- 3. Write

O9.Linux Directory Service – Account Authentication

10.Difference between Active Directory, LDAP, IDM, WinBIND, OpenLDAP etc.

11. System Utility Commands in linux

- 1. Date
- 2. Uptime
- 3. Hostname
- 4. Uname
- 5. Which
- 6. Cal
- 7. Cal
- 8.bc





- 12.Processes, Jobs and Scheduling
- 13. Systemctl command
- 14.Ps command
- 15. Top command
- 16.Kill command
- 17. Crontab command
- 18.At command
- 19.Additional cronjobs (Hourly, daily, Weekly, monthly)
- 20.Process Management (bg, fg, nice)
- 21.System Monitoring Commands in Linux:
 - 1. Top
 - 2. Df
 - 3. Dmesg
 - 4. loststat
 - 5. Netstat
 - 6. Free
 - 7. Cat/proc/cpuinfo
 - 8. Cat/proc/meminfo

22. System Logs Monitor in Linux:

- 1. /var/log
- 2./var/log/message
- 3. Dmseg
- 4. mail





23.System Maintenance Commands in Linux:

- 1. Shutdown
- 2. Reboot
- 3. Init 0-6
- 4.halt
- 24.Changing System Hostname (hostnamectl)

25.Finding System Information in Linux

- 1. Uname
- 2. Cat/etc/redhat release
- 3. Cat/etc/*rel*
- 4. dmidecode

26.Finding System Architecture in Linux (arch)

- 27. Terminal Control Keys
- 28.Terminal Commands (Clear, exit, script)

29.Recover Root Password In Linux:

- 1. Restart the system or type reboot
- 2. Catch the grub screen
- 3. Stop at your kernel line and press "e" to enter the editing mode
- 4. Find the line that starts with Linux and go to the end of the line and type
- 5.rd.read
- 6. Press ctrl+x to enter into the rescue mode
- 7. #mount -o remount, rw /sysroot





- 8. #chroot /sysroot
- 9. #passwd
- 10. #touch /.autorelabel
- 11. #exit
- 12. #exit
- 30.SOS Report
- 31.Special Permissions with setuid, setgid and sticky bit

SHELL SCRIPTING IN LINUX

- 01.Linux Kernel
- 02. What is Shell?
- **O3. Types of Shells**
- **04.Shell Scripting**
- **O5.Basic Shell Scripts in Linux**

#!/bin/bash

Echo "Hello Elysium"

O6.Input and Output of Script

07.lf-then Scripts in Linux

#!/bin/bash

if [-e /home/iafzal/veronica]

then

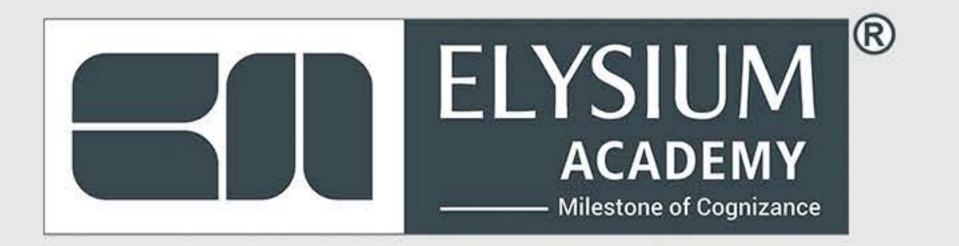
echo "File exist"

else

echo "File does not exist"

fi







08.For Loop Scripts in Linux #!/bin/bash if [-e /home/iafzal/check] then echo "File exist" else echo "File does not exist" 09.Linux do-while Scripts: #!/bin/bash count=0 num=10 while [\$count -It 10] do echo echo \$num seconds left to stop this process \$1 echo sleep 1 num=`expr \$num - 1` count='expr \$count + 1' done echo echo \$1 process is stopped!!! echo





10.Case Statement Scripts Linux case Statement Scripts:

```
#!/bin/bash
echo Please enter the letter next to the
command that you want to select:
echo 'a date'
echo 'b ls'
echo 'c who'
echo 'd hostname'
read choice
case $choice in
a) date;;
b) ls;;
c) who;;
d) hostname;;
*) echo Invalid choice - Bye.
esac
```

11.Check Remote Servers Connectivity12.Setting up Aliases (alias) in Linux13.User and Global Aliases14.Shell History in Linux





NETWORKING, SERVICES, & SYSTEM UPDATES

01.Enable Internet on Linux VM:

- 1. Open Virtualbox Manager
- 2. Select the machine you cannot get internet on in the left pane
- 3. Click the Settings button in the top menu
- 4. Click Network in the left pane in the settings window
- 5. Switched to Bridged Adaptor in the Attached to drop-down menu
- 6. Hit OK to save your changes
- 7. Start your VM

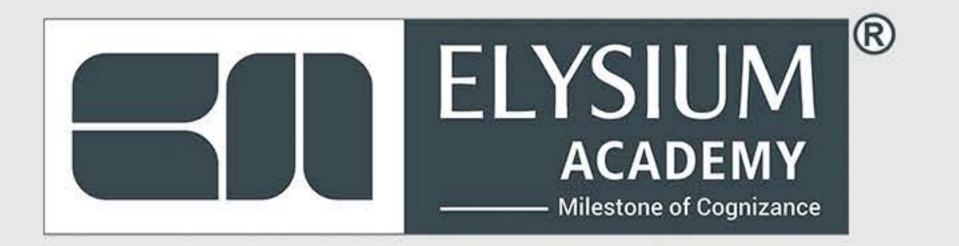
02.Network Components

- 1. IP
- 2. Subnet mask
- 3. Gateway
- 4. Static vs. DHCP
- 5. Interface
- 6. Interface MAC

O3.Network Files and Commands Network Files and Commands in Linux: Interface configuration files

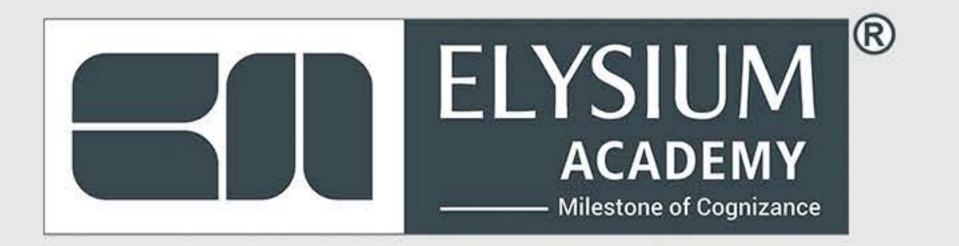
- 1. /etc/hosts
- 2. Verion 6 = /etc/sysconfig/network
- 3. Version 7 = /etc/hostname
- 4./etc/sysconfig/network-scripts/ifcfg-nic







- 5. /etc/resolv.conf
- 6. /etc/nsswitch.conf
- 7. Network Commands
- 8.ping
- 9. if config
- 10. ifup or ifdown
- 11. netstat
- 12. tcpdump
- 04.NIC Information (ethtool) in Linux
- **O5.NIC or Port Bonding**
- O6.New Network Utilities (nmtui, nmcli, nm-connection editor and GNOME Settings)
- O7.Downloading Files or Apps (wget) in Linux
- 08. Curl and ping commands in Linux
- 09.FTP -File Transfer Protocol
- 10.SCP Secure Copy Protocol
- 11.rsync Remote Synchronization
- 12. System Updates and Repos
 - 1. rpm
 - 2. yum
- 13.System Upgrade and Patch Management
- 14.Crate Local Repository from CD/DVD/USB in Linux
- 15. Advance Package Management





16.Rollback Patches and Updates in Linux

17.SSH and Telnet

- 1. SSH and Telnet in Linux
- 2. SSH Vs. Telnet in Linux
- 18.DNS- Download, Install and Configure (Domain Name System) in Linux
- 19. Hostname or IP Lookup (nslookup and dig) in Linux

20.Network Time Protocol

- 1. Linux Network Time Protocol
- 2. Linux chronyd (New Version of NTP)
- 3. New System Utility Command (timedatectl)

21.Linux Sendmail

22. Web Server (Apache - HTTP)

<!DOCTYPE html>

<html>

<body style="background-color:lightgrey;">

<br

<h1 style="text-align:center;">Welcome to My

First Page</hl>

<h4 style="text-align:center;">My name is

Imran Afzal</h4>

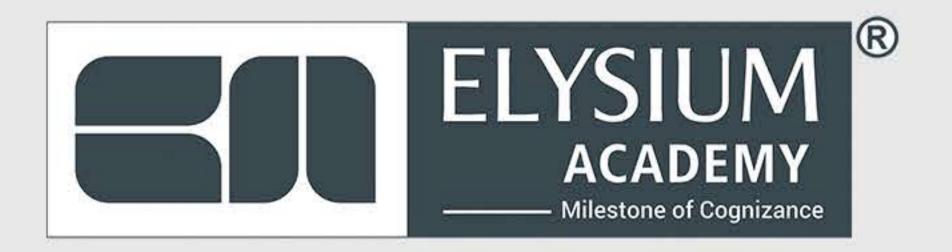
<br

<br

<br

</body>

</html>





- 23. Central Logger (rsyslog)
- 24.Securing Linux Machine (OS Hardening)
- 25. Open LDAP Installation
- 26. Tracing Network Traffic(traceoute)
- 27. Configure and Secure SSH
- 28.SSH Keys Access Remote Server without Password
- 29.Linux Web-Based Administration (cockpit)
- 30.Firewall
- 31.Tune System Performance (tuned, nice and renice)
- 32.Run Containers dockers and podman
- 33.Kickstart (Automate Linux Installation)
- 34.DHCP Server





DISK MANAGEMENT AND RUN LEVELS

- 01. System Run Levels
- 02. Computer Boot Process
- 03. Linux Boot Process
- 04. Message of the Day
- 05. Customize Message of the Day
- 06. Storage
- 07. Disk Partition (df, fdisk)
- O8. Add Disk and Create Standard Partition
- 09. Logical Volume Management
- 10. LVM Configuration During Installation
- 11. Add Disk Create New LVM Partition (pvcreate, vgcreate, lvcreate)
- 12. Extend Disk using LVM
- 13. Adding Swap Space
- 14. Advance Storage Management with Stratis
- 15. RAID (Redundant Array of Independent Disks)
- 16. File System Check (fsck and xfs_repair)
- 17. System Backup (dd Command)
- 18. Installation and Configuration of Network File System(NFS)







19. Samba Installation and Configuration20. NAS Drive for NFS or Samba21. SATA and SAS









ELYSIUM GROUP OF COMPANIES ELYSIUM ACADEMY PRIVATE LIMITED

ELYSIUN

AUTHORIZED INTERNATIONAL

-Partners—















