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Experiment No. 1

Title:

Introduction to Kali Linux Interface, Basic Commands, File Management, System Information, Networking, Process Management, and Compression Commands

Objective:

To familiarize students with the Kali Linux interface and practice essential Linux commands for file management, system info, networking, process handling, and compression.

Software/Tools Required:

- Kali Linux OS (2023 or later)
- Terminal access
- Basic user account

Theory:

Kali Linux Interface Overview:

Kali Linux is a Debian-based Linux distribution used for penetration testing and cybersecurity. Its interface includes:

- Desktop Environment (Xfce by default)
- Terminal Emulator
- Applications Menu
- Taskbar & Notification Area

1. Basic Linux Commands:

Command	Description
pwd	Shows current working directory
ls	Lists files and directories
cd	Changes the directory
clear	Clears the terminal

Command	Description
whoami	Displays the current user
man <command>	Displays manual page of a command

2. File Management Commands:

Command	Description
touch file.txt	Creates a new empty file
mkdir folder	Creates a new directory
cp file1 file2	Copies file1 to file2
mv old new	Moves or renames a file/directory
rm file.txt	Deletes a file
rmdir dir	Deletes an empty directory
cat file.txt	Displays contents of the file
nano file.txt	Opens file in terminal editor

3. System Information Commands:

Command	Description
uname -a	Shows kernel and system info
hostname	Displays the system's hostname
uptime	Shows how long the system has been up
top	Displays live system processes
free -h	Displays memory usage
df -h	Shows disk usage of all partitions

4. Networking Commands:

Command	Description
ifconfig / ip a	Shows IP address and interfaces

Command	Description
ping <host>	Sends ICMP echo to check network connectivity
netstat -tuln	Shows open ports and services
traceroute <host>	Traces route to a network host
nslookup <domain>	DNS lookup of a domain name

5. Process Management Commands:

Command	Description
ps	Displays running processes
ps aux	Detailed view of all processes
kill <PID>	Terminates process with given PID
top	Interactive real-time view of processes
htop	Enhanced process viewer (if installed)

6. Compression Commands:

Command	Description
tar -cvf file.tar folder/	Creates a tar archive
tar -xvf file.tar	Extracts tar archive
gzip file.txt	Compresses file to file.txt.gz
gunzip file.txt.gz	Decompresses file.txt.gz
zip file.zip file.txt	Zips the file
unzip file.zip	Extracts a zip file

Procedure:

1. Boot into Kali Linux and open a terminal.
2. Run `pwd`, `ls`, and `cd` to explore directories.
3. Create files using `touch`, edit with `nano`, and manage with `cp`, `mv`, and `rm`.

4. Explore system info using `uname -a`, `uptime`, and `df -h`.
5. Check network details using `ifconfig` and test ping to a website.
6. Monitor processes with `top`, and practice using the `kill` command.
7. Create and extract compressed files using `tar`, `gzip`, and `zip`.

Sample Commands with Output:

```
bash
CopyEdit
$ pwd
/home/student

$ mkdir TestLab
$ cd TestLab
$ touch hello.txt
$ echo "Welcome to Kali Linux" > hello.txt
$ cat hello.txt
Welcome to Kali Linux

$ uname -a
Linux kali 6.5.0-kali3-amd64 #1 SMP PREEMPT_DYNAMIC Debian

$ ifconfig
eth0: inet 192.168.1.5 netmask 255.255.255.0

$ ps aux | grep nano
student 1234 0.0 0.1 23212 1056 pts/0 S+ 14:52 0:00 nano
hello.txt
```

Output Screenshots:

```
└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt]
└─# pwd
/mnt
```

```
└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt]
└─# ls
Applications          Desktop      Downloads    Movies     Pictures   PycharmProjects  'Virtual Machines.localized'  build      private
Cisco Packet Tracer 8.2.2'  Documents    Library      Music      Public    Python           bash_profile           secure_data
```

```
└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt]
└─# cd Downloads
└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt/Downloads]
└─#
```

```
└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt/Downloads/Sample]
└─# nano sample2.txt
```

```
└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt/Downloads/Sample]
└─# touch sample.txt

└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt/Downloads/Sample]
└─# ls
file.tar  original.txt  sample.txt  sample2.txt

└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt/Downloads/Sample]
└─# gzip sample.txt

└─(root㉿cfda92dc-57cf-4d5e-afbb-9d4f5119448a)-[/mnt/Downloads/Sample]
└─# ls
file.tar  original.txt  sample.txt.gz  sample2.txt
```

```
[root@dc5ad3f3-c788-4bd3-9e4e-3b6c70f62eaf] [/mnt/Downloads/Sample]
# nano sample.txt

[root@dc5ad3f3-c788-4bd3-9e4e-3b6c70f62eaf] [/mnt/Downloads/Sample]
# cp sample.txt name.txt

[root@dc5ad3f3-c788-4bd3-9e4e-3b6c70f62eaf] [/mnt/Downloads/Sample]
# ls
file.tar  original.txt  sample.zip  unzipped_sample.txt
name.txt  sample.txt    sample2.txt

[root@dc5ad3f3-c788-4bd3-9e4e-3b6c70f62eaf] [/mnt/Downloads/Sample]
#
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
friends.txt  sample.txt  sample2.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# mv sample.txt original.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
friends.txt  original.txt  sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# rm friends.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
original.txt  sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# uname -a
Linux cfda92dc-57cf-4d5e-afbb-9d4f5119448a 6.12.28 #1 SMP Tue May 20 15:19:05 UTC 2025 aarch64 GNU/Linux
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# uptime
06:31:26 up 1:05, 0 users, load average: 0.00, 0.00, 0.00
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# df -h
Filesystem              Size  Used Avail Use% Mounted on
/dev/vdb                504G  1.1G  503G  1% /
none                   496M    0   496M  0% /dev
tmpfs                  64M    0   64M  0% /dev/shm
d24b1a3dfc5fd1590d43f7bd020be89c615e  229G  169G  61G  74% /mnt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ping google.com
PING google.com (142.250.67.174) 56(84) bytes of data.
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=1 ttl=116 time=7.90 ms
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=2 ttl=116 time=12.2 ms
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=3 ttl=116 time=8.80 ms
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=4 ttl=116 time=9.05 ms
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=5 ttl=116 time=12.9 ms
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=6 ttl=116 time=11.4 ms
64 bytes from bom12s07-in-f14.1e100.net (142.250.67.174): icmp_seq=7 ttl=116 time=12.3 ms
^C
--- google.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6039ms
rtt min/avg/max/mdev = 7.898/10.659/12.866/1.868 ms
```

```
top - 06:31:58 up 1:05, 0 users, load average: 0.00, 0.00, 0.00
Tasks: 2 total, 1 running, 1 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.1 sy, 0.0 ni, 99.9 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 992.2 total, 158.2 free, 59.8 used, 798.2 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 932.4 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
 1 root 20 0 4596 3500 2988 S 0.0 0.3 0:00.21 bash
7100 root 20 0 7636 4684 2636 R 0.0 0.5 0:00.02 top
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample2.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# tar -cvf file.tar original.txt
original.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# tar -xvf file.tar
original.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# touch sample.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample.txt sample2.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# gzip sample.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample.txt.gz sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# gunzip sample.txt.gz

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample.txt sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# zip sample sample.txt
adding: sample.txt (stored 0%)

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample.txt sample.zip sample2.txt
```

```
[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# unzip sample.zip
Archive: sample.zip
replace sample.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: r
new name: unzipped_sample.txt
extracting: unzipped_sample.txt

[root@cfda92dc-57cf-4d5e-afbb-9d4f5119448a] [/mnt/Downloads/Sample]
# ls
file.tar original.txt sample.txt sample.zip sample2.txt unzipped_sample.txt
```

Outcome:

- Navigate the Kali Linux interface using a terminal
- Execute basic file handling and directory commands
- Retrieve system and network configuration details
- Monitor and manage running processes
- Perform file compression and decompression using Linux commands

Conclusion:

In this experiment, students gained hands-on experience with the Kali Linux interface and practiced essential Linux commands required for managing files, viewing system and network information, and handling processes.