

CERT Lab 1 – Introduction to Linux Commands

Educational Objectives

1. Gain hands-on experience on Linux fundamentals
2. Getting familiar with the Linux command line

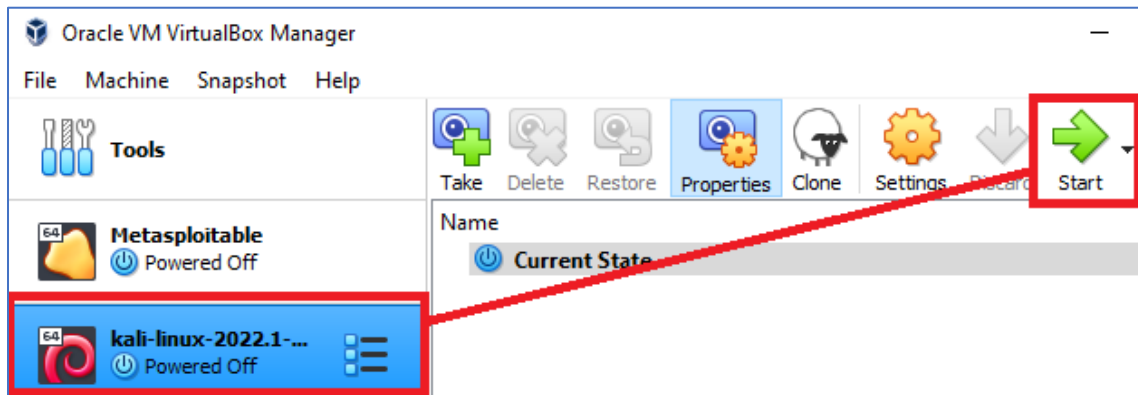
Tools

1. Oracle VirtualBox VMs
2. Kali Linux
3. Metasploitable

Note: In this tutorial try to use the command line interface as much as possible.

Lab Task 1.0:

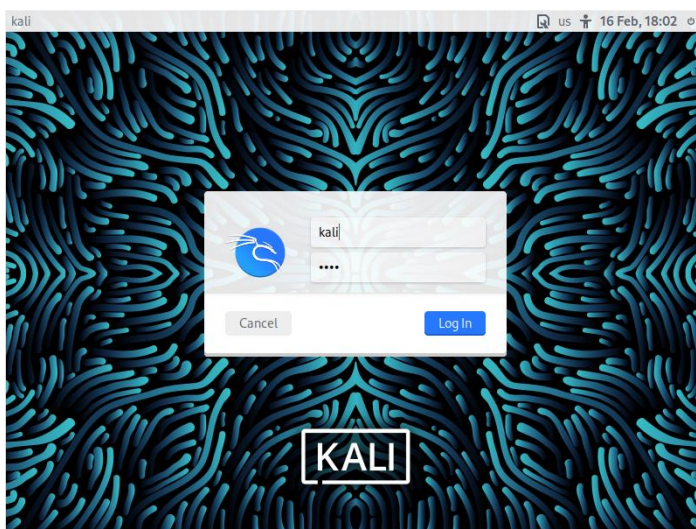
1. Open VirtualBox manager, click on kali linux and press Start to boot the Kali Linux Virtual Machine



2. Login to the Kali Linux machine using the following credentials:

User: **kali**

Password: **kali**



Step 1 – First commands: echo, whoami and ifconfig

We must be able to navigate to files, print their contents, and create files.

Let's begin with two of the initial commands, which are listed in the table below:

Command	Description
echo	Displaying lines of text which are passed as arguments on the command line
whoami	Find out what user we're currently logged in as
ifconfig	Display current network configuration

Echo command

1. Right click on the Desktop and click Open Terminal Here
2. To use **echo** as to output text, type echo followed by any text in the terminal

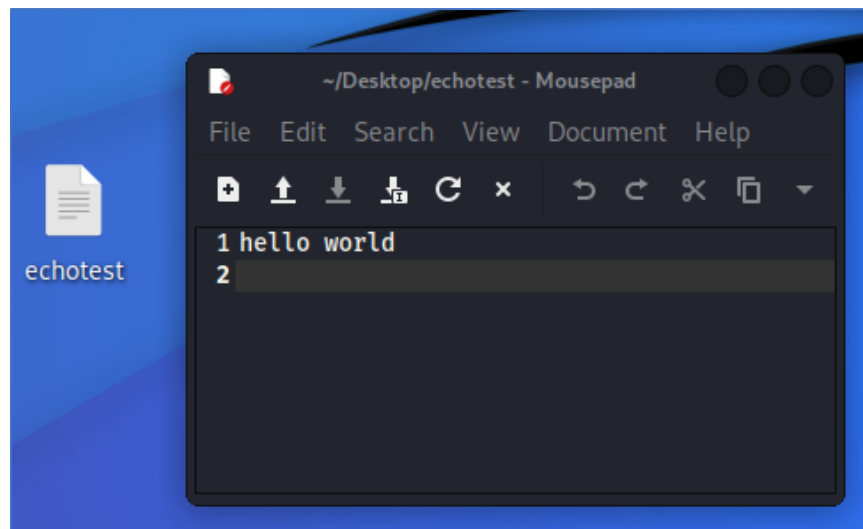
echo test hello world

```
(kali㉿kali)-[~/Desktop]
$ echo test hello world
test hello world
```

3. echo can also be used to write texts into a file. Use > or >> to include the string in an echo command in a file, instead of displaying it as output:
 - i. Right click on the desktop and select Create Document > Empty File.
 - ii. Rename the file as echotest
 - iii. Go back to the terminal and type the following command

echo hello world > echotest

- iv. Double click on the echotest file and observe that we have added in "hello world" into this empty file only by using the terminal



Whoami command

1. To check the username of the current user when a command is invoked, type in **whoami** in a terminal

```
(kali㉿kali)-[~/Desktop]
$ whoami
kali
```

2. To change the user into root (admin privileges) type **sudo su** into a terminal.
 - i. The system will ask for password, type in kali as password
 - ii. The terminal is now run as administrator
 - iii. Type **whoami**
 - iv. Notice that the output changes the user from kali to root

```
(kali㉿kali)-[~/Desktop]
$ sudo su
[sudo] password for kali:
(kali㉿kali)-[~/Desktop]
$ whoami
root
```

- v. Close the terminal

ifconfig command

1. Right click on the Desktop and click Open Terminal Here
2. Type the following command

ifconfig

```
(kali㉿kali)-[~/Desktop]
$ ifconfig
docker0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
    ether 02:42:05:64:1f:74 txqueuelen 0 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.100.4 netmask 255.255.255.0 broadcast 192.168.100.255
    inet6 fe80::a00:27ff:fe95:bd54 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:95:bd:54 txqueuelen 1000 (Ethernet)
    RX packets 6 bytes 1052 (1.0 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 22 bytes 3142 (3.0 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

- i. Your virtual machine's IP address is listed under the "eth0" adapter, next to the "inet"

Step 2 – Interacting with the file system

It's critical to be able to navigate the machine you're logged into without relying on a desktop environment. The following commands are going to be used a lot throughout the lab practical:

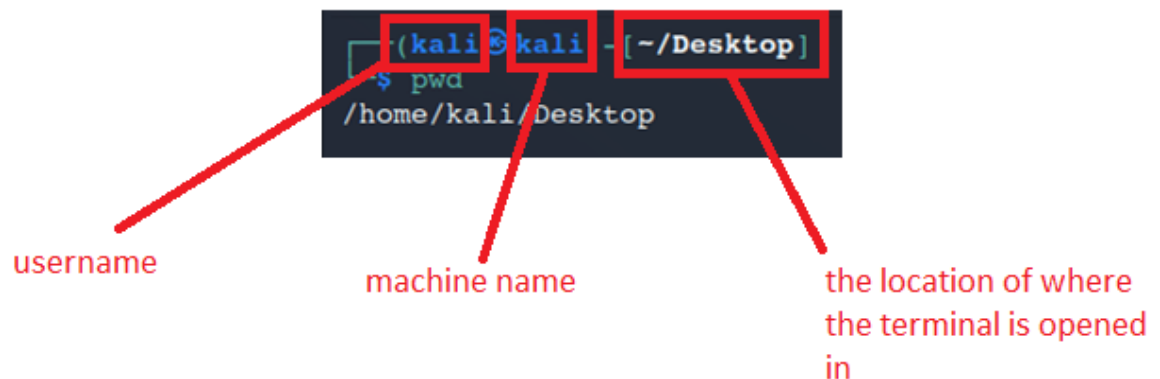
Command	Full Name	Description
ls	listing	list down the files and sub-directories within your current directory
cd	change directory	change the current working directory
cat	concatenate	create files, view content of a file
pwd	print working directory	writes the full pathname of the current working directory

To begin, press right click anywhere on the *Desktop* and click *Open Terminal Here*

1. pwd: Print Working Directory

- On the terminal, run the commands: **pwd** to give out the current directory in which the terminal process is running.

```
(kali@kali) - [~/Desktop]
$ pwd
/home/kali/Desktop
```



2. cd: change directory

- i. Use the command **cd** to change the working directory.

Run the command **cd /home/kali/** and press enter.

Type **pwd** again to check and confirm the current working directory

```
(kali㉿kali)-[~/Desktop]
$ cd /home/kali/

(kali㉿kali)-[~]
$ pwd
/home/kali
```

- ii. Get back to the Desktop directory again by typing **cd Desktop**
- iii. Type **cd ..** (cd followed by space and 2 dots without spaces) to navigate back one folder up

```
(kali㉿kali)-[~]
$ cd Desktop

(kali㉿kali)-[~/Desktop]
$ pwd
/home/kali/Desktop

(kali㉿kali)-[~/Desktop]
$ cd ..

(kali㉿kali)-[~]
$ pwd
/home/kali
```

3. ls: listing

- i. Change the terminal directory to Desktop again
- ii. Type **ls** to list out the contents of the current directory
- iii. Type **ls -l** to output a long listing of all files
- iv. Type **ls -a** to list all files including hidden files (files with names beginning with a dot)
- v. Combine the arguments into one, for example **ls -al** will use both **-a** and **-l**

```
(kali㉿kali)-[~/Desktop]
$ ls
echotest

(kali㉿kali)-[~/Desktop]
$ ls -a
.  ..  echotest

(kali㉿kali)-[~/Desktop]
$ ls -l
total 4
-rw-r--r-- 1 kali kali 12 Jun  5 20:24 echotest

(kali㉿kali)-[~/Desktop]
$ ls -al
total 12
drwxr-xr-x  2 kali kali 4096 Jun  5 20:24 .
drwxr-xr-x 20 kali kali 4096 Jun  5 20:41 ..
-rw-r--r--  1 kali kali  12 Jun  5 20:24 echotest
```

4. cat: concatenate

cat command allows us to create single or multiple files, view content of a file, concatenate files and redirect output in terminal or files. The general syntax for the cat command is **cat [OPTION] [FILE]...**

i. Display contents of a file

- a. Type the following command into a terminal. This will output the contents of the passwd file located in /etc/

```
cat /etc/passwd
```

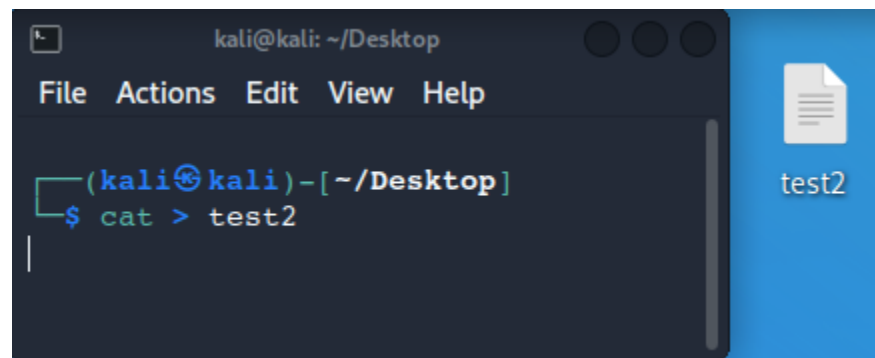
```
(kali㉿kali)-[~/Desktop]
$ cat /etc/passwd
root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
```

ii. Create a file with cat command

- a. Open a terminal in Desktop directory and type the following command:

```
cat > test2
```

- b. This will create an empty file named test2



Step 3 – Get Help: man and help command

There are lots of commands that can be used in Linux terminal and often we tend to forget how to use each of these commands. The following table lists out more helpful commands:

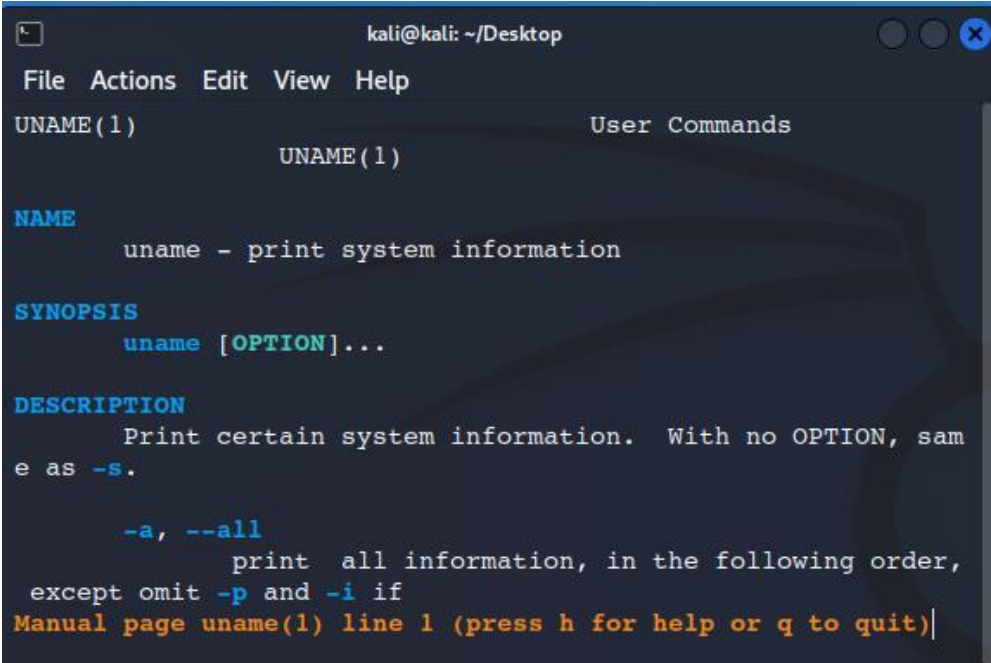
Command	Description
uname	Print basic system information
history	Print out previously used commands
mkdir/rmdir	Make directory / Remove directory
cp/mv/rm	Copy/Move/Remove file
find	Search and locate the list of files and directories
locate	Finds files using the file name
ping	Check network connectivity

Remembering the usage of these commands and their syntax takes a long time and we need to get help or manual on how to use them.

1. Display manual

- i. In the terminal, type `man` followed by the command you would like to get to know of, for example the **uname** manual command looks like

```
man uname
```



```
kali@kali: ~/Desktop
File Actions Edit View Help
UNAME(1) User Commands
UNAME(1)

NAME
    uname - print system information

SYNOPSIS
    uname [OPTION]...

DESCRIPTION
    Print certain system information.  With no OPTION, same as -s.

    -a, --all
        print all information, in the following order, except omit -p and -i if

Manual page uname(1) line 1 (press h for help or q to quit)|
```

We get a detailed manual of what this command is, the description, switches and how to use it

- ii. Press Q to exit the manual page

2. Display Help

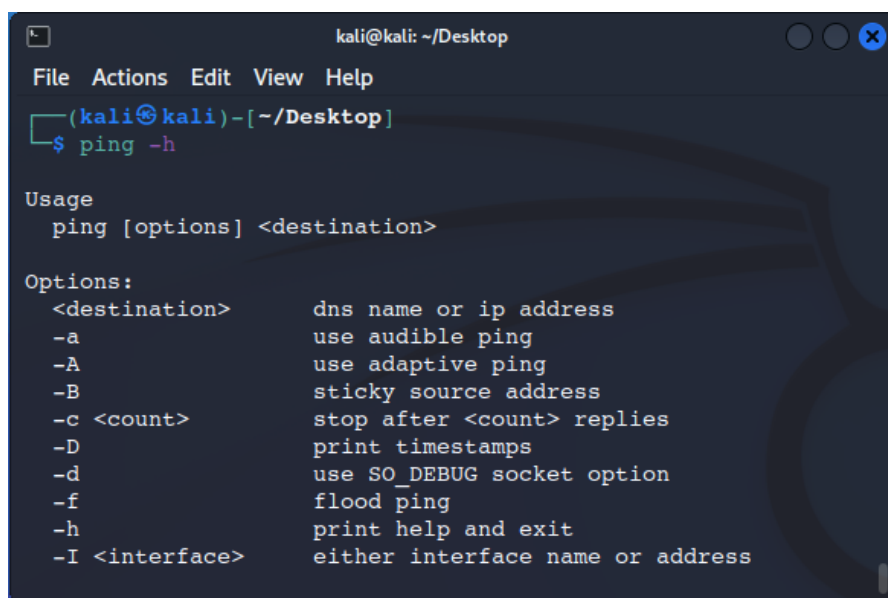
Like manual command, most commands have the help page to show how to use the command.

- i. In the terminal, type the command you would like to get to know of, followed by **-h** or **--help** for example the **ping** command looks like

```
ping -h
```

Or

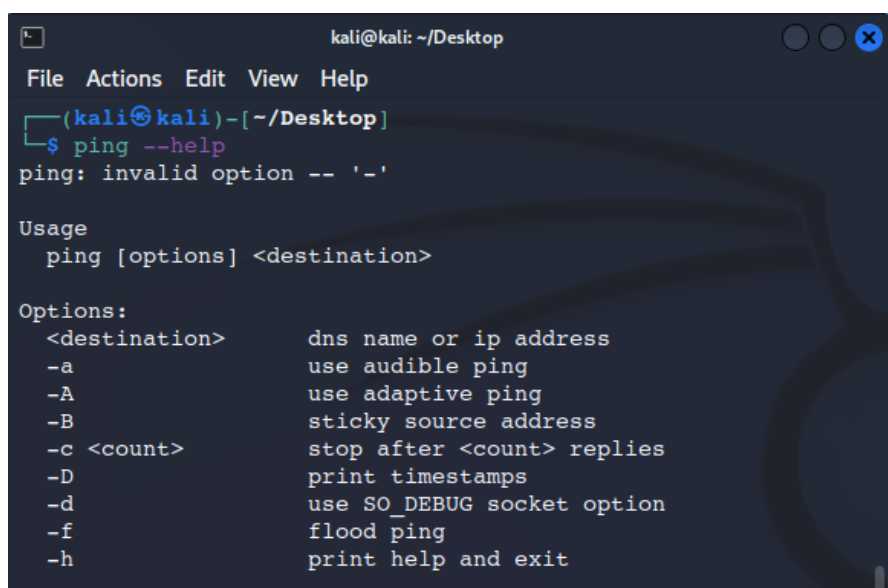
```
ping --help
```



```
kali@kali: ~/Desktop
File Actions Edit View Help
(kali@kali)-[~/Desktop]
$ ping -h

Usage
  ping [options] <destination>

Options:
  <destination>    dns name or ip address
  -a               use audible ping
  -A               use adaptive ping
  -B               sticky source address
  -c <count>       stop after <count> replies
  -D               print timestamps
  -d               use SO_DEBUG socket option
  -f               flood ping
  -h               print help and exit
  -I <interface>  either interface name or address
```



```
kali@kali: ~/Desktop
File Actions Edit View Help
(kali@kali)-[~/Desktop]
$ ping --help
ping: invalid option -- '-'

Usage
  ping [options] <destination>

Options:
  <destination>    dns name or ip address
  -a               use audible ping
  -A               use adaptive ping
  -B               sticky source address
  -c <count>       stop after <count> replies
  -D               print timestamps
  -d               use SO_DEBUG socket option
  -f               flood ping
  -h               print help and exit
```

(Q1) It is easier to navigate through files using the GUI based environment rather than the CLI (terminal).
Why is learning the terminal commands useful when it comes to Linux?

Recommended Links (further learning)

<https://tryhackme.com/module/linux-fundamentals>

<https://checkout.ine.com/starter-pass>