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Table of Contents

1	. Int	roduction	1	
2	. Ob	jective	1	
3	. Re	quired Tools	1	
4	. Lin	ux commands	1	
	4.1	script a1script	1	
	4.2	whoami	2	
	4.3	who	2	
	4.4	finger kali	3	
	4.5	date	3	
	4.6.1	ls	3	
	4.6.2	4.6.2 ls -a		
	4.6.3	ls -a -l	4	
	4.7 W	/hat's the difference?	4	
	4.8	cat /etc/passwd	5	
	4.9	echo "This is a one-line file" > test1	6	
	4.10	Creating another file with texts.	7	
	4.11	Combine test1 and test2	8	
	4.12	Exit the script	10	
5	Со	nclusion	.12	

Table of Figures

Figure 1: Script a1script started	2
Figure 2: Current Username	2
Figure 3: List of all users	
Figure 4: User account details	3
Figure 5:Current date and time	
Figure 6: Visible files in current directory	
Figure 7: All files in current directory	
Figure 8: Details of files in current directory	
Figure 9: Contents of /etc/passwd	
Figure 10: Contents of /etc/passwd	
Figure 11: Creating one line file	
Figure 12: test1 file created	6
Figure 13: Contents of test1 file	
Figure 14: Creating test2 file with text	
Figure 15: test2 file created	
Figure 16: Contents of test2 file	
Figure 17: Combining files test1 and test2	
Figure 18: Contents of test1 after combining	
Figure 19: Contents of test2 after combining	
Figure 20: Ending the recording of terminal activities	
Figure 21: Recorded content in a1script (1)	
Figure 22: Recorded content in a1script (2)	
Figure 23: Recorded content in a1script (3)	
Figure 24: Recorded content in a1script (4)	11

1. Introduction

Linux is a powerful open-source operating system that can be widely used in various domains, including system administration, cybersecurity, and software development. This lab report focuses on gaining hands-on experience with essential Linux commands. It provides a foundation for managing files, users, and system processes efficiently. After practicing these commands, one can navigate and operate a Linux-based system and enhancing the ability to perform administrative tasks.

2. Objective

The main objective of this workshop is to be familiar with the Linux commands.

3. Required Tools

Linux or Linux based operating system. Here, I am using Kali Linux.

4. Linux commands

4.1 script a1script

This command creates a file named a1script and starts recording the terminal activities.

```
Home X kali-linux-2023.4-vmware... X

File Actions Edit View Help

(kali® kali)-[~]
$ script alscript
Script started, output log file is 'alscript'.

(kali® kali)-[~]
```

Figure 1: Script a1script started

4.2 whoami

This command displays the name of the current username. Here, the username is Kali

```
(kali® kali)-[~]

$ whoami
kali

(kali® kali)-[~]
```

Figure 2: Current Username

4.3 who

This command shows all the users logged into the system.

Figure 3: List of all users

4.4 finger kali

The 'finger' command provides additional account details like login name, home directory and last login. In the command 'finger kali', kali is the username. We can obtain the username by typing 'whoami' in the terminal.

Figure 4: User account details

4.5 date

This command displays the current date and time of the system.

Figure 5: Current date and time

4.6.1 Is

This command displays all the visible files in the current directory as shown in the picture below.

```
(kali⊗ kali)-[~]
alscript Desktop Documents Downloads Laptop Music Pictures Public Templates Videos

(kali⊗ kali)-[~]
```

Figure 6: Visible files in current directory

4.6.2 Is -a

This command shows all the files including hidden files (those starting with dot '.') present in the current directory.

Figure 7: All files in current directory

4.6.3 Is -a -I

This command shows file permission, size, owners and modification times.

```
total 144
               17 kali kali
                                  4096 Dec 13 02:23
                                  4096 Nov 30
drwxr-xr-x
                3 root root
1 kali kali
1 kali kali
                                                   2023
                                  4096 Dec 13 02:27 alscript
                                  220 Nov 30 2023 .bash_logout
5551 Nov 30 2023 .bashrc
-rw-r--r-- 1 kali kali
drwxr-xr-x 10 kali kali
                                  3526 Nov 30 2023 .bashrc.original
                                               9 01:00
                                  4096 Dec
                                 4096 Jan 2
4096 Jan 2
35 Jan 2
drwxr-xr-x
                                                    2024 Documents
2024 Downloads
drwxr-xr-x
                                  4096 Jan
                                 11759 Nov 30
                                                    2023 .face
                                  5 Nov 30
4096 Jan 2
lrwxrwxrwx
                                                    2024
                                                    2024 .ICEauthority
                                  4096 Nov 30 2023 .java
4096 Dec 13 02:20 Laptop
drwxr-xr-x
drwxr-xr-x
                                  4096 Jan 2
4096 May 24
                                                    2024 .mozilla
2024 Music
drwx-
                                  4096 Jan
                                                   2023 .profile
2024 Public
                                   807 Nov 30
                                  0 Aug 27
4096 Jan 2
-rw-r--r--
drwxr-xr-x
                1 kali kali
2 kali kali
                                                   00:32 .sudo_as_admin_successful
                                                   2024 Template
2024 Videos
                                     49 Dec
                                                   02:19 .Xauthority
```

Figure 8: Details of files in current directory

4.7 What's the difference?

The command 'ls' displays the visible files only whereas the command 'ls -a' displays all the files including hidden files also and the command 'ls -a -l' displays all the files (including hidden files) with their file permission, size, owners and modification times.

4.8 cat /etc/passwd

This command shows the contents of the /etc/passwd file like user account details including usernames, UIDs and home directories.

```
s 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
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
 uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
 proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
 _apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management://usr/sbin/nologin
systemd-timesync:x:992:992:systemd Time Synchronization:/:/usr/sbin/nologin
messagebus:x:100:102::/nonexistent:/usr/sbin/nologin
tss:x:101:104:TPM software stack,,,:/var/lib/tpm:/bin/false
strongswan:x:102:65534::/var/lib/strongswan:/usr/sbin/nologin
tcpdump:x:103:105::/nonexistent:/usr/sbin/nologin
usbmux:x:104:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
sshd:x:105:65534::/run/sshd:/usr/sbin/nologin
dnsmasq:x:106:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
 avahi:x:107:108:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
```

Figure 9: Contents of /etc/passwd

```
speech-dispatcher:x:108:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
pulse:x:109:110:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
lightdm:x:110:112:Light Display Manager:/var/lib/lightdm:/bin/false
saned:x:111:114::/var/lib/saned:/usr/sbin/nologin
polkitd:x:991:991:polkit:/nonexistent:/usr/sbin/nologin
rtki:x:112:115:Realtimekit,,,:/proc:/usr/sbin/nologin
colord:x:113:116:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
nm-openvpn:x:114:117:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
nm-openconnect:x:115:118:NetworkManager OpenConnect plugin,,,:/var/lib/NetworkManager:/usr/sbin/nologin
_galera:x:116:65534::/nonexistent:/usr/sbin/nologin
_galera:x:1120:MariaDB Server,,,:/nonexistent:/bin/false
stunnel4:x:990:990:stunnel service system account:/var/run/stunnel4:/usr/sbin/nologin
_rpc:x:118:65534::/run/rpcbind:/usr/sbin/nologin
geoclue:x:119:122::/var/lib/geoclue:/usr/sbin/nologin
pebian-snmp:x:120:123::/var/lib/snmp:/bin/false
sslh:x:121:124::/nonexistent:/usr/sbin/nologin
ntpsec:x:123:128::/var/run/redsocks:/usr/sbin/nologin
redsocks:x:123:128::/var/run/redsocks:/usr/sbin/nologin
geophis:x:125:133::/var/lib/gophis:/usr/sbin/nologin
indine:x:126:65534::/var/spool/rwho:/usr/sbin/nologin
iodine:x:126:65534::/var/run/miredo:/usr/sbin/nologin
iodine:x:126:65534::/var/run/miredo:/usr/sbin/nologin
iodine:x:128:65534::/var/lib/fedis:/usr/sbin/nologin
statd:x:128:65534::/var/lib/fedis:/usr/sbin/nologin
postgres:x:130:132:PostgreSQL administrator,,;/var/lib/postgresql:/bin/bash
mosquitto:x:131:13::/var/lib/medis:/usr/sbin/nologin
inetsim:x:132:134::/var/lib/medis:/usr/sbin/nologin
inetsim:x:132:313::/var/lib/medis:/usr/sbin/nologin
inetsim:x:133:313::/var/lib/medis:/usr/sbin/nologin
inetsim:x:133:313::/var/lib/medis:/usr/sbin/nologin
inetsim:x:133:313::/var/lib/medis:/usr/sbin/nologin
inetsim:x:133:313::/var/lib/medis:/usr/sbin/nologin
inetsim:x:133:313:/var/lib/medis:/usr/sbin/nologin
```

Figure 10: Contents of /etc/passwd

4.9 echo "This is a one-line file" > test1

The 'echo' command is used to create a single-line file. The command mentioned above writes the text "This is a one-line file" in the file test. If the file has any other content, the content will be overwritten.

Figure 11: Creating one line file

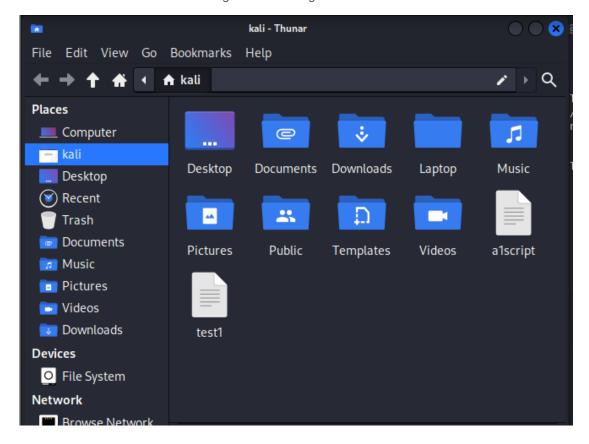


Figure 12: test1 file created

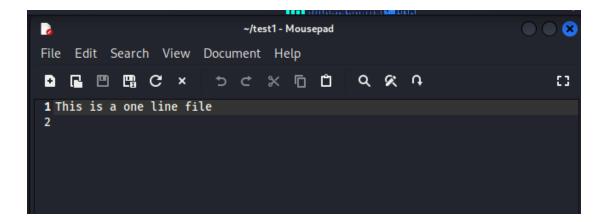


Figure 13: Contents of test1 file

4.10 Creating another file with texts.

cat > test2

This is file two.

It has several lines.

Three lines, in fact.

^D i.e. CTRL-D

The 'cat' command is used to input the multi-line content. Here, the file 'test2' is created. Then, we wrote multiple lines. We can press 'Ctrl+D' to save and exit.

Figure 14: Creating test2 file with text

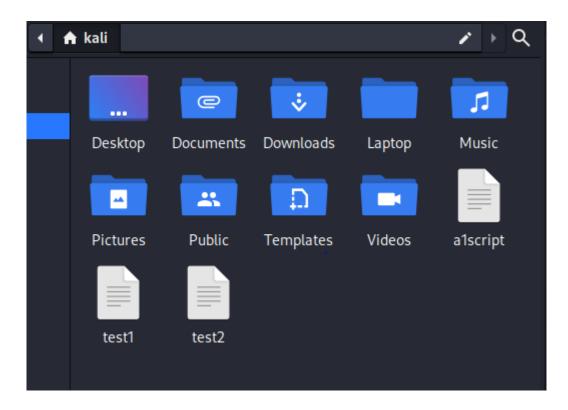


Figure 15: test2 file created

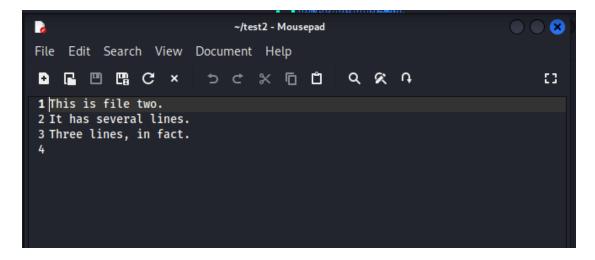


Figure 16: Contents of test2 file

4.11 Combine test1 and test2

The command 'test2 >> test1' combines the contents of the files test1, and test2. Then, store it in the file test1. The contents of the file test2 remains as it is.

```
(kali@ kali)-[~]
$ cat test2 >> test1

[kali@ kali)-[~]

.
```

Figure 17: Combining files test1 and test2

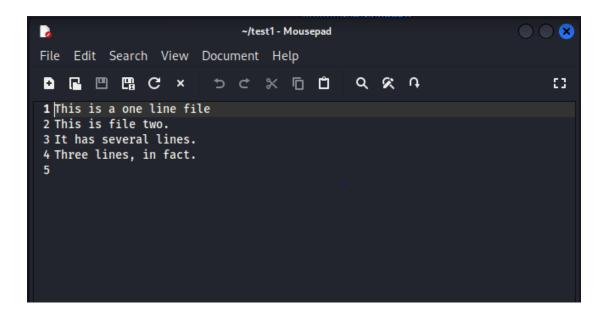


Figure 18: Contents of test1 after combining

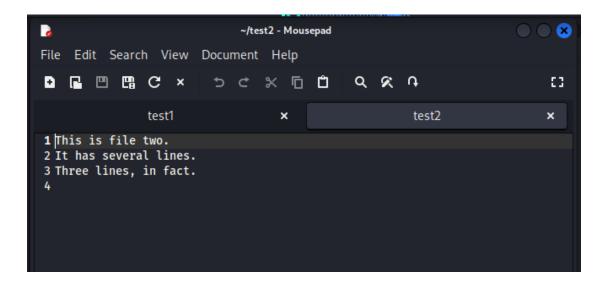


Figure 19: Contents of test2 after combining

4.12 Exit the script

The command 'exit a1script' stops recording the terminal activities.

```
(kali@ kali)-[~]
$ exit a1script
Script done.

(kali@ kali)-[~]

...
```

Figure 20: Ending the recording of terminal activities

The recorded script 'a1script' can be viewed again by opening the file again later when needed, by using the command 'cat a1script'. A part of it is shown in the picture below:

Figure 21: Recorded content in a1script (1)

Figure 22: Recorded content in a1script (2)

```
(Mali@ Mali)-[-]

3 cat / Atc/passed
root:x:08:08:root:/root:/usr/bin/zsh
daemon:x:11:1:daemon:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/ysr/sbin/nologin
sync:x:13:08:08:x:ysr/sbin/hologin
sync:x:13:08:08:x:ysr/sbin/hologin
sync:x:13:08:08:x:ysr/sbin/hologin
sync:x:13:08:08:x:ysr/sbin/hologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
np:x:/7:1p:/var/spool/lpd:/usr/sbin/nologin
malix:8:9:mali:/var/mali:/usr/sbin/nologin
malix:8:9:mali:/var/spool/uucp:/usr/sbin/nologin
prox:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
prox:x:13:13:prox:y:/bin:/usr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/nos:x:ysr/sbin/nologin
nucp:x:10:10:uucp:/var/spool/nos:x:ysr/sbin/nologin
nirc:x:39:39:ircd:/run/arcd:/usr/sbin/nologin
nobody:x:65534::65544::/nonexistent:/usr/sbin/nologin
nobody:x:65534::65544::/nonexistent:/usr/sbin/nologin
systemd-timesync:x:992:992:systemd Time Synchronization:/:/usr/sbin/nologin
systemd-timesync:x:992:992:systemd Time Synchronization:/:/usr/sbin/nologin
systemd-timesync:x:100:102:/nonexistent:/usr/sbin/nologin
ts:x:101:104:TbM software stack.,,:/var/lib/spm:/bin/false
strongswan:x:102:65534::/nonexistent:/usr/sbin/nologin
spech-dispatcher:x:103:105::/nonexistent:/usr/sbin/nologin
spech-dispatcher:x:108:29:Specch Dispatcher,,:/run/spech-dispatcher:/bin/false
pulse:x:109:102:110:Pulse:dadio daemon,,:/run/abi-daemon/usr/sbin/nologin
ightdm:x:110:112:Light Display Manager:/var/lib/misc:/usr/sbin/nologin
ightdm:x:110:112:Light Display Manager:/var/lib/lightdm:/bin/false
sned:x:111:114::/xir/lib/samed:/usr/sbin/nologin
oolodix:113:116:colord colour management daemon,,:/run/spech-dispatcher:/bin/false
stunnel4:x:990:990:stunnel service system account:/var/run/stunnel4:/usr/sbin/nologin
```

Figure 23: Recorded content in a1script (3)

Figure 24: Recorded content in a1script (4)

5 Conclusion

This lab provides an introduction to fundamental Linux commands and their practical applications in managing files, directories, and system information. These commands are essential building blocks for anyone working with Linux-based systems, as they enable us to interact with the operating system efficiently. By mastering commands such as whoami, Is, and cat, we can perform essential tasks like identifying system users, organizing files, and manipulating content.