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INTTODUCTION

This log focuses on fundamental Linux commands and scripting techniques to manage files, directories, and system information. Additionally, it covers creating and executing a script file to document and test commands, enhancing familiarity with the Linux command line. These tasks were completed in a virtualized environment using Ubuntu (or Kali Linux, depending on the system setup).

Ubuntu, a popular Linux distribution, is known for its ease of use and versatility in general-purpose computing (Cononical, 2024). It provided a user-friendly interface for practicing essential Linux commands, directory management, and scripting techniques. **Kali Linux**, a specialized Linux distribution for penetration testing and security tasks, was used to demonstrate proficiency in managing diverse Linux systems (Offensive Security, n.d.)

The primary focus was on understanding file systems, user management, and automation through scripting. Tools like the **script** command were employed to record sessions for analysis and review. By leveraging VirtualBox and these operating systems, the log explores practical applications of Linux commands and showcases their utility in real-world scenarios.

OBJECTIVES

- a. Practice essential Linux commands for managing files, directories, and system configurations.
- b. Create, execute, and test a script file to automate a series of Linux commands.
- c. Observe and analyse outputs for understanding command behaviour.

STEPS

Part 1:

1. Creating a New Directory

- Use the **mkdir** command to create directories and subdirectories.

```
mkdir myfolder
```

```
mkdir -p myfolder/smallfolder
```

- **Observation:** The **-p** option allows nested directories to be created in one step.

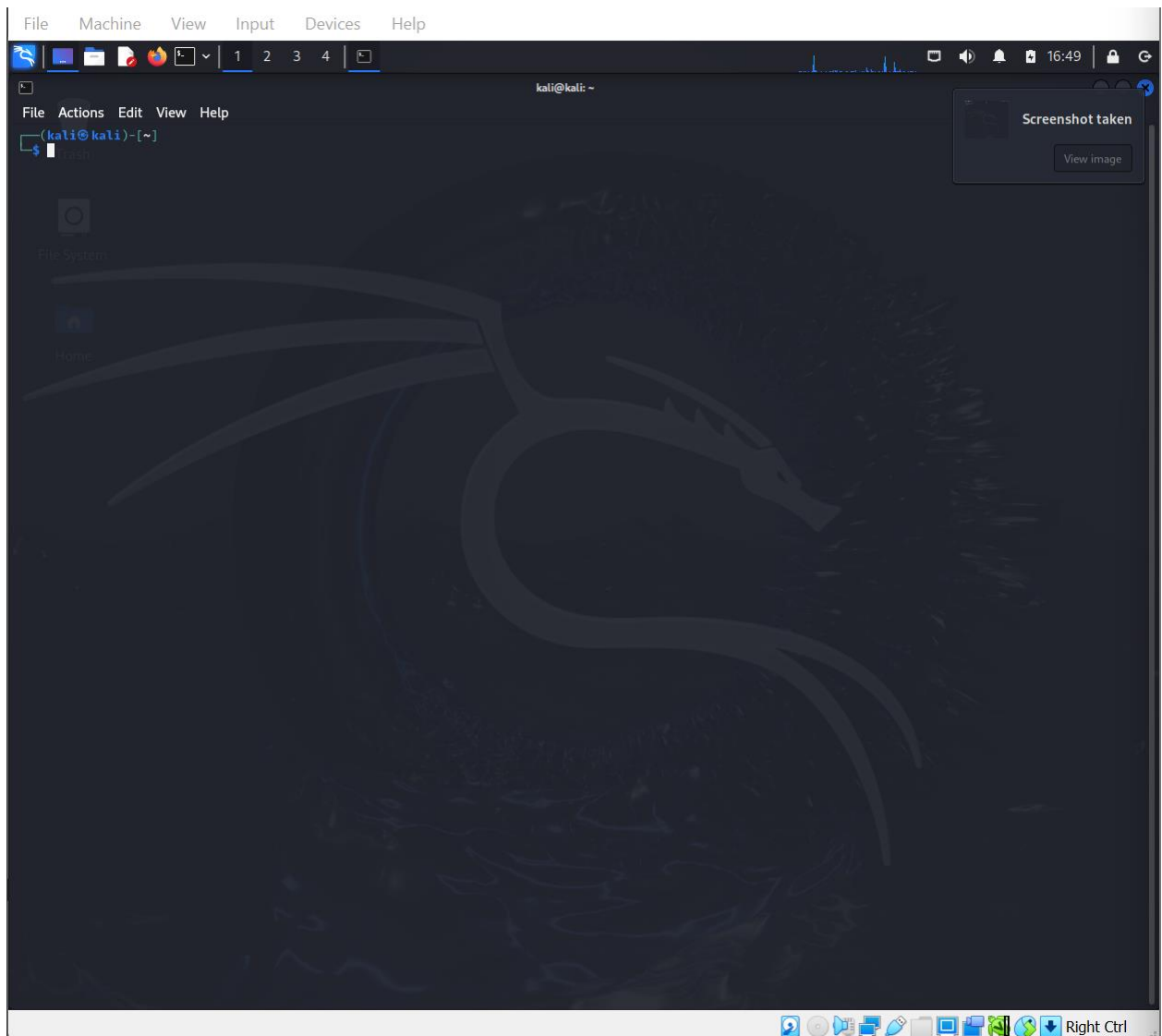


Figure 1: Opening Linux Terminal in kali

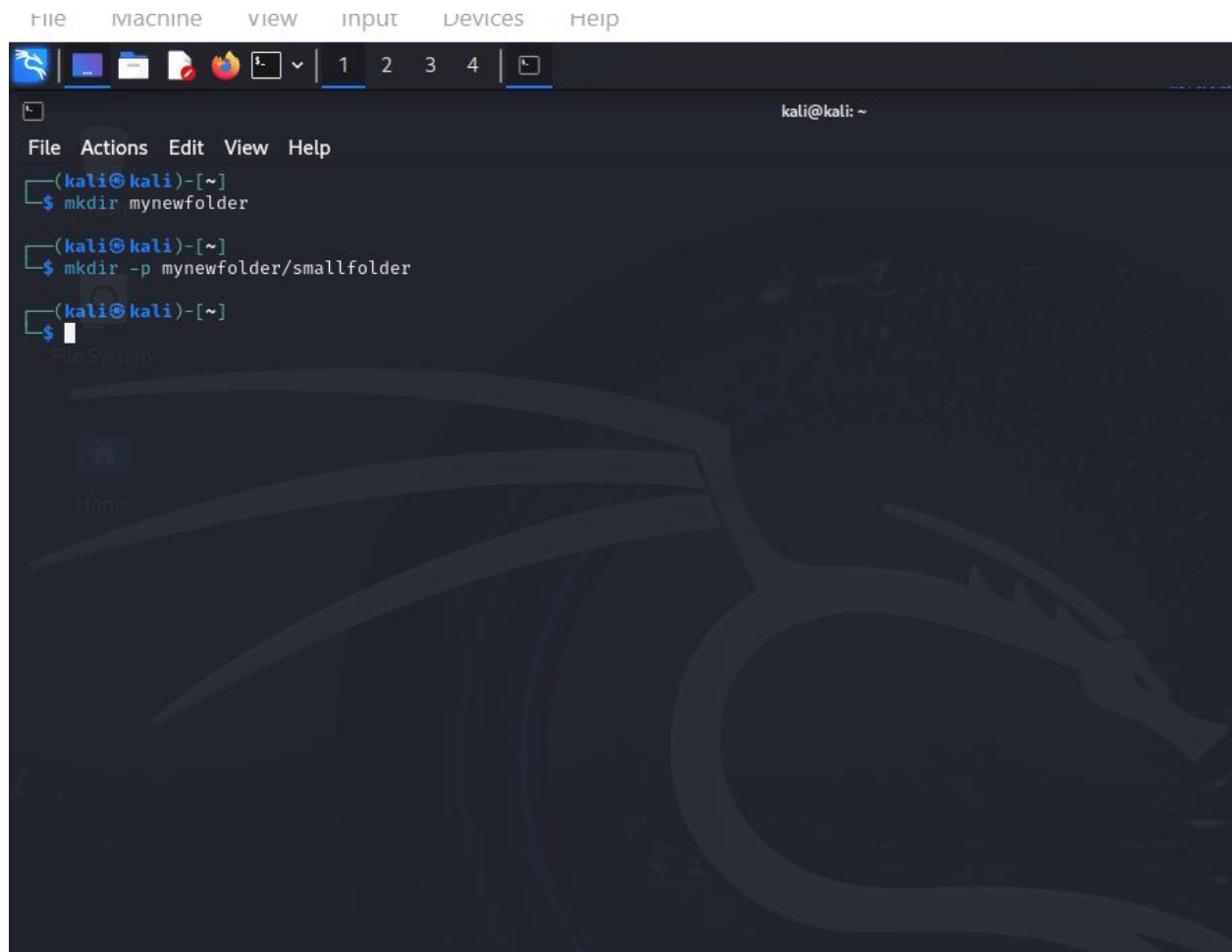


Figure 2 : Creating new folder with directory

2. Navigating Directories with cd

- Used cd to switch between directories:

```
cd myfolder  
cd ..
```

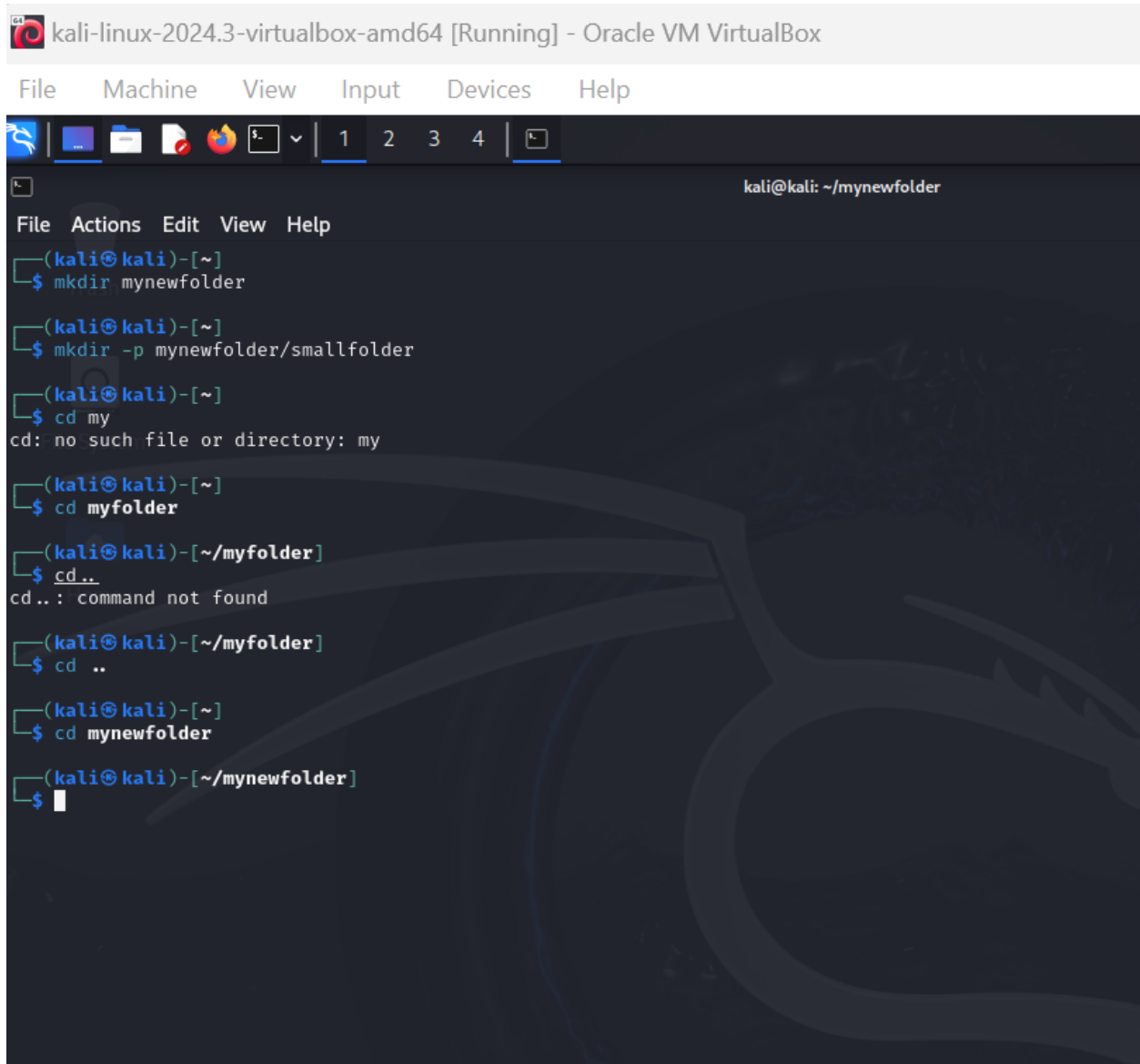


Figure 3: Using `cd` function to switch between directories

3. Removing Files and Directories

- Remove a file and an empty directory using `rm` and `rmdir`:

```
rm file.txt  
rmdir emptyfolder
```

- Remove directories with contents using:

```
rm -r smallfolder
```

```
(kali㉿kali)-[~/mynewfolder]
$ mkdir file.txt

(kali㉿kali)-[~/mynewfolder]
$ rm file.txt
rm: cannot remove 'file.txt': Is a directory

(kali㉿kali)-[~/mynewfolder]
$ rmdir file.txt

(kali㉿kali)-[~/mynewfolder]
$
```

Figure 4: Creating and removing file

```
(kali㉿kali)-[~/mynewfolder]
$ rm -r myfolder
rm: cannot remove 'myfolder': No such file or directory

(kali㉿kali)-[~/mynewfolder]
$ rm -r mynewfolder
rm: cannot remove 'mynewfolder': No such file or directory

(kali㉿kali)-[~/mynewfolder]
$ rm -r smallfolder

(kali㉿kali)-[~/mynewfolder]
$
```

Figure 5: Removing directories with content

4. Printing Text with ***printf***

- Printed text to the terminal:

```
printf "Hello, Linux\!\nWelcome to scripting.\n"
```



```
(kali㉿kali)-[~/mynewfolder]
$ printf "hello, worldto Linkux.\n"
hello, worldto Linkux.

(kali㉿kali)-[~/mynewfolder]
$ printf "Hello, Linux!\nWelcome to scripting.\n"
zsh: event not found: \nWelcome

(kali㉿kali)-[~/mynewfolder]
$ printf "Hello, Linux!\nWelcome to scripting.\n"
Hello, Linux!
Welcome to scripting.

(kali㉿kali)-[~/mynewfolder]
$
```

Figure 6: Printing Hello, Linux and Welcome to scripting in different lines

5. Displaying the Current Directory

- Used `pwd` to show the current working directory and chained commands:

```
pwd; cd mynewfolder; pwd
```

```
(kali㉿kali)-[~/mynewfolder]
$ pwd; cd mynewfolder; pwd
/home/kali/mynewfolder
/home/kali/mynewfolder/mynewfolder

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$
```

Figure 7: Using `pwd` to show directories

6. Listing Directory Contents with `ls`

- Compared outputs of `ls`, `ls -a`, and `ls -al`:

```
ls
```

```
ls -a
```

```
ls -al
```

```

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$ ls
smallfolder

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$ ls -a
.  ..  smallfolder

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$ ls -al
total 12
drwxrwxr-x 3 kali kali 4096 Dec 14 23:18 .
drwxrwxr-x 3 kali kali 4096 Dec 14 23:18 ..
drwxrwxr-x 2 kali kali 4096 Dec 14 23:18 smallfolder

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$

```

Figure 8: Comparing outputs of `ls`, `ls -a`, `ls -al`

7. Using the `cat` Command

- Displayed a file, created new files, and appended data:

```
cat > file1
```

```
Hello, this is file1.
```

```
(Press CTRL+D to save and exit)
```

```

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$ cat >file1
Hello, this is file1.

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$

```

Figure 9: using `cat>` command to create file

```
cat >> file1
```

```
Appending a new line to file1.
```

```
(Press CTRL+D to save and exit)
```

```
(kali㉿kali)-[~/mynewfolder/mynewfolder]
$ cat >> file1
Appending a new line to file1.

(kali㉿kali)-[~/mynewfolder/mynewfolder]
$
```

Figure 10: using cat>> command to amend to the file

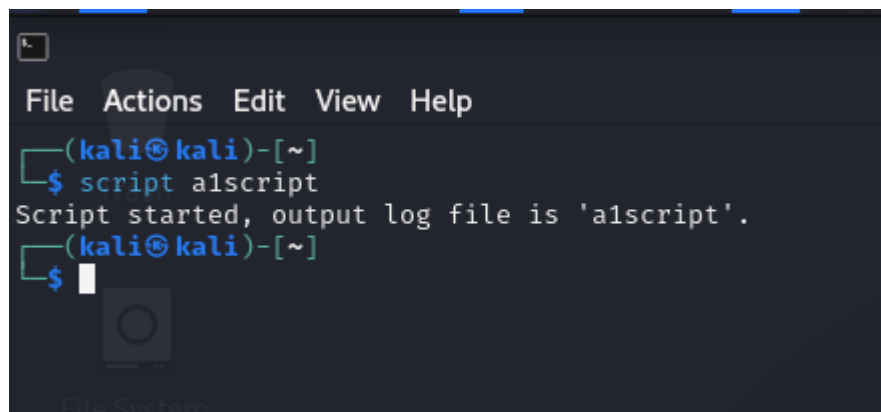
Part 2

1. Starting a Script Session

- Initiated a script session with `script a1script`:

```
script a1script
```

```
Script started, file is a1script
```



```
(kali㉿kali)-[~]
$ script a1script
Script started, output log file is 'a1script'.
(kali㉿kali)-[~]
$
```

Figure 11: Using script a1script command

2. User and System Information

- Checked the username and logged-in users:

```
whoami
```

```
who
```

```
(kali㉿kali)-[~]
$ whoami
kali

(kali㉿kali)-[~]
$ who
kali      tty7          2024-12-14 14:23 (:0)

(kali㉿kali)-[~]
$
```

Figure 12: Checking logged in users with `whoami` and `who` commands

- Gathered account details:

```
finger kali
```

```
(kali㉿kali)-[~]
$ finger kali
Login: kali                               Name:
Directory: /home/kali                     Shell: /usr/bin/zsh
On since Sat Dec 14 14:23 (+0545) on tty7 from :0
      9 hours 9 minutes idle
No mail.
No Plan.

(kali㉿kali)-[~]
$
```

Figure 13: Gathering account details with `finger` command

3. Viewing System Date and Files

- Displayed the date and file contents:

```
date
```

```
ls
```

```
ls -a
```

```
ls -al
```

```
(kali㉿kali)-[~]
$ date
Sat Dec 14 11:32:19 PM +0545 2024

(kali㉿kali)-[~]
$ ls
alscript Desktop Documents Downloads file1 Music myfolde myfolder mynewfolder Pictures Public Templates Videos
```

Figure 14: using date and ls command

```
(kali@kali)~$ ls -a
.
..
alscript
.bash_logout
.bashrc
.bashrc.original
.cache
.config
Desktop
.dmrc
Documents
Downloads
.face.icon
file1
.gnupg
.ICEauthority
.java
.local
Music
myfolde
myfolder
mynewfolder
Pictures
.profile
Public
.sudo_as_admin_successful
Templates
.vboxclient-clipboard-tty7-control.pid
.vboxclient-clipboard-tty7-service.pid
.vboxclient-display-svgx-x11-tty7-control.pid
.vboxclient-display-svgx-x11-tty7-service.pid
.vboxclient-draganddrop-tty7-control.pid
.vboxclient-draganddrop-tty7-service.pid
.vboxclient-hostversion-tty7-control.pid
.vboxclient-seamless-tty7-control.pid
.vboxclient-seamless-tty7-service.pid
.vboxclient-vmvga-session-tty7-control.pid
Videos
.Xauthority
.xsession-errors
.zsh_history
.zshrc
```

Figure 15: using ls -a command

```
(kali@kali)~$ ls -al
total 192
drwx----- 18 kali kali 4096 Dec 14 23:26 .
drwxr-xr-x 3 root root 4096 Aug 19 01:42 ..
-rw-rw-r-- 1 kali kali 8192 Dec 14 23:32 alscript
-rw-r--r-- 1 kali kali 220 Aug 19 01:42 .bash_logout
-rw-r--r-- 1 kali kali 5551 Aug 19 01:42 .bashrc
-rw-r--r-- 1 kali kali 3526 Aug 19 01:42 .bashrc.original
drwxrwxr-x 7 kali kali 4096 Dec 14 14:32 .cache
drwxr-xr-x 13 kali kali 4096 Dec 14 22:21 .config
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Desktop
-rw-r--r-- 1 kali kali 35 Dec 14 14:23 .dmrc
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Documents
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Downloads
-rw-r--r-- 1 kali kali 11759 Aug 19 01:42 .face
lrwxrwxrwx 1 kali kali 5 Aug 19 01:42 .face.icon -> .face
-rw-rw-r-- 1 kali kali 12 Dec 14 14:44 file1
drwx----- 3 kali kali 4096 Dec 14 14:23 .gnupg
-rw----- 1 kali kali 0 Dec 14 14:23 .ICEauthority
drwxr-xr-x 3 kali kali 4096 Aug 19 01:42 .java
drwxr-xr-x 4 kali kali 4096 Dec 14 14:23 .local
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Music
drwxrwxr-x 2 kali kali 4096 Dec 14 16:50 myfolde
drwxrwxr-x 3 kali kali 4096 Dec 14 16:51 myfolder
drwxrwxr-x 3 kali kali 4096 Dec 14 23:18 mynewfolder
drwxr-xr-x 2 kali kali 4096 Dec 14 16:49 Pictures
-rw-r--r-- 1 kali kali 807 Aug 19 01:42 .profile
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Public
-rw-r--r-- 1 kali kali 0 Dec 14 14:26 .sudo_as_admin_successful
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Templates
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-clipboard-tty7-control.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-clipboard-tty7-service.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-display-svgx-x11-tty7-control.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-display-svgx-x11-tty7-service.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-draganddrop-tty7-control.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-draganddrop-tty7-service.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-hostversion-tty7-control.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-seamless-tty7-control.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-seamless-tty7-service.pid
-rw-r----- 1 kali kali 5 Dec 14 14:23 .vboxclient-vmvga-session-tty7-control.pid
drwxr-xr-x 2 kali kali 4096 Dec 14 14:23 Videos
-rw----- 1 kali kali 49 Dec 14 14:23 .Xauthority
-rw----- 1 kali kali 11596 Dec 14 23:25 .xsession-errors
-rw----- 1 kali kali 867 Dec 14 23:25 .zsh_history
-rw-r--r-- 1 kali kali 10868 Aug 19 01:42 .zshrc
```

Figure 16: using ls -al command

4. Exploring the File System

- Displayed system information using cat:

```
cat /etc/passwd
```

```

(kali@kali)-[~]
└─$ 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-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
sshd:x:104:65534::/run/ssh:/usr/sbin/nologin
usbmux:x:105:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:999:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
avahi:x:106:108:Avahi mDNS daemon,,,:/run/avahi-daemon:/usr/sbin/nologin
speech-dispatcher:x:107:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
pulse:x:108:110:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
lightdm:x:109:112:Light Display Manager:/var/lib/lightdm:/bin/false
saned:x:110:114::/var/lib/saned:/usr/sbin/nologin
polkitd:x:991:991:User for polkitd:/:usr/sbin/nologin
rtkit:x:111:115:RealtimeKit,,,:/proc:/usr/sbin/nologin
colord:x:112:116:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
nm-openvpn:x:113:117:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
nm-openconnect:x:114:118:NetworkManager OpenConnect plugin,,,:/var/lib/NetworkManager:/usr/sbin/nologin
_galera:x:115:65534::/nonexistent:/usr/sbin/nologin
mysql:x:116:120:MariaDB Server,,,:/nonexistent:/bin/false
stunnel4:x:990:990:stunnel service system account:/var/run/stunnel4:/usr/sbin/nologin
_rpc:x:117:65534::/run/rpcbind:/usr/sbin/nologin
geoclue:x:118:122::/var/lib/geoclue:/usr/sbin/nologin
Debian-snmpp:x:119:123::/var/lib/snmpp:/bin/false
sshd:x:120:124::/nonexistent:/usr/sbin/nologin
ntpd:x:121:127::/nonexistent:/usr/sbin/nologin
redsocks:x:122:128::/var/run/redsocks:/usr/sbin/nologin
rwhod:x:123:65534::/var/spool/rwho:/usr/sbin/nologin
_gophish:x:124:130::/var/lib/gophish:/usr/sbin/nologin
iodine:x:125:65534::/run/iodine:/usr/sbin/nologin
miredo:x:126:65534::/var/run/miredo:/usr/sbin/nologin
statd:x:127:65534::/var/lib/nfs:/usr/sbin/nologin
redis:x:128:131::/var/lib/redis:/usr/sbin/nologin
postgres:x:129:132:PostgreSQL administrator,,,:/var/lib/postgresql:/bin/bash
mosquitto:x:130:133::/var/lib/mosquitto:/usr/sbin/nologin
inetsim:x:131:134::/var/lib/inetsim:/usr/sbin/nologin
_gvm:x:132:135::/var/lib/opensv:/usr/sbin/nologin
kali:x:1000:1000,,,:/home/kali:/usr/bin/zsh

```

Figure 17: Using cat /etc/passwd command

5. Creating and Managing Files

- Created and viewed test1 and test2:

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

```
cat > test2
```

```
This is file two.
```

```
It has multiple lines.
```

```
Three lines, to be exact.
```

```
(Press CTRL+D to save and exit)
```

```
(kali㉿kali)-[~]  
$ cat>test2  
This is File two.  
It has multiple lines.  
Three lines, to be exact.  
  
(kali㉿kali)-[~]  
$
```

Figure 18:

6. Combining Files

- Combined the contents of test1 and test2 into combined:

```
cat test1 test2 > combined
```

```
cat combined
```

```
(kali㉿kali)-[~]  
$ cat test1 test2> combined  
  
(kali㉿kali)-[~]  
$ cat combined  
This a one-line file  
This is File two.  
It has multiple lines.  
Three lines, to be exact.  
  
(kali㉿kali)-[~]  
$
```

Figure 19:

7. Exiting the Script Session

- Ended the script session:

```
exit
```

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

Figure 20:

OBSERVATIONS

1. Basic Linux commands like mkdir, cd, rm, and cat were successfully used to manage files and directories.
2. The outputs of ls, ls -a, and ls -al were compared to understand hidden files and file permissions.
3. The script session (alscript) recorded all commands and outputs for review.
4. Combining files with cat demonstrated its utility for file management.

SUMMARY

In this log, we explored:

1. Core Linux commands for file and directory management.
2. Creating and executing scripts to automate tasks and document system activity.
3. Observing outputs to deepen the understanding of Linux command-line functionality.

These activities enhance familiarity with Linux for tasks such as system administration, file handling, and automation using scripts.

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