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I confirm that I understand my coursework needs to be submitted online via my second teacher platform under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

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Introduction

Virtualization is a technique to merge or splitting computing resources to give one or more execution environments using technique like division of hardware and software,

machine simulation, mirroring and other (Rodríguez-Haro, et al.). It is the developing technology in the IT world. Majority of the IT company are using this technology to solidify their work load. Virtualization in computer system means creating a virtual instance of anything means it is the logical division of the resources of the system.

i) Virtualization

A hypervisor is one of many virtualization techniques which allow multiple operating systems, termed guests, to run concurrently on a host computer (Li, 2010). An operating

system on virtual machine is called a guest OS. Virtualization enables users to run multiple virtual machines on a single machine maximizing the use of hardware. Use of

virtualization technique is actually cost effective because it reduces the extra system.

At last virtualization is enhancing the resources effectively, flexibility, security and cost- effective.

ii) Containerization

In alternate to virtualization we can containerization platform like Docker. It is simply operating system for different containers. Docker provides you a platform that enables software to run in its own. Docker does not need a separate OS instance for each container so it is light weight. Docker let developer to ship code faster in standardize way by improving resource utilization.

Kali Linux:-

Kali Linux is a version of the Linux made for testing the security of systems. Before it was called Backtrack, which combined three older Linux systems: IWHAX, WHOPPIX, and Auditor. Backtrack was very popular at that time. Kali Linux officially launched on March 12, 2013, as a new and improved version. Within just five days, over 90,000 people had downloaded it (allen, et al., 2014).

Features of Kali Linux:

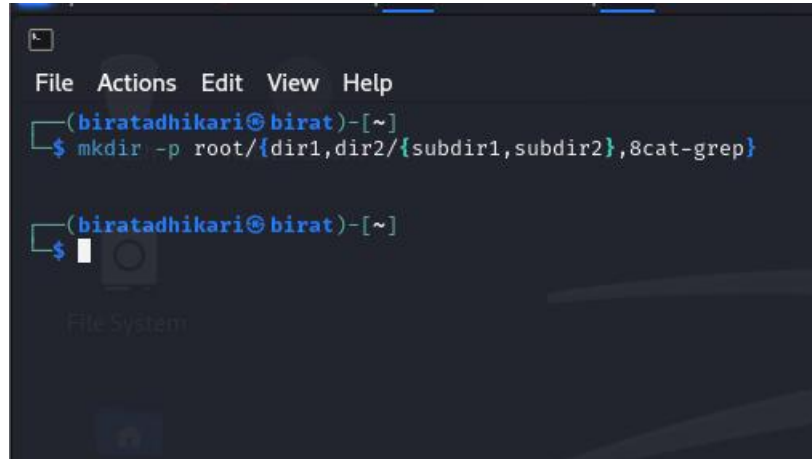
- Built on Debian: It's based on the Debian Linux system.
- Lots of Tools: It has more than 300 tools for security testing.
- Supports Wireless Devices: Works well with many wireless cards.
- Special Kernel: Includes a kernel that allows packet injection.
- Secure Software: All its software is signed for security.
- Customizable: Users can change it to fit their needs.
- Supports ARM Devices: Works on devices like Raspberry Pi.

Objective:

The objective of this workshop is to develop practical skills in Kali Linux command-line utilities for file management, pattern searching, alias creation, command execution.

Steps to replicate:

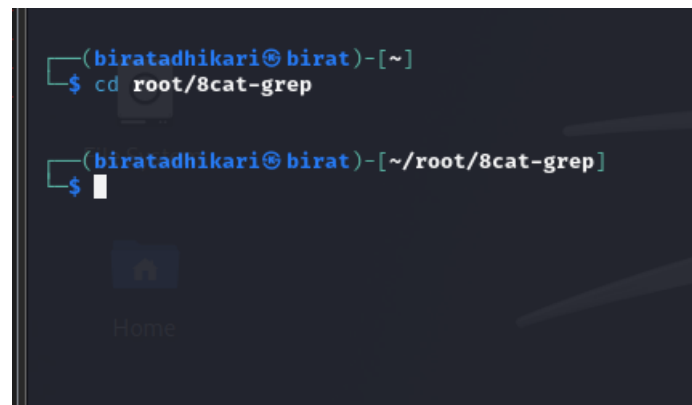
Step 1: Create a directory with mkdir command and other relative path

A terminal window with a dark background and light blue text. The prompt is (biratadhikari@birat)-[~]. The command mkdir -p root/{dir1,dir2/{subdir1,subdir2},8cat-grep} is entered and executed. The prompt returns to (biratadhikari@birat)-[~].

```
(biratadhikari@birat)-[~]  
$ mkdir -p root/{dir1,dir2/{subdir1,subdir2},8cat-grep}  
  
(biratadhikari@birat)-[~]  
$
```

Figure 1:creation of the directory

Step 2: Change to 8cat-grep directory

A terminal window with a dark background and light blue text. The prompt is (biratadhikari@birat)-[~]. The command cd root/8cat-grep is entered and executed. The prompt changes to (biratadhikari@birat)-[~/root/8cat-grep].

```
(biratadhikari@birat)-[~]  
$ cd root/8cat-grep  
  
(biratadhikari@birat)-[~/root/8cat-grep]  
$
```

Figure 2:changing directories

Step 3: Create Files testa and testb with cat

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ cat > testa << EOF
Kkkll
lllmm
oo-oo
mmdd
ddkk
EOF

(biratadhikari@birat)-[~/root/8cat-grep]
$ cat > testb << EOF
KKKKK
LLLLL
MMMMM
DDDDD
EOF

(biratadhikari@birat)-[~/root/8cat-grep]
$
```

Figure 3:creating a file with cat command

Step 4.1: Finding files containing 'll'

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ ^[[200~grep -l ll *
zsh: bad pattern: ^[[200~grep

(biratadhikari@birat)-[~/root/8cat-grep]
$ ~
```

Figure 4:filenames containing the pattern ll

Step 4.2: Finding files that doesn't contain 'll'

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ ^[[200~grep -l ll *
zsh: bad pattern: ^[[200~grep

(biratadhikari@birat)-[~/root/8cat-grep]
$ ~
```

Figure 5:displaying lines in testa that do not contain ll.

Step 4.3: Line Numbers for 'll' in testa

```
(biratadhikari@birat)~/root/8cat-grep
$ grep -n ll testa

1:Kkkll
2:llmm

(biratadhikari@birat)~/root/8cat-grep
$
```

Figure 6:output of grep -n ll testa

Step 4.4: Line Numbers for 'll' in testa

```
(biratadhikari@birat)~/root/8cat-grep
$ grep -l ll *

testa

(biratadhikari@birat)~/root/8cat-grep
$
```

Figure 7:output of grep -l ll testa

Step 4.5: Case-Insensitive Search for 'll'

```
(biratadhikari@birat)~/root/8cat-grep
$ grep -i ll *

testa:Kkkll
testa:llmm
testb:lllll

(biratadhikari@birat)~/root/8cat-grep
$
```

Figure 8:case-insensitive matches for ll

Step 4.6: Case-Insensitive Search for 'LL'

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ grep -i LL *

testa:Kkkll
testa:lllmm
testb:lllll

(biratadhikari@birat)-[~/root/8cat-grep]
$
```

Figure 9:case-insensitive matches for LL

Step 4.7: Count Lines Containing 'll'

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ grep -i LL *

testa:Kkkll
testa:lllmm
testb:lllll

(biratadhikari@birat)-[~/root/8cat-grep]
$
```

Figure 10:Count Lines Containing 'll'

Step 4.8: Lines starts with 'k'

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ grep '^K' testa testb

testa:Kkkll
testb:KKKKK

(biratadhikari@birat)-[~/root/8cat-grep]
$
```

Figure 11:Lines starts with 'k'

Step 4.9: All Lines in testa

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ grep -n '^' testa

1:Kkkll
2:lllmm
3:oo-oo
4:mmmdd
5:dddkk

(biratadhikari@birat)-[~/root/8cat-grep]
$
```

Figure 12: All Lines in test a

Step 5: Alias

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ alias lsal='ls -al'

(biratadhikari@birat)-[~/root/8cat-grep]
$
```

Figure 13: creation of the lsal alias for ls -al

Step 6: Test lsal Alias

```
(biratadhikari@birat)-[~/root/8cat-grep]
$ cd ~
lsal
total 152
drwx----- 21 biratadhikari biratadhikari 4096 Dec 28 08:16 .
drwxr-xr-x 3 root root 4096 Dec 14 09:24 ..
-rw----- 1 biratadhikari biratadhikari 0 Dec 14 09:26 .ICEauthority
-rw----- 1 biratadhikari biratadhikari 50 Dec 28 08:11 .Xauthority
-rw-r--r-- 1 biratadhikari biratadhikari 220 Dec 14 09:24 .bash_logout
-rw-r--r-- 1 biratadhikari biratadhikari 5551 Dec 14 09:24 .bashrc
-rw-r--r-- 1 biratadhikari biratadhikari 3526 Dec 14 09:24 .bashrc.original
drwxrwxr-x 10 biratadhikari biratadhikari 4096 Dec 15 01:31 .cache
drwxr-xr-x 13 biratadhikari biratadhikari 4096 Dec 21 21:11 .config
-rw-r--r-- 1 biratadhikari biratadhikari 35 Dec 14 09:26 .dmrc
-rw-r--r-- 1 biratadhikari biratadhikari 11759 Dec 14 09:24 .face
lrwxrwxrwx 1 biratadhikari biratadhikari 5 Dec 14 09:24 .face.icon -> .face
drwx----- 3 biratadhikari biratadhikari 4096 Dec 14 09:26 .gnupg
drwxr-xr-x 3 biratadhikari biratadhikari 4096 Dec 14 09:24 .java
drwxr-xr-x 4 biratadhikari biratadhikari 4096 Dec 14 09:26 .local
drwx----- 4 biratadhikari biratadhikari 4096 Dec 14 09:38 .mozilla
-rw-r--r-- 1 biratadhikari biratadhikari 807 Dec 14 09:24 .profile
-rw----- 1 biratadhikari biratadhikari 4121 Dec 28 08:25 .xsession-errors
-rw----- 1 biratadhikari biratadhikari 3952 Dec 25 23:39 .xsession-errors.old
-rw----- 1 biratadhikari biratadhikari 388 Dec 28 08:16 .zsh_history
-rw-r--r-- 1 biratadhikari biratadhikari 10868 Dec 14 09:24 .zshrc
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Desktop
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Documents
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Downloads
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Music
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 28 08:25 Pictures
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Public
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Templates
drwxr-xr-x 2 biratadhikari biratadhikari 4096 Dec 14 09:26 Videos
drwxrwxr-x 3 biratadhikari biratadhikari 4096 Dec 25 23:42 directory
drwxrwxr-x 5 biratadhikari biratadhikari 4096 Dec 28 08:12 root
drwxrwxr-x 4 biratadhikari biratadhikari 4096 Dec 21 06:43 w7
drwxrwxr-x 7 biratadhikari biratadhikari 4096 Dec 21 06:40 w7-1
drwxrwxr-x 3 biratadhikari biratadhikari 4096 Dec 21 06:40 w7-2
(biratadhikari@birat)-[~]
$
```

Figure 14: alias being used in the home directory

Step 7: Removing lsal Alias

```
(biratadhikari@birat)-[~/w7/w7-1]
$ chmod u+rw 1level3/file1
(biratadhikari@birat)-[~/w7/w7-1]
$ las -l 1level3
Command 'las' not found, did you mean:
  command 'as' from deb binutils
  command 'als' from deb atool
  command 'ls' from deb coreutils
  command 'kas' from deb kas
  command 'lvs' from deb lvm2
  command 'lrs' from deb lrslib
  command 'last' from deb wtmpdb
  command 'les' from deb atm-tools
  command 'laps' from deb epix
  command 'cas' from deb amule-utils
Try: sudo apt install <deb name>
(biratadhikari@birat)-[~/w7/w7-1]
$ ls -l 1level3/
total 4
-rw----- 1 biratadhikari biratadhikari 9 Dec 21 07:00 file1
(biratadhikari@birat)-[~/w7/w7-1]
$
```

Figure 15: remove the alias and verification.

References

- Rodríguez-Haro, F., Freitag, F., Navarro, L., Hernández-sánchez, E., FaríasMendoza, N., Guerrero-Ibáñez, J.A. and González-Potes, A., 2012. A summary of virtualization techniques. *Procedia Technology*, 3, pp.267-272.
- Allen, L., Heriyanto, T. and Ali, S., 2014. *Kali Linux—Assuring security by penetration testing*. Packt Publishing Ltd.