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1.Introduction

In a Linux-based Network Operating System (NOS) environment, this log concentrates on hands-on exercises pertaining to Unix/Linux file system operations and commands. Participants will gain fundamental abilities in text output and managing the special characters, directory listing, file copying, file manipulation and management, directory file creation and navigation, and more through practical activities. The purpose of these exercises is to get a greater grasp of Linux command line interfaces using tools such as "mkdir," "cd," "cat," "chmod," and "ls." Among the crucial duties of systems administration these exercises provide us with practical experience dealing with the file system and file permissions.

2.Creating directory structure using mkdir command for given figure

Make the directory structure shown in the following illustration. Utilize your home directory's relative pathnames with the mkdir command. Try the two:
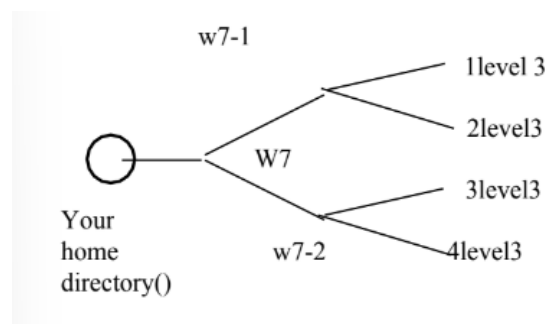
No option and -p option for the command.

Figure 1 creating directory and related pathname

3.Changing 1level3 directory using relative pathname
Change the 1level3 directory by one step by using relative pathname

```
vboxuser@Ubuntu:~$ cd W7/W7-1/1level3/
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cd ../../W7-2/4level3/
vboxuser@Ubuntu:~/W7/W7-2/4level3$ W7/W7-2/4level3
```

Figure 2 changing 1level3 using related pathname

4.Changing directories in my directory by one command using relative pathname.

Use relative pathnames to practice switching directories inside your directory hierarchy with a single command, such as from 1level3 to 2level3, from 2level3 to 4level3, from 4level3 to w7, etc.

Make use of the parent and child directory names (' and '..' too).

```
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cd ../../W7-2/4level3/
vboxuser@Ubuntu:~/W7/W7-2/4level3$
```

Figure 3 Changing directory from 1level3 to 2level3

5.changing 1level3 and creating a text file.
Changing directory to 1level3 and creating a text using "cat".

```
vboxuser@Ubuntu:~/W7/W7-2/4level3$ cd ../../W7-1/1level3/
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cat>file
This is my file
cat>file
^Z
[1]+  Stopped                 cat > file
vboxuser@Ubuntu:~/W7/W7-1/1level3$ 
```

Figure 4 changing 1level3 and creating text file

6.Copying the text file from 1level3 to 1level3 (with the name file 1).
Also copying the file to 2 level3 as well

```
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cd ../../W7-1/1level3/
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cp file file1
vboxuser@Ubuntu:~/W7/W7-1/1level3$ ls
file  file1
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cp file ../2level3/
vboxuser@Ubuntu:~/W7/W7-1/1level3$ ls ../2level3/
file
vboxuser@Ubuntu:~/W7/W7-1/1level3$
```

Figure 5 copying text file from 1leve3 to 1level3

7.Moving the file to 4level3.

Once the text file has been moved to 4level3, it can be seen that it is in 4level3 and not in 1level3.

```
vboxuser@Ubuntu:~/W7/W7-1/1level3$ mv file ../../W7-2/4level3
vboxuser@Ubuntu:~/W7/W7-1/1level3$ ls ../../W7-2/4level3
file
vboxuser@Ubuntu:~/W7/W7-1/1level3$ ls
file1
vboxuser@Ubuntu:~/W7/W7-1/1level3$
```

Figure 6 moving file to4level3

8.Printing the text each in one echo or "printf" command

Hello! I can do it

5>(20:8) < (30*2)

Line 1

Line 2

a-b, A+B,-,+,<,>,#,$,&,%

```
vboxuser@Ubuntu:~/W7/W7-1/1level3$  echo -e "Hello! I can do it\n5>(20:8)<(30*2)
\nLine 1\nLine 2\na-b,A-B,-,+,<,>,#,$.%,&"
Hello! I can do it
5>(20:8)<(30*2)
Line 1
Line 2
a-b,A-B,-,+,<,>,#,$.%,&
vboxuser@Ubuntu:~/W7/W7-1/1level3$
```

Figure 7printing text using "echo"

9.Giving the "ls" command (with a,d,g) in W7/W7-1/1level3 directory.

Give the "ls" command (without option and with a, d, g, l options) in home directoryW7, W7 1, and 1level3 directories.

Figure 8 giving ls command with option or without option

10.Changing directory to W7-1

10.1. Displaying access permission for the file "file 1" in level 3.

Changing the directory to W7-1 and displaying the permission for the file "file1" in 1level3.

Figure 9displaying access permission for file 1 in 1 level3

10.2 Remove all access permission for file

Remove all the access permission for file "file 1" using the command "chmod"

Figure 10removing access permission for file

10.3 Displaying access permission for this file

```
vboxuser@Ubuntu:~/W7/W7-1$ ls -l 1level3/
total 4
---------- 1 vboxuser vboxuser 26 Dec 19 12:47 file1
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 11displaying access permission for file

10.4 Trying to read this file using "cat" utility

Trying to read the "file1" using the command "cat". The read permission is denied because we have remove all the access permissions for this file.

```
vboxuser@Ubuntu:~/W7/W7-1$ cat 1level3/file1
cat: 1level3/file1: Permission denied
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 12 : trying to read files using "cat" utility

10.5 Trying to write into the file using any "cat" utility

Trying to write the "file1" using the command "cat>>" The write permission is denied because we had remove all the access permissions for this file.

```
cat: 1level3/file1: Permission denied
vboxuser@Ubuntu:~/W7/W7-1$ cat>>1level3/file1
bash: 1level3/file1: Permission denied
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 13 trying to write into file using "cat>>" utility

10.6 Adding read and write access permission using "chmod u+rw"

Adding read and write access permissions for user for the file file1 using the command "chmod u+rw".

```
vboxuser@Ubuntu:~/W7/W7-1$ chmod -rw 1level3/file1
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 14 reading and writing permissions using "chmod u+rw"

10.7 Displaying access permission to this file

```
vboxuser@Ubuntu:~/W7/W7-1$ ls -l 1level3/
total 4
-rw------- 1 vboxuser vboxuser 26 Dec 19 12:47 file1
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 15 displaying access permission for this file

10.8 Trying to read this file with "cat" utility

```
vboxuser@Ubuntu:~/W7/W7-1$ cat 1level3/file1
This is my file
cat>file
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 16 trying to read file using "cat" utility

10.9 Trying to write this file using "cat" utility

```
vboxuser@Ubuntu:~/W7/W7-2/4level3$ cd ../../W7-1/1level3/
vboxuser@Ubuntu:~/W7/W7-1/1level3$ cat>file
This is my file
cat>file
^Z
[1]+  Stopped                 cat > file
vboxuser@Ubuntu:~/W7/W7-1/1level3$
```

Figure 17 trying writing into this file using "cat>>" utility

11. Changing directory to 1level3

11.1.1 Displaying access permission for 1level3.

```
vboxuser@Ubuntu:~/W7/W7-1$ ls -l
total 8
drwxrwxr-x 2 vboxuser vboxuser 4096 Dec 19 12:55 1level3
drwxrwxr-x 2 vboxuser vboxuser 4096 Dec 19 12:48 2level3
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 18 displaying access permission for 1level3

11.2 Remove access permission for 1level3 directory and displaying access info

```
vboxuser@Ubuntu:~/W7/W7-1$ chmod -rwx 1level3/
vboxuser@Ubuntu:~/W7/W7-1$ ls -l
total 8
d--------- 2 vboxuser vboxuser 4096 Dec 19 12:55 1level3
drwxrwxr-x 2 vboxuser vboxuser 4096 Dec 19 12:48 2level3
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 19 :removing all permissions for 1level3 and displaying across permission

11.3 Trying to read a file from 1level3 using any utility

```
vboxuser@Ubuntu:~/W7/W7-1$ cat 1level3/file1
cat: 1level3/file1: Permission denied
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 20 trying to read file from 1level3 using any utility

11.4 Trying to put a file into 1level3 using any utility

```
vboxuser@Ubuntu:~/W7/W7-1$ cat>>1level3/file1
bash: 1level3/file1: Permission denied
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 21:trying to put file into 1leve3 using any utility

11.5 Trying to search in 1level3 using any command

```
vboxuser@Ubuntu:~/W7/W7-1$ ls 1level3/
ls: cannot open directory '1level3/': Permission denied
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 22 trying to search 1level3 using any command

11.6 Adding read ,write and execute permission for 1level3 directory

Adding read, write, and execute access permissions for user for the 1level3 directory.

```
vboxuser@Ubuntu:~/W7/W7-1$ chmod u+rwx 1level3/
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 23adding read, write and execute permission for 1level3

11.7 Displaying access permission for 1level3

```
vboxuser@Ubuntu:~/W7/W7-1$ chmod -rwx 1level3/
vboxuser@Ubuntu:~/W7/W7-1$ ls -l
total 8
d--------- 2 vboxuser vboxuser 4096 Dec 19 12:55 1level3
drwxrwxr-x 2 vboxuser vboxuser 4096 Dec 19 12:48 2level3
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 24 displaying access permission for 1level3

11.8 Trying to read a file from 1level3 using any utility

```
vboxuser@Ubuntu:~/W7/W7-1$ cat>>1level3/file1
This is my second line.
^Z
[1]+  Stopped                 cat >> 1level3/file1
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 25 :trying to read file from 1level3 using any utility

11.9 Trying to put a file into 1level3 using any utility

```
vboxuser@Ubuntu:~/W7/W7-1$ cat>1level3/file1
This is my third line.
^Z
[2]+  Stopped                 cat > 1level3/file1
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 26trying to put a file into 1level3 using any command

11.10 Trying to search in 1level3 using any utility

```
vboxuser@Ubuntu:~/W7/W7-1$ ls 1level3/
file1
vboxuser@Ubuntu:~/W7/W7-1$
```

Figure 27 :trying searching in 1level3 using any command

12.Conclusion

I looked into several methods for working with Linux directories and files in this diary. I successfully created a complex directory structure and used relative paths to access it. The procedures of producing, copying, and transferring files also gave me real-world experience. I changed access permissions using the chmod command and observed how it affected the accessibility of files and folders. These exercises demonstrated the need of access restrictions as a key element of system security and provided crucial practical experience managing files and directories on a Linux system. My ability to deal with network operating systems and my understanding of key Linux commands have both significantly increased as a result of this hands-on training, which has also boosted my technical skills.

13.References

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