

Introduction to Linux

<Project> Case Study

Author: <Anindya Guha>

1. Create a directory "exercise" inside your home directory and create nested (dir1/dir2/dir3) directory structure inside "exercise" with single command.

```
File Edit View Search Terminal Help
ttn@anindya:~$ mkdir -p exercise/dir1/dir2/dir3
ttn@anindya:~$ cd exercise
ttn@anindya:~/exercise$
ttn@anindya:~/exercise$ cd dir1
ttn@anindya:~/exercise/dir1$ cd dir2
ttn@anindya:~/exercise/dir1/dir2$ cd dir3
ttn@anindya:~/exercise/dir1/dir2/dir3$
```

2. Create two empty files inside dir2 directory: emptyFile1, emptyFile2 in single command

```
File Edit View Search Terminal Help
ttn@anindya:~$ mkdir -p exercise/dir1/dir2/dir3
ttn@anindya:~$ cd exercise
ttn@anindya:~/exercise$
ttn@anindya:~/exercise$ cd dir1
ttn@anindya:~/exercise/dir1$ cd dir2
ttn@anindya:~/exercise/dir1/dir2$ cd dir3
ttn@anindya:~/exercise/dir1/dir2/dir3$ cd ...
bash: cd: ...: No such file or directory
ttn@anindya:~/exercise/dir1/dir2/dir3$ cd ..
ttn@anindya:~/exercise/dir1/dir2$ sudo touch file1 file2
[sudo] password for ttn:
ttn@anindya:~/exercise/dir1/dir2$
```

3. Create one file file1.txt containing text "hello world" and save it.

```
File Edit View Search Terminal Help
ttn@anindya:~$ mkdir -p exercise/dir1/dir2/dir3
ttn@anindya:~$ cd exercise
ttn@anindya:~/exercise$
ttn@anindya:~/exercise$ cd dir1
ttn@anindya:~/exercise/dir1$ cd dir2
ttn@anindya:~/exercise/dir1/dir2$ cd dir3
ttn@anindya:~/exercise/dir1/dir2/dir3$ cd ...
bash: cd: ...: No such file or directory
ttn@anindya:~/exercise/dir1/dir2/dir3$ cd ..
ttn@anindya:~/exercise/dir1/dir2$ sudo touch file1 file2
[sudo] password for ttn:
ttn@anindya:~/exercise/dir1/dir2$ cd ~
ttn@anindya:~$ echo "hello world" >> file1.txt
ttn@anindya:~$ cat file1.txt
hello world
ttn@anindya:~$
```

4. Find a "passwd" file using find command inside /etc. copy this file as passwd_copy and then rename this file as passwd_backup.

```
ttn@anindya:~$ cd exercise/dir1/dir2
ttn@anindya:~/exercise/dir1/dir2$ cp /etc/passwd ~/exercise/passwd_copy
ttn@anindya:~/exercise/dir1/dir2$ mv ~/exercise/passwd_copy ~/exercise/passwd_backup
ttn@anindya:~/exercise/dir1/dir2$
```

5. Try reading passwd_backup file in multiple tools: less, more, cat, strings etc and find the difference in their usage.

```
File Edit View Search Terminal Help
root:x:0:0:root:/root:/bin/bash
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:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/
sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nol
ogin
:
```



```
File Edit View Search Terminal Help
_apt:x:104:65534::/nonexistent:/usr/sbin/nologin
uidd:x:105:111::/run/uidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/
nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper
:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/
false
whoopsie:x:112:117::/nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/no
login
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
geoclue:x:119:124::/var/lib/geoclue:/usr/sbin/nologin
gnome-initial-setup:x:120:65534::/run/gnome-initial-setup:/bin/false
gdm:x:121:125:Gnome Display Manager:/var/lib/gdm3:/bin/false
ttn:x:1000:1000:anindya:/home/ttn:/bin/bash
(END)
```

6. Find out the number of line in password_backup containing "/bin/false".

```
File Edit View Search Terminal Help
ttn@anindya:/etc$ less passwd_backup
ttn@anindya:/etc$ grep "/bin/false" passwd_backup | wc -l
5
```

7. Get the first 5 lines of a file "password_backup" and Redirect the output of the above commands into file "output".

```
ttn@anindya:/etc$ head -n 5 passwd_backup > ~/output.txt
ttn@anindya:/etc$ cat output.txt
cat: output.txt: No such file or directory
ttn@anindya:/etc$ cd ~
ttn@anindya:~$ cat output.txt
root:x:0:0:root:/root:/bin/bash
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
ttn@anindya:~$
```

8. Create a "test" user, create its password and find out its uid and gid.

```
File Edit View Search Terminal Help
ttn@anindya:~$ sudo su
[sudo] password for ttn:
root@anindya:/home/ttn# adduser test
Adding user `test' ...
Adding new group `test' (1001) ...
Adding new user `test' (1001) with group `test' ...
Creating home directory `/home/test' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for test
Enter the new value, or press ENTER for the default
  Full Name []:
  Room Number []:
  Work Phone []:
  Home Phone []:
  Other []:
Is the information correct? [Y/n] y
root@anindya:/home/ttn# id -u test
1001
root@anindya:/home/ttn# id -g test
1001
root@anindya:/home/ttn#
```

9. Change the timestamp of emptyFile1, emptyFile2 which are exist in dir2


```
File Edit View Search Terminal Help
ttn@anindya:~$ cd exercise/dir1/dir2
ttn@anindya:~/exercise/dir1/dir2$ touch emptyfile1 emptyfile2
ttn@anindya:~/exercise/dir1/dir2$ ls -l
total 4
drwxr-xr-x 2 ttn ttn 4096 Feb  4 18:00 dir3
-rw-r--r-- 1 ttn ttn  0 Feb  4 18:16 emptyfile1
-rw-rw-r-- 1 ttn ttn  0 Feb  4 18:03 emptyfile1.txt
-rw-r--r-- 1 ttn ttn  0 Feb  4 18:16 emptyfile2
-rw-rw-r-- 1 ttn ttn  0 Feb  4 18:03 emptyfile2.txt
ttn@anindya:~/exercise/dir1/dir2$
```

11. Create alias with your name so that it creates a file as "/tmp/aliastesting".

a>

```
ttn@anindya:~$ alias anindya="touch /tmp/aliastesting"
ttn@anindya:~$ ls /tmp
config-err-G99Tao
mozilla_ttn0
ssh-JKZz52dCUFjY
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-bolt.service-VxbWqK
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-colord.service-nXVb9Z
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-fwupd.service-FilF8y
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-rtkit-daemon.service-FRxwim
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-systemd-resolved.service-NDgovf
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-systemd-timesyncd.service-qMbkV
e
Temp-a3f76d52-a26f-4e7e-b757-98f6b290998c
Temp-e628bef1-d6da-44d6-8450-4abc87aeef5b
```

b>


```
ttn@anindya:~$ anindya
ttn@anindya:~$ sudo ls /tmp
[sudo] password for ttn:
aliastesting
config-err-G99Tao
deepin-screenshot.TJ7934.png
deepin-screenshot.XM7934.png
mozilla_ttn0
ssh-JKZz52dCUFjY
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-bolt.service-VxbWqK
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-colord.service-nXVb9Z
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-fwupd.service-FilF8y
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-rtkit-daemon.service-FRxwim
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-systemd-resolved.service-NDgovf
systemd-private-d2a9ce1a271b422eabdbe9c25606b375-systemd-timesyncd.service-qMbkV
e
Temp-a3f76d52-a26f-4e7e-b757-98f6b290998c
Temp-e628bef1-d6da-44d6-8450-4abc87aeef5b
ttn@anindya:~$
```

12. Edit ~/.bashrc file such that when you change to "test" user it should clear the screen and print "Welcome".

```
ttn@anindya:~$ sudo su - test
test@anindya:~$ echo clear >> .bashrc
test@anindya:~$ echo "echo welcome" >> .bashrc
test@anindya:~$ exit
logout
ttn@anindya:~$ sudo su - test

welcome
test@anindya:~$ █
```

13. Install “zip” package.

```
File Edit View Search Terminal Help
0 upgraded, 0 newly installed, 0 to remove and 7 not upgraded.
ttn@anindya:~$ clear

ttn@anindya:~$ zip -v
Copyright (c) 1990-2008 Info-ZIP - Type 'zip "-L"' for software license.
This is Zip 3.0 (July 5th 2008), by Info-ZIP.
Currently maintained by E. Gordon. Please send bug reports to
the authors using the web page at www.info-zip.org; see README for details.

Latest sources and executables are at ftp://ftp.info-zip.org/pub/infozip,
as of above date; see http://www.info-zip.org/ for other sites.

Compiled with gcc 6.3.0 20170415 for Unix (Linux ELF).

Zip special compilation options:
    USE_EF_UT_TIME      (store Universal Time)
    BZIP2_SUPPORT       (bzip2 library version 1.0.6, 6-Sept-2010)
                        bzip2 code and library copyright (c) Julian R Seward
                        (See the bzip2 license for terms of use)
    SYMLINK_SUPPORT     (symbolic links supported)
    LARGE_FILE_SUPPORT  (can read and write large files on file system)
    ZIP64_SUPPORT       (use Zip64 to store large files in archives)
    UNICODE_SUPPORT     (store and read UTF-8 Unicode paths)
    STORE_UNIX_UIDs_GIDs (store UID/GID sizes/values using new extra field)
```

14. Compress "output" and "password_backup" files into a tar ball. List the files present inside the tar created.

```
ttn@anindya:~$ sudo tar -czvf archive.tar.gz output.txt passwd_backup
output.txt
passwd_backup
ttn@anindya:~$ tar --list --verbose --file=archive.tar.gz
-rw-r--r-- ttn/ttn      189 2019-02-04 17:35 output.txt
-rw-r--r-- root/root   2441 2019-02-04 23:24 passwd_backup
ttn@anindya:~$
```

16. Unzip this tar bar by logging into the remote server

```
Try 'tar --help' or 'tar --usage' for more information.
ttn@anindya:~$ tar -xvzf archive.tar.gz
output.txt
passwd_backup
ttn@anindya:~$
```

17. Download any image from web and move to desktop

```
ttn@anindya:~$ wget -A jpg -r https://www.google.com/search?q=india&client=ubuntu&hs=NR7&channel=fs&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj9tsT
F5aLgAhXbfX0KHUdIAP4Q_AUIECgD&biw=1299&bih=639#imgcr=rFv55EpATbNTTM:
[1] 25913
[2] 25914
[3] 25915
[4] 25916
[5] 25917
[6] 25918
[7] 25919
[8] 25920
[9] 25921
[2] Done client=ubuntu
[3] Done hs=NR7
[4] Done channel=fs
[6] Done tbm=isch
[7] Done sa=X
[8]- Done ved=0ahUKEwj9tsTF5aLgAhXbfX0KHUdIAP4Q_AUIECgD
ttn@anindya:~$
Redirecting output to 'wget-log.2'.
cd ~/Desktop$ ls
bash: cd: too many arguments
[1] Exit 8 wget -A jpg -r https://www.google.com/search?q=india
[5]- Done source=lnms
[9]+ Done biw=1299
ttn@anindya:~$
```

18. How to get help of commands usages.


```
File Edit View Search Terminal Help
test@anindya:~$ tar --help
Usage: tar [OPTION...] [FILE]...
GNU 'tar' saves many files together into a single tape or disk archive, and can
restore individual files from the archive.

Examples:
tar -cf archive.tar foo bar # Create archive.tar from files foo and bar.
tar -tvf archive.tar        # List all files in archive.tar verbosely.
tar -xf archive.tar          # Extract all files from archive.tar.

Local file name selection:

--add-file=FILE      add given FILE to the archive (useful if its name
--C, --directory=DIR change to directory DIR
--exclude=PATTERN    exclude files, given as a PATTERN
--exclude-backups    exclude backup and lock files
--exclude-caches     exclude contents of directories containing
                    CACHEDIR.TAG, except for the tag file itself
--exclude-caches-all exclude directories containing CACHEDIR.TAG
--exclude-caches-under exclude everything under directories containing
                    CACHEDIR.TAG
--exclude-ignore=FILE read exclude patterns for each directory from
                    FILE, if it exists
--exclude-ignore-recursive=FILE read exclude patterns for each directory and its
                    subdirectories from FILE, if it exists
--exclude-tag=FILE    exclude contents of directories containing FILE,
                    except for FILE itself
--exclude-tag-all=FILE exclude directories containing FILE
--exclude-tag-under=FILE exclude everything under directories
                    containing FILE
--exclude-vcs         exclude version control system directories
--exclude-vcs-ignores read exclude patterns from the VCS ignore files
--no-null             disable the effect of the previous --null option
--no-recursion        avoid descending automatically in directories
--no-unquote          do not unquote input file or member names
--no-verbatim-files-from -T treats file names starting with dash as
```

19. Create a symlink of /etc/services into /tmp/ports-info

```
ttn@anindya:~/Desktop$ ln -s /etc/services /tmp/ports-info
ttn@anindya:~/Desktop$
```

20. You are appointed as a Software/DevOps Engineer in ABC media services. On your first day you need to troubleshoot a problem. There is a command "xyz" somewhere installed in that linux system. But as a new joinee you do not have any idea about where is that Installed. How can you check that?

Ans: we use where is xyz.