

ADVANCED COMPUTER NETWORK

ASSIGNMENT 4

TOPIC: - Take screenshots of basic Linux commands IV

Submitted By:
Anilect Jose
Roll no: 17
S2 RMCA A

Submitted To:
Meera Mathew

Submitted on:
11-08-2021

BASIC LINUX COMMANDS

1. wc

- wc stands for word count.
- Used for counting purpose.
- It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.
 - #wc state.txt
 - #wc state.txt capital.txt
 - wc -l state.txt
 - wc -w state.txt capital.txt
 - wc -c state.txt
 - wc -m state.txt

```
kaj@kaj-VirtualBox:~$ ls
abc.txt  Desktop  Downloads  Pictures  snap      Videos
Anilect  Documents  Music    Public    Templates
kaj@kaj-VirtualBox:~$ wc abc.txt
2 2 35 abc.txt
kaj@kaj-VirtualBox:~$ wc -l abc.txt
2 abc.txt
kaj@kaj-VirtualBox:~$ wc -w abc.txt
2 abc.txt
kaj@kaj-VirtualBox:~$ wc -c abc.txt
35 abc.txt
kaj@kaj-VirtualBox:~$ cat >> file2.txt
Hello hai
kaj@kaj-VirtualBox:~$ wc abc.txt file2.txt
2 2 35 abc.txt
1 2 10 file2.txt
3 4 45 total
kaj@kaj-VirtualBox:~$ wc -m file2.txt
10 file2.txt
kaj@kaj-VirtualBox:~$ █
```

2. tar

The Linux ‘tar’stands for tape archive, is used to create Archive and extract the Archive files

- Linux tar command to create compressed or uncompressed Archive files

- Options:

- c : Creates Archive
- x : Extract the archive
- f : creates archive with given filename
- t : displays or lists files in archived file
- u : archives and adds to an existing archive file
- v : Displays Verbose Information
- A : Concatenates the archive files
- z : zip, tells tar command that creates tar file using gzip
- j : filter archive tar file using tbzip
- W : Verify a archive file
- r : update or add file or directory in already existed .tar file

```
#tar cf archive.tar state.txt capital.txt //create archive file
```

```
#ls archive.tar
```

```
#tar tf /archive.tar // list contents of tar archive file
```

- Extract an archive created with tar

```
#mkdir backup
```

```
#cd backup
```

```
#tar xf /home/kaj/Documents/Kaj_Linux/archive.tar
```

- Compression Types

```
gzip(z),bzip2(j), xz(J)
```

```
#tar czf /abc.tar.gz /etc
```

```
#tar cjf /abcd.tar.bz2 /etc
```

```
#tar cJf /abcde.tar.xz /etc
```

- Extract an archive

```
#mkdir backup1
```

```

#cd backup1
#tar xzf /abc.tar.gz
#mkdir backup2
#cd backup2
#tar xjf /abcd.tar.bz2
#mkdir backup3
#cd backup3
#tar xJf /abcde.tar.xz

```

● tar commands

```

kaj@kaj-VirtualBox:~$ tar cf archive.tar abc.txt file2.txt
kaj@kaj-VirtualBox:~$ ls archive.tar
archive.tar
kaj@kaj-VirtualBox:~$ ls
abc.txt archive.tar Documents file2.txt Pictures snap Videos
Anilect Desktop Downloads Music Public Templates
kaj@kaj-VirtualBox:~$ tar tf archive.tar
tar: Old option 'f' requires an argument.
Try 'tar --help' or 'tar --usage' for more information.
kaj@kaj-VirtualBox:~$ tar tf /archive.tar
tar: /archive.tar: Cannot open: No such file or directory
tar: Error is not recoverable: exiting now
kaj@kaj-VirtualBox:~$ tar tf archive.tar
abc.txt
file2.txt
kaj@kaj-VirtualBox:~$ mkdir Extracted
kaj@kaj-VirtualBox:~$ cd Extracted/
kaj@kaj-VirtualBox:~/Extracted$ pwd
/home/kaj/Extracted
kaj@kaj-VirtualBox:~/Extracted$ tar xf /home/kaj/archive.tar
kaj@kaj-VirtualBox:~/Extracted$ ls
abc.txt file2.txt

```

● Compressing using gz, bz2 and xz

```

kaj@kaj-VirtualBox:~/Anilect$ ls
abc.txt ani.txt file2.txt file.txt
kaj@kaj-VirtualBox:~/Anilect$ sudo tar czf mca.tar.gz /etc
[sudo] password for kaj:
tar: Removing leading `/' from member names
kaj@kaj-VirtualBox:~/Anilect$ ls
abc.txt ani.txt file2.txt file.txt mca.tar.gz
kaj@kaj-VirtualBox:~/Anilect$ sudo tar cJf mcareg.tar.gz /etc
tar: Removing leading `/' from member names
kaj@kaj-VirtualBox:~/Anilect$ ls
abc.txt ani.txt file2.txt file.txt mcareg.tar.gz mca.tar.gz
kaj@kaj-VirtualBox:~/Anilect$ sudo tar cJf mcareg.tar.bz2 abc.txt ani.txt
kaj@kaj-VirtualBox:~/Anilect$ ls
abc.txt file2.txt mcareg.tar.bz2 mca.tar.gz
ani.txt file.txt mcareg.tar.gz
kaj@kaj-VirtualBox:~/Anilect$ sudo tar cJf mcareg.tar.xz file.txt file2.txt
kaj@kaj-VirtualBox:~/Anilect$ ls
abc.txt file2.txt mcareg.tar.bz2 mcareg.tar.xz
ani.txt file.txt mcareg.tar.gz mca.tar.gz
kaj@kaj-VirtualBox:~/Anilect$ mkdir Lab
kaj@kaj-VirtualBox:~/Anilect$ cd Lab/

```

- Extract using gzip

```
kaj@kaj-VirtualBox:~/Anilect/Lab$ tar xzf /home/kaj/Anilect/mca.tar.gz
kaj@kaj-VirtualBox:~/Anilect/Lab$ ls
etc
kaj@kaj-VirtualBox:~/Anilect/Lab$ ls etc
acpi           hosts           profile.d
adduser.conf   hosts.allow    protocols
alsa           hosts.deny    pulse
alternatives   hp             python3
anacrontab     ifplugd       Python3.9
apg.conf       init           rc0.d
apm            init.d        rc1.d
apparmor       initramfs-tools rc2.d
apparmor.d     inputrc       rc3.d
apport         inserv.conf.d rc4.d
appstream.conf ipp-usb       rc5.d
apt            iproute2      rc6.d
avahi          issue         rcs.d
bash.bashrc    issue.net    resolv.conf
bash_completion kernel         rmt
bash_completion.d kernel-img.conf rpc
bindresvport.blacklist kerneloops.conf rsyslog.conf
binfmt.d       ldap          rsyslog.d
bluetooth     ld.so.cache   rygel.conf
brlapi.key     ld.so.conf    sane.d
brltty         ld.so.conf.d security
brltty.conf    legal         selinux
ca-certificates libao.conf   sensors3.conf
```

- Extract using xz

```
kaj@kaj-VirtualBox:~/Anilect/Lab$ ls
etc
kaj@kaj-VirtualBox:~/Anilect/Lab$ tar xJf /home/kaj/Anilect/mcareg.tar.xz
kaj@kaj-VirtualBox:~/Anilect/Lab$ ls
etc  file2.txt  file.txt
```

- Extract using bz2

```
kaj@kaj-VirtualBox:~/Anilect/Lab$ tar xJf /home/kaj/Anilect/mcareg.tar.bz2
kaj@kaj-VirtualBox:~/Anilect/Lab$ ls
abc.txt  ani.txt  etc  file2.txt  file.txt
```

3. expr

The expr command evaluates a given expression and displays its corresponding output. It is used for:

- Basic operations like addition, subtraction, multiplication, division, and modulus on integers.
- Evaluating regular expressions, string operations like substring, length of strings etc.
- Performing operations on variables inside a shell script

```
#expr 10 + 2
```

```
kaj@kaj-VirtualBox:~$ expr --version
expr (GNU coreutils) 8.32
Copyright (C) 2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Mike Parker, James Youngman, and Paul Eggert.
kaj@kaj-VirtualBox:~$ expr 10 + 5
15
kaj@kaj-VirtualBox:~$ expr 10 \* 5
50
kaj@kaj-VirtualBox:~$ expr 10 / 5
2
kaj@kaj-VirtualBox:~$ expr 10 - 5
5
kaj@kaj-VirtualBox:~$ expr 11 % 5
1
kaj@kaj-VirtualBox:~$
```

```
kaj@kaj-VirtualBox:~$ expr length "Anilect" "<" 5 " | " 19 - 6 ">" 10
1
kaj@kaj-VirtualBox:~$ expr length "Anilect" "<" 5 " | " 19 - 6 ">" 20
0
```

4. Redirections & Piping

A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.

- Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

```
#ls -l | wc -l
```

```
#cat /etc/passwd.txt | head -7 | tail -5
```

```
kaj@kaj-VirtualBox:~$ ls -l
total 64
-rw-rw-r-- 1 kaj kaj 731 Aug 12 12:55 abc.txt
drwxrwxr-x 2 ant kaj 4096 Aug 11 20:15 Anilect
-rw-rw-r-- 1 kaj kaj 10240 Aug 11 22:09 archive.tar
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Desktop
drwxr-xr-x 3 kaj kaj 4096 Jun 20 21:51 Documents
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Downloads
drwxrwxr-x 2 kaj kaj 4096 Aug 11 22:15 Extracted
-rw-rw-r-- 1 kaj kaj 10 Aug 11 22:02 file2.txt
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Music
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Pictures
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Public
drwxr-xr-x 3 kaj kaj 4096 Jun 2 00:23 snap
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Templates
drwxr-xr-x 2 kaj kaj 4096 Jun 2 00:20 Videos
kaj@kaj-VirtualBox:~$ ls -l | wc -l
15
```

```
kaj@kaj-VirtualBox:~$ ls | wc -m -w
14      120
```

```
kaj@kaj-VirtualBox:~$ cat abc.txt | head -5 | tail -5
Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
```

```
kaj@kaj-VirtualBox:~$
```

5. ssh

ssh stands for “Secure Shell”.

- It is a protocol used to securely connect to a remote server/system.
- ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.
- It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

```
#ssh user_name@host(IP/Domain_name)
```

```
#ssh -X root@server1.example.com
```

```
kaj@kaj-VirtualBox:~$ sudo apt install openssh-client
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  liburing1
Use 'sudo apt autoremove' to remove it.
Suggested packages:
  keychain libpam-ssh monkeysphere ssh-askpass
The following packages will be upgraded:
  openssh-client
1 upgraded, 0 newly installed, 0 to remove and 226 not upgraded.
Need to get 702 kB of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 openssh-client amd64 1:8.4p1-5ubuntu1.1 [702 kB]
Fetched 702 kB in 1s (484 kB/s)
(Reading database ... 186834 files and directories currently installed.)
Preparing to unpack .../openssh-client_1%3a8.4p1-5ubuntu1.1_amd64.deb ...
Unpacking openssh-client (1:8.4p1-5ubuntu1.1) over (1:8.4p1-5ubuntu1) ...
Setting up openssh-client (1:8.4p1-5ubuntu1.1) ...
Processing triggers for man-db (2.9.4-2) ...
kaj@kaj-VirtualBox:~$ ssh localhost
ssh: connect to host localhost port 22: Connection refused
kaj@kaj-VirtualBox:~$ sudo apt-get install openssh-server i
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

```
kaj@kaj-VirtualBox:~$ ssh localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:TAWY3kIseZ06S6gaE8mr0n6NJ5em3cCKmPMz01hklzI.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
kaj@localhost's password:
Welcome to Ubuntu 21.04 (GNU/Linux 5.11.0-18-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

231 updates can be installed immediately.
97 of these updates are security updates.
To see these additional updates run: apt list --upgradable

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
```

6. scp

SCP (secure copy) is a command-line utility that allows you to securely

- copy files and directories between two locations.
- With scp, you can copy a file or directory:
- From your local system to a remote system.
- From a remote system to your local system.
- Between two remote systems from your local system.
- Remote file system locations are specified in format [user@]host:/path

Syntax:

```
scp [OPTION] [user@]SRC_HOST:]file1 [user@]DEST_HOST:]file2
```

```
$scp /etc/yum.config /etc/hosts ServerX:/home/student
```

```
$scp ServerX:/etc/hostname /home/student
```

7. ssh-keygen

ssh-keygen command to generate a public/private authentication key pair. Authentication keys allow a user to connect to a remote system without supplying a password. Keys must be generated for each user separately. If you generate key pairs as the root user, only the root can use the keys.

```
$ssh-keygen -t rsa
```

```
kaj@kaj-VirtualBox:~/Anilect/Keygen$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/kaj/.ssh/id_rsa): key1
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in key1
Your public key has been saved in key1.pub
The key fingerprint is:
SHA256:T5p9D717xvpqgSp5Bkfa7KG8tROIfR38bW2Rxak8BPc kaj@kaj-VirtualBox
The key's randomart image is:
+---[RSA 3072]---+
|          . |
|       . . o |
|      = o .o |
|     . * Eo |
|    oS*.o = .o|
|   . =*B +.o =|
|   .oB++o .= |
|   =.*o o...+|
|   .=.. .*B. |
+---[SHA256]---+
kaj@kaj-VirtualBox:~/Anilect/Keygen$ ls
key1  key1.pub
```

8. ssh-copy-id

The ssh-copy-id command allows you to install an SSH key on a remote server's authorized keys.

- This command facilitates SSH key login, which removes the need for a password for each login, thus ensuring a password-less, automatic login process.

```
$ssh-copy-id username@remote_host
```