Networking and Systems Administration Lab

Assignment 4: Basic Linux Commands

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Basic Linux Commands: Explain linux commands wc, tar(create, extract using gzip, xz, bzip2), expr,
redirections and piping, ssh, ssh-keygen, scp, ssh-copy-id with examples

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

```
amalthomson@amalthomson:~/Downloads$ wc assign1.txt
10 12 79 assign1.txt
amalthomson@amalthomson:~/Downloads$ wc -l assign1.txt
10 assign1.txt
amalthomson@amalthomson:~/Downloads$ wc -w assign1.txt
12 assign1.txt
amalthomson@amalthomson:~/Downloads$ wc -c assign1.txt
79 assign1.txt
amalthomson@amalthomson:~/Downloads$ wc -m assign1.txt
77 assign1.txt
amalthomson@amalthomson:~/Downloads$
```

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/meera/Documents/Meera_Linux/archive.tar
• Compression Types
gzip(z),bzip2(j), xz(J)
#tar czf /abc.tar.gz /etc
#mkdir backup2
#tar cjf /abcd.tar.bz2 /etc
#cd backup2
#tar cJf /abcde.tar.xz /etc
#tar xjf /abcd.tar.bz2
Extract an archive
#mkdir backup3
#mkdir backup1
#cd backup3
#cd backup1
#tar xJf /abcde.tar.xz
#tar xzf /abc.tar.gz

```
amalthomson@amalthomson:~/Downloads$ tar czf archive1.tar.gz file.txt
amalthomson@amalthomson:~/Downloads$ ls
archive1.tar  archive1.tar.gz  assign1.txt.gz  assign2.txt.gz  file.txt  rsa  rsa.pub
amalthomson@amalthomson:~/Downloads$ tar xzf archive1.tar.gz
amalthomson@amalthomson:~/Downloads$ ls
archive1.tar  archive1.tar.gz  assign1.txt.gz  assign2.txt.gz  file.txt  rsa  rsa.pub
amalthomson@amalthomson:~/Downloads$ tar cjf arc2.tar.bz2 file.txt
amalthomson@amalthomson:~/Downloads$ ls
arc2.tar.bz2  archive1.tar.gz  file.txt  nsal
amalthomson@amalthomson:~/Downloads$ tar xjf arc2.tar.bz2
amalthomson@amalthomson:~/Downloads$ tar cJf arc3.tar.x2 file.txt
amalthomson@amalthomson:~/Downloads$ ls
arc2.tar.bz2  arc3.tar.x2  archive1.tar.gz  file.txt  nsal
amalthomson@amalthomson:~/Downloads$ tar xJf arc3.tar.x2
amalthomson@amalthomson:~/Downloads$
```

3.<u>expr</u>
The expr command evaluates a given expression and displays its 6 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

```
amalthomson@amalthomson:~/Downloads$ expr 10 + 5
15
```

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

```
amalthomson@amalthomson:~/Downloads$ ls -l|wc -l
4
amalthomson@amalthomson:~/Downloads$
```

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

```
ssh: connect to host amalthomson port 22: Connection refused
amalthomson@amalthomson:~/Downloads$
```

6.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

```
amalthomson@amalthomson:~/Downloads$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/amalthomson/.ssh/id_rsa): rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in rsa
Your public key has been saved in rsa.pub
The key fingerprint is:
SHA256:qCHen8zB40Xvjo6iIxQqVIZ2S9Og8j0g/NgBQauVbT0 amalthomson@amalthomson
The key's randomart image is:
+---[RSA 3072]----+
|.+o.o            |
|.o+O o           |
|++O.= E          |
|o*+=.  o         |
|+.+o+ . S        |
|oo o = . .       |
|o . o + . .      |
|. . .= * o       |
| ..o .B.o.o      |
+----[SHA256]-----+
amalthomson@amalthomson:~/Downloads$
```