

20MCA136 - Networking & System Administration Lab

RECORD

ATHUL C AUGUSTIAN

31

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Pwd

The `pwd` command to find out the path of the current working directory (folder) you're in. The command will return an absolute (full) path, which is basically a path of all the directories that starts with a forward slash (/)

```
athulc@athulc-VirtualBox:~$ pwd  
/home/athulc  
athulc@athulc-VirtualBox:~$ █
```

Man

Man command in Linux is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command

```
For example, try man man.  
athulc@athulc-VirtualBox:~$ man man  
Man(1) Manual page search tool
```

```
MAN(1)          Manual pager utils          MAN(1)  
  
NAME  
      man - an interface to the system reference manuals  
  
SYNOPSIS  
      man [man options] [[section] page ...] ...  
      man -k [apropos options] regexp ...  
      man -K [man options] [section] term ...  
      man -f [whatis options] page ...  
      man -l [man options] file ...  
      man -w|-W [man options] page ...  
  
DESCRIPTION  
      man  is the system's manual pager.  Each page argument given to man  is  
      normally the name of a program, utility or function.  The manual page  
      associated with each of these arguments is then found and displayed.  
      A section, if provided, will direct man  to look only in that section  
      of the manual.  The default action is to search in all of the available  
      sections following a pre-defined order (see DEFAULTS), and to  
      show only the first page found, even if page exists in several sec-  
tions.  
  
      The table below shows the section numbers of the manual followed by  
      the types of pages they contain.  
  
      1  Executable programs or shell commands  
      2  System calls (functions provided by the kernel)  
Manual page man(1) line 1 (press h for help or q to quit)
```

Cd

Linux cd command is used to change the current working directory (i.e., in which the current user is working). The "cd" stands for 'change directory'.

History

History command is particularly useful if you want to review the commands you have entered before

```
athulc@athulc-VirtualBox:~$ history
1 cd
2 pwd
3 history
```

Mkdir

mkdir command in Linux allows the user to create directories

```
athulc@athulc-VirtualBox:~$ mkdir lab
athulc@athulc-VirtualBox:~$ ls
Desktop Documents Downloads lab Music Pictures Public Templates Videos
```

Ls

The ls command is used to view the contents of a directory. By default, this command will display the contents of your current working directory

```
athulc@athulc-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
```

rmdir

rmdir command is used remove empty directories from the filesystem in Linux. The rmdir command removes each and every directory specified in the command line only if these directories are empty

```
athulc@athulc-VirtualBox:~$ rmdir lab
athulc@athulc-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
```

Touch

The touch command allows you to create a blank new file through the Linux command line.

```
athulc@athulc-VirtualBox:~$ touch athulc.txt
```

Rm

The rm command is used to delete directories and the contents within them. If you only want to delete the directory

```
athulc@athulc-VirtualBox:~$ rm athulc.txt
```

Cat

cat (short for concatenate) is one of the most frequently used commands in Linux. It is used to list the contents of a file on the standard output stdout .

```
athulc@athulc-VirtualBox:~$ touch athulc.txt  
athulc@athulc-VirtualBox:~$ cat athulc.txt  
good morning athul
```

cat > filename creates a new file

```
cat: ./ld: No such file or directory  
athulc@athulc-VirtualBox:~$ cat >ld  
athulc mca 2022  
^C  
athulc@athulc-VirtualBox:~$ cat >li  
pg course year of passing  
^C
```

Echo

- To move some text into a file
- To add a text

Head

- used to view the first lines of any text file
- default it shows 10 lines

```
athul@athul-VirtualBox:~/Downloads$ head gamerc.txt
hi i am athul c
i am a computer proffesional
id like to build applications and games
id also like to do other stuff like having
adventure
sporting
bikes
car
long drives
```

Tail

- will display the last ten lines of a text files

```
athul@athul-VirtualBox:~/Downloads$ tail /etc/passwd
nmb-openvpn:x:118:124:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
hplip:x:119:7:HPLIP system user,,,:/run/hplip:/bin/false
whoopsie:x:120:125::/nonexistent:/bin/false
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:124:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:125:130:Gnome Display Manager:/var/lib/gdm3:/bin/false
athul:x:1000:1000:Athul C Augustian,,,:/home/athul:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper://:/usr/sbin/nologin
athul@athul-VirtualBox:~/Downloads$
```

read

- read the contents of a line into a variable

```
athul@athul-VirtualBox:~/Downloads$ read a1 a2 a3
athul mirash alan
athul@athul-VirtualBox:~/Downloads$ echo ["a1"] ["a2"] ["a3"]
[a1] [a2] [a3]
athul@athul-VirtualBox:~/Downloads$ echo ["$a1"] ["$a2"] ["$a3"]
[athul] [mirash] [alan]
```

more

- displays content of the file. Only difference is that in case of larger files cat command output will scroll off your screen while more command displays output one screenful at a time.
- Enter key : to scroll down page line by line
- Space bar : to go to next page
- b key : to go to the backward page
- /key : to search string

```
athul@athul-VirtualBox:~/Downloads$ more /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x: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:/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
```

less

- Automatically adjust with the width and height of terminal Window

```
athul@athul-VirtualBox:~/Downloads$ less /etc/passwd
```

cut

- used for cutting out the section from each lines of files and writing the standard output.
- It can be used to cut parts of a line by byte position character and field

```
athul@athul-VirtualBox:~/Downloads$ echo hello >> athulcca.txt
athul@athul-VirtualBox:~/Downloads$ echo gdnigh >> athulcca.txt
athul@athul-VirtualBox:~/Downloads$ cat athulcca.txt
hello
gdnigh
athul@athul-VirtualBox:~/Downloads$ cut -b q,3 athulcca.txt
cut: invalid byte/character position 'q,3'
Try 'cut --help' for more information.
athul@athul-VirtualBox:~/Downloads$ cut -b 1,2 athulcca.txt
he
gd
```

paste

- used to join files horizontally by outputting lines consisting of lines from each file specified, separated by tab as delimiter, to the standard output.

```
athul@athul-VirtualBox:~/Downloads$ cut -b 1,2 athulcca.txt
he
gd
athul@athul-VirtualBox:~/Downloads$ cat > number.txt
1
2
3
^C
athul@athul-VirtualBox:~/Downloads$ cat number.txt
1
2
3
athul@athul-VirtualBox:~/Downloads$ paste athulcca.txt number.txt
hello 1
gdnigh 2
      3
```

uname

- will print detailed information about your linux system like machine name, operating system, kernel etc..

```
athul@athul-VirtualBox:~/Downloads$ uname
Linux
athul@athul-VirtualBox:~/Downloads$ uname -r
5.8.0-55-generic
athul@athul-VirtualBox:~/Downloads$ uname -v
#62~20.04.1-Ubuntu SMP Wed Jun 2 08:55:04 UTC 2021
athul@athul-VirtualBox:~/Downloads$ uname -p
x86_64
```

cp

- used to copy files from the current directory to a different directory
- cp -i (will ask for user's consent in case of a potential file overwrite.)
- cp -p (will preserve source file mode, ownership and time stamp)
- cp -r (will copy directories recursively)
- cp -u (copies files only if the destination file is not existing or the source file is newer than the destination file)

```
athul@athul-VirtualBox:~/Downloads$ mkdir cn
athul@athul-VirtualBox:~/Downloads$ cp athulcca.txt cn/
athul@athul-VirtualBox:~/Downloads$ ls cn
athulcca.txt
athul@athul-VirtualBox:~/Downloads$ ls
athulca.txt  athulcca.txt  athulc.txt  cn  gamer  gamerc.txt  number.txt
```

mv

- to move files
- rename files

```
athul@athul-VirtualBox:~/Downloads$ mv athulc.txt cn/
athul@athul-VirtualBox:~/Downloads$ ls
athulca.txt  athulcca.txt  cn  gamer  gamerc.txt  number.txt
athul@athul-VirtualBox:~/Downloads$ ls cn
athulcca.txt  athulc.txt
```

12) locate

- to find a file
- locate -i filename (make it case insensitive you can search file if you don't remember its exact name)
- * (to search for a file that contains two or more words)

13) find

- To search for files or directories
 - Find. -name filename (to find files in the current directory)
- ```
athul@athul-VirtualBox:~/Downloads$ find /home/ -name gamerc.txt
/home/athul/Downloads/gamerc.txt
```

## 14) grep

- Search through all the text in a given file

```
athul@athul-VirtualBox:~/Downloads$ grep hello athulcca.txt
hello
```

## 15) df

- To get report on the system's disk space usage shows in percentage and kbs.

```
athul@athul-VirtualBox:~/Downloads$ df
Filesystem 1K-blocks Used Available Use% Mounted on
udev 472604 0 472604 0% /dev
tmpfs 100432 1328 99104 2% /run
/dev/sda5 9736500 7375480 1846716 80% /
tmpfs 502156 0 502156 0% /dev/shm
tmpfs 5120 4 5116 1% /run/lock
tmpfs 502156 0 502156 0% /sys/fs/cgroup
/dev/loop1 56832 56832 0 100% /snap/core18/2066
/dev/loop0 224256 224256 0 100% /snap/gnome-3-34-1804/66
/dev/loop4 66688 66688 0 100% /snap/gtk-common-themes/1515
/dev/loop3 66432 66432 0 100% /snap/gtk-common-themes/1514
/dev/loop2 56832 56832 0 100% /snap/core18/2074
/dev/loop8 32896 32896 0 100% /snap/snapd/12057
/dev/loop7 52224 52224 0 100% /snap/snap-store/547
/dev/loop9 33152 33152 0 100% /snap/snapd/12704
/dev/loop6 52224 52224 0 100% /snap/snap-store/542
/dev/loop5 224256 224256 0 100% /snap/gnome-3-34-1804/72
/dev/sda1 523248 4 523244 1% /boot/efi
tmpfs 100428 44 100384 1% /run/user/1000
```

## 16) du

- to check how many space a file or directory takes.

```
athul@athul-VirtualBox:~/Downloads$ du
12 ./cn
32 .
athul@athul-VirtualBox:~/Downloads$ du -h
12K ./cn
32K .
```

## 17) useradd

- available only for system admins.
- To create new user18) userdel
- remove user or delete user account

```
athul@athul-VirtualBox:~/Downloads$ sudo useradd athul
[sudo] password for athul:
Sorry, try again.
[sudo] password for athul:
useradd: user 'athul' already exists
athul@athul-VirtualBox:~/Downloads$ sudo useradd athulc
athul@athul-VirtualBox:~/Downloads$ cherukattu
cherukattu: command not found
athul@athul-VirtualBox:~/Downloads$ sudo useradd athulca
athul@athul-VirtualBox:~/Downloads$ sudo useradd at
athul@athul-VirtualBox:~/Downloads$ sudo useradd jomeesh
athul@athul-VirtualBox:~/Downloads$ sudo passwd athul
New password:
Retype new password:
passwd: password updated successfully
athul@athul-VirtualBox:~/Downloads$ sudo passwd athul
New password:
Retype new password:
passwd: password updated successfully
```

## userdel

- remove user or delete user account

## 1. usermod

- usermod command is used to change the properties of a user in Linux through the command line
- command-line utility that allows you to modify a user's login information
- #usermod --help
- #usermod -u 2000 Tom

```
athul@athul-VirtualBox:~/Downloads$ sudo useradd athu
```

```
athul@athul-VirtualBox:~/Downloads$ sudo usermod -u 6445 athu
athul@athul-VirtualBox:~/Downloads$ sudo usermod --help
Usage: usermod [options] LOGIN

Options:
 -b, --badnames allow bad names
 -c, --comment COMMENT new value of the GECOS field
 -d, --home HOME_DIR new home directory for the user account
 -e, --expiredate EXPIRE_DATE set account expiration date to EXPIRE_DATE
 -f, --inactive INACTIVE set password inactive after expiration
 to INACTIVE
 -g, --gid GROUP force use GROUP as new primary group
 -G, --groups GROUPS new list of supplementary GROUPS
 -a, --append append the user to the supplemental GROUPS
 mentioned by the -G option without removing
 the user from other groups
 -h, --help display this help message and exit
 -l, --login NEW_LOGIN new value of the login name
 -L, --lock lock the user account
 lock the user account
 -m, --move-home move contents of the home directory to the
 new location (use only with -d)
 -o, --non-unique allow using duplicate (non-unique) UID
 -p, --password PASSWORD use encrypted password for the new password
 -R, --root CHROOT_DIR directory to chroot into
 -P, --prefix PREFIX_DIR prefix directory where are located the /etc/* f
iles
 -s, --shell SHELL new login shell for the user account
 -u, --uid UID new UID for the user account
 -U, --unlock unlock the user account
 -v, --add-subuids FIRST-LAST add range of subordinate uids
 -V, --del-subuids FIRST-LAST remove range of subordinate uids
 -w, --add-subgids FIRST-LAST add range of subordinate gids
 -W, --del-subgids FIRST-LAST remove range of subordinate gids
 -Z, --selinux-user SEUSER new SELinux user mapping for the user account
```

```
athul@athul-VirtualBox:~/Downloads$ █
```

## 2. groupadd

groupadd command creates a new group account using the values specified on the command line and the default values from the system.

- #groupadd student

```
athul@athul-VirtualBox:~/Downloads$ sudo groupadd MCA
```

## 3. groups

print the groups a user is in

- #groups alice

## 4. groupdel

groupdel command modifies the system account files, deleting all entries that refer to group.

The named group must exist

- #groupdel marketing

```
athul@athul-VirtualBox:~/Downloads$ sudo groupadd car
[sudo] password for athul:
athul@athul-VirtualBox:~/Downloads$ sudo groupadd bike
athul@athul-VirtualBox:~/Downloads$ sudo groupadd truck
athul@athul-VirtualBox:~/Downloads$ sudo usermod -G car,bike,truck athu
athul@athul-VirtualBox:~/Downloads$ groups athu
athu : athu car bike truck
athul@athul-VirtualBox:~/Downloads$ sudo groupdel car
athul@athul-VirtualBox:~/Downloads$ groups athu
athu : athu bike truck
athul@athul-VirtualBox:~/Downloads$
```

## 5. groupmod

The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group database.

- # groupmod -n group1 group2

```
athul@athul-VirtualBox:~/Downloads$ sudo groupmod -n car bike
athul@athul-VirtualBox:~/Downloads$ groups athu
athu : athu truck car
athul@athul-VirtualBox:~/Downloads$ sudo groupmod -n new_group truck
athul@athul-VirtualBox:~/Downloads$ groups athu
athu : athu car new_group
```

## 6. chmod

- To change directory permissions of file/ Directory in Linux.

#chmod whowhatwhich file/directory

- chmod +rwx filename to add permissions.
- chmod -rwx directoryname to remove permissions.
- chmod +x filename to allow executable permissions.
- chmod -wx filename to take out write and executable permissions.

#chmod u+x test

#chmod g-rwx test

#chmod o-r test

```
athul@athul-VirtualBox:~/Downloads$ mkdir athul
athul@athul-VirtualBox:~/Downloads$ ls
athul athulca.txt athulcca.txt cn gamer gamerc.txt number.txt
```

```
athul@athul-VirtualBox:~/Downloads$ chmod +rws athul
athul@athul-VirtualBox:~/Downloads$ chmod -w athul
```

## 7. chown

The chown command allows you to change the user and/or group ownership of a given file, directory.

- #chown Tom Test

## 8. id

id command in Linux is used to find out user and group names and numeric ID's (UID or group ID) of the current user.

- #id

```
athul@athul-VirtualBox:~/Downloads$ id athu
uid=6445(athu) gid=1005(athu) groups=1005(athu),1007(car),1008(new group)
```

## 9. ps

The ps command, short for Process Status, is a command line utility that is used to display or view information related to the processes running in a Linux system.

- PID – This is the unique process ID
- TTY – This is the type of terminal that the user is logged in to
- TIME – This is the time in minutes and seconds that the process has been running
- CMD – The command that launched the process

```
#ps -a
```

## 10.top

top command is used to show the Linux processes. It provides a dynamic real-time view of the running system

- #top -u rose

```

athul@athul-VirtualBox:~/Downloads$ ps
 PID TTY TIME CMD
 1702 pts/0 00:00:00 bash
 2030 pts/0 00:00:00 ps
athul@athul-VirtualBox:~/Downloads$ ps -a
 PID TTY TIME CMD
 781 tty2 00:00:12 Xorg
 884 tty2 00:00:00 gnome-session-b
 2032 pts/0 00:00:00 ps
athul@athul-VirtualBox:~/Downloads$ top

top - 22:43:17 up 1:23, 1 user, load average: 0.00, 0.02, 0.00
Tasks: 166 total, 1 running, 165 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.7 us, 0.7 sy, 0.0 ni, 98.6 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 980.8 total, 67.8 free, 600.0 used, 313.0 buff/cache
MiB Swap: 448.5 total, 384.9 free, 63.6 used. 233.7 avail Mem

 PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
 1020 athul 20 0 3438936 289888 89164 S 0.3 28.9 0:31.13 gnome ++
 2027 root 20 0 0 0 0 I 0.3 0.0 0:00.17 kworker +
 2033 athul 20 0 20488 3656 3144 R 0.3 0.4 0:00.28 top
 1 root 20 0 169008 12004 8120 S 0.0 1.2 0:02.33 systemd
 2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthrea +
 3 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_gp
 4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_pa +
 10 root 20 0 0 0 0 S 0.0 0.0 0:00.20 ksofti +
 11 root 20 0 0 0 0 I 0.0 0.0 0:00.71 rcu_sc +
 12 root rt 0 0 0 0 S 0.0 0.0 0:00.07 migrat +
 13 root -51 0 0 0 0 S 0.0 0.0 0:00.00 idle_i +
 14 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
 15 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kdevtm +
 16 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 netns
 17 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_ta +
 18 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_ta +
 19 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_ta +
 20 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kauditd
 21 root 20 0 0 0 0 S 0.0 0.0 0:00.00 khungt +
 22 root 20 0 0 0 0 S 0.0 0.0 0:00.00 oom_re +

```

## 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

```
athulc@athulc-VirtualBox:~$ cat>>sd.txt
athul
alan
mirash
mishal
^C
athulc@athulc-VirtualBox:~$ wc sd.txt
4 4 25 sd.txt
```

## 2. tar(create, extract using gzip, xz, bzip2)

- 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

```
4 4 25 sd.txt
athulc@athulc-VirtualBox:~$ tar cf all.tar athulc.txt athul.txt sd.txt
athulc@athulc-VirtualBox:~$ ls
1 athulc.txt Desktop Downloads ld Music Public Templates
all.tar athul.txt Documents l li Pictures sd.txt Videos
athulc@athulc-VirtualBox:~$
```

## 2. tar(create, extract using gzip, xz, bzip2)

- 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.

```
athulc@athulc-VirtualBox:~$ expr 10 + 12
22
athulc@athulc-VirtualBox:~$
```

## 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.

```
athulc@athulc-VirtualBox:~$ ls -l
total 68
-rw-rw-r-- 1 athulc athulc 8 Oct 4 11:51 1
-rw-rw-r-- 1 athulc athulc 10240 Oct 4 12:19 all.tar
-rw-rw-r-- 1 athulc athulc 11 Oct 4 11:37 athulc.txt
-rw-rw-r-- 1 athulc athulc 11 Oct 4 11:35 athul.txt
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Desktop
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Documents
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Downloads
-rw-rw-r-- 1 athulc athulc 0 Oct 4 11:54 l
-rw-rw-r-- 1 athulc athulc 16 Oct 4 11:47 ld
-rw-rw-r-- 1 athulc athulc 16 Oct 4 11:54 li
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Music
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Pictures
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Public
-rw-rw-r-- 1 athulc athulc 25 Oct 4 12:14 sd.txt
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Templates
drwxr-xr-x 2 athulc athulc 4096 Oct 4 11:19 Videos
athulc@athulc-VirtualBox:~$ ls -l |wc -l
17
```

## 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.

```
athulc@athulc-VirtualBox:~$ ssh
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-B bind_interface]
 [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
 [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
 [-i identity_file] [-J [user@]host[:port]] [-L address]
 [-l login_name] [-m mac_spec] [-o ctl_cmd] [-o option] [-p port]
 [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
 [-w local_tun[:remote_tun]] destination [command]
athulc@athulc-VirtualBox:~$
```

## 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.

```
athulc@athulc-VirtualBox:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/athulc/.ssh/id_rsa): root
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in root
Your public key has been saved in root.pub
The key fingerprint is:
SHA256:fNNM3EV2wrSfob0j3YNAyPXAURx6KUbeh6CvpuiEoZI athulc@athulc-VirtualBox
The key's randomart image is:
+---[RSA 3072]---+
| .++=+=|
| +=+o+=.|
| ..o==oo |
| . oo=o.o.o|
| . S +.oo ..|
| .. o ..o o |
|E. . . o .o.|
|.. . . o o.o.|
| .o|
+---[SHA256]---+
athulc@athulc-VirtualBox:~$
```

## 7.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

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

## 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

## Lab Assignment Managing Files, Creating Users and Groups Using Command-line tools

1

- a. Create six files with name of the form songX.mp3

```
athul@athul-VirtualBox:~$ touch song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3
```

- b. Create six files with name of the form snapX.mp3

```
athul@athul-VirtualBox:~$ touch snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap6.mp3
```

- c. Create six files with name of the form filmX.mp3

(In each set, replace X with the numbers 1 through 6)

```
athul@athul-VirtualBox:~$ touch film1.mp3 film2.mp3 film3.mp3 film4.mp3 film5.mp3 film6.mp3
```

2. From your home directory, move the song files into your music subdirectory, the snapshot files into your pictures subdirectory, and the movie files into videos subdirectory

```
athul@athul-VirtualBox:~$ mv snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap6.mp3 Pictures
athul@athul-VirtualBox:~$ pwd
/home/athul
athul@athul-VirtualBox:~$ mv song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3 Music
athul@athul-VirtualBox:~$ mv film1.mp3 film2.mp3 film3.mp3 film4.mp3 film5.mp3 film6.mp3 Videos
```

3. In your home directory, create three subdirectories for organizing your files. Call these directories friends, family, and work. Create all three with one command.

```
athul@athul-VirtualBox:~$ mkdir family friends work
```

4. Copy song files to the friends folder and snap files to family folder.

```
athul@athul-VirtualBox:~$ cd friends/
athul@athul-VirtualBox:~/friends$ cp ../Music/song1.mp3 .
athul@athul-VirtualBox:~/friends$ cp ../Music/song2.mp3 .
athul@athul-VirtualBox:~/friends$ cp ../Music/song3.mp3 .
athul@athul-VirtualBox:~/friends$ cp ../Music/song4.mp3 .
athul@athul-VirtualBox:~/friends$ cp ../Music/song5.mp3 .
athul@athul-VirtualBox:~/friends$ cp ../Music/song6.mp3 .
athul@athul-VirtualBox:~/friends$ ^C
athul@athul-VirtualBox:~/friends$ ls
song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3
athul@athul-VirtualBox:~/friends$ cd ../family/
athul@athul-VirtualBox:~/family$ pwd
/home/athul/family
athul@athul-VirtualBox:~/family$ cp ../Pictures/snap1.mp3 .
athul@athul-VirtualBox:~/family$ cp ../Pictures/snap2.mp3 .
athul@athul-VirtualBox:~/family$ cp ../Pictures/snap3.mp3 .
athul@athul-VirtualBox:~/family$ cp ../Pictures/snap4.mp3 .
athul@athul-VirtualBox:~/family$ cp ../Pictures/snap5.mp3 .
athul@athul-VirtualBox:~/family$ cp ../Pictures/snap6.mp3 .
athul@athul-VirtualBox:~/family$ ls
snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap6.mp3
athul@athul-VirtualBox:~/family$
```

5. Attempt to delete both family and friends projects with a single rmdir command.

```
athul@athul-VirtualBox:~/family$ rmdir family friends
rmdir: failed to remove 'family': No such file or directory
rmdir: failed to remove 'friends': No such file or directory
athul@athul-VirtualBox:~/family$
```

6. Use another command that will succeed in deleting both the family and friends folder.

```
athul@athul-VirtualBox:~/family$ rm -r family
rm: cannot remove 'family': No such file or directory
```

7. Redirect a long listing of all home directory files, including hidden, into a file named allfiles.txt. Confirm that the file contains the listing.

```
try 'ls --help' for more information.
athul@athul-VirtualBox:~/family$ ls -al >allfiles.txt
```

8. In the command window, display today's date with day of the week, month, date and year

```
athul@athul-VirtualBox:~/family$ date
Tuesday 17 August 2021 04:25:39 PM IST
athul@athul-VirtualBox:~/family$ ls
allfiles.txt snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap6.mp3
```

## 9. Add the user Juliet

```
athul@athul-VirtualBox:~/family$ sudo useradd juliet
[sudo] password for athul:
athul@athul-VirtualBox:~/family$
```

## 10. Confirm that Juliet has been added by examining the /etc/passwd file

```
athul@athul-VirtualBox:~/family$ cat /etc/passwd
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:/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:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:103:106::/nonexistent:/usr/sbin/nologin
avahi-autoipd:x:109:116:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:110:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
rtkit:x:111:117:RealtimeKit,,,:/proc:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
cups-pk-helper:x:113:120:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:114:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
avahi:x:115:121:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
kernoops:x:116:65534:KernelOops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:117:123::/var/lib/saned:/usr/sbin/nologin
nm-openvpn:x:118:124:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
hplip:x:119:7:HPLIP system user,,,:/run/hplip:/bin/false
whoopsie:x:120:125::/nonexistent:/bin/false
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
```

## 11. Use the passwd command to initialize Juliet's password

```
athul@athul-VirtualBox:~/family$ sudo passwd juliet
New password:
Retype new password:
passwd: password updated successfully
```

12. Create a supplementary group called Shakespeare with a group id of 30000

```
athul@athul-VirtualBox:~/family$ sudo groupadd -g 30000 shakespeare
```

13. Create a supplementary group called artists.

```
athul@athul-VirtualBox:~/family$ sudo groupadd -g 123458 artists
```

14. Confirm that Shakespeare and artists have been added by examining the /etc/group file

```
athul@athul-VirtualBox:~/family$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,athul
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:athul
floppy:x:25:
tape:x:26:
sudo:x:27:athul
audio:x:29:pulse
dip:x:30:athul
www-data:x:33:
avahi:x:121:
scanner:x:122:saned
saned:x:123:
nm-openvpn:x:124:
whoopsie:x:125:
colord:x:126:
geoclue:x:127:
pulse:x:128:
pulse-access:x:129:
gdm:x:130:
lxde:x:131:athul
athul:x:1000:
sambashare:x:132:athul
systemd-coredump:x:999:
athulc:x:1001:
athulca:x:1002:
at:x:1003:
jomeesh:x:1004:
athu:x:1005:
car:x:1007:athu
new_group:x:1008:athu
juliet:x:6446:
shakespeare:x:30000:
artists:x:123458:
```

15. Add the Juliet user to the Shakespeare group as a supplementary group.

```
athul@athul-VirtualBox:~/family$ sudo usermod -a -G shakespeare juliet
[sudo] password for athul:
Usage: usermod [options] LOGIN

Options:
 -b, --badnames allow bad names
 -c, --comment COMMENT new value of the GECOS field
 -d, --home HOME_DIR new home directory for the user account
 -e, --expiredate EXPIRE_DATE set account expiration date to EXPIRE_DATE
 -f, --inactive INACTIVE set password inactive after expiration
 to INACTIVE
 -g, --gid GROUP force use GROUP as new primary group
 -G, --groups GROUPS new list of supplementary GROUPS
 -a, --append append the user to the supplemental GROUPS
 mentioned by the -G option without removing
 the user from other groups
 -h, --help display this help message and exit
 -l, --login NEW_LOGIN new value of the login name
 -L, --lock lock the user account
 -m, --move-home move contents of the home directory to the
 new location (use only with -d)
 -o, --non-unique allow using duplicate (non-unique) UID
 -p, --password PASSWORD use encrypted password for the new password
 -P, --root CHROOT_DIR directory to chroot into
 -p, --password PASSWORD use encrypted password for the new password
 -R, --root CHROOT_DIR directory to chroot into
 -P, --prefix PREFIX_DIR prefix directory where are located the /etc/* f
iles
 -s, --shell SHELL new login shell for the user account
 -u, --uid UID new UID for the user account
 -U, --unlock unlock the user account
 -v, --add-subuids FIRST-LAST add range of subordinate uids
 -V, --del-subuids FIRST-LAST remove range of subordinate uids
 -w, --add-subgids FIRST-LAST add range of subordinate gids
 -W, --del-subgids FIRST-LAST remove range of subordinate gids
 -Z, --selinux-user SEUSER new SELinux user mapping for the user account
```

```
athul@athul-VirtualBox:~/family$ █
```

16. Confirm that Juliet has been added using the id command.

```
athul@athul-VirtualBox:~/family$ id juliet
uid=6446(juliet) gid=6446(juliet) groups=6446(juliet)
athul@athul-VirtualBox:~/family$ █
```

17. Add Romeo and Hamlet to the Shakespeare group.

```
athul@athul-VirtualBox:~/family$ sudo useradd Romeo
athul@athul-VirtualBox:~/family$ sudo useradd Hamlet
athul@athul-VirtualBox:~/family$ usermod -a -G shakespeare Romeo Hamlet
Usage: usermod [options] LOGIN

Options:
-b, --badnames allow bad names
-c, --comment COMMENT new value of the GECOS field
-d, --home HOME_DIR new home directory for the user account
-e, --expiredate EXPIRE_DATE set account expiration date to EXPIRE_DATE
-f, --inactive INACTIVE set password inactive after expiration
 to INACTIVE
-g, --gid GROUP force use GROUP as new primary group
-G, --groups GROUPS new list of supplementary GROUPS
-a, --append append the user to the supplemental GROUPS
 mentioned by the -G option without removing
 the user from other groups
-h, --help display this help message and exit
-l, --login NEW_LOGIN new value of the login name
-L, --lock lock the user account
-m, --move-home move contents of the home directory to the
 new location (use only with -d)
-o, --non-unique allow using duplicate (non-unique) UID
-p, --password PASSWORD use encrypted password for the new password
-R, --root CHROOT_DIR directory to chroot into
-P, --prefix PREFIX_DIR prefix directory where are located the /etc/* f
```

## 18. Add Reba, Dolly and Elvis to the artists group.

```
athul@athul-VirtualBox:~/family$ sudo usermod -a -G artists Reba
athul@athul-VirtualBox:~/family$ sudo usermod -a -G artists Dolly
athul@athul-VirtualBox:~/family$ sudo usermod -a -G artists Elvis
```

## 19. Verify the supplemental group memberships by examining the /etc/group file.

```
athul@athul-VirtualBox:~/family$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,athul
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:athul
floppy:x:25:
tape:x:26:
sudo:x:27:athul
audio:x:29:pulse
dip:x:30:athul
```

```
scanner:x:122:saned
saned:x:123:
nm-openvpn:x:124:
whoopsie:x:125:
colord:x:126:
geoclue:x:127:
pulse:x:128:
pulse-access:x:129:
gdm:x:130:
lxd:x:131:athul
athul:x:1000:
sambashare:x:132:athul
systemd-coredump:x:999:
athulc:x:1001:
athulca:x:1002:
at:x:1003:
jomeesh:x:1004:
athu:x:1005:
car:x:1007:athu
new_group:x:1008:athu
juliet:x:6446:
shakesphere:x:30000:
artists:x:123458:Reba,Dolly,Elvis
Romeo:x:6447:
Hamlet:x:6448:
Reba:x:6449:
Dolly:x:6450:
Elvis:x:6451:
athul@athul-VirtualBox:~/family$
```

## 20. Attempt to remove user Dolly

```
athul@athul-VirtualBox:~/family$ userdel -r Dolly
userdel: Permission denied.
userdel: cannot lock /etc/passwd; try again later.
athul@athul-VirtualBox:~/family$
```

## ping

```
C:\ Command Prompt
Microsoft Windows [Version 10.0.19043.1237]
(c) Microsoft Corporation. All rights reserved.

C:\Users\USER>ping www.google.com

Pinging www.google.com [2404:6800:4007:809::2004] with 32 bytes of data:
Reply from 2404:6800:4007:809::2004: time=845ms
Reply from 2404:6800:4007:809::2004: time=399ms
Reply from 2404:6800:4007:809::2004: time=68ms
Reply from 2404:6800:4007:809::2004: time=63ms

Ping statistics for 2404:6800:4007:809::2004:
 Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
 Minimum = 63ms, Maximum = 845ms, Average = 343ms

C:\Users\USER>
```

```
C:\Users\USER>ping /t 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=87ms TTL=54
Reply from 8.8.8.8: bytes=32 time=56ms TTL=54
Reply from 8.8.8.8: bytes=32 time=51ms TTL=54
Reply from 8.8.8.8: bytes=32 time=70ms TTL=54
Reply from 8.8.8.8: bytes=32 time=65ms TTL=54
Reply from 8.8.8.8: bytes=32 time=62ms TTL=54
Reply from 8.8.8.8: bytes=32 time=68ms TTL=54
Reply from 8.8.8.8: bytes=32 time=54ms TTL=54
Reply from 8.8.8.8: bytes=32 time=60ms TTL=54
Reply from 8.8.8.8: bytes=32 time=78ms TTL=54
Reply from 8.8.8.8: bytes=32 time=76ms TTL=54

Ping statistics for 8.8.8.8:
 Packets: Sent = 11, Received = 11, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
 Minimum = 51ms, Maximum = 87ms, Average = 66ms
Control-C
^C
C:\Users\USER>
```

## Route

```
C:\Users\USER>route print
=====
Interface List
 5...08 97 98 a7 56 47Realtek PCIe GbE Family Controller
 13...82 30 49 24 5e 77Microsoft Wi-Fi Direct Virtual Adapter #3
 21...92 30 49 24 5e 77Microsoft Wi-Fi Direct Virtual Adapter #4
 2...80 30 49 24 5e 77Qualcomm Atheros QCA9377 Wireless Network Adapter
 1.....Software Loopback Interface 1
=====
IPv4 Route Table
=====
Active Routes:
Network Destination Netmask Gateway Interface Metric
 0.0.0.0 0.0.0.0 192.168.43.1 192.168.43.151 55
 127.0.0.0 255.0.0.0 On-link 127.0.0.1 331
 127.0.0.1 255.255.255.255 On-link 127.0.0.1 331
 127.255.255.255 255.255.255.255 On-link 127.0.0.1 331
 192.168.43.0 255.255.255.0 On-link 192.168.43.151 311
 192.168.43.151 255.255.255.255 On-link 192.168.43.151 311
 192.168.43.255 255.255.255.255 On-link 192.168.43.151 311
 224.0.0.0 240.0.0.0 On-link 127.0.0.1 331
 224.0.0.0 240.0.0.0 On-link 192.168.43.151 311
 255.255.255.255 255.255.255.255 On-link 127.0.0.1 331
 255.255.255.255 255.255.255.255 On-link 192.168.43.151 311
=====
Persistent Routes:
 None
```

```
C:\Users\USER>route -n
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
 [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f Clears the routing tables of all gateway entries. If this is
 used in conjunction with one of the commands, the tables are
 cleared prior to running the command.

-p When used with the ADD command, makes a route persistent across
 boots of the system. By default, routes are not preserved
 when the system is restarted. Ignored for all other commands,
 which always affect the appropriate persistent routes.

-4 Force using IPv4.

-6 Force using IPv6.

Pattern match is only allowed in PRINT command.
Diagnostic Notes:
 Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
 Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
 The route addition failed: The specified mask parameter is invalid. (Destination & Mask) != Destination

Examples:
> route PRINT
> route PRINT -4
> route PRINT -6
> route PRINT 157* Only prints those matching 157*
> route ADD 157.0.0.0 MASK 255.0.0.0 157.55.80.1 METRIC 3 IF 2
 destination^ ^mask ^gateway metric^ ^
 ^ ^ ^
 Interface^
 If IF is not given, it tries to find the best interface for a given
 gateway.
> route ADD 3ffe::/32 3ffe::1

> route CHANGE 157.0.0.0 MASK 255.0.0.0 157.55.80.5 METRIC 2 IF 2
 CHANGE is used to modify gateway and/or metric only.

> route DELETE 157.0.0.0
> route DELETE 3ffe::/32

C:\Users\USER>
```

```
C:\Users\USER>route -cn

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
 [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f Clears the routing tables of all gateway entries. If this is
 used in conjunction with one of the commands, the tables are
 cleared prior to running the command.

-p When used with the ADD command, makes a route persistent across
 boots of the system. By default, routes are not preserved.
 when the system is restarted. Ignored for all other commands,
 which always affect the appropriate persistent routes.

-4 Force using IPv4.

-6 Force using IPv6.

command One of these:
 PRINT Prints a route
 ADD Adds a route
 DELETE Deletes a route
 CHANGE Modifies an existing route

destination Specifies the host.
MASK Specifies that the next parameter is the 'netmask' value.
netmask Specifies a subnet mask value for this route entry.
 If not specified, it defaults to 255.255.255.255.
gateway Specifies gateway.
```

```
Pattern match is only allowed in PRINT command.

Diagnostic Notes:
 Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
 Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
 The route addition failed: The specified mask parameter is invalid. (Destination & Mask) != Destination.
```

#### Examples:

```
> route PRINT
> route PRINT -4
> route PRINT -6
> route PRINT 157* Only prints those matching 157*

> route ADD 157.0.0.0 MASK 255.0.0.0 157.55.80.1 METRIC 3 IF 2
 destination^ ^mask ^gateway metric^ ^
 Interface^
 If IF is not given, it tries to find the best interface for a given
 gateway.
> route ADD 3ffe::/32 3ffe::1

> route CHANGE 157.0.0.0 MASK 255.0.0.0 157.55.80.5 METRIC 2 IF 2
 CHANGE is used to modify gateway and/or metric only.

> route DELETE 157.0.0.0
> route DELETE 3ffe::/32
```

```
C:\Users\USER>
```

## traceroute

```
C:\Users\USER>tracert google.com

Tracing route to google.com [2404:6800:4007:818::200e]
over a maximum of 30 hops:

 1 5 ms 6 ms 4 ms 2409:4073:39c:f5c4::fe
 2 * * * Request timed out.
 3 105 ms 52 ms 61 ms 2405:200:314:1501::3
 4 1096 ms 87 ms 41 ms 2405:200:801:1100::46a
 5 69 ms 55 ms 70 ms 2405:200:801:1100::453
 6 * * * Request timed out.
 7 * * * Request timed out.
 8 * * * Request timed out.
 9 * 75 ms * 2001:4860:0:1::aca
10 * 104 ms ^C
```

## C:\Users\USER>tracert

```
Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
 [-R] [-S srcaddr] [-4] [-6] target_name
```

### Options:

|                 |                                                 |
|-----------------|-------------------------------------------------|
| -d              | Do not resolve addresses to hostnames.          |
| -h maximum_hops | Maximum number of hops to search for target.    |
| -j host-list    | Loose source route along host-list (IPv4-only). |
| -w timeout      | Wait timeout milliseconds for each reply.       |
| -R              | Trace round-trip path (IPv6-only).              |
| -S srcaddr      | Source address to use (IPv6-only).              |
| -4              | Force using IPv4.                               |
| -6              | Force using IPv6.                               |

```
C:\Users\USER>
```

## nslookup

```
C:\Users\USER>ns lookup
'ns' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\USER>nslookup
Default Server: UnKnown
Address: 192.168.43.1

>
>
>
>
C:\Users\USER>
```

## Ipconfig

```
C:\Users\USER>ipconfig /release

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 11 while it has its media disconnected.
No operation can be performed on Local Area Connection* 12 while it has its media disconnected.

Ethernet adapter Ethernet:

 Media State : Media disconnected
 Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 11:

 Media State : Media disconnected
 Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 12:

 Media State : Media disconnected
 Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

 Connection-specific DNS Suffix . :
 IPv6 Address : 2409:4073:39c:f5c4:5c5f:d6a9:202d:a801
 Temporary IPv6 Address : 2409:4073:39c:f5c4:184:999d:ca38:116f
 Link-local IPv6 Address : fe80::5c5f:d6a9:202d:a801%2
 Default Gateway : fe80::da32:e3ff:fe56:160c%2

C:\Users\USER>
```

## NetStat

```
C:\Users\USER>netstat -r

Interface List
 5...08 97 98 a7 56 47Realtek PCIe GbE Family Controller
 13...82 30 49 24 5e 77Microsoft Wi-Fi Direct Virtual Adapter #3
 21...92 30 49 24 5e 77Microsoft Wi-Fi Direct Virtual Adapter #4
 2...80 30 49 24 5e 77Qualcomm Atheros QCA9377 Wireless Network Adapter
 1.....Software Loopback Interface 1

IPv4 Route Table
Active Routes:
Network Destination Netmask Gateway Interface Metric
 0.0.0.0 0.0.0.0 192.168.43.1 192.168.43.151 55
 127.0.0.0 255.0.0.0 On-link 127.0.0.1 331
 127.0.0.1 255.255.255.255 On-link 127.0.0.1 331
 127.255.255.255 255.255.255.255 On-link 127.0.0.1 331
 192.168.43.151 255.255.255.255 On-link 192.168.43.151 311
 192.168.43.151 255.255.255.255 On-link 192.168.43.151 311
 192.168.43.255 255.255.255.255 On-link 192.168.43.151 311
 224.0.0.0 240.0.0.0 On-link 127.0.0.1 331
 224.0.0.0 240.0.0.0 On-link 192.168.43.151 311
 255.255.255.255 255.255.255.255 On-link 192.168.43.151 311
 255.255.255.255 255.255.255.255 On-link 192.168.43.151 311

Persistent Routes:
 None

IPv6 Route Table
Active Routes:
If Metric Network Destination Gateway Interface Metric
 2 71 ::/0 fe80::da32:e3ff:fe56:160c
 1 331 ::1/128 On-link
 2 71 2409:4073:39c:f5c4::/64 On-link
 2 311 2409:4073:39c:f5c4:184:999d:ca38:116f/128
 2 311 2409:4073:39c:f5c4:5c5f:d6a9:202d:a801/128
 2 311 fe80::/64 On-link
 2 311 fe80::5c5f:d6a9:202d:a801/128
 1 331 ff00::/8 On-link
 2 311 ff00::/8 On-link

Persistent Routes:
 None
```

```
C:\Users\USER>netstat -nS

Displays protocol statistics and current TCP/IP network connections.

NETSTAT [-a] [-b] [-e] [-f] [-n] [-o] [-p proto] [-r] [-s] [-t] [-x] [-y] [interval]

-a Displays all connections and listening ports.
-b Displays the executable involved in creating each connection or
 listening port. In some cases well-known executables host
 multiple independent components, and in these cases the
 sequence of components involved in creating the connection
 or listening port is displayed. In this case the executable
 name is in [] at the bottom, on top is the component it called,
 and so forth until TCP/IP was reached. Note that this option
 can be time-consuming and will fail unless you have sufficient
 permissions.
-e Displays Ethernet statistics. This may be combined with the -s
 option.
-f Displays Fully Qualified Domain Names (FQDN) for foreign
 addresses.
-n Displays addresses and port numbers in numerical form.
-o Displays the owning process ID associated with each connection.
-p proto Shows connections for the protocol specified by proto; proto
 may be any of: TCP, UDP, TCPv6, or UDPv6. If used with the -s
 option to display per-protocol statistics, proto may be any of:
 IP, IPv6, ICMP, ICMPv6, TCP, TCPv6, UDP, or UDPv6.
-q Displays all connections, listening ports, and bound
 nonlistening TCP ports. Bound nonlistening ports may or may not
 be associated with an active connection.
-r Displays the routing table.
-s Displays per-protocol statistics. By default, statistics are
 shown for IP, IPv6, ICMP, ICMPv6, TCP, TCPv6, UDP, and UDPv6;
 the -p option may be used to specify a subset of the default.
-t Displays the current connection offload state.
-x Displays NetworkDirect connections, listeners, and shared
 endpoints.
-y Displays the TCP connection template for all connections.
 Cannot be combined with the other options.
interval Redisplays selected statistics, pausing interval seconds
 between each display. Press CTRL+C to stop redisplaying
 statistics. If omitted, netstat will print the current
 configuration information once.
```

```
C:\Users\USER>netstat
Active Connections
Proto Local Address Foreign Address State
TCP 127.0.0.1:57855 kubernetes:57856 ESTABLISHED
TCP 127.0.0.1:57856 kubernetes:57855 ESTABLISHED
TCP 127.0.0.1:62611 kubernetes:62612 ESTABLISHED
TCP 127.0.0.1:62612 kubernetes:62611 ESTABLISHED
TCP 192.168.43.151:49684 20.198.162.76:https ESTABLISHED
TCP 192.168.43.151:49725 20.197.71.89:https ESTABLISHED
TCP 192.168.43.151:62505 49.44.145.124:https ESTABLISHED
TCP 192.168.43.151:62506 49.44.145.124:https ESTABLISHED
TCP 192.168.43.151:62530 122.10.255.214:http CLOSE_WAIT
^C
C:\Users\USER>
```

## ping

```
athulc@athulc-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=112 time=83.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=112 time=85.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=112 time=203 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=112 time=80.7 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=112 time=126 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=112 time=82.6 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=112 time=72.3 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=112 time=79.5 ms
^C
--- www.google.com ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7013ms
rtt min/avg/max/mdev = 72.305/101.674/202.915/41.232 ms
athulc@athulc-VirtualBox:~$
```

```
athulc@athulc-VirtualBox:~$ ping 0
PING 0 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.031 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.040 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.049 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.042 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.051 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.048 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.049 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.049 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.049 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.076 ms
^C
--- 0 ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11244ms
rtt min/avg/max/mdev = 0.031/0.047/0.076/0.010 ms
```

```

 cc mch/avg/max/mdev = 0.051/0.047/0.070/0.010 ms
athulc@athulc-VirtualBox:~$ ping fb.com
PING fb.com (157.240.228.35) 56(84) bytes of data.
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=1 ttl=51 time=65.5 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=2 ttl=51 time=84.5 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=3 ttl=51 time=84.0 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=4 ttl=51 time=94.6 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=5 ttl=51 time=92.1 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=6 ttl=51 time=92.1 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=7 ttl=51 time=88.7 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
q=8 ttl=51 time=75.8 ms
^Z
[1]+ Stopped ping fb.com
athulc@athulc-VirtualBox:~$ █

```

```

athulc@athulc-VirtualBox:~$ ping -c
ping: option requires an argument -- 'c'

Usage
 ping [options] <destination>

Options:
 <destination> dns name or ip address
 -a use audible ping
 -A use adaptive ping
 -B sticky source address
 -c <count> stop after <count> replies
 -D print timestamps
 -d use SO_DEBUG socket option
 -f flood ping
 -h print help and exit
 -I <interface> either interface name or address
 -i <interval> seconds between sending each packet
 -L suppress loopback of multicast packets
 -l <preload> send <preload> number of packages while waiting replies
 -m <mark> tag the packets going out
 -M <pmtud opt> define mtu discovery, can be one of <do|dont|want>
 -n no dns name resolution
 -O report outstanding replies
 -p <pattern> contents of padding byte
 -q quiet output
 -Q <tclass> use quality of service <tclass> bits
 -s <size> use <size> as number of data bytes to be sent
 -S <size> use <size> as SO_SNDBUF socket option value
 -M <pmtud opt> define mtu discovery, can be one of <do|dont|want>
 -n no dns name resolution
 -O report outstanding replies
 -p <pattern> contents of padding byte
 -q quiet output
 -Q <tclass> use quality of service <tclass> bits
 -s <size> use <size> as number of data bytes to be sent
 -S <size> use <size> as SO_SNDBUF socket option value
 -U define lifetime to alive
 -V print user-to-user latency
 -v verbose output
 -w <deadline> print version and exit
 -W <timeout> reply wait <deadline> in seconds
 -w <timeout> time to wait for response

IPv4 options:
 -4 use IPv4
 -b allow pinging broadcast
 -R record route
 -T <timestamp> define timestamp, can be one of <tsonly|tsandaddr|tsprespe>

IPv6 options:
 -6 use IPv6
 -F <flowlabel> define flow label, default is random
 -N <nodeinfo opt> use icmp6 node info query, try <help> as argument

For more details see ping(8).
athulc@athulc-VirtualBox:~$ █

```

## route

```
athulc@athulc-VirtualBox:~$ route -cn
route: invalid option -- 'c'
Usage: route [-nNvee] [-FC] [<AF>] List kernel routing tables
 route [-v] [-FC] {add|del|flush} ... Modify routing table for AF.

 route {-h|--help} [<AF>] Detailed usage syntax for specific
d AF.
 route {-V|--version} Display version/author and exit.

 -v, --verbose be verbose
 -n, --numeric don't resolve names
 -e, --extend display other/more information
 -F, --fib display Forwarding Information Base (default)
 -C, --cache display routing cache instead of FIB

<AF>=Use -4, -6, '-A <af>' or '--<af>'; default: inet
List of possible address families (which support routing):
 inet (DARPA Internet) inet6 (IPv6) ax25 (AMPR AX.25)
 netrom (AMPR NET/ROM) ipx (Novell IPX) ddp (Appletalk DDP)
 x25 (CCITT X.25)
athulc@athulc-VirtualBox:~$
```

```
athulc@athulc-VirtualBox:~$ traceroute www.fb.com
traceroute to star-mini.c10r.facebook.com (157.240.228.35), 64 hops max
 1 10.0.2.2 0.003ms 0.002ms 0.004ms
 2 * * *
 3 * * *
 4 * * *
 5 * * *
 6 * * *
 7 * * *
```

## ifconfig

```
ls: /proc/net/sockmap: No such file or directory
athulc@athulc-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
 inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
 inet6 fe80::ddcb:98cd:1a27:6289 prefixlen 64 scopeid 0x20<link>
 ether 08:00:27:4b:f4:f9 txqueuelen 1000 (Ethernet)
 RX packets 163765 bytes 234542281 (234.5 MB)
 RX errors 0 dropped 0 overruns 0 frame 0
 TX packets 39684 bytes 2487972 (2.4 MB)
 TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
 inet 127.0.0.1 netmask 255.0.0.0
 inet6 ::1 prefixlen 128 scopeid 0x10<host>
 loop txqueuelen 1000 (Local Loopback)
 RX packets 393 bytes 35022 (35.0 KB)
 RX errors 0 dropped 0 overruns 0 frame 0
 TX packets 393 bytes 35022 (35.0 KB)
 TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

athulc@athulc-VirtualBox:~$
```

```
C:\Users\USER>hostname
LAPTOP-J4HCVHAO
```

```
C:\Users\USER>
```

```
athulc@athulc-VirtualBox:~$ hostname
athulc-VirtualBox
athulc@athulc-VirtualBox:~$
```

```
C:\Users\USER>getmac

Physical Address Transport Name
===== =====
08-97-98-A7-56-47 Media disconnected
80-30-49-24-5E-77 \Device\Tcpip_{072775C5-6323-473F-8F6C-99EDD24F2876}
C:\Users\USER>
```

```
C:\Users\USER>tasklist

Image Name PID Session Name Session# Mem Usage
===== ===== ===== =====
System Idle Process 0 Services 0 8 K
System 4 Services 0 3,048 K
Secure System 72 Services 0 26,556 K
Registry 132 Services 0 46,532 K
smss.exe 584 Services 0 972 K
csrss.exe 772 Services 0 4,352 K
wininit.exe 860 Services 0 5,424 K
cssrs.exe 868 Console 1 5,392 K
services.exe 932 Services 0 9,288 K
winlogon.exe 964 Console 1 9,140 K
lsalso.exe 996 Services 0 2,480 K
lsass.exe 1008 Services 0 20,500 K
fontdrvhost.exe 728 Console 1 15,084 K
fontdrvhost.exe 512 Services 0 2,456 K
svchost.exe 1064 Services 0 33,124 K
MUIFHHost.exe 1172 Services 0 4,980 K
svchost.exe 1220 Services 0 16,788 K
svchost.exe 1268 Services 0 7,852 K
dwm.exe 1356 Console 1 2,22,956 K
svchost.exe 1444 Services 0 4,864 K
svchost.exe 1556 Services 0 7,656 K
svchost.exe 1580 Services 0 14,216 K
svchost.exe 1616 Services 0 15,492 K
svchost.exe 1624 Services 0 12,364 K
svchost.exe 1632 Services 0 11,416 K
svchost.exe 1780 Services 0 5,892 K
svchost.exe 1920 Services 0 9,568 K
svchost.exe 2068 Services 0 6,284 K
svchost.exe 2152 Services 0 9,140 K
svchost.exe 2180 Services 0 10,288 K
svchost.exe 2212 Services 0 7,324 K
svchost.exe 2256 Services 0 1,10,640 K
svchost.exe 2264 Services 0 5,440 K
svchost.exe 2272 Services 0 7,052 K
svchost.exe 2284 Services 0 30,032 K
svchost.exe 2388 Services 0 8,080 K
svchost.exe 2436 Services 0 11,948 K
```

```
C:\Users\USER>Systeminfo

Host Name: LAPTOP-J4HCVHAO
OS Name: Microsoft Windows 10 Home Single Language
OS Version: 10.0.19043 N/A Build 19043
OS Manufacturer: Microsoft Corporation
OS Configuration: Standalone Workstation
OS Build Type: Multiprocessor Free
Registered Owner: USER
Registered Organization: N/A
Product ID: 00327-35888-02898-AA0EM
Original Install Date: 14-12-2020, 21:22:31
System Boot Time: 04-10-2021, 13:39:21
System Manufacturer: Acer
System Model: Aspire A315-56
System Type: x64-based PC
Processor(s): 1 Processor(s) Installed.
 [01]: Intel® Family 6 Model 126 Stepping 5 GenuineIntel ~991 Mhz
BIOS Version: [01]: Insyde Corp. V1.09, 27-03-2020
Windows Directory: C:\WINDOWS
System Directory: C:\WINDOWS\system32
Boot Device: \Device\HarddiskVolume1
System Locale: en-us;English (United States)
Input Locale: 00000400
Time Zone: (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory: 7,981 MB
Available Physical Memory: 973 MB
Virtual Memory: Max Size: 12,523 MB
Virtual Memory: Available: 2,233 MB
Virtual Memory: In Use: 10,290 MB
Page File Location(s): C:\pagefile.sys
Domain: WORKGROUP
Logon Server: \\LAPTOP-J4HCVHAO
Hotfix(s): 10 Hotfix(s) Installed.
 [01]: KB50005539
 [02]: KB4562830
 [03]: KB4577586
 [04]: KB4580325
 [05]: KB4589212
 [06]: KB4593175
 [07]: KB4598481
 [08]: KB5000736
 [09]: KB5000565
 [10]: KB50005699
Network Card(s): 2 NIC(s) Installed.
 [01]: Realtek PCIe GbE Family Controller
 Connection Name: Ethernet
```

```
athulc@athulc-VirtualBox:~$ dig google.com

; <>> DiG 9.16.1-Ubuntu <>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 25164
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;google.com. IN A

;; ANSWER SECTION:
google.com. 248 IN A 172.217.160.142

;; Query time: 68 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Mon Oct 04 15:11:50 IST 2021
;; MSG SIZE rcvd: 55

athulc@athulc-VirtualBox:~$
```

## **Install Apachet**

- Update your system  
sudo apt update
- Install Apache using apt:  
sudo apt install apache2
- Confirm that Apache is now running with the following command:  
sudo systemctl status apache2
- if it is not working  
sudo systemctl start apache2

- Once installed, test by accessing your server's IP in your browser:

<http://youripaddress>  
( find out your ip address using ifconfig)

## **Install mariaDB**

- sudo apt install mariadb-server mariadb-client

Check mariadb Installation

- sudo systemctl status mysql

## **Install PHP and commonly used modules**

- 

sudo apt install php libapache2-mod-php php-ocpache  
php-cli php-gd php-curl php-mysql

- 

Restart apache2

- 

sudo systemctl restart apache2

## **Now you can check php installation**

```
sudo echo "<?php phpinfo(); ?>"
| sudo tee -a
/var/www/html/phpinfo.php > /dev/
```

## **Open a browser**

<http://127.0.0.1/phpinfo.php>

## **Install phpmyadmin**

- sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl  
(It asks for webserver select apache2, select db-

configuration and set  
password)

Restart apache2

➤ sudo systemctl restart apache2

**Check phpmyadmin**

Open a browser

http://localhost/phpmyadmin

username : root

password : yourpassword

```
athulc@athulc-VirtualBox:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
 Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres>
 Active: active (running) since Wed 2021-09-29 20:07:01 IST; 2min 59s ago
 Docs: https://httpd.apache.org/docs/2.4/
 Process: 672 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SU>
 Main PID: 840 (apache2)
 Tasks: 6 (limit: 2312)
 Memory: 20.1M
 CPU: 0.000 CPU(s) since start
 CGroup: /system.slice/apache2.service
 ├─840 /usr/sbin/apache2 -k start
 ├─855 /usr/sbin/apache2 -k start
 ├─856 /usr/sbin/apache2 -k start
 ├─857 /usr/sbin/apache2 -k start
 ├─858 /usr/sbin/apache2 -k start
 └─860 /usr/sbin/apache2 -k start

Sep 29 20:06:54 athulc-VirtualBox systemd[1]: Starting The Apache HTTP Server.>
Sep 29 20:07:01 athulc-VirtualBox apachectl[706]: AH00558: apache2: Could not >
Sep 29 20:07:01 athulc-VirtualBox systemd[1]: Started The Apache HTTP Server.
Lines 1-19/19 (END)
```

Apache2 Ubuntu Default Page +

localhost



# Apache2 Ubuntu Default Page

## ubuntu

**It works!**

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Apache packaging is derived. If you can read this page, it means that the Apache HTTP server at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

### Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, which is split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **man apache2-doc** package, which was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
```

```
athulc@athulc-VirtualBox:~$ sudo systemctl status mysql
● mariadb.service - MariaDB 10.3.31 database server
 Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor pre
 Active: active (running) since Wed 2021-09-29 20:07:07 IST; 7min ago
 Docs: man:mysqld(8)
 https://mariadb.com/kb/en/library/systemd/
 Process: 673 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /
 Process: 679 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_
 Process: 681 ExecStartPre=/bin/sh -c [! -e /usr/bin/galera_recovery]
 Process: 961 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_
 Process: 965 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0)
 Main PID: 767 (mysqld)
 Status: "Taking your SQL requests now..."
 Tasks: 30 (limit: 2312)
 Memory: 81.5M
 CGroup: /system.slice/mariadb.service
 └─767 /usr/sbin/mysqld

Sep 29 20:07:01 athulc-VirtualBox mysqld[767]: 2021-09-29 20:07:01 0 [Note]
Sep 29 20:07:07 athulc-VirtualBox systemd[1]: Started MariaDB 10.3.31 database
Sep 29 20:07:07 athulc-VirtualBox /etc/mysql/debian-start[967]: Upgrading MySQL
Sep 29 20:07:09 athulc-VirtualBox /etc/mysql/debian-start[974]: Looking for
Sep 29 20:07:09 athulc-VirtualBox /etc/mysql/debian-start[974]: Looking for
Sep 29 20:07:09 athulc-VirtualBox /etc/mysql/debian-start[974]: Version che
Sep 29 20:07:09 athulc-VirtualBox /etc/mysql/debian-start[974]: ERROR 1045
Sep 29 20:07:09 athulc-VirtualBox /etc/mysql/debian-start[974]: FATAL ERROR
Sep 29 20:07:09 athulc-VirtualBox /etc/mysql/debian-start[1005]: Checking t
Sep 29 20:07:09 athulc-VirtualBox debian-start[1008]: ERROR 1045 (28000): A
lines 1-27/27 (END)
```

```
athulc@athulc-VirtualBox:~$ php --version
PHP 7.4.3 (cli) (built: Aug 13 2021 05:39:12) (NTS)
Copyright (c) The PHP Group
Zend Engine v3.4.0, Copyright (c) Zend Technologies
 with Zend OPcache v7.4.3, Copyright (c), by Zend Technologies
athulc@athulc-VirtualBox:~$
```

PHP Version 7.4.3

```
athulc@athulc-VirtualBox:~$ sudo mysql -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 24
Server version: 10.3.31-MariaDB-0ubuntu0.20.04.1 Ubuntu 20.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| phpmyadmin |
+-----+
4 rows in set (0.000 sec)

MariaDB [(none)]>
```

The screenshot shows the PHPMyAdmin interface running on a local host. The browser tab is titled "localhost / localhost | php". The main navigation bar includes links for Databases, SQL, Status, User accounts, Export, and Import. Below the navigation, there are three main configuration sections:

- General settings**: Includes options for "Change password" and "Server connection collation" set to "utf8mb4\_unicode\_ci".
- Appearance settings**: Includes options for "Language" (set to English), "Theme" (set to pmahomme), "Font size" (set to 82%), and a "More settings" link.
- Database server**: Includes a "Console" link.

```
athulc@athulc-VirtualBox:~$ sudo apt-get install ansible
[sudo] password for athulc:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
 linux-headers-5.8.0-43-generic linux-hwe-5.8-headers-5.8.0-43
 linux-image-5.8.0-43-generic linux-modules-5.8.0-43-generic
 linux-modules-extra-5.8.0-43-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
 ieee-data python3-argcomplete python3-crypto python3-distutils
 python3-dnspython python3-jinja2 python3-jmespath python3-kerberos
 python3-libcloud python3-netaddr python3-ntlm-auth
 python3-requests-kerberos python3-requests-ntlm python3-selinux
 python3-winrm python3-xmltodict
Suggested packages:
 cowsay sshpass python-jinja2-doc ipython3 python-netaddr-docs
The following NEW packages will be installed:
 ansible ieee-data python3-argcomplete python3-crypto python3-distutils
 python3-dnspython python3-jinja2 python3-jmespath python3-kerberos
 python3-libcloud python3-netaddr python3-ntlm-auth
 python3-requests-kerberos python3-requests-ntlm python3-selinux
 python3-winrm python3-xmltodict
0 upgraded, 17 newly installed, 0 to remove and 202 not upgraded.
Need to get 9,865 kB of archives.
After this operation, 92.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-jinja2 all 2
```

```
Processing triggers for man-db (2.9.1-1) ...
athulc@athulc-VirtualBox:~$ ansible --version
ansible 2.9.6
 config file = /etc/ansible/ansible.cfg
 configured module search path = ['/home/athulc/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
 ansible python module location = /usr/lib/python3/dist-packages/ansible
 executable location = /usr/bin/ansible
 python version = 3.8.10 (default, Jun 2 2021, 10:49:15) [GCC 9.4.0]
athulc@athulc-VirtualBox:~$
```

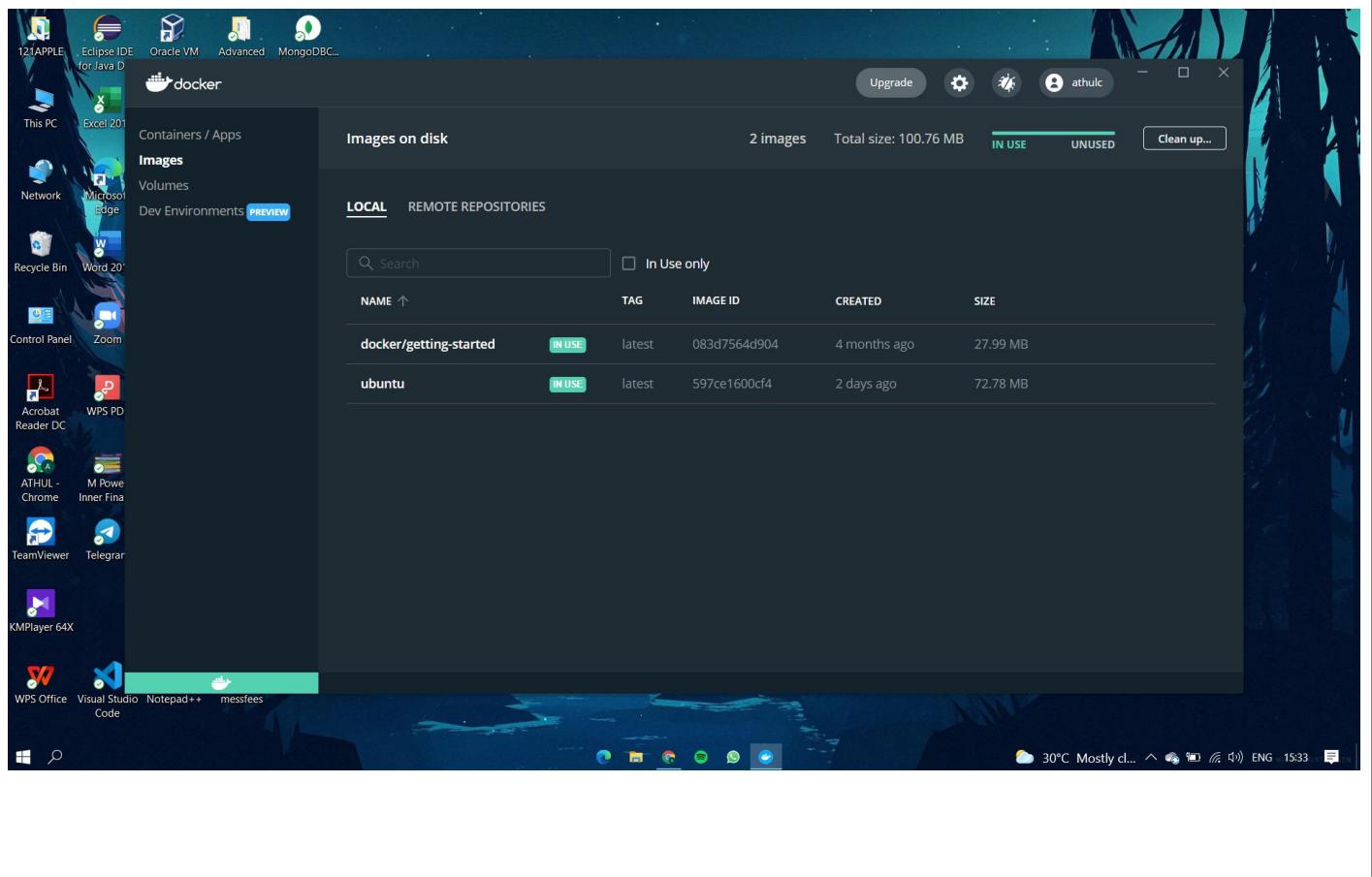
The screenshot shows the Docker desktop application running on a Windows host. A terminal window is open, displaying a command-line session. The session starts with pulling the 'ubuntu' image, followed by running it with the command '-it'. Inside the container, the user runs 'echo "athulc"', which outputs 'athulc' to the terminal. Finally, the user exits the container with 'exit'. The Docker interface includes a top bar with icons for upgrade, settings, and user profile, and a sidebar on the left.

```
In Administrator: Command Prompt
b2e41dd2ded0: Pull complete
7f40c809fb2d: Pull complete
758848c48411: Pull complete
23ded5c3e1fe: Pull complete
38a847d4d941: Pull complete
Digest: sha256:10555bb0c50e13fc4dd965ddb5f00e948ffa53c13ff15dcdb85b7ab65e1f240b
Status: Downloaded newer image for docker/getting-started:latest
e7412fbfc81117a988f8dd460a58782ce0610bb481e4e11b75fa5f2d9fdb5b83

C:\WINDOWS\system32>docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
f3ef4ff62e00: Pull complete
Digest: sha256:44ab2c3b26363823dc9b965498ab06abf74a1e6af20a732902250743df0d4172d
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

C:\WINDOWS\system32>docker run -it ubuntu
root@d42be09c4891:/# echo "athulc"
athulc
root@d42be09c4891:/# exit
exit

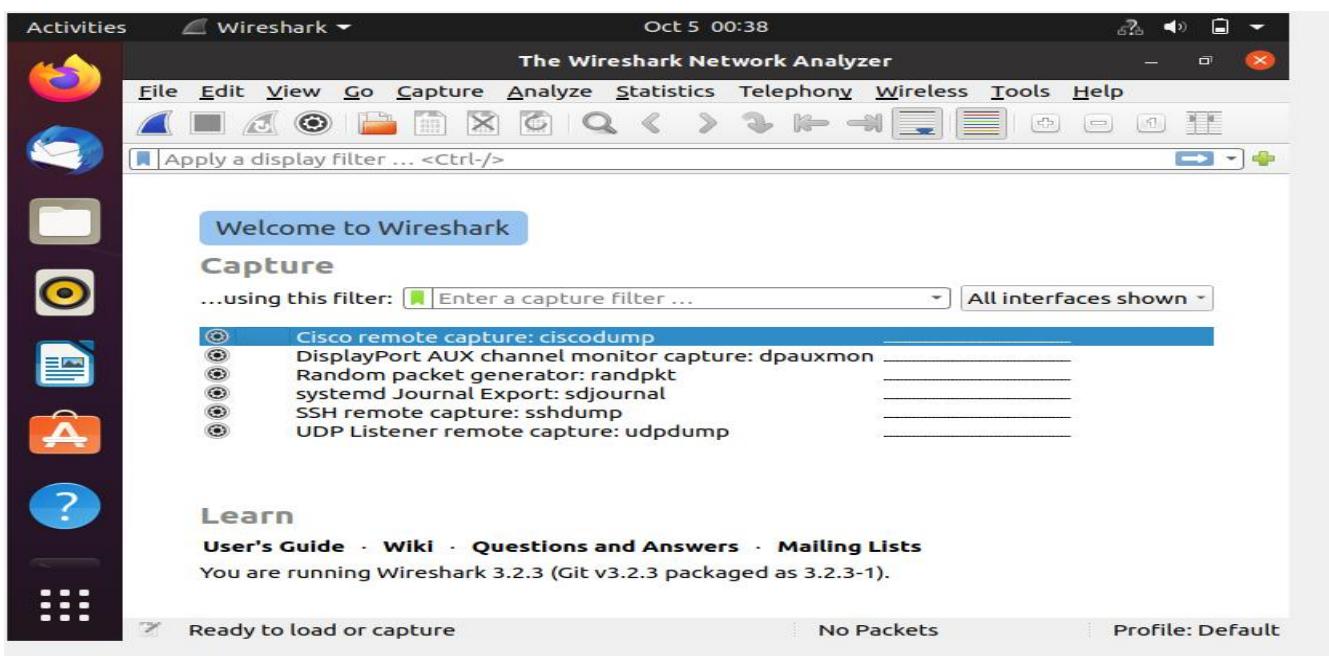
C:\WINDOWS\system32>
```



```
sudo apt-get install wireshark
```

```
athulc@athulc-VirtualBox:~$ sudo apt-get install wireshark
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
 libc-ares2 libdouble-conversion3 liblua5.2-0 libpcre2-16-0 libqt5core5a
 libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins
 libqt5multimeddiagsttools5 libqt5multimediawidgets5 libqt5network5
 libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l0
 libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13
 libwiredtap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0
 qt5-gtk-platformtheme qttranslations5-l10n wireshark-common wireshark-qt
Suggested packages:
 qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geoipupdate
 geoip-database geoip-database-extra libjs-leaflet
 libjs-leaflet.markercluster wireshark-doc
The following NEW packages will be installed:
 libc-ares2 libdouble-conversion3 liblua5.2-0 libpcre2-16-0 libqt5core5a
 libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins
 libqt5multimeddiagsttools5 libqt5multimediawidgets5 libqt5network5
 libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l0
 libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13
 libwiredtap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0
```

```
athulc@athulc-VirtualBox:~$ sudo apt install wireshark-qt
Reading package lists... Done
Building dependency tree
Reading state information... Done
wireshark-qt is already the newest version (3.2.3-1).
wireshark-qt set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 333 not upgraded.
athulc@athulc-VirtualBox:~$
```



## Netcat

```
nc -z -v 10.0.2.255 20-80
```

```
^C
athulc@athulc-VirtualBox:~$ netcat -z -v 10.0.2.255 20-80
netcat: connect to 10.0.2.255 port 20 (tcp) failed: Connection timed out
^C
athulc@athulc-VirtualBox:~$ netcat -z -v 10.0.2.255 20-80
```

1. Write a shell script to ask your name, and college name and print it on the screen.

2. Write a shell script to set a value for a variable and display it on command line interface.

```
#!/bin/bash
a=9
echo "$a"

~
~

athulc@athulc-VirtualBox:~$ bash view.sh
9
```

3. Write a shell script to perform addition, subtraction, multiplication, division with two numbers that is accepted from user.

```
#!/bin/bash

echo "read 2 integers"

read a b

add=` expr "$a + $b" | bc`

echo "$add"

sub=` expr "$a - $b" | bc`

echo "$sub"

mul=` expr "$a * $b" | bc`

echo $mul

div=` expr "$a / $b" | bc`

echo $div

~"arithmetic.sh" 27 lines, 212 characters
```

```
athulc@athulc-VirtualBox:~$ bash arithmetic.sh
read 2 integers
23 34
57
-11
782
0
athulc@athulc-VirtualBox:~$
```

4 . Write a shell script to check the value of a given number and display whether the number is found or not.

```

#!/bin/bash
echo "Finding a number"

echo "Enter a number"
read a
if [$a == 10];
then
 echo "Number found!"
else
 echo "Number not found!"
fi

```

5. Write a shell script to display current date, calendar

```

#!/bin/bash
echo "Time and Calender"

echo "Today is $(date)"

echo "Calender"

```

6. Write a shell script to check a number is even or odd.

```

#!/bin/bash
echo "EVEN OR ODD"

echo "Enter a number"
read n
x=$((n%2))
if [$x -eq 0];
then
 echo "Number is even"
else
 echo "Number is odd"
fi

```

7. Write a shell script to check a number is greater than, less than or equal to another number.

```

#!/bin/bash
echo "avg, sum & product of 4 numbers"

echo "enter first number"
read a
echo "enter second number"
read b
echo "enter third number"
read c
echo "enter forth number"
read d

sum=$((a + b + c + d))
avg=$(echo $sum/4 | bc-l)
prod=$((a * b * c * d))

echo "the sum of the numbers is:" $sum
echo "the average of the numbers is:" $avg
echo "the product of the numbers is:" $prod

```

7. Write a shell script to find the sum of first 10 numbers.

```

#!/bin/bash
echo "Sum of Numbers"

a=0
for ((i=1;i<=10;i++))
do
 a=`expr $a + $i`
done
echo "Sum of 10 numbers=$a"

```

9. Write a shell script to find the sum, the average and the product of the four integers entered.

```
#!/bin/bash
echo "avg, sum & product of 4 numbers"

echo "enter first number"
read a
echo "enter second number"
read b
echo "enter third number"
read c
echo "enter forth number"
read d

sum=$((a + b + c + d))
avg=$(echo $sum/4 | bc-l)
prod=$((a * b * c * d))

echo "the sum of the numbers is:" $sum
echo "the average of the numbers is:" $avg
echo "the product of the numbers is:" $prod
```

10. Write a shell script to find the smallest of three numbers.

11. Write a shell program to find factorial of given number.

```
#!/bin/bash
echo "Factorial"

echo "enter a number"
read num
fact=1
for((i=2;i<=num;i++))
{
 fact=$((fact*i))
}
echo "factorial is $fact"
"
```

12. Write a shell program to check a number is palindrome or not.

```
#!/bin/bash
echo "Palindrome or NOT"

echo "Enter number to check"
read n
rev=$(echo $n | rev)
if [$n -eq $rev];
then
 echo "Number is Palindrome"
else
 echo "Number is not Palindrome"
fi
```

13. Write a shell script to find the average of the numbers entered in command line.

```
#!/bin/bash
echo "Avg of n numbers"

echo "enter size"
read n
i=1
sum=0

echo "Enter numbers"
while [$i -le $n]
do
 read num
 sum=$((sum + num))
 i=$((i + 1))
done
avg=$(echo $sum/$n | bc -l)
echo $avg
```

13. Write a shell program to find the sum of all the digits in a number.

```
#!/bin/bash
echo "Sum of all digits"

echo "Enter a number"
read num
sum=0

while [$num -gt 0]
do
 mod=$((num % 10))
 sum=$((sum + mod))
 num=$((num / 10))
done
echo "Sum of digits is $sum"
```

14. Write a shell Script to check whether given year is leap year or not.

```
#!/bin/bash
echo "Leap year or Not"

echo "Enter the year"
read y
a=`expr $y % 4`
b=`expr $y % 100`
c=`expr $y % 400`
if [$a -eq 0 -a $b -ne 0 -o $c -eq 0];
then
 echo "$y is leap year"
else
 echo "$y is not leap year"
fi
```