Networking & System Administration

Lab Record

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Roll no:06

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Basic linux commands explain linux commands pwd , history, man, Is, cd, mkdir, rmdir, touch, rm, cat with examples.

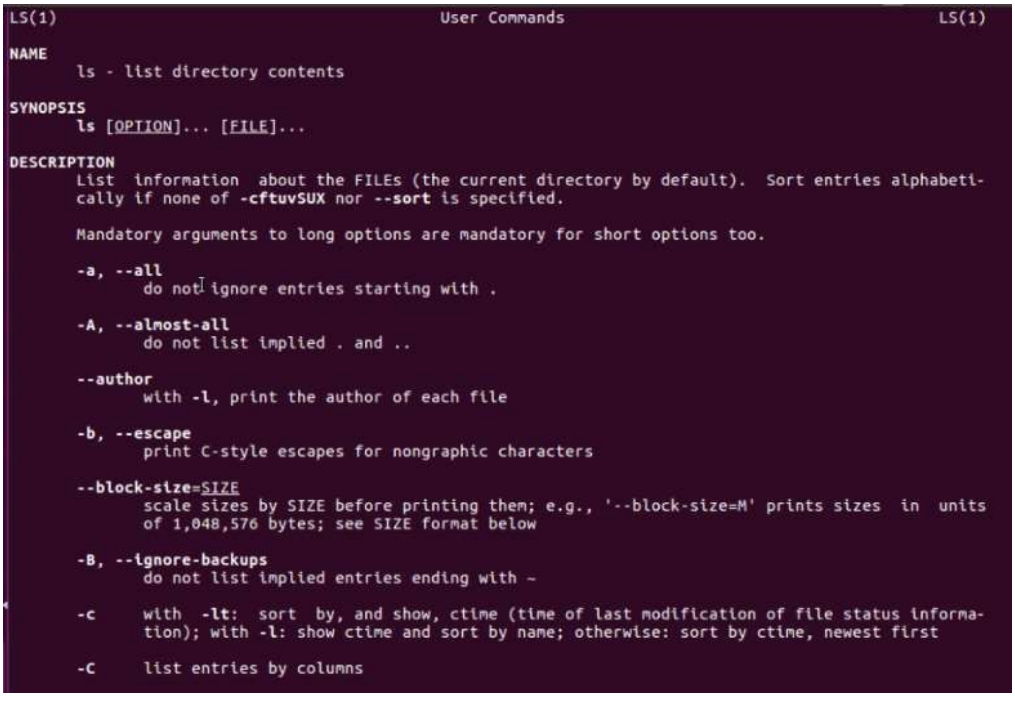
pwd

Linux pwd(printing work directory) commands displays Your location currently you are working on .It give the whole path starting from the root ending to the directory.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ pwd
/home/onworks
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

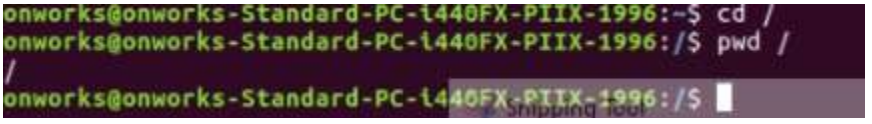
man

The man is the short term for manual page. A manual page associated with each of these arguments is displayed



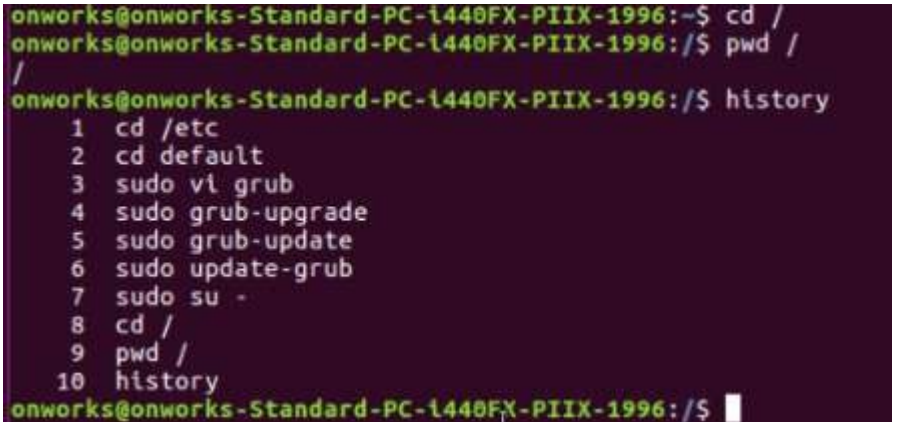
cd

The cd commands stands for change directory. It is used to change to the directory you want to from the present directory.

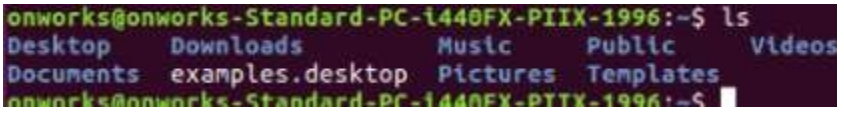


history

History command is used to view the previously executed command.



ls
Is is the list of command in linux. It will show the full list or content of your directory.



mkdir

With mkdir command you can create your own directory.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mkdir new
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop    Downloads         Music  Pictures  Templates
Documents  examples.desktop  new    Public    Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

rmdir

The rmdir command is used to remove a directory from your system.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rmdir
rmdir: missing operand
Try 'rmdir --help' for more information.
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rm -d
rm: missing operand
Try 'rm --help' for more information.
```

touch

Touch command is a way to create empty files. You can update the modification and access time of each file with the command.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch onworks
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop    Downloads         Music  onworks   Public     Videos
Documents  examples.desktop  new    Pictures  Templates
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

rm

The rm means remove. This command is used to remove a file . The command line doesnt have a recycle bin or trash unlike other GUIs to recover the files.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rm onworks
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop    Downloads         Music  Pictures  Templates
Documents  examples.desktop  new    Public    Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

cat

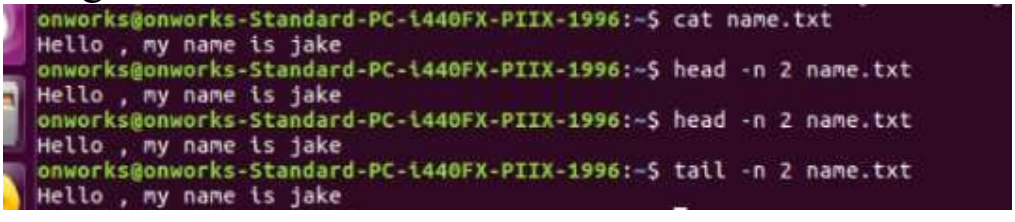
It is used to list the contents of a file on the standard output stdout.

echo

echo command is used to move some data into a file “Hello, my name is Jake” into a file called name.txt, you would type echo Hello, my name is Jake >>name.txt

head

The head command is used to view the first lines of any text file.
By default, it will show the first ten lines, but you can change this number to your
liking.



tail

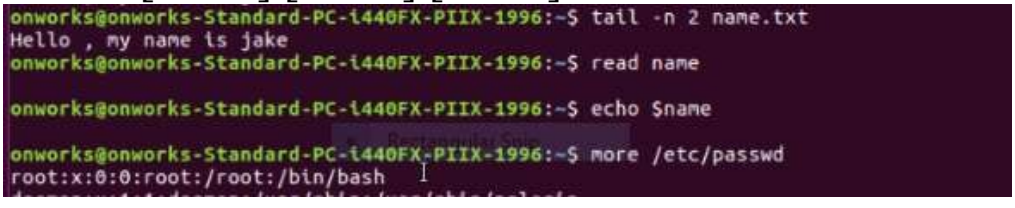
This one has a similar function to the head command, but instead of showing the first lines, the tail command will display the last 10 lines of a text file.

Tail -n filename.txt

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ tail -n 2 name.txt
Hello , my name is jake
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ read name

onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ echo $name

onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ more /etc/passwd
root:x:0:0:root:/root:/bin/bash
```

read

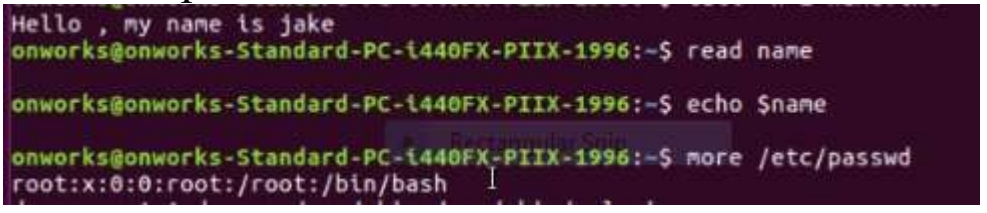
read the contents of a line into a varable. The read command can be used with and without arguments
read command is used to read [options]
[name..]
$read var 1 var2 var3
$echo “[$var1] [$var2] [$var3]”
read command is used to read [options]
$echo “[$var1] [$var2] [$var3]”



more

Like cat command , more command displays the content of a file. Only difference is that, in case of larger files, ‘cat’ command output will scroll off ‘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: Lets you search the string.
Syntax: more <file name>
more /etc/passwd



less

The ‘less’ command is same as ‘more’ command but include some more features.It automatically adjust with the width and height of the terminal window, while ‘more’ command commands cut the content as the width of the terminal window gets shorter.

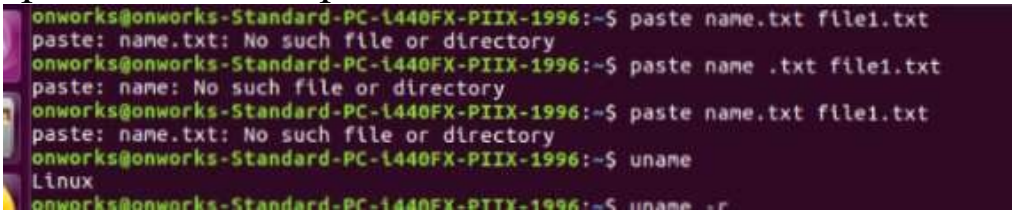
less <file name>$less/etc/passwd

cut

The cut command is used for cutting out the sections from each line of files and
writing the result to standard output. It can be used to cut parts of a line by byte
positions, character and field
cut OPTION…[FILE]
$cut -b 1,2,3 state.txt

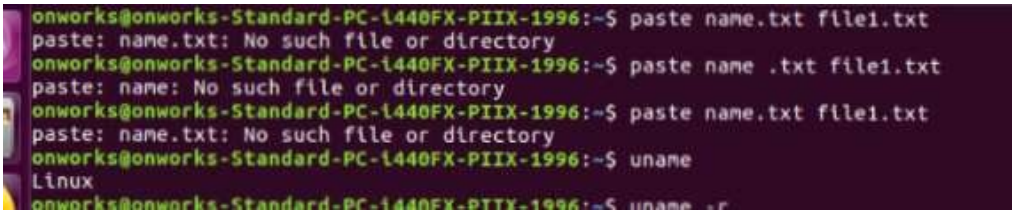
paste

It is used to join files horizontally (parallel merging) by lines from each file specified,
paste[OPTION]…[FILES]…
$paste state.txt capital.txt



uname

The uname command,short for Unix Name, will print detailed information about your Linux system like the machine name ,operating system, kernel.
$uname
$uname -r

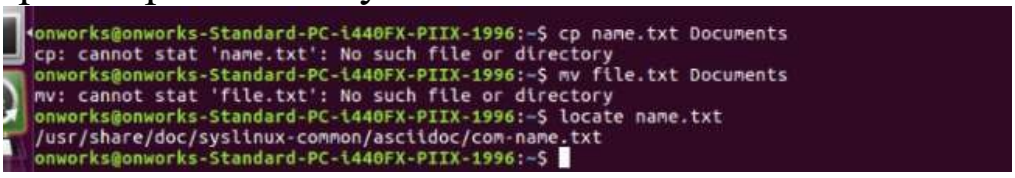


cp

command is used to copy files from the current directory to a different directory.For instance, the command cp scenery.jpg

cp -i will ask for users consent in case of a potential file overwrite.
cp -p will preserve source files mode

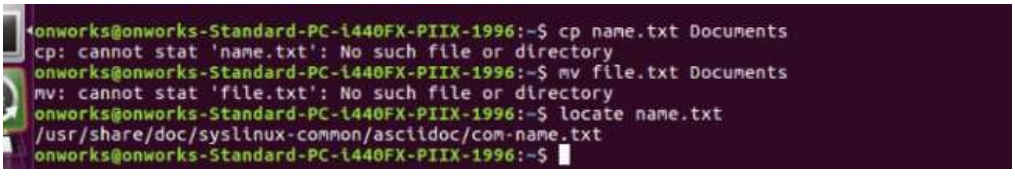
cp -r will copy directories recursively
cp -u copies file only if the destination file



mv

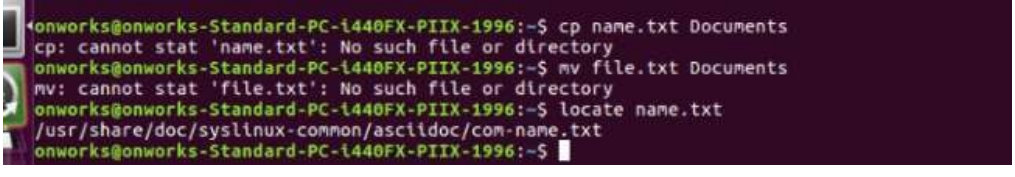
The primary use of the mv command is to move files, it can be used to rename files. The arguments in mv are similar to the cp command.

Mv file.txt/home/username/documents
To rename the file , the linux is mv



locate

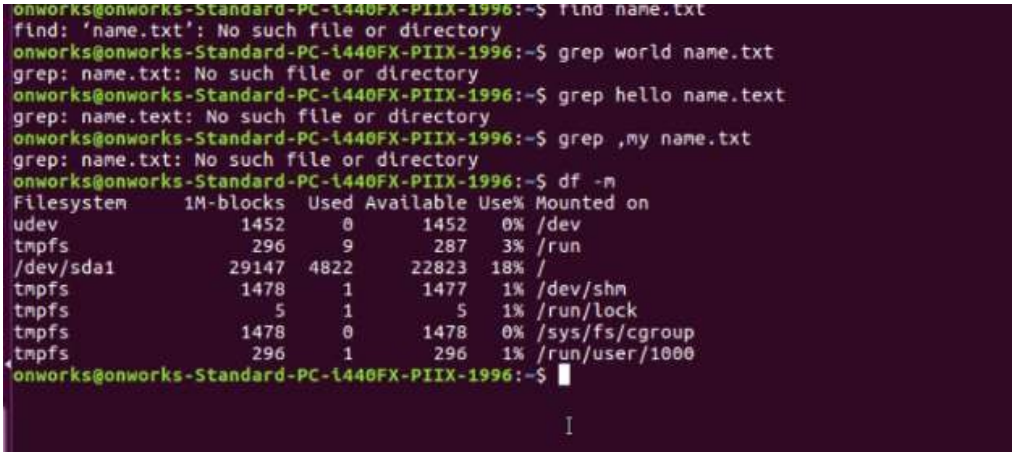
To locate a file , just like search command in windows



find

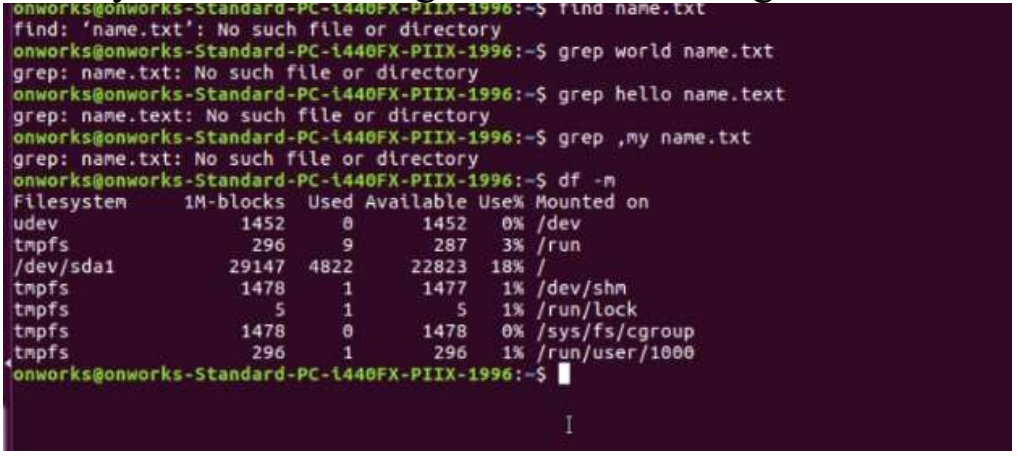
Similar to the locate command,using find also searches for files and directories.

Find/home/ -name notes.txt



grep

It lets you search through all the text in a given file.



df

Use df command to get a report on the system disk space usage, percentage and KBs.
If you want to report in megabytes ,types df -m

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ df -m
Filesystem     1M-blocks  Used Available Use% Mounted on
udev                1452     0      1452   0% /dev
tmpfs                296     9       287   3% /run
/dev/sda1          29147  4822     22823  18% /
tmpfs               1478     1      1477   1% /dev/shm
tmpfs                  5     1         5   1% /run/lock
tmpfs               1478     0      1478   0% /sys/fs/cgroup
tmpfs                296     1       296   1% /run/user/1000
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

du

If you want to check how much space a file or a directoy takes, the du(disk usage) command is the answer.
$du –h

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ du -h
4,0K    ./Public
4,0K    ./.gnupg/private-keys-v1.d
8,0K    ./.gnupg
```

useradd

This is avail only to the system admins. Since linux is a multi user system, this means more than one person can interact with the same system at the same time.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo dscl . -create/Users/ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo dscl . -create/Users/ana
[sudo] password for onworks:

Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo /usr/bin/dscl . -delete "/Users/ana"
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:

sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo userdel ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
```

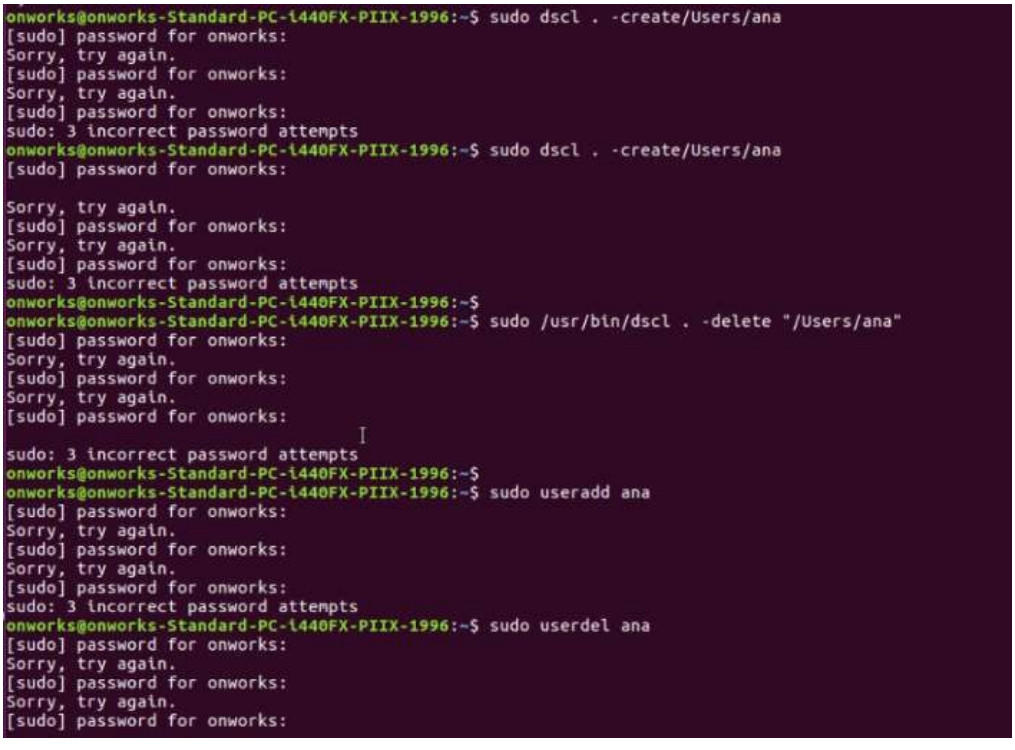
userdel

Remove a user is very similar to adding a new user.To delete the user account type userdel username

```
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo userdel ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ passwd passwd onwork
Usage: passwd [options] [LOGIN]
```

sudo

Short for “SuperUser Do”, this command enables you to perform tasks that require administrative or root permission
sudo useradd maria



```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo dscl . -create/Users/ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo dscl . -create/Users/ana
[sudo] password for onworks:

Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo /usr/bin/dscl . -delete "/Users/ana"
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:

sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo userdel ana
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
```

passwd

Change passwords for user accounts. A normal user may only change password for their own account.
passwd[option] [username]
passwd passwd user1

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ passwd
Changing password for onworks.
(current) UNIX password:
```

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 login information
#usermod –help
#usermod –u 2000 tom

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ usermod --help
Usage: usermod [options] LOGIN

Options:
  -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
                                him/her 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
  -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
```

groupadd

grupadd command creates a new group account using the values specified on the command line and the default values
#groupadd student

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd student
[sudo] password for onworks:
```

groups

print the groups a user is in
#groups alice

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ groups onworks
onworks : onworks adm cdrom sudo dip plugdev lpadmin sambashare
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

groupdel

groupdel command modifies the system acount files, deleting all entries that refer to group. The named group must exist
#groupdel marketing

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupdel student
[sudo] password for onworks:
```

groupmod

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

#groupmod –n group1 group2

chmod

To change directory permissions of file/directory in linux.
#chmod who what which file or directory
Chmod +rwx filename to add permissions
Chmod –rwx directory name 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

id

id command in linux is used to find out numeric id (UID or group ID) of the current user.
#id

ps

The ps command,short for process status 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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ps -a
  PID TTY          TIME CMD
25136 pts/1    00:00:00 ps
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

top

top command is used to show the linux processes. It provide a dynamic real-time view of the running system
#top –u rose

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ top -u onworks

top - 07:11:39 up 35 min,  1 user,  load average: 0,00, 0,00, 0,04
Tasks: 159 total,   1 running, 123 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1,2 us,  0,2 sy,  0,0 ni, 98,7 id,  0,0 wa,  0,0 hi,  0,0 si,  0,0 st
KiB Mem :  3024932 total,   535420 free,   468784 used,  2020728 buff/cache
KiB Swap:   998396 total,   998396 free,        0 used.  2191960 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
 1601 onworks   20   0  383672 187400  75772 S   1,0  6,2   0:42.65 compiz
  826 onworks   20   0    6400   4196   3628 S   0,0  0,1   0:00.04 systemd
  827 onworks   20   0    7588   1308      0 S   0,0  0,0   0:00.00 (sd-pam)
```

wc

wc stands for word count and used for counting purpose also to find out number of lines, word count,byte and charcters
in the file arguments.
wc state.txt•
6 8 5 4 state.txt
wc state.txt capital .txt•
wc -1 state.txt
wc –w state.txt capital.txt
wc –c state.txt
wc –m state.txt

```
rks@onworks-Standard-PC-i440FX-PIIX-1996: ~
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ wc rare.txt
wc: rare.txt: No such file or directory
```

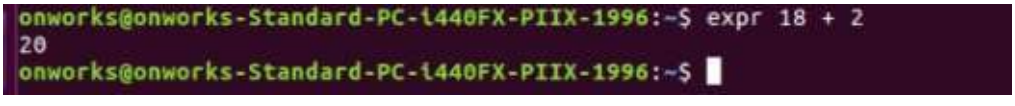
tar

The linux ‘tar’ stands for tape archive, is used to create archive
the archive files
Linux tar command to create compressed or uncompressed archive files.
-c: create 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 a
-v: displays verbose information

-a: concatenate the archive file
-z: zip, tells tar command that create tar file using gzip
-j: filter archive tar file using tbzip
-w: verify a archive file
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

expr

The expr command evaluates a given expression and displays its corresponding output. It is used for basic operation like addition,subtraction,multiplication,division and modulus on integers.
Evaluating regular expression, string operations like substring, length of string.
Performing operations on variables inside a shell script
#expr 10 + 2



Redirections & Piping

A pipe is a form of redirection to send the output of one command/program/proces
s 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 the next command an
#ls -1 | wc -1
#cat /etc.passwd.txt | head -7 |tail

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls -l|wc -l
11
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

ssh

ssh stands for “Secure Shell”
It’s 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 and transfers inputs from the client to the host and relays back the out
put. ssh runs at TCP/IP port 22.
#ssh user_name@host(IP/Domain_name)
#ssh-X root @server1.example.com

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ssh --help
unknown option -- -
usage: ssh [-1246AaCfGgKkMNnqsTtVvXxYy] [-b bind_address] [-c cipher_spec]
           [-D [bind_address:]port] [-E log_file] [-e escape_char]
           [-F configfile] [-I pkcs11] [-i identity_file] [-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]] [user@]hostname [command]
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

scp

scp is secure copy and its command
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 systems to your local systems
Between two remote systems from your local system.
Remote file system locations are specified in format [user@]host:/path
Syntax
scp [OPTIO
N] [user@]SRC_HOST:] file1 [user@] DEST_HOST:]file2
$scp/etc/yum.config/etc/hosts server x:/home/student
$scp server x :/etc/hostname/home/student

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ssh onworks@onworks
ssh: Could not resolve hostname onworks: Name or service not known
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ssh -keygen
Bad escape character 'ygen'.
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

ssh-copy-id

the ssh copy id command allows you to install an SSH key on a remote servers authorized keys.
This command facilitate SSH key login, which remove the need for a password for each login, thus ensuring a password
process.
$ssh-copy-id username@remote_host

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ssh -copy-id onworks
Unknown cipher type 'opy-id'
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

a,Create six files with name of the form songX.mp3
b, Create six files with name of the form snapX.mp3
c, Create six files with name of the form filmX.mp3

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 s
ong6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch filim1.mp3 filim2.mp3 filim3.mp3 filim4.mp3 filim5.
mp3 filim6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop           filim1.mp3  filim5.mp3  Public     snap4.mp3  song3.mp3  Templates
Documents         filim2.mp3  filim6.mp3  snap1.mp3  snap5.mp3  song4.mp3  Videos
Downloads         filim3.mp3  Music       snap2.mp3  song1.mp3  song5.mp3
examples.desktop  filim4.mp3  Pictures    snap3.mp3  song2.mp3  song6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song
6.mp3 ./Music/
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop    examples.desktop  filim3.mp3  filim6.mp3  Public     snap3.mp3  Templates
Documents  filim1.mp3        filim4.mp3  Music       snap1.mp3  snap4.mp3  Videos
Downloads  filim2.mp3        filim5.mp3  Pictures    snap2.mp3  snap5.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls -R Music
Music:
song1.mp3  song2.mp3  song3.mp3  song4.mp3  song5.mp3  song6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap
6.mp3 ./pictures/
mv: target './pictures/' is not a directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap
6.mp3 ./pictures/
mv: target './pictures/' is not a directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls -R Pictures
Pictures:
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv filim1.mp3 filim2.mp3 filim3.mp3 filim4.mp3 filim5.mp3
 filim6.mp3 ./Videos/
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls -R Videos
Videos:
filim1.mp3  filim2.mp3  filim3.mp3  filim4.mp3  filim5.mp3  filim6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

In your home directory, create three subdirectories for organizing your files. call these directories friends, family.create with one command.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mkdir friends family work
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop    Downloads         family    Music     Public     snap2.mp3  snap4.mp3  Templates  work
Documents  examples.desktop  friends   Pictures  snap1.mp3  snap3.mp3  snap5.mp3  Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp Pictures/snap6.mp3 family
cp: cannot stat 'Pictures/snap6.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp pictures/sanp5.mp3 family
cp: cannot stat 'pictures/sanp5.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp pictures/snap4.mp3 family
cp: cannot stat 'pictures/snap4.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp pictures/snap3.mp3 family
cp: cannot stat 'pictures/snap3.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp pictures/snap2.mp3 family
cp: cannot stat 'pictures/snap2.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp pictures/snap1.mp3 family
cp: cannot stat 'pictures/snap1.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls family
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop    Downloads         family    Music     Public     snap2.mp3  snap4.mp3  Templates  work
Documents  examples.desktop  friends   Pictures  snap1.mp3  snap3.mp3  snap5.mp3  Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp Pictures/snap6.mp3 friends
cp: cannot stat 'Pictures/snap6.mp3': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop  Documents  Downloads  examples.desktop  Music  Pictures  Public  Templates  Videos
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rm -r family friends
rm: cannot remove 'family': No such file or directory
rm: cannot remove 'friends': No such file or directory
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop  Documents  Downloads  examples.desktop  Music  Pictures  Public  Templates  Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

Use another command that will succeed in deleting both family andfriends folder.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rmdir family friends
rmdir: failed to remove 'family': No such file or directory
rmdir: failed to remove 'friends': No such file or directory
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch allfiles.txt
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls -al > allfiles.txt
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
allfiles.txt  Documents  examples.desktop  Pictures  Templates
Desktop       Downloads  Music             Public    Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat allfiles.txt
total 108
drwxr-xr-x 16 onworks onworks 4096 Aug 17 17:03 .
drwxr-xr-x  3 root    root    4096 Mai  5  2019 ..
-rw-rw-r--  1 onworks onworks    0 Aug 17 17:04 allfiles.txt
-rw-------  1 onworks onworks   94 Mai 31  2019 .bash_history
-rw-r--r--  1 onworks onworks  220 Mai  5  2019 .bash_logout
-rw-r--r--  1 onworks onworks 3771 Mai  5  2019 .bashrc
drwx------ 11 onworks onworks 4096 Mai  5  2019 .cache
drwx------  3 onworks onworks 4096 Mai  5  2019 .compiz
drwx------ 14 onworks onworks 4096 Mai  5  2019 .config
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Desktop
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Documents
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Downloads
-rw-r--r--  1 onworks onworks 8980 Mai  5  2019 examples.desktop
drwx------  2 onworks onworks 4096 Mai  5  2019 .gconf
drwx------  3 onworks onworks 4096 Aug 30  2019 .gnupg
-rw-------  1 onworks onworks 3496 Aug 30  2019 .ICEauthority
drwx------  3 onworks onworks 4096 Mai  5  2019 .local
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Music
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Pictures
-rw-r--r--  1 onworks onworks  655 Mai  5  2019 .profile
```

In the command window, display today date with date of the week month, date and year.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ date
Di 17. Aug 15:31:00 CEST 2021
```

Add the user Juliet.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd juliet
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ 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:/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-timesync:x:100:102:systemd Time Synchronization,,,:/run/systemd:/bin/false
systemd-network:x:101:103:systemd Network Management,,,:/run/systemd/netif:/bin/false
```

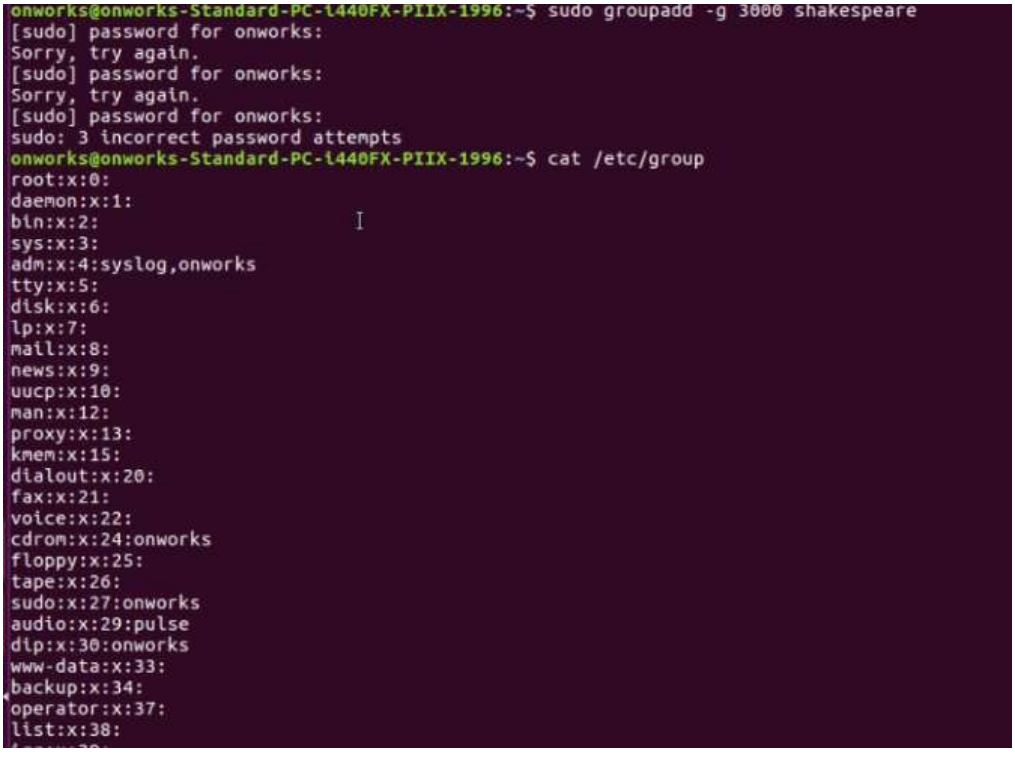
Confirm that Juliet has been added by examining the /etc/passwd file

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ 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:/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
hplip:x:115:7:HPLIP system user,,,:/var/run/hplip:/bin/false
kernoops:x:116:65534:Kernel Oops Tracking Daemon,,,:/:/bin/false
pulse:x:117:124:PulseAudio daemon,,,:/var/run/pulse:/bin/false
rtkit:x:118:126:RealtimeKit,,,:/proc:/bin/false
saned:x:119:127::/var/lib/saned:/bin/false
usbmux:x:120:46:usbmux daemon,,,:/var/lib/usbmux:/bin/false
onworks:x:1000:1000:onworks,,,:/home/onworks:/bin/bash
```

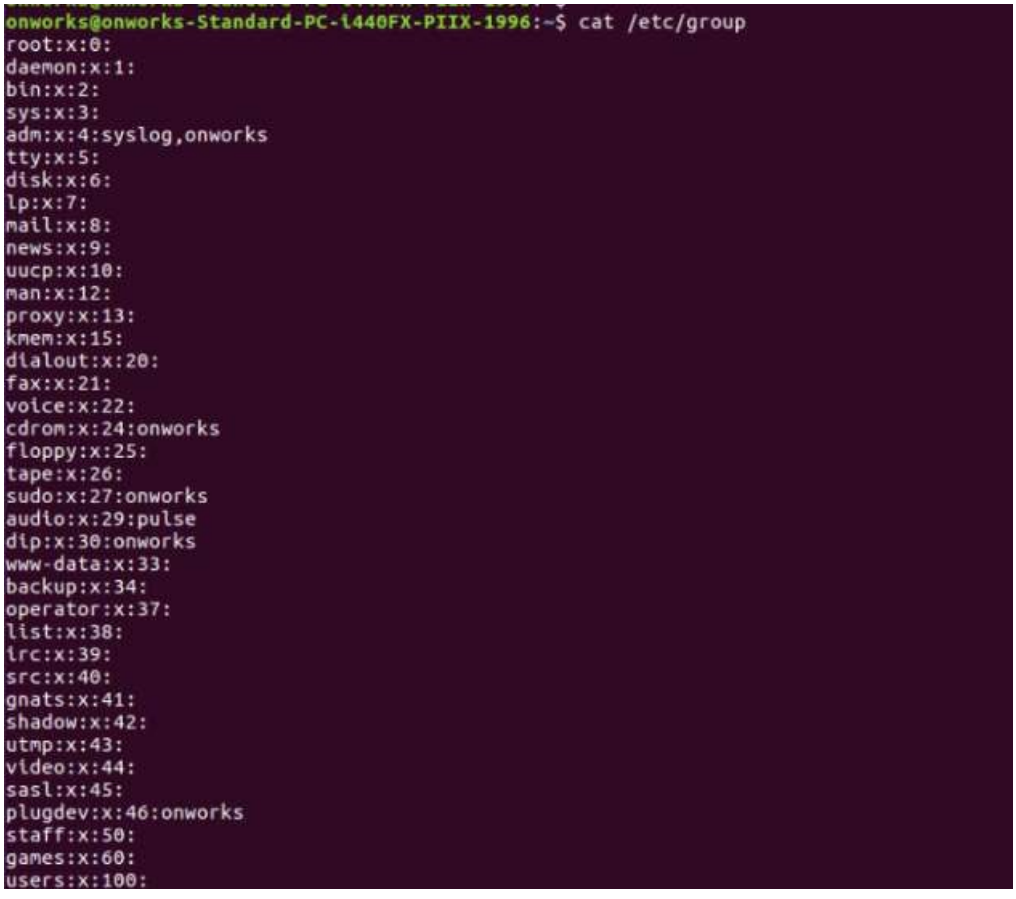
Use the passwd command to initialize Juliet password.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo passwd juliet
[sudo] password for onworks:
```

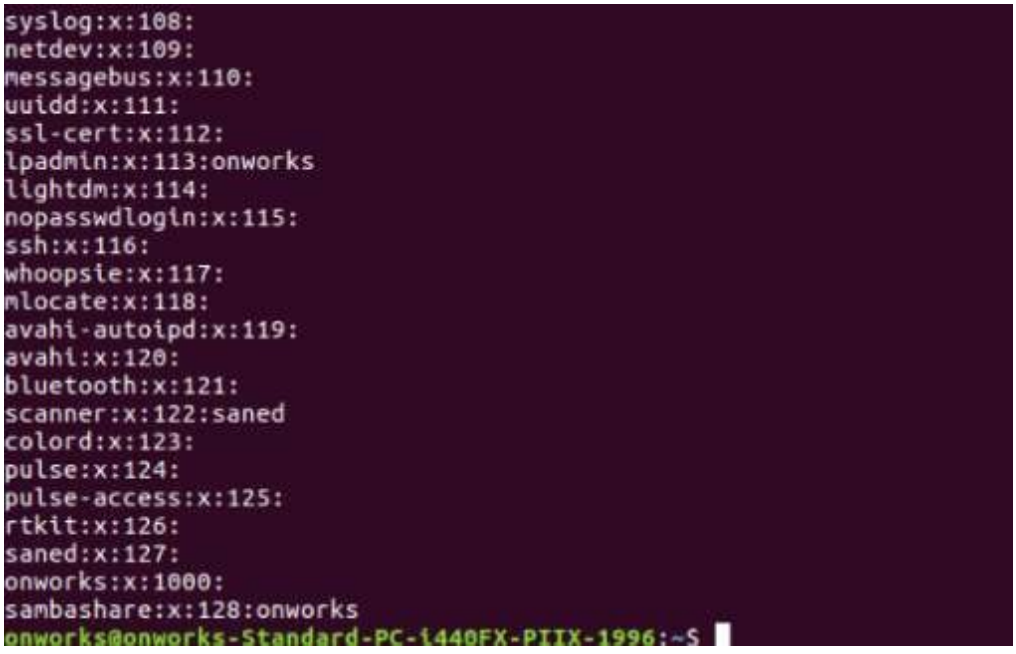
Create a supplementary group called 30000



Create a supplementary group called artists.



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



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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo  usermod -G shakespeare juliet
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:

Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,onworks
tty:x:5:
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:onworks
floppy:x:25:
tape:x:26:
sudo:x:27:onworks
audio:x:29:pulse
dip:x:30:onworks
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
shadow:x:42:
utmp:x:43:
video:x:44:
```

Confirm that Juliet has been added using the id command.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id -u juliet
id: 'juliet': no such user
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id -g juliet
id: 'juliet': no such user
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

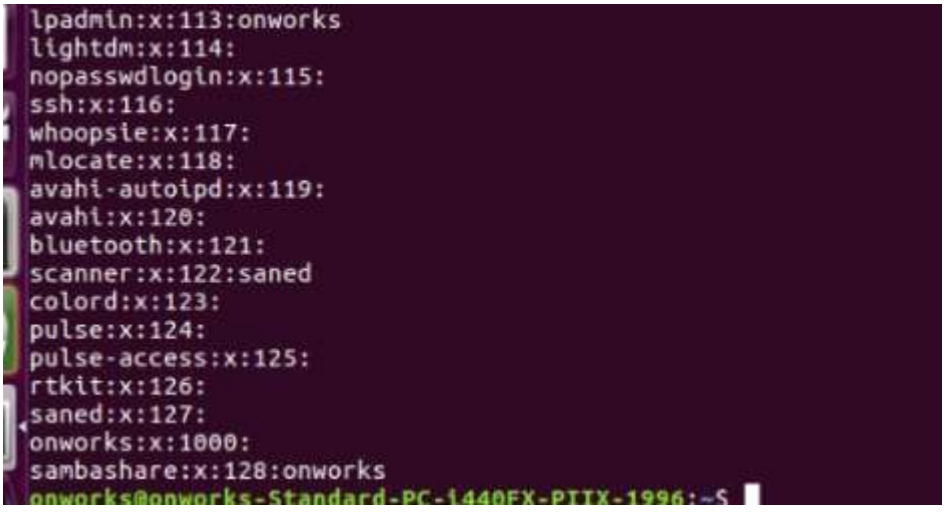
Add Romeo and Hamlet to the Shakespeare group.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -G shakespeare Romeo
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -G shakespeare Hamlet
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,onworks
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
```

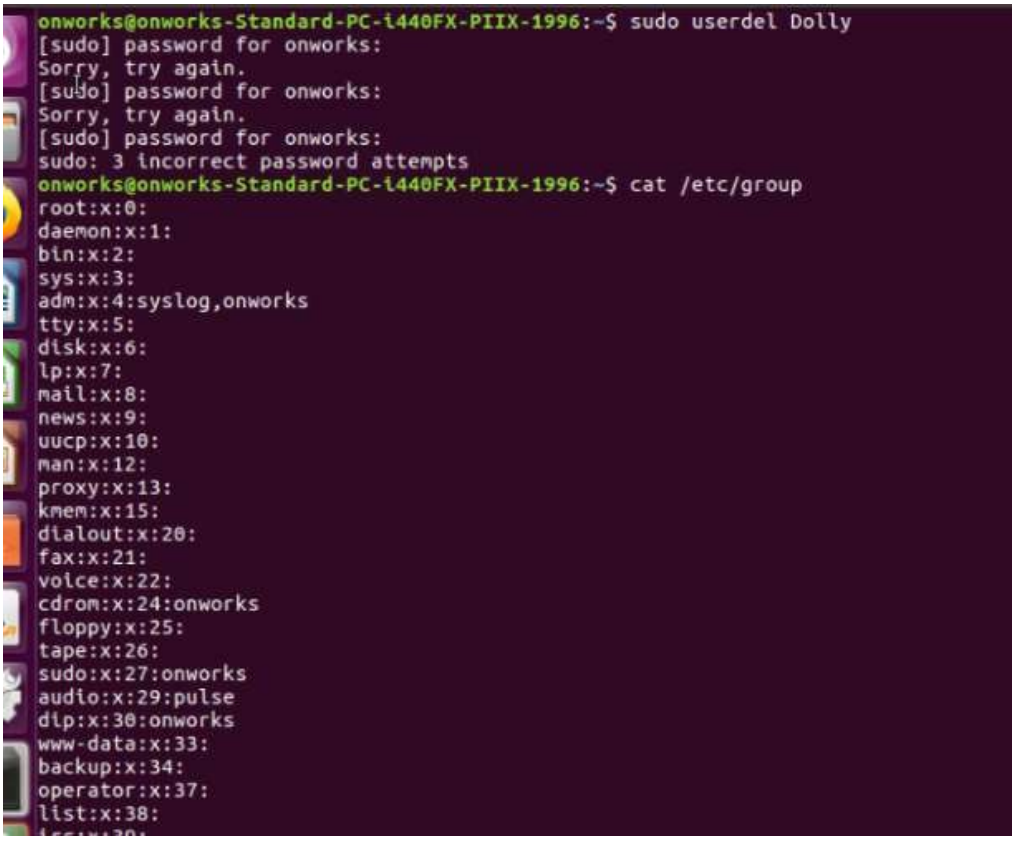
Dolly and Elvis to the artists group.

```
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -G artists Dolly
[sudo] password for onworks:


Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -G artists Elvis
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
Sorry, try again.
[sudo] password for onworks:
sudo: 3 incorrect password attempts
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,onworks
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
```

Verify the supplemental group membership by examining the /etc/gr



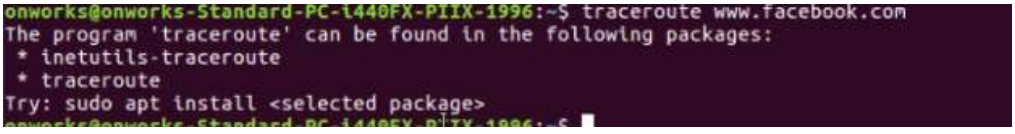
Attempt to remove user Dolly.



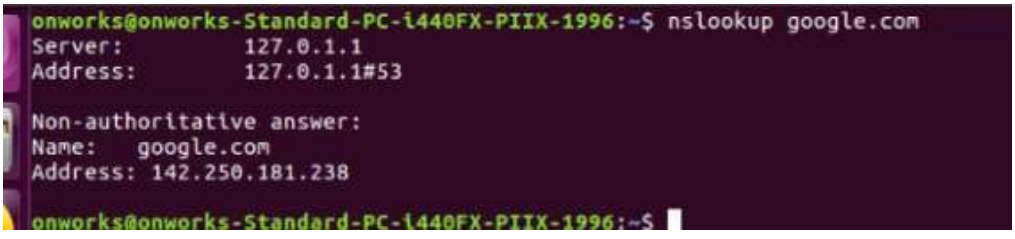
Try out these network commands in Window as well as in Linux and perform at least 4 options with each command: ping route traceroute, nslookup,Ip Config, NetStat

Ping

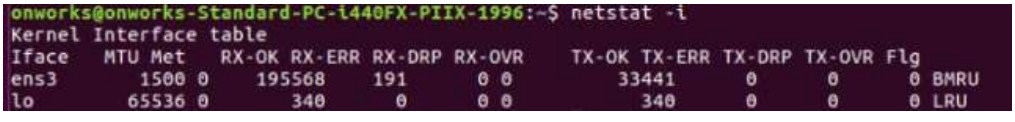
Traceoute



Nslookup



Netstat



```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ netstat -1
netstat: invalid option -- '1'
usage: netstat [-vWeenNcCF] [<Af>] -r         netstat {-V|--version|-h|--help}
       netstat [-vWnNcaeol] [<Socket> ...]
       netstat { [-vWeenNac] -i | [-cWnNe] -M | -s }

        -r, --route              display routing table
        -i, --interfaces         display interface table
        -g, --groups             display multicast group memberships
        -s, --statistics         display networking statistics (like SNMP)
        -M, --masquerade         display masqueraded connections

        -v, --verbose            be verbose
        -W, --wide               don't truncate IP addresses
        -n, --numeric            don't resolve names
        --numeric-hosts          don't resolve host names
        --numeric-ports          don't resolve port names
        --numeric-users          don't resolve user names
        -N, --symbolic           resolve hardware names
        -e, --extend             display other/more information
        -p, --programs           display PID/Program name for sockets
        -c, --continuous         continuous listing

        -l, --listening          display listening server sockets
        -a, --all, --listening   display all sockets (default: connected)
        -o, --timers             display timers
        -F, --fib                display Forwarding Information Base (default)
        -C, --cache              display routing cache instead of FIB

  <Socket>={-t|--tcp} {-u|--udp} {-w|--raw} {-x|--unix} --ax25 --ipx --netrom
  <AF>=Use '-6|-4' or '-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)
```

Route

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.0.2.2        0.0.0.0         UG    100    0        0 ens3
10.0.2.0        *               255.255.255.0   U     100    0        0 ens3
link-local      *               255.255.0.0     U     1000   0        0 ens3
```

Ifconfig

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ifconfig
ens3      Link encap:Ethernet  HWaddr 52:54:00:12:34:56
          inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
          inet6 addr: fe80::ae8:44ad:baf7:10fd/64 Scope:Link
          inet6 addr: fec0::794a:6ae2:1411:54a5/64 Scope:Site
          inet6 addr: fec0::e319:1b8b:5ce5:c3e1/64 Scope:Site
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:195553 errors:193 dropped:0 overruns:0 frame:193
          TX packets:33416 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:290554974 (290.5 MB)  TX bytes:2062265 (2.0 MB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:338 errors:0 dropped:0 overruns:0 frame:0
          TX packets:338 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:30333 (30.3 KB)  TX bytes:30333 (30.3 KB)
```

Ping

```
C:\Users\aksa>ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
            [-r count] [-s count] [[-j host-list] | [-k host-list]]
            [-w timeout] [-R] [-S srcaddr] [-c compartment] [-p]
            [-4] [-6] target_name

Options:
    -t             Ping the specified host until stopped.
                   To see statistics and continue - type Control-Break;
                   To stop - type Control-C.
    -a             Resolve addresses to hostnames.
    -n count       Number of echo requests to send.
    -l size        Send buffer size.
    -f             Set Don't Fragment flag in packet (IPv4-only).
    -i TTL         Time To Live.
    -v TOS         Type Of Service (IPv4-only. This setting has been deprecated
                   and has no effect on the type of service field in the IP
                   Header).
    -r count       Record route for count hops (IPv4-only).
    -s count       Timestamp for count hops (IPv4-only).
    -j host-list   Loose source route along host-list (IPv4-only).
    -k host-list   Strict source route along host-list (IPv4-only).
    -w timeout     Timeout in milliseconds to wait for each reply.
    -R             Use routing header to test reverse route also (IPv6-only).
                   Per RFC 5095 the use of this routing header has been
                   deprecated. Some systems may drop echo requests if
                   this header is used.
    -S srcaddr     Source address to use.
    -c compartment Routing compartment identifier.
    -p             Ping a Hyper-V Network Virtualization provider address.
    -4             Force using IPv4.
    -6             Force using IPv6.
```

Route

```
C:\Users\aksa>route

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.
  interface    the interface number for the specified route.
  METRIC       specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE. Destination or gateway can be a wildcard,
(wildcard is specified as a star '*'), or the gateway argument may be omitted.
```

```
C:\Users\aksa>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.
```

Netstat

```
C:\Users\aksa>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:5939         DESKTOP-CHDET2N:57280  ESTABLISHED
  TCP    127.0.0.1:52936        DESKTOP-CHDET2N:52937  ESTABLISHED
  TCP    127.0.0.1:52937        DESKTOP-CHDET2N:52936  ESTABLISHED
  TCP    127.0.0.1:57280        DESKTOP-CHDET2N:5939   ESTABLISHED
  TCP    127.0.0.1:62774        DESKTOP-CHDET2N:62775  ESTABLISHED
  TCP    127.0.0.1:62775        DESKTOP-CHDET2N:62774  ESTABLISHED
```

```
C:\Users\aksa>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

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

Wireless LAN adapter Local Area Connection* 1:

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

Wireless LAN adapter Local Area Connection* 2:

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

Wireless LAN adapter Wi-Fi:

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

Ethernet adapter Bluetooth Network Connection:

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

Identify and perform 5 more network commands and it's working.

PathPing

Generally speaking, the Windows 10 network command PathPing combines the ping command with the tracert information about network latency and network loss at intermediate hops between a source and destination. As you can see in
PathPing command provides more detail than either ping or tracert can provide, such as latency reports and statistics on packet loss.

```
C:\Users\aksa>pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
                [-p period] [-q num_queries] [-w timeout]
                [-4] [-6] target_name

Options:
    -g host-list     Loose source route along host-list.
    -h maximum_hops  Maximum number of hops to search for target.
    -i address       Use the specified source address.
    -n               Do not resolve addresses to hostnames.
    -p period        Wait period milliseconds between pings.
    -q num_queries   Number of queries per hop.
    -w timeout       Wait timeout milliseconds for each reply.
    -4               Force using IPv4.
    -6               Force using IPv6.
```

HostName

The Windows 10 HostName network command will simply display the current name of your Windows 10 computer. This is the name your computer uses to identify itself to the other devices and servers on your local network. You can find this name in the System information screen in the GUI, but this command is quicker.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ hostname -n
hostname: invalid option -- 'n'
Usage: hostname [-b] {hostname|-F file}         set host name (from file)
       hostname [-a|-A|-d|-f|-i|-I|-s|-y]       display formatted name
       hostname                                 display host name

       {yp,nis,}domainname {nisdomain|-F file}  set NIS domain name (from file)
       {yp,nis,}domainname                      display NIS domain name

       dnsdomainname                            display dns domain name

       hostname -V|--version|-h|--help          print info and exit

Program name:
       {yp,nis,}domainname=hostname -y
       dnsdomainname=hostname -d

Program options:
    -a, --alias            alias names
    -A, --all-fqdns        all long host names (FQDNs)
    -b, --boot             set default hostname if none available
    -d, --domain           DNS domain name
    -f, --fqdn, --long     long host name (FQDN)
    -F, --file             read host name or NIS domain name from given file
    -i, --ip-address       addresses for the host name
    -I, --all-ip-addresses all addresses for the host
    -s, --short            short host name
    -y, --yp, --nis        NIS/YP domain name
```

Arp

The Windows 10 network command Arp displays entries in the Address Resolution Protocol (ARP) cache, which contains one or more tables that are used to store IP addresses and their resolved Ethernet physical addresses. To get useful information from the Arp command you must provide a parameter. The most general parameter is /a, which displays current Arp cache tables for all interfaces.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ arp
Address                  HWtype  HWaddress           Flags Mask            Iface
10.0.2.3                 ether   52:55:0a:00:02:03   C                     ens3
10.0.2.2                 ether   52:55:0a:00:02:02   C                     ens3
```

Nbtstat

Diagnostic tool for troubleshooting netBIOS problem

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ nbstat
No command 'nbstat' found, did you mean:
 Command 'nstat' from package 'iproute2' (main)
 Command 'bnstat' from package 'pvpgn' (universe)
 Command 'fbstat' from package 'firebird2.5-super' (universe)
 Command 'fbstat' from package 'firebird2.5-classic-common' (universe)
 Command 'gbstat' from package 'gbutils' (universe)
 Command 'ibstat' from package 'infiniband-diags' (universe)
```

Getmac

Every network capable device on the internet has a unique identifying number called its MAC address. The number is assigned during manufacture and is established in the hardware of the device. Us Getmac command, a user can determine the MAC address of their various network devices. Some administrators will use the unique MAC addresses of devices to limit what can and cannot connect to a network.

```
C:\Users\aksa>getmac

Physical Address    Transport Name
=================== ==========================
30-F9-ED-D3-06-27   Media disconnected
A4-17-31-F1-DF-A7   Media disconnected
A4-17-31-F1-DF-A8   Media disconnected
```

SystemInfo

The last command on our list is the SystemInfo command, which displays a detailed list of configuration information about your Windows 10 PC. The information listed by this command is too lengthy to mention in full but includes the installed version of Windows 10, the host name, the Product ID, the type and number of CPUs, RAM configuration, network card details and installed hotfixes.

```
C:\Users\aksa>systeminfo

Host Name:                 DESKTOP-CHDET2N
OS Name:                   Microsoft Windows 10 Pro
OS Version:                10.0.19042 N/A Build 19042
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:          N/A
Registered Organization:   N/A
```

Lamp installation

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ apt update
Reading package lists... Done
W: chmod 0700 of directory /var/lib/apt/lists/partial failed - SetupAPTPartialDirectory (1: Operation not
 permitted)
E: Could not open lock file /var/lib/apt/lists/lock - open (13: Permission denied)
E: Unable to lock directory /var/lib/apt/lists/
W: Problem unlinking the file /var/cache/apt/pkgcache.bin - RemoveCaches (13: Permission denied)
W: Problem unlinking the file /var/cache/apt/srcpkgcache.bin - RemoveCaches (13: Permission denied)
```

Ansible Installation

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ansible --version
The program 'ansible' is currently not installed. You can install it by typing:
sudo apt install ansible
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo apt install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-headers-4.15.0-45 linux-headers-4.15.0-45-generic
  linux-image-4.15.0-45-generic linux-modules-4.15.0-45-generic
  linux-modules-extra-4.15.0-45-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ieee-data python-crypto python-ecdsa python-httplib2 python-jinja2
  python-markupsafe python-netaddr python-paramiko python-pkg-resources
  python-selinux python-six python-yaml
Suggested packages:
  sshpass python-crypto-dbg python-crypto-doc python-jinja2-doc ipython
  python-netaddr-docs python-setuptools
The following NEW packages will be installed:
  ansible ieee-data python-crypto python-ecdsa python-httplib2 python-jinja2
  python-markupsafe python-netaddr python-paramiko python-pkg-resources
  python-selinux python-six python-yaml
0 upgraded, 13 newly installed, 0 to remove and 395 not upgraded.
Need to get 2.969 kB of archives.
After this operation, 17,9 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://de.archive.ubuntu.com/ubuntu xenial-updates/main i386 python-crypto i386 2.6.1-6ubuntu0.16.0
```

```
  linux-modules-extra-4.15.0-45-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ieee-data python-crypto python-ecdsa python-httplib2 python-jinja2
  python-markupsafe python-netaddr python-paramiko python-pkg-resources
  python-selinux python-six python-yaml
Suggested packages:
  sshpass python-crypto-dbg python-crypto-doc python-jinja2-doc ipython
  python-netaddr-docs python-setuptools
The following NEW packages will be installed:
  ansible ieee-data python-crypto python-ecdsa python-httplib2 python-jinja2
  python-markupsafe python-netaddr python-paramiko python-pkg-resources
  python-selinux python-six python-yaml
0 upgraded, 13 newly installed, 0 to remove and 395 not upgraded.
Need to get 2.969 kB of archives.
After this operation, 17,9 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://de.archive.ubuntu.com/ubuntu xenial-updates/main i386 python-crypto i386 2.6.1-6ubuntu0.16.0
4.3 [244 kB]
Get:2 http://de.archive.ubuntu.com/ubuntu xenial/main i386 python-markupsafe i386 0.23-2build2 [15,7 kB]
Get:3 http://de.archive.ubuntu.com/ubuntu xenial-updates/main i386 python-jinja2 all 2.8-1ubuntu0.1 [106
kB]
Get:4 http://de.archive.ubuntu.com/ubuntu xenial/main i386 python-six all 1.10.0-3 [10,9 kB]
Get:5 http://de.archive.ubuntu.com/ubuntu xenial-updates/main i386 python-ecdsa all 0.13-2ubuntu0.16.04.1
 [36,2 kB]
```

Ansible Version

```
Preparing to unpack .../ansible_2.0.0.2-2ubuntu1.3_all.deb ...
Unpacking ansible (2.0.0.2-2ubuntu1.3) ...
Selecting previously unselected package python-selinux.
Preparing to unpack .../python-selinux_2.4-3build2_i386.deb ...
Unpacking python-selinux (2.4-3build2) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up python-crypto (2.6.1-6ubuntu0.16.04.3) ...
Setting up python-markupsafe (0.23-2build2) ...
Setting up python-jinja2 (2.8-1ubuntu0.1) ...
Setting up python-six (1.10.0-3) ...
Setting up python-ecdsa (0.13-2ubuntu0.16.04.1) ...
Setting up python-paramiko (1.16.0-1ubuntu0.2) ...
Setting up python-pkg-resources (20.7.0-1) ...
Setting up python-yaml (3.11-3build1) ...
Setting up python-httplib2 (0.9.1+dfsg-1) ...
Setting up ieee-data (20150531.1) ...
Setting up python-netaddr (0.7.18-1) ...
Setting up ansible (2.0.0.2-2ubuntu1.3) ...
Setting up python-selinux (2.4-3build2) ...
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ansible --version
ansible 2.0.0.2
  config file = /etc/ansible/ansible.cfg
  configured module search path = Default w/o overrides
```

Shell scripting

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

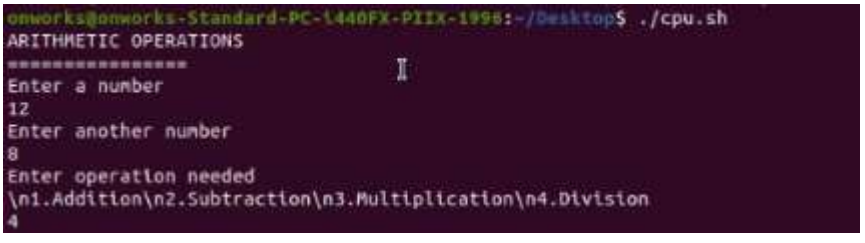
```
#!/bin/bash
echo " Enter Details and View”
echo "================="
echo Enter your Name
read name
echo Enter your College name
read college
clear
echo Details you entered
echo Name: $name
echo College: $colleg
```

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

```
#!/bin/bash
echo "Display value of a Variable "
echo "====================="
a=10
echo "$a
```

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

```
#!/bin/bash
echo "ARITHMETIC OPERATIONS"
echo "======================"
echo "Enter a number"
read a
echo "Enter another number"
read b
echo "Enter operation needed"
echo "\n1.Addition\n2.Substraction
read op
case "$op" in
"1") echo "a+b="$(($a+$b));;
"2") echo "a-b="$(($a-$b));;
"3") echo "a*b="$(($a*$b));;
"4") echo "a/b="$(($a/$b));;
esac
```



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

```
#!/bin/bash
echo "Finding a number"
echo "================"
echo "Enter a number"
read a
if [ $a == 10 ]; then
echo "Number found ;)"
else
echo "Number NOT found !"
fi
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./thread.sh
Finding a number
==============
Enter a number
5
Number found !
```

Write a shell script to display current date, calendar.

```
#!/bin/bash
echo "Time and Calendar"
echo "================"
echo "Today is $(date)"
echo""
echo "Calendar :"
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./loop.sh
Time and Calendar
=============
Today is So 3. Okt 08:34:39 CEST 2021

Calendar :
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$
```

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

```
#!/bin/bash
echo "EVEN OR ODD"
echo "==========="
echo "Enter a number"
read n
x=$(($n%2))
if [ $x -eq 0 ]; then
echo "Number is Even"
else
echo "Number is odd"
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./num.sh
EVEN OR ODD
==========
Enter a number
8
Number is Even
```

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

```
#!/bin/bash
echo "Comparing numbers"
echo "=========="
echo "Enter first number"
read a
echo "Enter second number"
read b
if [ $a -gt $b ]; then
echo "$a is greater"
elif [$b -gt $a ]; then
echo "$b is greater"
else
echo "Both are Equal"
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./ab.sh
Comparing numbers
==========
Enter first number
5
Enter second number
1
```

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

```
#!/bin/bash
echo "Sum of Numbers"
echo "========="
s=0
for (( i=1;i<=10;i++))
do
s= 'expr $s +$i'
done
echo "Sum of first 10 numbers = $s"
```

```
Sum of Numbers
==============
Sum of first 10 numbers =expr $s + $i
```

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

Open ▾ avg.sh ~/Desktop

```
#!/bin/bash
echo "AVG, SUM & Product of 4 No."
echo "---------------------------"
echo "Please enter your first number:"
read a
echo "Second number:"
read b
echo "Third number:"
read c
echo "Fourth number:"
read d


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


echo "The sum of these numbers is: "$sum
exho "The average of these numbers is: "$avg
echo "The product of these numbers is: "$prod
```

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

Open ▾ bash10.sh ~/Desktop

```
#!/bin/bash
echo "LARGEST OF THREE"
echo "----------------"
echo "Enter first number"
read a
echo "Enter second number"
read b
echo "Enter third number"
read c
if [$a -gt $b]; then
if [$a -gt $c]; then
echo "$a is big"
else
echo "$c is big"
fi
elif [$b -gt $c];then
echo " $b is big"
else
echo "$c is big
```

Write a shell program to find factorial of given number.

```
#!/bin/bash
echo "Factorial"
echo "========="
echo "Enter a number"
read num
fact=1

for((i=2;i<=num;i++))
{
fact=$((fact * i)) #fact = fact * i
}
echo "Factorial is $fact"
```

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

```
#!/bin/bash
echo "Palindrome or Not"
echo "================="
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
```

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

```
#!/bin/bash
echo "Average of N numbers"
echo "===================="
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
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./bash13.sh
Average of N numbers
====================
Enter Size
2
Enter Numbers
5
88
46.50000000000000000000
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$
```

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

```
#!/bin/bash
echo "Sun of all digits"
echo "================"
echo "Enter a number:"
read num
sum=0

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

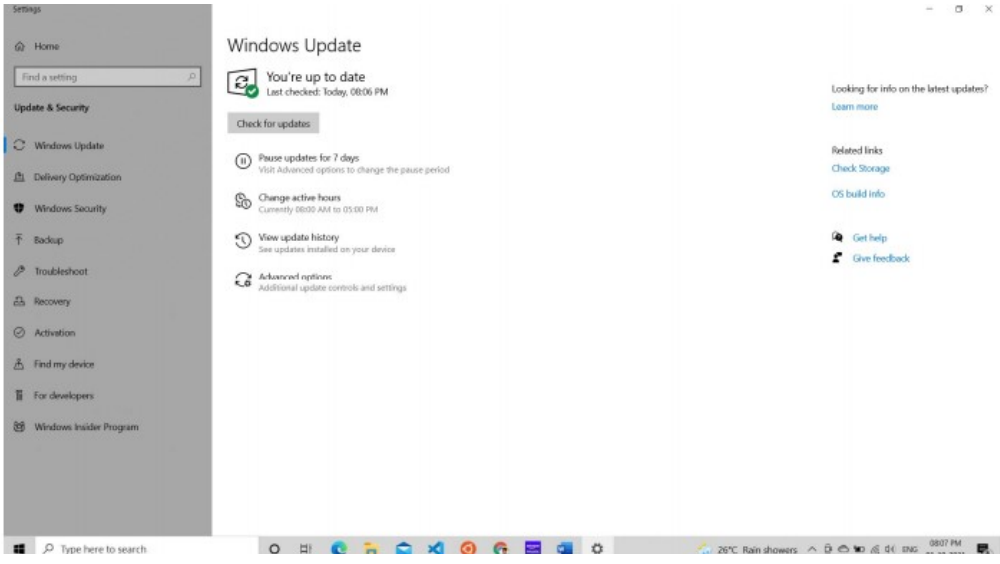
```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./bash14.sh
Sun of all digits
================
Enter a number:
7765888
```

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

```
#!/bin/bash
echo "LEAP YEAR OR NOT"
echo "================"
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
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~/Desktop$ ./bash15.sh
LEAP YEAR OR NOT
================
Enter the year
2018
./bash15.sh: line 6: expr $y % 4: command not found
./bash15.sh: line 7: expr $y % 100: command not found
./bash15.sh: line 8: expr $y % 400: command not found
./bash15.sh: line 9: [: too many arguments
2018 is not leap year
```

Installing Docker on Windows 10
First make sure Windows is up to date.
In the Windows search type "Windows Update" and select Windows Update setting
You should see a green check and “You’re up to date”. If not click “Check for updates”. You will need to repeat this process until you no longer have any updates to install.



Next install WSL2

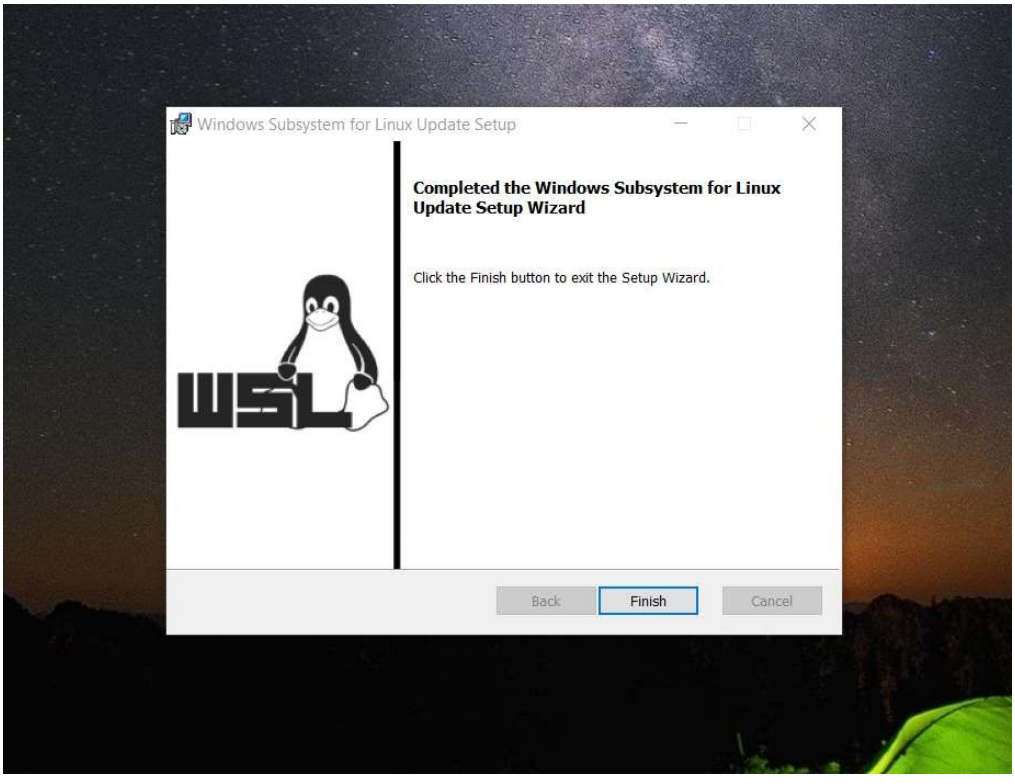
- From the Windows Search Type "powershell" then right PowerShell and then Run as administrator.
- Click `Yes' to allow PowerShell to make changes to your device.
- In the Administrator: Windows PowerShell window run (copy and past) "wsl to install Windows Services for Linux (wsl).

```
        Display usage information.
PS C:\Windows\system32> wsl --install
Installing: Virtual Machine Platform
Virtual Machine Platform has been installed.
Installing: Windows Subsystem for Linux
Windows Subsystem for Linux has been installed.
Downloading: WSL Kernel
Installing: WSL Kernel
WSL Kernel has been installed.
Downloading: Ubuntu
The requested operation is successful. Changes will not be effective until the system is rebooted.
PS C:\Windows\system32>
```

- Next enable the Virtual Machine Platform. In the Administrator: Windows Powe
rShell run (copy and past) "dism.exe /online /enable feature /featurename:VirtualMachinePlatform /all /norestart".

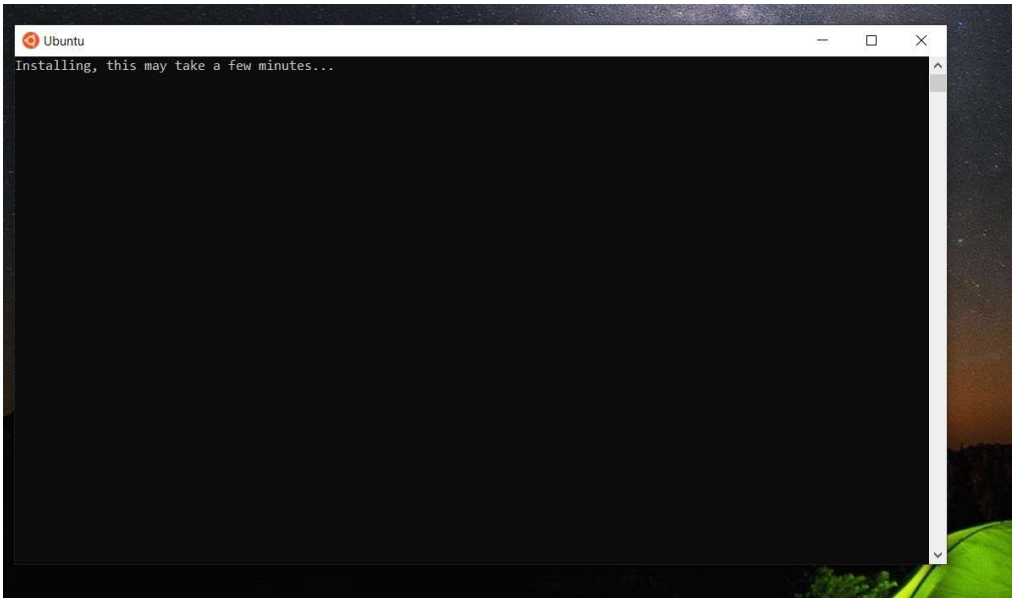
```
PS C:\Windows\system32> dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart

Deployment Image Servicing and Management tool
Version: 10.0.19041.844

Image Version: 10.0.19043.1266

Enabling feature(s)
[==========================100.0%==========================]
The operation completed successfully.
PS C:\Windows\system32>
```

Download and install the WSL2 Linux kernel update package for x64 machines.



-

set up a Linux user



```
Retype new password:
passwd: password updated successfully
Installation successful!
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.10.16.3-microsoft-standard-WSL2 x86_64)

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

  System information as of Fri Oct  1 11:50:30 IST 2021

  System load:  0.16               Processes:             8
  Usage of /:   0.4% of 250.98GB   Users logged in:       0
  Memory usage: 2%                 IPv4 address for eth0: 172.24.46.235
  Swap usage:   0%

0 updates can be installed immediately.
0 of these updates are security updates.


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


This message is shown once once a day. To disable it please create the
/home/sam/.hushlogin file.
sam@LAPTOP-2S6KTBFB:~$
```

Reboot Windows.

•

Again, from the Windows Search Type "powershell" then right Windows PowerShell and then Run as administrator.
In the PowerShell window run "**wsl --set-default-version 2”.**

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Windows\system32> wsl --set-default-version 2
For information on key differences with WSL 2 please visit https://aka.ms/wsl2
The operation completed successfully.
PS C:\Windows\system32>
```
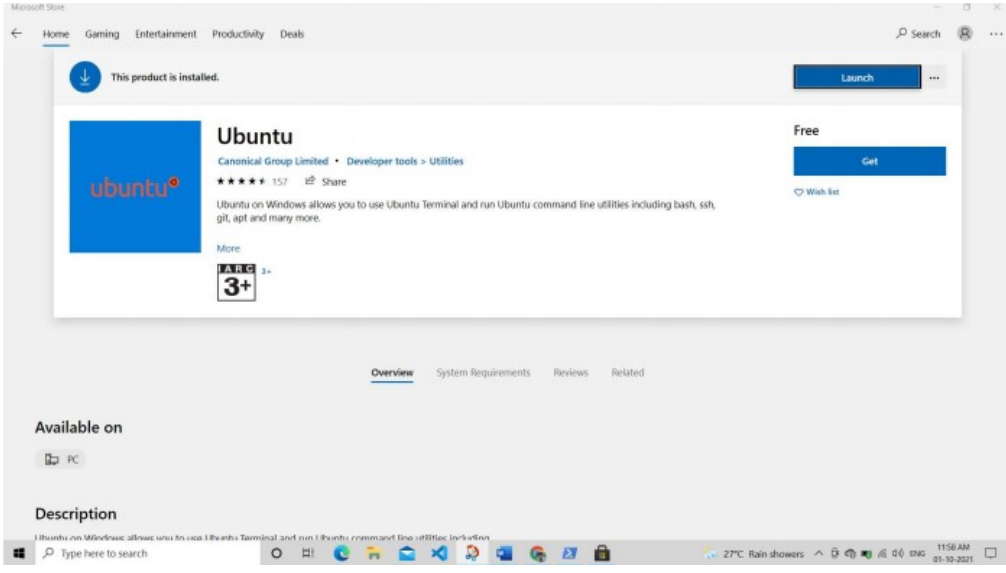
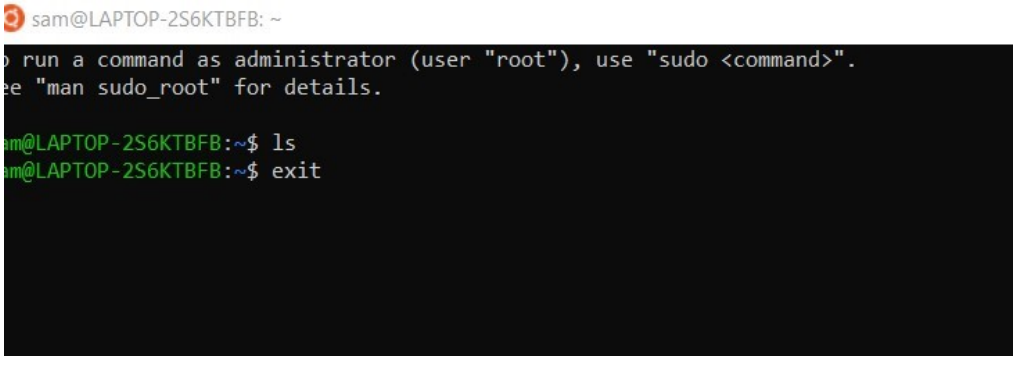

Next install a Linux distribution from the Microsoft software

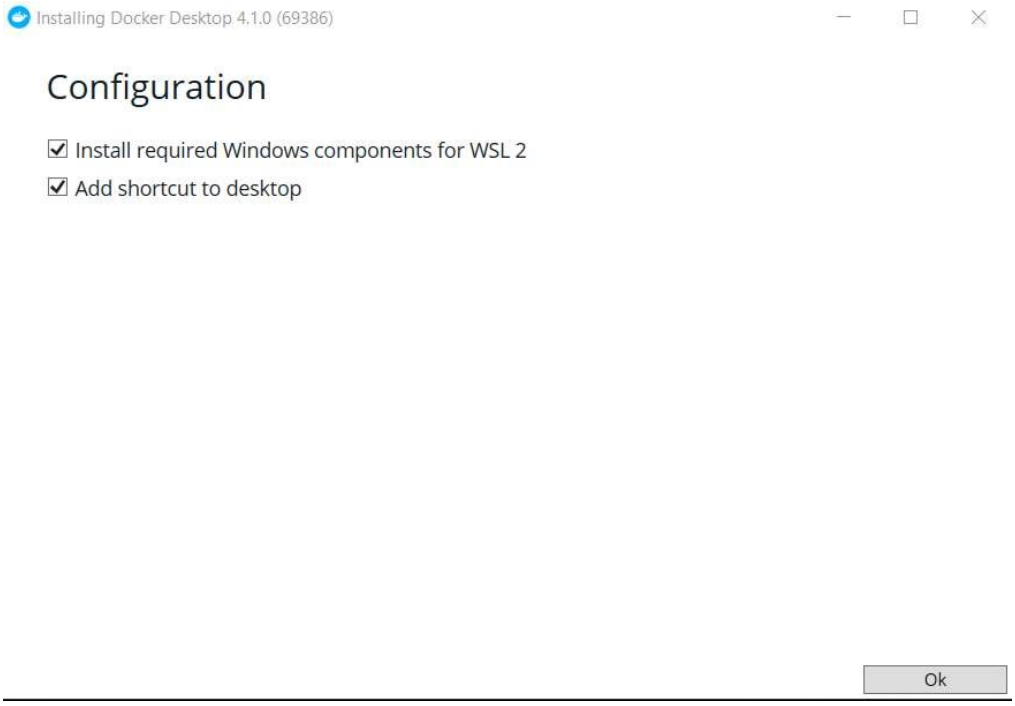


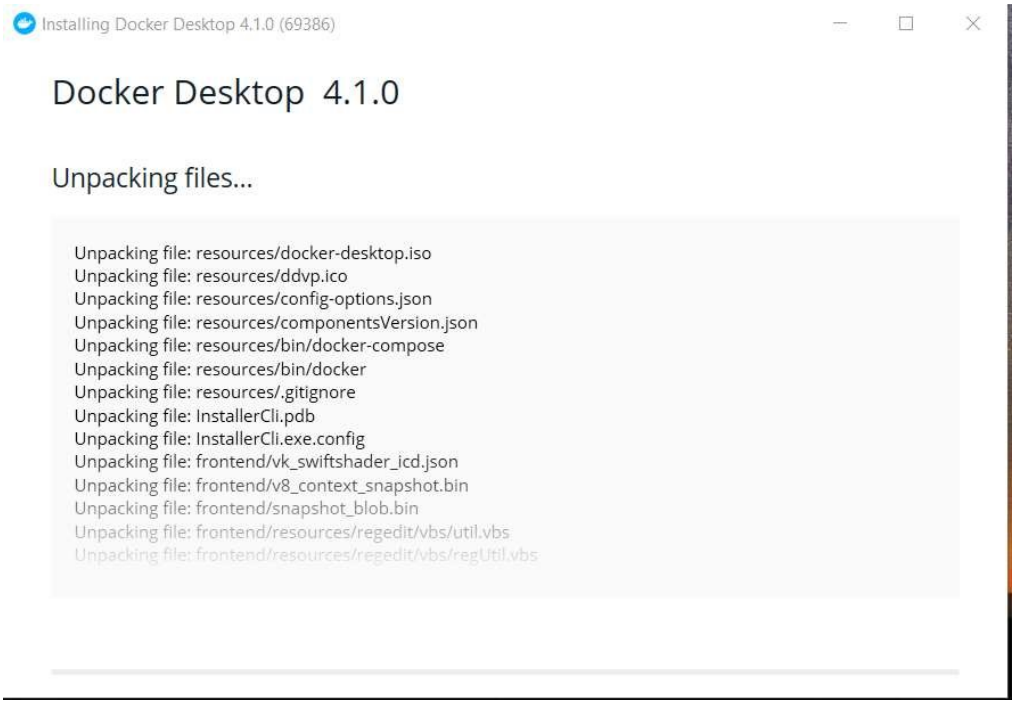
You will now be able to run Linux commands in the Ubuntu terminal window.

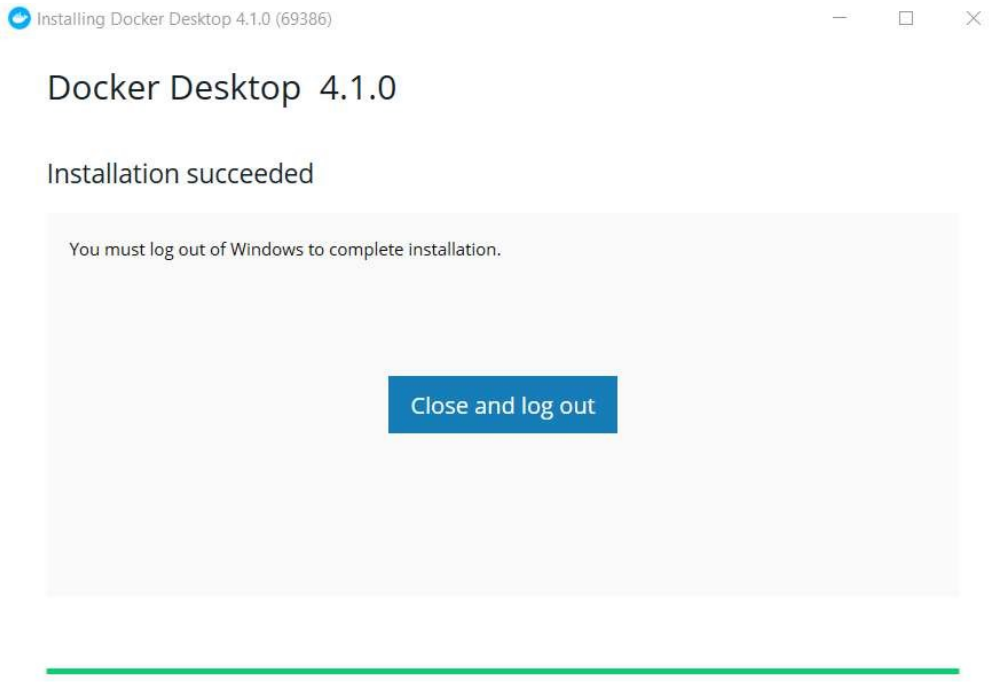


Now you can install Docker Desktop for Windows

Download the Docker Desktop for Windows installer from https://www.docker.com/products/docker-desktop
Run the installer.

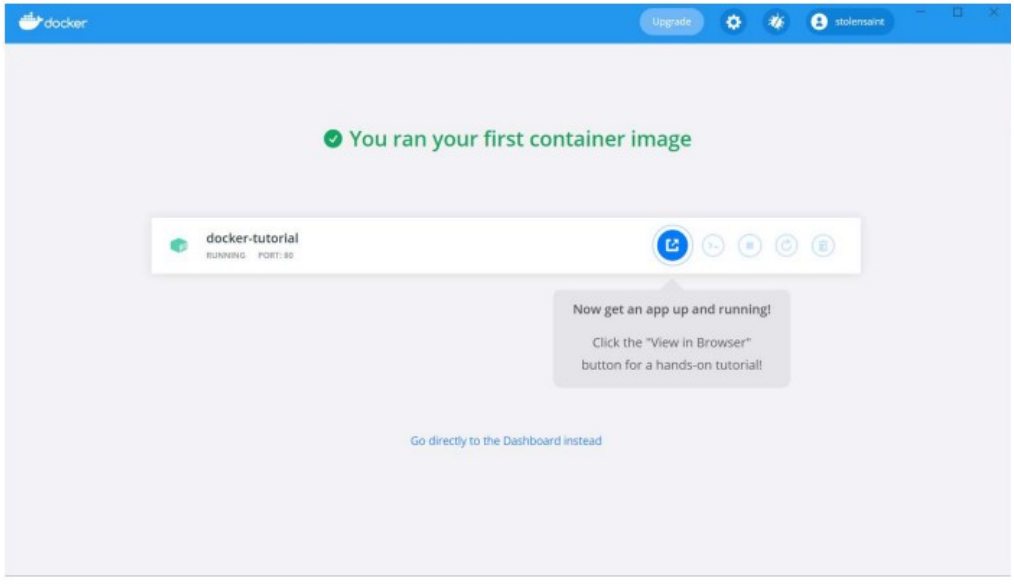


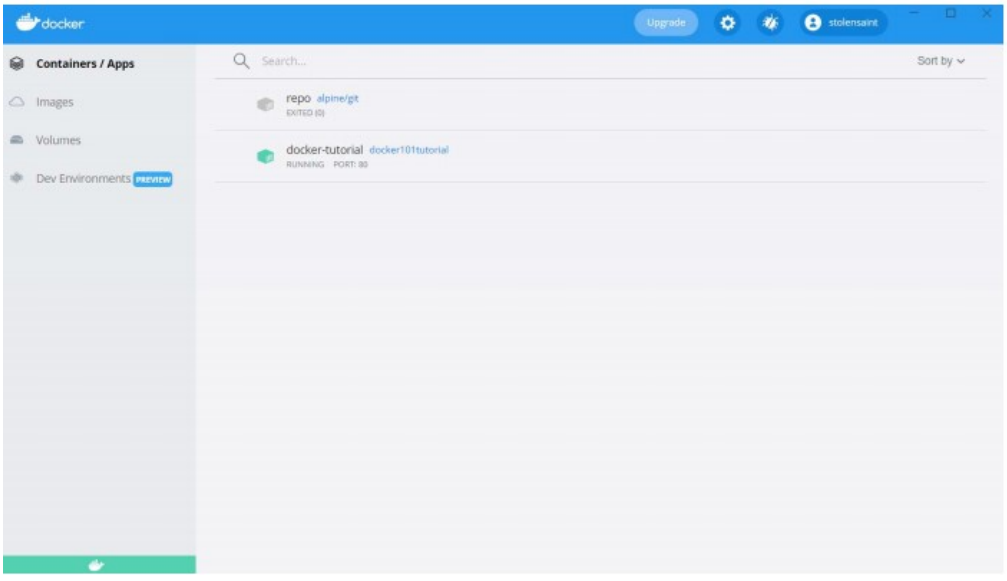




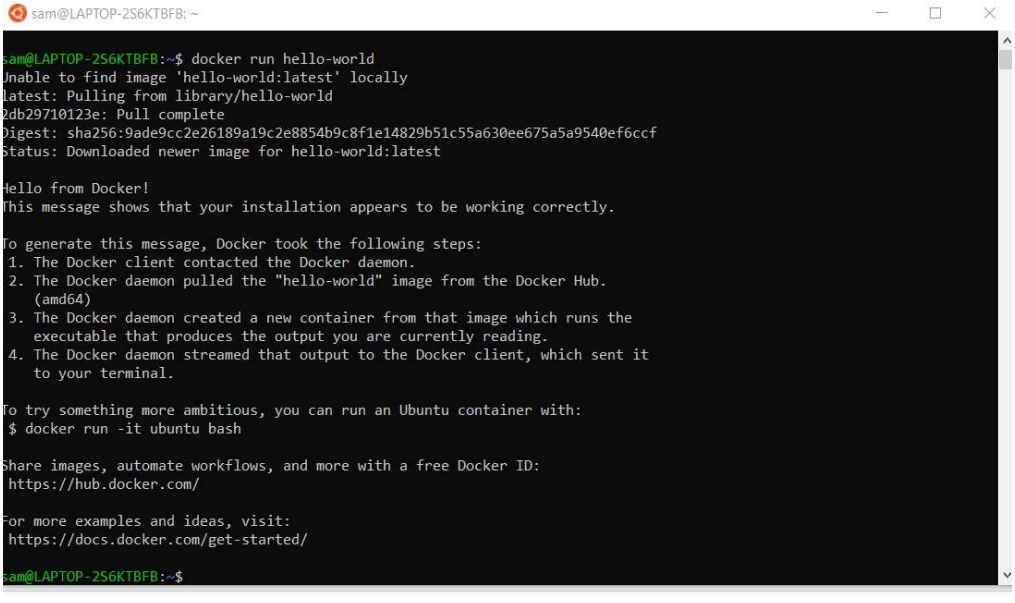
Reboot Windows.

Login to Windows and let Docker finish setting up. This can take a few minutes depending on your machine.





Run the docker "**Hello World** " from an Ubuntu Terminal run " run " **docker run hello world".**



Running the Ubuntu Machine

-

Run the command **"docker run –t -i /ubuntu/bin/bash"in powershell**

-

This is a Linux root bash

```
root@afab3919c935: /
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Windows\system32> docker run -t -i ubuntu /bin/bash
root@afab3919c935:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@afab3919c935:/# pwd
/
root@afab3919c935:/# cat >> demo.txt
Hi I'm Sam
^C
root@afab3919c935:/# cat demo.txt
Hi I'm Sam
root@afab3919c935:/# mkdir demo
root@afab3919c935:/# mv demo.txt demo
root@afab3919c935:/# cd demo
root@afab3919c935:/demo# ls
demo.txt
root@afab3919c935:/demo# rm demo.txt
root@afab3919c935:/demo# ls
root@afab3919c935:/demo# cd ..
root@afab3919c935:/# rmdir demo
root@afab3919c935:/# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@afab3919c935:/#
```
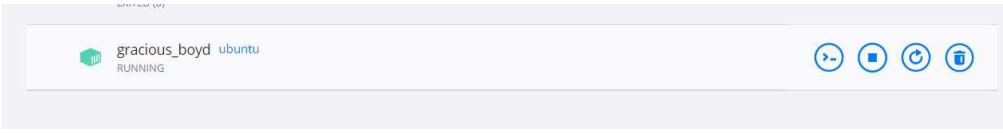
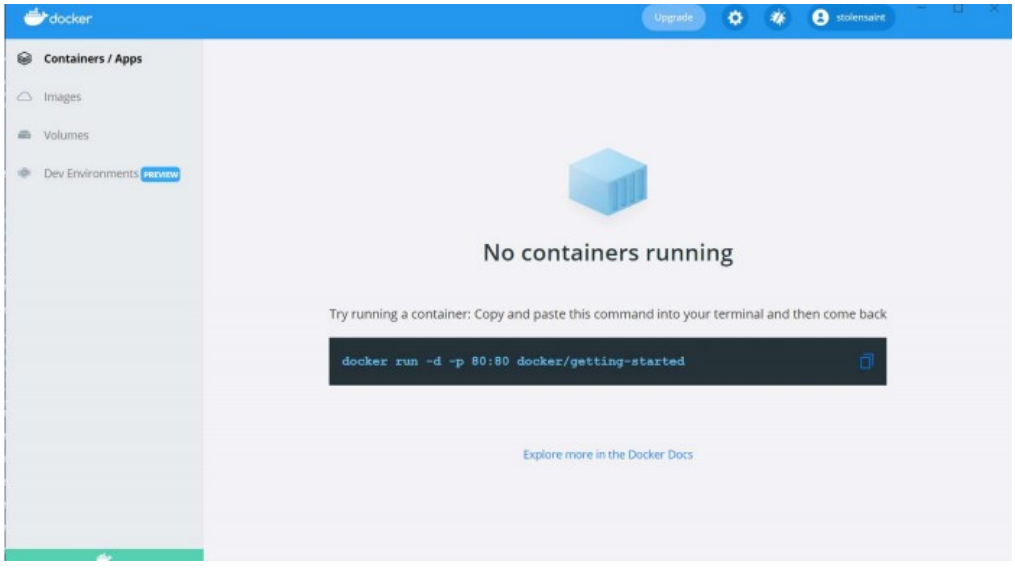

Docker GUI-Containers



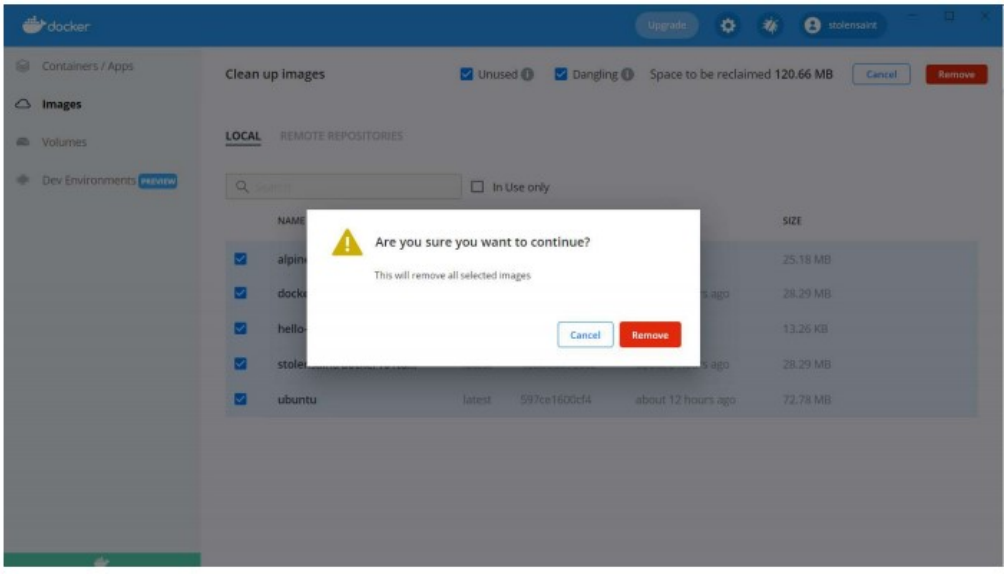
Removing All Containers

```
root@afab3919c935:/# exit
exit
PS C:\Windows\system32> docker ps -a
CONTAINER ID   IMAGE              COMMAND                  CREATED         STATUS                     PORTS     NAMESafab3919c935   ubuntu
acious_boyd
8d21c1d81c22   ubuntu:latest      "bash"                   6 hours ago     Exited (255) 8 minutes ago           busy_maxwell
1b0186a069a3   ubuntu             "bash"                   6 hours ago     Exited (0) 6 hours ago               serene_dubinsky
48ab9a4423d5   ubuntu             "bash"                   7 hours ago     Exited (0) 7 hours ago               serene_bhaskara
fd9061619454   ubuntu             "bash"                   7 hours ago     Exited (0) 7 hours ago               beautiful_tereshkova
398156a697cc   hello-world        "/hello"                 8 hours ago     Exited (0) 8 hours ago               jolly_torvalds
a7e83e3eeeda   docker101tutorial  "/docker-entrypoint.…"   8 hours ago     Exited (0) 7 hours ago               docker-tutorial
e750d0f55bb4   alpine/git         "git clone https://g…"   8 hours ago     Exited (0) 8 hours ago               repo
PS C:\Windows\system32>
```

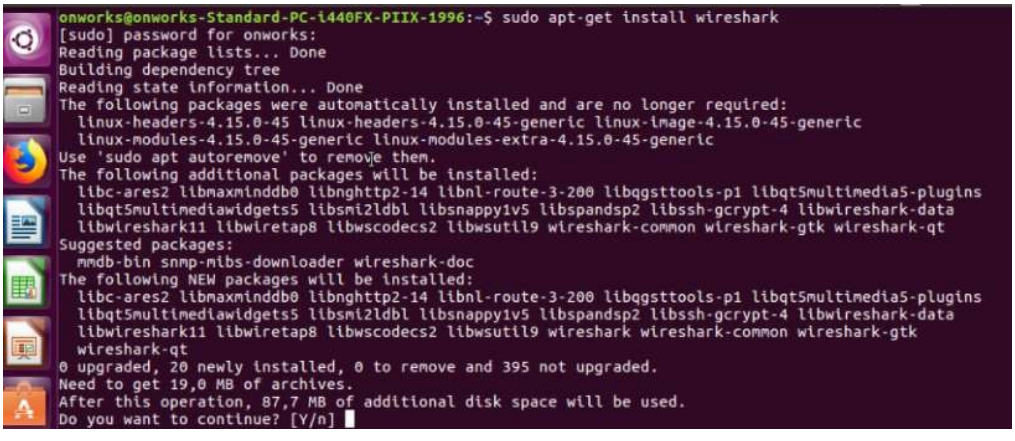
```
PS C:\Windows\system32> docker rm -f busy_maxwell
busy_maxwell
PS C:\Windows\system32> docker ps -a
CONTAINER ID   IMAGE                COMMAND                  CREATED         STATUS                     PORTS     NAMES
afab3919c935   ubuntu               "/bin/bash"              7 minutes ago   Exited (0) 2 minutes ago             gracious_boyd
1b0186a069a3   ubuntu               "bash"                   6 hours ago     Exited (0) 6 hours ago               serene_dubinsky
48ab9a4423d5   ubuntu               "bash"                   8 hours ago     Exited (0) 7 hours ago               serene_bhaskara
fd9061619454   ubuntu               "bash"                   8 hours ago     Exited (0) 7 hours ago               beautiful_tereshkova
398156a697cc   hello-world          "/hello"                 8 hours ago     Exited (0) 8 hours ago               jolly_torvalds
a7e83e3eeeda   docker101tutorial    "/docker-entrypoint.…"   8 hours ago     Exited (0) 8 hours ago               docker-tutorial
e750d0f55bb4   alpine/git           "git clone https://g…"   8 hours ago     Exited (0) 8 hours ago               repo
PS C:\Windows\system32> docker rm -f gracious_boyd
gracious_boyd
PS C:\Windows\system32> docker rm -f serene_dubinsky
serene_dubinsky
PS C:\Windows\system32> docker rm -f serene_bhaskara
serene_bhaskara
PS C:\Windows\system32> docker rm -f beautiful_tereshkova
beautiful_tereshkova
PS C:\Windows\system32> docker rm -f jolly_torvalds
jolly_torvalds
PS C:\Windows\system32> docker rm -f docker-tutorial
docker-tutorial
PS C:\Windows\system32> docker rm -f  repo
repo
PS C:\Windows\system32> docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
PS C:\Windows\system32>
```



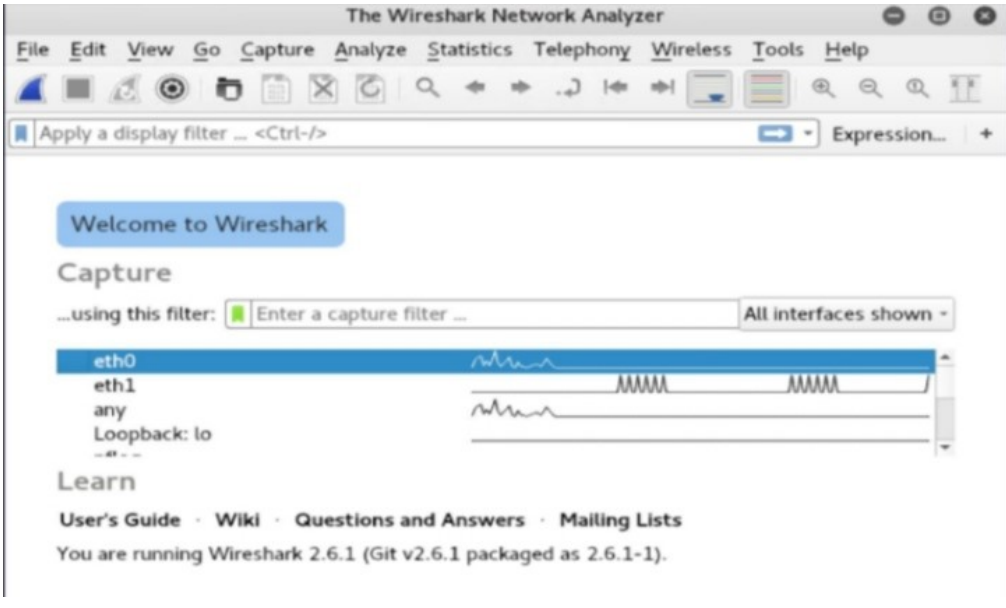
Cleaning Up Images

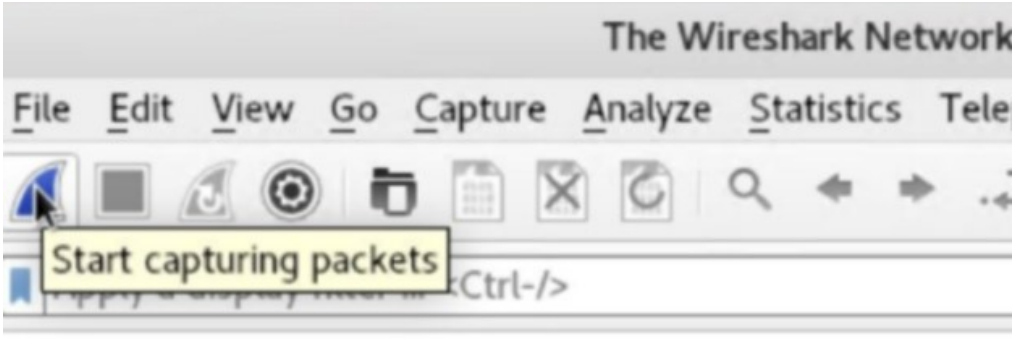


Analyzing network packet stream using wireshark. Perform basic network service tests using nc.



```
After this operation, 160 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Err:1 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libdouble-conversion3 amd64 3.1.5-2
  404  Not Found [IP: 141.30.62.22 80]
Err:2 http://de.archive.ubuntu.com/ubuntu eoan/main amd64 libpcre2-16-0 amd64 10.32-5
  404  Not Found [IP: 141.30.62.22 80]
Err:3 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5core5a amd64 5.12.4+dfsg-4ubuntu1
  404  Not Found [IP: 141.30.62.22 80]
Err:4 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5dbus5 amd64 5.12.4+dfsg-4ubuntu1
  404  Not Found [IP: 141.30.62.22 80]
Err:5 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5network5 amd64 5.12.4+dfsg-4ubuntu1
  404  Not Found [IP: 141.30.62.22 80]
Err:6 http://de.archive.ubuntu.com/ubuntu eoan/main amd64 libxcb-xinerama0 amd64 1.13.1-2
  404  Not Found [IP: 141.30.62.22 80]
Err:7 http://de.archive.ubuntu.com/ubuntu eoan/main amd64 libxcb-xinput0 amd64 1.13.1-2
  404  Not Found [IP: 141.30.62.22 80]
Err:8 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5gui5 amd64 5.12.4+dfsg-4ubuntu1
  404  Not Found [IP: 141.30.62.22 80]
Err:9 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5widgets5 amd64 5.12.4+dfsg-4ubuntu1
  404  Not Found [IP: 141.30.62.22 80]
Err:10 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5svg5 amd64 5.12.4-1
  404  Not Found [IP: 141.30.62.22 80]
Err:11 http://de.archive.ubuntu.com/ubuntu eoan/main amd64 liblua5.2-0 amd64 5.2.4-1.1build2
  404  Not Found [IP: 141.30.62.22 80]
Err:12 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libmaxminddb0 amd64 1.3.2-1
  404  Not Found [IP: 141.30.62.22 80]
Err:13 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5multimedia5 amd64 5.12.4-1
  404  Not Found [IP: 141.30.62.22 80]
Err:14 http://de.archive.ubuntu.com/ubuntu eoan/universe amd64 libqt5opengl5 amd64 5.12.4+dfsg-4ubuntu1
```





Welcome to Wireshark