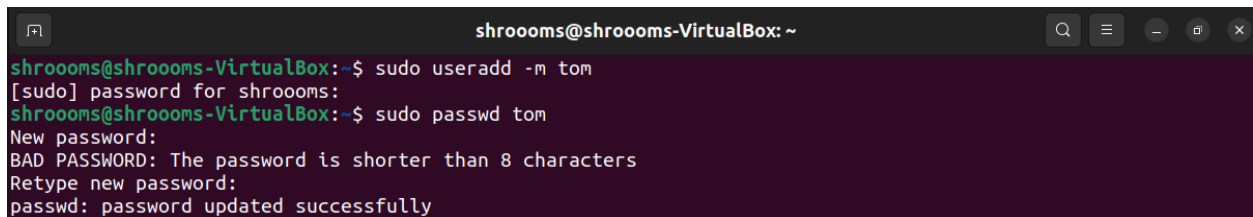# Assignment 3 - Sharams Kunwar - Creating Users and Managing Privileges

Hands-on

Step 1:

User tom was created. User tom required to have home directory.
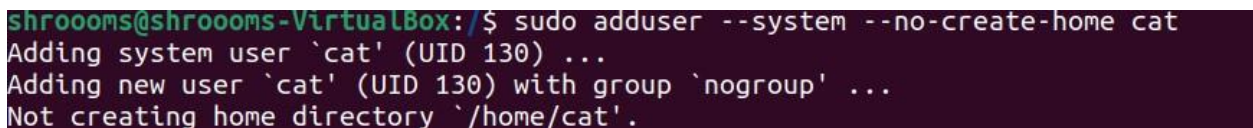
Screenshot:

Command: sudo useraddd -m tom

Step 2:

User cat was created. User cat required to have no home directory.

Screenshot:

Command: sudo adduser –system –no-create-home cat

Step 3:

User tom was added to sudo group. Sudo group is a group of superusers who can execute root commands and have elevated privileges than normal users.

Screenshot:

Command: sudo adduser tom sudo

Step 4:

Verification that the user 'tom' was in sudo group was done using command 'getent'. It can alternatively be done using user id.


```
shroooms@shroooms-VirtualBox:~$ getent group sudo
sudo:x:27:shroooms,tom
shroooms@shroooms-VirtualBox:~$
```



```
shroooms@shroooms-VirtualBox:~$ su tom
Password:
$ whoami
tom
$ sudo apt update
[sudo] password for tom:
Hit:1 http://np.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:3 http://np.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [802 kB]
Get:5 http://np.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:6 http://np.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [493 kB]
Get:7 http://security.ubuntu.com/ubuntu jammy-security/main i386 Packages [328 kB]
Get:8 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [169 kB]
Get:9 http://np.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1,011 kB]
Get:10 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [43.0 kB]
Get:11 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [11.3 kB]
Get:12 http://security.ubuntu.com/ubuntu jammy-security/universe i386 Packages [557 kB]
Get:13 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [783 kB]
Get:14 http://np.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [227 kB]
Get:15 http://np.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [101 kB]
Get:16 http://np.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [15.6 kB]
Get:17 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe i386 Packages [655 kB]
Get:18 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [984 kB]
Get:19 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [215 kB]
Get:20 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 DEP-11 Metadata [289 kB]
Get:21 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 DEP-11 Metadata [40.1 kB]
Get:22 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [21.8 kB]
Get:23 http://np.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 DEP-11 Metadata [940 B]
Get:24 http://np.archive.ubuntu.com/ubuntu jammy-backports/main amd64 DEP-11 Metadata [4,908 B]
Get:25 http://np.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 DEP-11 Metadata [17.7 kB]
Fetched 7,106 kB in 7s (1,062 kB/s)
Reading package lists... Done
```

Command: getent group sudo

Command: sudo apt update

Result: command was executed as 'tom' has sudo privileges

Step 5:

Verification that only user 'tom' had sudo privileges and not the user 'cat'.

Screenshot:

```
shrooooms@shrooooms-VirtualBox:~$ su cat
Password:
$ whoami
cat
$ sudo apt update
[sudo] password for cat:
cat is not in the sudoers file.  This incident will be reported.
$
```

Command: sudo apt update

Result: command was not executed as 'cat' doesn't have sudo privileges.

Step 6:

A file named 'test.txt' was created by user 'tom'. 'tom' can read and write the file.

Screenshot:

```
$ sudo touch test.txt
$ sudo ls
Desktop     Downloads  Pictures       Public  Templates  test.yaml
Documents  Music       privilege.txt  snap    test.txt   Videos
$ sudo ls -al test.txt
-rw-r--r-- 1 root root 0 सितम्बर 21 08:55 test.txt
$ sudo echo "there is read and write permission for owner, read only for groups and other"
there is read and write permission for owner, read only for groups and other
$ whoami
tom
```

Command: sudo touch test.txt

Step 6:

We want 'cat' to be able to write in the file, but it can't have sudo privileges. Hence, a separate group named 'writeprivileges' was created, and user 'cat' was added to the group. Then, the ownership of the file was transferred to the group using 'chown' command. Also, ist permissions were edited using 'chmod' command.

Screenshot:

```
$ whoami
tom
$ sudo groupadd writeprivileges
$ sudo usermod -a -G writeprivileges cat
$ sudo cat /etc/passwd | grep cat
cat:x:1002:1002::/home/cat:/bin/sh
$ sudo getent group writeprivileges
writeprivileges:x:1003:cat
Help   chown :writeprivileges test.txt
     ls -al test.txt
-rw-r--rw- 1 root writeprivileges 0 सितम्बर 21 08:55 test.txt
$
```

```
$ whoami
tom
$ sudo chmod 664 test.txt
$ ls -al test.txt
ls: cannot access 'test.txt': Permission denied
$ sudo ls -al test.txt
-rw-rw-r-- 1 root writeprivileges 0 सितम्बर 21 08:55 test.txt
$
```

Commands:

Whoami = to know which user is logged in

Sudo groupadd writeprivileges = creating gorup

Sudo usermod -a -G writeprivileges cat = adding cat to the group

Sudo getent group writeprivileges = to verify the adding

Sudo chown :writeprivileges test.txt = transferring ownership from tom to the created group

Step 7:

On trying to access the directory home/tom, the process couldn't be executed.

Screenshot:

```
shroooms@shroooms-VirtualBox:~$ su cat
Password:
$ cd home/tom
sh: 1: cd: can't cd to home/tom
$ cd home/tom/
sh: 2: cd: can't cd to home/tom/
$
```

Step 8:

Ownership of the directory was transferred to the group as well. So, that the file could be accessed by user 'cat'.

Screenshot:

```
$ ls -ald /home/tom
drwxrw---- 2 tom tom 4096 सितम्बर 21 08:52 /home/tom
$ sudo chown :writeprivileges /home/tom
$ ls -ald /home/tom
drwxrw---- 2 tom writeprivileges 4096 सितम्बर 21 08:52 /home/tom
$
```

Command:

Sudo chown :writeprivileges /home/tom = transferring ownership

Step 9:

Also, permission to execute was given to the group.

Screenshot:

```
$ ls -ald /home/tom
drwxrw---- 3 tom writeprivileges 4096 सितम्बर 21 09:52 /home/tom
$ chmod 770 /home/tom
$ ls -ald /home/tom
drwxrwx--- 3 tom writeprivileges 4096 सितम्बर 21 09:52 /home/tom
$
```

Command:

Chmod 770 /home/tom

Step 10:

The file was finally editable by the user 'cat'.
Screenshot:

```
$ whoami
cat
$ ls
test.txt
$ cat>test.txt
hi
^C
$ cat test.txt
hi
$
```

Command:

Cat>test.text

Key Concepts:

1. Difference between dpkg and apt

dpkg	apt
We cannot download Dpkg Packages from external repositories.	We can download APT Packages from external repositories.
Dpkg can't resolve dependencies. It terminates and reports missing dependencies.	Apt can resolve dependencies. It doesn't terminate and downloads the dependencies too.
It doesn't support remote package installation.	Apt supports remote package installation.
When removing the packages: Dpkg -r <package> removes only the packages.	When removing packages, Apt-get remove –purge <package> bremoves package and other dependencies as well

2. Difference between yum vs rpm

YUM	RPM
Is a user-friendly interface to manage packages.	It requires users to use specific commands to manage packages.

It can find and install all required dependencies, even if the packages aren't available in same repo.	It can resolve dependencies within same package only.
YUM supports remote package installation.	RPM packages shall be manually downloaded and installed.
It has plugin support like caching, bandwidth limiting and package signing.	It has no support for plugins.

3. Bash

   Bash is a command-line shell and scripting language used in Unix and Unix-like operating systems. Bash provides a command-line interface (CLI) for users to interact with the operating system by typing commands. It also functions as a scripting language, allowing users to write scripts to automate tasks and perform system administration tasks.

   Bash allows customization by defining aliases, setting environment variables, and creating custom functions. Bash supports job control, allowing users to run processes in the background and manage running processes. It supports the use of pipes to chain multiple commands, enabling complex data processing. Also, redirection is made possible using pipes to chain multiple commands, enabling complex data processing. Bash scripts can create conditional statements and loops for decision-making and repetitive tasks. Script execution is done using the ".sh" extension, and Bash provided shell environment.