Users and Groups

sudo command

What is sudo?

The sudo (superuser do) command gives some admin privileges to non-admin users

- When you put sudo in front of any command in terminal, that command runs with elevated privileges, which is why it's the solution to privilege-related errors.

```
user@clarusway:~/Downloads$ dpkg -i virtualbox.deb
dpkg: error: requested operation requires superuser privilige
```

```
user@clarusway:~/Downloads$ sudo dpkg -i virtualbox.deb
[sudo] password for user:
(Reading database ...20545 files an directories currently installed.)
Preparing to unpack virtualbox.deb ...
```

Tips:

- If you're not sure if you're using sudo or su, look at the trailing character on the command line. If it's a pound sign (#), you're logged in as root.
- Use the su command to switch to the superuser (root), or you can use the sudo command instead.

Using `sudo`

Commands	Meaning
sudo -l	List available commands.
sudo command	Run command as root.
sudo -u root command	Run command as root.
sudo -u user command	Run command as user.
sudo su	Switch to the superuser account.
sudo su -	Switch to the superuser account with root's environment.
sudo su - username	Switch to the username's account with the username's environment.
sudo -s	Start a shell as root
sudo -u root -s	Same as above.
sudo -u user -s	Start a shell as user.

> Q: What does sudo mean?
> A: sudo is an abbreviation of "**su**per user **do**" and is a Linux command that allows programs to be executed as a super user (aka root user)
>
> — - Interview Q&A

Basic User Commands

1. whoami

Your username is indicated by the `whoami` command.

```
clarusway@DESKTOP-UN6T2ES:~$ whoami
clarusway
clarusway@DESKTOP-UN6T2ES:~$
```

2. who

The `who` command will provide you with details about who is logged on the system.

```
clarusway@DESKTOP-UN6T2ES:~$ who
root pts/0 2019-11-10 23:07 (10.104.33.101)
james pts/1 2019-11-10 23:30 (10.104.33.101)
john pts/2 2019-11-10 23:34 (10.104.33.96)
clarusway pts/3 2019-11-10 23:39 (10.104.33.91)
clarusway@DESKTOP-UN6T2ES:~$
```

3. who am i

`who am i` the who command will only show the line that points to your current session.

```
clarusway@DESKTOP-UN6T2ES:~$ who am i
clarusway pts/1 2019-11-10 14:30 (10.104.33.101)
clarusway@DESKTOP-UN6T2ES:~$
```

4. w

The `w` command will inform you who is logged on and what they are doing.

```
clarusway@DESKTOP-UN6T2ES:~$ w
 14:22:38 up  1:52,  0 users,  load average: 0.52, 0.58, 0.59
USER TTY LOGIN@ IDLE JCPU PCPU WHAT
root pts/0 14:07 15.00s 0.01s 0.01s top
clarusway@DESKTOP-UN6T2ES:~$
```

5. id

The `id` command will provide your user id, your primary group id, and a list of the groups you belong to.

```
clarusway@DESKTOP-UN6T2ES:~$ id
uid=1000(clarusway) gid=1000(clarusway) groups=1000(clarusway)
clarusway@DESKTOP-UN6T2ES:~$
```

6. su

The `su` command enables a shell to be run as another user.

```
clarusway@DESKTOP-UN6T2ES:/$ su john
Password:
john@DESKTOP-UN6T2ES:/$
```

7. su -

The `su` command retains the same shell environment by default. To become another user and also get the environment of the target user, issue the `su -` command followed by the target username.

```
root@DESKTOP-UN6T2ES:/# su john
john@DESKTOP-UN6T2ES:/$ exit
exit
root@DESKTOP-UN6T2ES:/# su - john
john@DESKTOP-UN6T2ES:~$ pwd
/home/john
john@DESKTOP-UN6T2ES:~$
```

8. su -

If `su` or `su -` is not provided with a username, the command assumes that root is the target.

```
root@DESKTOP-UN6T2ES:/# su -
Password:
root@DESKTOP-UN6T2ES:~#
```

9. sudo su

The root user does not have a password set on some Linux systems like Ubuntu and Xubuntu. On these Linux systems, You can become root user via `sudo su` command.

```
clarusway@DESKTOP-UN6T2ES:~$ sudo su
[sudo] password for clarusway:
root@DESKTOP-UN6T2ES:/home/clarusway#
```

User management

Linux is a multiuser operating system. In a multiuser environment, it is a common administration task to create new users, modify existing users, or remove users. For ease of access management, users are assigned to groups. Creating, deleting, and modifying groups is also another common administration task.

1. /etc/passwd

On Linux, the local user database is /etc/passwd.

```
clarusway@DESKTOP-UN6T2ES:~$ tail -5 /etc/passwd
clarusway:x:1000:1000:,,,:/home/clarusway:/bin/bash
james:x:1001:1001::/home/james:/bin/sh
john:x:1002:1005:john,room,work,home,other:/home/john:/bin/bash
oliver:x:1003:1005:oliver,room_1,work_1,home_1:/home/oliver:/bin/bash
aaron:x:1004:1006:aaron,room_2,work_2,home_2:/home/aaron:/bin/bash
clarusway@DESKTOP-UN6T2ES:~$
```

This file comprises seven columns separated by a colon, as you can see. These are:

- username
- optional encrypted password
- numerical user ID
- numerical group ID
- the primary group id
- a description
- the name of the home directory
- the login shell

2. root

The most powerful account on your Linux system is the root user also called the superuser. This user is capable of doing almost everything, even creating other users. The userid of the root user is always 0.

```
root@DESKTOP-UN6T2ES:~# id
uid=0(root) gid=0(root) groups=0(root)
root@DESKTOP-UN6T2ES:~#
```

3. useradd

`useradd` command is used for creating a new user. The following example shows how to add a user.

```
root@DESKTOP-UN6T2ES:~# useradd -m -d /home/walter -c "walter clarus" walter
root@DESKTOP-UN6T2ES:~# tail -1 /etc/passwd
walter:x:1004:1004:walter clarus:/home/walter:/bin/sh
```

- -m is used for forcing the creation of the home directory
- -d is used for setting the name of the home directory
- -c is used for setting a description

4. adduser

`adduser` is not a standard Linux command. It's basically a Perl script that uses the useradd command in the background. This is more effective at creating new users on Linux. Default parameters can also be set for all new users through the adduser command. You can walk through a series of questions by calling adduser with just a username.

```
root@DESKTOP-UN6T2ES:~# adduser aaron
Adding user `aaron' ...
Adding new group `aaron' (1001) ...
Adding new user `aaron' (1001) with group `aaron' ...
Creating home directory `/home/aaron' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for aaron
Enter the new value, or press ENTER for the default
        Full Name []: aaron
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] y
root@DESKTOP-UN6T2ES:~#
```

Using the `useradd` command, the command will look similar to this to produce almost the same result:

```
root@DESKTOP-UN6T2ES:~# useradd -d /home/aaron -m -s/bin/bash -c aaron, Work Phone
    ,Work Phone,OtherInfo aaron && passwd aaron
```

5. userdel

You can delete a user with `userdel` command. `userdel` command will not remove the user's home directory from the file system. If you want to remove the home directory, you need to use the `-r` in the command line.

```
root@DESKTOP-UN6T2ES:~# userdel -r james
```

6. usermod

With the `usermod` command, you can modify a user's properties. This example uses usermod to modify the description of the user walter.

```
root@DESKTOP-UN6T2ES:~# tail -1 /etc/passwd
walter:x:1004:1004:walter clarus:/home/walter:/bin/sh
root@DESKTOP-UN6T2ES:~# usermod -c 'aws solution architect' walter
root@DESKTOP-UN6T2ES:~# tail -1 /etc/passwd
walter:x:1004:1004:aws solution architect:/home/walter:/bin/sh
root@DESKTOP-UN6T2ES:~#
```

User Passwords

1. passwd

User passwords can be set with the `passwd` command. Before entering the new one, users will have to provide their old password.

```
oliver@DESKTOP-UN6T2ES:~$ passwd
Changing password for oliver.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
Bad: new password is too simple
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
oliver@DESKTOP-UN6T2ES:~$
```

As you see above, the passwd tool does some basic authentication to prevent users from using too simple passwords. But, the root user is not expected to follow these rules. The root user is also not required to provide the old password before entering the new password.

```
root@DESKTOP-UN6T2ES:~# passwd john
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@DESKTOP-UN6T2ES:~#
```

2. shadow file

User passwords are encrypted and stored in /etc / shadow file. The /etc/shadow file is only read and can be accessed by root only.

```
clarusway@DESKTOP-UN6T2ES:~$ tail -4 /etc/shadow
tail: cannot open '/etc/shadow' for reading: Permission denied
clarusway@DESKTOP-UN6T2ES:~$ sudo su -
root@DESKTOP-UN6T2ES:~# tail -4 /etc/shadow
clarusway:$6$c2IXDMI2$B9GPOjcYyGLctUmTDP7tfNEBIXGo2YAUF
    /Y5NNIDkumJuP5uyxW1xHDMobWPFx0wfOh1C4iBj9PvP4XnP/Uv10:18323:0:99999:7:::
john:$6$ITd.yBmK$MxMz9wm7.lDxdQx7At.0VB6chlXU22BMXhTbPkWjdk0B
    .SmnwjYR922DmCeAzP8WFyIhGoHPl0Dqt6MO7rxON0:18333:0:99999:7:::
oliver:$6$tTRbLfc5$jlNMBc9tvBotwCtFMt0Qq2K0nbQW2zBv/zwufBwOnhUs7UMoczD.m
    /5Tnz1uCKymhISOSzZbdSCRKkLF.wSD00:18333:0:99999:7:::
walter:$6$aMR4T5iB$7ZJzvy2VCEaOnPZIbaofUSLQp.aeIOCZgDeNug5hWcIkSnAjA6n6V
    .tR3IAJY5IScImcnl5K/ZMFug1D2gK6L/:18333:0:99999:7:::
root@DESKTOP-UN6T2ES:~#
```

The /etc/shadow file has nine colon separated columns. The nine fields are (from left to right):

- The user name,
- The encrypted password,
- The day the password was last changed (day 1 is January 1, 1970),
- number of days the password must be left unchanged,
- password expiry day,
- warning number of days before password expiry,
- number of days after expiry before disabling the account,
- the day the account was disabled (again, since 1970)
- Reserve field

3. /etc/login.defs

The /etc/login.defs file includes some default user password settings, such as password aging and length settings.

```
clarusway@DESKTOP-UN6T2ES:~$ grep ^PASS /etc/login.defs
PASS_MAX_DAYS   99999
PASS_MIN_DAYS   0
PASS_WARN_AGE   7
clarusway@DESKTOP-UN6T2ES:~$
```

Group Management

Groups are a collection of users. Assigning users to groups makes it easier to manage permissions. For example, you can set permissions to ensure that files are accessible to people in a particular group like accounts, etc.

1. groupadd

`groupadd` command is used to create a new group.

```
root@DESKTOP-UN6T2ES:~# groupadd linux
root@DESKTOP-UN6T2ES:~# groupadd aws
root@DESKTOP-UN6T2ES:~# groupadd python
```

2. usermod

You can change group membership with the useradd or usermod command.

```
root@DESKTOP-UN6T2ES:~# usermod -a -G linux james
root@DESKTOP-UN6T2ES:~# usermod -a -G linux aaron
```

- Be careful when using usermod to add users to groups.
- By default, if the group is not specified in the command, the usermod command will remove the user from any group he/she is a member of!
- Using the -a (append) option prevents this behaviour.

3. Group File

Users can belong to several groups. Group membership is specified via the /etc/group file.

```
root@DESKTOP-UN6T2ES:/home/clarusway# tail -3 /etc/group
linux:x:1006:john,james,aaron
aws:x:1007:walter
python:x:1008:oliver
root@DESKTOP-UN6T2ES:/home/clarusway#
```

- The first field is the group's name.
- The second field is the group's encrypted password.
- The third field is the group identification or GID (Group Identifier).
- The fourth field is the list of members.

4. groups

`groups` command is used to display a list of groups to which the user belongs.

```
john@DESKTOP-UN6T2ES:~$ groups
john linux
john@DESKTOP-UN6T2ES:~$
```

5. groupmod

`groupmod` command can be used to change the group name.

```
root@DESKTOP-UN6T2ES:~# groupmod -n ubuntu linux
root@DESKTOP-UN6T2ES:~# tail -3 /etc/group
aws:x:1007:walter
python:x:1008:oliver
ubuntu:x:1006:john,james,aaron
root@DESKTOP-UN6T2ES:~#
```

6. groupdel

`groupdel` command is used to delete a group.

```
root@DESKTOP-UN6T2ES:~# groupdel ubuntu
root@DESKTOP-UN6T2ES:~#
```

7. gpasswd

With the gpasswd command, we can add a user to a group and to remove a user from a group. In the example below:

- We add john to aws group with `gpasswd -a` command.
- We remove walter from aws group with `gpasswd -d` command.

```
root@DESKTOP-UN6T2ES:~# gpasswd -a john aws
Adding user john to group aws
root@DESKTOP-UN6T2ES:~# gpasswd -d walter aws
Removing user walter from group aws
root@DESKTOP-UN6T2ES:~#
```

> Q: how do you add a user to the sudo group
> A: I should follow these steps:
>
> - Log in to computer or server as the **root user**.
> - Use the **adduser** command to add a new user to system. (#adduser username)
> - Use the **usermod** command to add the user to the sudo group. (#usermod -aG sudo username)
> - Test sudo access on new user account. (# su - username)
>
> — - Interview Q&A