Operating Systems

Lab 05

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User Management

- As the administrator, it is your job to create and manage the accounts for all required users.
- Since Linux is a multi-user operating system, several people may be logged in and actively working on a given machine at the same time.
  - For security purposes, it is never a good idea to allow users to share the credentials of the same account.
- We will use:
  - $useradd\ /\ adduser$
  - $userdel$
  - $usermod$
  - $groupadd$

User Management

$useradd$ - add a user to the system.

- User accounts are stored in the $/etc/passwd$ file.

```
lvl3@lvl3-vm:~/Desktop$ useradd omar
useradd: Permission denied.
useradd: cannot lock /etc/passwd; try again later.
```

  - The command requires root permissions

```
lvl3@lvl3-vm:~/Desktop$ sudo useradd omar
[sudo] password for lvl3:
```

User Management

$useradd$ - add a user to the system.

- You can see the account created in the $passwd$ file

```
lvl3@lvl3-vm:~/Desktop$ tail /etc/passwd
whoopsie:x:120:125::/nonexistent:/bin/false
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/no
login
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:124:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:125:130:Gnome Display Manager:/var/lib/gdm3:/bin/false
sssd:x:126:131:SSSD system user,,,:/var/lib/sss:/usr/sbin/nologin
lvl3:x:1000:1000:lvl3,,,:/home/lvl3:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
omar:x:1001:1001::/home/omar:/bin/sh
```

User Management

$useradd$ - add a user to the system.

- When you first create a new user using the $useradd$ command, you must set a new password for it to log in it.

```
lvl3@lvl3-vm:~/Desktop$ sudo passwd omar
New password:
Retype new password:
passwd: password updated successfully
```

User Management

$adduser$ – adds new user.

- Allows creating a new user with a specific password and additional details.

```
lvl3@lvl3-vm:~/Desktop$ sudo adduser ahmed
Adding user `ahmed' ...
Adding new group `ahmed' (1002) ...
Adding new user `ahmed' (1002) with group `ahmed' ...
Creating home directory `/home/ahmed' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for ahmed
Enter the new value, or press ENTER for the default
        Full Name []: Ahmed
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] y
```

User Management

su – switch user.

- Allows switching user from terminal.

User Management

$userdel$ – delete a user account.

```
lvl3@lvl3-vm:~/Desktop$ sudo userdel omar
[sudo] password for lvl3:
```

Option	Description
-f, --force	forces the removal of the user account, even if the user is still logged in.
-r, --remove	Files in the user's home directory will be removed along with the home directory itself

User Management

$groupadd$ – create new group

- Allows creating new groups.

```
lvl3@lvl3-vm:~/Desktop$ sudo groupadd my_group
[sudo] password for lvl3:
```

- You can show the groups on the system from the $/etc/group$ file.

```
lvl3@lvl3-vm:~/Desktop$ tail /etc/group
pulse-access:x:129:
gdm:x:130:
sssd:x:131:
lxd:x:132:lvl3
lvl3:x:1000:
sambashare:x:133:lvl3
systemd-coredump:x:999:
omar:x:1001:
ahmed:x:1002:
my_group:x:1003:
```

User Management

$usermod$ – modify a user account.

- Modifies the system account files to reflect the changes that are specified on the command line.
- This option must be used with an option.

Option	Description
-c, --comment	Add a comment to the user account.
-d, --home	Change the user's login directory.
-g, --gid	Change the primary group
-G, , --groups	Adding Supplementary Groups to a User Account.
-a, --append	Append the user to the supplemental GROUPS mentioned by the -G option without removing the user from other groups.
-L, --lock	Lock the user account.

User Management

$usermod$ – modify a user account.

- Add comment.

```
lvl3@lvl3-vm:~/Desktop$ sudo usermod -c "This is an empty user account" ahmed
[sudo] password for lvl3:
lvl3@lvl3-vm:~/Desktop$ tail /etc/passwd
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:124:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:125:130:Gnome Display Manager:/var/lib/gdm3:/bin/false
sssd:x:126:131:SSSD system user,,,:/var/lib/sss:/usr/sbin/nologin
lvl3:x:1000:1000:lvl3,,,:/home/lvl3:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
ahmed:x:1002:1002:This is an empty user account:/home/ahmed:/bin/bash
omar:x:1003:1004::/home/omar:/bin/sh
```

User Management

$usermod$ – modify a user account.

- Append the user to another group.

```
lvl3@lvl3-vm:~/Desktop$ sudo usermod -aG my_group ahmed
```

```
lvl3@lvl3-vm:~/Desktop$ id ahmed
uid=1002(ahmed) gid=1002(ahmed) groups=1002(ahmed),1003(my_group)
```

User Management

$finger$ – user information lookup.

- This command is used by system admins to show details about the user.
- You need to install it.

```
lvl3@lvl3-vm:~/Desktop$ sudo apt install finger
```

```
lvl3@lvl3-vm:~/Desktop$ finger lvl3
Login: lvl3                             Name: lvl3
Directory: /home/lvl3                   Shell: /bin/bash
On since Sat Apr  2 21:14 (EET) on :0 from :0 (messages off)
No mail.
No Plan.
```

```
lvl3@lvl3-vm:~/Desktop$ finger ahmed
Login: ahmed                            Name: This is an empty user account
Directory: /home/ahmed                  Shell: /bin/bash
Never logged in.
No mail.
No Plan.
```

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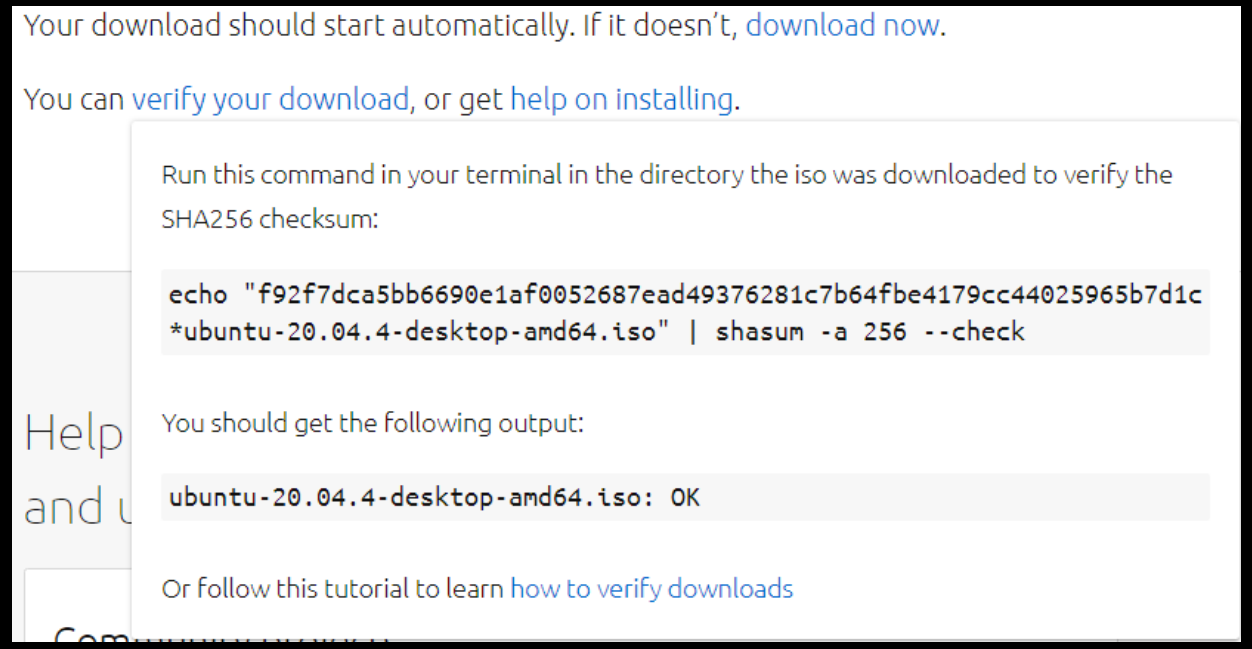
Environment Management

- SHA-1 is a hash function used to verify a file has been unaltered.
  - This is done by producing a checksum before the file has been transmitted, and then again once it reaches its destination.
- The transmitted file can be considered genuine only if both checksums are identical.
- Example, when downloading Ubuntu, there is an option to check if the downloaded file is original file or not.



Environment Management

$sha1sum$ – computes the checksum of a file.

```
lvl3@lvl3-vm:~/Desktop$ sha1sum file.txt
f5403843ceb694b0cb24a91ff36150835193566b9  file.txt
```

- Check if two files are the same or not using $sha1sum$ and $diff$ commands.

```
lvl3@lvl3-vm:~/Desktop$ sha1sum file.txt > hash1.txt
lvl3@lvl3-vm:~/Desktop$ sha1sum xyz.txt > hash2.txt
lvl3@lvl3-vm:~/Desktop$ diff -sq hash1.txt hash2.txt
Files hash1.txt and hash2.txt differ
```

```
lvl3@lvl3-vm:~/Desktop$ sha1sum file.txt > hash1.txt
lvl3@lvl3-vm:~/Desktop$ sha1sum file.txt > hash2.txt
lvl3@lvl3-vm:~/Desktop$ diff -sq hash1.txt hash2.txt
Files hash1.txt and hash2.txt are identical
```

  - The $-sq$ option tells $diff$ command to print if the two files are identical of different.

Environment Management

$type$ – display information about a command.

- You can easily find whether the given command is an alias, shell built-in, file, function, or keyword.

```
lvl3@lvl3-vm:~/Desktop$ type ls
ls is aliased to `ls --color=auto'
lvl3@lvl3-vm:~/Desktop$ type pwd
pwd is a shell builtin
lvl3@lvl3-vm:~/Desktop$ type type
type is a shell builtin
lvl3@lvl3-vm:~/Desktop$ type cd
cd is a shell builtin
lvl3@lvl3-vm:~/Desktop$ type mkdir
mkdir is /usr/bin/mkdir
```

Environment Management

$chown$ – change owner.

- Allows changing the user and/or group ownership of a file or a directory.

```
chown [OPTIONS] USER[:GROUP] FILE(s)
```

  - $USER$ - If only the user is specified, the specified user will become the owner of the given files, the group ownership is not changed.
  - $USER$: - When the username is followed by a colon :, and the group name is not given, the user will become the owner of the files, and the files group ownership is changed to user's login group.
  - $USER$: $GROUP$ - If both the user and the group are specified, the user ownership of the files is changed to the given user and the group ownership is changed to the given group.
  - : $GROUP$ - If the User is omitted and the group is prefixed with a colon :, only the group ownership of the files is changed to the given group.

Environment Management

$chown$ – change owner.

```
lvl3@lvl3-vm:~/Desktop$ ls -l dummy.tx
-rwxr--r-x 1 lvl3 lvl3 0 10:27 29 مار dummy.tx
lvl3@lvl3-vm:~/Desktop$ sudo chown ahmed dummy.tx
[sudo] password for lvl3:
lvl3@lvl3-vm:~/Desktop$ ls -l dummy.tx
-rwxr--r-x 1 ahmed lvl3 0 10:27 29 مار dummy.tx
lvl3@lvl3-vm:~/Desktop$ sudo chown ahmed:ahmed dummy.tx
lvl3@lvl3-vm:~/Desktop$ ls -l dummy.tx
-rwxr--r-x 1 ahmed ahmed 0 10:27 29 مار dummy.tx
```

Environment Management

tac – read file from end.

- Similar to cat command but reads a file from the end.

```
lvl3@lvl3-vm:~/Desktop$ cat a1.txt
aa
bc
mona
ahme
ali

lvl3@lvl3-vm:~/Desktop$ tac a1.txt

ali
ahme
mona
bc
aa
```

Environment Management

$find$ - search for files in a directory hierarchy.

- It supports searching by file, folder, name, creation date, modification date, owner and permissions.

```
$ find [where to start searching from]
 [expression determines what to find] [-options] [what to find]
```

- Example, find a file named “f1.txt” starting from Downloads directory.

```
lvl3@lvl3-vm:~/Desktop$ find ~/Downloads -name f1.txt
/home/lvl3/Downloads/new_dir5/f1.txt
/home/lvl3/Downloads/dir2/f1.txt
/home/lvl3/Downloads/dir1/f1.txt
```

Environment Management

- Find all files that ends in .sh starting from home directory.

```
lvl3@lvl3-vm:~/Desktop$ find ~ -name '*.sh'
/home/lvl3/Desktop/qqq/mydir/rand10.sh
/home/lvl3/Desktop/qqq/mydir/rand9.sh
/home/lvl3/Desktop/qqq/mydir/rand12.sh
/home/lvl3/Desktop/qqq/mydir/rand11.sh
```

- Find all files that has permission 777 starting from home directory.

```
lvl3@lvl3-vm:~/Desktop$ find ~ -perm 777
/home/lvl3/.mozilla/firefox/krqsl33c.default-release/lock
/home/lvl3/Desktop/xyz.txt
```

Environment Management

- Find all files that any permission except 777 starting from home directory.

```
lvl3@lvl3-vm:~/Desktop$ find ~ -type f ! -perm 777
/home/lvl3/Pictures/Screenshot from 2022-03-06 17-14-59.png
/home/lvl3/.bashrc
/home/lvl3/.bash_logout
/home/lvl3/.config/dconf/user
/home/lvl3/.config/user-dirs.locale
```

- Find all directories that has permission 664 starting from home directory.

```
lvl3@lvl3-vm:~/Desktop$ find ~ -type d ! -perm 664
/home/lvl3
/home/lvl3/Public
/home/lvl3/Pictures
/home/lvl3/Templates
/home/lvl3/.config
/home/lvl3/.config/gnome-session
/home/lvl3/.config/gnome-session/saved-session
```

Summary

- $finger$
- $sha1sum$
- $useradd$
- $adduser$
- $groupadd$
- $usermod$
- $userdel$
- su
- $type$
- $chown$
- tac
- $find$

TASK

- Create a new user “user1” using $useradd$.
- Create a new user “user2” using $adduser$.
- Switch between the users. What do you notice? What is the main difference between $useradd$ and $adduser$?
- What are the following commands: $groupdel$, $groupmod$.
- Write a command to display files changed in last 1 hour.
- Write a command to find files larger than 10MB.