Operating Systems 1
lecture 4

Lecturer

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Users

- Linux is a multi-user system and a user is anyone who wants to use the system.
- User information except password is stored in /etc/passwd file.
- This file contains a line for each user in the system.
- Each line is formatted the same way and contains information about the user.
- The next slide contains a line example from passwd file and its description.

passwd file

- mohsen:x:1000:1000:Mohsen Ibrahim,,,:/home/mohsen:/bin/bash
- The first column is the user's name, it is used when logging in the system and should be between 1 and 32 characters long.
- The second one contains an 'x', this was used to store the password but it is moved to another file (/etc/shadow).
- The third column is the User ID (UID) the first normal user on the system should have a UID of 1000, this is set in /etc/login.defs file.
- The fourth column is the Group ID (GID), each user has one primary group, here its GID is stored, the first normal group on the system should have a GID of 1000, this is set in /etc/login.defs file.

passwd file

- The fifth column is the additional user info such as first name, last name, phone number etc...
- The sixth column is the home directory path for the user.
- The last column is the login shell for the user.
- There are also some system users such as
- www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
- Can you extract the previous information from this line??

Reading from passwd file

- We can print the contents of this file using cat /etc/passwd.
- We can search for users in the file using grep "username" /etc/passwd
- The command grep is used to search for text in a file.
- We can use getent command to get user entries
- getent passwd mohsen

shadow file

- This file is only readable by the root user and it is used to store the encrypted passwords for each user in the system.
- This is an example line from it
- mohsen:6eRkpW0Vr$JE1H4xKlVnIuoSSd3kwL..GgCrjgnVUwWBz1MuukPJlVoyPvRwsOO8uvlZVlkJvNiWeDtKrF4Rlee/YngQlji0:17065:0:99999:7:::
- The first column is the user name.
- The second one is the encrypted password.
- The third one is the number of days since 1/1/1970 before the password was last changed.

shadow file

- The fourth one is the minmum number of days a user must wait before changing his password, 0 means he can change it any time.
- The fifth column is the maximum number of days before the user is forced to change his password, default is 99999 days.
- The sixth column is the number of days before a warning is displayed to change password, default is 7.
- The seventh column is the number of days a user is allowed to use an expired password.
- The last column is the number of days since 1/1/1970 before the account expires and is completely blocked.

Groups

- In linux groups are used to logically bring several users together in a single group to ease the task of managing permissions and many users.
- The group information are stored in /etc/group file.
- This is an example line from this file
- adm:x:4:syslog,mohsen
- The first column is the group's name.
- The second one is groups password, it is stored in /etc/gshadow file and rarely used.

group and gshadow files

- The third column is the groups ID (GID).
- The last one is the list of usernames in the group separated by commas.
- More information are stored in /etc/gshadow file, this is an example line from it.
- adm:*::syslog,mohsen
- The first column is the group's name, the second one is the encrypted password, the third one contains the group's admin and the last one is a list of the group's users.

Group and user commands

- We can use the id command to print information about our current user.
- id -g prints the user's main group, id -G prints all users groups.
- id user_name prints the information of the user named user_name.
- We can use the groups command to print the names of the groups the current user is member in them.

Additional commands

- We can use the cut command to divide the output based on a delimiter.
- The default delimiter is space character.
- In user and group files the delimiter must be : character.
- We can change the delimiter with -d option.
- We can print fields using -f <field_order> option.
- cut -d”:” -f 1 *“/etc/passwd”,* this command prints the user names of all users in the system.
- We can use unique command to print only unique values.

Exercise

- Use the right commands to execute the following tasks
- Print the user names of all system users.
- Print the home directory of a user called hassan.
- Print the encrypted password of the user called hassan.
- Print the group members of a group called adm.
- Print the unique shells for all users on the system.

GOOD LUCK