Linux Administration

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Day2 contents

- User and group administration.
- Permissions.
- Switching to other accounts.
- User and group ownership
- sudo

Listing directory content

- -rwxr-xr-x 1 root root 512 May 21 16:06 file1
- drwxr-xr-x 2 fatma fatma 512 May 21 16:06 dir2

  type Permission nuOfHLOwner Group Size Creation_date_time Name_of_file

User accounts

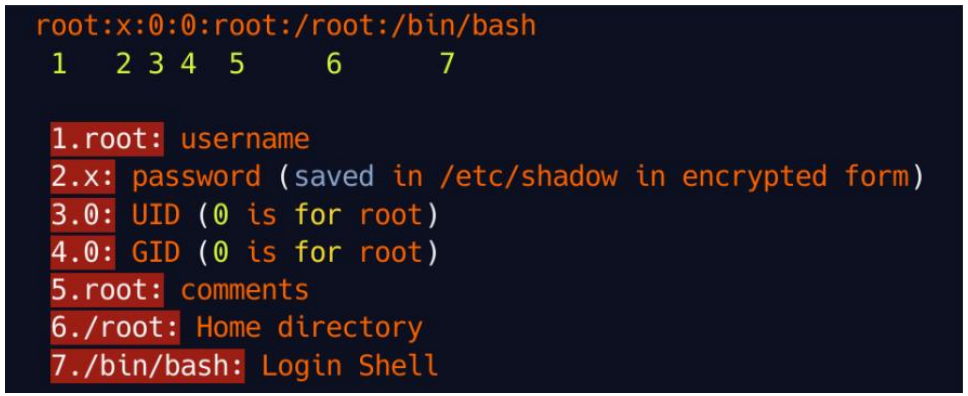
- Root user (super).
- Normal user.
- Service user.
  - Root starts the service and then give its service user the control

Users passwd file

- The /etc/passwd file

  login-name:x:uid:gid:comment:home-directory:login-shell

  - Included fields are:
    - Login name.
    - Encrypted password.
    - User Id (uid).
    - Group Id (gid).
    - Comment about the user.
    - Home Directory.
    - Login shell.



Users shadow file

- The /etc/shadow file

  username:encrypted passwd:last_changed:min:max:warn:inactive:expire:future-use

  - Included fields are
    - Login name.
    - Encrypted password.
    - Days since Jan 1, 1970 that password was last changed.
    - Days before password may not be changed.
    - Days after which password must be changed.
    - Days before password is to expire that user is warned.
    - Days after password expires that account is disabled.
    - Days since Jan 1, 1970 that account is disabled.

groups

- The /etc/group file

  groupname:x:gid: members_who_this_group_is_secondary_for_them

- The /etc/gshadow

  groupname:encrypted_pass:group_admin:members_who_this_group_is_secondary_for_them

Creating new user

- **#useradd [options] username**
  - The useradd command populates user home directories from the /etc/skel directory.
  - #useradd -c ➔ to make comment
  - #useradd -md ➔ to put home dir
  - #useradd –s ➔ to put login shell
  - #useradd –g ➔ to set primary group
  - #useradd –G ➔ to set secondary groups
  - #useradd –u ➔ to set uid
  - #useradd –f <days> <user> ➔ to set when the user will be inactive (will be locked)
  - #useradd –e <days> <user> ➔ to set when the user will be expired (can't login again)
  - #useradd -p <encrypted_pass>➔ to give password to user during creation
- **#passwd username**
  - #passwd –d <username> ➔ first login without password then must create pass for himself
- **View and modify default setting of user and password**
  - #useradd –D ➔ read useradd defaults from /etc/default/useradd
  - Default password settings are from /etc/login.defs
- **Adding multiple user accounts**
  - #vi file

    User-name1:password:uid:gid:comment:homedir:loginshell
    User-name2:password:uid:gid:comment:homedir:loginshell
    ……etc
  - #newusers filename

Modifying user accounts

- To change a user's account information, you can:
  - Edit the /etc/passwd or /etc/shadow files manually. (not recommended)
  - Use the **usermod** or **chage** commands.
- usermod
  - The usermod command can be used to set all properties of users as stored in /etc/passwd and /etc/shadow, plus some additional tasks, such as managing group membership.
  - #usermod -l ➔to change login name of a created user
  - #usermod –c ➔ to change the comment of the user
  - #usermod –g ➔ to change the primary group of the user
  - #usermod –aG ➔ to add user in a secondary group (a to append to current groups)
  - #usermod -s ➔ to change the default shell
  - #usermod -md➔ to change the home dir of the user
  - #usermod -u ➔ change userid
  - #usermod -U➔ to unlock this user
  - #usermod -L➔ to lock this user

Password aging policies

- Change password age
  - #chage –m ➔ to change the min number of days between password changes
  - #chage –M ➔ to change the max number of days between password changes
  - #chage –W ➔ to change the number of days to start warning before a password
  - change will be required
  - #chage –I ➔ to change inactive time (if the user don't access the system for this period, it will be automatically locked)
    you must change the Max to change inactive
  - #chage –E ➔ to change the expiration date for the account (calculated from 1/1/1970) if it set to -1 means will never expire
    #chage -E 2026-12-31 john
  - #chage –l <user>➔ to list all info about user's password; read them from /etc/shadow
- Passwd
  - #passwd -n ➔ change the min number of days between password changes
  - #passwd -x ➔ change the max number of days between password changes
  - #passwd -w ➔ To change the number of days to start warning before a password change will be required
  - #passwd –i ➔ to change the expiration date for the account
  - #passwd -l➔ to lock the password [the same job of usermod -L]
  - #passwd -u ➔ to unlock password [the same job of usermod -U]

Deleting user accounts

- To delete a user account, you can
  - Manually remove the user from:
    - /etc/passwd file.
    - /etc/shadow files.
    - /etc/group file.
    - remove the user's home directory (/home/username).
    - and mail spool file (/var/spool/mail/username).
  - #userdel <user_name>
  - #userdel –r <user_name> ➔ It will remove user’s home dir and the user’s mail spool.

Ownership

- To change user and group ownership of a file or dir
  - chown <user_name> <file_path>
  - chown -R <user_name> <dir_path>
  - chown <user_name>:<group_name> <file_path>
  - chown -R <user_name>:<group_name> <dir_path>
  - chown :<group_name> <file_path> === chgrp <group_name> <file_path>

Creating new group

- #groupadd [options] <group_name>
  - #groupadd –g ➔ to set a specific group id not the default one
- Linux users can be a member of two different kinds of groups
  - Primary group
    - Every user must be a member of only one "private" primary group.
  - Secondary group
    - Every user can be a member of one or more secondary groups
- Give password to a group
  - #gpasswd <group_name>
  - #gpasswd -A <username> <group_name> ➔ set an admin for group
  - #gpasswd -a a7med ca ➔ admin of ca add a7med to the group
  - #gpasswd -d a7med ca ➔ admin of ca delete a7med from the group
  - #gpasswd -r ca ➔ admin of ca remove password of this group
  - #gpasswd -R ca ➔ restrict the access to this group to it's members
  - #gpasswd -M a7md ca ➔ to make a7med member of ca group[by root]
- print all my groups
  - #groups
- print all user's groups
  - #groups <user_name>
  - #groupmems -g group1 –l ➔ see which users are a member of group1
- Switch to a group
  - #newgrp <group_name>
  - I can switch to a certain group if I am member in it or I have it's password.
  - when I switch to group and create any files or dirs, the permissions on group part for the group that I switch not for my primary group.

Modifying and deleting an existing group

- groupmod [options] <group_name>
  - groupmod command can be used to change the name or group ID of the group,
  - but it does not allow you to add group members.
  - #groupmod –n ➔ to change group name
  - #groupmod –g ➔ to change group ID
- **Deleting a certain group**
  - #groupdel <group_name>
- To list all file which are owned by groups not defined in /etc/group file
  - #find / -nogroup

Switching accounts

- #su <account>
- #su - <account>
- #su - <account> -c “<command>”

Basic permissions

permission	Read	write	execute
File	cat,more,less,head,tail,cp,wc	gedit,vi	If it's a program
directory	ls	mkdir,touch,rm,rmdir,mv	cd

Symbolic mode

Who
- u: Owner permissions
- g: Group permissions
- o: Other permissions
- a: all permissions

Operator
- + Add permissions
- - Remove permissions
- = Assign permissions absolutely

Permissions
- r: read
- w: write
- x: execute

Octal mode

- 4 read
- 2 write
- 1 execute

To change the permission use
- #chmod permission <filename>
- #chmod u=symbolic_value,g+symbolic_value,o-symbolic_value <filename>
- #chmod octal_value <filename>

Default permissions

- The #umask command shows and sets the default permissions for files and directories
- #umask ➔ to show default permissions in octal mode
- #umask –S ➔ to show default permissions in symbolic mode
- #umask <permissions> ➔ to change the default permissions of files and dir (#umask u=rwx,g=rwx,o=rwx)
- Note: File don’t have execute permissions by default anyway.

Advanced permissions

- It’s the fourth number of umask command (suid=4,sgid=2,sticky=1).
  - **suid(only applied on commands)**
    - chmod u+s /usr/sbin/useradd OR chmod 4755
    - ls -l /usr/sbin/useradd (rws r-x r-x) s==x+s S== s
    - Example: ls –l /usr/bin/passwd
  - **sgid(applied on commands and dirs)**
    - chmod g+s /usr/sbin/useradd OR chmod 2755
    - chmod g+s /dir1 OR chmod 2755 /dir1
    - ls -l /dir1 or ls -l /usr/bin/useradd (rwx rws ---)
    - Example : ls –l /usr/bin/locate
  - **sticky(only applied on dirs)**
    - chmod o+t /dir1
    - ls -l /dir1 (rwx rwx rwt)

sudo

- vi /etc/sudoers and go to the end of the file
- Create a new file with the authorization rules in the /etc/sudoers.d directory, all files under this dir included in /etc/sudoers file (#includedir /etc/sudoers.d)
  - #echo "username ALL=(ALL) NOPASSWD:ALL" | sudo tee /etc/sudoers.d/username
- visudo will open the file directly

  <user_namr> ALL=(ALL) /usr/sbin/useradd, /usr/sbin/usermod
  %<group_name> ALL=(ALL) ALL
  <user_namr> ALL=(ALL) NOPASSWD: /usr/sbin/useradd, /usr/sbin/usermod
  <username> <hostname.example.com> = (<run_as_user>:<run_as_group>) <path/to/command>

- Permit a sudo for a user on all system commands
  - #visudo

    <user_name> ALL=(ALL) ALL
  - #usermod -aG wheel <username>
- Use sudo as a normal user
  - #sudo -u <username> <command>
- Log file of login ➔ /var/log/secure