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User Management

Linux Administration

User in Unix

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- A user is an entity, in a Linux operating system, that can manipulate files and perform several other operations.
- A UID (user identifier) is a number assigned by Linux to each user on the system. This number is used to identify the user to the system and to determine which system resources the user can access. UIDs are stored in the /etc/passwd file.
- Most Linux distributions reserve the first 100 UIDs for system use. New users are assigned UIDs starting from 500 or 1000. For example, new users in Ubuntu start from 1000.
- When you create a new account, it will usually be give the next-highest unused number. If we create a new user on our Ubuntu system, it will be given the UID of 1001
- Groups in Linux are defined by GIDs (group IDs). Just like with UIDs, the first 100 GIDs are usually reserved for system use. The GID of 0 corresponds to the root group and the GID of 100 usually represents the users group. GIDs are stored in the /etc/groups file.

root account

- The root user, also known as the superuser or administrator, is a special user account in Linux used for system administration. It is the most privileged user on the Linux system and it has access to all commands and files.
  The root user can do many things an ordinary user cannot, such as installing new software, changing the ownership of files, and managing other user accounts.
- It is not recommended to use root for ordinary tasks for security purpose. It is advisable to create a normal user account for such tasks. If root permissions are needed, the su and sudo commands can be used.

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Understanding /etc/passwd

- The full user account information is stored in the /etc/passwd file. This file contains a record per system user account and has the following format (fields are delimited by a colon).

  [username]:[x]:[UID]:[GID]:[Comment]:[Home directory]:[Default shell]

- Fields [username] and [Comment] are self explanatory.
- The x in the second field indicates that the account is protected by a shadowed password (in /etc/shadow), which is needed to logon as [username].
- The [UID] and [GID] fields are integers that represent the User Identification and the primary Group Identification to which [username] belongs, respectively.
- The [Home directory] indicates the absolute path to [username]'s home directory, and The [Default shell] is the shell that will be made available to this user when he or she logins the system.

System and normal user

- Each user has a numeric user ID called UID.
- If not specified when creating a new user with the useradd command, the UID will be automatically selected from the /etc/login.defs file depending on the UID_MIN and UID_MAX values.
- To check the UID_MIN and UID_MAX values on your system you can use the following command:

```
[root@localhost ~]# grep -E '^UID_MIN|^UID_MAX' /etc/login.defs
```

Adding User Accounts

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- To add a new user account, you can run either of the following two commands as root.

```
# adduser [new_account]
# useradd [new_account]
```

- When a new user account is added to the system, the following operations are performed.

1. His/her home directory is created (**/home/username** by default).
2. The following hidden files are copied into the user's home directory, and will be used to provide environment variables for his/her user session.

```
.bash_logout
.bash_profile
.bashrc
```

3. A mail spool is created for the user at /var/spool/mail/**username**.
4. A group is created and given the same name as the new user account.

Adding New User Accounts

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- To add/create a new user, all you've to follow the command '**useradd**' or '**adduser**' with 'username'. The 'username' is a user login name, that is used by user to login into the system.
- Only one user can be added and that username must be unique (different from other username already exists on the system)
- We all are aware about the most popular command called '**useradd**' or '**adduser**' in Linux. There are times when a Linux System Administrator asked to create user accounts on Linux with some specific properties, limitations or comments.

Adding New User Accounts

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- When we run '**useradd**' command in Linux terminal, it performs following major things:
- It edits /etc/passwd, /etc/shadow, /etc/group and /etc/gshadow files for the newly created User account.
- Creates and populate a home directory for the new user.
- Sets permissions and ownerships to home directory.
- Basic syntax of command is:

useradd [options] username

1. How to Add a New User in Linux

- To add/create a new user, all you've to follow the command '**useradd**' or '**adduser**' with 'username'. The 'username' is a user login name, that is used by user to login into the system.
- Only one user can be added and that username must be unique (different from other username already exists on the system).

Adding New User Accounts Example

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- For example, to add a new user called '**test**', use the following command.

```
[root@localhost ~]#  useradd test
```

- When we add a new user in Linux with 'useradd' command it gets created in locked state and to unlock that user account, we need to set a password for that account with '**passwd**' command.

```
[root@localhost ~]# passwd test
Changing password for user test
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

- Once a new user created, it's entry automatically added to the '**/etc/passwd**' file. The file is used to store users information and the entry should be.

```
test:x:504:504:test:/home/test:/bin/bash
```

Adding New User Accounts Example

2. Create a User with Different Home Directory

- By default '**useradd**' command creates a user's home directory under **/home** directory with username. Thus, for example, we've seen above the default home directory for the user '**test**' is '**/home/test**'.
- However, this action can be changed by using '**-d**' option along with the location of new home directory (i.e. **/data/projects**). For example, the following command will create a user '**test1**' with a home directory '**/data/projects**'.

```
[root@localhost ~]# useradd -d /data/projects test1
```

- You can see the user home directory and other user related information like user id, group id, shell and comments.

```
[root@localhost ~]# cat /etc/passwd | grep test1
test1:x:505:505::/data/projects:/bin/bash
```

Adding New User Accounts Example

3. Create a User with Specific User ID

- In Linux, every user has its own **UID** (**Unique Identification Number**). By default, whenever we create a new user accounts in **Linux**, it assigns userid **500**, **501**, **502** and so on…
- But, we can create user's with custom userid with '**-u**' option. For example, the following command will create a user '**navin**' with custom userid '**999**'.

```
[root@localhost ~]# useradd -u 999 navin
```

4. Create a User with Specific Group ID

- Similarly, every user has its own **GID** (**Group Identification Number**). We can create users with specific group ID's as well with **-g** option.
- Here in this example, we will add a user '**tarunika**' with a specific **UID** and **GID** simultaneously with the help of '**-u**' and '**-g**' options.

```
[root@localhost ~]# useradd -u 1000 -g 500 tarunika
```

Adding New User Accounts Example

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5. Add a User to Multiple Groups

- The '**-G**' option is used to add a user to additional groups. Each group name is separated by a comma, with no intervening spaces.
- Here in this example, we are adding a user '**test**' into multiple groups like **admins**, **webadmin** and **developer**.

```
[root@localhost ~]# useradd -G admins,webadmin,developers test
```

Group

- A group in Linux is a collection of accounts that can be given special permissions on the system. For example, you can give one group the Read permission on a file and another group the Read/Write permissions on the same file. This way, the users in the first group can only read the file while the users in the second group can read and modify it.
- Every user in Linux must have a primary group assigned. In most Linux distributions, the primary group is a group with the same name as the user. When a user creates files or launch programs, those files and running programs are associated with that group.
- The /etc/group file is a configuration file that stores group information. This file is readable by all users.

Group

- Group (Primary/Secondary/New/Existing)
- To simply show a user's group memberships for the current user, type:
  - $ groups
- You can easily count total group with the following wc command:
  - $ groups | wc -w
- Recommend alternative to groups command
- The groups command has been obsoleted by the id command You need to use the following command which is equivalent to id -Gn:
  - $ id -Gn
  - $ id -Gn root

Group

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There are two kinds of groups:

Primary Group: This is the group applied to you when you log in; in most user cases it has the same name as your login name. The primary group is used by default when creating new files (or directories), modifying files, or executing commands.

Secondary Groups : These are groups you are a member of beyond your primary group. As an example, this means that if a directory or file belongs to the test group (as used by the web server process in this case), then all test group members can read or modify these files directly.
A list of all currently available groups can be found in the /etc/group file.

Groups

Understanding /etc/group

- Group information is stored in the **/etc/group** file. Each record has the following format.

  [Group name]:[Group password]:[GID]:[Group members]

  [Group name] is the name of group.
  An **x** in **[Group password]** indicates group passwords are not being used.
  [GID]: same as in /etc/passwd.
  [Group members]: a comma separated list of users who are members of **[Group name]**.

- Displaying the groups an user is a member of

  ```
  # groups test
  # id test
  ```

Groups

- To add new groups
  - Deleting a group
    - # groupadd testgrp
    - # groupdel testgroup
- To assign password to group
  - #gpasswd testgrp
- To add user in a group as a secondary memberships
  - # useradd ravi
  - #usermod -G testgroup ravi
- To add user in group as a primary member
  - #useradd ali
  - #usermod -g testgroup ali
- Removig user from group
  - #gpasswd -d <username> <groupname>
  - #gpasswd -d ravi testgroup

Modifying User attributes

- Usermod command is used to change user attributes.
- When we execute ‘usermod‘ command in terminal, the following files are used and affected.

  /etc/passwd – User account information.
  /etc/shadow – Secure account information.
  /etc/group – Group account information.
  /etc/gshadow – Secure group account information.
  /etc/login.defs – Shadow password suite configuration..
- Basic syntax of command is:

  usermod [options] username
- Requirements

  1. We must have existing user accounts to execute usermod command.
  2. Only superuser (root) is allowed to execute usermod command.
  3. The usermod command can be executed on any Linux distribution.
  4. Must have basic knowledge of usermod command with options

Modifying User attributes

Options of Usermod

The '**usermod**' command is simple to use with lots of options to make changes to an existing user. Let us see how to use usermod command by modifying some existing users in Linux box with the help of following options.

-c = We can add comment field for the useraccount.

-d = To modify the directory for any existing user account.

-e = Using this option we can make the account expiry in specific period.

-g = Change the primary group for a User.

-G = To add a supplementary groups.

-a = To add anyone of the group to a secondary group.

-l = To change the login name from test to test_admin.

-L = To lock the user account. This will lock the password so we can't use the account.

-U = To unlock the user accounts. This will remove the password lock and allow us to use the user account.

Modifying User attributes

- Adding Information to User Account
- The '**-c**' option is used to set a brief comment (information) about the user account. For example, let's add information on '**test**' user, using the following command.

```
# usermod -c "This is test" test
```

- Change User Primary Group

To set or change a user primary group, we use option '**-g**' with usermod command. Before, changing user primary group, first make sure to check the current group for the user **test_test**.

```
# id test_test
```

Now, set the **babin** group as a primary group to user **test_test** and confirm the changes.

```
# usermod -g babin test_test
```

Modifying User attributes

- Adding Group to an Existing User

If you want to add a new group called '**test_test0**' to '**test**' user, you can use option '**-G**' with usermod command as shown below.

```
# usermod -G test_test0 test
```

- Lock User Account

To Lock any system user account, we can use '**-L**' (lock) option, After the account is locked we can't login by using the password and you will see a **!** added before the encrypted password in **/etc/shadow** file, means password disabled.

```
# usermod -L babin
```

- Unlock User Account

The '**-U**' option is used to unlock any locked user, this will remove the **!** lbefore the encrypted password.

```
# usermod -U babin
```

Manage passwords

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- Chage chage command can be used to view and change a user account's password expiration information. The root user can modify information such as the account expiration date, the minimum and maximum number of days between password changes, the number of days before account expiration that the system will warn the user, etc.
- Here is a list and a brief description of the options available with the chage commands:

Option	Description
l	displays all password expiration information for the specified user
m	sets the minimum number of days between password changes
M	changes the number of days the password is valid
I (capital i)	sets the number of days between password expiration and account disablement
E	changes the password expiration date
W	sets the number of days before account expiration that the system will warn the user

Manage passwords

- In order to verify that someone entering that user ID really is that person, a second identification, the password, known only to that person and to the system itself, is entered by the user.
- As per standard password policy, most networks require that end users change their passwords on a periodic basis.
- **passwd command :** The passwd command is used to create and change the password of a user account. A normal user can run passwd to change their own password, and a system administrator (the superuser ROOT) can use passwd to change another user's password, or define how that account's password can be used or changed.

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Manage passwords

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passwd [OPTION] [USER] Usage:

- -d, --delete the password for the named account (root only)
- -l, --lock the named account (root only)
- -u, --unlock the named account (root only)
- -f, --force operation
- -x, --maximum=DAYS maximum password lifetime (root only)
- -n, --minimum=DAYS minimum password lifetime (root only)
- -w, --warning=DAYS number of days warning users receives before password expiration (root only)
- -i, --inactive=DAYS number of days after password expiration when an account becomes disabled (root only)
- -S, --status report password status on the named account (root only)
- --stdin read new tokens from stdin (root only)

Identify yourself on linux system

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- -i, --inactive=DAYS number of days after password expiration when an account becomes disabled (root only)
- -S, --status report password status on the named account (root only)
- --stdin read new tokens from stdin (root only)

Other user management commands

whoami

- The whoami command tells you your username.

who

- The who command will give you information about who is logged on the system.

who am i

- With who am i the who command will display only the line pointing to your current session.

w

- The w command shows you who is logged on and what they are doing.

id

- The id command will give you your user id, primary group id and a list of the groups that you belong to.

References

URL :

1. Managing Users & Groups, File Permissions & Attributes and Enabling sudo Access on Accounts - Part 8 (tecmint.com)

2. Linux User Commands Tutorial: Administration & Management (guru99.com)