Capgemini

Linux Fundamentals

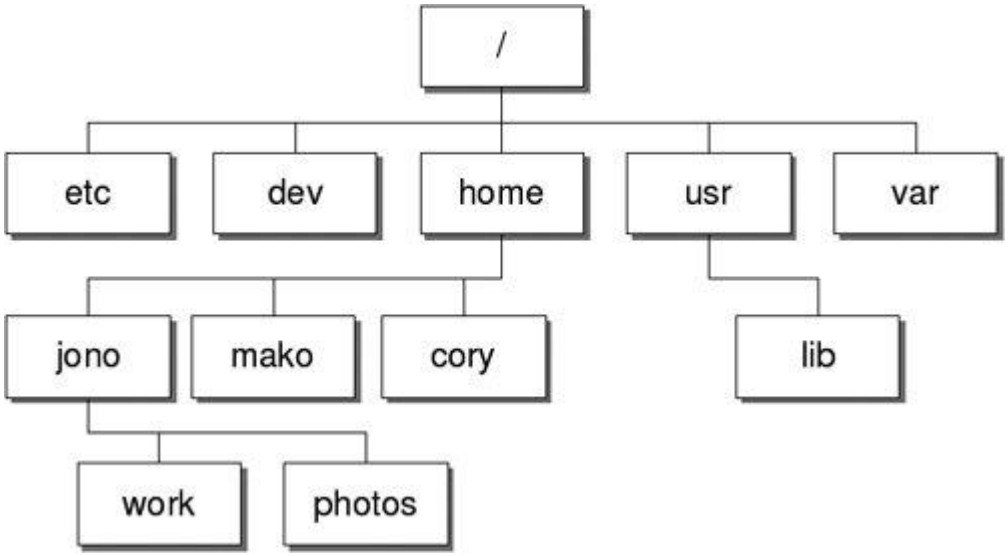
Lesson 2 The Linux File System

Lesson Objectives

In this lesson, you will learn:

- Linux File system
- File types
- File permissions
- Commands related to file permission

File system Hierarchy



File Types in Linux

We have the following file types in Linux:

- Regular File
- Directory File
- Device File

File Permissions

Every file

- Is owned by some user.
- Belongs to a group .
- Has certain access permissions for owner, group, and others.
- Default permissions determined by umask.

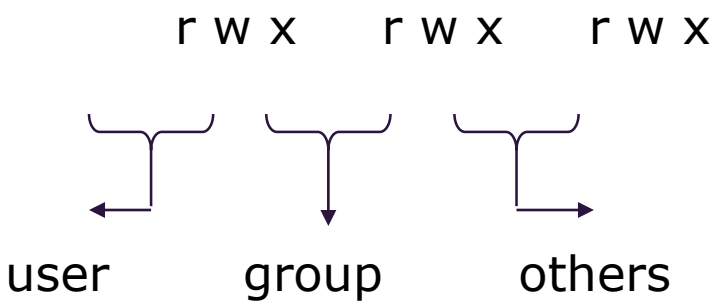
File Permissions

Every user:

- Has a uid (login name), gid (login group) and membership of a "groups" list:
  - The *uid* is who you are (name and number) .
  - The *gid* is your initial “login group” you normally belong to.
  - The groups *list* is the file groups you can access via group permissions.

File Permissions in Linux

File Access Permissions



File Permissions in Linux

Permissions are associated with every file, and are useful for security.

There are three categories of users:

- Owner (u)
- Group (g)
- Others (o)

There are three types of “access permissions”:

- Read (r)
- Write (w)
- Execute (e)

Changing File Permissions - chmod

chmod command is used to change the file permissions.

- Syntax: chmod <category> <operation> <permission> <filenames>

Category	Operations	Attribute
u-user	+assigns permission	r-read
g-group	-remove permission	w-write
o-others	=assigns absolute permission	x-execute
a-all		

Changing Permissions – Symbolic Method

- Example:

$chmod u+x note

- $ ls - l note
- -rwx r-- r --1 …… note

$ chmod ugo+x note

- $ ls - l note
- -rwxr-xr-x …… note
  - ➢When we use + symbol, the previous permissions will be retained and new permissions will be added.
  - ➢When we use = symbol, previous permissions will be overwritten.

Changing Permissions – Numeric Method

Octal notation:

- It describes both category and permission.
- It is similar to = operator (absolute assignment).
  - read permission: assigned value is 4
  - write permission: assigned value is 2
  - execute permission: assigned value is 1
- Example 1:

```
$ chmod   666    note
```

  - It will assign read and write permission to all.

File related Commands - pwd

pwd Command

- The pwd command checks current directory.
- $pwd

  Output: /usr/Kumar

cd Command

The cd command changes directories to specified directory .

The directory name can be specified by using absolute path (Full Path) or relative path.

- Ex: $cd Program
- $pwd
- Output: /usr/Kumar/Program

cd Command

Moving one level up:

- $cd ..

Switching to home directory

- $cd

Switching to /usr/sharma:

- $cd /usr/sharma

Switching to root directory:

- $ cd /

Displaying Directory Contents

Lists the contents of the current directory or a specified directory

Usage:

ls [options] [*files_or_dirs*]

Example:

ls -a (include hidden files).

ls -l (display extra information).

ls -R (recurse through directories).

ls -ld (directory and symbolic link information).

Moving and Renaming Files and Directories

mv - move and/or rename files and directories

Usage:

mv [options] *file destination*

More than one file may be moved at a time if the destination is a directory:

mv [options] *file1 file2 destination*

Destination works like cp

Creating and Removing Files

touch - create empty files or update file timestamps.

rm - remove or deletes the file.

Usage:

rm [options] <file>...

Example:

rm -i file (interactive)

rm -r directory (recursive)

rm -f file (force)

Creating and Removing Directories

mkdir creates directories.

- Ex: $mkdir data
- $ mkdir doc doc/example doc/data

rmdir removes empty directories.

- $rmdir data
- $ rmdir doc/example doc

rm -r recursively removes directory trees.

Determining Disk Usage With df and du

df

- df finds the disk free space or disk usage.
- Ex: $df
- Outputs a table consisting of six columns. Column names explains each column. Columns, size, used and avail use kilobyte as unit.

du

- du command displays the list of directories that exist in the current directory along with their sizes.
- The last line of the output gives the total size of the current directory including its subdirectories.
- Note that by default the sizes given are in kilobytes.

Summary

In this lesson you have learnt

- File System hierarchy
- File Types
- File Permissions
- File related commands

Review Questions

Question 1: ‘/’ represents the _____ of file system.