

EXPERIMENT - 3

DATE : 09/04/2024

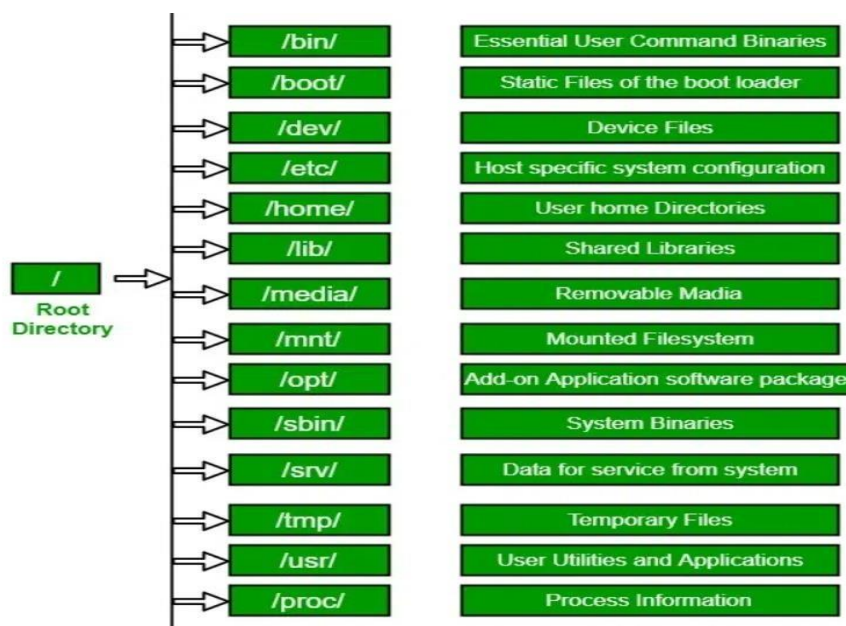
AIM:

File system hierarchy is a common linux distribution, file and device permissions, study of the system configuration files in /etc, familiarizing log files for system events, user activity, network events.

FILE SYSTEM HIERARCHY

The Linux File Hierarchy Structure or the Filesystem Hierarchy Standard (FHS) defines the directory structure and directory contents in Unix-like operating systems. It is maintained by the Linux Foundation.

- In the FHS, all files and directories appear under the root directory /, even if they are stored on different physical or virtual devices.
- Some of these directories only exist on a particular system if certain subsystems, such as the X Window System, are installed.
- Most of these directories exist in all UNIX operating systems and are generally used in much the same way; however, the descriptions here are those used specifically for the FHS and are not considered authoritative for platforms other than Linux.



/(Root)

Primary hierarchy root and root directory of the entire file system hierarchy.

- Every single file and directory start from the root directory.
- The only root user has the right to write under this directory.
- /root is the root user's home directory, which is not the same as /

/boot/ Directory

The `/boot/` directory contains static files required to boot the system, such as the Linux kernel. These files are essential for the system to boot properly

/bin/ Directory

Essential command binaries that need to be available in singleuser mode; for all users, e.g., cat, ls, cp.

- Contains binary executables.
- Common linux commands you need to use in single-user modes are located under this directory.
- Commands used by all the users of the system are located here e.g. ps, ls, ping, grep, cp

/dev/ Directory

The `/dev/` directory contains file system entries which represent devices that are attached to the system. These files are essential for the system to function properly.

/etc/ Directory

The `/etc/` directory is reserved for configuration files that are local to the machine. No binaries are to be placed in `/etc/`. Any binaries that were once located in `/etc/` should be placed into `/sbin/` or `/bin/`.

The `X11/` and `skel/` directories are subdirectories of the `/etc/` directory. The `/etc/X11/` directory is for X Window System configuration files, such as `xorg.conf`. The `/etc/skel/` directory is for "skeleton" user files, which are used to populate a home directory when a user is first created.

/lib/ Directory

The `/lib/` directory should contain only those libraries needed to execute the binaries in `/bin/` and `/sbin/`. These shared library images are particularly important for booting the system and executing commands within the root file system.

/media/ Directory

The `/media/` directory contains subdirectories used as mount points for removable media, such as 3.5 diskettes, CD-ROMs, and Zip disks.

/mnt/ Directory

The `/mnt/` directory is reserved for temporarily mounted file systems, such as NFS file system mounts. For all removable media, use the `/media/` directory.

/opt/Directory

The `/opt/` directory provides storage for large, static application software packages.

A package placing files in the `/opt/` directory creates a directory bearing the same name as the package. This directory, in turn, holds files that otherwise would be scattered throughout the file system, giving the system administrator an easy way to determine the role of each file within a particular package.

/proc/Directory

Virtual filesystem providing process and kernel information as files. In Linux, it corresponds to a `proc` mount. Generally, automatically generated and populated by the system, on the fly.

- Contains information about system process.
- This is a pseudo filesystem that contains information about running processes. For example: `/proc/{pid}` directory contains information about the process with that particular `pid`.
- This is a virtual filesystem with text information about system resources. For example: `/proc/uptime`

/sbin/ Directory

The `/sbin/` directory stores executables used by the root user. The executables in `/sbin/` are only used at boot time and perform system recovery operations. Of this directory, the FHS says:

`/sbin` contains binaries essential for booting, restoring, recovering, and/or repairing the system in addition to the binaries in `/bin`. Programs executed after `/usr/` is known to be mounted (when there are no problems) are generally placed into `/usr/sbin`. Locally-installed system administration programs should be placed into `/usr/local/sbin`.

/sys/Directory

The `/sys/` directory utilizes the new `sysfs` virtual file system specific to the 2.6 kernel. With the increased support for hot plug hardware devices in the 2.6 kernel, the `/sys/` directory contains information similarly held in `/proc/`, but displays a hierarchical view of specific device information in regards to hot plug devices.

To see how certain USB and FireWire devices are actually mounted, refer to the `/sbin/hotplug` and `/sbin/udev` man pages.

/srv / Directory

Site-specific data served by this system, such as data and scripts for web servers, data offered by FTP servers, and repositories for version control systems

- `srv` stands for service.
- Contains server specific services related data.
- Example, `/srv/cvs` contains CVS related data.

/tmp/ Directory

Temporary files. Often not preserved between system reboots and may be severely size restricted.

- Directory that contains temporary files created by system and users.
- Files under this directory are deleted when the system is rebooted.

`/run/` Directory

The `/run` directory is a temporary filesystem that contains volatile runtime data that shows the system has since it was booted. Files under the `/run` directory must be deleted (removed or truncated as convenient) at the start of the boot process