LINUX FILE HIERARCHY STRUCTURE

INTRODUCTION

- 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.
- It is possible to define two independent distinctions among files: shareable vs. unshareable and variable vs. static.
- Files that differ in either of these respects should be located in different directories. This makes it easy to store files with different usage characteristics on different filesystems.
- "Shareable" files are those that can be stored on one host and used on others (like files in user home directories) .
- "Unshareable" files are those that are not shareable (like device lock files) .
- "Static" files include binaries, libraries, documentation files and other files that do not change without system administrator intervention.
- "Variable" files are files that are not static.

The Root Filesystem

- The contents of the root filesystem must be adequate to boot, restore, recover, and/or repair the system.
  - To boot a system, enough software and data must be present on the root partition to mount other filesystems.
  - This includes utilities, configuration, boot loader information, and other essential startup data.
  - To enable recovery and/or repair of a system, those utilities needed by an experienced maintainer to diagnose and reconstruct a damaged system must be present on the root filesystem.
  - To restore a system, those utilities needed to restore from system backups (on floppy, tape, etc.) must be present on the root filesystem.
- The following directories, or symbolic links to directories, are required in /
  - bin : Essential command binaries.
  - boot : Static files of the boot loader.
  - dev : Device files.
  - etc : Host-specific system configuration.
  - lib : Essential shared libraries and kernel modules.
  - media : Mount point for removable media.
  - mnt : Mount point for mounting a filesystem temporarily.
  - opt : Add-on application software packages.
  - run : Data relevant to running processes.
  - sbin : Essential system binaries.

- srv : Data for services provided by this system.
- tmp : Temporary files.
- usr : Secondary hierarchy.
- var : Variable data.

/bin

- It contains commands that may be used by both the system administrator and by users, but which are required when no other filesystems are mounted (e.g. in single user mode).
- It may also contain commands which are used indirectly by scripts.
  Eg : cat, date, kill, rmdir etc.

/boot

- This directory contains everything required for the boot process except configuration files not needed at boot time and the map installer.
- Thus /boot stores data that is used before the kernel begins executing user-mode programs.

/dev

- The /dev directory is the location of special or device files.

/etc

- The /etc hierarchy contains configuration files.
- A "configuration file" is a local file used to control the operation of a program.
- It is recommended that files be stored in subdirectories of /etc rather than directly in /etc.

/home

- /home is a fairly standard concept, but it is clearly a site-specific filesystem.
- The setup will differ from host to host.
- Therefore, no program should assume any specific location for a home directory, rather it should query for it.

/lib

- The /lib directory contains those shared library images needed to boot the system and run the commands in the root filesystem, ie. by binaries in /bin and /sbin.

/media

- This directory contains subdirectories which are used as mount points for removable media such as floppy disks, cd roms and zip disks.

/mnt

- This directory is provided so that the system administrator may temporarily mount a filesystem as needed.
- The content of this directory is a local issue and should not affect the manner in which any program is run.
- This directory must not be used by installation programs: a suitable temporary directory not in use by the system must be used instead.

/opt

- /opt is reserved for the installation of add-on application software packages.
- A package to be installed in /opt must locate its static files in a separate /opt/ or / opt/ directory tree, where is a name that describes the software package and is the provider's LANANA registered name.

/run

- This directory contains system information data describing the system since it was booted.
- Files under this directory must be cleared (removed or truncated as appropriate) at the beginning of the boot process.

/sbin

- Utilities used for system administration (and other root-only commands) are stored in /sbin, /usr/ sbin, and /usr/local/sbin.
- /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.

/srv

- /srv contains site-specific data which is served by this system.

/tmp

- The /tmp directory must be made available for programs that require temporary files.
- Programs must not assume that any files or directories in /tmp are preserved between invocations of the program.

/usr

- usr is the second major section of the filesystem.
- /usr is shareable, read-only data. That means that /usr should be shareable between various FHS-compliant hosts and must not be written to.
- Any information that is host-specific or varies with time is stored elsewhere.

/var

- /var contains variable data files.
- This includes spool directories and files, administrative and logging data, and transient and temporary files.
- Some portions of /var are not shareable between different systems. For instance, /var/log, /var/ lock, and /var/run.
- Other portions may be shared, notably /var/mail, /var/cache/man, /var/cache/fonts, and /var/spool/news.
- /var is specified here in order to make it possible to mount /usr read-only.
- Everything that once went into /usr that is written to during system operation must be in /var.
- If /var cannot be made a separate partition, it is often preferable to move /var out of the root partition and into the /usr partition.