Linux File Systems: Filesystem Hierarchy Standard (FHS)

- The **Filesystem Hierarchy Standard (FHS)** defines the directory structure and its contents in Linux- and Unix-like operating systems
- In the **FHS**, all files and directories are present under the root directory (represented by /)

Table displaying directories and their description specific to the FHS

Directory	Description
/bin	Essential command binaries. Ex: cat, ls, cp.
/boot	Static files of the boot loader. Ex: Kernels, initrd
/dev	Essential device files. Ex: /dev/null
/etc	Host-specific system configuration files
/home	Users' home directories, holding saved files, personal settings, etc.
/lib	Essential libraries for the binaries in /bin/ and /sbin/
/media	Mount points for removable media
/mnt	Temporarily mounted filesystems
/opt	Add-on application software packages
/root	Home directory for the root user
/proc	Virtual file system providing process and kernel information as files
/run	Information about running processes. Ex: running daemons, currently logged-in users
/sbin	Contains the binary files required for working
/srv	Site-specific data for services provided by the system
/tmp	Temporary files
/usr	Secondary hierarchy for read-only user data
/var	Variable data. Ex: logs, spool files, etc.

Linux File Systems: Extended File System (EXT)

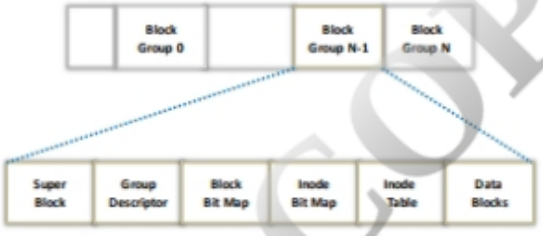
- EXT was the first file system for the Linux operating system to overcome certain limitations of the **Minix file system**
- It has a maximum partition size of 2 GB and a maximum file name size of 255 characters
- It removes the two major Minix file system limitations of a **64 MB partition size** and **short file names**
- The major limitation of this file system is that it doesn't support separate access, inode modification, or data modification time stamps
- It is replaced by the **second extended file system**

Notes:

Linux File Systems: Second Extended File System (EXT2)

1. EXT2 is a standard file system that uses improved algorithms, which significantly enhances its speed. It also maintains additional time stamps
2. It maintains a special field in the superblock that keeps track of the file system status and identifies it as either clean or dirty
3. Its major shortcomings are the risk of file system corruption when writing to EXT2, and that it is not a journaling file system

Physical layout of the EXT2 File system



Linux File Systems: Third Extended File System (EXT3)

- Ext3 is a journaling version of the EXT2 file system and is commonly used with the Linux operating system
- It is an enhanced version of the **EXT2** file system
- It uses **file system maintenance utilities** (like fsck) for maintenance and repair, like the EXT2 file system
- The following is the command to convert EXT2 to EXT3 file system:
  - `# /sbin/tune2fs -j <partition-name>`

Ext3 Features

Data Integrity
- It provides stronger **data integrity** for events that occur owing to computer system shutdowns

Speed
- As the EXT3 file system is journaling the file system, it has **higher throughput**, in most cases, than EXT2

Easy Transition
- The user can easily change the file system from EXT2 to EXT3 and **increase the performance** of the system

Notes: