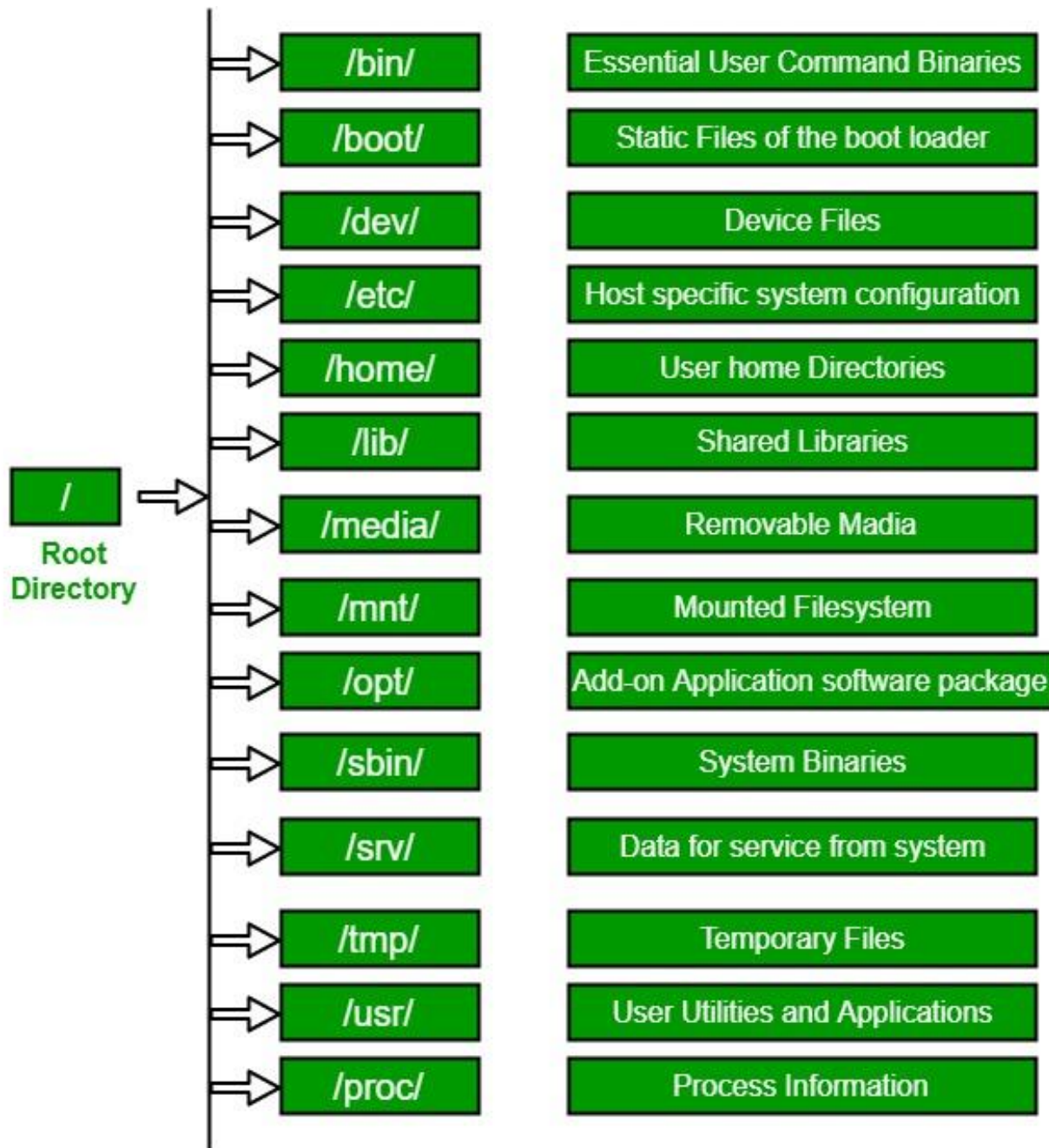


Linux File System

- A Linux file system is a structured collection of files on a disk drive or a partition.
- A partition is a segment of memory and contains some specific data.
- In our machine, there can be various partitions of the memory.
- Generally, every partition contains a file system.
- system needs to store data systematically so that we can easily access the files in less time.
- It stores the data on hard disks (HDD)
- It helps to arrange the file on the disk storage.
- It manages the file name, file size, creation date, and much more information about a file.

Linux Filesystem Hierarchy Standard (FHS)

- Filesystem hierarchy standard (FHS) describes directory structure and its content in Linux.
- It explains where files and directories should be located and what it contain.
- Its current version is 3.0 released on June 3rd 2015 and is maintained by Free Standards Group.
- Only Linux distributions follow the FHS.
- Below fig shows the FHS in linux.....



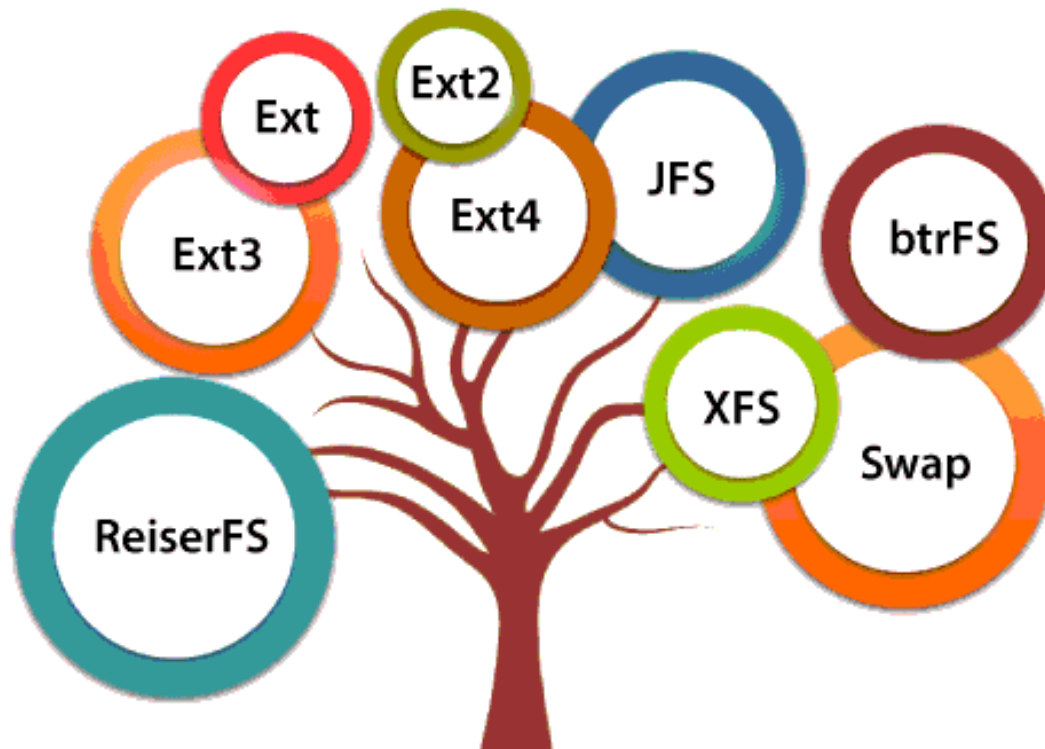
1. / (Root):

- Every single file and directory starts from the root directory
- The only root user has the right to write under this directory

Types of Linux File System

When we install the Linux operating system, Linux offers many file systems such as **Ext**, **Ext2**, **Ext3**, **Ext4**, **JFS**, **ReiserFS**, **XFS**, **btrfs**, and **swap**.

Types of Linux File System



Ext, Ext2, Ext3 and Ext4 file system-

- The file system Ext stands for **Extended File System**.
- It was primarily developed for **MINIX OS**.
- The **Ext** file system is an older version.
- **Ext2** is the first Linux file system that allows managing two terabytes of data.
- **Ext3** is developed through Ext2.
- it is an upgraded version of Ext2 .
- It is that it does not support servers because this file system does not support file recovery.
- **Ext4** file system is the faster file system among all the Ext file systems.
- It is a very compatible option for the SSD (solid-state drive) disks,
- it is the default file system in Linux distribution.

JFS File System

- JFS stands for **Journalled File System**,.
- it is developed by **IBM for AIX Unix**.
- It is an alternative to the Ext file system.
- It can also be used in place of Ext4.

•ReiserFS File System

- ReiserFS is an alternative to the Ext3 file system.
- The ReiserFS was used as the default file system in SUSE Linux.
- This file system dynamically supports the file extension.

•XFS File System

- XFS file system was considered as high-speed JFS.
- it is developed for parallel I/O processing.
- NASA still using this file system with its high storage server (300+ Terabyte server).

Btrfs File System

- Btrfs stands for the **B tree file system**.
- It is used for repair system, file administration, extensive storage configuration, and more.

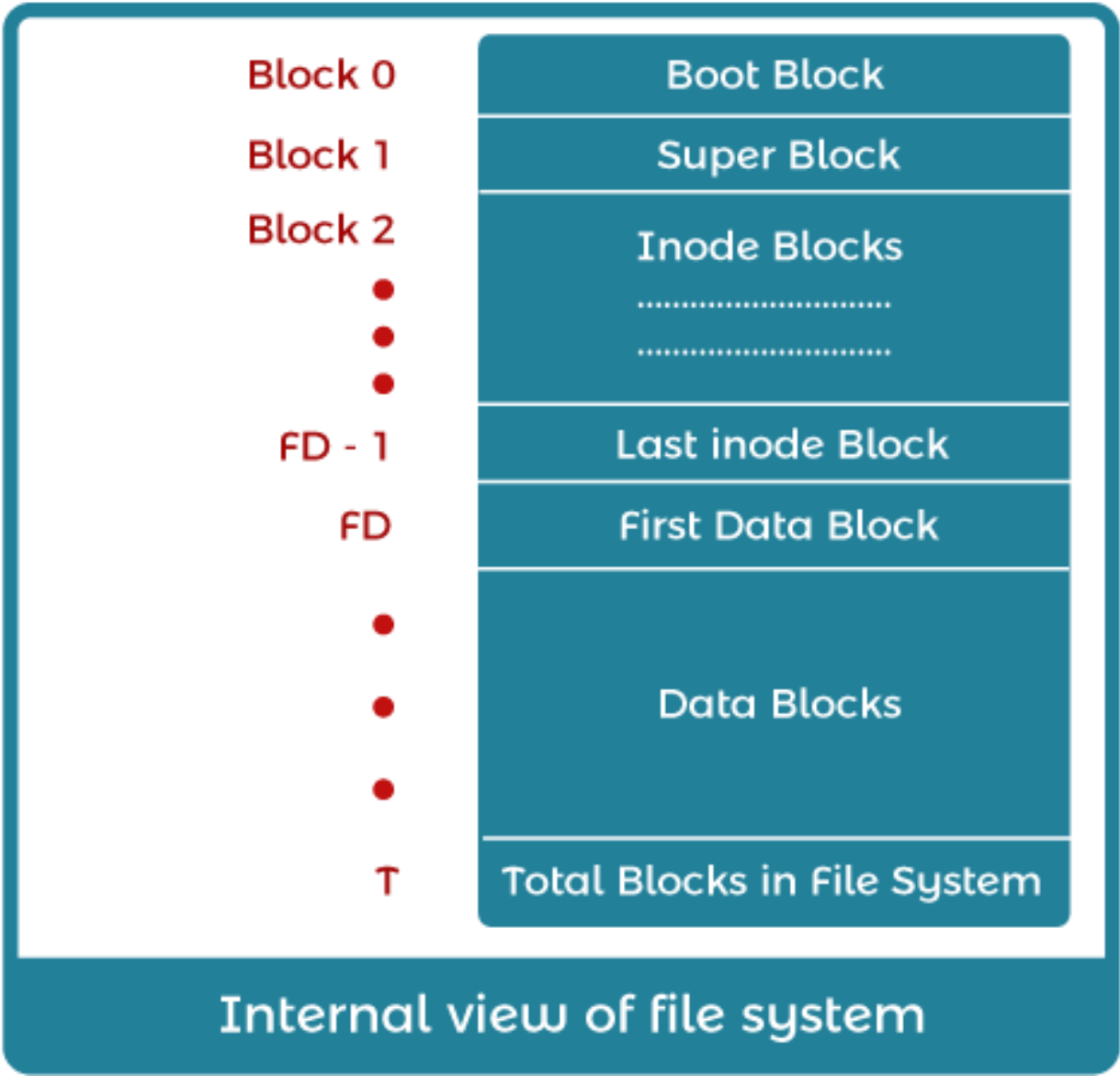
• Swap File System

- The swap file system is used for memory paging in Linux operating .
- A system that never goes in hibernate state is required to have swap space equal to its [RAM](#) size.

• **Hibernate mode** stop all works , but saves the information to your hard disk, which allows your computer to be turned off completely and use no energy.

• **Memory paging** is a memory management scheme by which a computer stores and retrieves data from secondary storage for use in main memory.

The internal view of the LINUX file system shows in the following figure



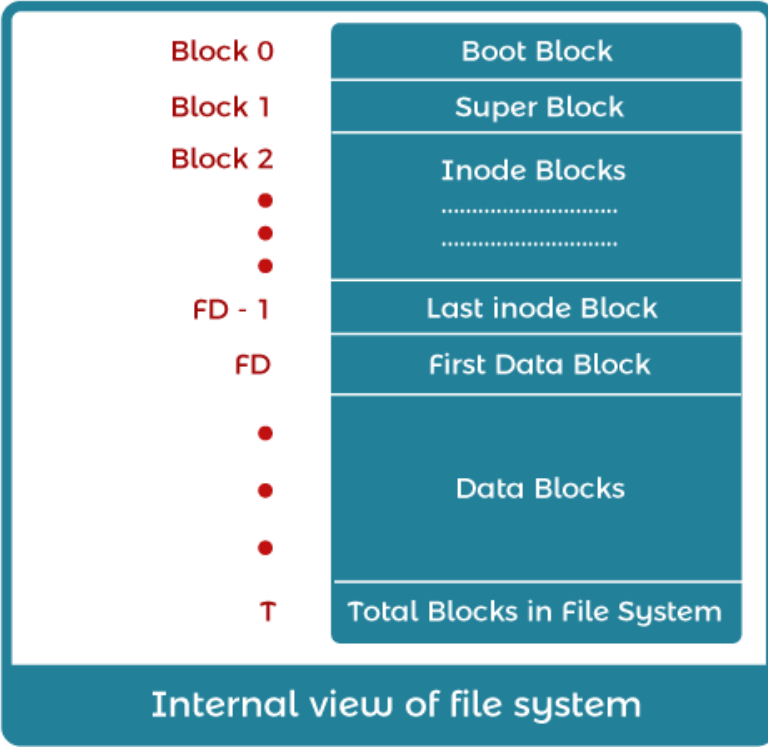
Boot block:

- It is the first block of the UNIX file system and contains a small bootstrap program.
- It is loaded into the main memory and executed when booted up.
- This bootstrap program is fetched from the boot block of one file system known as a root file system.
- Bootstrap is a free, open source front-end development framework for the creation of websites and web apps.*

Superblock:

- It contains static parameters of the file system.
 - total size,
 - the total number of data blocks
 - file system status,
 - number of inodes,
 - the free and used inodes,
 - block size for the file system.

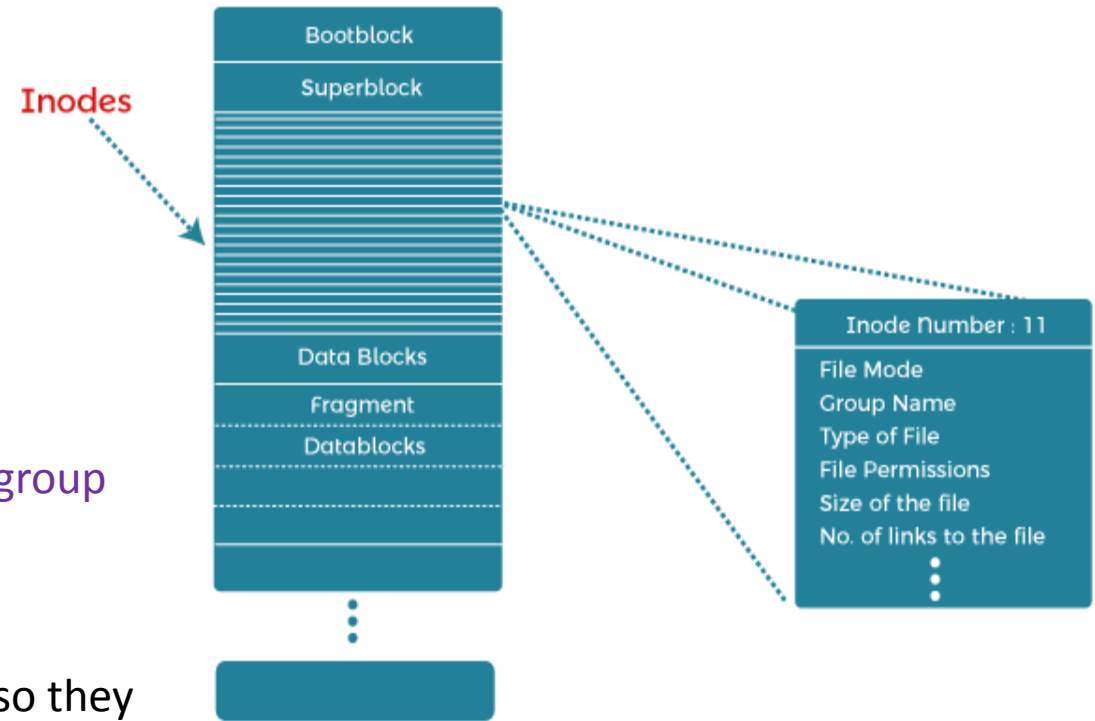
The superblock is kept in the memory and maintained by the kernel.



Inodes:

- It stands for index node.
- When a file is created, Linux assigned a unique number known as an inode number
- every file in UNIX has an inode number.
- The number of inodes represents the maximum number of files in the UNIX system.
- A file's inode is responsible for storing the entire file's relevant data, except its name.
- When a file is opened, the kernel copies its corresponding inode from disk to main memory.

- The inode includes
 - type of file,
 - a file's access information, i.e., read, write or execute
 - length of files in bytes,
 - representations of the user and group who owns the file.



UNIX treats all directories as files, so they also have an inode number.

Closure view of the inode block

Data blocks:

- The data blocks start at the end of the inode list and contain the file data.
- An allocated data block can belong to one and only one file in the UNIX system.
- The disk head seeks to access the data block.

Linux mount

- The mount command attaches the filesystem of an external device to the filesystem of a system.
- Mounting will make files, directories and devices available to the users.
- It mounts the external storage devices like hard disks, pen drives, USBs , DVD etc.
- umount** command unmount the mount point and detach the device from the system.

To mount a device generally, following syntax is used

Syntax:

```
mount -t type <device> <directory>
```

- Here, this command instructs kernel to attach filesystem of device at the specified directory.

THANK YOU