



Linux File System

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What is File System?

- ▶ Linux file system is generally a built-in layer of a Linux operating system used to handle the data management of the storage. 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.
- ▶ It does indexing of data as well as provides a way to store meta data about these files such as their permissions, names, creation and modification times and other attributes.
- ▶ Each Operating system uses their own choice of file system based on their targeted audience or requirements such as few are rich in security features, few does provide faster storage and few supports larger file sizes.

Types of Linux File Systems

A standard Linux Distribution provides the choice of partitioning disk with the file formats listed below, each of which has special meaning associated with it.

1. ext2
2. ext3
3. ext4
4. XFS
5. Btrfs

EXT2, EXT3

- ▶ The file system Ext stands for Extended File System. It was primarily developed for MINIX OS. The Ext file system is an older version, and is no longer used due to some limitations.
- ▶ 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 and contains backward compatibility. The major drawback of Ext3 is that it does not support servers because this file system does not support file recovery and disk snapshot.

EXT4


- ▶ The fourth generation File System of the Ext (Extended) file system family. It is the default file system in RHEL , Debian , Ubuntu and so on. Ext4 fs can read and write to Ext2 or Ext3 file systems, but the Ext4 it is not compatible with Ext2 and Ext3 drivers.
- ▶ Ext4 comes up with some new and improved features such as:
 - ▶ Extent-based metadata
 - ▶ Delayed allocation
 - ▶ Journal check summing
 - ▶ Large storage support
 - ▶ Multi-block allocation

XFS File System

- ▶ XFS is a robust and mature 64-bit journaling file system that supports very large files (scales to exabytes) and file systems on a single host. It is the default file system in RHEL 7. Journaling ensures file system integrity after system crashes (for example, due to power outages) by keeping a record of file system operations that can be replayed when the system is restarted and the file system remounted.
- ▶ XFS supports a wealth of features including the following:
 - ▶ Delayed allocation
 - ▶ Dynamically allocated inodes
 - ▶ B-tree indexing for scalability of free space management
 - ▶ Online defragmentation
 - ▶ Online filesystem growing
 - ▶ Comprehensive diagnostics capabilities
 - ▶ Scalable and fast repair utilities
 - ▶ Optimized to support streaming video workloads
 - ▶ Support a large number of parallel operations

BTRFS

- ▶ Btrfs stands for the B tree file system.
- ▶ It is used for fault tolerance, repair system, fun administration, extensive storage configuration, and more. It is not a good suit for the production system.
- ▶ It provides a very advanced filesystem feature set to Linux and might replace ext4 one day. Though Btrfs is currently considered experimental.
- ▶ BTRFS can support up to a 16 exbibyte partition (sixteen times of the data of Ext4) and a file of the same size as ext4.

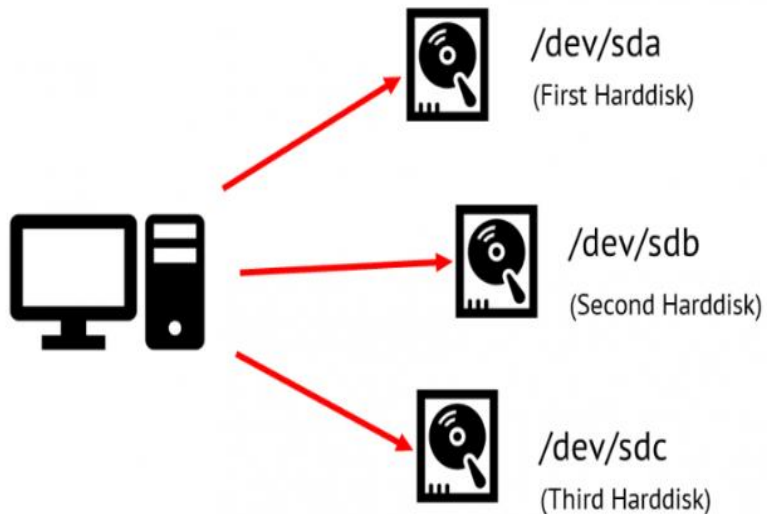


Find out your file system

There are many ways we can find out file system details on our system.

- ▶ `lsblk -f`
- ▶ `df -hT`
- ▶ `blkid`

Familiar with the device naming syntax

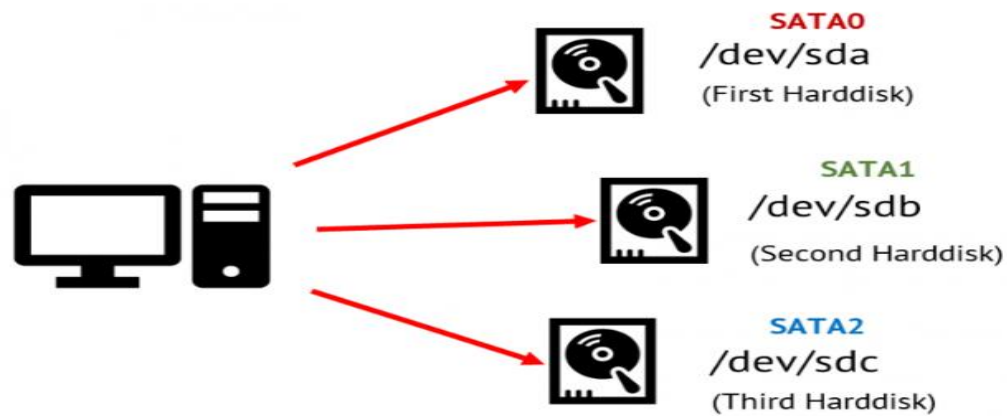


Device Naming Syntax

- The first hard disk in the system is sda.
- The second hard disk in the system is sdb.
- And the third hard disk in the system is sdc.

All of these hard disks are addressed us

Familiar with the device naming syntax



device naming allocation as per port