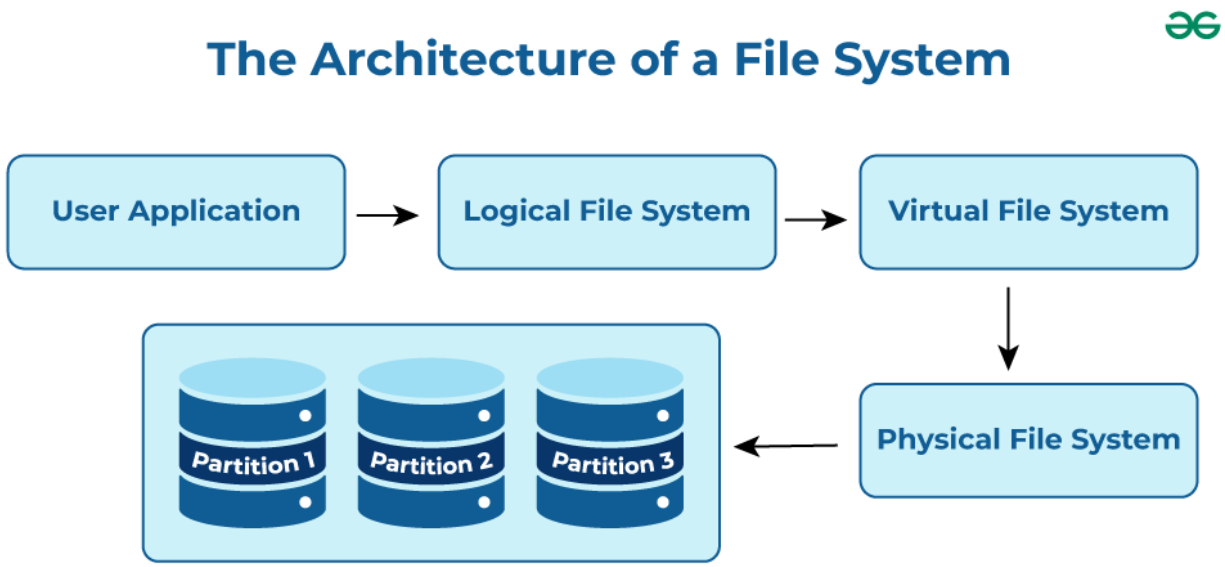

Designing and developing an on-disk file system in Linux involves . It typically involves partitioning a disk, choosing a filesystem type (like ext4, XFS, or btrfs), and mounting the filesystem.
Here's a more detailed breakdown:
1. Disk Partitioning:

- Before creating a filesystem, you need to partition the physical disk, dividing it into logical units that can be treated as independent storage.
- Tools like `fdisk` or `parted` are used for this task.
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2. Choosing a Filesystem Type:

- Linux offers various filesystem types, each with its own characteristics (performance, features, etc.).
- Common choices include:
    - **ext4:** A robust and widely used filesystem for Linux.
    - **XFS:** A high-performance filesystem, often preferred for servers.
    - **btrfs:** A newer filesystem with features like snapshots and RAID support.
    - Other options include ext2, ext3, and FAT32.
    -

3. Creating the Filesystem:

- Once you have a partition, you can use a tool like `mkfs` (e.g., `mkfs.ext4`, `mkfs.xfs`) to create the filesystem.
- This tool formats the partition according to the chosen filesystem type.
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4. Identifying the Filesystem UUID:

- Each filesystem has a unique identifier (UUID) that can be used to mount it automatically.
- You can find the UUID using `blkid`.
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5. Mounting the Filesystem:

- After creating the filesystem, you need to mount it to a directory in the Linux file system hierarchy, making its contents accessible.
- You can use the `mount` command with the UUID or the device path.
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6. Basic Components of a File System:

- **Superblock:** Contains metadata about the filesystem, including the size, number of blocks, and number of inodes.
- **Inodes:** Store information about each file, like its type, size, permissions, and the location of its data blocks.
- **Data Blocks:** Contain the actual file contents.