



DEPARTMENT OF AIML 23CST202- OPERATING SYSTEMS

II YEAR IV SEM AIML-B

UNIT 4-FILE SYSTEM

TOPIC –FILE SYSTEM MOUNTING,FILE SHARING

FILE SYSTEM MOUNTING

What is File System Mounting?

Mounting is a process in which the operating system adds the directories and files from a storage device to the user's computer file system. The file system is attached to an empty directory, by adding so the system user can access the data that is available inside the storage device through the system file manager. Storage systems can be internal hard disks, external hard disks, USB flash drivers, SSD cards, memory cards, network-attached storage devices, CDs and DVDs, remote file systems, or anything else.

Terminologies used in File System Mounting

- **File System:** It is the method used by the operating system to manage data storage in a storage device. So, a user can access and organize the directories and files in an efficient manner.
- **Device name:** It is a name/identifier given to a storage partition. In windows, for example, "D:" in windows.
- **Mount point:** It is an empty directory in which we are adding the file system during the process of mounting.

Mounting Indifferent Operating Systems

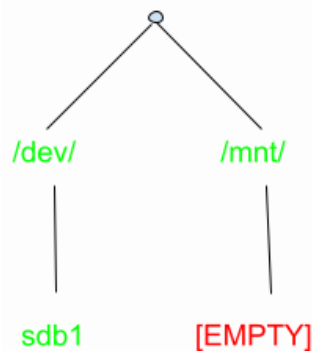
1. Linux-Unix based OS

We want to mount **/dev/sdb1** to an existing directory **/mnt**.

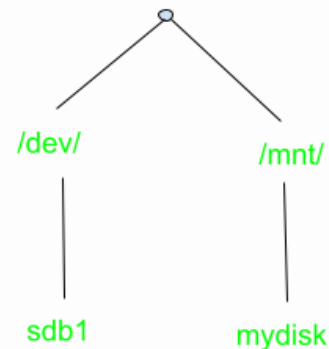
```
sudo mount /dev/sdb1 /mnt/mydisk
```

After mounting, we have to unmount after use

```
sudo umount /mnt/mydisk
```



(Before Mounting)



(After Mounting)

before and after mounting

2. Windows OS

In windows mounting is very easy for a user. When we connect the external storage devices, windows automatically detect the file system and mount it to the drive letter. Drive letter may be **D:** or **E:**.

Steps:

- Connect an external storage device to your PC.
- Windows detects the file system on the drive (e.g., FAT32 or NTFS) and assigns it a drive letter, such as "E:".
- You can access the drive by going through, THIS PC --> FILE EXPLORER --> "E:" drive
- Access the data.

3. Mac OS

In Mac OS when we connect an external storage it will automatically mount, and it will be accessible via Finder. As an advanced mounting method user can also use the command **diskutil** in Terminal.

Method 1:

Steps:

- Connect an external storage device to your MAC.
- MS OS detects the file system and automatically mount it.
- You can access the drive by opening Finder, and it will appear in the sidebar.

Method 2(Using diskutil):

To mount a drive with a known identifier: **disk2s1**

```
diskutil mount /dev/disk2s1
```

To unmount:



```
diskutil unmount /dev/disk2s1
```

FILE SHARING

File Sharing in an Operating System(OS) denotes how information and files are shared between different users, computers, or devices on a network; and files are units of data that are stored in a computer in the form of documents/images/videos or any others types of information needed.

For Example: Suppose letting your computer talk to another computer and exchange pictures, documents, or any useful data. This is generally useful when one wants to work on a project with others, send files to friends, or simply shift stuff to another device. Our OS provides ways to do this like email attachments, cloud services, etc. to make the sharing process easier and more secure.

Now, file sharing is nothing like a magical bridge between Computer A to Computer B allowing them to swap some files with each other.

Primary Terminology Related to File Sharing

Let's see what are the various ways to achieve this, but there are some important terminologies one should know beforehand. Let's discuss those primary terminologies first:

- **Folder/Directory:** It is basically like a container for all of our files on a computer. The folder can contain files and even other folders maintaining like hierarchical structure for organizing data.
- **Networking:** It is involved in connecting computers or devices where we need to share the resources. Networks can be local (LAN) or global (Internet).
- **IP Address:** It is numerical data given to every connected device on the network
- **Protocol:** It is given as the set of rules which drives the communication between devices on a network. In the context of file sharing, protocols define how files are transferred between computers.
- **File Transfer Protocol (FTP):** FTP is a standard network protocol used to transfer files between a client and a server on a computer network.

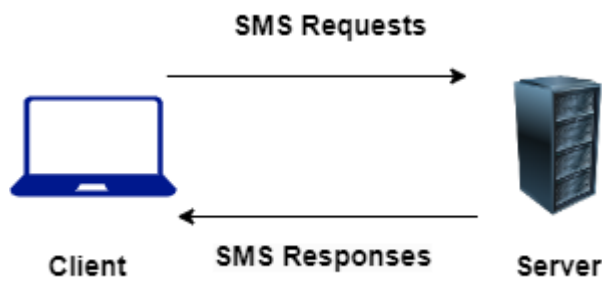
Various Ways to Achieve File Sharing

Let's see the various ways through which we can achieve file sharing in an OS.

1. Server Message Block (SMB)

SMB is like a network based file sharing protocol mainly used in windows operating systems. It allows our computer to share files/printer on a network. SMB is now the standard way for seamless file transfer method and printer sharing.

Example: Imagine in a company where the employees have to share the files on a particular project . Here SMB is employed to share files among all the windows based operating system.orate on projects. SMB/CIFS is employed to share files between Windows-based computers. Users can access shared folders on a server, create, modify, and delete files.



SMB File Sharing

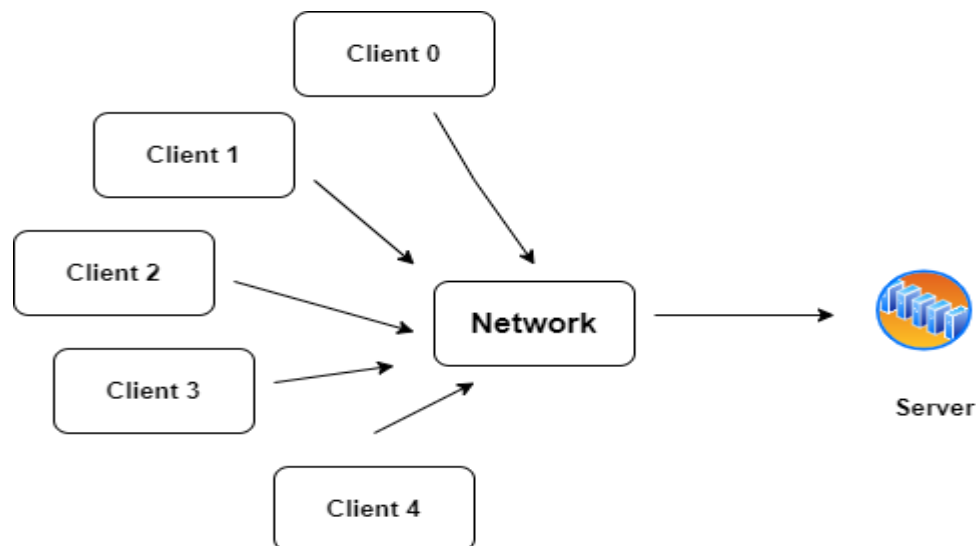
Read more about SMB in the article :

SMB and its implementation

2. Network File System (NFS)

NFS is a distributed based file sharing protocol mainly used in Linux/Unix based operating System. It allows a computer to share files over a network as if they were based on local. It provides a efficient way of transfer of files between servers and clients.

Example: Many Programmer/Universities/Research Institution uses Unix/Linux based Operating System. The Institutes puts up a global server datasets using NFS. The Researchers and students can access these shared directories and everyone can collaborate on it.



NFS File

Sharing

Read more about NFS in the article:

NFS and its architecture

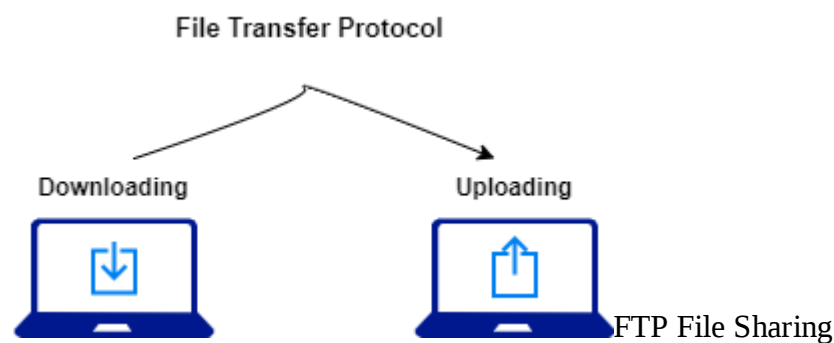
3. File Transfer Protocol (FTP)



It is the most common standard protocol for transferring of the files between a client and a server on a computer network. FTPs supports both uploading and downloading of the files, here we can download,upload and transfer of files from Computer A to Computer B over the internet or between computer systems.

Example: Suppose the developer makes changes on the server. Using the FTP protocol, the developer connects to the server they can update the server with new website content and updates the existing file over there.

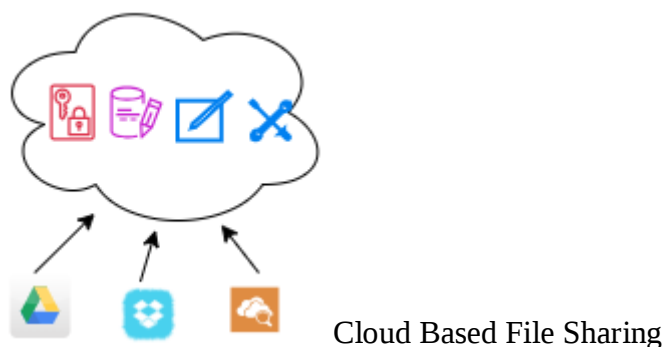
Read more about FTP: FTP and it's implementation



4. Cloud-Based File Sharing

It involves the famous ways of using online services like Google Drive, DropBox , One Drive ,etc. Any user can store files over these cloud services and they can share that with others, and providing access from many users. It includes collaboration in realtime file sharing and version control access.

Ex: Several students working on a project and they can use Google Drive to store and share for that purpose. They can access the files from any computer or mobile devices and they can make changes in realtime and track the changes over there.



These all file sharing methods serves different purpose and needs according to the requirements and flexibility of the users based on the operating system.