**Level 1: Windows File Systems**

Refer to the following document when answering the questions for Level 1.

<https://fossbytes.com/fat32-vs-ntfs-vs-exfat-difference-three-file-systems/>

What is the definition of a file system? A file system is basically a set of rules used to decide how data is stored and fetched in a [storage device](http://fossbytes.com/how-do-hard-drives-work-and-store-tons-of-data/), be it a hard drive, flash drive, or something else. Like the conventional way we used to store data in our offices in different files, the same method is deployed in computing.

1. What are the three file systems used on Windows computers?

**FAT32** File System. **FAT32** is an advanced version of **FAT file system**. It can be used on drives from 512 MB to **2TB** in size. One of the most important features of **FAT** and **FAT32** is that they offer compatibility with operating systems other than **Windows 2000**.

1. What are the properties of the FAT file system?
   1. The FAT file system was the original Windows 95 file system. When was it introduced? **File Allocation Table** (**FAT**) is a computer [file system](https://en.wikipedia.org/wiki/File_system) architecture and a family of industry-standard file systems utilizing it. The FAT file system is a continuing standard which borrows source code from the original, [legacy](https://en.wikipedia.org/wiki/Legacy_system) file system and proves to be simple and robust.[[3]](https://en.wikipedia.org/wiki/File_Allocation_Table#cite_note-Microsoft_2010_FAT-4) It offers useful performance even in lightweight implementations, but cannot deliver the same performance, reliability and scalability as some modern file systems. It is, however, supported for compatibility reasons by nearly all currently developed [operating systems](https://en.wikipedia.org/wiki/Operating_system) for personal computers.
   2. How is the FAT16 file system different from the FAT32 file system? Differences between **FAT12**, FAT16, FAT32. a **FAT12** file system contains 1.5 bytes per cluster within the file allocation table. a FAT16 file system contains 2 bytes per cluster within the file allocation table. a FAT32 file system includes 4 bytes per cluster within the file allocation table.
   3. What is the file size limit of the FAT32 file system? **file Allocation Table** (**FAT**) is a computer [file system](https://en.wikipedia.org/wiki/File_system) architecture and a family of industry-standard file systems utilizing it. The FAT file system is a continuing standard which borrows source code from the original, [legacy](https://en.wikipedia.org/wiki/Legacy_system) file system and proves to be simple and robust.
   4. What is the disk size limit of the FAT32 file system? FAT32 provides the following enhancements over previous implementations of the FAT file system: FAT32 supports drives up to **2 terabytes** in size

* What other devices currently use the FAT file system? FAT12 (12-bit **File** Allocation Table)
* **FAT16** (16-bit **File** Allocation Table)
* **FAT32** (32-bit **File** Allocation Table)
* exFAT (Extended **File** Allocation Table)

1. What are the properties of the NTFS file system?
   1. The NTFS file system is what is used on current Windows computers. When was it introduced? So basically **NTFS** (NT **file system**; sometimes New Technology **File System**) is the **file system** that the **Windows** NT operating **system** uses for storing and retrieving **file**s on a hard disk. **NTFS** is the **Windows** NT equivalent of the **Windows** 95 **file** allocation table (FAT) and the OS/2 High Performance **File System** (HPFS).
   2. How is the NTFS file system different from the FAT file system? NTFS (NT file system; sometimes New Technology File System) is the file system that the **Windows NT** operating system uses for storing and retrieving files on a hard disk. NTFS is the **Windows NT** equivalent of the Windows 95 file allocation table (FAT) and the OS/2 High Performance File System (**HPFS**).
   3. What is the file size limit of the NTFS file system?

Understanding File-Size Limits on NTFS and FAT. In the April 17 Windows Client UPDATE, I wrote about the **4GB** file-size limit in FAT32. In response, I've received dozens of email messages telling me that FAT32 isn't limited to **4GB** but rather that the **4GB** limit is a FAT16 artifact.

* 1. What is the disk size limit of the NTFS file system?

However, large compressible files become highly fragmented since every chunk smaller than **64 KB** becomes a fragment. According to research by Microsoft's NTFS Development team, 50–60 GB is a reasonable maximum size for a compressed file on an NTFS volume with a 4 KB (default) cluster (block) size.

* 1. What are some notable features of the NTFS file system?

1. Scalability. **NTFS** is optimized for 4 KB clusters, but supports a maximum cluster size of 2 MB. ...
2. Journaling. ...
3. Hard links. ...
4. Alternate data streams (ADS) ...
5. **File** compression. ...
6. Sparse **files**. ...
7. Volume Shadow Copy. ...
8. Transactions.

F What are some limitations regarding how other devices support the NTFS file system?

using 64 KB clusters, the maximum size Windows XP NTFS volume is 256 TB minus 64 KB. Using the default cluster size of **4 KB**, the maximum NTFS volume size is **16 TB** minus **4 KB**. Both of these are vastly higher than the 128 GB limit in Windows XP SP

1. Provide a summary of the exFAT file system.

**exFAT** (Extended **File** Allocation Table) is a Microsoft **file system** introduced in 2006 optimized for flash memory such as USB flash drives and SD cards.

**Level 2: Windows NTFS Permissions**

Refer to the following document when answering the questions for Level 2.

<http://www.ntfs.com/ntfs-permissions.htm>

1. Read the information provided on the “Setting Permissions” page.
   1. Summarize how to view and set file and folder permissions. So basically in any Windows network, you can set sharing permissions for drives and folders. On that network, each user can choose to share entire drives or individual folders with the network.
   2. Select a file or folder on your student drive. The folders, often referred to as **directories**, are used to organize files on your computer. The folders themselves take up virtually no space on the hard drive.

c.Summarize the permissions set on your file/folder. (using words and a screen shot) ll versions of Windows have the built-in screen capture feature allowing you to capture either the entire screen or a single active window. The two options are detailed below Press the **Print Screen** (sometimes marked as **Prt Sc** or **Prt Scn**) key on the keyboard (generally located in the top right hand corner) to capture an image of the entire screen and store it in the Windows clipboard.

1. Read the information provided on the “Advanced Permissions” page.
   1. List the advanced permissions that affect files. The reason that these permissions are called "advanced" permissions is because they appear in the Advanced Security Settings dialog box. To get to them, you must click the Advanced button in the Properties dialog box, Security tab.
   2. List the advanced permissions that affect folders.
2. Read the information provided on the “Basic Permissions” page.
   1. The basic permissions are listed at the top of the columns in the table. List the 6 basic permissions. **Basic Full Control, Basic Modify, Basic Read & Execute, Basic List Folder Contents, Basic Read, Basic Write.**
   2. What basic permissions allow a user to write data to a file? The permission descriptions in the previous section described permissions relative to files and folders. There is a different set of permissions for Registry keys, printers, and Active Directory objects.
   3. What basic permissions allow a user to delete a folder? Allows or denies deleting the file or folder. If you don't have Delete permission on a file or folder, you can still delete it if you have been granted Delete Subfolders and Files on the parent folder.
3. .

**Level 3: Windows Share Permissions**

Refer to the following document when answering the questions for Level 3.

<https://blog.netwrix.com/2018/05/03/differences-between-share-and-ntfs-permissions/>

1. What are share permissions? Share permissions manage access to folders shared over a network; they don’t apply to users who log on locally. Share permissions apply to all files and folders in the share; you cannot granularly control access to subfolders or objects on a share. You can specify the number of users who are allowed to access the shared folder. Share permissions can be used with NTFS, FAT and FAT32 file systems.
   1. Who do share permissions affect? This section will be of interest to an administrator who is familiar with security settings on a FAT32 volume where permissions for a shared folder are the only permissions protecting files and subfolders in the shared folder.
   2. Who do share permissions not affect? Because of the fact that users have can have many different rights settings and objects can have many different permission settings, it is possible that conflicting permission settings might apply to a particular object and access method.
   3. Summarize the 3 types of share permissions.
2. Summarize the main difference between NTFS and Share Permissions.

The main **difference between NTFS permissions and share permissions** is the location of the person that is affected by either one. **NTFS permissions** apply to local users or those who has physical access to the machine. **Share permissions** apply only to folders and files that have been **shared** to the network

1. Summarize how to view and change share permissions.

Right-click the **shared folder**.

Click “Properties”.

Open the “**Sharing**” tab.

Click “Advanced **Sharing**”.

Click “**Permissions**”.

Select a user or group from the list.

Select either “Allow” or “Deny” for each of the settings

**Level 4: Your Files and Folders**

1. Organized your files and folders on your network drive to match your GitHub repository.
2. Create a folder on your student drive for Computer Science Work Navigate to the location where you want to create the folder. ...
3. Hold down the Ctrl, Shift, and N keys at the same time. ...
4. Enter your desired folder name. ...
5. Navigate to the location where you want to create the folder.
6. Right-click on a blank space in the folder location.
   1. Create sub-folders (e.g. Topic A, etc.) to match the folders on your GitHub repository
   2. Move your answer files and other work you have done for this course into the proper sub-folders.
   3. Show your organized folders/files to Mr. Nestor
7. View and list some of the important NTFS permissions that have been set on your files and folders. When a user creates a file or folder, Windows 2003 automatically assigns Full Control permissions to the creator/owner. Full Control allows the user to assign permissions to other users for the files he or she creates.