Module A.5 – Windows File Systems

**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/>

1. 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, be it a hard drive, flash drive, or something else.

A defined set of data called a ‘File’ is stored at a specified location in a storage device. If the file system is kicked out of the computing world, all we will be left with is a large chunk of unrecognizable data in our storage media.

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

FAT32, NTFS, exFAT are three different files systems used to store data in a storage device.

3. What are the properties of the FAT file system?

a. The FAT file system was the original Windows 95 file system. When was it introduced?

1977.

b. How is the FAT16 file system different from the FAT32 file system?

FAT32 surmounted the limited volume size offered by the FAT16 file system. FAT32 allows you to store files of size up to 4GB and the maximum disk size can go up to 16TB.

c. What is the file size limit of the FAT32 file system?

FAT32 allows you to store files of size up to 4GB.

d. What is the disk size limit of the FAT32 file system?

The maximum disk size can go up to 16TB.

e. What other devices currently use the FAT file system?

It has been widely implemented beyond the realm of computers, like gaming consoles, HDTVs, DVD & Blu-Ray players, and practically any device with a USB port. All versions of Windows and Linux distributions support the FAT32 file system, even Apple’s MacOS provides complete support it.

4. What are the properties of the NTFS file system?

a. The NTFS file system is what is used on current Windows computers. When was it introduced?

1993.

b. How is the NTFS file system different from the FAT file system?

The NTFS file system offers a theoretical file size of 16 [EB](https://en.wikipedia.org/wiki/Exabyte) – 1 KB which is 18,446,744,073,709,550,592 bytes, compared to FAT32’s max file size of 4 GB and max disk size of 16 TB.

c. What is the file size limit of the NTFS file system?

NTFS file system offers inexhaustible file size limits. As of now, it would be next to impossible for us to even reach somewhere near the boundary. The NTFS file system offers a theoretical file size of 16 EB – 1 KB which is 18,446,744,073,709,550,592 bytes.

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

The implemented capacity of NTFS file system is only 256 TB out the whopping 16 EB – 1KB.

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

NTFS v3.1 was launched with Microsoft’s Windows XP and it hasn’t been changed much since then, although, numerous additions like partition shrinking, self-healing, and NTFS Symbolic links have been added.

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

The NTFS file system is supported by Windows XP and later versions. Apple’s Mac OS X provides read-only support for an NTFS-formatted drive and only a few Linux variants are able to provide write support for NTFS.

5. Provide a summary of the exFAT file system.

The exFAT (Extended FAT) is another Microsoft proprietary file system which finds its use in ball games where the FAT32 feels out of breath. Most of the modern digital cameras use exFAT. High capacity SDXC memory cards are now pre-formatted with the exFAT file system, as it is lighter in contrast to NTFS and supports file of sizes, more than 4GB.

**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.

a. Summarize how to view and set file and folder permissions.

To set permissions for an object:

1. In Windows Explorer, right-click a file, folder or volume and choose **Properties** from the context menu. The **Properties** dialog box appears.
2. Click the **Security** tab.
3. Under **Group or user names**, select or add a group or user.
4. At the bottom, allow or deny one of the available permissions.

b. Select a file or folder on your student drive.

c. Summarize the permissions set on your file/folder. (using words and a screen shot)

**Traverse Folder/Execute File**

* Traverse Folder: Allows or denies moving through a restricted folder to reach files and folders beneath the restricted folder in the folder hierarchy. Execute File: Allows or denies running program (executable) files.

**List Folder/Read Data**

* List Folder: Allows or denies viewing file names and subfolder names within the folder. List Folder only affects the contents of that folder and does not affect whether the folder you are setting the permission on will be listed.Read Data: Allows or denies viewing data in files.

**Read Attributes**

* Allows or denies viewing the attributes of a file or folder, for example, "read-only" and "hidden".
* **Read Extended Attributes**
* Allows or denies viewing the extended attributes of a file or folder. Extended attributes are defined by programs and may vary by program.
* **Create Files/Write Data**
* Create Files: Allows or denies creating files within the folder.
* Write Data: Allows or denies making changes to a file and overwriting existing content.
* **Create Folders/Append Data**
* Create Folders: Allows or denies creating subfolders within the folder.
* Append Data: Allows or denies making changes to the end of the file but not changing, deleting, or overwriting existing data.