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Operating System

Lab Manual: 7

Questions:

Question #1:

Define file.

File:

A file is an object on a computer that stores data, information, settings, or commands used with a computer program. In a GUI (Graphical user interface), such as Microsoft windows, files display as icons that relate to the program that opens the file.

For example:

all PDF icons, appear the same and open in Adobe Acrobat or the reader associated with PDF files. If a program is associated with a program, double-clicking the icon opens it in the default program.

Question #2:

Define Directory.

Directory:

A directory is another name for a folder. file systems use directories to organize files within a storage device, such as an HDD or SSD.

For example:

System files may be located in one directory, while user files

may be stored in another.
While directories often contain files, they may also contain other directories, or subdirectories. The user folder, for instance, may include directories such as Documents, Pictures, and videos. Each of these directories may contain files and other subdirectories. This resulting directories structure. The top-level directory of a volume that contains all other directories is aptly labeled the root directory.

Question #3:

Why we use file allocation strategies?

File Allocation Strategies:

The allocation method defines how the files are stored in the disk blocks. The direct access nature of the disks gives us the flexibility to implement the files.

There are different kinds of methods that are used to allocate disk space. we must select the best method for the file allocation because it will directly affect the system performance and system efficiency. with the help of the allocation, we can utilize the disk, and also files can be accessed.

There are various types of allocation methods:

1- Contigious allocation
2- Linked allocation
3- Indexed allocation
4- Linked Indexed allocation
5. Multilevel Indexed allocation
6. Inode
7. clustering
8. Extents.

Question #4:

What are the advantages and dis-advantages Indexed Allocation?

Indexed Allocation:

Indexed allocation brings all pointers together into one location called the **index block.**

Each file has its own index block, which is an array of disk-block addresses (address i is the address of ith block of the file).

Advantages:

- Supports direct access.
- No external fragmentation.
- Does not require keeping a large FAT in memory.

Disadvantages:

- wasted space within index blocks.
- Data blocks may be spread all over the volume, resulting in many read/write head movements.

Question #5:

Define Sequential file allocation.

Sequential file allocation:

In the sequential file Allocation method, the file is divided into smaller chunks and these chunks are then allocated memory blocks in the main memory. These smaller file chunks are stored one after another in a contiguous manner, this makes the file searching easier for the file allocation system. The contigious (sequential) file Allocation is one of the file Allocation Methods in the Operating System. The other file Allocation method is the Non-Contigious file Allocation which

also has two types -
* Linked file Allocation
* Indexed file Allocation.

Question #6:

what are the advantages and disadvantages of sequential file Allocation?

Advantages:

- Both the sequential and direct Accesses are supported by this. for direct access, the address of the kth block of the file which starts at block b can easily be obtained as (b+k).
- This is extremely fast since the number of seeks are minimal because of contiguous allocation of file blocks.

Disadvantages:

- This method suffers from both internal and external fragmentation. This makes it inefficient in terms of memory utilization.
- Increasing file size is difficult because it depends on the availability of contigious memory at a particular instance.
