FILE MANAGEMENT IN OPERATING SYSTEM

A file is a collection of related information that is recorded on secondary storage. Or file is a collection of logically related entities. From user's perspective a file is the smallest allotment of logical secondary storage.

The name of the file is divided into two parts as shown below:

- name
- extension, separated by a period.

File Systems

File system is the part of the operating system which is responsible for file management. It provides a mechanism to store the data and access to the file contents including data and programs. Some Operating systems treats everything as a file for example Ubuntu.

The File system takes care of the following issues

1. File Structure

We have seen various data structures in which the file can be stored. The task of the file system is to maintain an optimal file structure.

2. Recovering Free space

Whenever a file gets deleted from the hard disk, there is a free space created in the disk. There can be many such spaces which need to be recovered in order to reallocate them to other files.

3.Disk space assignment to the files

The major concern about the file is deciding where to store the files on the hard disk. There are various disks scheduling algorithm which will be covered later in this tutorial.

4.Tracking data location

A File may or may not be stored within only one block. It can be stored in the non contiguous blocks on the disk. We need to keep track of all the blocks on which the part of the files reside.

Objective of File management System

1.It provides I/O support for a variety of storage device types.

2.Minimizes the chances of lost or destroyed data

3.Helps OS to standardized I/O interface routines for user processes.

4.It provides I/O support for multiple users in a multiuser systems environment.

Properties of a File System

1.Files are stored on disk or other storage and do not disappear when a user logs off.

2.Files have names and are associated with access permission that permits controlled sharing.

3.Files could be arranged or more complex structures to reflect the relationship between them.

File structure

A File Structure needs to be predefined format in such a way that an operating system understands . It has an exclusively defined structure, which is based on its type.

Three types of files structure in OS:

1.A text file: It is a series of characters that is organized in lines.

2.An object file: It is a series of bytes that is organized into blocks.

3.A source file: It is a series of functions and processes.

File Attributes

A file has a name and data. Moreover, it also stores meta information like file creation date and time, current size, last modified date, etc. All this information is called the attributes of a file system.

some important File attributes used in OS:

Name: It is the only information stored in a human-readable form.

Identifier: Every file is identified by a unique tag number within a file system known as an identifier.

Location: Points to file location on device.

Type: This attribute is required for systems that support various types of files.

Size. Attribute used to display the current file size.

Protection. This attribute assigns and controls the access rights of reading, writing, and executing the file.

Time, date and security: It is used for protection, security, and also used for monitoring