Basic Concepts:

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Computer can store information on various storage media, such as magnetic tapes, magnetic disks and optical disks.

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So as to make the computer system to conveniently use, the OS provides a uniform logical view of information storage.

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The visible aspect of an OS is the file system.

file system consists of two distinct parts:

1) collection of files, each storing related data.

2) directory ~~system~~. structure.

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file system provides a mechanism for on-line storage of and access to both data and programs of OS.

③

The OS abstracts from the physical properties of its storage devices to define a logical storage unit ie file.

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These files are mapped to physical devices by OS. These storage devices are nonvolatile. so that the contents are persistent through powerfailure or system reboots

A file is a named collection of related information that is recorded on secondary storage.

from a user's perspective, file is a smallest allotment of logical secondary storage.

, Data cannot be written to secondary storage unless they are within a file

- A file is a sequence of bits, bytes, lines or records the meaning of which is defined by the creator or user.

The info in a file is defined by the creator.

Many different types of info can be stored in a file — source programs, object programs, executable programs, numeric data, text, records, graphic images, sound recordings etc.

file Attributes

file's attributes vary from one os to another but some common attributes are

1. **Name:** A file is named for the user convenience of the user and file is refered by its name.

2. **Identifier:** This is a unique tag, usually a number, for identifying the file within the file system, it is non human readable name for the file.

3. **Type:** This info is needed for systems that support different types of files.

4. **location:** Pointer to file location on device

5. **size:** The current size of the file (in bytes, words)

6. **Protection:** This controls and assigns the power of reading, writing and executing.

7. **Time, date and user identification:** This info can be useful for Protection security and usage monitoring.

The info about all files is kept in the directory structure, which also resides on secondary storage.

File Operations:

A file is a abstract data type.
OS performs system calls to create, write, read, reposition, delete and truncate files.
let us see what actually OS does to ~~do the~~ perform the following file operations.

1. Creating file: Two steps are necessary to create a file
1). space in the file system must be found for the file.
2). entry for the new file must be made in directory.

2. writing a file: To write a file, we make a system call specifying both name of the file and the info to be written to the file.

The system must keep a write pointer to the location in the file where the next write takes place and every time write pointer need to be updated whenever write occurs.

Reading a file: we use a system call that specifies the name of the file and where the next block of the file should be put.

System needs to keep a read pointer to the location in the file where the next read takes place. Once the read takes place, the read pointer is updated.

Both read and write operation use the same pointer for saving space and reducing system complexity

Repositioning within a file: The directory is searched for the appropriate entry, and the current file-position pointer is repositioned to a given value.

Deleting a file: To delete a file, we search the directory for the named file and the directory is searched for the appropriate entry.

The we release all file space, so that it can be reused by other files. and erase the directory Entry

Truncating file: if the user may want to erase the contents of the file but keep its attributes. Rather than forcing the user to delete the file and recreate it, this function allows all the attributes to remain unchanged except for file length, It lets the file to reset the length to zero and file space will be released.

Some of the other operations are appending,

→ renaming the Existing file.

Instead of always searching the directory for the entry, to avoid this constant searching, many system use open() system call is made before a file is first used actively

OS keeps a small table called the open-file table, containing info abt all the open files.

When a file Operation is requested first it will check the open-file table instead of again a system call.

when the file is no longer actively used it is closed by the process and OS removes its entry from the open-file table.

Create, delete work with closed files rather than openfiles

file types: (depending upon the ~~files~~ content we write files are classified

1. Executable files	exe, com, bin	ready to run machine languge program
2. object	obj, o	compiled, machine language
3. source code	c, java, pas asm, a	source code in various languages
~~4. ~~ ~~batch~~	~~batch~~, sh	
4. text	txt, doc	textual data, document
5. archeive	arc, zip, tar	related files grouped into one file

...ments
...lly and convert it to

multimedia	mpeg, mov, rm mp3,	binary file containing audio/video

file structure :

File types can be used to indicate the internal file structure of the file. Every file type need a structure to be understood by OS

every OS may have multiple structures for supporting different files

if it has no.of structures then it need to contain code, for each to support these file structures. This is a bad disadvantage

some OS have only minimal number of file structures

This provides max flexibility. each program includes its own code to interrupt a input file was to change to appropriate structure.

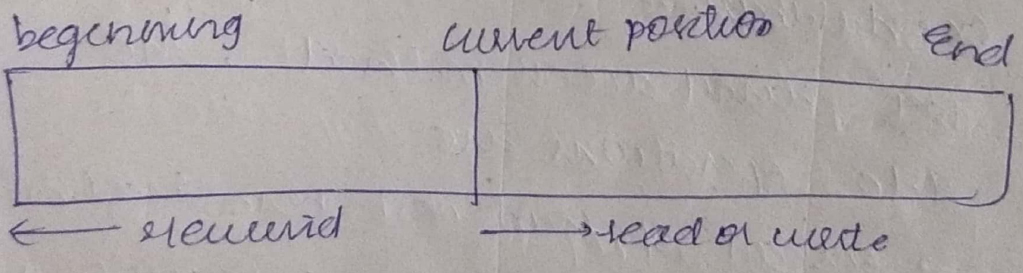
w The way that files are accessed and read into memory is determined by Access methods ..

1) Sequential Access :

This is the simplest access method. The information is accessed in order, one record after the other.

* when read operation is carried out (read pointer next) - reads the next portion of the file and automatically advances the pointer.

When write operation is carried out (write next) - ~~write~~ appends to the end of the file and advance the pointer to the ~~ee~~ end of the newly written record.



ex: compiler.

Direct Access Method:

This method is also called relative access method.

A file is made of ~~file~~ fixed length of record, this method is based on disk model of a file, since disk allows random access to any file block. The file is viewed as a numbered sequence of block.

for every record a number sequence is given. Thus we may read block 14, 53, 47 randomly without any restrictions

This access method is of great use for immediate access to large amount of info

ex: database.

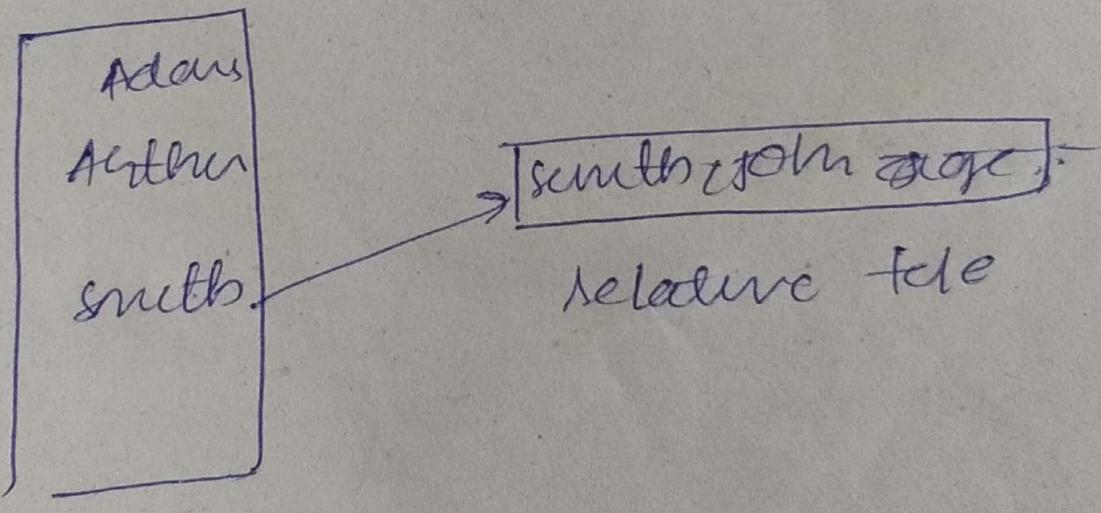
for direct access method, the file operations are

→ instead of read next here read n

→ instead of write next here write n

Other Access Methods:

These methods generally involve the construction of an index for the file. an index contains pointers to the various blocks. To find a record in the file we first search the index and then use the pointer to access the file directly and to find the desired record.



index file