File management

- Desirable properties of a file
  - Long-term Existence
  - Sharable
  - Structure.

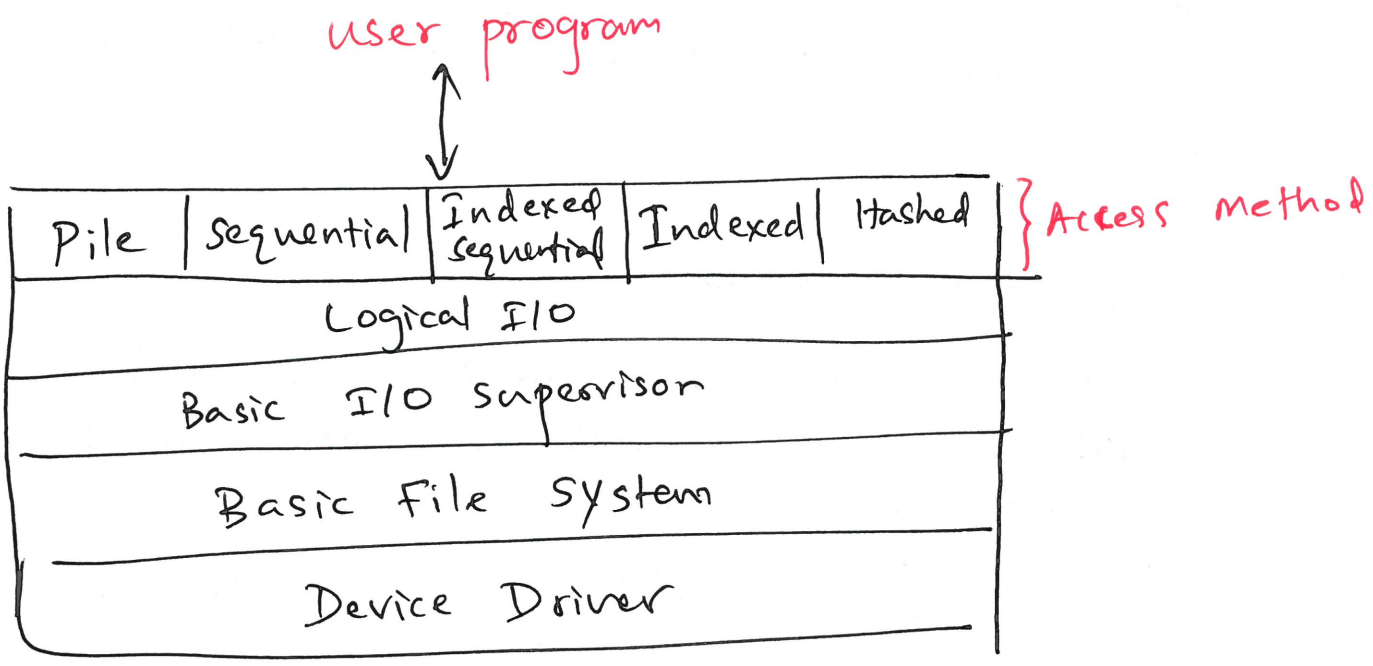
File structure

Field - Basic Element of Data

Record - collection of related fields.

File - collection of ~~similar~~ similar records.

File system Software architecture.



Device Drivers

- communicate directly with the peripheral devices or their controlers or channels.
- Responsible for starting I/O ~~request~~ operations on a device & processing the completion of a request.

Basic File System / Physical I/O Level

- primary interface with the environment outside of the computer system.
- Deals with block of data that are exchanged with disk/SSD/tape.
- concerned ~~on~~ with the placement of blocks of data in SS and on the buffering of those blocks in main memory.
- Does not understand the content of the data or the structure of the files involved.
- part of OS.

Basic I/O Supervisor.

- Responsible for I/O initiation & termination.
- maintains ~~device~~ control structures that deal with device I/O, scheduling, and file status.
- Selects ~~which~~ the device on which file is located to perform the I/O request.
- I/O buffers are assigned and secondary storage is allocated at this level.

Logical I/O

- Enables users and applications to access records.
- Deals with file records.
- Maintains basic data about files.

Access Method.

- standard interface between applications & the file system & devices that holds data.

File Organization Structure Types.

1. The pile
2. The sequential File
3. The Indexed sequential File
4. The indexed file.
5. Direct or hashed file.

The pile

- variable-length records.
- chronological order
- simply accumulate the mass of data and save it.
- Record access by exhaustive search.

The sequential file.

- Fixed record sizes
- Sequential order based on a key-field.

The indexed sequential file.

- We have an index on top of sequential file
- reduces time takes to access a single record.
- multiple levels of index can be used.

Indexed file.

- variable length records
- multiple exhaustive indexes for different fields.

Hashed file.

- Hashing function is used to keep track of the record location.
- fixed-length records.

Record blocking

- packs records into a block.
  - Fixed - Length blocking
  - variable length - spanned blocking
  - variable length - unspanned.

File Allocation

- One SS, file consists of collection of blocks.
- OS is responsible for allocating blocks to files.
- Space is allocated to a file as one or more portions (contignous set of allocated blocks)
- File Allocation Table (FAT)
  - Data structure that keeps track of the portions assigned to a file.

Strategies

- ⇒ contignous
- → chained
- → Indexed