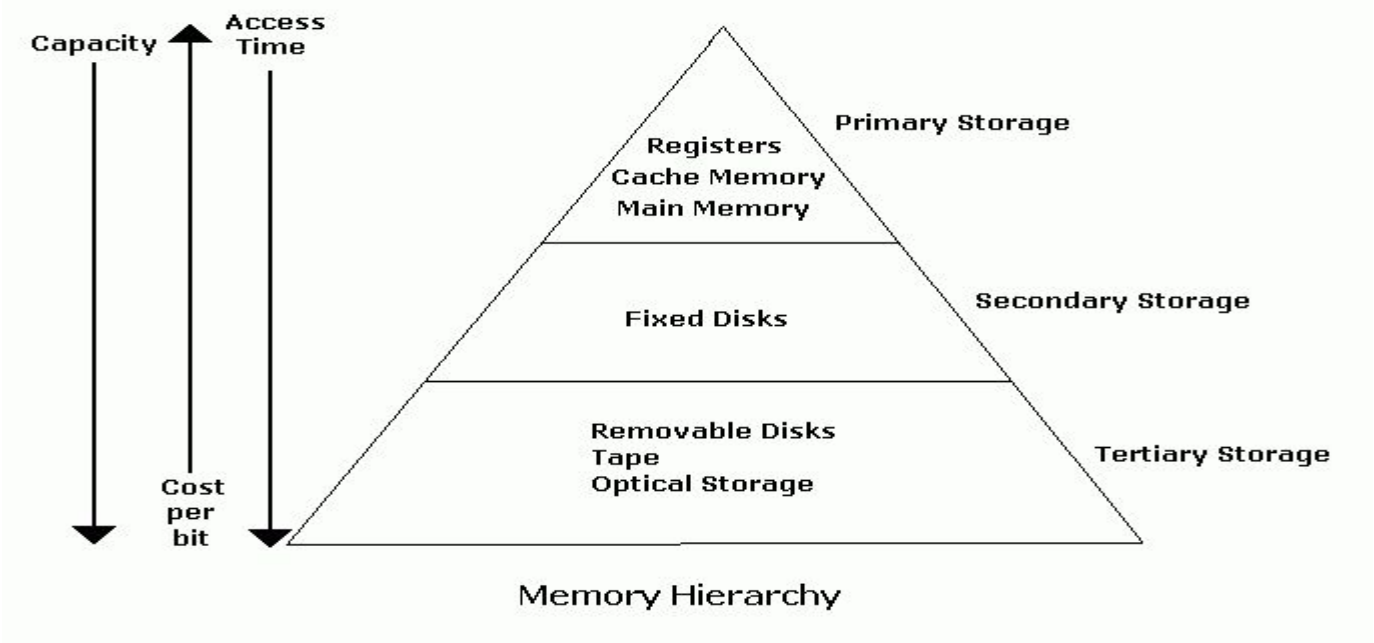
CD-ROM - FUNCTIONS

3.6 Strengths and Weaknesses

- CD-ROM Strengths: High storage capacity, inexpensive price, durability.
- CD-ROM Weaknesses: extremely slow seek performance (between 1/2 a second to a second) ==> Intelligent File Structures are critical.

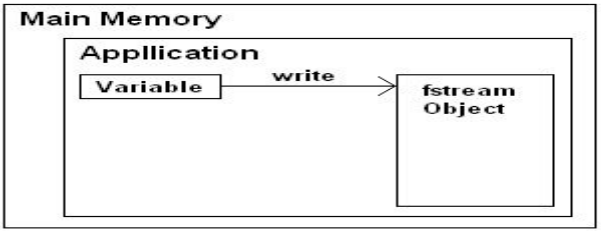
3.7 Storage as a Hierarchy



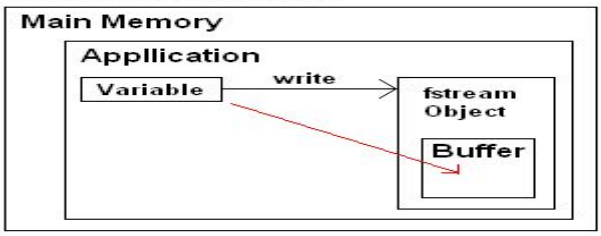
Memory Hierarchy

3.8 A Journey of a Byte

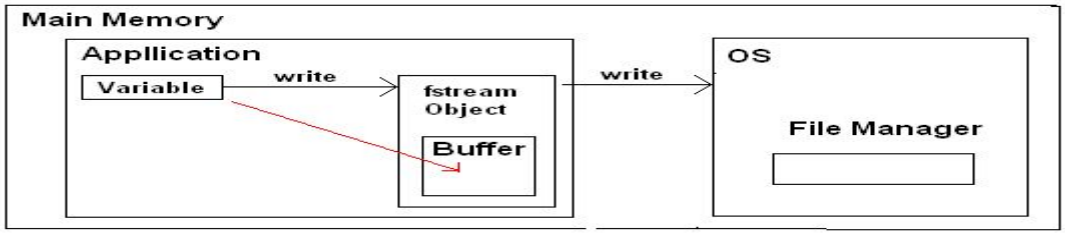
1. An application in main memory issues a write command to an fstream object.



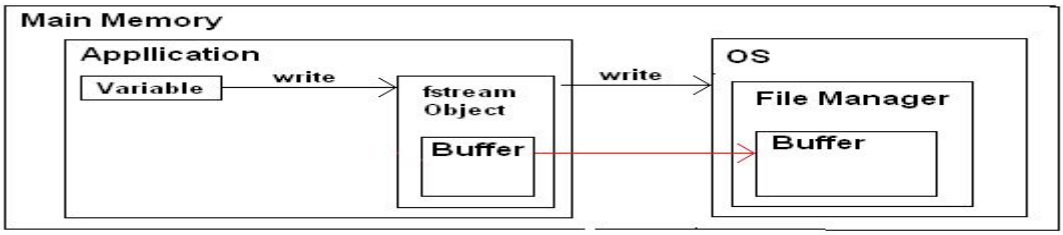
2. The fstream object copies the variable into an internal buffer.



3. After repeated write, the fstream buffer fills up and the fstream object issues a write request to the operating system

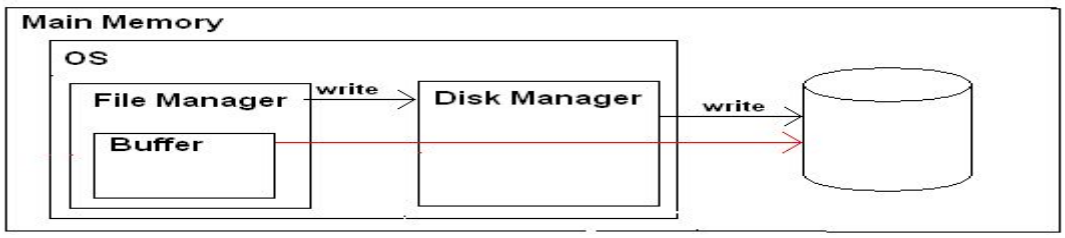


4. The operating system file manager copies the contents of the fstream buffer into an OS buffer.



5. After repeated writes, the OS buffer fills up, and the File Manager issues a write request to the OS disk manager.

6. The disk manager issues a write request to the disk drive



3.9 Buffer Management

Buffer Bottlenecks

Assume that the system has a single buffer and is performing both input and output on one character at a time, alternatively.

- In this case, the sector containing the character to be read is constantly over written by the sector containing the spot where the character will be written, and vice versa.
- In such a case, the system needs more than 1 buffer: at least, one for input and the other one for output.
- Moving data to or from disk is very slow and programs may become I/O Bound ==> Find better strategies to avoid this problem.

Buffering strategies

- Multiple buffering -Double Buffering
  -Buffer Pooling
- Move mode and Locate mode
- Scatter/Gather I/O