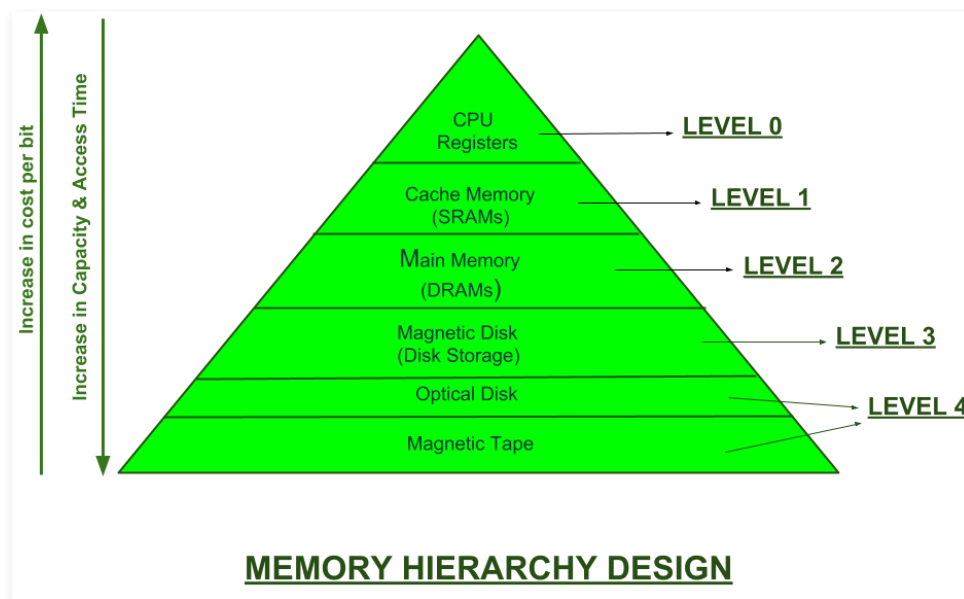


Memory Hierarchy Design and its Characteristics

Difficulty Level : Easy • Last Updated : 17 Dec, 2018

In the Computer System Design, Memory Hierarchy is an enhancement to organize the memory such that it can minimize the access time. The Memory Hierarchy was developed based on a program behavior known as locality of references. The figure below clearly demonstrates the different levels of memory hierarchy :



This Memory Hierarchy Design is divided into 2 main types:

1. External Memory or Secondary Memory –

Comprising of Magnetic Disk, Optical Disk, Magnetic Tape i.e. peripheral storage devices which are accessible by the processor via I/O Module.

2. Internal Memory or Primary Memory –

Comprising of Main Memory, Cache Memory & CPU registers. This is directly

1. **Capacity:**

It is the global volume of information the memory can store. As we move from top to bottom in the Hierarchy, the capacity increases.

2. **Access Time:**

It is the time interval between the read/write request and the availability of the data. As we move from top to bottom in the Hierarchy, the access time increases.

3. **Performance:**

Earlier when the computer system was designed without Memory Hierarchy design, the speed gap increases between the CPU registers and Main Memory due to large difference in access time. This results in lower performance of the system and thus, enhancement was required. This enhancement was made in the form of Memory Hierarchy Design because of which the performance of the system increases. One of the most significant ways to increase system performance is minimizing how far down the memory hierarchy one has to go to manipulate data.

4. **Cost per bit:**

As we move from bottom to top in the Hierarchy, the cost per bit increases i.e. Internal Memory is costlier than External Memory.

Attention reader! Don't stop learning now. Practice GATE exam well before the actual exam with the subject-wise and overall quizzes available in [GATE Test Series Course](#).

Learn all [GATE CS concepts with Free Live Classes](#) on our youtube channel.

Like 0

Previous

Next



RECOMMENDED ARTICLES



Page : 1 2 3 4 5 6