



A

Seminar Report

On

“MULTI CORE”

By

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CERTIFICATE

Certified that seminar work entitled “**MULTI - CORE**” is a bonafide work carried out in the second semester by “**GULSHAN PATEL**” in partial fulfillment for the award of Master of Computer Application in National Institute of Technology Karnataka, Surathkal during the Academic year 2018-2021.

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ABSTRACT

There are many basic data structures that can be used to solve application problems. Array is a good static data structure that can be accessed randomly and is fairly easy to implement. Linked Lists on the other hand is dynamic and is ideal for application that requires frequent operations such as add, delete, and update. One drawback of linked list is that data access is sequential. Then there are other specialized data structures like, stacks and queues that allows us to solve complicated problems (eg: Maze traversal) using these restricted data structures. One other data structure is the hash table that allows users to program applications that require frequent search and updates. They can be done in $O(1)$ in a hash table.

One of the disadvantages of using an array or linked list to store data is the time necessary to search for an item. Since both the arrays and Linked Lists are **linear structures** the time required to search a “linear” list is proportional to the size of the data set. For example, if the size of the data set is n , then the number of comparisons needed to find (or not find) an item may be as bad as some multiple of n . So imagine doing the search on a linked list (or array) with $n = 10^6$ nodes. Even on a machine that can do million comparisons per second, searching for m items will take roughly m seconds. This not acceptable in today’s world where speed at which we complete operations is extremely important. Time is money. Therefore it seems that better (more efficient) data structures are needed to store and search data.

Core

- A core is a part of something that is central to its existence or character
- In computer system CPU is referred as core
- Basically there are two type of core processor
 1. Single core processor
 2. Multi core processor

Processor

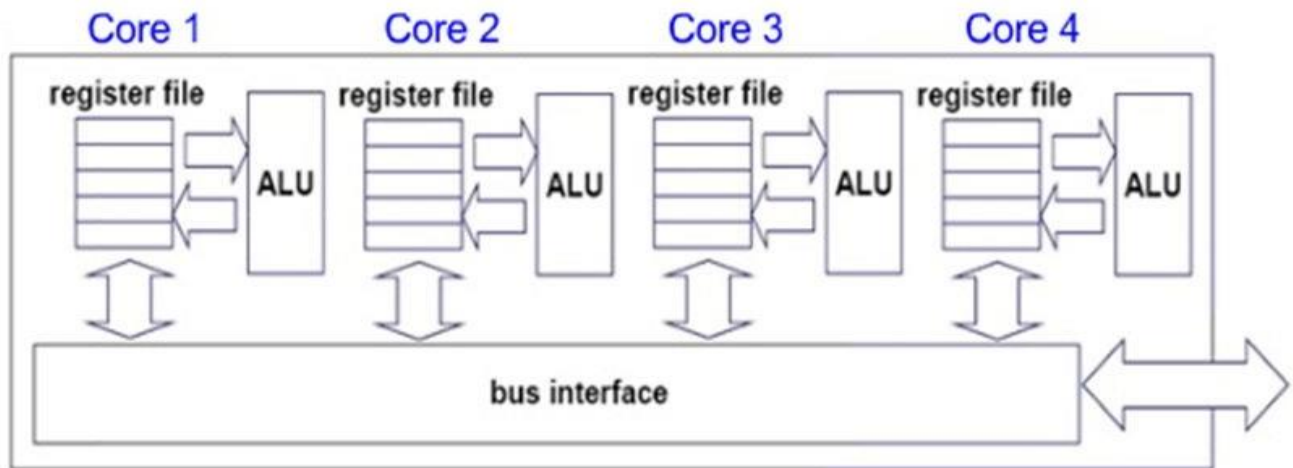
What is Processor?

- A processor is the logical circuitry that responds to and processes the basic instruction that drive a computer.

What do you mean by multicore processor?

A **‘multi-core processor’** is a single computing component with two or more independent processing units called cores, which read and execute program instruction.

MULTICORE ARCHITECTURE



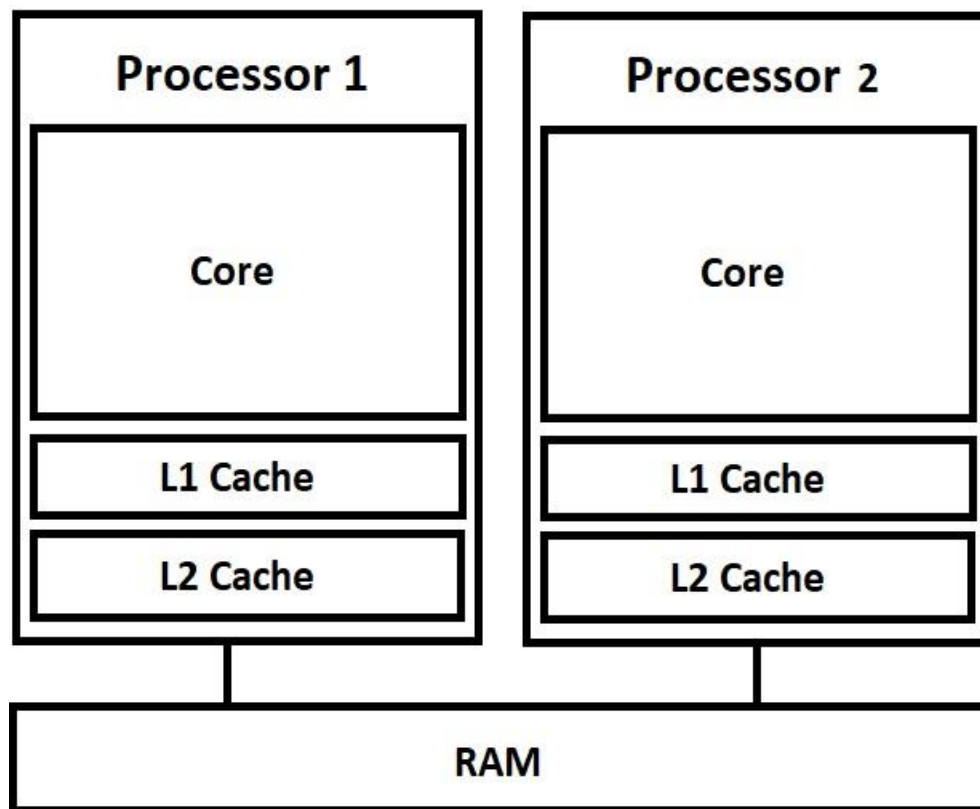
HOW MULTICORE PROCESSOR WORK ?

Multithreading

- A thread is the most basic form of code that can be independently managed by operating system
- The operating system must be able to support multi core processor
- The ability of OS of splitting the code in to threads, to feed in to core simultaneously

Hyper Threading

- A single physical core with hyper threading appears as two logical CPU hyper threading is a way of cleaver
- It debuted CPU with Pentium 4 ht back in 2002
- The operating system can tell the processor to do multiple things at the same time using separate cores.
- Multiprocessing can be implemented through data sharing
- A multi core processor has levels of cache memory called |1 and |2 generally |1 is unique for each code and |2 is shared.



- One of the main advantages to have a set cache is the ability to use a cache to its full set
- First the processor looks in L1 and then L2 and so on and finally the RAM or main memory.

Parallel processing

- In computers parallel processing is the processing of program instruction by dividing them among multiple processes with the objective of running a program in less time.
- The next step in parallel processing was the introduction of multiprocessing. In these systems, two or more processors share the work to be done.
- The earliest version had a master slave configuration one processor was programmed to be responsible for all of the work. In the system the other (the slave) performed only those tasks it was assigned by the master.

Intel Processor

Some of Intel core processor are :-

- i3 - The 1st core i3 processor launch on Jan 7 2010 with 2 core processing unit and hyper threading.

Feature – Low power consumption, small cache

- i5 - The 1st core i5 processor launch on Sep 8 2009. A mobile i5 processor has 2-core and hyper threading and desktop have 4-core and no hyper threading. Then all have in common include on board graphics and turbo boost.
- i7 - Intel core i7 has an initial brand name apply to several family of laptop and desktop 64-bit version. All core i7 has hyper threading for heavy workload. More cache, In better on board graphics and fast turbo boosts There are low type processors.

Problems with Single Core

- To increase the work first you need to increase the clock time.
- Increasing clock time drastically increase power consumption and heat dissipation to extremely high level making the processor inefficient.

Multi core processor offer

- Energy Efficiency- By using multi core processor architect can decrease the number of embedded computer.
- Performance multiprocessing can increased performance by running multiple applications concurrently.

Disadvantage

- Cost is more as compared to a single or a lesser Core processor
- Does not have twice the efficiency than that of a single Core processor in practical.
- More difficult to manage thermally and lower density In single Core processors.

- Fast battery drainage because more number of cores running in parallel.

Future of Multi-core Processor

- Increasing the number of transistors per square millimeter of silicon.
- Increasing the number of cores in a processor in an efficient manner.
- Better materials for the products of a processor to reduce cost.
- More environmentally friendly production methods.
- Better software to improve the process of threading.

Bibliography

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Thank You