

UNIT - 8

MULTICORES, MULTIPROCESSORS



- Multiprocessor, Multicore
- Amdahl's law
- Shared Memory system
- Multithreading
- cluster & Message passing system
- Different types of processors.

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Explain Multiprocessor, Multicores & Parallelism

Refer class Notes.



Explain Amdahl's law.

Execution time after improvement =

Execution time affected by improvement

Amount of improvement

+

Time
unaffected

[Problem on above formula - Refer class Notes]

Write a note on Shared Memory Multiprocessors

(Diagram & Theory - Refer class Notes)

Explain MultiThreading

Refer class Notes.

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Write a note on clusters & Message passing Multiprocessors.

In case of message passing systems, many processors would have their own memory apart from cache.

(Diagram; Refer class Notes)

The multi processor must communicate using message passing techniques. To support message passing, normally 2 routines [functions] are used.

- ① send message routine
- ② receive message routine

send message routine is a function used by processor with private memory to pass message to another processor.

receive message routine is a function used by a processor with private memory to receive message from another processor.

using the send & receive message, the processors coordinate the task of execution.

clusters are generally collection of computers that are connected to each other over their I/O interconnect.

These are several drawbacks of cluster.

- ① Maintenance of cluster systems are quite difficult than compared with maintaining multiprocessor system.

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- ② Another drawback is division of memory. A cluster of n machines has n independent memories & n copies of O.S.
- ③ Another drawback is that clusters are connected using I/O interconnect which slowdown performance.

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Explain the following

SISD, MIMD, SIMD, SPMD & VECTOR

SISD - SISD stands for single instruction stream single data stream. It is a uniprocessor system. i.e. it can execute single instruction & single data.

MIMD - MIMD stands for multiple instruction stream, multiple data stream. It is a multiprocessor system. i.e. multiple instruction & multiple data can be handled simultaneously.

SIMD - SIMD stands for single instruction stream multiple data stream. It is a multiprocessor computer in which same instruction is applied to many data streams.

SPMD - SPMD stands for single program multiple data streams, i.e. a single program which runs on all processors.

VECTOR are array processor which does simultaneous processing.