- OS Concepts

- Process vs Threads

- Serial vs Parallel Execution

- Single vs Multithreading Process

- Parallel Computing

- Computational Problem

- Applications

- Why?

- Limitations Of Serial Computing

- Amdahl's Law

- Von Neumann Architecture

- Direct Memory Access ( DMA )

- Flynn's Taxonomy

- SISD

- SIMD

- MISD

- MIMD

- Parallel Terminology

- Task

- Parallel Task

- Serial Execution

- Parallel Execution

- Shared Memory

- Distributed Memory

- Communication

- Synchronization

- Granularity

- Fine grained

- Coarse grained

- Observed Speedup

- Parallel Overhead

- Massively Parllel

- Scalability

- Scope Of Parallelism

- Implicit Parallelism: Trends in Microprocessor Architectures

- Pipelining And Superscalar Execution

- Performance

- Limitations

- True data dependency

- Resource dependency

- Branch dependency

- ISsue mechanisms

- Efficiency Considerations

- Very Long Instruction Word (VLIW) Processors

- Considerations

- Limitations of memory system performance

- Bandwidth and latency

- Memory latency

- Latency using caches

- Impact of memory bandwidth

- Hiding memory latency

- latency hiding

- Multithreading

- Prefetching

- Tradeoffs

- Interconnection networks

- Static and dynamic interconnection networks

- Network interfaces

- Network topologies: buses

- Network topologies: crossbar

- Message passing costs in parrallel computers

- Task decomposition

- Examples

- Granularity

- Degree of concurrency

- Critical Path Length

- Limits

- Task interaction graphs

- Processes and mapping

- Decomposition techniques

- Recursive

- Data

- Exploratory decomposition

- Speculative decomposition

- Symmetric vs Asymmetric Multiprocessing

- Memory Architectures

- Shared memory

- UMA

- NUMA

- UMA vs NUMA

- Advantages

- Disadvantages

- Distributed memory

- Advantages

- Disadvantages

- Hybrid Distributed Shared Memory

- Architecture

- Communication

- Scalability

- Draw backs

- Software Availability

- Parallel Programming Models

- Shared Memory

- Threads

- Message Passing

- Data Prallel

- Hybrid

- Single Program Multiple Data (SPMD)

- Multiple Program Multiple Data (MPMD)

- OpenMP

- Complete Chapter# 7 slide