OPERATING SYSTEM

Computer System Architecture

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Computer Science

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OPERATING SYSTEMS

Computer-System Architecture

- Most systems use a single general-purpose processor
  - Most systems have special-purpose processors as well
- **Multiprocessors** systems growing in use and importance
  - Also known as **parallel systems**, **tightly-coupled systems**
  - Advantages include:
    - **Increased throughput**
    - **Economy of scale**
    - **Increased reliability** – graceful degradation or fault tolerance
  - Two types:
    - **Asymmetric Multiprocessing** – each processor is assigned a specific task.
    - **Symmetric Multiprocessing** – each processor performs all tasks

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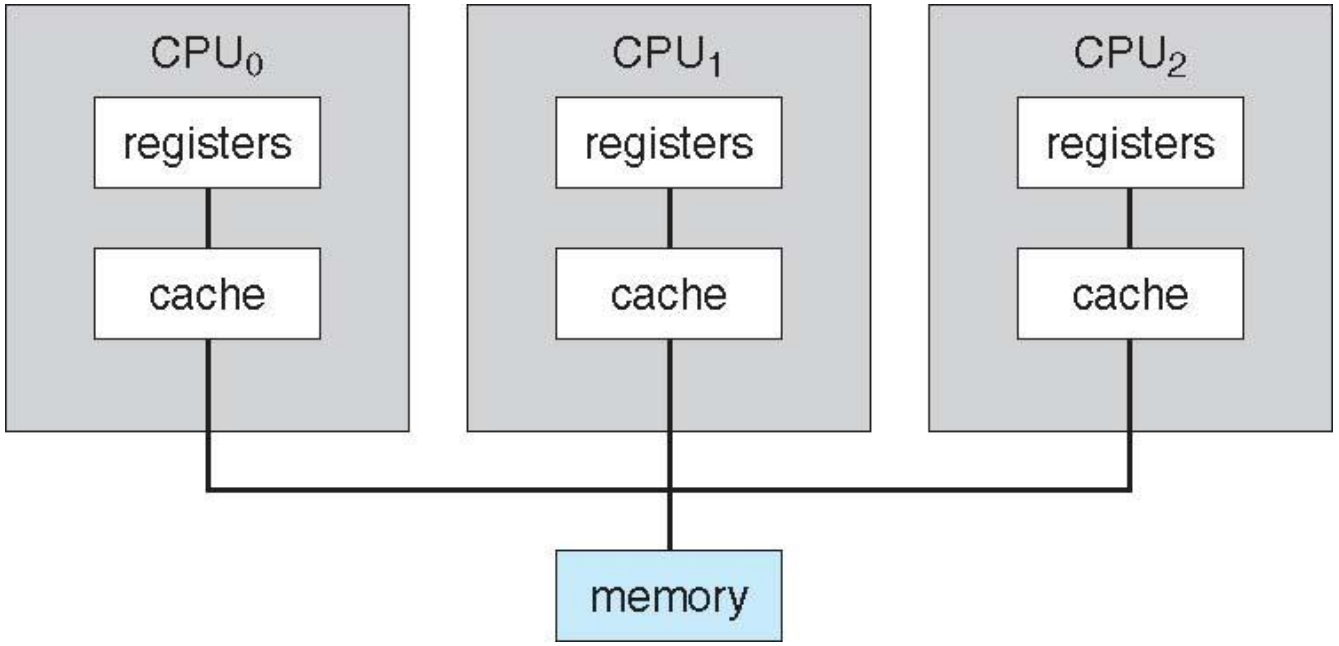
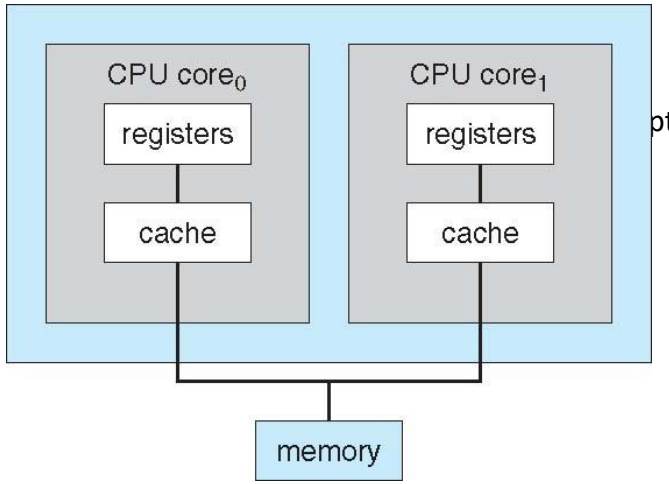
OPERATING SYSTEMS

Symmetric Multiprocessing Architecture



A Dual Core Design

- Multi-chip and **multicore**
- Systems containing all chips
  - Chassis containing multiple separate systems



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Clustered Systems

- Like multiprocessor systems, but multiple systems working together
  - Usually sharing storage via a **storage-area network (SAN)**
  - Provides a **high-availability** service which survives failures

    - **Asymmetric clustering** has one machine in hot-standby mode
    - **Symmetric clustering** has multiple nodes running applications, monitoring each other
  - Some clusters are for **high-performance computing (HPC)**
    - Applications must be written to use **parallelization**
  - Some have **distributed lock manager** (**DLM**) to avoid conflicting operations

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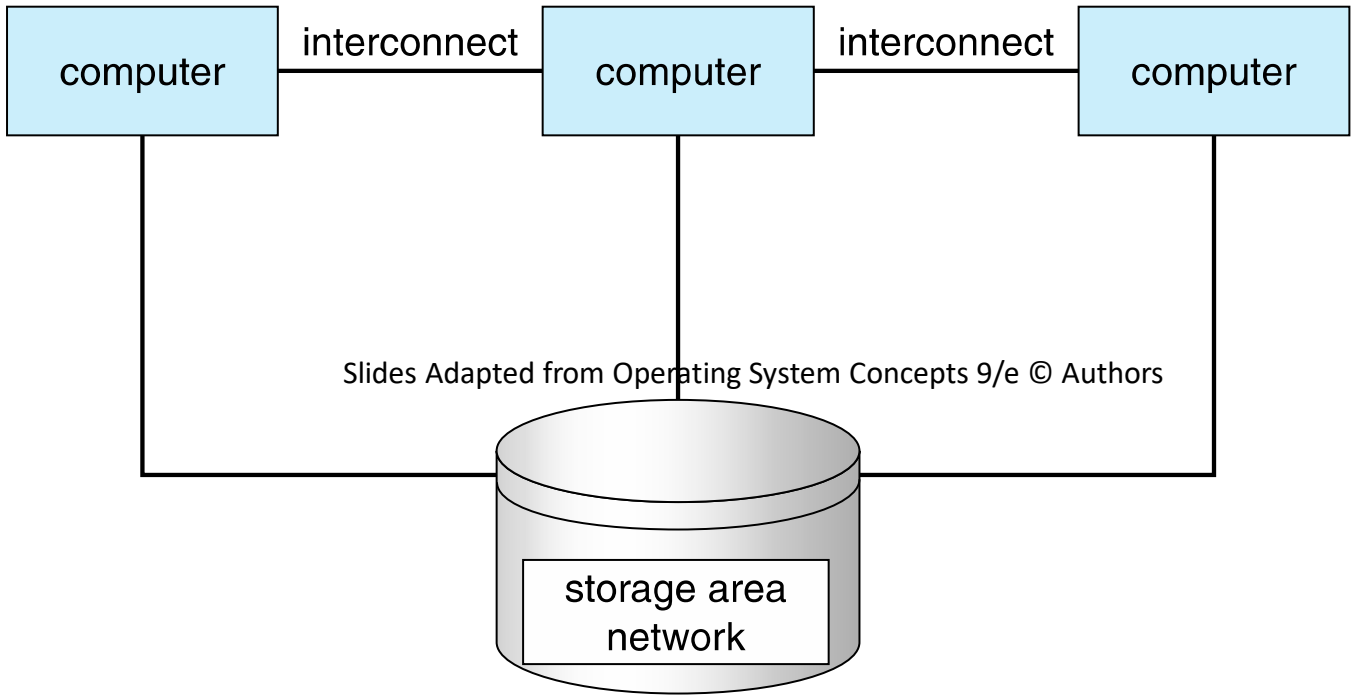
Clustered Systems



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THANK YOU

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