

## Categories of computer systems

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Primary issue: data accessing and generation

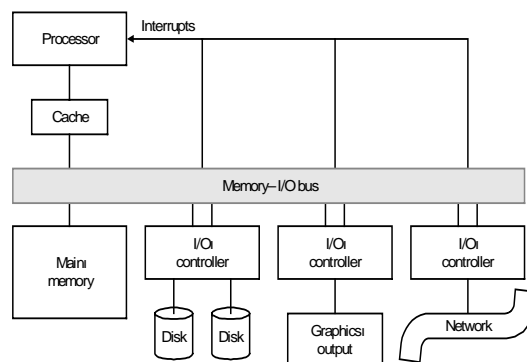
Types:

- Conventional sequential machines (mainframes, minicomputers + network of terminals) - multitasking, multiusers.
- Conventional systems with special purpose components (specialized processors) - single specialized task.
- Multiprocessor systems - single task allowing parallel computation.
- Distributed systems (computers connected by a network) - different task, shared data.

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## Conventional sequential machines

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## Conventional systems with special purpose components

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(Master and slave architecture)

- A special purpose unit (e.g. math processor) attached to the main bus
- Back-end system (additional separate machine, e.g. graphic terminal)
- Example: iDBP
  - file operations: positioning and manipulating a cursor in a file
  - used to implement relational database systems
  - add-on board or back-end system

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## Multiprocessor systems

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Multiprocessor systems:

- Multiple processors
- Shared memory (single address space) vs. multiple private memories
- Centralized memory vs. distributed memory

Categories of parallelism:

- Single instruction stream, single data stream (SISD)
- Single instruction stream, multiple data streams (SIMD)
- Multiple instruction streams, single data stream (MISD)
- Multiple instruction streams, multiple data streams (MIMD)

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## Distributed computer systems

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### Issues:

- data location and security
- load distribution
- process migration
- fault tolerance

### Types:

- homogeneous systems
- heterogeneous systems

### Distributed file systems:

- Apollo DOMAIN (efficient data sharing)
- NFS (UNIX, DOS, system independence)
- AFS (scalability, cache at the file level)
- CFS (mobile systems)

### Fault-tolerant networks:

- redundancy (static, dynamic)
- consistency (strong, weak)
- self-stabilizing networks