



Concurrent Programming

Session 14: Distributed Programming I

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Remind ...

- **Single/Multi-Processor**
 - A set of processors which communicate through a bus
- **Multi-Computers**
 - A set of workstations which communicate through a network.



Remind ...

- **Comparison**
 - Programming Model
 - Scalability
 - Ease of Programming
 - Cost of construction
 - Availability

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Properties of Distributed Systems

- Concurrent Processes
 - Message Passing
 - Independent Failures
 - No Global Clock
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Motivation

- Resource Sharing
- Scalability
- Collaboration

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Transparency

- **Access**
 - Hide differences in data representation and how a resource is accessed.
- **Location**
 - Hide where a resource is located
- **Migration**
 - Hide that a resource may move to another location
- **Relocation**
 - Hide that a resource may be moved to another location while in use

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Transparency (cont.)

- **Replication**
 - Hide that a resource is replicated
- **Concurrency**
 - Hide that a resource may be shared by several competitive users
- **Failure**
 - Hide the failure and recovery of a resource
- **Persistence**
 - Hide whether a (software) resource is in memory or on disk

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Question

- What's the **proper** degree of transparency in a distributed system?
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