CHAPTER 2: DISTRIBUTED SYSTEM CONCEPTS AND ARCHITECTURES

Characteristics of distributed systems

- **multiplicity**
  - multiple users
  - concurrent processes
  - replication of resources

- **dispersion**
  - distributed resources
  - decentralized control

- *Non-negligible communication delay*

- *Lack of global information*

- *Failures*
Transparency

- Access
- Location
- Migration
- Concurrency
- Parallelism
- Failure
- Performance
- Size
- Revision
Distributed system architectures

The workstation-server model

The processor-pool model
Communication network architectures

OSI protocol suite

![Diagram of OSI protocol suite]
TCP/IP protocol suite

- Application processes
  - Peer to peer protocols
  - Message
    - Transport layer
      - Packet
        - Internet layer
          - Datagram
            - Data link and physical layer
              - Frame in bits
                - Communication networks
**Major design issues**

- *Object models and naming schemes:* object, client/server, name server
- *Distributed coordination:* synchronization and distributed algorithms
- *Interprocess communication:* socket and RPC
- *Distributed resources:* sharing and replication
- *Fault-tolerance and security:* redundancy, recovery, protection

**DCE example**

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<td>time, name, process services, etc.</td>
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