

Distributed Systems 2010 - Recapitulation

Introduction

- What is a Distributed System?
- Different types of distributed systems
- Definition(s) of distributed systems
- Examples of distributed systems
- Important issues within distributed systems

Communication

- Computer Networks
- Flow control
- Data Communication
- Open systems
- Protocol
- OSI model
- Saltzer's end-to-end-argument
- Local Networks

CORBA

- CORBA — *Common Object request Broker Architecture*

System Architectures

- Architectural Styles
- System Architectures

Processes

- Threads
- Client-Server Architectures
- Code Migration

Naming

- Addresses
- Identifiers
- Names
- Ports

Process-Process Synchronization

- The Coordinated Attack Problem
- Partial Ordering of Events in a Distributed System
- Vector Clocks
- Logical Clocks
- Total Ordering of Events in a Distributed System
- Physical Clock Synchronization
- Snapshot Algorithm

Distributed Algorithms

- Complexity Analysis
- Algorithms for Information Distribution
- Resource Allocation
- Election
 - Flooding
 - Echo Algorithm
 - Virtual Ring Algorithm
 - Logical Clock Algorithm
 - Voting Algorithm
 - Bully Algorithm
- Algorithm for Local Networks

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Distributed Transactions

- Atomic Transactions
- Two Phase Commit

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Fault-Tolerant Systems

- Failure Semantics
- Fault-Tolerant software
- Fault-Tolerant hardware
- Fault-Tolerant data storage
 - Pessimistic solution — Stable storage
 - Optimistic solution — Replicated data and network partitioning
- Physical Clocks
 - MARS algorithm
- The most unreliable environment
 - Byzantine Generals Problem

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Atomic Broadcast

- Multicast
- Asynchronous algorithms
 - Virtual Ring algorithms
 - Chang-Maxemchuck protocol
 - ISIS system
 - ABCAST
 - CBCAST
 - GBCAST
- Fault tolerant Atomic Broadcast Synchronous Algorithm

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Distributed Object-Based Systems

- Distributed Objects
- Persistent and Transient Objects
- Enterprise Java Beans
- RMI example

Distributed File Systems

- Network Transparency
- Network Operating System
- Distributed Operating System
- LOCUS
- ANDREW
- NFS

Additional

- Transparency in Distributed Systems
- Distributed Coordination-Based Systems
- Security