

Challenges of Distributed Systems

Shahul Hamead H,
AP/CSE-SSN

Heterogeneity

- Networks
 - Hardwares
 - Operating Systems
 - Platforms
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- Middlewares
 - Mobile Code

Openness

- “The openness of distributed systems is determined primarily by the degree to which new resource-sharing services can be added and be made available for use by a variety of client programs”

Security

- Confidentiality, Integrity and Availability
- Authentication, Encryption
- DoS, Vulnerability of Mobile Code

Scalability

- To provision the resources as per the requirement
- *Controlling the cost of physical resources*
- *Controlling the performance loss*
- *Preventing software resources running out*
- *Avoiding performance bottlenecks*

Failure Handling

- What is Failure ?
- Detecting Failure
- Masking Failure
- Tolerating Failure
- Recovery
- Redundancy

Concurrency

- Bidding - An Example Problem
- Proper Synchronization

Transparency

- RM-ODP
- Access Transparency
- Location Transparency
- Concurrency Transparency
- Replication Transparency
- Failure Transparency
- Mobility Transparency
- Performance Transparency
- Scaling Transparency