
DISTRIBUTED PROCESSING

Paper Code **CEN-804**

Course Credits **4**

Lectures / week **3**

Tutorial / week **1**

Course Description **UNIT – I**

Distributed Computing-introduction, definition , its history; Distributed Computing system definition and its evolution, reasons for its popularity, Strength and weaknesses of distributed computing, Different forms of Computing: Minicomputer model, workstation model, workstation server model, Processor pool Model; Cluster:- definitions, reasons for its popularity cluster computer system architecture, Windows cluster, solaris cluster, Linux cluster; Using cluster, distributed Computing System models: Distributed operating system, Introduction to DCE, architecture of Distributed Applications, Toolkits. Frameworks, and component, Introduction to UML

UNIT- II

Message passing:-introduction, desirable features of a good message passing system, Issues in IPC by Message passing, synchronization, Buffering, Multi-datagram messages, Encoding and decoding of message data, Process addressing, Failure handling, IPC :- Program interface, Event synchronization, time outs and threading, deadlock and time out data Representation, data encoding, Text Based protocols, event diagram and Sequence diagram , connection oriented versus connectionless IPC, evolution of Paradigms for Inter-process Communication

UNIT- III

Group Communication: Uni-casting versus multi-casting, Multicast API, Connectionless versus connection oriented Multicast Reliable multicast versus unreliable multi-casting basic multicast API, Reliable multicast API, Ordering and their implementation:

Absolute, causal, Consistent Distributed Computing Paradigms:- paradigms and abstraction, an example application Paradigms for distributed application:-Message Passing, Client-server paradigm, Peer to Peer paradigm. Message system paradigm Remote Procedure call model, distributed Object Paradigms, Object space, mobile agent paradigm, Network services Paradigm, Collaborative Application(Group ware) Paradigm, Message Queue System Paradigm:- Point to Point message model, Publish/subscribe message model Mobile agent:- Basic architecture, advantages of Mobile agents, Mobile-agent Framework system.

UNIT- IV

Remote Procedure Calls : Introduction, RPC modelits transparency, implementation, stub generation, RPC messages, Marshalling Arguments and result, server management Call semantics, Communication protocols for RPCs, Complicated RPCs, client server binding sepecuial RPCs, RPC in heterogeneous environment, Light weight RPC, Optimizing for better performance Socket Metaphor in IPC, Datagram Socket API, Stream mode Socket API, sockets with non blocking I/O Operations

Secure Socket API

Client server paradigm issues, software engineering issues for a network service, Connection Oriented and connectionless Servers

Iterative servers and concurrent server, stateful servers

Synchronization :Mutual exclusion, deadlock, election algorithm,

Resource Management: Introduction, desirable features of a good global scheduling algorithm, task assignment approach, load balancing approach, Load sharing approach; Process management: introduction, Process migration, threads

UNIT – V

Distributed file system: introduction, desirable features of a good DFS, file models, File accessing models, file sharing semantics, file caching semantics, file replication, fault tolerance, atomic transaction, design principles

Distributed object: Message passing versus distributed objects, distributed object architecture, distributed object system, RPC, remote method invocation, RMI architecture API for RMI, RMI application, comparison of RMI and socket API, Client Call back, Stub downloading, RMI security manager,

Common Object Broker architecture: basic architecture, Corba Object interface, Inter-ORB protocol, object server and object client, CORBNA object references, CORBNA naming service and the inter-operable naming service, CORBA Object services, Object adapter, Java IDL

References / Text Books:

- Distributed Computing Principles and Application, M.L.Liu, Pearson Education
- Distributed Operating system, Pradeep k Singha, PHI
- Distributed system Concepts and design, Couloouris, Pearson education

Computer Usage / Software Requires:

- Distributed System, Principles and paradigm , Tanenbaum, PHI
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