

Distributed Computing

Credit: 3

Unit-I

1. Introduction.

Distributed computing Concepts, Basic network concepts, Basic operating system concepts.

2. Inter process Communication.

Basic model, Primitives (operations): connect, send, receive, disconnect, Connection-oriented/connectionless, Data marshalling: data flattening, data representation, serialization, Event synchronization, Event diagram, sequence diagram.

3. Distributed Computing Paradigms.

Message passing, client server, P2P, message system, RPC, Distributed Object Paradigm, Object Space, Mobile agent, Network services, Groupware paradigms, SOA, Overview & comparison of each paradigm.

Unit-II

4. The Socket API.

The basic model, Stream-mode (connection-oriented) socket, Datagram socket (connectionless) socket, Java socket API, Using socket to implement a client. Using socket to implement a server, A simple middleware using sockets, Secure sockets and the Java secure socket extension API.

5. The Client-server Paradigm.

The daytime protocol and a sample client-server suite, The echo protocol and a sample client-server suite, Connection-oriented client-server, Connectionless client-server, Iterative server and concurrent server, Stateful server and stateless server.

6. Group Communications.

Unicast versus multicast, Basic model of group communications, The Java multicast API. Sample multicast sender program, Sample multicast listener program, Multicast and message ordering, Reliable multicast/broadcast.

Unit-III

7. Distributed objects.

Message passing versus distributed objects, The basic model, Remote procedure call, Remote method invocation, CORBA Historical Perspective

8. Advanced Remote Method Invocations (RMI).

RMI stub downloading, Security policy, Callback.

9. Internet applications.

Basic components and protocols: HTTP, HTML, XML, MIME, web server, browser, web forms, Web document types: static, dynamic, executable, active, CGI: background; interaction and passing of data among browser, web server, and script(s), HTTP Session state information: hidden tags, cookies, session objects, Client-side programming: Applets, JavaScript, Server-side programming: common gateway Interface (CGI), servlets, server pages, Applets, Servlets; session data maintenance, Introduction to Web services and the Simple Object Access Protocol (SOAP), REST Protocol.

Text books:

1. Distributed Computing: Principles and Applications, M L Liu, Pearson Publisher.
2. Distributed Systems Concept and Design, George Coulouris, Jean Dollimore and Tim Kindberg, Pearson Publisher.