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New Scheme Based On AICTE Flexible Curricula

Computer Science & Information Technology, V-Semester

CS IT501 - Computer Networking

Course Objectives

- To provide students with an overview of the concepts and fundamentals of computer networks
- To familiarize with the basic taxonomy and terminology of computer networking area.
- Describe how computer networks are organized with the concept of layered approach
- To experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite

Unit I

Importance of computer networks, broadcast and point to point networks, Local area networks and Wide area networks , ISO-OSI reference model, TCP/IP model , interfaces and services, Protocol data unit, connection oriented and connectionless services, service primitives, Binding Protocol Address- ARP & RARP, packet format, Encapsulation.

Unit II

Data-Link layer: - Data link layer design issues, framing , flow & error control , physical addressing, Stop & Wait protocol ,Go back N ARQ ,selective repeat ARQ ,piggybacking and pipelining ,HDLC LAN Protocol stack-Logical link control and Media Access Control sublayer, IEEE 802.2 LLC Frame format; MAC layer Protocols- static and dynamic allocation, Pure and slotted ALOHA, Carrier sense multiple access, Persistent and non persistent CSMA, IEEE standard 802.3, 802.4, 802.5, FDDI,

Unit III

The Network layer- logical addressing, classful & classless addressing, packet delivery & forwarding. unicast routing protocols , multicast routing protocols, Routing algorithm- Least Cost, Dijkstra's, Bellman-ford, Introduction to Internet protocol, IPv4 header, IPv4 Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Super netting- special case of IP addresses, Ipv6-Motivation, frame format and addressing. ICMP: Introduction, ICMP Header, ICMP message types.

Unit IV

Transport layer- TCP: Introduction ,Transport services , Process to process delivery, TCP ,congestion control algorithms, quality of service, headers, connection establishment and termination, timeout of connection establishment, maximum segment size, port no. and socket addresses, TCP timers, UDP: Introduction, UDP header, UDP checksum, UDP operations, encapsulation & decapsulation, queuing, SCTP-Services, transmission sequence number, stream identifier, stream sequence number, packet format.

Unit V

Application layer - BOOTP:-operation, packet format, DHCP:-Address allocation, configuration & packet Format, DNS: Distribution of name spaces, DNS in the internet, FTP:-Connection, Communication, command processing, TFTP, E-Mail: SMTP, POP, IMAP, SNMP. study of internetworking devices and their configuration– switches, hubs, Bridges, routers and Gateways.

References

1. .“Computer Networks” - Tanenbaum ,PHI Learning
2. “Data Communication & Networks ” , Fourouzan TMH
3. “TCP/IP-Protocol suite”, Forouzan, TMH 3rd edition
4. “Computer Networks and Internets”, D.E.Comer, Pearson
5. “TCP/IP Illustrated” W. Richard Stevens, Volume I, Addison Wesley,
6. “Internetworking with TCP/IP Vol. I, II & III”, Comer , PHI Learning.

Course Outcomes

Upon successful completion of this course the students will:

- Have agood understanding of the OSI Reference Model and its Layers
- Identify core networking and infrastructure components and the roles they serve; and given requirements and constraints, design an IT infrastructure including devices, topologies, protocols, systems software, management and security;
- Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies
- Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols