

COMPUTER NETWORKS



INTRODUCTION TO CN

- Motivation to study CN

IP ADDRESSING / SUBNETTING / SUPERNETTING

- IP address representation
- Classful IP addressing - Part 1
- Classful IP addressing - Part 2
- Casting
- Types of IP addresses
- Network Mask / Subnet Mask
- Subnetting
- Applications of Subnetting
- Problem solving with Subnetting - Part1
- Problem solving with Subnetting - Part2
- Variable length subnet mask (VLSM)
- Types of Subnet mask
- Supernetting
- Problem solving with Supernetting
- Classless IP addressing
- Problem solving with Classless addressing
- “Subnet” problems with Classless addressing
- Subnetting in CIDR
- VLSM in CIDR
- Dynamic Host Configuration Protocol-DHCP
- Dynamic IP + Static IP + Ping command + Loopback address

DATA LINK LAYER

- Delays in computer networks
- Introduction to OSI Model
- Flow Control method- Stop & Wait ARQ
- Performance factors
- Performance factors– Examples
- Roundtrip time – examples
- Drawback of Stop & Wait ARQ
- Go Back N ARQ
- Problem solving with Go Back N ARQ
- Selective Repeat ARQ
- Problem solving with Selective Repeat ARQ
- Stop & Wait ARQ v/s Go Back N ARQ v/s Selective Repeat ARQ

- Access Control methods
- Controlled Access Protocol
- Random Access Protocol
- CSMA/CD
- Back-off algorithm
- CSMA/CA
- ALOHA
- Token Ring
- Error Control
- Hamming Code
- Cyclic Redundancy Check(CRC)
- Polynomial CRC Generator
- Rules to set CRC Generator
- CheckSum
- Framing in DLL
- Character stuffing & Bit stuffing
- Encoding
- Ethernet & Ethernet Frame Format
- Token Ring Frame format
- Monitor & Piggybacking in token ring

NETWORK LAYER

- Network Layer
- Switching
- Packet Switching
- Performance of Packet Switching
- Circuit v/s Packet v/s Message Switching
- IPv4 Header
- IPv4 Header Field- Internet Header Length
- IPv4 Header – Part 3
- IPv4 Header Field- Options
- IPv4 Header Field- Options
- Fragmentation @ NL
- Fragmentation Process - Example
- Network Layer Protocol-ARP
- Network Layer Protocol-RARP
- Network Layer Protocol-ICMP
- Error Reporting with ICMP
- Query messages with ICMP
- Traceroute with ICMP

- Introduction to Routing algorithms
- Distance vector routing(DVR)
- DVR-Example2
- Count to infinity – DVR problem
- Split Horizon
- Link-state routing (LSR)
- Link-state routing (LSR) – Part2
- LSR v/s DVR

TRANSPORT LAYER

- Introduction to Transport Layer
- TCP Header
- Congestion control with TCP
- User Datagram Protocol (UDP)

APPLICATION LAYER

- Application layer protocols
- Domain name system (DNS)
- Hyper Text Transfer Protocol(HTTP)
- File transfer protocol(FTP)

HARDWARE DEVICES

- Ethernet Cables
- HUB & Repeater
- Bridge
- Switches
- Routers
- Gateways
- Firewall