Networking Concepts

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WISH YOU ALL

A JOYFUL, FRUITFUL

NEW YEAR
Topics

1. Definition
2. Need
3. Media (Transmission)
4. Topology
5. Hardware
6. Troubleshooting
7. Network Types
8. Reference Models
1. Definition

• A network is a collection of computer systems, devices connected together so that they can communicate and exchange data.

Eg – Banking, Railways, Postal Services, Government Organizations etc.
1.1 Network
1.2 Network vs Standalone
1.3 Storage Devices

- Punch Cards
- Magnetic Tapes
- Floppy Disk – 5 ¼ & 3.5 inches
- Compact Disks (CDs), DVDs, Blue Ray
- Pendrives
- Memory cards
2. Need

- Hardware sharing.
- Information sharing.
- Electronic transfer of text.
- Communication between organizations.
- High reliability by having alternative sources of supply.
3. Media (Transmission)

- Twisted Pair cable
- Coaxial cable
- Optical Fiber
- Wireless Transmission
3.1 Twisted pair cable
3.2 Coaxial cable
3.3 Fiber Optical Cable
Wireless transmission system
INFRARED
BLUETOOTH IEEE 802.15.1
satellite

earth-based station
4. Topology

Network Topology is the arrangement of various elements (nodes, links etc) of a computer Network.

Eg: bus, ring, star, mesh etc
4.1 Bus Topology
4.2 Ring Topology
4.3 Star Topology
4.4 Mesh Topology
5. Hardware

- LAN card
- Repeaters
- Hubs / Switches
- Routers
5.1 LAN card
Network Interface Controller (NIC) Card:

• A network interface card, more commonly referred to as a NIC, is a device that allows computers to be joined together in a LAN, or local area network.

• In computer networking, a NIC provides the hardware interface between a computer and a network.
5.2 Repeaters
5.3 Hubs / Switches
Hubs

• Devices that are made up of many NIC ports.
• Take the electrical signals that a computer transmits into them and repeats them out every port on the device except for the one the signals arrived in.
• Offer no services other than repeating signals to multiple ports, they are often called multiport repeaters.
5.4 Routers
• A **router** is a **networking device** that forwards **data packets** between **computer networks**.

• Routers perform the "traffic directing" functions on the **Internet**. A data packet is typically forwarded from one router to another through the networks that constitute the internetwork until it reaches its destination node.
6. Troubleshooting

• Network Adapter
• Connection Verification
• ping <ip address>
• Tracert <ipaddress>
7. Network Types

• Local Area Networks (LAN)

• Metropolitan Area Networks (MAN)

• Wide Area Networks (WAN)
7.1 LAN

- Small network, short distance
- A room, a floor, a building
- Limited by no. of computers and distance covered

- Examples:
  - Network inside the Student Computer Room
  - Network inside your home
7.2 MAN

- Medium network, long distances.
- A city, across various buildings.

- **Examples:**
  - Cable System
7.3 WAN

A network that uses long-range telecommunication links to connect 2 or more LANs, WANs/computers housed in different places far apart.

- Towns, states, countries

Examples:
- Network of our Campus with other campuses
- Internet

[Diagram showing network connections between different locations]
8. Reference Model

The OSI Reference Model

Diagram 4
File Sharing

• Google Drive – 15GB free
• Amazon Web Services (AWS)
• RackSpace
• Drop Box
• Microsoft Azure
• OneDrive
Thank U