Mobile Device and Network Architecture

Module 1: Communication Principles

Computer Networks

- A computer network is the infrastructure that allows two or more computers (called hosts) to communicate with each other.
- This is achieved by providing a set of rules for communication, called protocols, which should be observed by all participating hosts.

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Computer networks are categorized into different types based on the following criteria:

Geographic Scope:

LAN (Local Area Network) versus MAN (Metropolitan Area Network) versus WAN (Wide Area Network)

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Access Scope:

Private versus Public

- Networks meant for the private use of the organizations to which they belong are private networks.
  - Networks maintained by banks, insurance companies, airlines, hospitals, etc
- Public networks, on the other hand, are generally accessible to the average user, but may require registration and payment of connection fees.

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Communication Model:

Point to Point versus Broadcast

- In the point-to-point model, a message follows a specific route across the network in order to get from one node to another.
- In the broadcast model, on the other hand, all nodes share the same communication medium and, as a result, a message transmitted by any node can be received by all other nodes.

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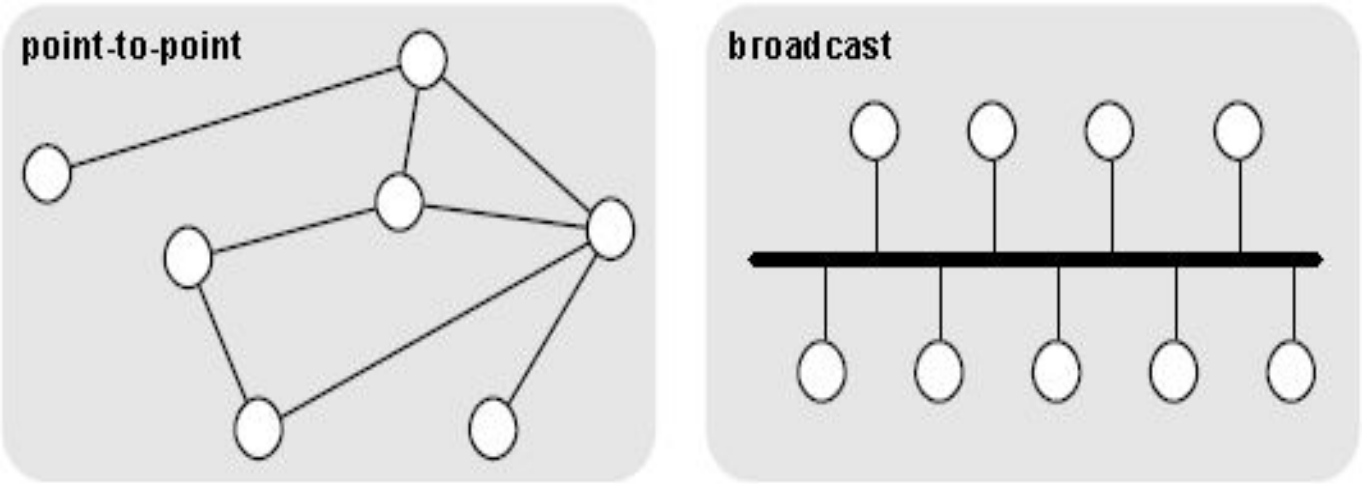
- A part of the message (an address) indicates for which node the message is intended.



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Switching Model:

Circuit Switched versus Packet Switched

- In circuit switching, a dedicated communication path is allocated between A and B via a set of intermediate nodes.
- The data are sent along the path as a continuous stream of bits.
- This path is maintained for the duration of communication between A and B and is then released.

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Switching Model:

Circuit Switched versus Packet Switched

- In packet switching, data are divided into packets (chunks of specific length and characteristics) which are sent from A to B via intermediate nodes.
- Each intermediate node temporarily stores the packet and waits for the receiving node to become available to receive it.
- Different packets can be routed differently in order to spread the load between the nodes and improve performance.