



Applications of Information and Communication Technology(ICT)

Lecture 5

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Lecture Outline

- Networks
- Types of Network
 - Local Area Network (LAN)
 - Wireless Local Area Network (WLAN)
 - Metropolitan Area Network (MAN)
 - Wide Area Network (WAN)
 - Personal Area Network (PAN)
- Physical Structure of Computer Networks
 - Ring Topology
 - Bus Topology
 - Star Topology
 - Mesh Topology

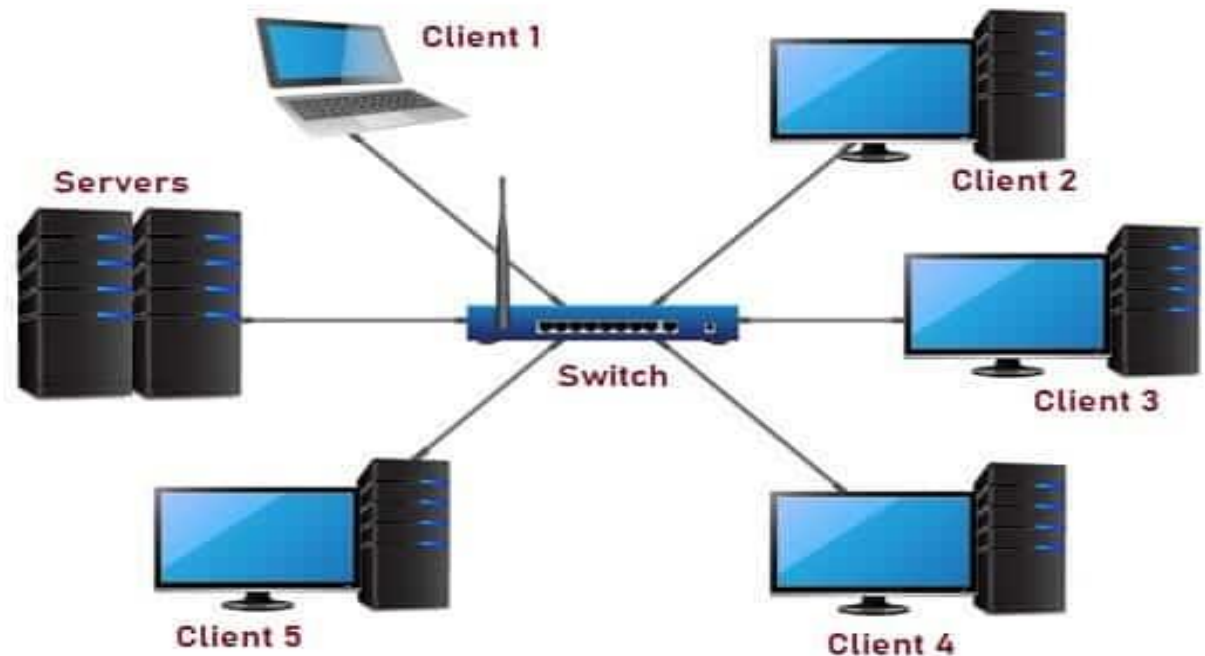


Network

- A network refers to a collection of interconnected entities or nodes that are linked together in some way.
- In computer networks, nodes typically refer to computers or other devices that are connected to each other through some kind of communication medium, such as cables or wireless signals.
- Computer networks can be local (LAN), wide-area (WAN), or global (Internet), and can be used for various purposes such as sharing resources, communication, and accessing information.

Types of Computer Networks (Local Area Network)

- A school lab with its ten computers networked together is an example of a local area network.
- LANs can be set up in any defined area, such as a home, a school, an office building.
- LANs are most likely to be based on Ethernet technology.



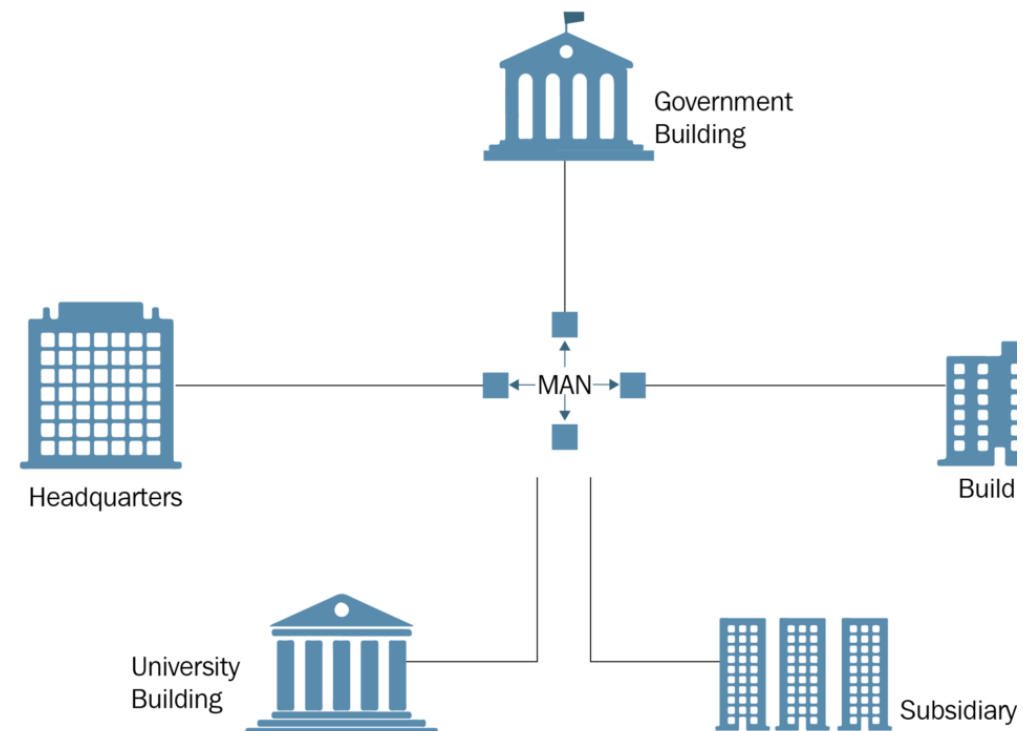
Types of Computer Networks (Wireless Local Area Network)

- A WLAN, or wireless LAN, is a network that allows devices to connect and communicate wirelessly.
- Unlike a traditional wired LAN, in which devices communicate over Ethernet cables, devices on a WLAN communicate via Wi-Fi.



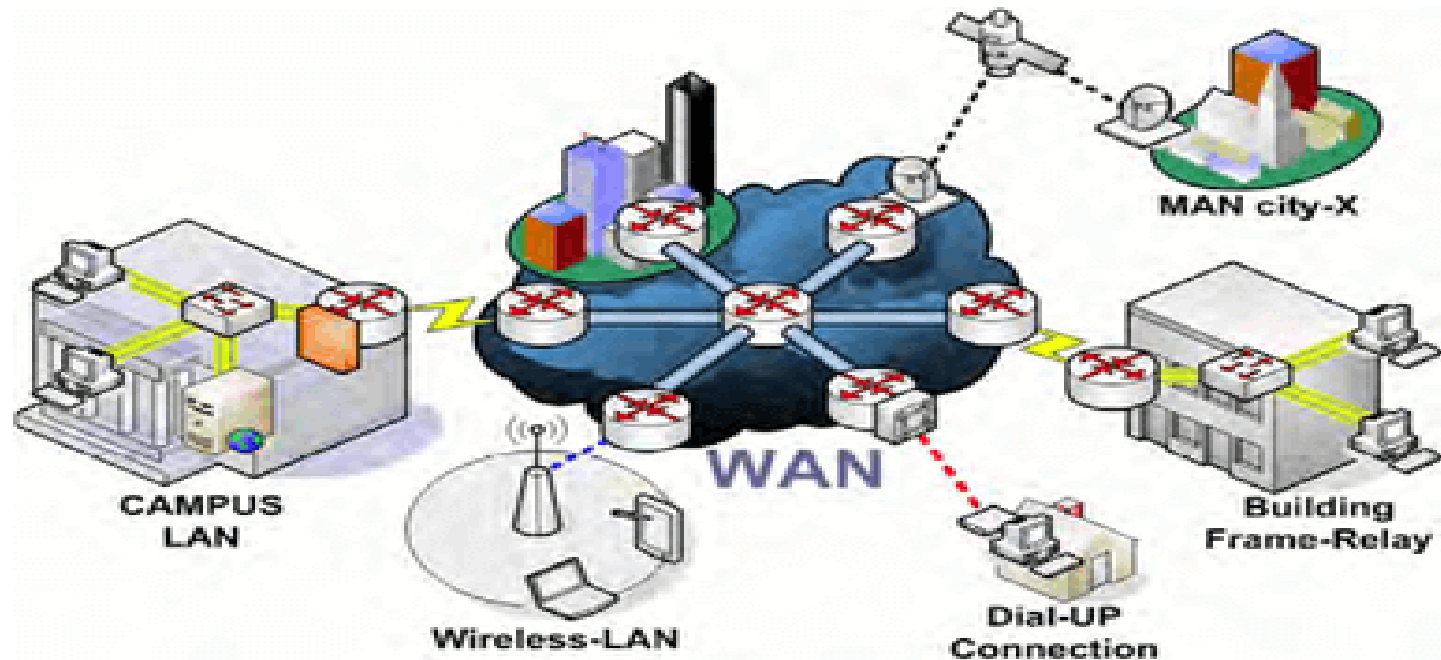
Types of Computer Networks (Metropolitan Area Network)

- A metropolitan area network is a computer network that usually spans a city or in a large metropolitan area.
- A MAN is larger than a LAN but smaller than a WAN.



Types of Computer Networks (Wide Area Network)

- A wide area network (WAN) connects computers and other resources that are miles or even continents apart.
- It covers large distance for communication between computers.
- The most well-known WAN is the Internet, which may cover the entire globe.



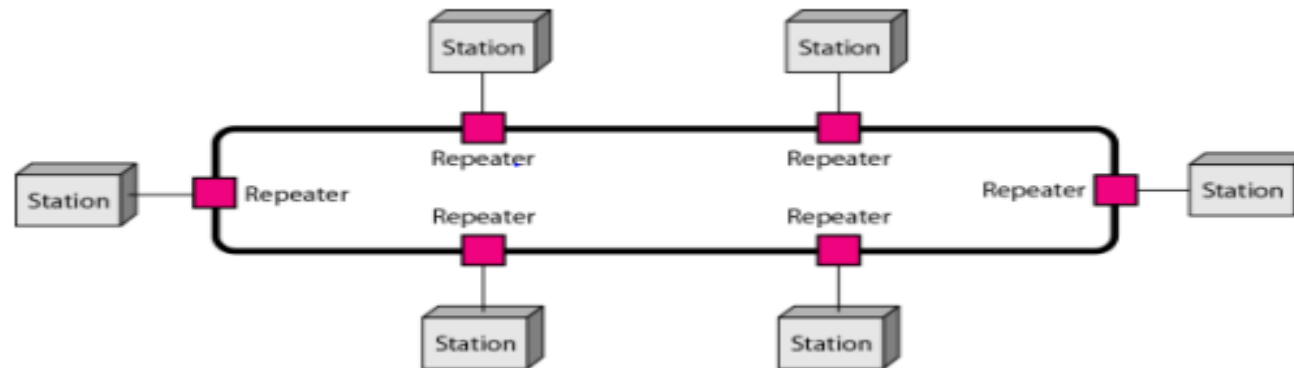
Types of Computer Networks (Personal Area Network)

- PAN is the computer network that connects computers/devices within the range of an individual person.
- A PAN typically involves a computer, phone, tablet, printer, PDA (Personal Digital Assistant) and other entertainment devices like speakers, video game consoles, etc.



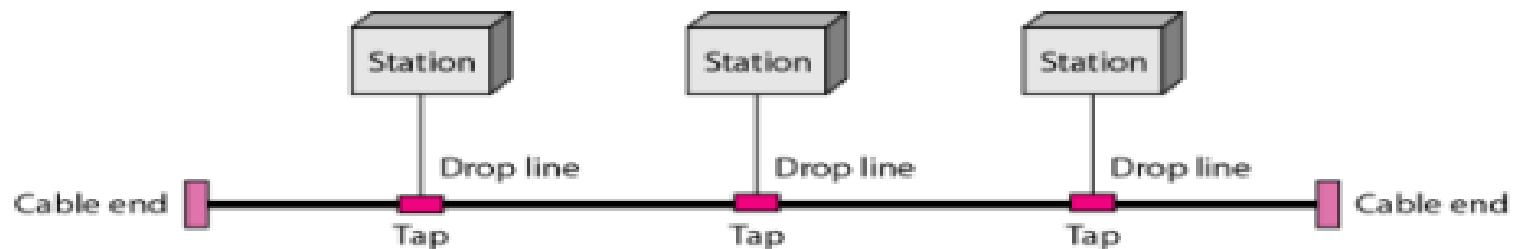
Physical Structure of Computer Networks (Ring Topology)

- Each device has dedicated point-to-point link with only devices on either sides
- The message travels along the ring in one direction
- Each node has repeater to regenerate the message
- Advantages:
 - Easy installation & reconfiguration, and fault isolation
- Disadvantages:
 - Unidirectional traffic, and dependency on ring
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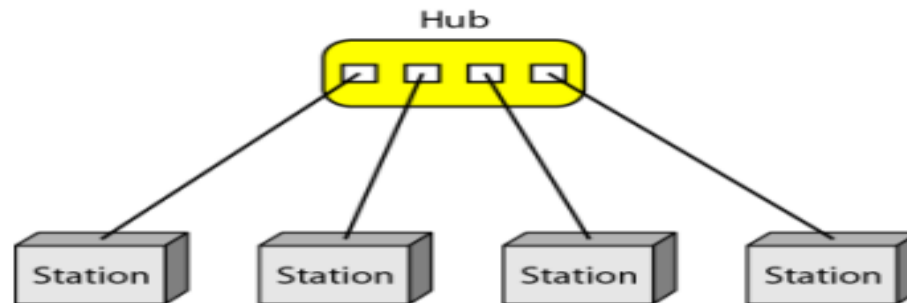
Physical Structure of Computer Networks (Bus Topology)

- Only one cable (bus cable) acts as backbone to link all devices
- Nodes are connected to bus cable through drop line and taps.
 - Drop line is the connection between the device and bus cable
 - Tap is the connector
- Advantages:
 - Easy installation, and less cabling
- Disadvantages:
 - Difficult reconnections, and fault isolation



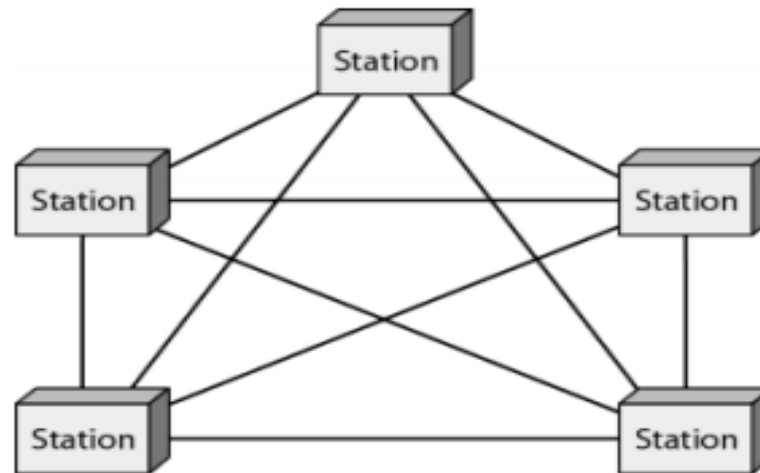
Physical Structure of Computer Networks (Star Topology)

- Each device has a dedicated point-to-point link to a central controller, known as hub.
- Nodes are not directly connected but connected through hub.
- Advantages:
 - Less expensive, each device requires only one link and one I/O port, less cabling, robustness, and fault identification & isolation
- Disadvantages:
 - The main disadvantage is its dependency on a single point



Physical Structure of Computer Networks (Mesh Topology)

- Every device has a dedicated point-to-point link to every other device
- Advantages:
 - No traffic problems due to dedicated links, robustness, privacy or security, and fault identification & isolation
- Disadvantages:
 - The main disadvantage is the number of cables and I/O ports





Note for the Students

- Note: Dear Students you can Download Books/Lectures and other helping material form the given link.
- Link: <https://cslearnerr.com/applications-of-information-and-communication-technologyict/>