

**Practical Network**

**Computer Science**

**Third Class part 1 2020**

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**Teacher**



# NETWORKS

A network is a set of devices (often referred to as *nodes*) connected by communication links.

A node can be a computer, printer, or any other device capable of sending and/or receiving data generated by other nodes on the network.

# Network's Components

Client

Workstations

Network Interface Card (NIC)

Communication Medium (type of cables)

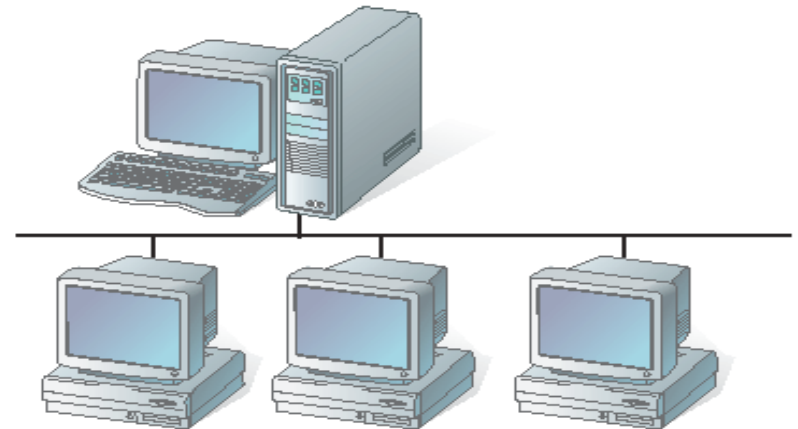
Routers, Hubs, Switches, Servers



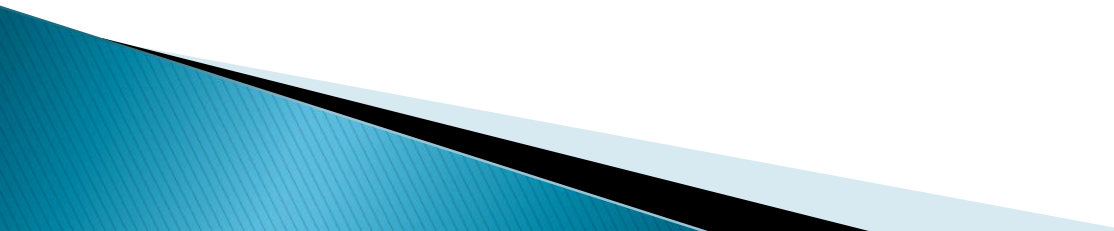
Hub



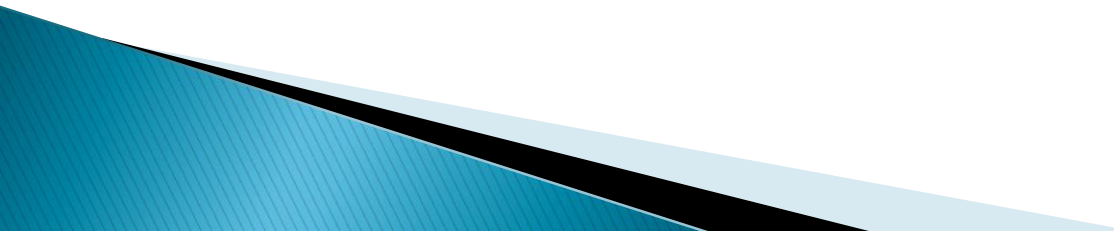
Connections



# A network Client

- A network client or client is a device on a computer network that requests services or resources from a server.
  - Clients can be printers, workstations, servers, or any other device connected to the computers on a network.
  - The most common network clients are workstations.
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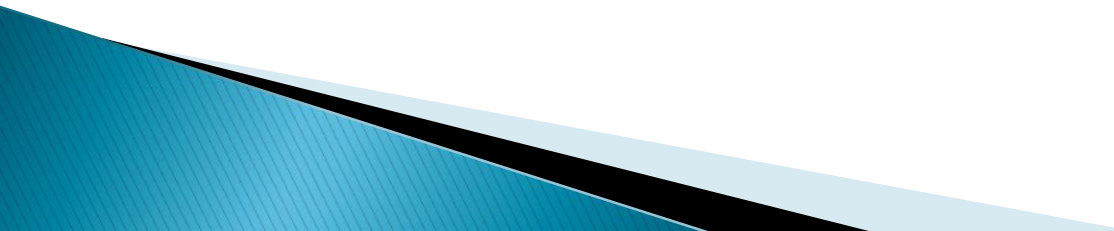
# Workstation

- A workstation is a computer that operates separate of the network.
  - It manages its own files and processing.
  - Workstations connect to the network for the purpose of security and centralized management of networked resources.
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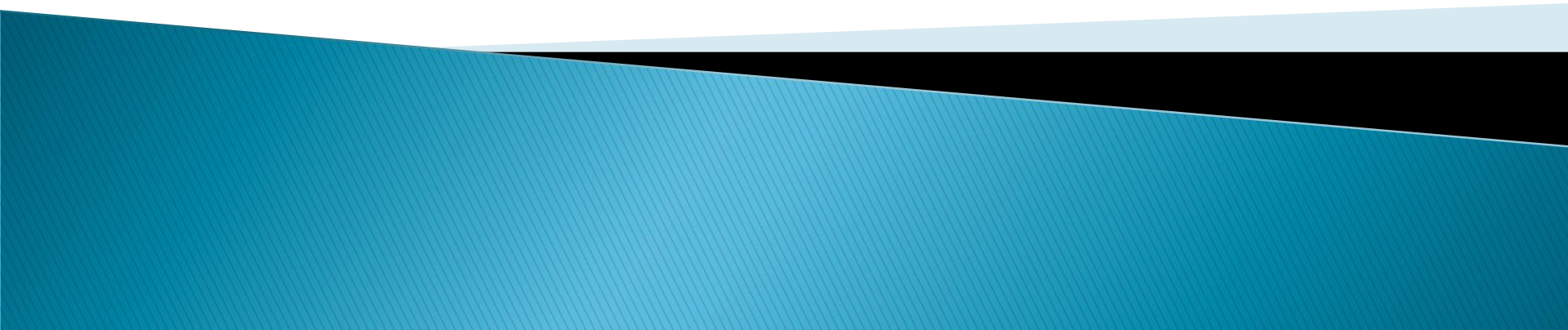
# Interface of Work Stations



# Communication Medium

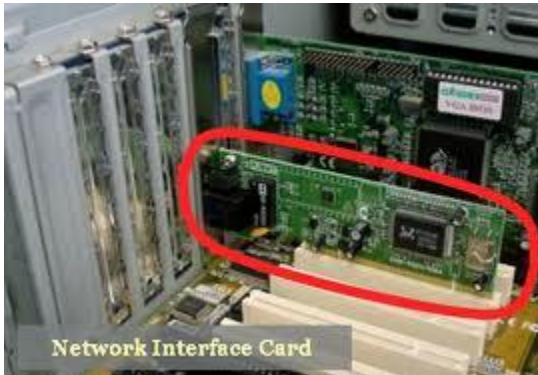
- A communication medium is the physical path between the networked resources.
  - The medium used is either a coaxial cable or a twisted-pair wire and fiber-optic cabling
  - Wireless medium like Nano-station, Nano beam and router satellite etc..... .
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# Network Interface Card (NIC)

- A NIC, also known as the network board, is used to connect the networked components to the physical cable.
  - The NIC provides a physical connection to the device and also creates and sends signals from one networked device to another.
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# Network Interface Card



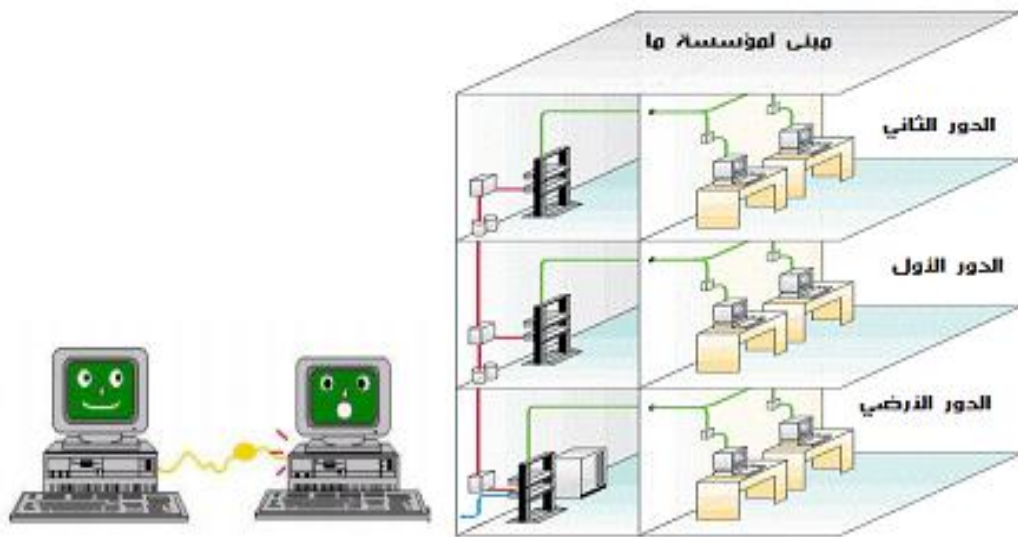
# Network Classification

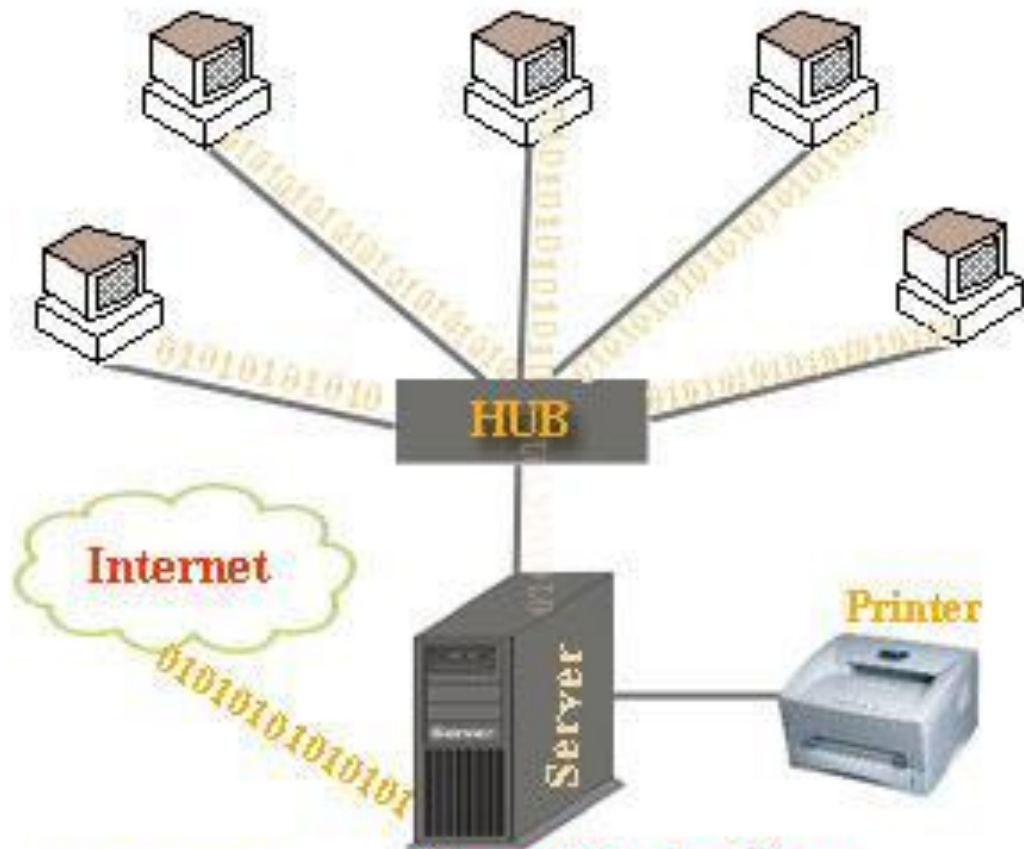
Network classification by size or scale:

- LAN
- MAN
- WAN

# Local Area Network (LAN)

- ❑ Contains printers, servers and computers
- ❑ Systems are close to each other
- ❑ Contained in one office or building
- ❑ Organizations often have several LANS





**Network  
Structure**

- Internet Sharing Server
- Mail Server
- Sharing Resource
- File Security server

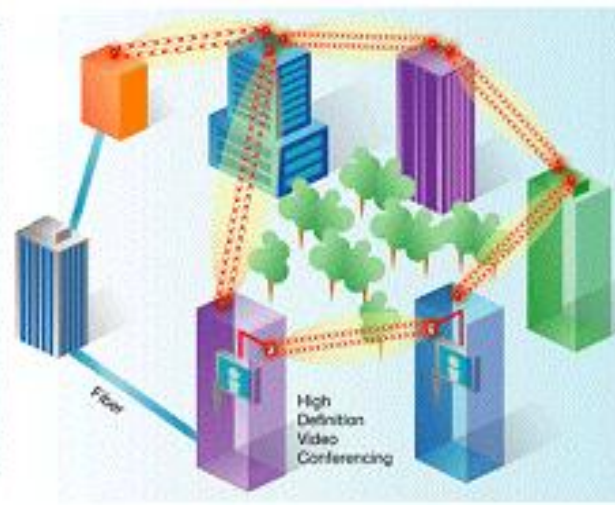
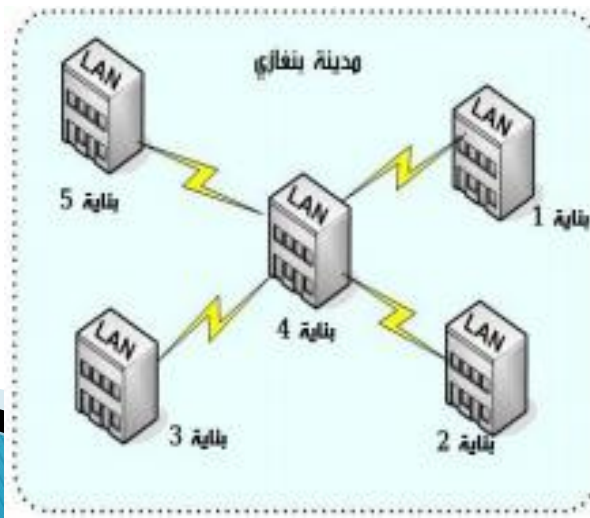
# Metropolitan Area Network (MAN)

Metropolitan area network (MAN) is a computer network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but smaller than the area covered by a wide area network (WAN).

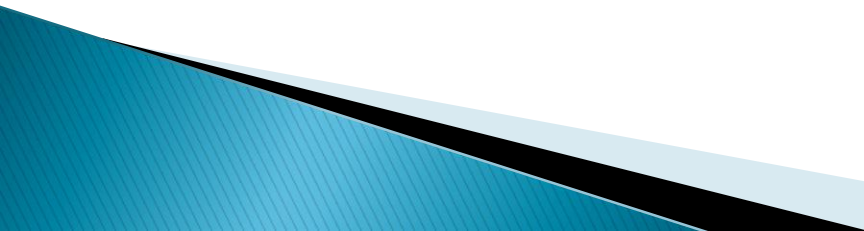


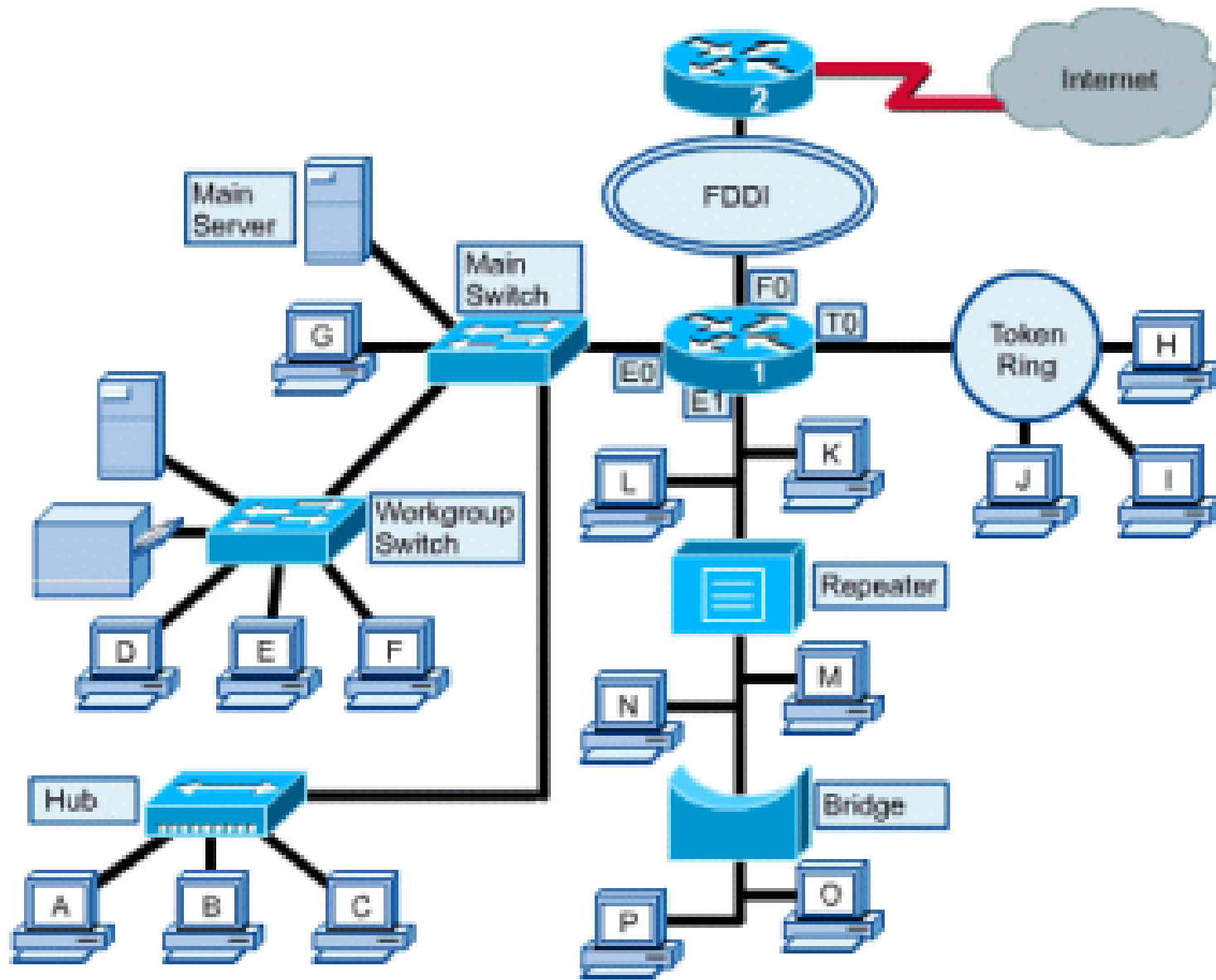
# Wide Area Networks (WAN)

- ❑ Two or more LANs connected
- ❑ Over a large geographic area
- ❑ Typically use public or leased lines
- ❑ Phone lines
- ❑ Satellite
- ❑ The Internet is a WAN its about 10-100 km



# Topology of Network

- ❑ The network topology defines the layout of the network(network form or structure).
  - ❑ It shows how devices on the network are interconnected.
  - ❑ Devices on the network are termed nodes.
  - ❑ A network has both a physical and a logical topology.
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# Bus Topology

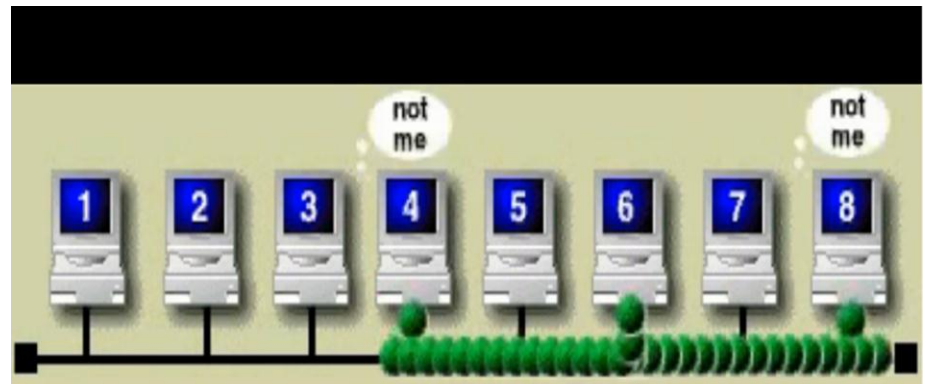
- ❑ Also called linear bus
- ❑ One wire connects all nodes
- ❑ Terminator ends the wires

## Advantages

- Easy to setup
- Small amount of wire
- It works well for small networks
- It does not need a central device, such as a hub, switch, or router

## Disadvantages

- Slow
- Easy to crash
- It works well for small networks



# Network star

All nodes connect to a hub

- ❑ Packets sent to hub
- ❑ Hub sends packet to destination
- ❑ Most common topology

Advantages

- Easy to setup
- One cable can not crash network
- It is upgradeable, flexible, and reliable
- This topology allows for more throughput than any other topology

Disadvantages

- ❑ One hub crashing downs entire network
- ❑ Uses lots of cable
- ❑ It is more expensive to build because of the additional cost of cables and devices

