

What is a Computer Network?

A computer network is a telecommunications network which allows computers to exchange data.

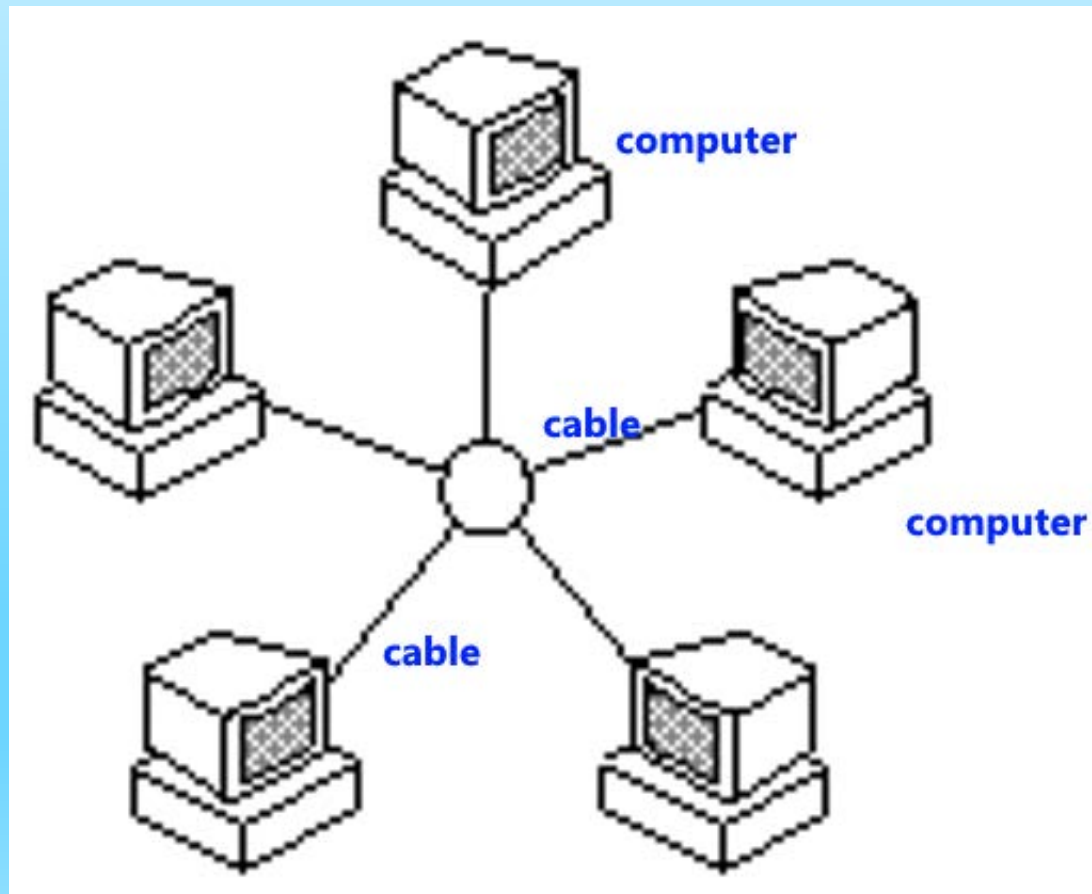
Computer Networking Impacts in Our Daily Lives

Networks support the way we

- learn.
- communicate.
- work.
- play.

Chapter 1

Example of a Computer Network



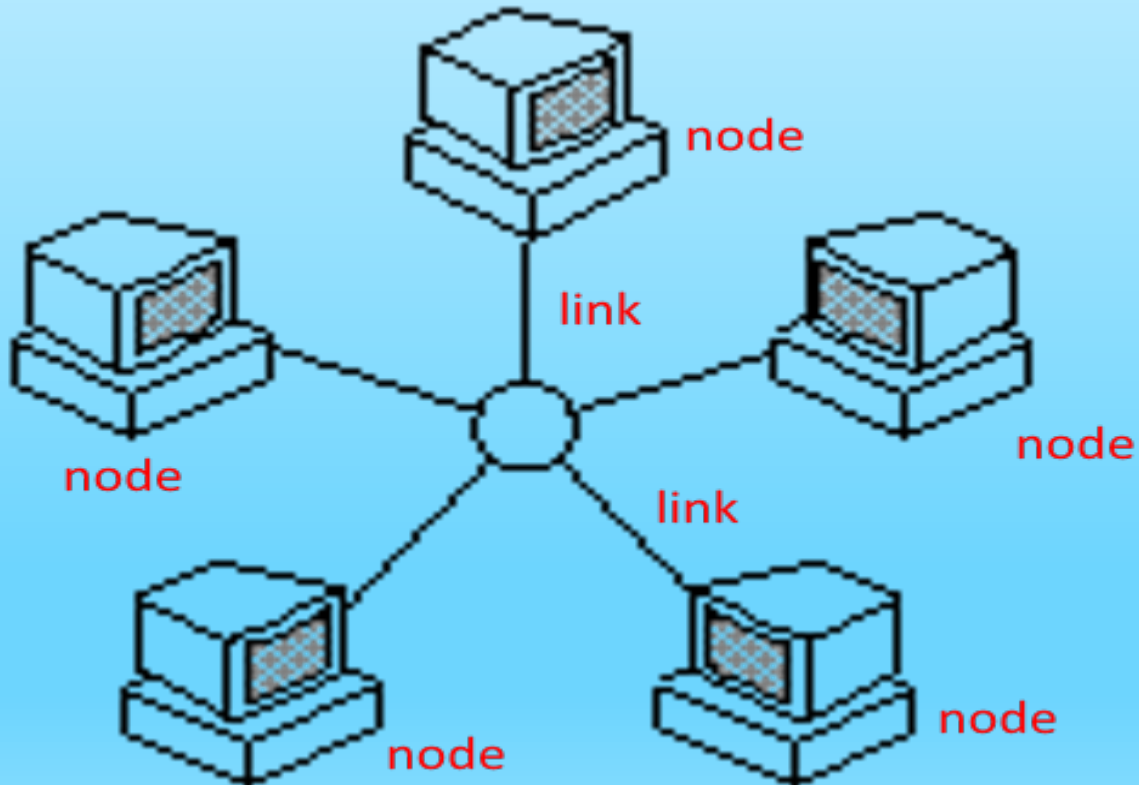
Network Topology

Network Topology is the arrangement of various elements in a computer network.

Each computer or device in the a network is called a **node**.

Cables connecting the nodes are known as **links**.

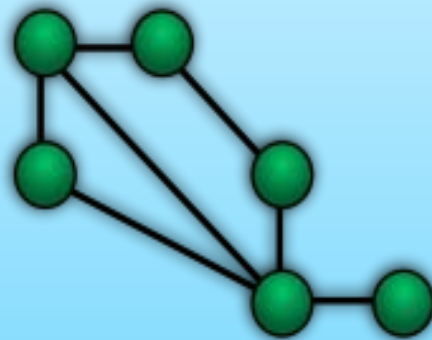
Network Topology



Types of Network Topology



Ring



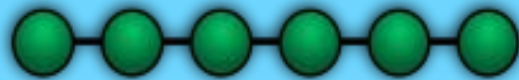
Mesh



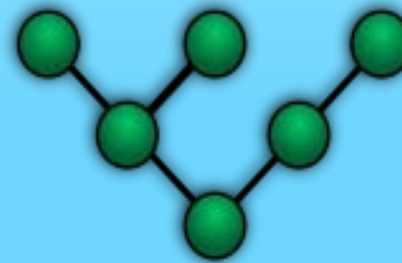
Star



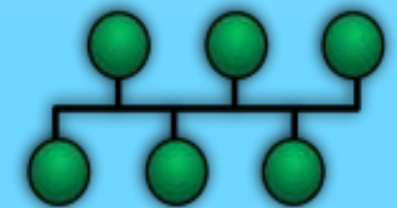
Fully Connected



Line

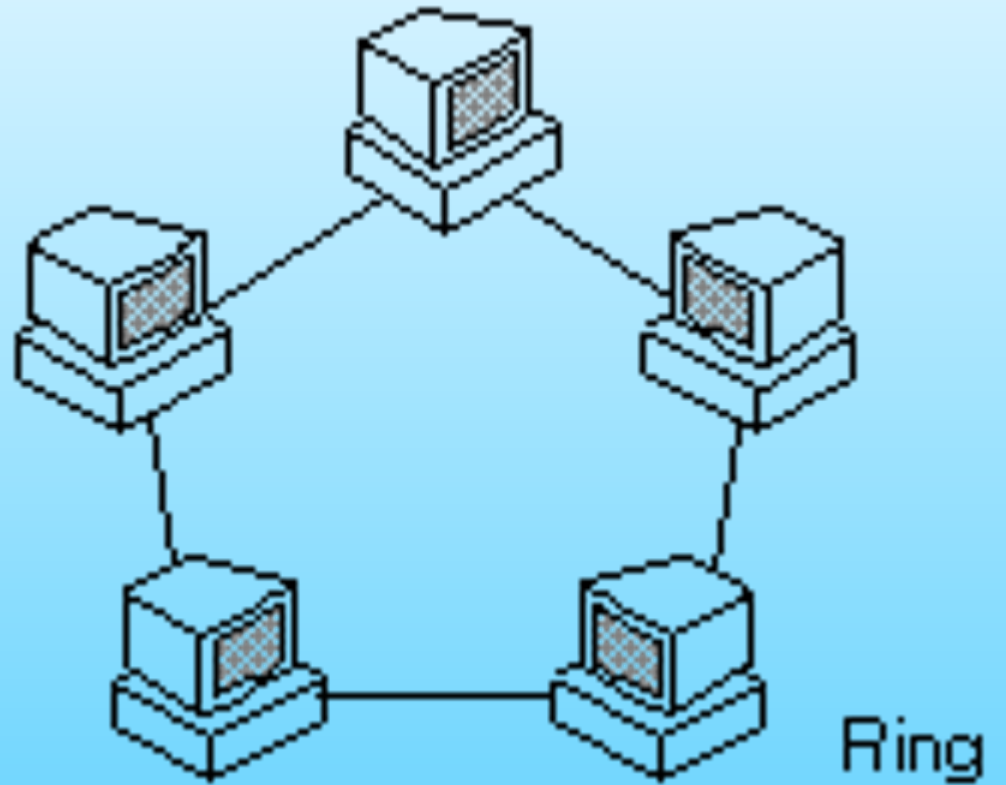


Tree

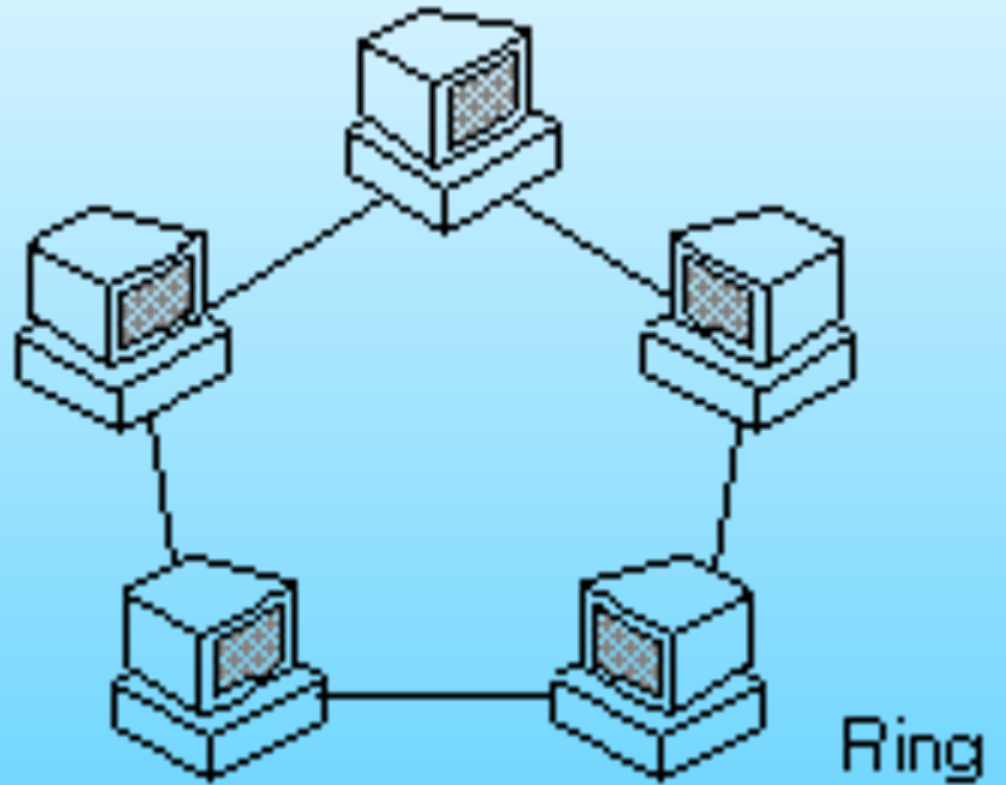


Bus

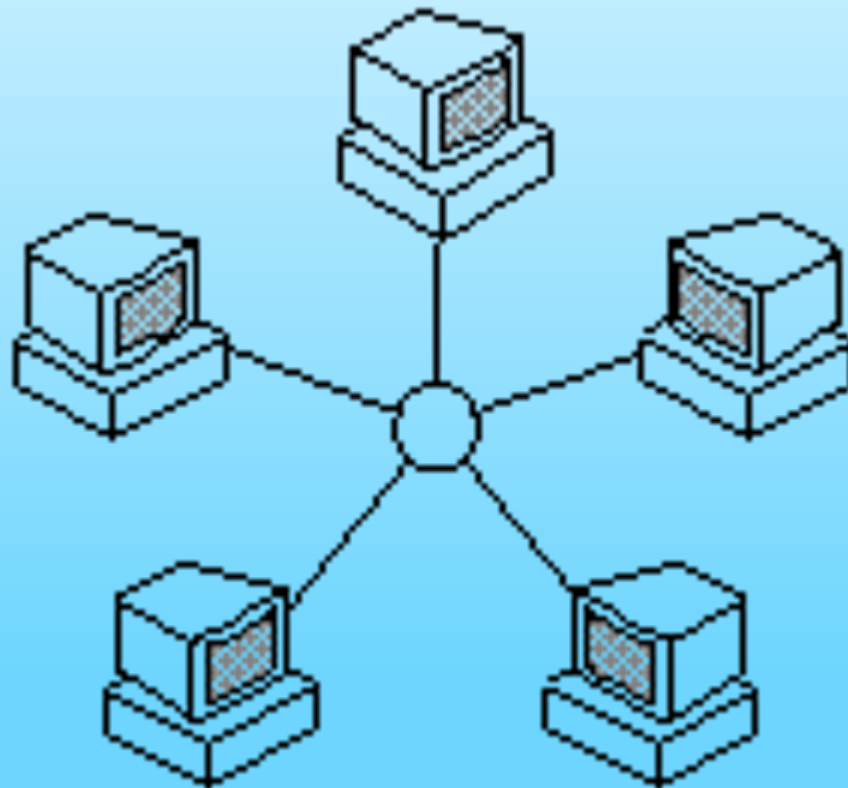
Topology



Topology

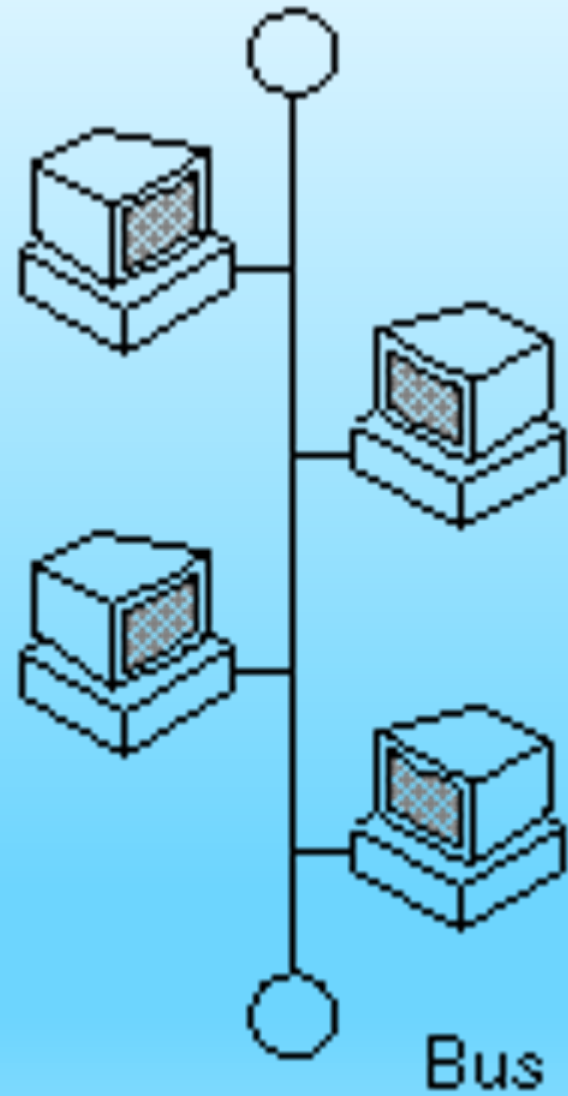


Topology

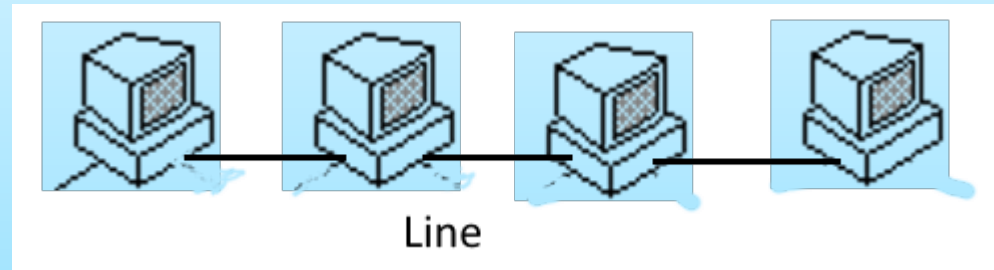


Star

Topology

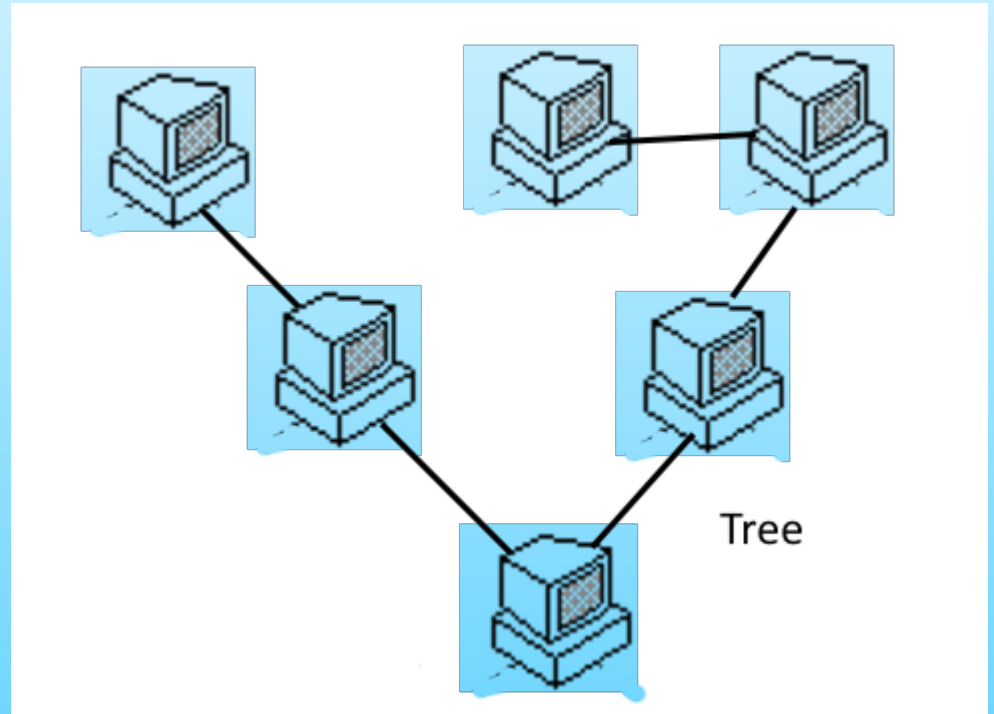


Topology



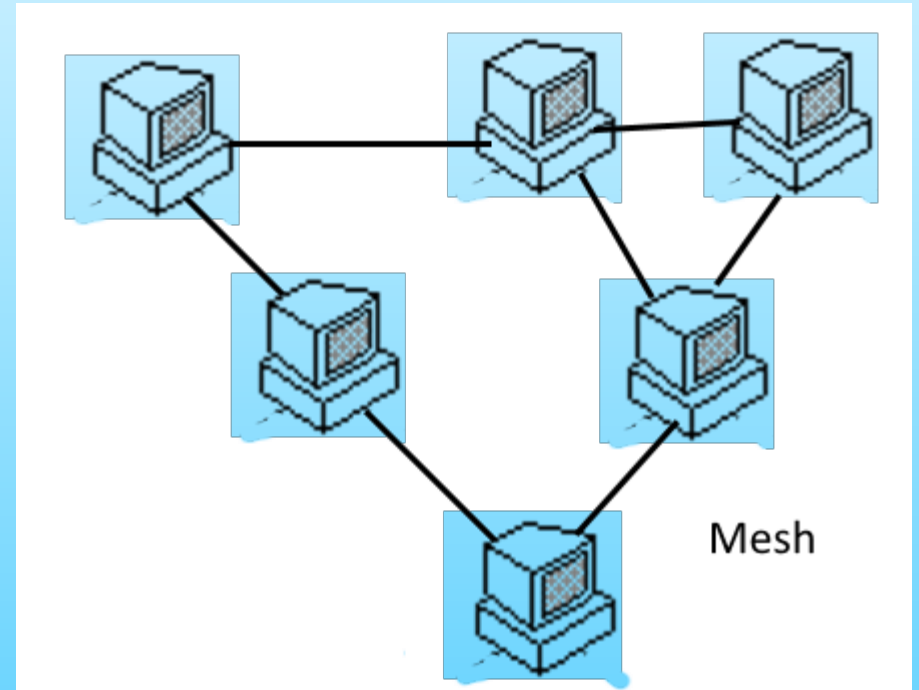
Chapter 1

Topology



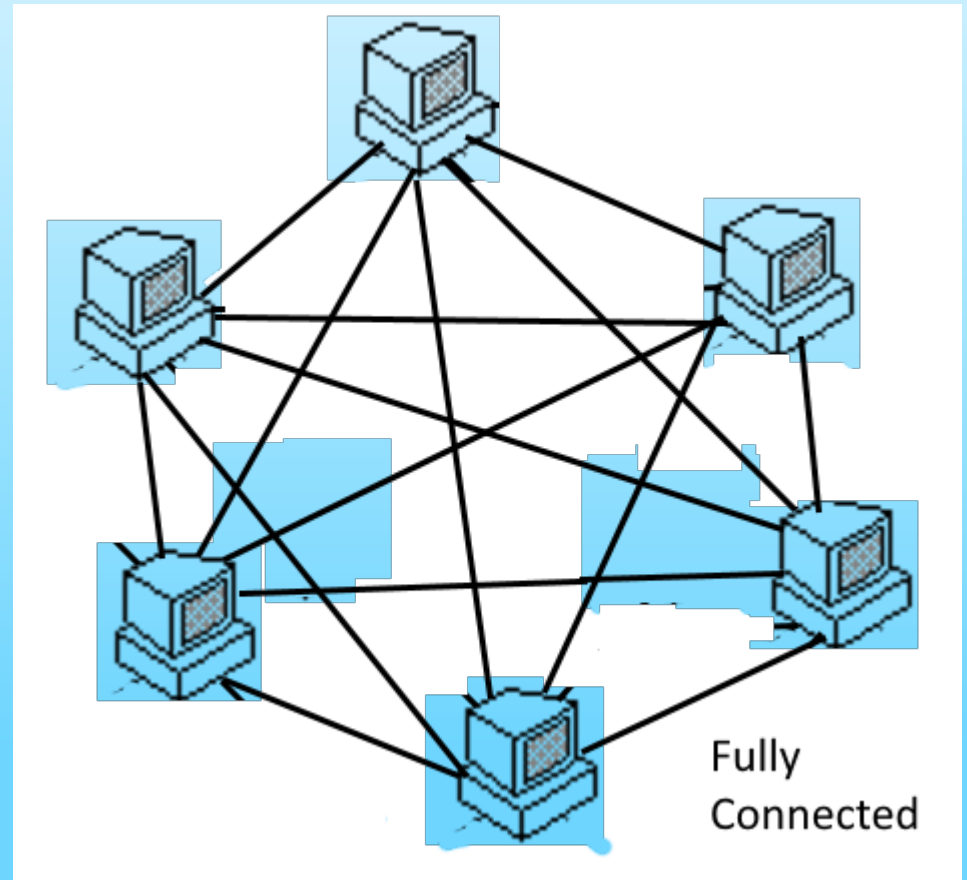
Chapter 1

Topology



Chapter 1

Topology



Networks of Different Sizes



Small Home Networks



Small Office/Home Office Networks



Medium to Large Networks



World Wide Networks

Types of Network

- Peer-to-Peer Network
- Client/Server Network
- Local Area Network (LAN)
- Wide Area Network (WAN)
- Metropolitan Area Network (MAN)
- Wireless LAN (WLAN)
- Storage Area Network (SAN)

Peer-to-Peer Network



Computers are connected directly using cables.

The advantages of peer-to-peer networking:

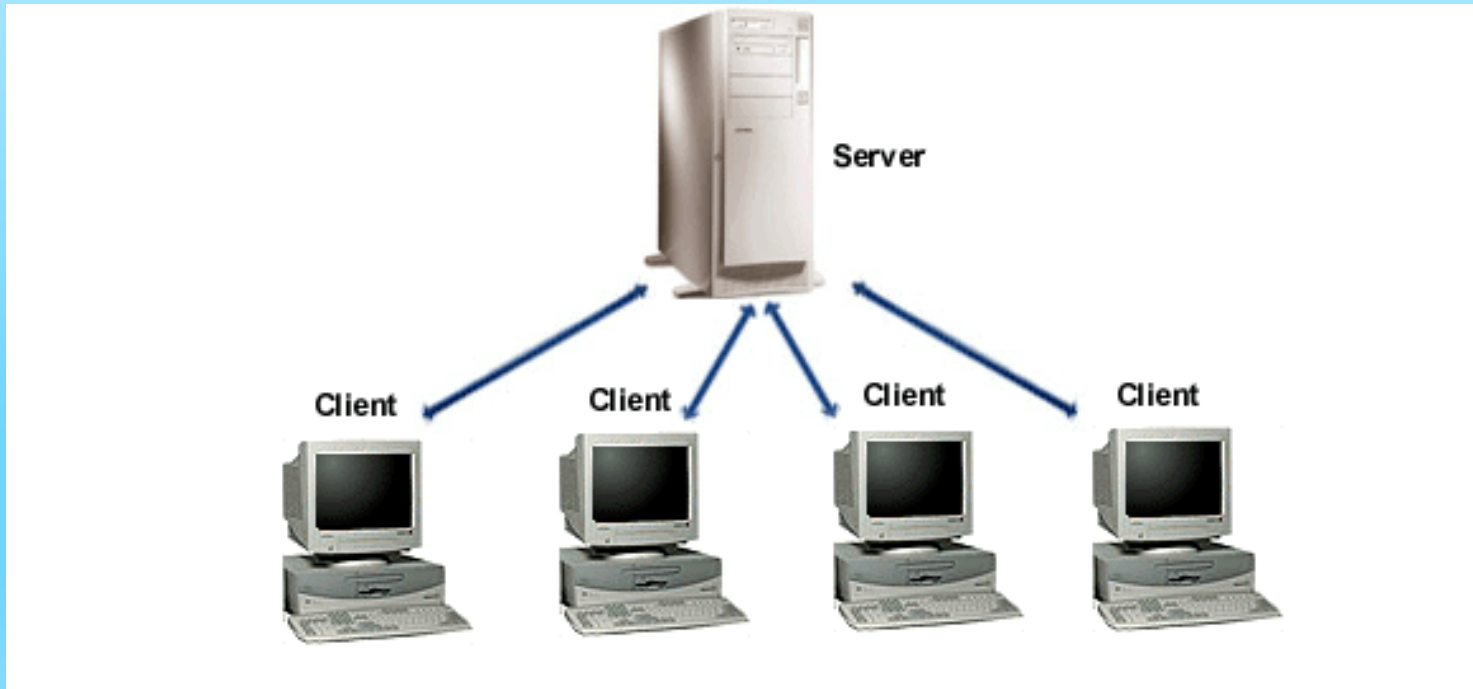
- Easy to set up
- Less complexity
- Lower cost since network devices and dedicated servers may not be required
- Can be used for simple tasks such as transferring files and sharing printers

The disadvantages of peer-to-peer networking:

- No centralized administration
- Not as secure
- Not scalable
- All devices may act as both clients and servers which can slow their performance

Client /Server Network

A Client/Server Network is a system where standalone (client) PCs are connected to a Server (PC with Server OS)



Clients and Server Network

- In a client/server environment, each computer still holds resources and files. Other computers can access the resources stored in a computer, as in a peer-to-peer scenario.
- Files and resources are centralized. The server has the resources and other computers can access them.

Clients and Server Network

- The server is always ON, the client machines can access the files and resources without caring whether a certain computer is ON.
- Should the server be turned OFF, all resources will not be available. A standby server can be used for emergency.

Clients and Server Network

- Security is created, managed, and can get enforced.

To access the network, a person, called a user must provide some credentials, such as a username and a password.

- If the credentials are not valid, the user is prevented from accessing the network.

Components of a Network

There are three categories of network components:

- Devices
- Media
- Services

Components of a Network

Example of devices

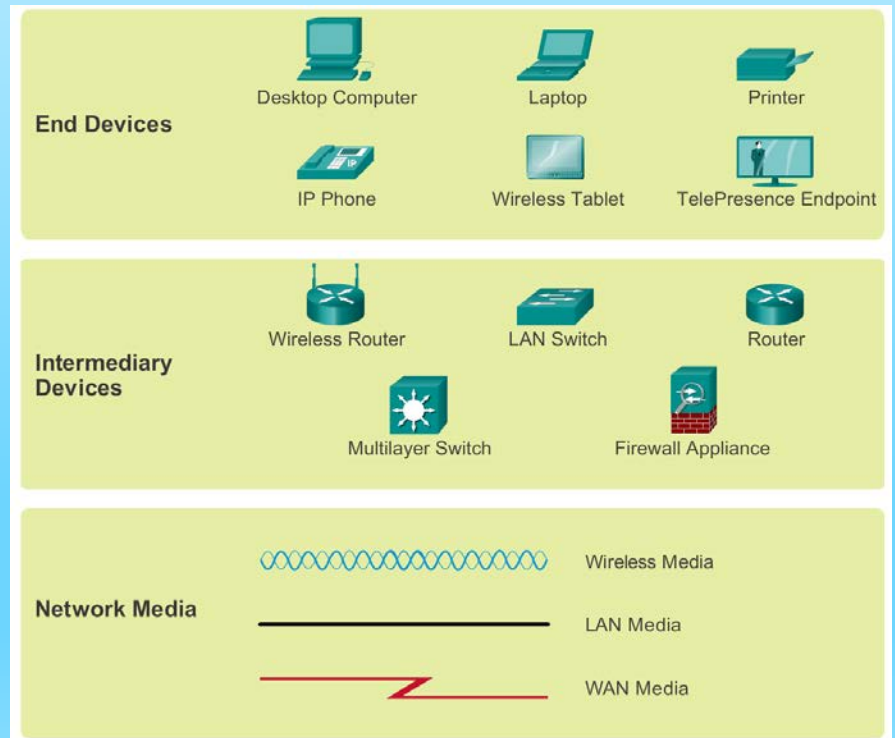
- Computers (work stations, laptops, file servers, web servers)
- Network printers
- VoIP (Voice over Internet Protocol) phones
- TelePresence endpoint
- Security cameras
- Mobile handheld devices (such as smart phones, tablets, PDAs, and wireless debit / credit card readers and barcode scanners)

Components of a Network

Network Infrastructure Devices

Examples of intermediary network devices are:

- Network Access Devices (switches, and wireless access points)
- Internetworking Devices (routers)
- Security Devices (firewalls)

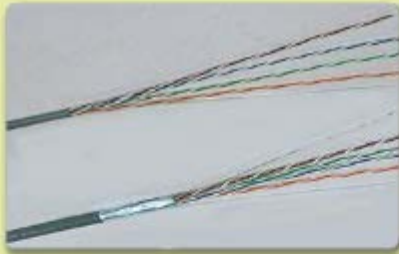


Components of a Network

Network Media

The things that connect the devices

Copper



Fiber Optic

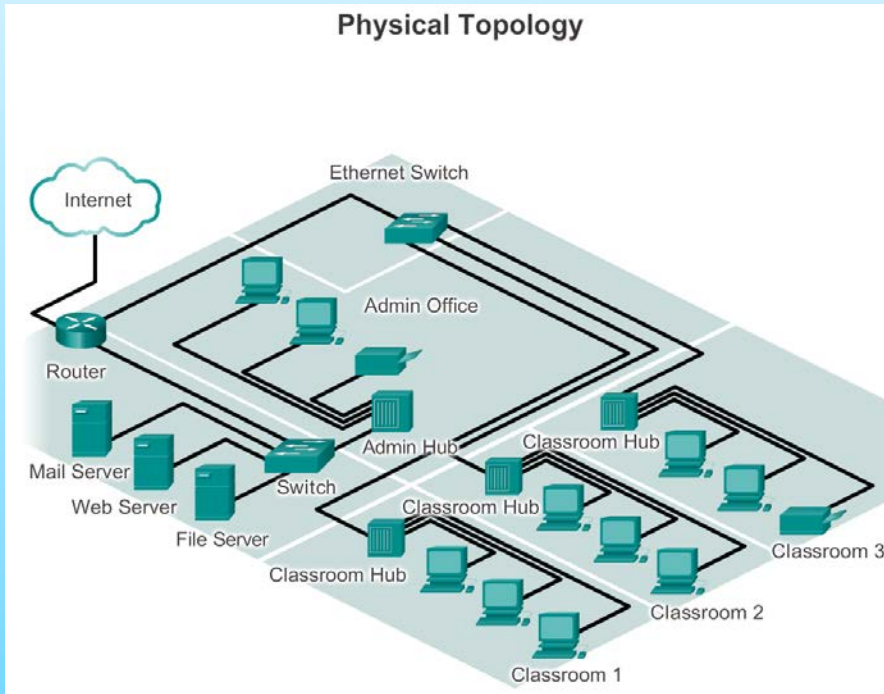


Wireless



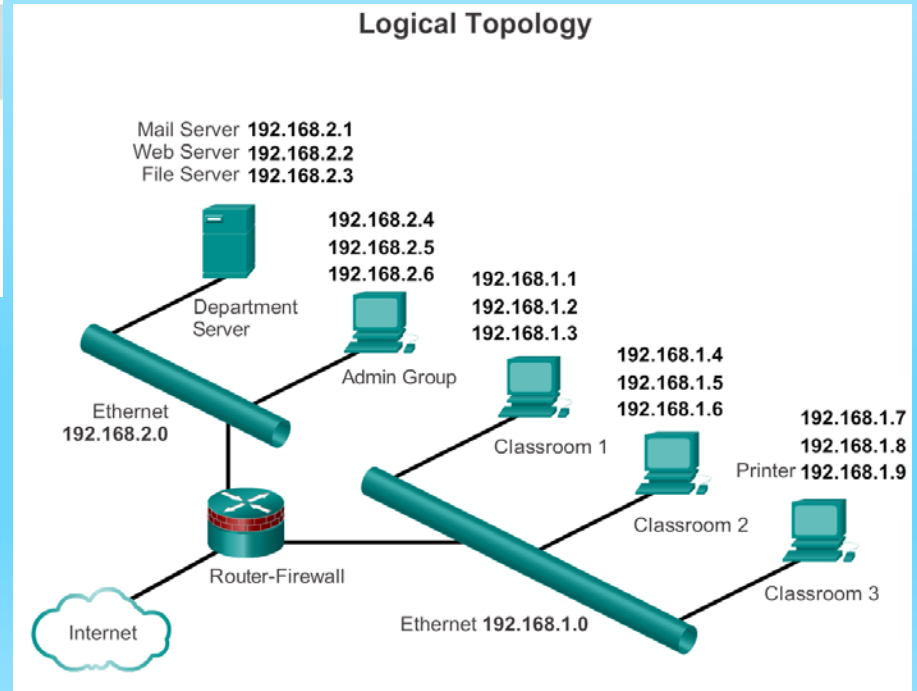
Components of a Network Topology Diagrams

Physical Topology



Layout according to IP addresses

Logical Topology



Actual physical layout

END OF CHAPTER 1A

REVIEW

Chapter 1

1. What is a Computer Network?

Chapter 1

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A computer network is a telecommunications network which allows computers to exchange data.

Chapter 1

2. What is Network Topology

-

Chapter 1

2. What is Network Topology

Network Topology is the arrangement of various elements in a computer network.

Chapter 1

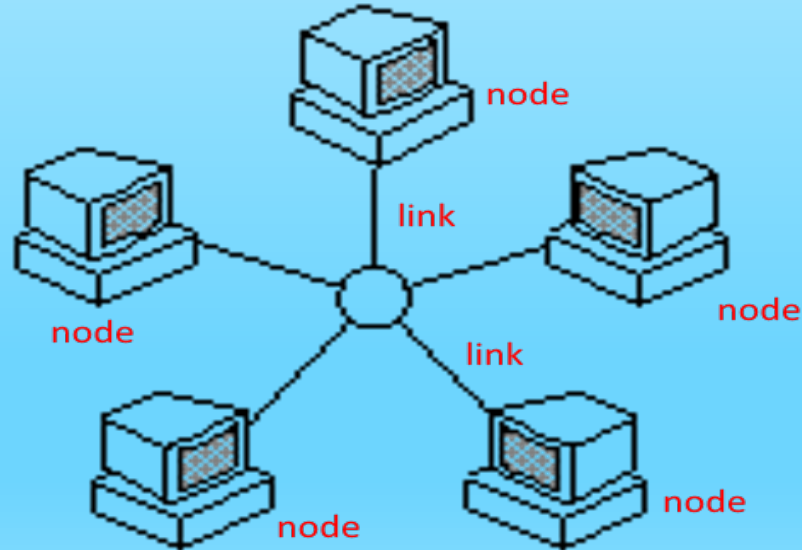
Each computer or device in the a network is called a _____.

Cables connecting the nodes are known as _____.

Chapter 1

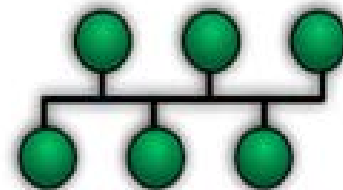
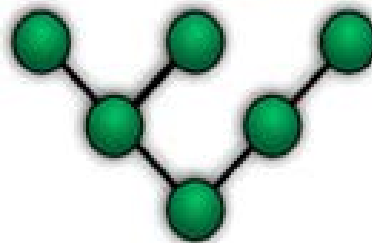
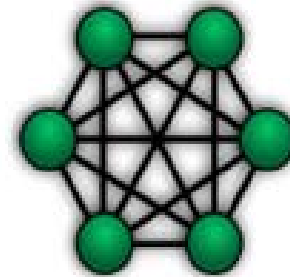
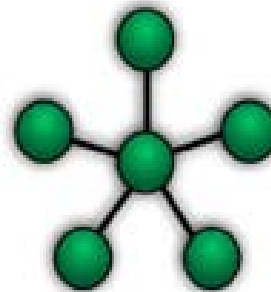
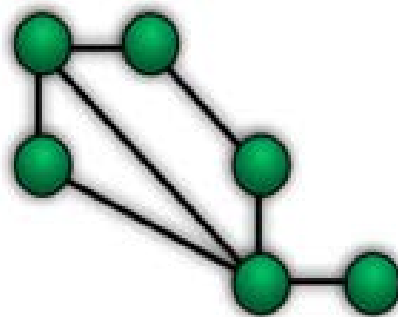
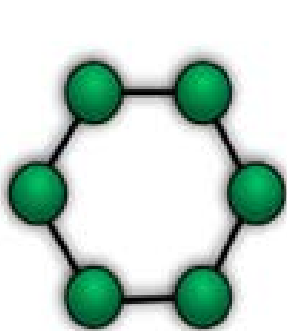
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Cables connecting the nodes are known as **links**.



Chapter 1

3. Names the topologies shown.

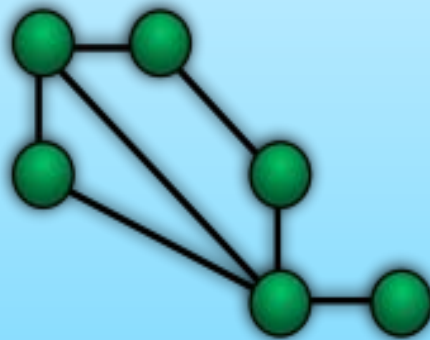


Chapter 1

Types of Network Topology



Ring



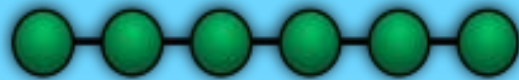
Mesh



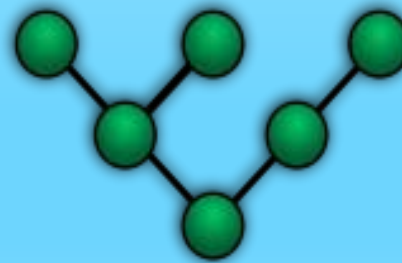
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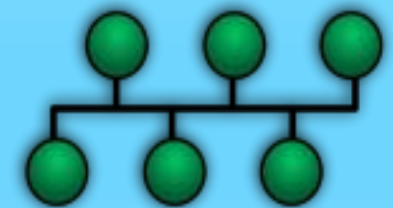
Fully Connected



Line

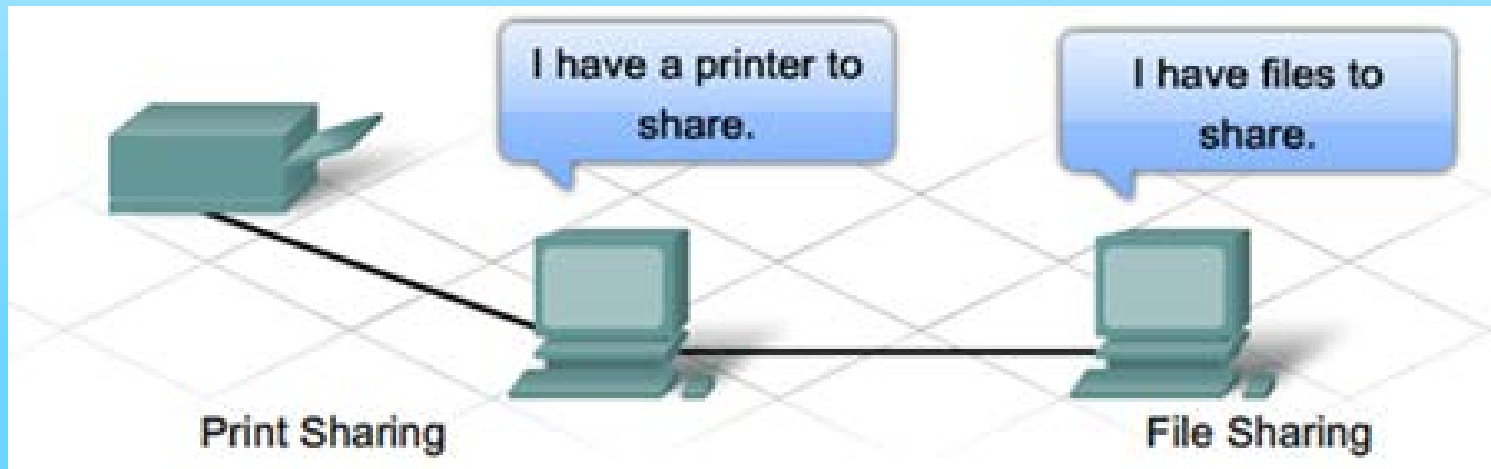


Tree

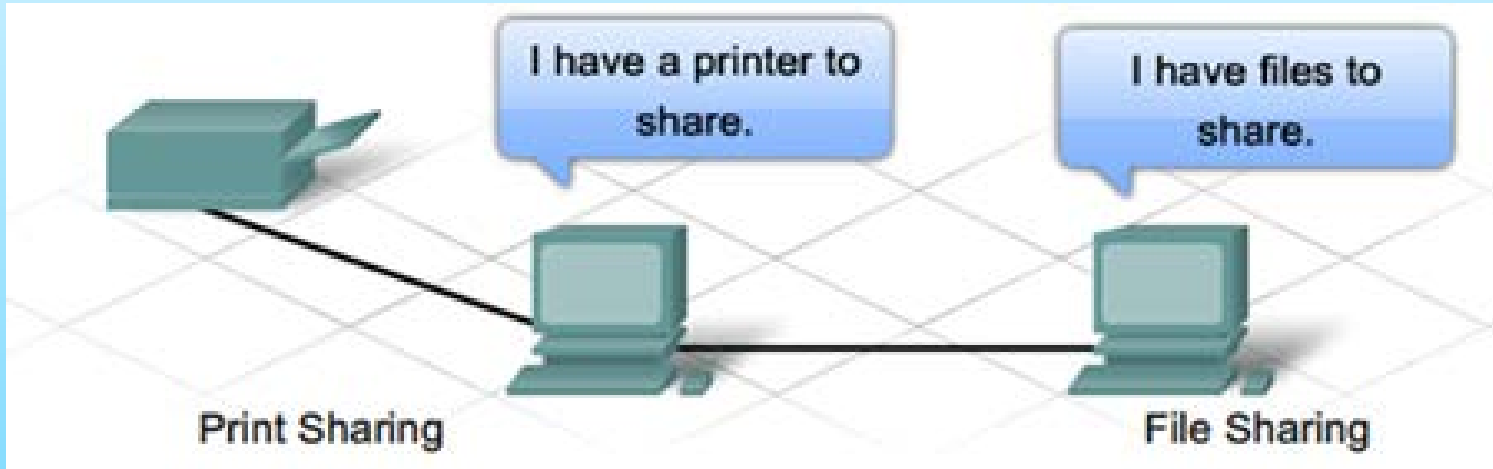


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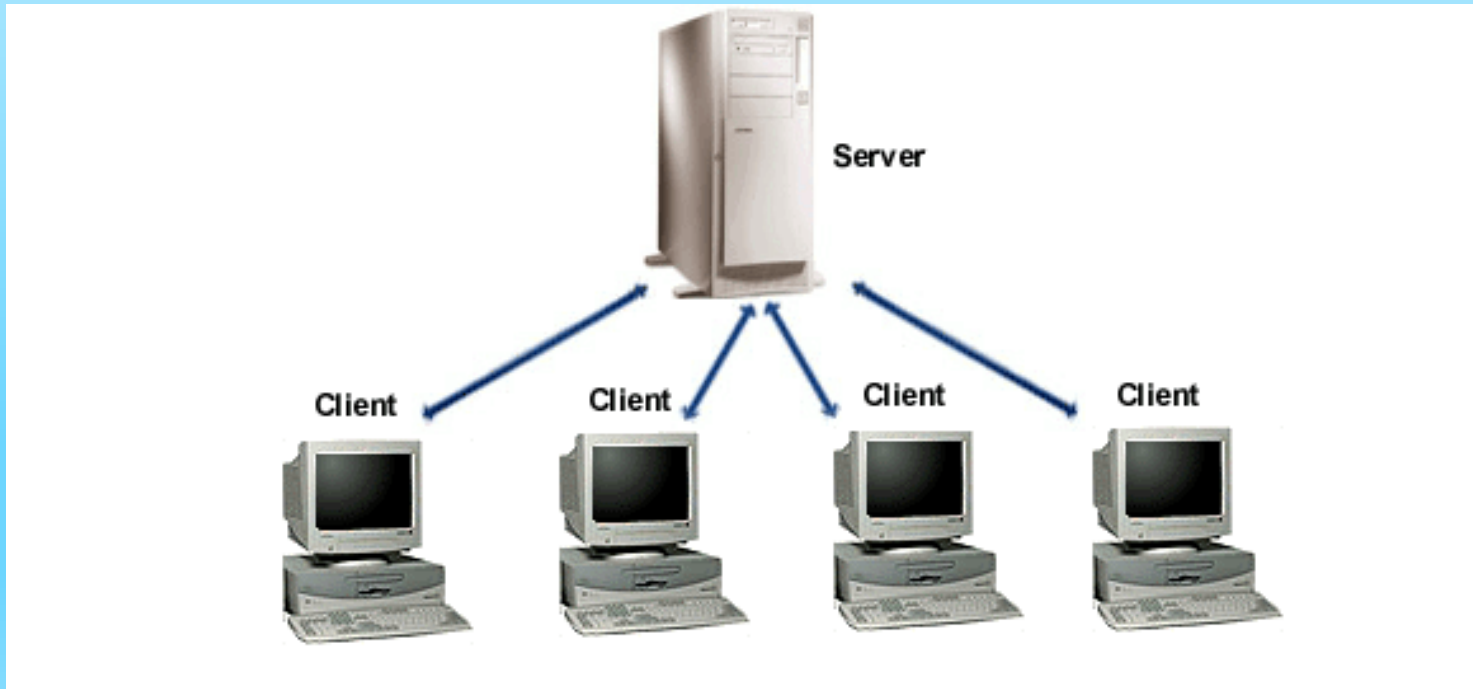
4. What network is this?



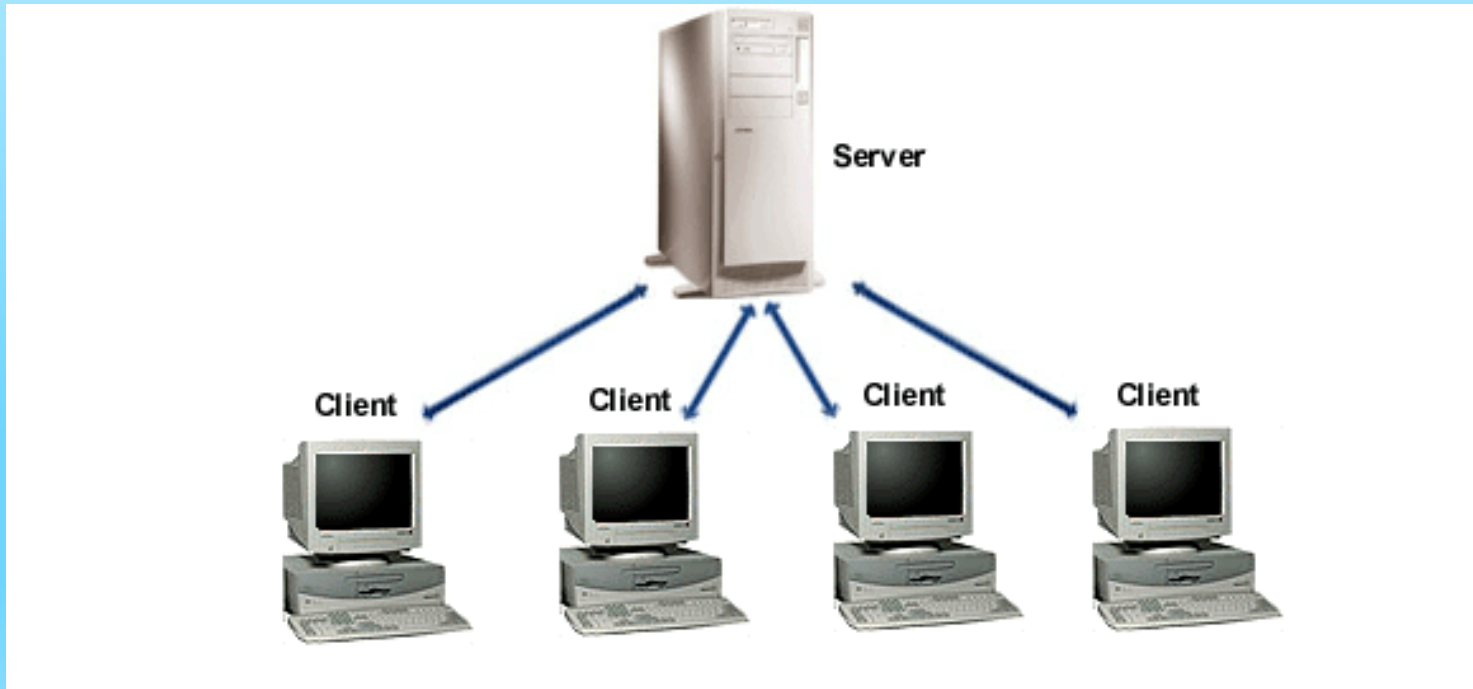
4. What network is this? Peer-to-Peer Network



What Network is this?



5. What Network is this? Client-Server Network



6. In a Peer-to-Peer Network, can one computer access the resources of the other computer?

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Yes

7. In a Client Server Network, can one computer access the resources of the other computer?

6. In a Peer-to-Peer Network, can one computer access the resources of the other computer?

Yes

7. In a Clients and Server Network, if one computer is not turned on, can the other computers access the server?

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Yes

8. In a Clients and Server Network, what must users have to access the server?

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Credentials – userid and password

9. What are the three categories of network components?

- Devices
- Media
- Services

10. Name some Components of a Network

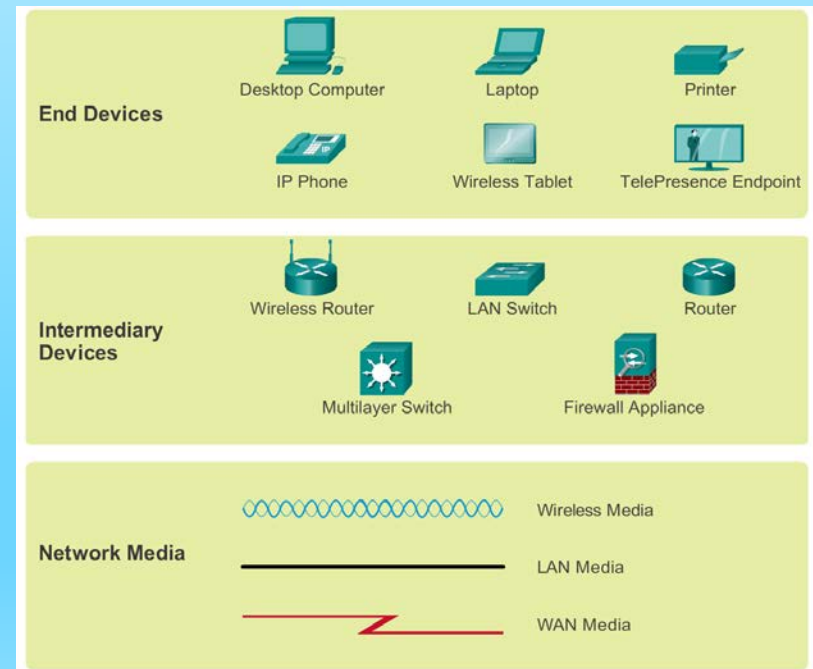
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- TelePresence endpoint
- Security cameras
- Mobile handheld

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- Internetworking Devices (routers)
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12. What are the 3 types of media for transporting data?

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- **Copper**
- **Fiber optic**
- **wireless**

Copper



Fiber Optic



Wireless

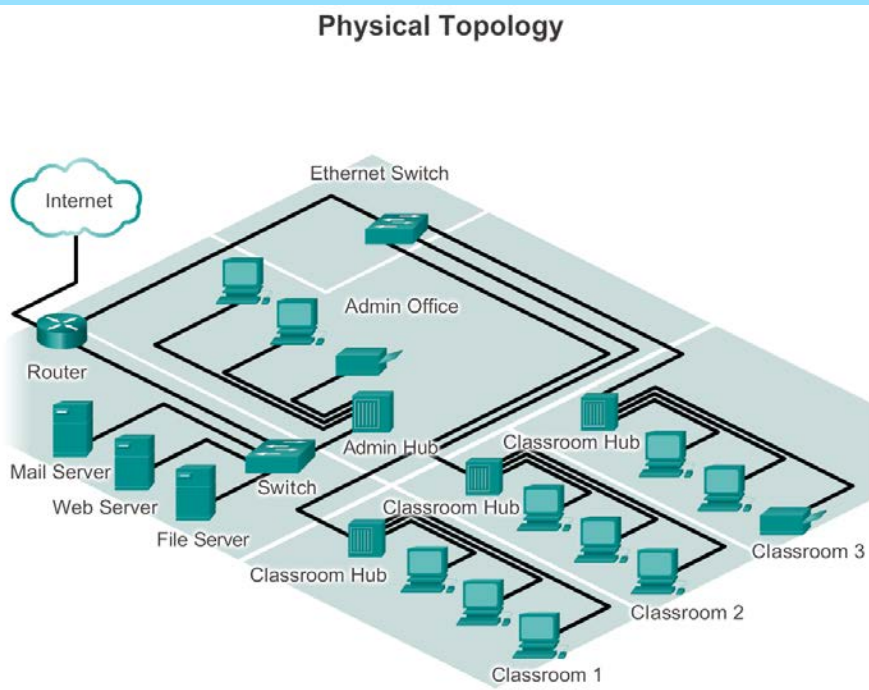


13. What are the 2 types of Network topology?

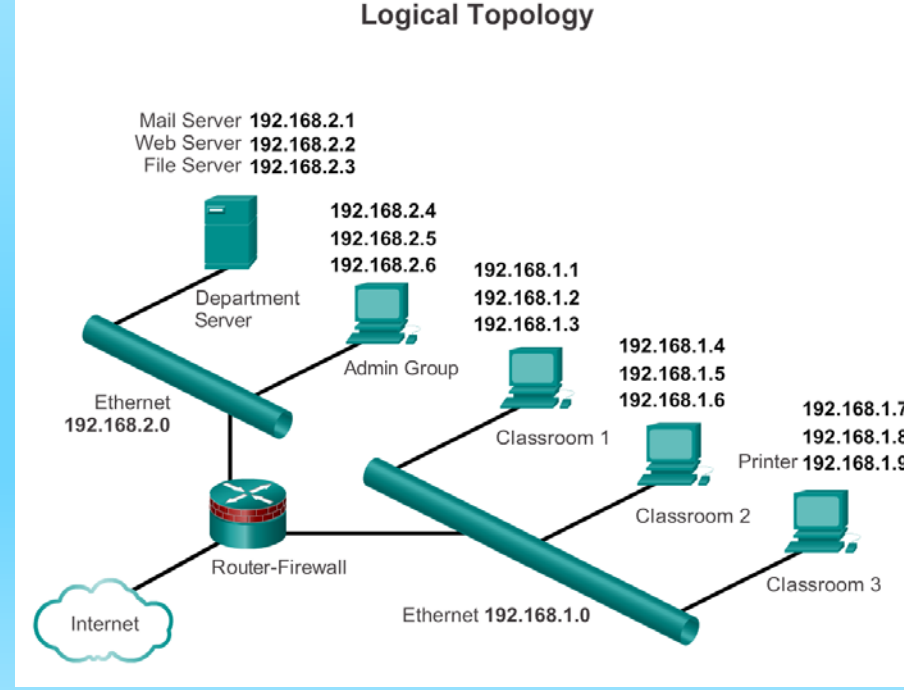
13. What are the 2 types of Network topology?

- Physical
- logical

Physical Topology

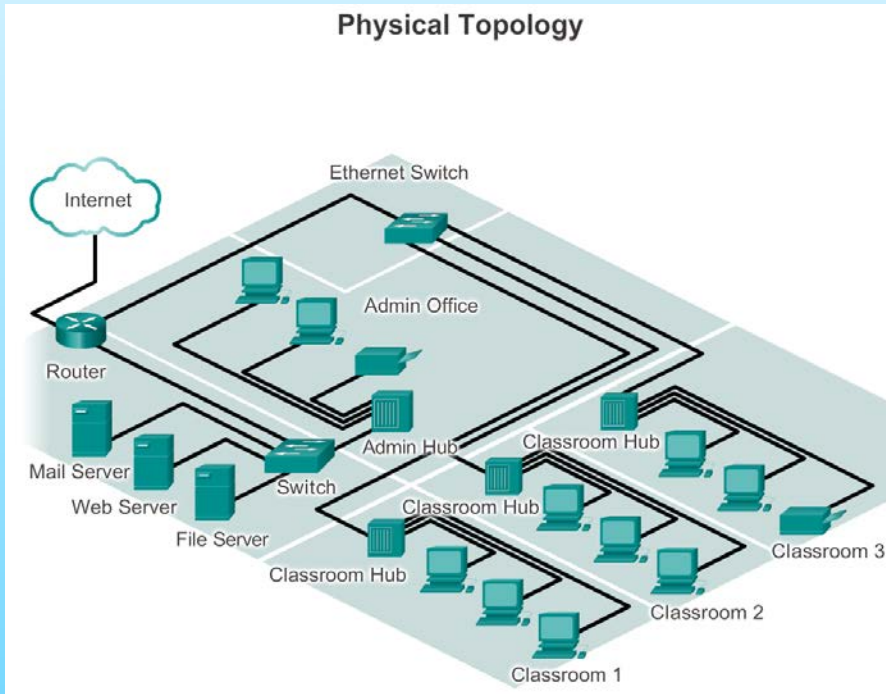


Logical Topology

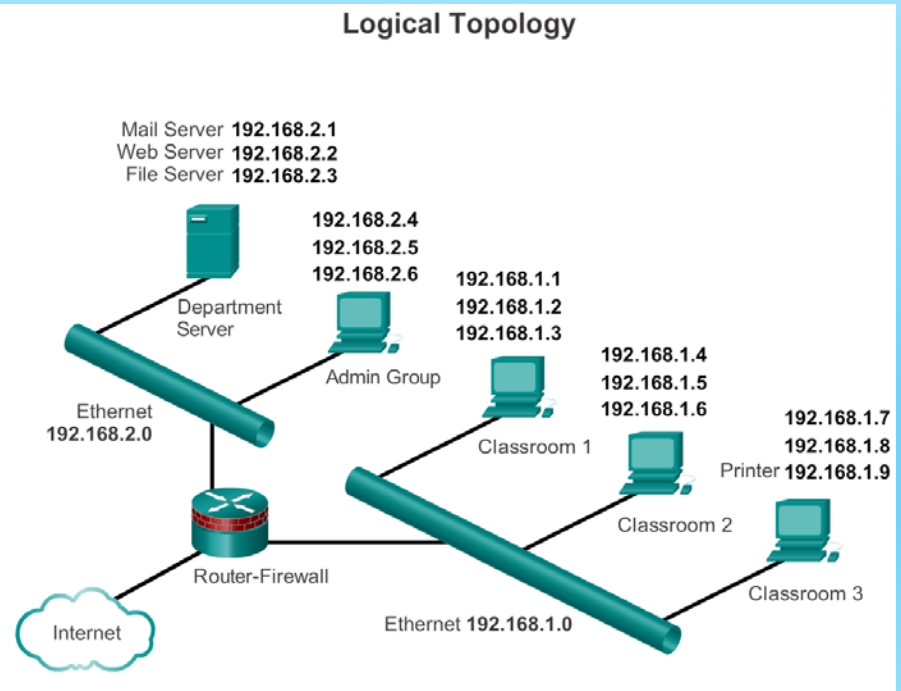


Components of a Network Topology Diagrams

Physical Topology



Logical Topology



**How many questions did you answer
correctly?**