



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

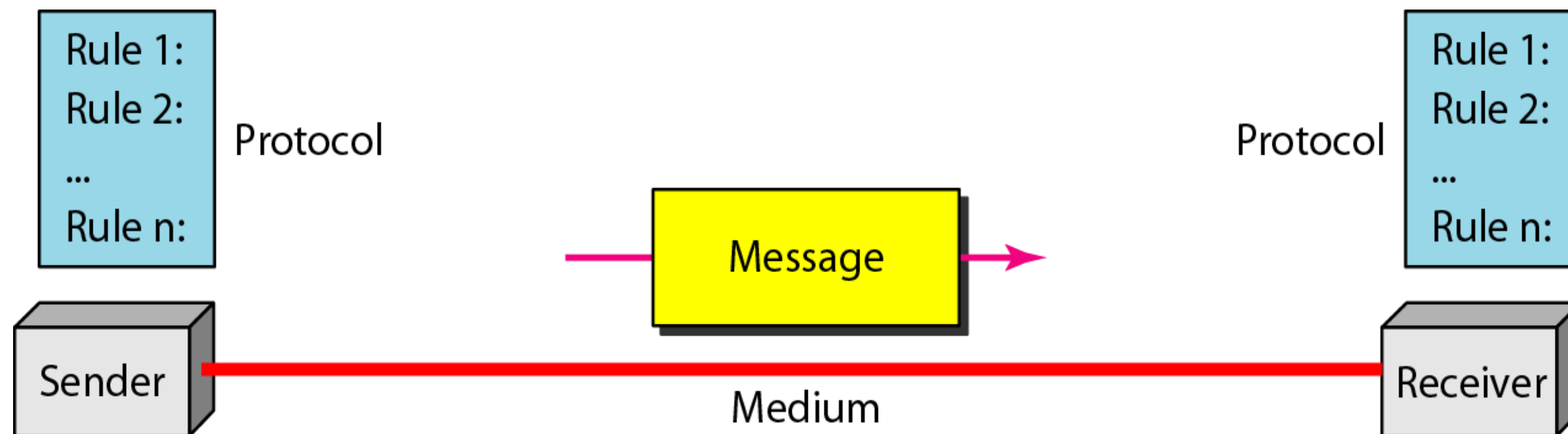
COURSE NAME :19IT401 COMPUTER NETWORKS
II YEAR /IV SEMESTER

Unit 1- INTRODUCTION AND PHYSICAL LAYER
Topic 1 and 2 :Computer networks and Internet



Computer Networks

- A network is the interconnection of a set of devices(nodes) capable of communication
- A node can be a computer, printer, switch, router or any other device capable of sending and/or receiving data
- These devices in a network are connected using wired or wireless transmission media such as cable or air.





list of several computer networking jobs



[Network support specialist](#)

Primary duties: A network support specialist is a computer networking professional who provides assistance to computer users.

[Network technician](#)

Primary duties: Network technicians handle a variety of tasks related to installing and maintaining network systems.

[Network administrator](#)

Primary duties: Network administrators are responsible for maintaining networks, including internet systems, local area networks (LANs) and wide area networks (WANs).

[Field service engineer](#)

Primary duties: Field service engineers are computer networking professionals who install and repair network systems on site.

[Computer systems analyst](#)

Primary duties: A computer systems analyst studies the computer systems of an organization to help improve them.

[Computer systems administrator](#)

Primary duties: Computer systems administrators are responsible for developing and maintaining the computer network systems of an organization.

[Network engineer](#)

Primary duties: Network engineers are computer networking professionals who plan and create computer networks for organizations.

[Wireless engineer](#)

Primary duties: A wireless engineer is responsible for installing and configuring wireless network systems.

[Network architect](#)

Primary duties: Network architects design computer network systems. They also create data communication networks, including cloud networks.

[Technical architect](#)

Primary duties: Technical architects are responsible for designing network systems for their clients. They manage all aspects of computer networking projects, often supervising other professionals.



Career in Computer Networking: Top Recruiters



Many big and small firms hire computer networkers as there is always a demand for professionals. Here is a list of top recruiters in the country.

1. Intel Corporation
2. Acer India (Pvt) Ltd
3. Dell
4. Casio India Company
5. HCL
6. TCS
7. Infosys
8. Wipro
9. Accenture





Computer Networks



Network Criteria

A network must be able to meet a certain number of criteria. The most important of these are performance, reliability, and security.

✓ **Performance can be measured in many ways, including transit time and response time.**

Transit time is the amount of time required for a message to travel from one device to another. Response time is the elapsed time between an inquiry and a response.

✓ **Reliability**

In addition to accuracy of delivery, network **reliability is measured by the frequency of failure, the time it takes a link to recover from a failure, and the network's robustness**

✓ **Security**

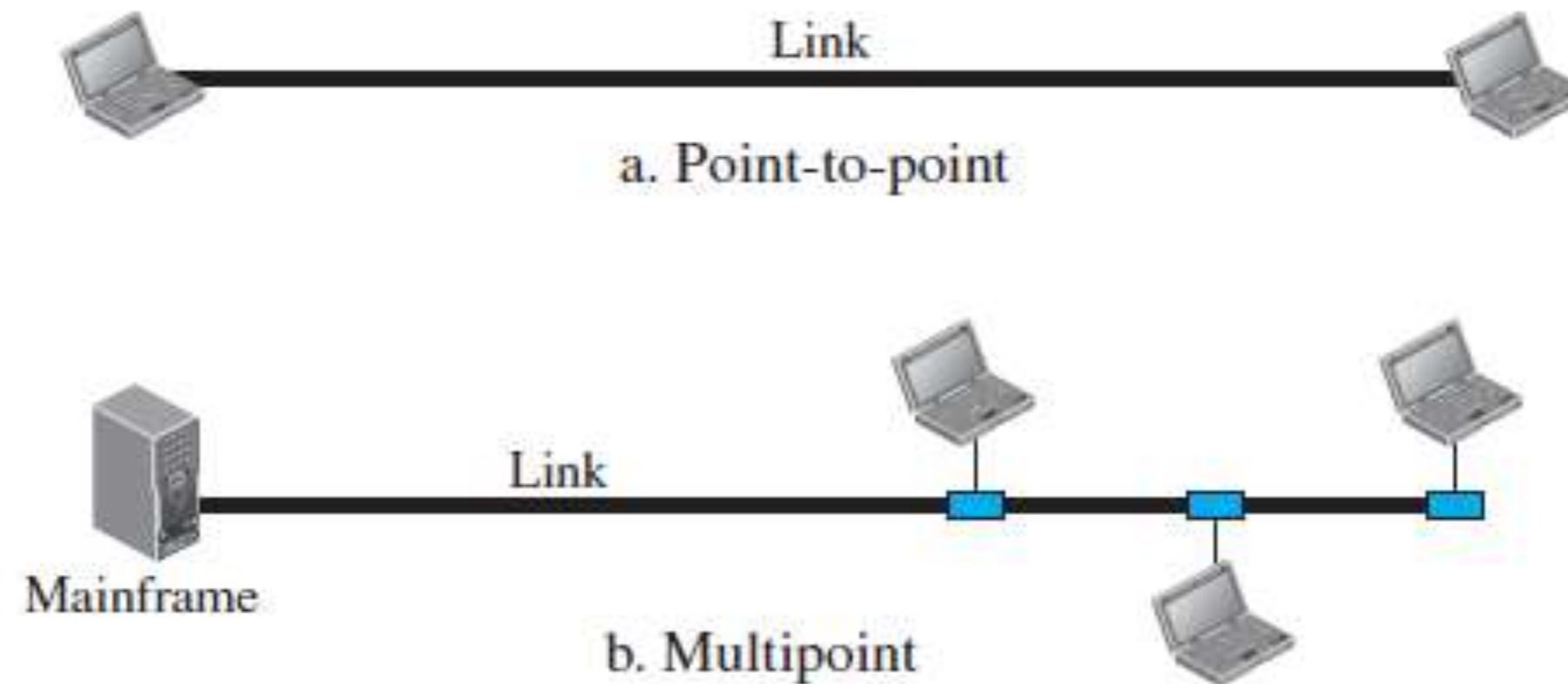
Network **security issues include protecting data from unauthorized access, protecting data from damage and development,**



Computer Networks



Types of connections: point-to-point and multipoint





Computer Networks



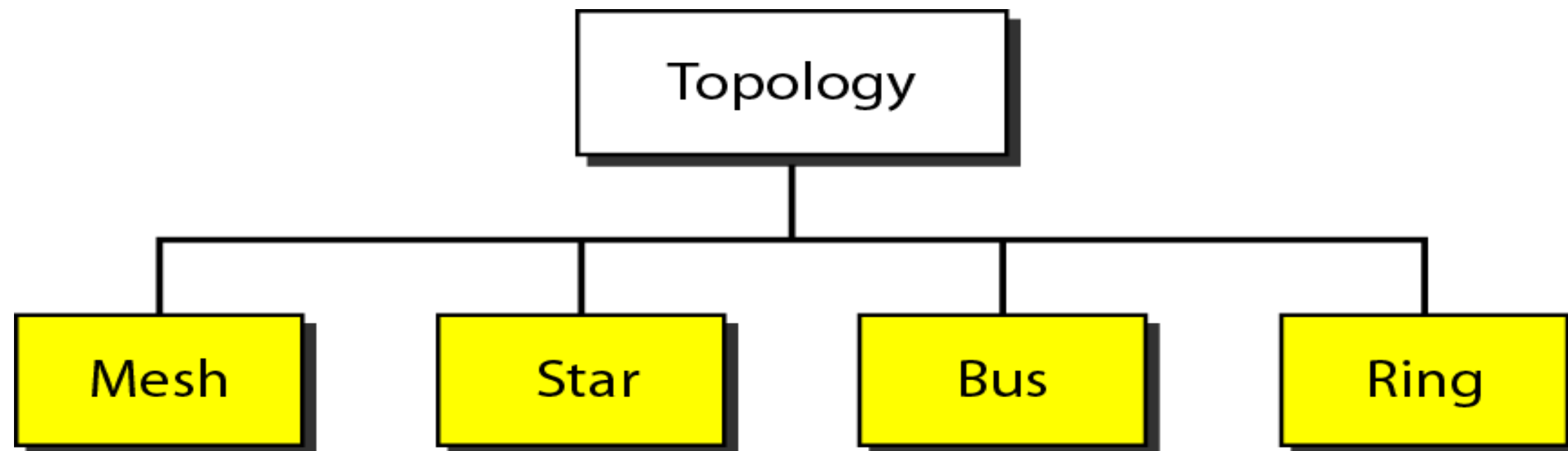
Physical Topology

The term *physical topology* refers to the way in which a network is laid out physically.

The topology of a network is the geometric representation of the relationship of all the links and linking devices (usually called nodes) to one another.

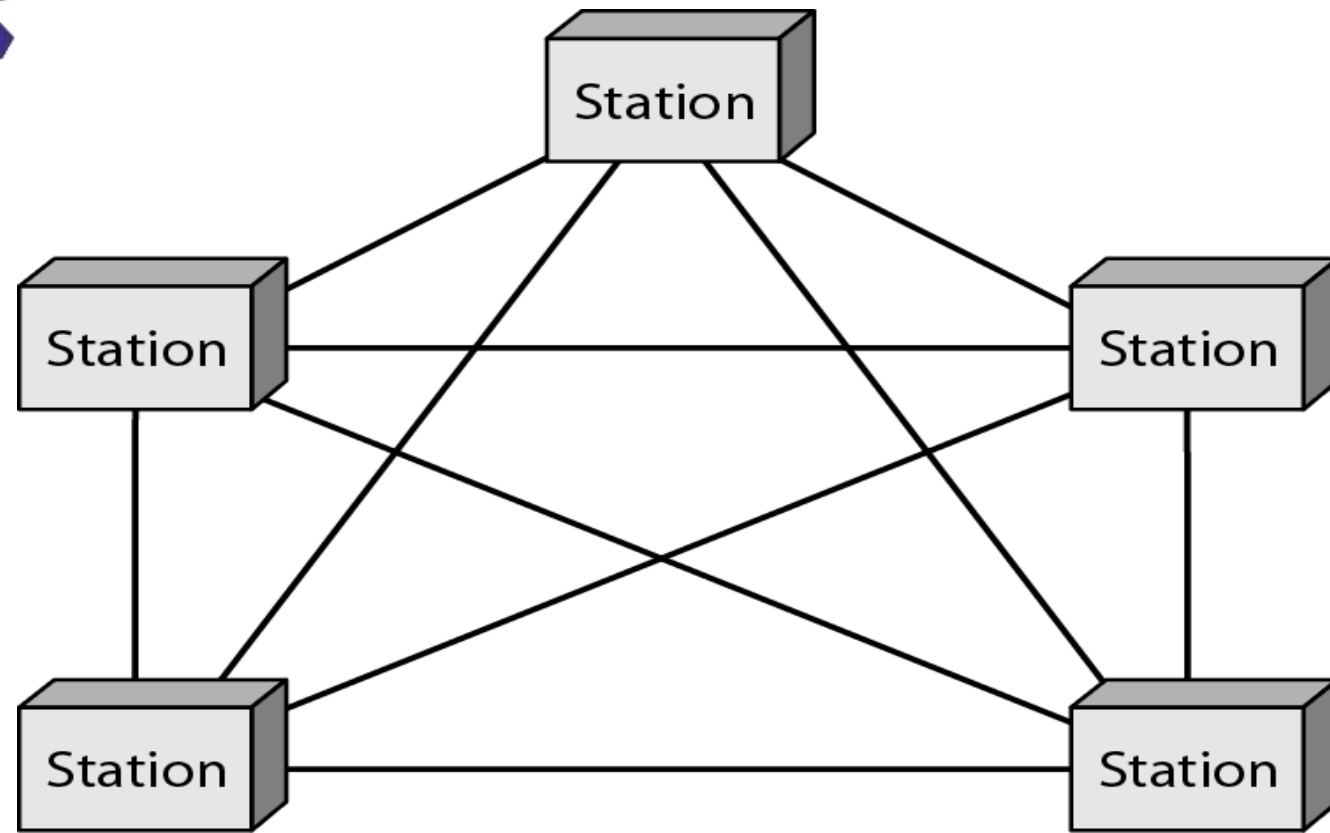
There are four basic topologies possible: mesh, star, bus, and ring

- ✓ **Connection of devices**
- ✓ **Type of transmission - unicast, mulitcast, broadcast**

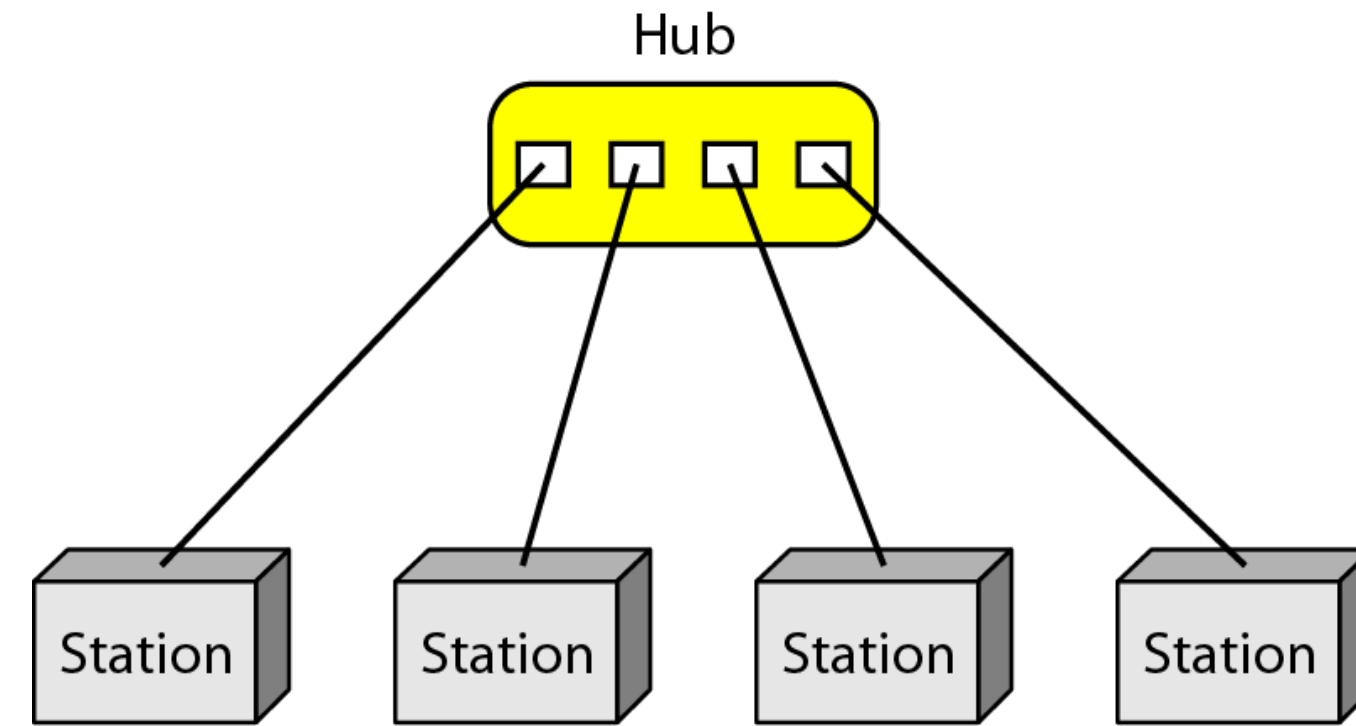




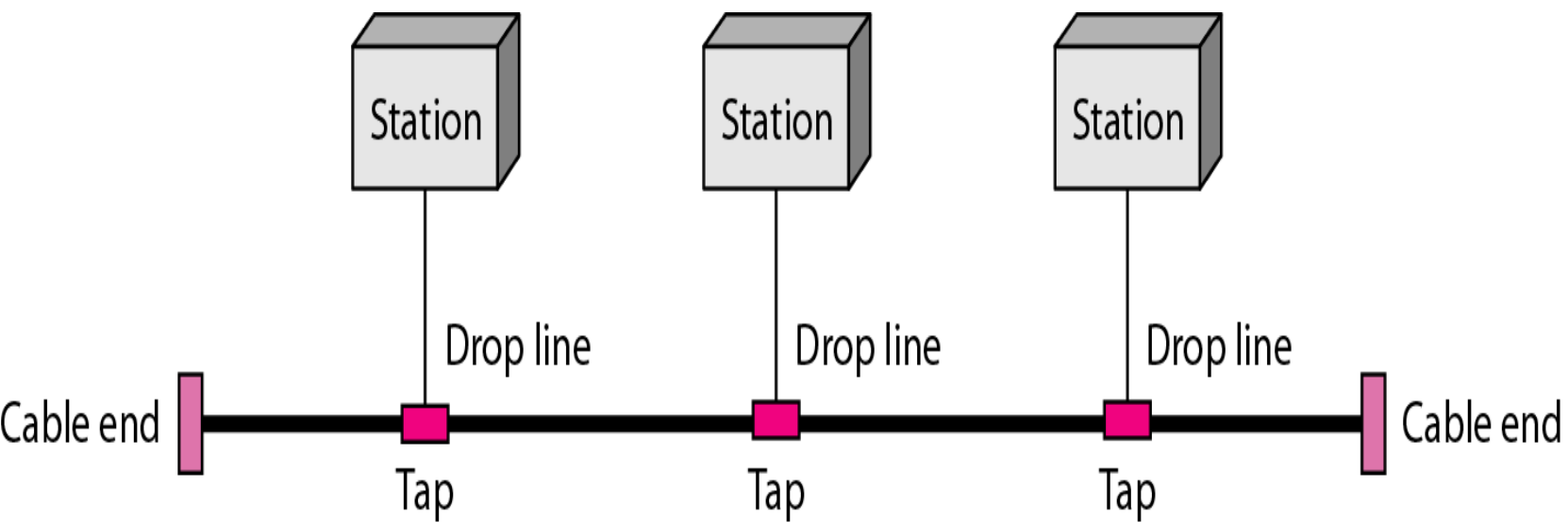
Physical Topology



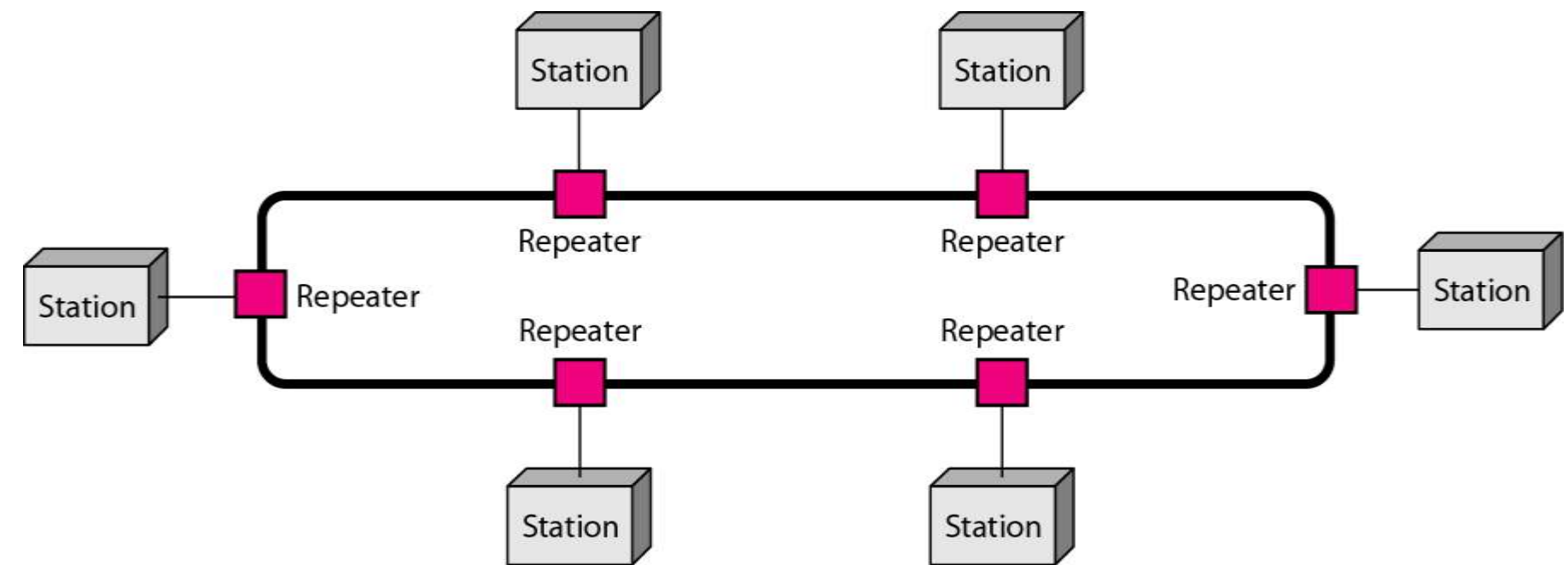
A fully connected mesh topology (five devices)



A star topology connecting four stations



A bus topology connecting three stations



A ring topology connecting six stations



MESH

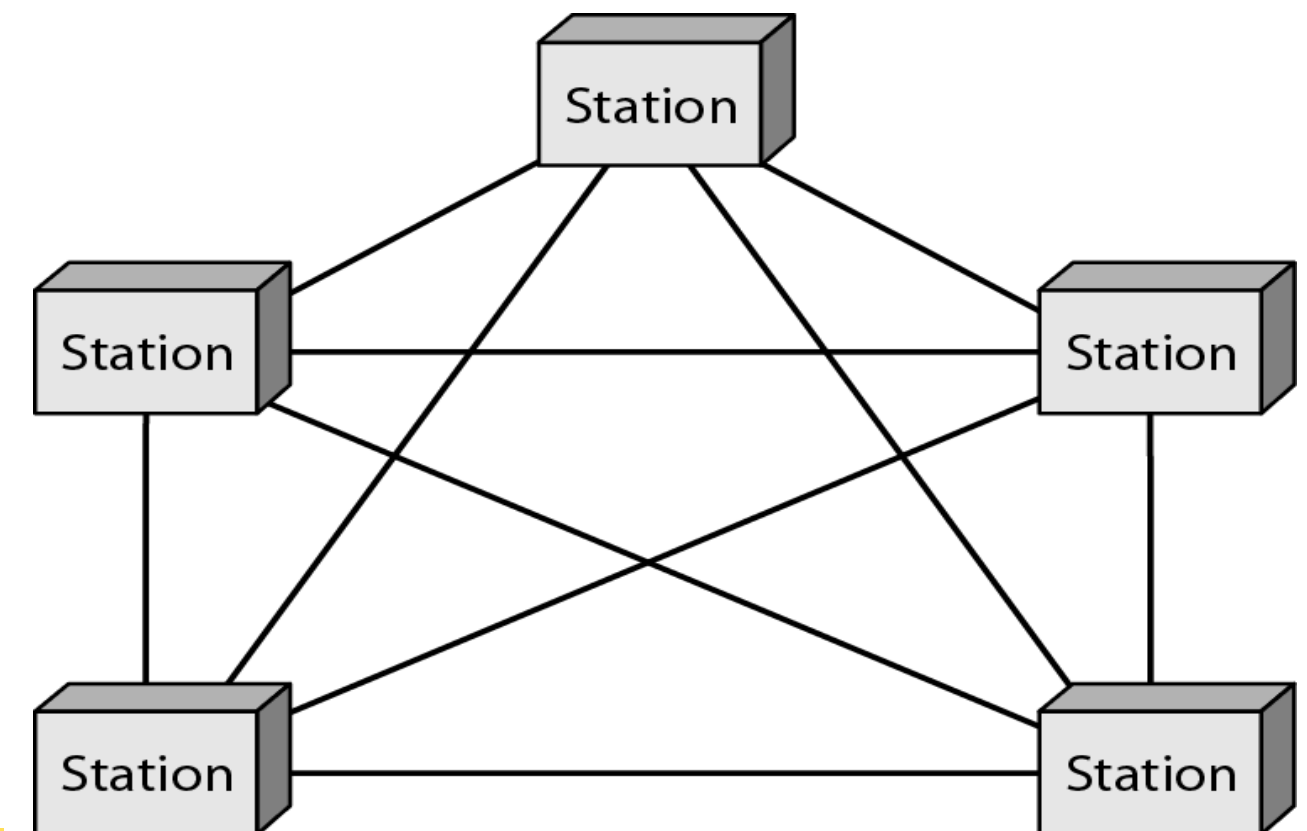


Advantages:

1. Dedicated links
2. A mesh topology is robust. If one link becomes unusable, it does not incapacitate the entire system.
3. There is the advantage of privacy or security
4. Point-to-point links make fault identification and fault isolation easy

Disadvantages:

1. Amount of cabling
2. The hardware required to connect each link (I/O ports and cable) can be prohibitively expensive.



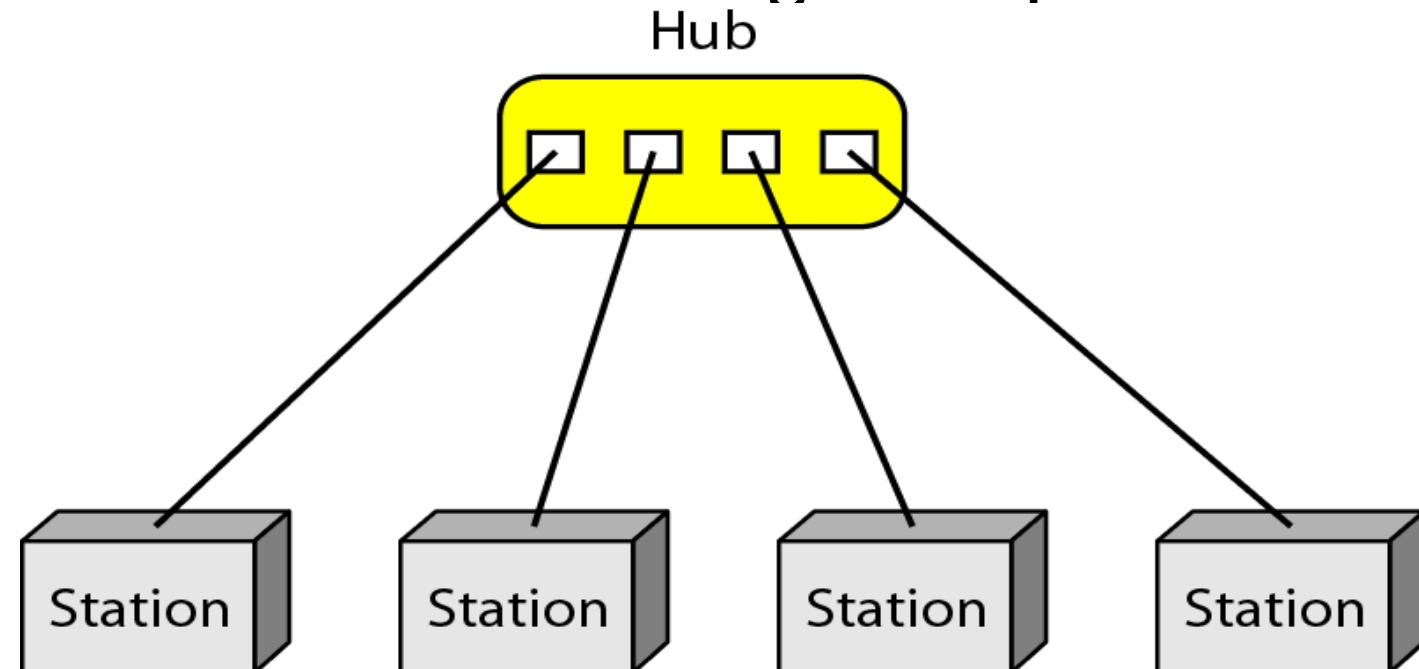
STAR

Advantages :

1. Robustness. If one link fails, only that link is affected. All other links remain active.
2. Easy fault identification and fault isolation

Disadvantages:

1. The dependency of the whole topology on one single point, the hub. If the hub goes down, the whole system is dead.
2. Although a star requires far less cable than a mesh, each node must be linked to a central hub.
3. More cabling is required in a star than in some other topologies (such as ring or bus).





BUS

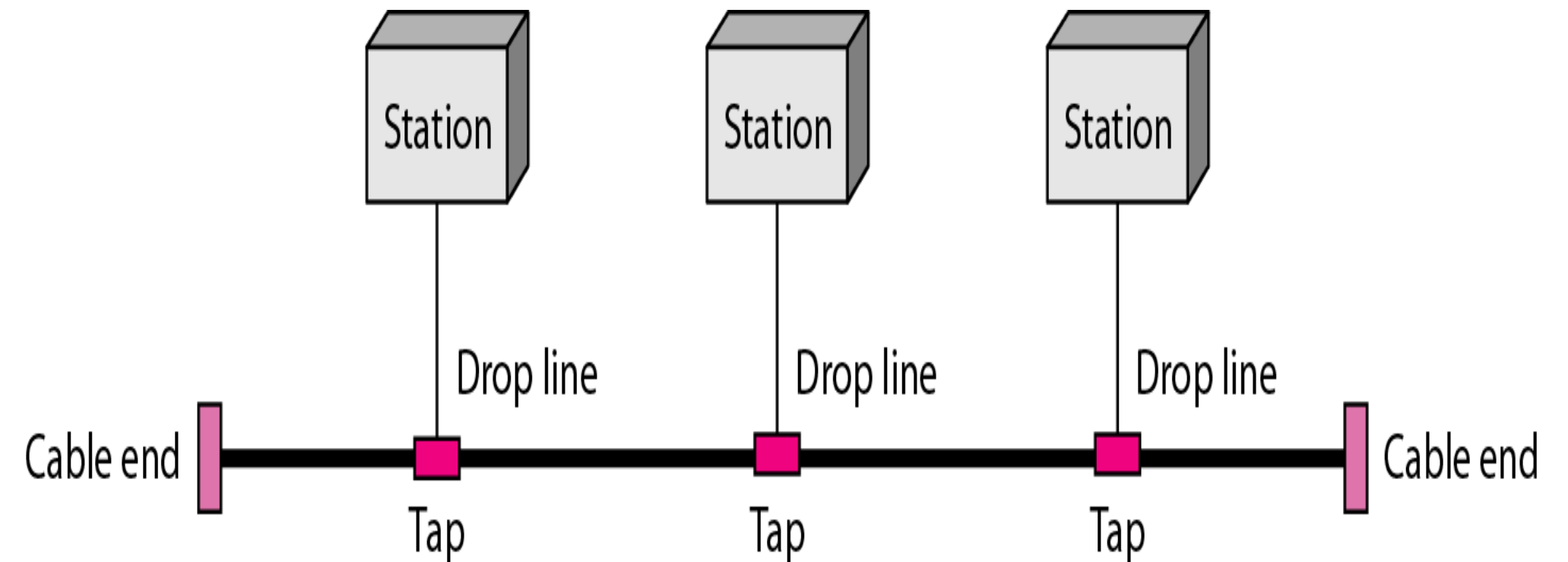


Advantages

1. Ease of installation.
2. Uses less cabling than mesh or star topologies

Disadvantages

1. Difficult reconnection and fault isolation.
2. Difficult to add new devices.



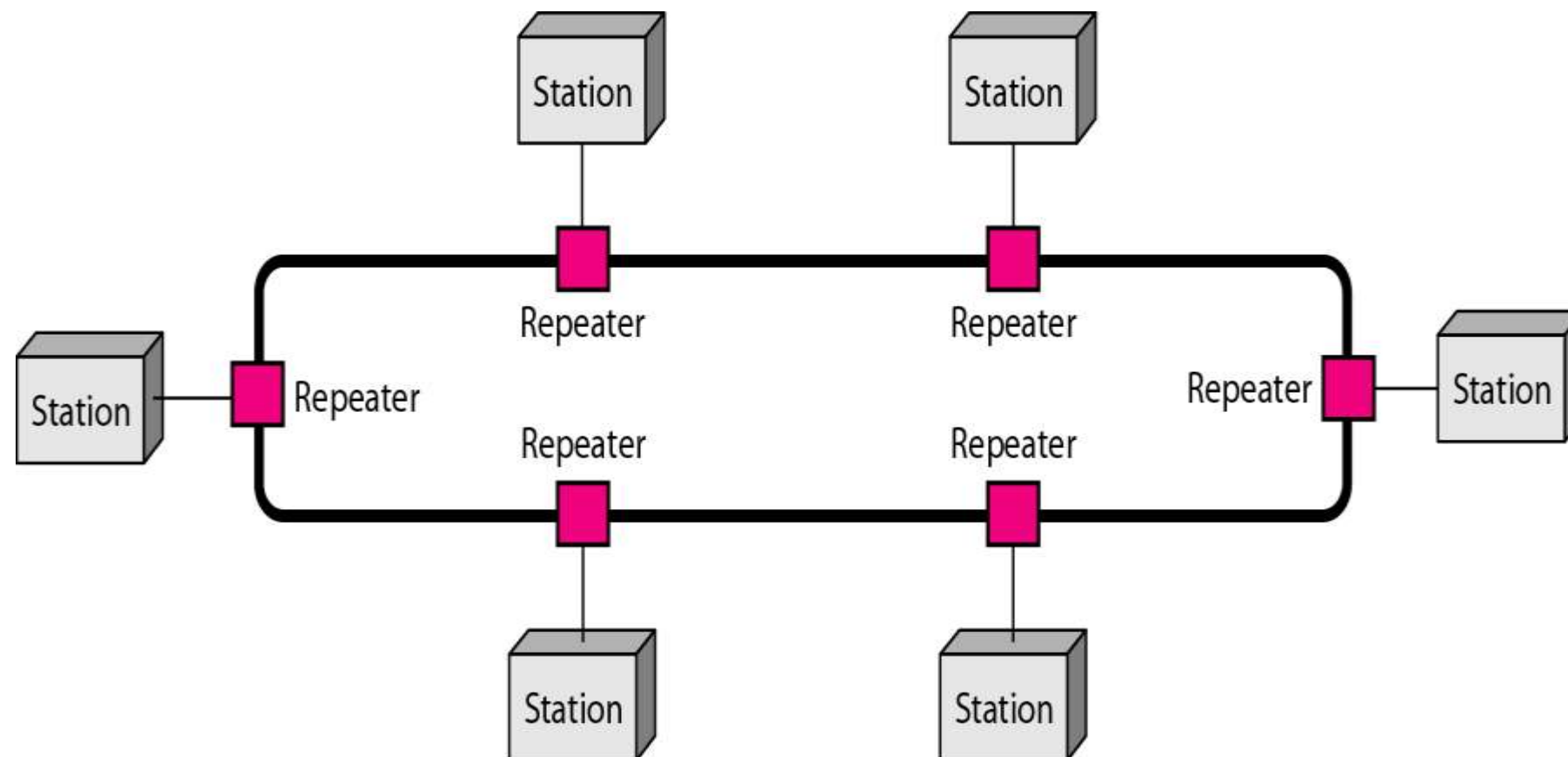
RING

Advantages:

1. A ring is relatively easy to install and reconfigure.
2. To add or delete a device requires changing only two connections.
3. fault isolation is simplified.

Disadvantages:

1. In a simple ring, a break in the ring (such as a disabled station) can disable the entire network.



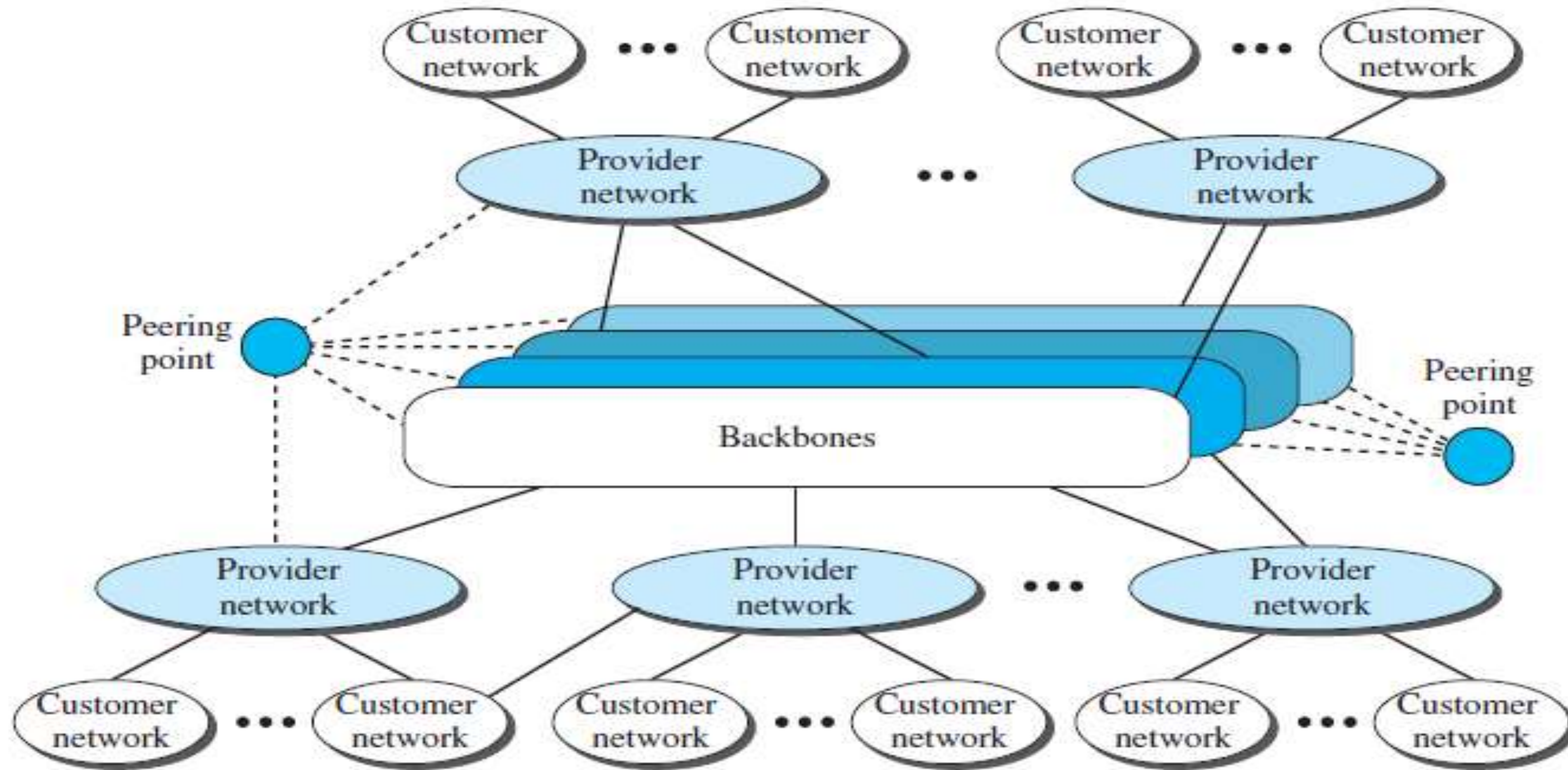


INTERNET



- ✓ The Internet has several backbones, provider networks, and customer networks.
- ✓ The *backbones* are large networks owned by some communication companies such as Sprint, Verizon, AT&T, TATA communications
- ✓ The backbone networks are connected through some complex switching systems, called *peering points*.
- ✓ *Provider networks*, that use the services of the backbones for a fee. The provider networks are connected to backbones and sometimes to other provider networks.
- ✓ The *customer networks* use the services provided by the Internet.
- ✓ They pay fees to provider networks for receiving services.
- ✓ Backbones and provider networks are also called **Internet Service Providers (ISPs)**.
- ✓ **The backbones are often referred to as *international ISPs*;**
- ✓ **The *provider networks* are often referred to as *national or regional ISPs*.**

Computer Networks and Internet





Assessment



- a).What is computer networks?
- b) List the Network topologies?
- c) Compare Network topologies
- d)List Networks criteria





Reference



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