Ministry of Higher Education and Scientific

Research Al-Mustaqbal University College

Department of Technical Computer Engineering

Lecture Number: 3

Computer Networks 3rd Stage

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Physical Topology

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

There are four basic topologies possible:

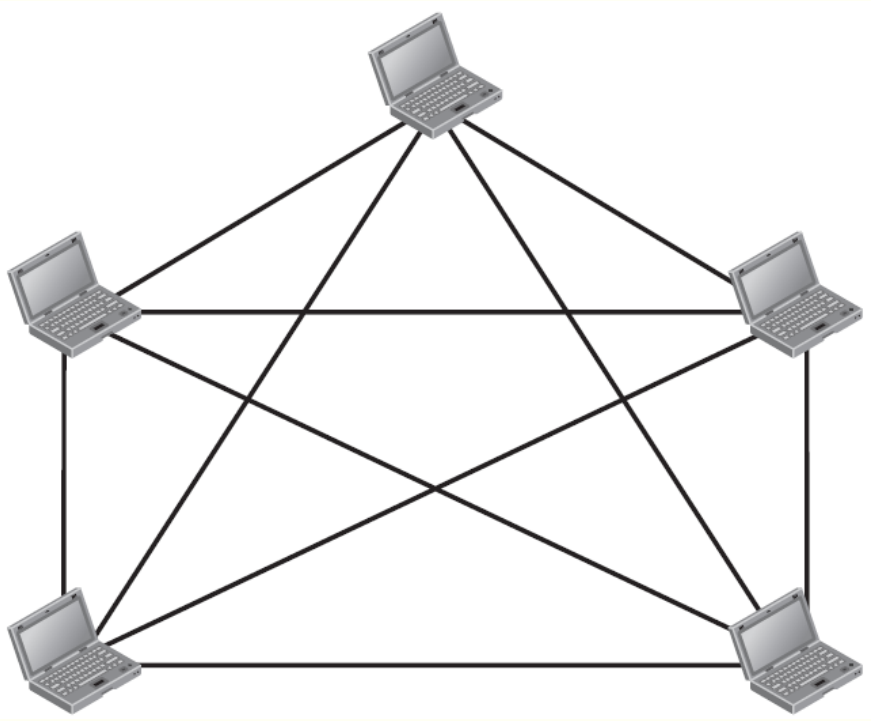
1. Mesh Topology
2. Star Topology
3. Bus Topology
4. Ring Topology

Physical Topology

1. Mesh Topology

- In a mesh topology, every device has a dedicated point-to-point link to every other device.
- The number of physical links in a fully connected mesh network with n node. n (n – 1) / 2.
- 5(5-1)/2 =10

Advantage	Disadvantage
1. Dedicated link peer to peer	1. High cost
2. Robust	2. Large number of cable
3. Very good security	
4. Identification easy	

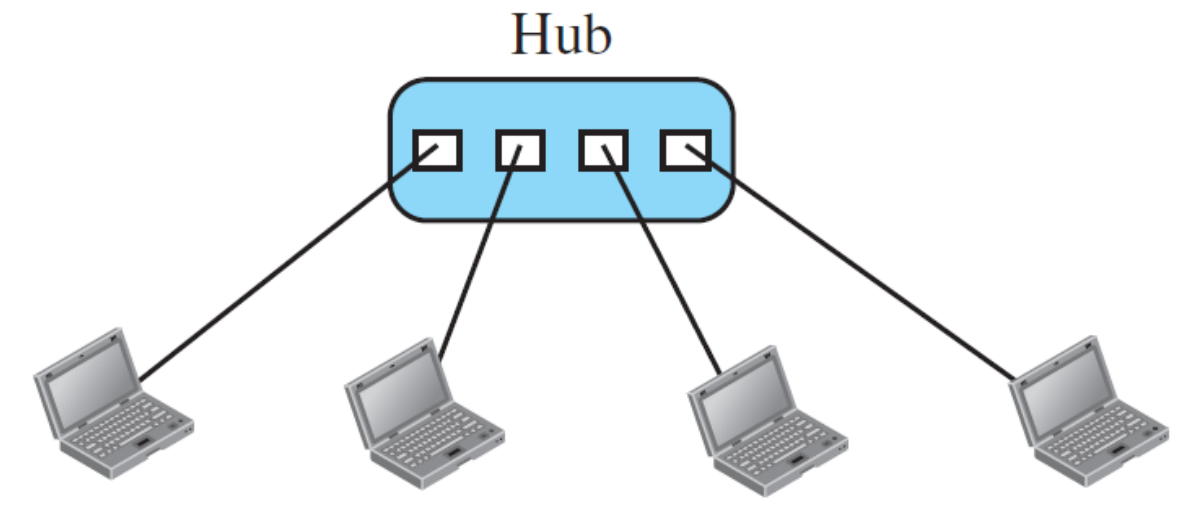


Physical Topology

2. Star Topology

In a star topology, each device has a dedicated point-to-point link only to a central controller, usually called a hub. For n nodes we need n connections.

Advantage	Disadvantage
1. Easy to install	When the central device (hub) stop network stop.
2. Robustness	
3. Fault isolation	
4. Less expensive	

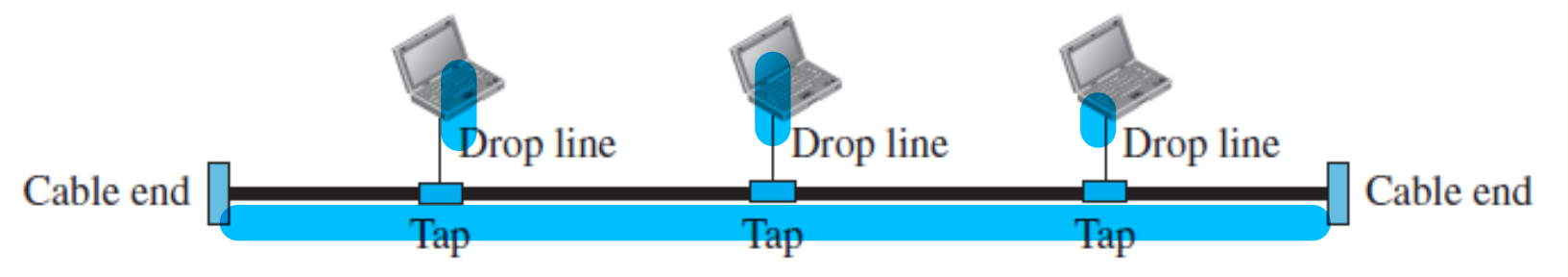


Physical Topology

3. Bus Topology

A bus topology, is multipoint. One long cable acts as a backbone to link all the devices in a network.

Advantage	Disadvantage
1. Easy to installation	1. Fault or break in the bus cable stops all transmission.
2. Bus use less cable than mesh or star.	2. Adding new devices may therefore require modification or replacement of the backbone.

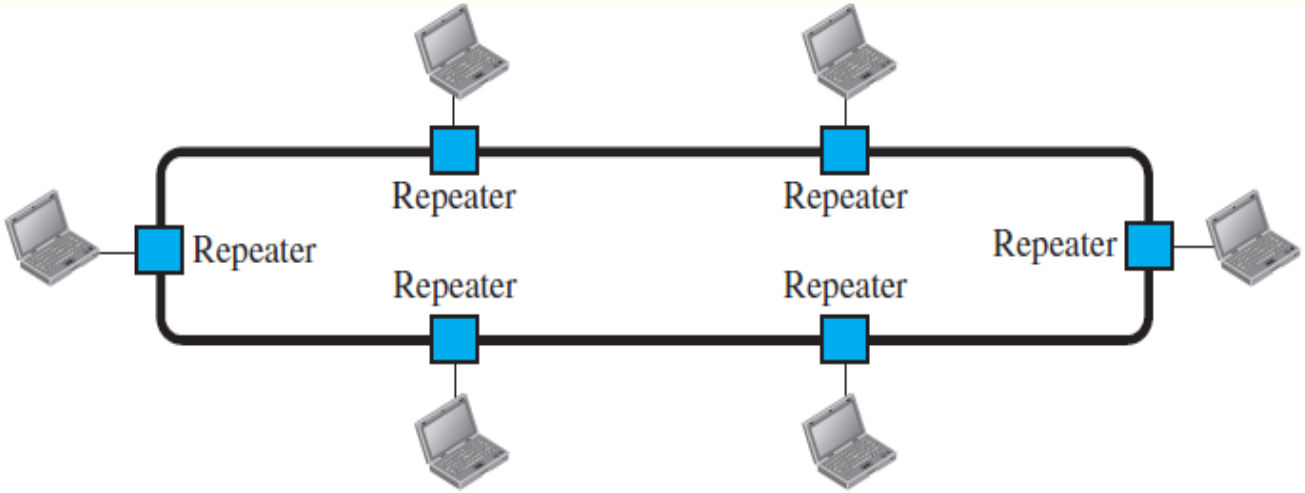


Physical Topology

4. Ring Topology

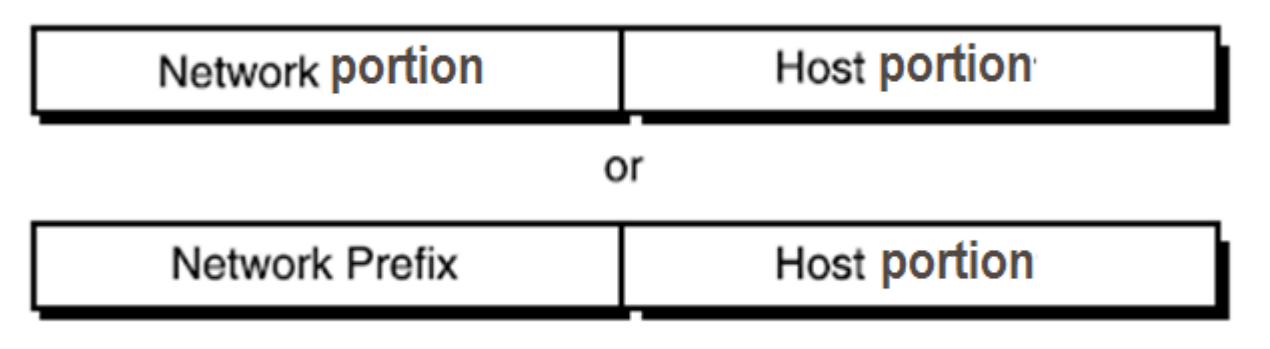
In a ring topology, each device has a dedicated point-to-point connection with only the two devices on either side of it.

Advantage	Disadvantage
1. A ring is relatively easy to install	1. One way data flow.
2. To add or delete a device requires changing only two connections.	Break cable stop all network.



IP Address

- An IPv4 address is a **32-bit** address that **uniquely** and **universally**.
- Every **host** and **router** on the Internet has an IP address.
- IP is comprised of a variable-length **network portion** in the top bits and a **host portion** in the bottom bits.
- All hosts share the same network **portion**.
- Different networks must have different network **portion**.

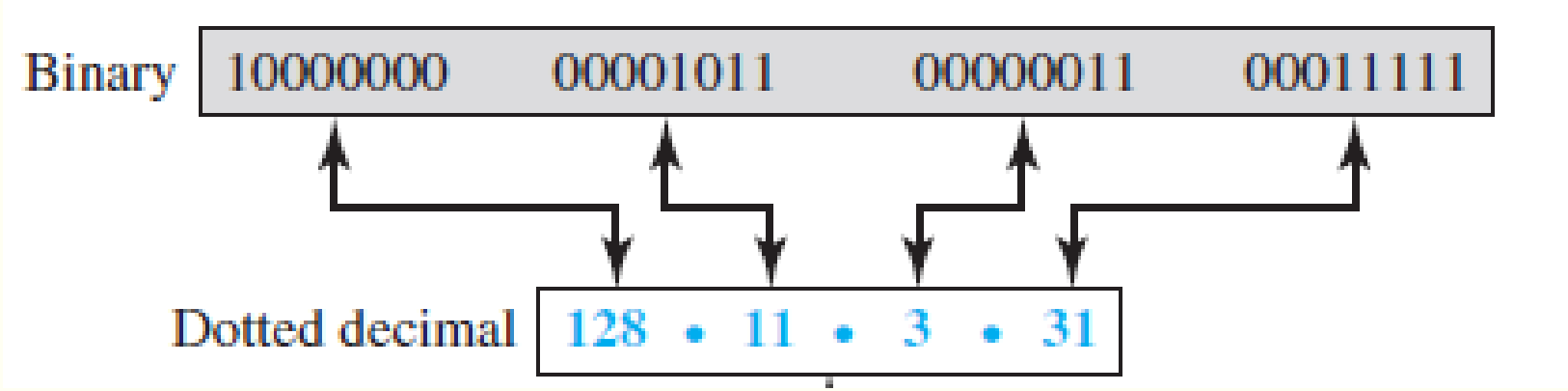


Two-Level Internet Address Structure

Notation

There are two common notations for IPv4:

1. binary notation (base 2)
2. dotted-decimal notation (base 256)
   four decimal numbers, each separated by a dot.



notations in IPv4 addressing

Primary Address Classes

To support networks of varying sizes

Three Primary address classes

- Class A
- Class B
- Class C

- self-encoding key