

# Types by Topology

We'll study the types of computer networks based on topologies in this lesson.

## WE'LL COVER THE FOLLOWING ^

- Bus
  - Limitations
- Ring
  - Limitations
- Star
  - Limitations
- Tree
- Mesh
  - Limitations
- Quick Quiz!

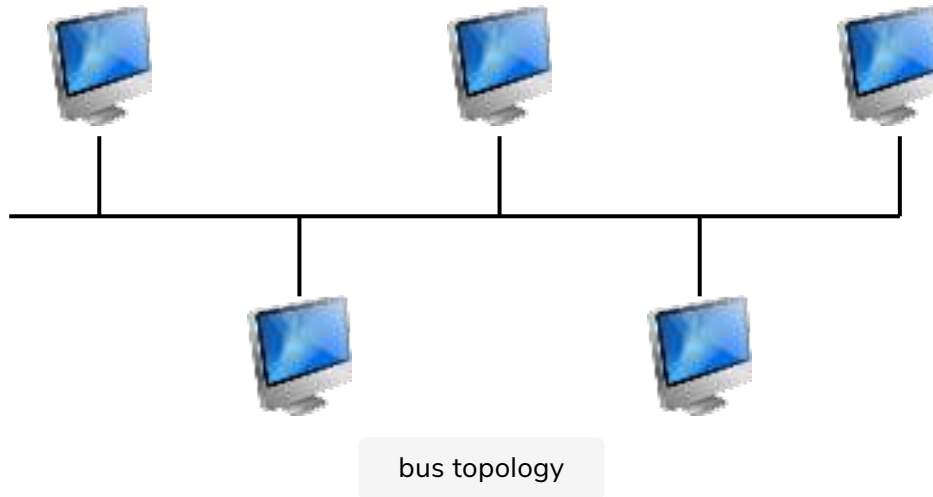
Computer networks can also be categorized in terms of **network topologies** that you might have studied about in a high school computer science class. These topologies include: **bus, ring, star, tree, and mesh**. Note that these topologies are strictly *logical*, i.e., they do not dictate how the wires would be connected physically, but they do dictate how the data flows in the network.

## Bus #

Every end system will receive any signal that is sent on the main or **backbone** medium. The medium can be guided or unguided.

## Limitations #

- A break in the cable will disrupt the entire network.
- Only one system can transmit at a time.

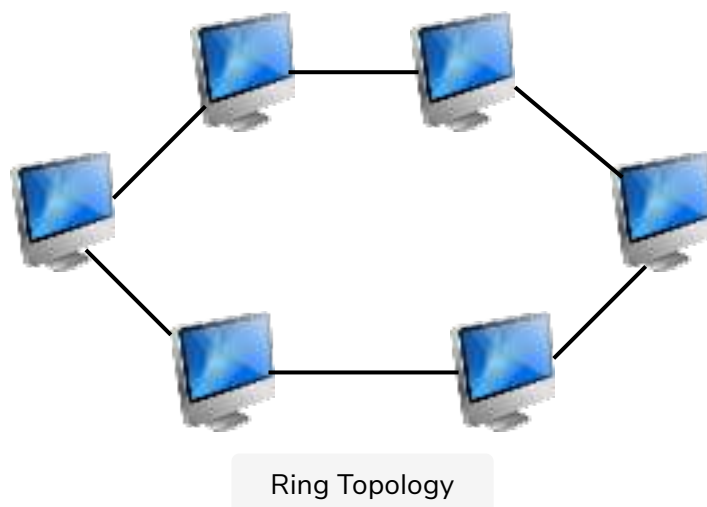


## Ring #

In this topology, end systems communicate with each other **through each other**. So the message travels along the ring passing each system until the target system itself is reached. Theoretically,  $n/2$  systems can be transmitting to their adjacent neighbor at the same time.

## Limitations #

- The basic ring topology is unidirectional so  $n - 1$  end systems would have to transfer messages for end system #1 to talk to end system #n
- A break in the cable will disrupt the entire network.

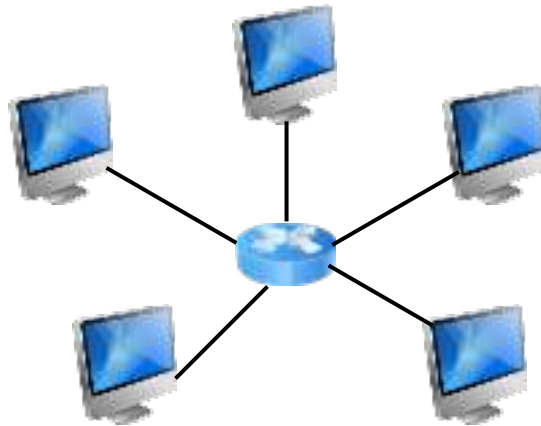


## Star #

All end systems talk to each other through one central device such as a router or switch. Routers and switches are discussed in-depth in the data link layer chapter!

## Limitations #

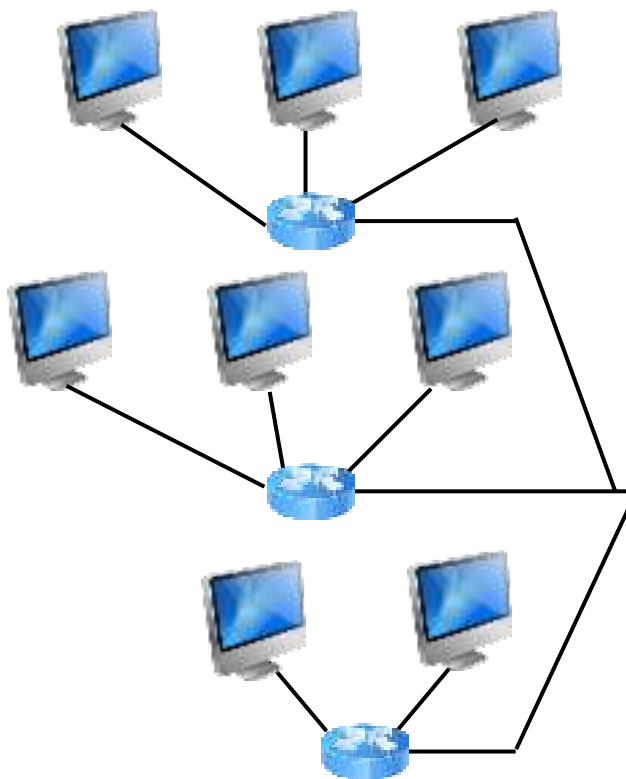
- Hosts can all be transmitting at the same time. However, if the central device fails, the network is completely down.



Star topology

## Tree #

This topology is also known as the **star-bus** topology. It essentially consists of a bunch of star networks connected together with a large bus.



tree topology

## Mesh #

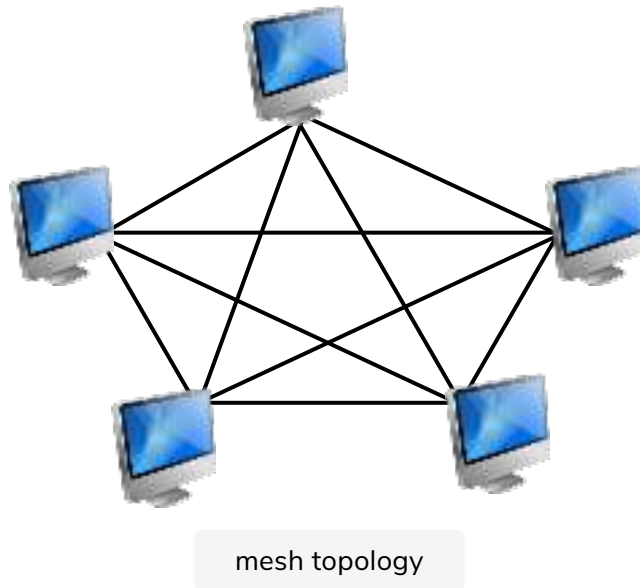
In this topology, every end system is **directly connected** to every other end

system.

## Limitations #

The mesh topology (if physically realized as a mesh):

- Is expensive
- Hard to scale
- Used in specialized applications only



## Quick Quiz! #

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A disadvantage of the bus topology is that if the backbone wire is broken, the network may get negatively impacted

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Starting in the next lesson, we'll learn about how the working of the Internet is organized into conceptual layers.

is organized into conceptual layers.