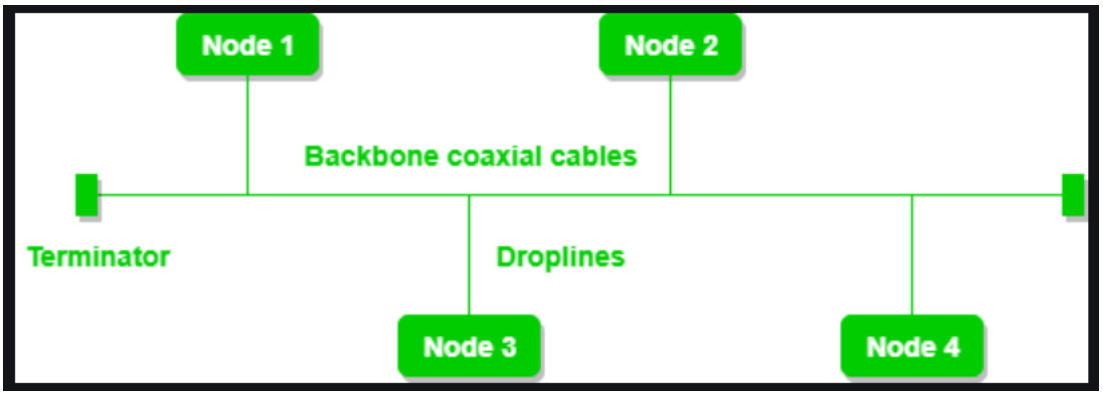
TOPOLOGY

Topology in the context of computer networks refers to the physical or logical arrangement of devices and connections in a network. There are several types of network topologies, each with its own advantages and disadvantages. Here are some common types of network topologies:

- Point to Point Topology
- Mesh Topology
- Star Topology
- Bus Topology
- Ring Topology
- Tree Topology
- Hybrid Topology

Bus Topology:

- All devices share a single communication line.
- Data is transmitted to all devices, and each device checks the data to see if it is the intended recipient.
- Simple and cost-effective for small networks but can be inefficient for larger networks.



Advantages:

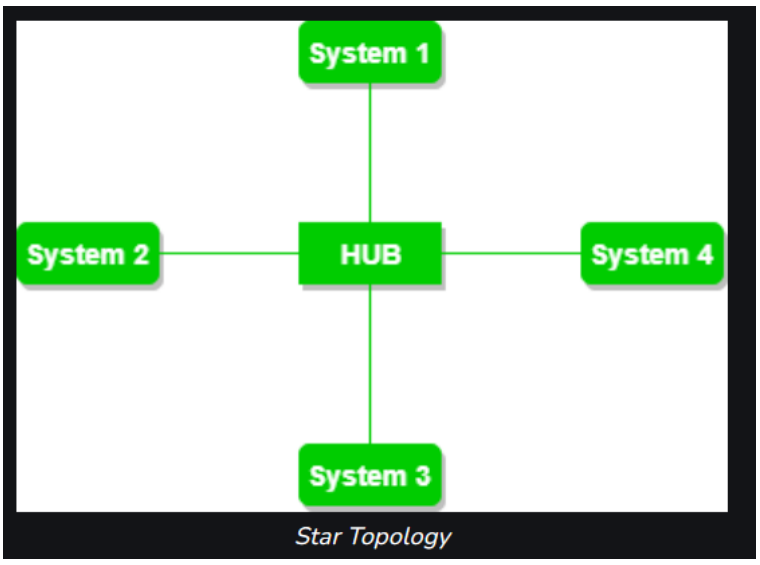
- Simple and inexpensive to set up.
- Well-suited for small networks with limited devices.

Disadvantages:

- ❖ Performance decreases as more devices are added.
- ❖ Entire network can be affected if the main cable fails.

Star Topology:

- All devices are connected to a central hub or switch.
- Hub/switch acts as a repeater for data flow.
- Easy to install and manage, and if one cable or device fails, it doesn't affect the entire network.



Advantages of Star Topology

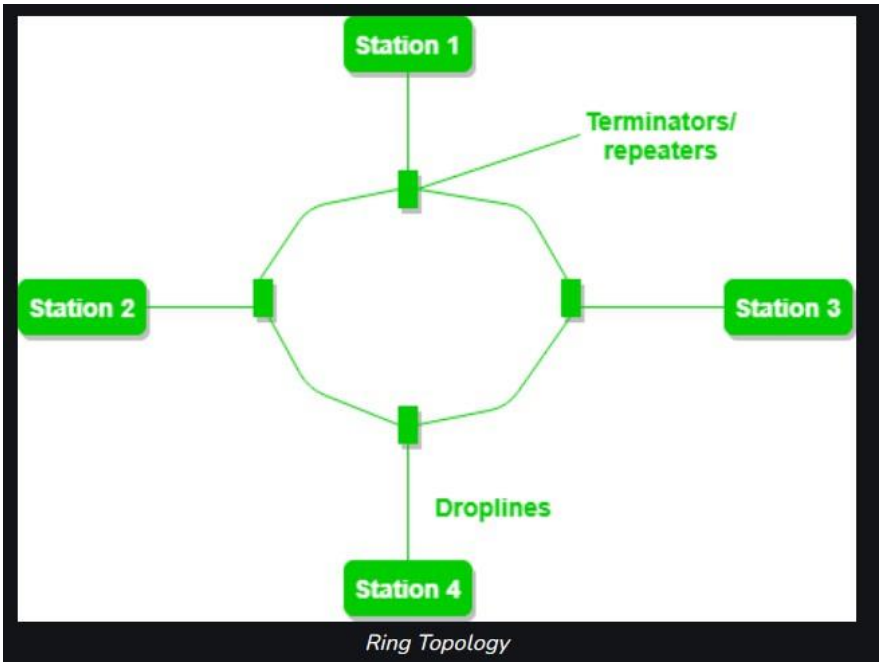
- If N devices are connected to each other in a star topology, then the number of cables required to connect them is N. So, it is easy to set up.
- Each device requires only 1 port i.e. to connect to the hub, therefore the total number of ports required is N.
- It is Robust. If one link fails only that link will affect and not other than that.
- Easy to fault identification and fault isolation.
- Star topology is cost-effective as it uses inexpensive coaxial cable.

Drawbacks of Star Topology

- If the concentrator (hub) on which the whole topology relies fails, the whole system will crash down.
- The cost of installation is high.
- Performance is based on the single concentrator i.e. hub.

Ring Topology:

- Devices are connected in yea circular fashion.
- Each device is connected to exactly two other devices, forming a ring.
- Data travels in one direction, and a failure in any one device or cable can disrupt the entire network.



Ring Topology

Advantages:

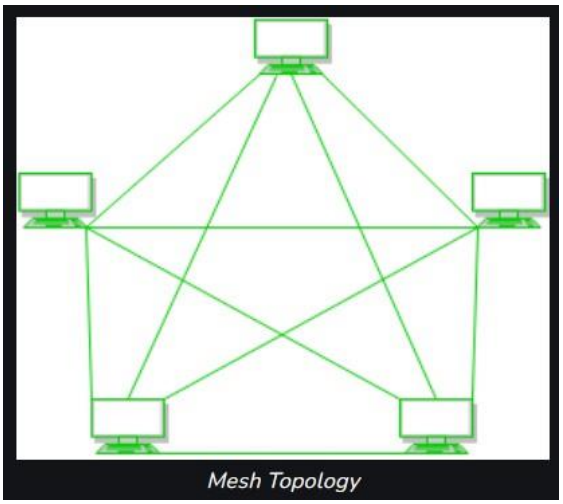
- Simple and easy to install.
- Data travels in one direction, reducing collisions.

Disadvantages:

- A failure in any device or cable can disrupt the entire network.
- Adding or removing devices can be challenging.

Mesh Topology:

- Devices are interconnected, and each device may connect to every other.
- Redundancy is high, and data can take multiple paths to reach its destination.
- Complex and costly to implement, but provides high reliability.



Advantages of Mesh Topology

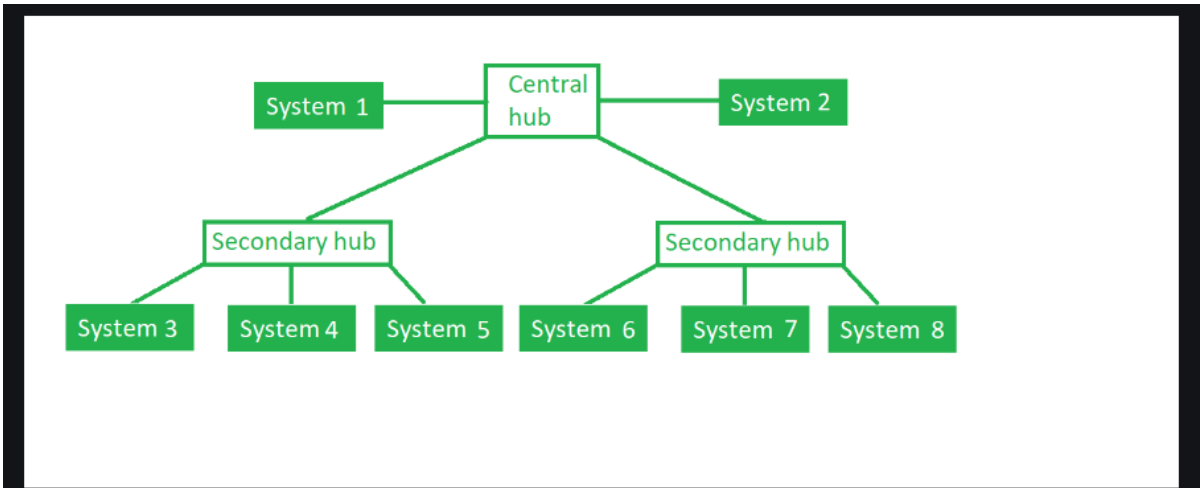
- Communication is very fast between the nodes.
- Mesh Topology is robust.
- The fault is diagnosed easily. Data is reliable because data is transferred among the devices through dedicated channels or links.
- Provides security and privacy.

Drawbacks of Mesh Topology

- Installation and configuration are difficult.
- The cost of cables is high as bulk wiring is required, hence suitable for less number of devices.
- The cost of maintenance is high.

Tree Topology:

- Combination of star and bus topologies.
- Groups of star-configured networks are connected to a linear bus backbone.
- Scalable and allows for expansion, but a failure in the backbone affects the entire segment.



Tree Topology

Advantages:

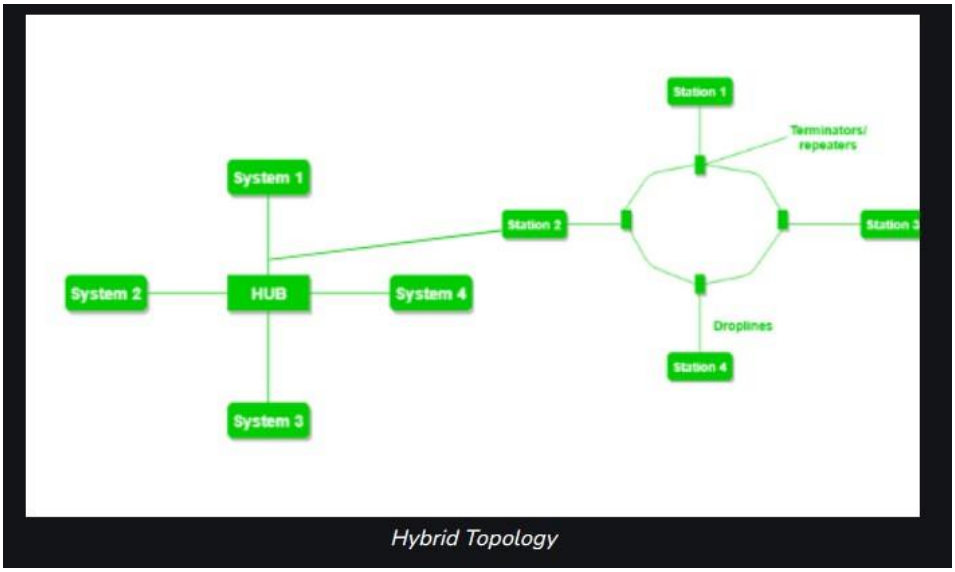
- ❖ Scalable and allows for network expansion.
- ❖ Suitable for larger organizations with multiple departments.

Disadvantages:

- ❖ If the central backbone fails, it affects the entire segment.
- ❖ Can be complex to manage as the network grows.

Hybrid Topology:

- ➢ Combination of two or more different types of topologies.
- ➢ Used to leverage the advantages of multiple topologies to meet specific network requirements.



Hybrid Topology

Advantages:

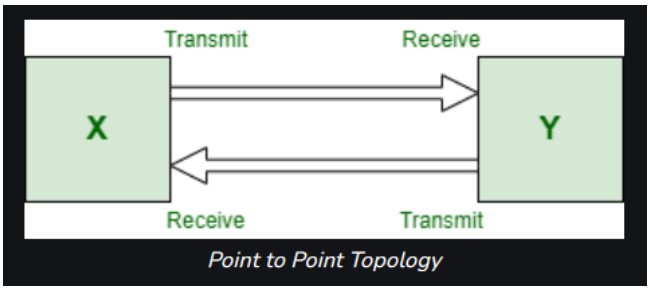
- ❖ Allows customization to meet specific network needs.
- ❖ Combines the strengths of different topologies.

Disadvantages:

- ❖ Can be complex and costly to implement.
- ❖ Requires careful planning and management.

Point-to-Point Topology:

- ➢ Connects two devices directly.
- ➢ Commonly used in simple networks or for connecting two distant locations.
- ➢ These topologies can be applied in both wired and wireless networks, depending on the specific requirements and constraints of the network environment. The choice of topology depends on factors such as cost, scalability, reliability, and ease of maintenance.



Point to Point Topology

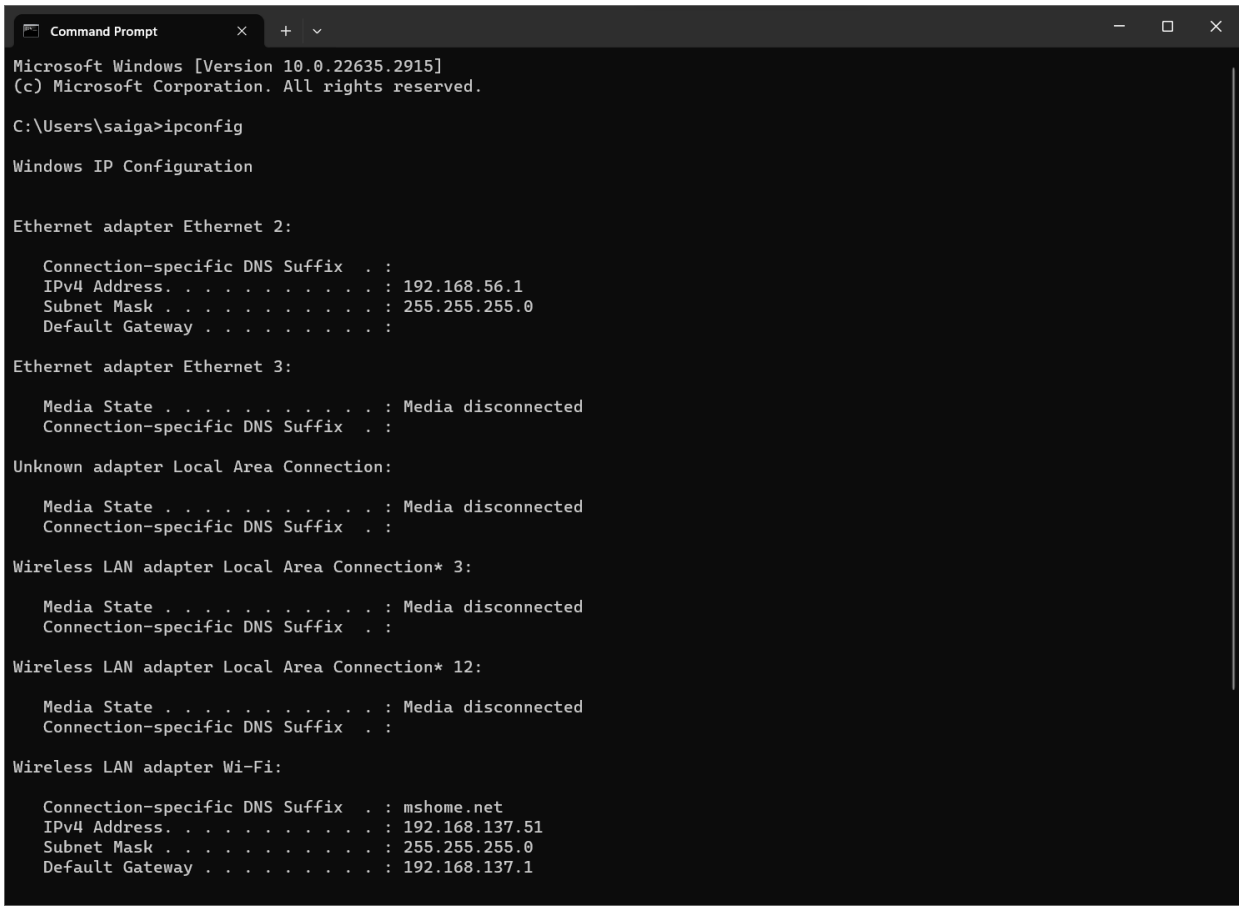
Advantages:

- ❖ Direct and efficient communication between two devices.
- ❖ Simple and effective for connecting remote locations.

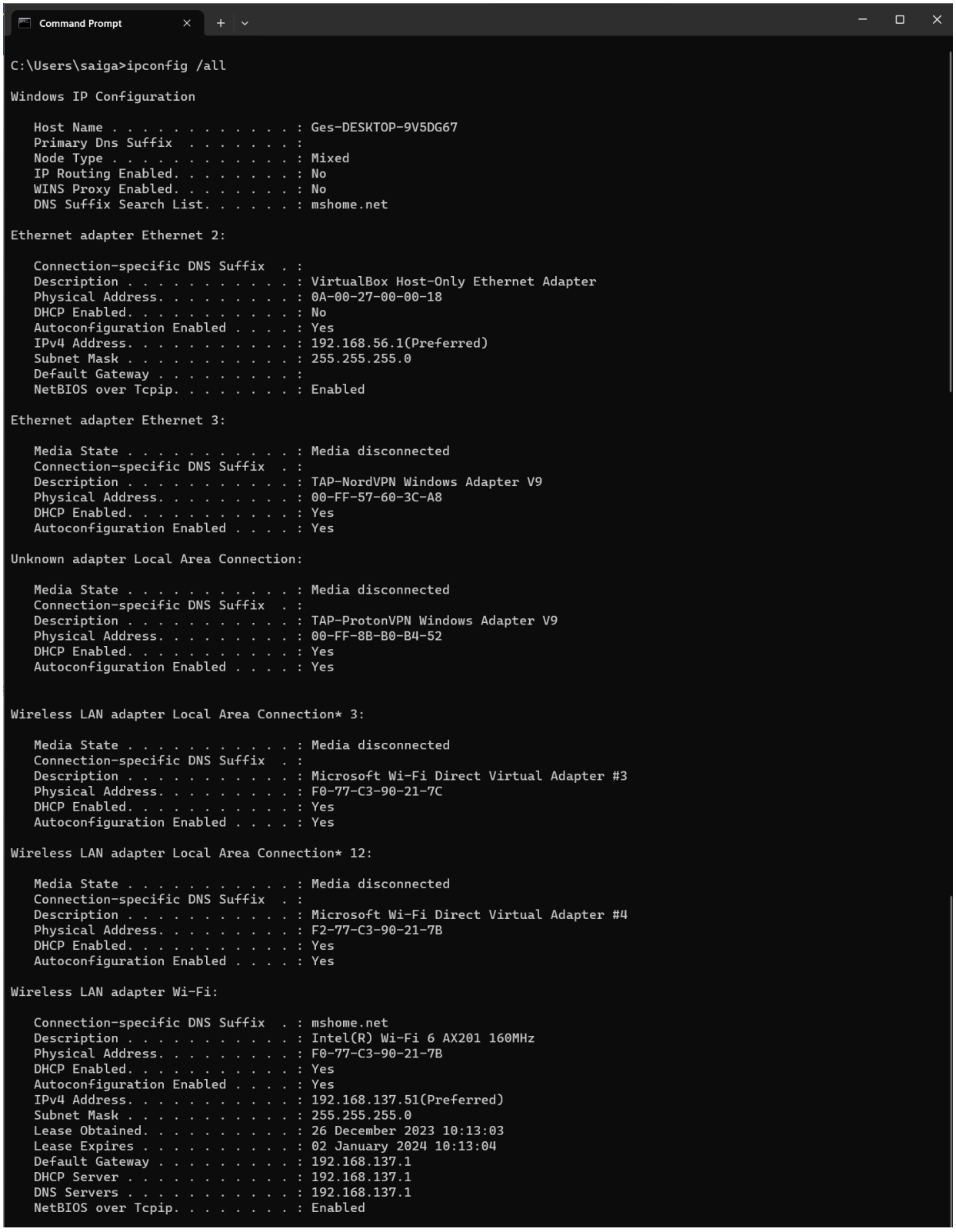
Disadvantages:

- ❖ Not suitable for networks with many devices.
- ❖ Scalability is limited.

IPCONFIG COMMAND



IPCONFIG /ALL COMMAND



CHECKING NETWORK SPEED