Notes

Computer Network and Internet

Part-6

Satellite Network system: A satellite is an object that revolves around another object. A communication satellite processes the data coming from one earth station and it converts the data into another form and send it to the second earth station.

Geostationary Earth Orbit: An object in such an orbit has an orbital period equal to the Earth's rotational period, one sidereal day, and so to ground observers it appears motionless, in a fixed position in the sky.

Medium Earth Orbit: The orbit is home to a number of artificial satellites – the most common uses include navigation, communication, and geodetic/space environment science

Low Earth Orbit: A low Earth orbit (LEO) is, as the name suggests, an orbit that is relatively close to Earth's surface. It is normally at an altitude of less than 1000 km but could be as low as 160 km above Earth – which is low compared to other orbits, but still very far above Earth's surface.

Network Operating System: Network Operating System is one of the important types of operating system. The basic purpose of the network operating system is to allow shared file and printer access among multiple computers in a network, typically a local area network (LAN), private network or to other networks. Some examples of network operating systems include Windows NT, Novell NetWare, UNIX, Linux etc.

Windows NT: Windows NT is a family of operating systems produced by Microsoft, the first version of which was released on July 27, 1993. It is a processor-independent, multiprocessing and multi-user operating system.

Novel Netware: Novell developed with NetWare a network operating system that no complex and over weighted GUI needs for use on servers. Novell provides simple but powerful text-based menus on the command line for the configuration since the first NetWare release. The administration of resources like printers, files and users is possible with a client and a graphical window system and granted administrator rights.

UNIX: Unix is a family of multitasking, multiuser computer operating systems that derive from the original AT&T Unix, development starting in the 1970s at the Bell Labs research center by Ken Thompson, Dennis Ritchie, and others

Linux: Linux is the best-known and most-used open source operating system. Linux is an open-source operating system like other operating systems such as Microsoft Windows, Apple Mac OS, iOS, Google android, etc. An operating system is a software that enables the communication between computer hardware and software. It conveys input to get processed by the processor and brings output to the hardware to display it. This is the basic function of an operating system. Although it performs many other important tasks.

Windows OS: Microsoft Windows, also called Windows and Windows OS, computer operating system (OS) developed by Microsoft Corporation to run personal computers (PCs). Featuring the first graphical user interface (GUI) for IBM-compatible PCs, the Windows OS soon dominated the PC market. Approximately 90 percent of PCs run some version of Windows.
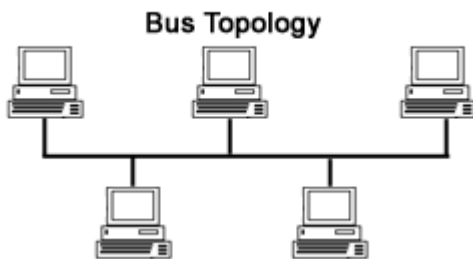
Network topology: Network topology refers to how various nodes, devices, and connections on your network are physically or logically arranged in relation to each other. Think of your network as a city, and the topology as the road map. Just as there are many ways to arrange and maintain a city.

1. **Physical –** The physical network topology refers to the actual connections (wires, cables, etc.) of how the network is arranged. Setup, maintenance, and provisioning tasks require insight into the physical network.
2. **Logical –** The logical network topology is a higher-level *idea* of how the network is set up, including which nodes connect to each other and in which ways, as well as

how data is transmitted through the network. Logical network topology includes any virtual and cloud resources.

Bus topology: Alternatively referred to as line topology, bus topology is a network setup where each computer and network device is connected to a single cable or backbone. Depending on the type of computer network card, a coaxial cable or an RJ-45 network cable is used to connect them together.

The following sections contain both the advantages and disadvantages of using a bus topology with your devices.

Advantages of bus topology

- It works well when you have a small network.

- It's the easiest network topology for connecting computers or peripherals in a linear fashion.

- It requires less cable length than a star topology.

Disadvantages of bus topology

- It can be difficult to identify the problems if the whole network goes down.

- It can be hard to troubleshoot individual device issues.

- Bus topology is not great for large networks.

- Terminators are required for both ends of the main cable.

- Additional devices slow the network down.

- If a main cable is damaged, the network fails or splits into two.

Ring Topology:

A ring topology is a network configuration where device connections create a circular data path. Each networked device is connected to two others, like points on a circle. Together, devices in a ring topology are referred to as a ring network.

In a ring network, packets of data travel from one device to the next until they reach their destination. Most ring topologies allow packets to travel only in one direction, called a unidirectional ring network. Others permit data to move in either direction, called bidirectional.

The major disadvantage of a ring topology is that if any individual connection in the ring is broken, the entire network is affected.
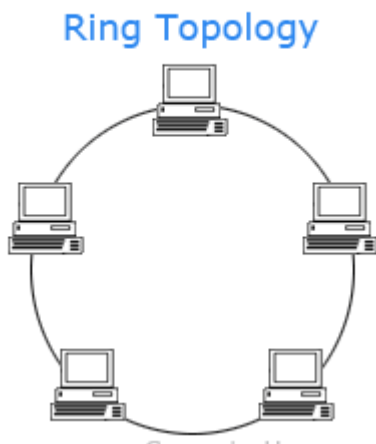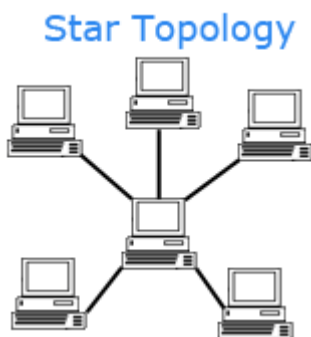

Advantages of a ring topology

- All data flows in one direction, reducing the chance of packet collisions.
- A network server is not needed to control network connectivity between each workstation.

- Data can transfer between workstations at high speeds.

- Additional workstations can be added without impacting performance of the network.

Disadvantages of a ring topology

- All data being transferred over the network must pass through each workstation on the network, which can make it slower than a star topology.

- The entire network will be impacted if one workstation shuts down.

- The hardware needed to connect each workstation to the network is more expensive than Ethernet cards and hubs/switches.

Star topology: Alternatively referred to as a star network, star topology is one of the most common network setups. In this configuration, every node connects to a central network device, like a hub, switch, or computer. The central network device acts as a server and the peripheral devices act as clients. In a star topology setup, either a coaxial or RJ-45 network cable is used, depending on the type of network card installed in each computer. The image shows how this network setup gets its name, as it is shaped like a star.

Advantages of star topology

- Centralized management of the network, through the use of the central computer, hub, or switch.

- Easy to add another computer to the network.

- If one computer on the network fails, the rest of the network continues to function normally.

Disadvantages of star topology

- May have a higher cost to implement, especially when using a switch or router as the central network device.

- The central network device determines the performance and number of nodes the network can handle.

- If the central computer, hub, or switch fails, the entire network goes down and all computers are disconnected from the network.