

- Metropolitan Area Network (MAN)

Local Area Network : A local-area network is a computer network covering a small geographic area, like a home, office, or groups of buildings e.g. a school. For example, a library will have a wired or wireless LAN for users to interconnect local devices e.g., printers and servers to connect to the internet. The defining characteristics of LANs, in contrast to wide-area networks (WANs), includes their much higher data-transfer rates, smaller geographic range, and lack of need for leased telecommunication lines. Although switched Ethernet is now the most common protocol for LAN. Current Ethernet or other IEEE 802.3 LAN technologies operate at speeds up to 10 Gbit/s. IEEE has projects investigating the standardization of 100 Gbit/s, and possibly 40 Gbit/s. Smaller LANs generally consist of a one or more switches linked to each other - of ten with one connected to a router, cable modem, or DSL modem for Internet access. LANs may have connections with other LANs via leased lines, leased services.

Wide Area Network : A WAN is a data communications network that covers a relatively broad geographic area i.e. one city to another and one country to another country and that often uses transmission facilities provided by common carriers, such as telephone companies. Any network whose communications links cross metropolitan, regional, or national boundaries. Or, less formally, a network that uses routers and public communications links. Contrast with local area networks (LANs) or metropolitan area networks (MANs) which are usually limited to a room, building, campus or specific metropolitan area respectively. The largest and most well-known example of a WAN is the Internet. WANs are used to connect LANs and other types of networks together, so that users and computers in one location can communicate with users and computers in other locations. Many WANs are built for one particular organization and are private. Others, built by Internet service providers, provide connections from an organization's LAN to the Internet. WANs are often built using leased lines. At each end of the leased line, a router connects to the LAN on one side and a hub within the WAN on the other. Leased lines can be very expensive. Network protocols including TCP/IP deliver transport and addressing functions. Several options are available for WAN connectivity. Transmission rate usually range from 1200 bits/second to 6 Mbit/s, although some connections such as ATM and Leased lines can reach speeds greater than 56 Mbit/s. Typical communication links used in WANs are telephone lines, microwave links & satellite channels.

Metropolitan Area Network : Metropolitan area networks, or MANs, are large computer networks usually spanning a city. They typically use wireless infrastructure or Optical fiber connections to link their sites. A Metropolitan Area Network is a network that connects two or more Local Area Networks or Campus Area Networks together but does not extend beyond the boundaries of the immediate town, city, or metropolitan area. Multiple routers, switches & hubs are connected to create a MAN.

According to IEEE, A MAN is optimized for a larger geographical area than a LAN, ranging from several blocks of buildings to entire cities. MANs can also depend on communications channels of moderate-to-high data rates. A MAN might be owned and operated by a single organization, but it usually will be used by many individuals and organizations. MANs might also be owned and operated as public utilities. They will often provide means for internet working of local networks. Metropolitan area networks can span up to 50km, devices used are modem and wire/cable.

Q. What are the different Network Topologies?

Ans.: Network topology is the study of the arrangement or mapping of the devices of a network, especially the physical and logical interconnections between nodes. Classification of Network Topologies : There are two basic categories of network topologies :

1. Physical Topology
2. Logical Topology

Physical Topology : The mapping of the nodes of a network and the physical connections between them i.e., the layout of wiring, cables, the locations of nodes, and the interconnections between the nodes and the cabling or wiring system referred as physical topology

Logical Topology : The mapping of the apparent connections between the nodes of a network, as evidenced by the path that data appears to take when traveling between the nodes.

Types of the Topologies :

- Bus
- Star
- Ring
- Mesh
- partially connected mesh (or simply 'mesh') or fully connected mesh or Tree
- Hybrid

Bus : The type of network topology in which all of the nodes of the network are connected to a common transmission medium which has exactly two endpoints ;this is the 'bus', which is also commonly referred to as the backbone, or trunk, all data that is transmitted between nodes in the network is transmitted over this common transmission medium and is able to be received by all nodes in the network virtually simultaneously.

Advantages :

- Easy to connect a computer or peripheral to a bus.
- Requires less cable length than a star topology.

Disadvantages :

- Entire network shuts down if there is a break in the main cable.
- Terminators are required at both ends of the backbone cable.
- Difficult to identify the problem if the entire network goes down.
- Not meant to be used as a stand- alone solution in a large building.

