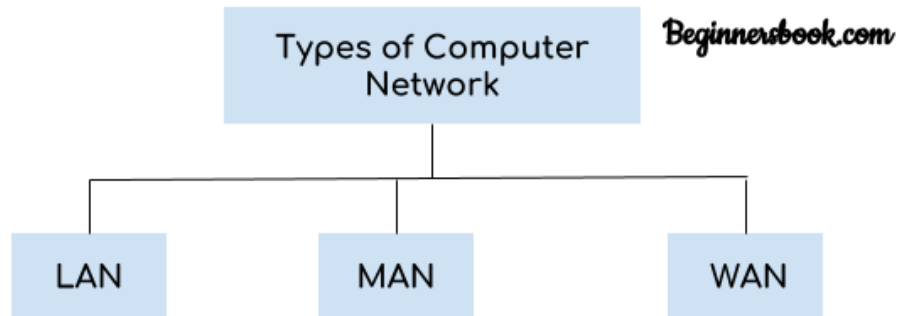


# Types of Computer Network



## LAN

- Definition

A LAN (**local area network**) is a network of computers within the same building, such as a school, home or business. A LAN is not necessarily connected to the internet.

- **Advantages of LAN**

### 1. Resource Sharing

Sharing of resources such as hard disk drives, DVD drives and Printers are made easy in Local Area Network. For an example all the resources can be connected to one single computer with a network so

that whenever there is a need of resources it can be shared with the connected computers.

## **2. Software Sharing**

Another type of sharing made easy here is the Software sharing. A single computer with the licensed software can be shared among other users in the network. There is no need to purchase individual license for each and every computer in the network. All can be worked under one single license.

## **3. Convenient Communication**

Using LAN users can exchange messages and data in a convenient way. Since the data is placed on the server it can be accessed anytime by the LAN users. Every single LAN user can do this with others on the network. Hence, this not only saves lots of time, it ensures that messages get delivered to the right people.

## **4. Centralized Data**

As mentioned earlier data of the users are located at the centralized server. Any workstation in a particular network can be used to access this information. Moreover users can access their own set of data by logging into their respective accounts.

## **5. Improved Security**

Since data is stored on a local server, it can be guaranteed to be secure. If the data on the server is updated then simply all the LAN users can access them. In addition to that, the host has the capability to deny or allow users in a particular network so that additional security measurements can be imposed.

## **6. Internet Sharing**

LAN has the capability to share internet connection among all the LAN users. One single computer with an internet connection shares internet with all the connected computers. This type of infrastructure can be seen in Offices and Netcafes.

## **7. Computer Identification**

For the purpose of identification, each computers on the LAN is assigned with a MAC address. This address will be normally used when sending and receiving data. In modern computers these data is stored inside the network adapter that comes attached with the motherboard.

- **Disadvantages of LAN**

### **1. Implementation Cost**

Even though LAN saves lots of money in terms of resource sharing, the initial cost involved in setting up the network is quite high. This is mainly due to the requirement of a special software that is needed to make a server. In addition to that purchasing of hardware equipments such as routers, hubs, switches and cables are required for the first time setup.

## **2. Policy Violations**

Since all the data of the connected computers are stored inside a central server, unauthorized users can view all the browsing history and downloads of all the connected computers. Especially the LAN administrator has the authority to check personal data of each and every LAN user. Therefore, this can lead to Policy violations.

## **3. Security**

Since it is rather easy to gain access to programs and other types of data, security concerns are a big issue in LAN. The sole responsibility to stop unauthorized access is in the hands of LAN administrators. The LAN administrator has to make sure that the centralized data is properly secured by

implementing correct set of rules and privacy policies on the server.

#### **4. Maintenance**

LAN often faces hardware problems and system failure. Hence, it requires a special administrator to look after these issues. The administrator needs to be well knowledgeable in the field of networking and needed at its full time job.

#### **5. Area Coverage**

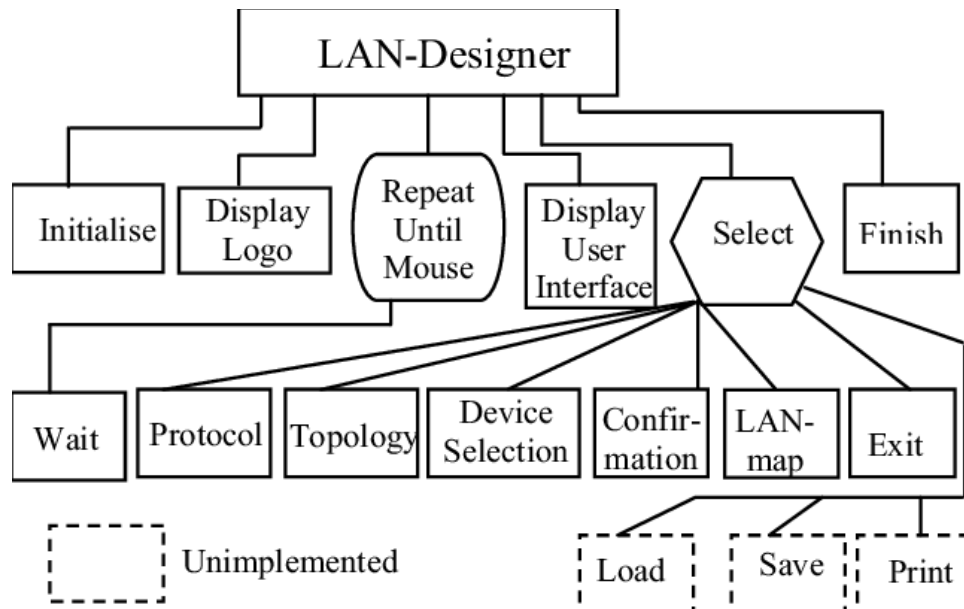
LAN is usually made to cover up a limited distance (up to 10km). Most probably it is operated in small areas such as in offices, banks and schools. This is because its cabling system cannot be extended more than a certain range.

#### **6. Server Crashes**

Central server which is present on the LAN architecture manages all the attached computers. If in case the server encounters any faults all the connected computers are affected too. For an example if the files on the server gets corrupted, no more data on the attached computers can be accessible.

## 7. Malware Spreading

- **Structure**



### MAN

- **Definition**

MAN (**M**etropolitan **a**rea **N**etwork) covers a larger area than that of a LAN and smaller area as compared to WAN. It connects two or more computers that are apart but reside in the same or different cities. It covers a large geographical area and may serve as an ISP

- **Advantages of a MAN Network**

There are many advantages of the MAN network, some of them given below.

#### 1: Less Expensive:

It is less expensive to attach MAN with WAN Network. MAN gives you good efficiency of data. All data on MAN is easily manageable in a centralized way.

#### 2: Sending Local Emails:

You can send local emails fast and free on MAN.

#### 3: High Speed than WAN:

The speed of data can easily reach 1000 Mbps, as MAN uses fiber optics. Files and database transfer rates are fast.

#### 4: Sharing of the Internet:

With the installation of MANs, users can share their internet connection. In this way, multiple users can get the same high-speed internet.

#### 5: Conversion of LAN to MAN is Easy:

MAN is a combination of two or more LAN network. So it is a faster way to connect two LAN networks together. It is possible by the fast configuration of links.

#### 6: High Security:

MAN has a high-security level than WAN.

### **Disadvantages of MAN Network**

#### 1: Difficult To Manage:

It is very difficult to manage if the size and number of LANs network increase. This is due to security and extra

configuration problems.

## 2: Internet Speed Difference:

As it cannot work on phone copper wires. Copper wires affect the speed of MAN. So high cost is needed for fiber optics.

## 3: Hackers Attack:

In this network, there is a high risk of attacking hackers as compared to LAN. So data may be a leak. Highly security staff is the need in MAN.

## 4: Technical Staff Requires to Set up:

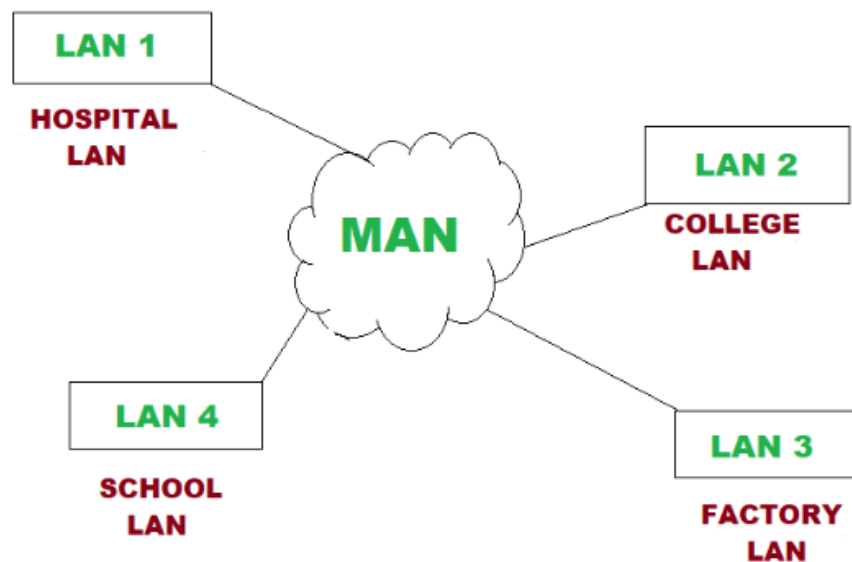
Highly technical people require to setup MAN. The technical people are network administrators and troubleshooters.

## 5: Need More wires:

In MAN more than LAN network, cables require. As you know, it is a combination of two LANs.

- **Structure**





## WAN

- **Definition**

WAN (**wide area network**), a computer communications network that spans cities, countries, and the globe, generally using telephone lines and satellite links. The Internet connects multiple WANs; as its name suggests, it is a network of networks.

## **Advantages of Wide Area Network**

### **1. Area Coverage**

WAN generally covers geographical areas of large proportions (1000kms or more than that). Probably if your business offices are located at different locations, then without an effort all the branches can be communicated through WAN. For this purpose Internet Service Providers (ISPs) can provide leased lines.

## **2. Centralized Data**

Using WAN means that you can share the data connected to all the devices in the respective network. For an example you can setup head office server and share the data among all the office branches. Hence, there is no need to purchase separate emails, files and backup servers. Instead you can get all the backup and support from the head office server.

## **3. Updated Files**

From WAN users can get updated files and data from the servers. Companies can work to update files from the servers so that all the connected devices can receive them. That too in a fraction of seconds.

## **4. Message Exchange**

With the advancement of [Internet of Things \(IoT\)](#) and LAN, a sudden growth of WAN based devices can be seen. From this communication through messages can be done fast with the help of popular applications such as messenger and whatsapp.

## **5. Increased Bandwidth**

In order for forming a backbone of a respective network, corporate LAN often often uses leased lines. Using leased lines means that there are more bandwidths compared to a standard broadband connection. Ultimately business improvement in productivity can be seen.

## **6. Assured Uptime**

Another biggest plus of WAN is that they offer guaranteed uptime. WAN providers offer uptime weekly, quarterly or annually. It is a part of the SLA. It doesn't matter what the industry is the uptime can be assured.

## **Disadvantages of Wide Area Network**

### **1. Security**

Since WAN has more technologies combined to each other, it faces more security issues comparing to LAN and MAN. This can open a security gap which paves the way for malicious attacks and identity thefts. Besides that WAN possesses wide coverage which can be used negatively by people of different computers.

### **2. Need of Security Solutions**

As mentioned earlier WAN frequently faces security issues. Probably as a result of the data transfer that can be easily accessed by the hackers. Hence, in every PCs, firewall needs to be enabled. And there are chances where malicious attacks can take place. Therefore, Antivirus software also needs to be installed.

### **3. Installation Costs**

WANs are on default complicated and complex basically because of their geographical coverage. Hence, they are expensive to setup. Setting up a WAN requires purchasing of routers, switches and security solutions.

### **4. Disconnection Problems**

In some areas especially in remote locations, there is no proper electricity supply or line structure. Due to this customers often face disconnection issues more frequently. For getting rid of this customers are required to purchase a dedicated line from the ISP.

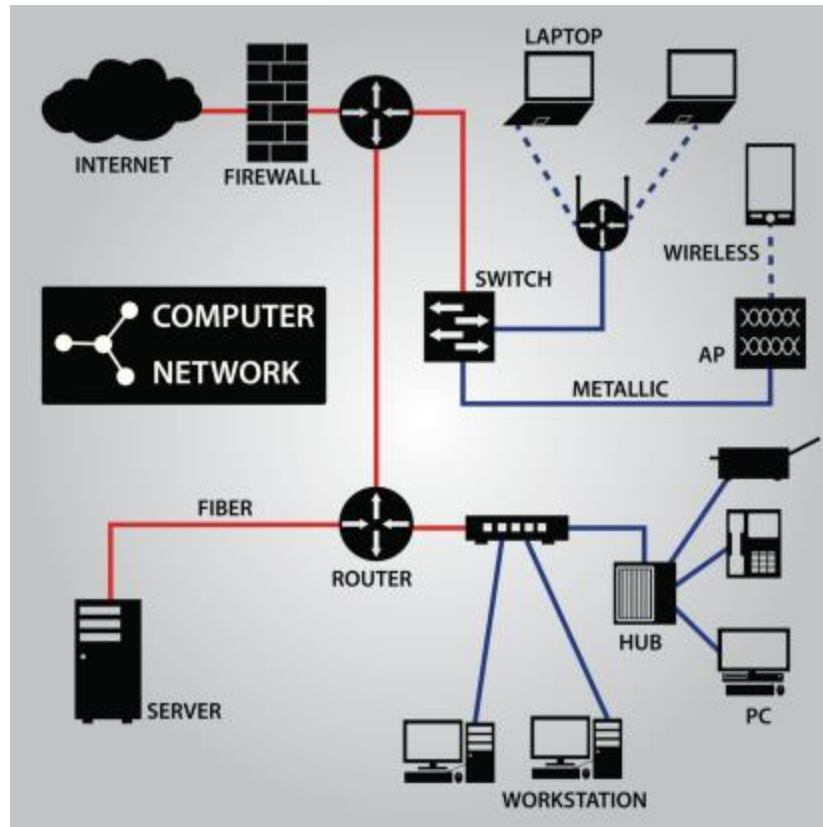
## **5. Troubleshooting Issues**

Troubleshooting WAN issues is a difficult task and requires more time. If there are issues in the network, it is difficult to pinpoint the exact cause due to their broad coverage of geographical areas. Moreover wires of the WAN goes under the sea. In case if those wires gets broken, it can be challenging to fix them since it involves lots of resources.

## **6. Maintenance Issues**

Maintaining WAN is a difficult task to carry out. Especially maintaining a data center that operates 24/7 is the biggest challenge out of all. It is full time job that needs assistance from network administrators and technicians.

# **Structure**



## WLAN

- **Definition**

A wireless LAN (WLAN) is a wireless computer network that links two or more devices using wireless communication to form a local area network (LAN) within a limited area such as a home, school, computer laboratory, campus, or office building. This gives users the ability to move around within the area and remain connected to the network. Through a gateway, a WLAN can also provide a connection to the wider Internet.

- **Theory of operation**

A wireless LAN (WLAN) is a wireless computer network that **links two or more devices using wireless**

**communication to form a local area network (LAN)** within a limited area such as a home, school, computer laboratory, campus, or office building.

- **Advantages of wireless local area network (WLAN) :**

1. It's a reliable sort of communication.
2. As WLAN reduces physical wires so it's a versatile way of communication.
3. WLAN also reduces the value of ownership.
4. It's easier to feature or remove workstation.
5. It provides high rate thanks to small area coverage.
6. You'll also move workstation while maintaining the connectivity.
7. For propagation, the sunshine of sight isn't required.
8. The direction of connectivity are often anywhere i.e. you'll connect devices in any direction unless it's within the range of access point.
9. Easy installation and you would like don't need extra cables for installation.

- **Disadvantages of wireless local area network (WLAN) :**

- 1) WLAN requires license.
- 2) it's a limited area to hide.
- 3) The Government agencies can control the flow of signals of WLAN and can also limit it if required. this will affect data transfer from connected devices to the web.
- 4) If the amount of connected devices increases then data transfer rate decreases.

- 5) WLAN uses frequency which may interfere with other devices which use frequency.
- 6) If there's rain or thunder then communication may interfere.
- 7) Due to Low security as attackers can get access to the transmitted data.
- 8) Signals could also be suffering from the environment as compared to using fiber optics.
- 9) The radiation of WLAN are often harmful to the environment.

## Structure

