Networking Essentials
ITC 2243

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Network Types

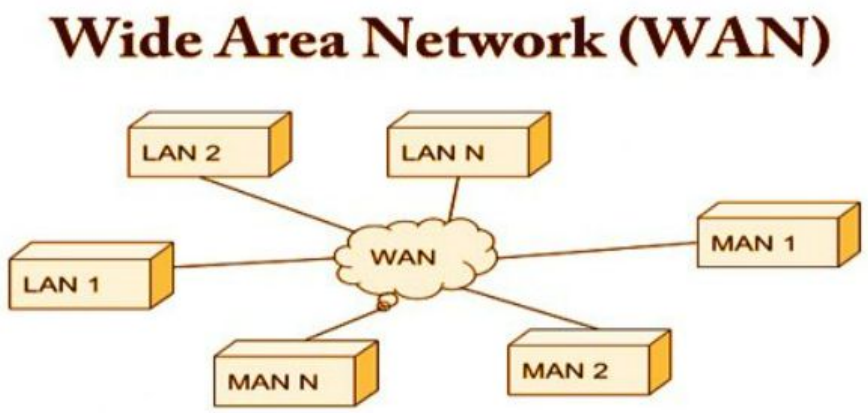
- Depending on their size, capabilities and the geographical area they cover, a computer network can be classified into following types :

✔ LAN
✔ MAN
✔ WAN
✔ PAN (Personal Area Network)
✔ SAN (Storage Area Network)
✔ CAN (Controller Area Network)
✔ VPN (Virtual Private Network)

Local Area Networks (LAN)

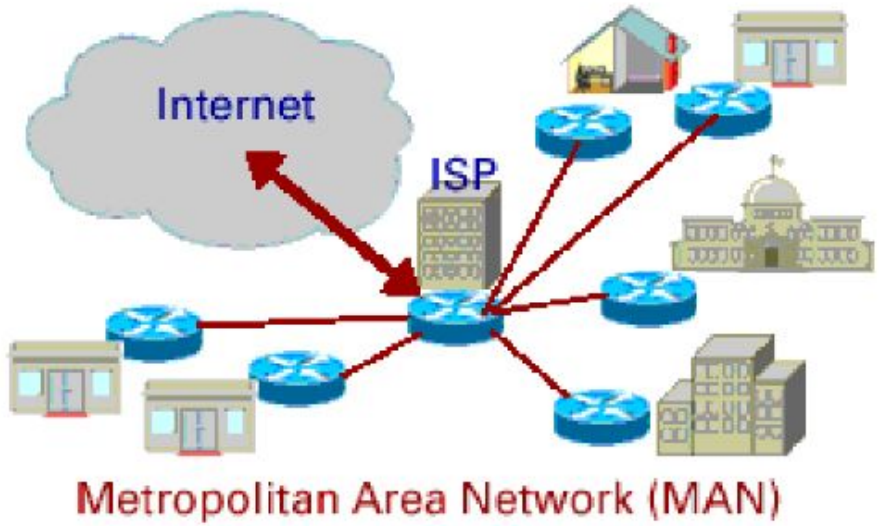
- A Local Area Network spans across a small geographic area
- LANs are usually confined to one building or a group of buildings
- Usually privately owned
- Provides high data rates
- The most common type of Local Area Network is called Ethernet

Wide Area Network (WAN)



- A network which covers a very large geographical area such as a country, continent or even the world
- Provides long distance communication of data or information
- Operating at low speeds (compared to LANs)

Metropolitan Area Network (MAN)



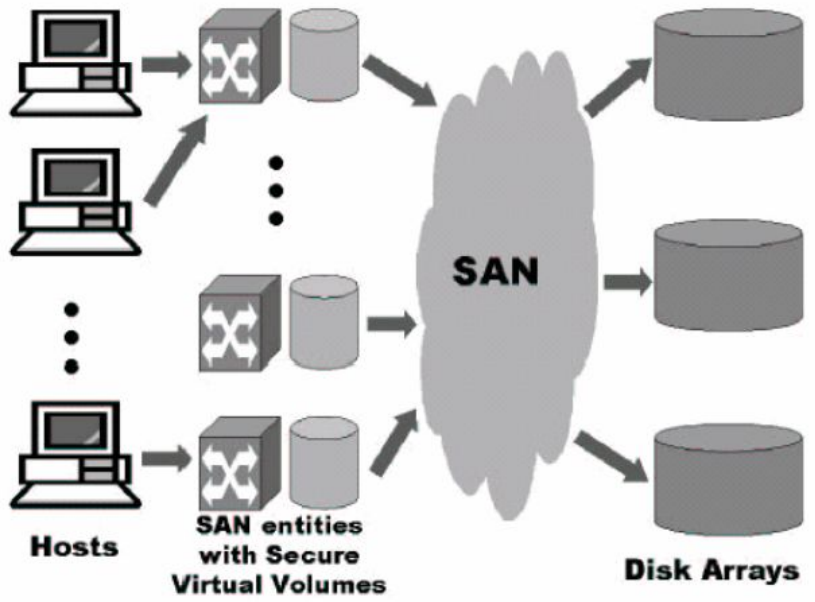
- A network which covers medium geographical area such as a town or a city.
- Provides high speed connectivity for Internet through DSL/ ADSL lines and other services such as cable TV.

Personal Area Network (PAN)

- Personal Area Network or PAN is a network organized by an individual user for its personal use. It uses Bluetooth, USB or Wi-Fi technology for the internet connections. Its range is up to 10m or a room only.

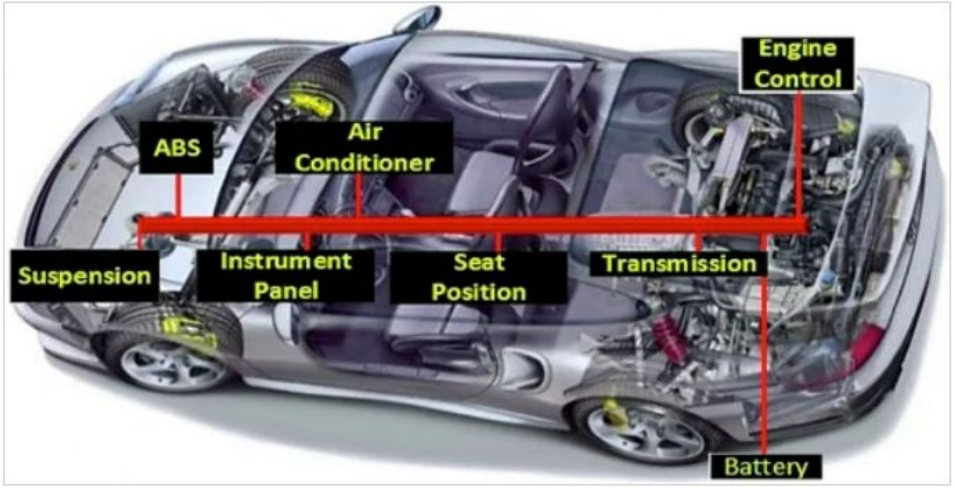
Storage Area Network (SAN)

- A Storage Area Network (SAN) is a high-speed special-purpose network (or sub network) that interconnects different kinds of data storage devices with as sociated data servers.



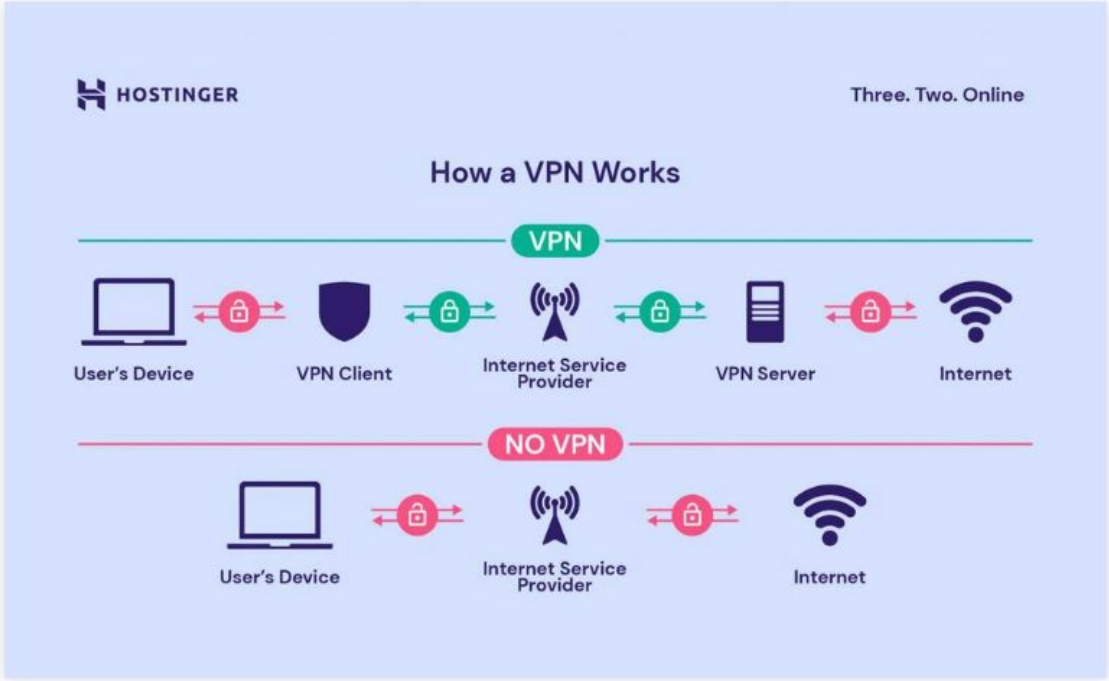
Controller Area Network (CAN)

- Controller Area Network is a serial bus network of microcontrollers that connects devices, sensors and actuators in a system or sub-system for real-time control applications.
- It is a dedicated development of the automotive electronic industry



Virtual Private Network (VPN)

- A virtual private network is a mechanism for creating a secure connection between a computing device and a computer network, or between two networks, using an insecure communication medium such as the public Internet.
- Became popular as more employees worked in remote locations.
- Employees can access the network (Intranet) from remote locations.
- The Internet is used as the backbone for VPNs.
- Reduces cost tremendously from reduction of equipment and maintenance costs.



Comparison Between The Network Types

Parameters	PAN	LAN	CAN	MAN	WAN
Full Name	Personal Area Network	Local Area Network	Campus Area Network	Metropolitan Area Network	Wide Area Network
Technology	Bluetooth, IrDA,Zigbee	Ethernet & Wifi	Ethernet	FDDI, CDDi. ATM	Leased Line, Dial-Up
Range	1-100 m	Upto 2km	1 – 5 km	5-50 km	Above 50 km
Transmission Speed	Very High	Very High	High	Average	Low
Ownership	Private	Private	Private	Private or Public	Private or Public
Maintenance	Very Easy	Easy	Moderate	Difficult	Very Difficult
Cost	Very Low	Low	Moderate	High	Very High

Public Vs Private Network

- Public Network
  - A public network is an unrestricted network that's accessible to the general public– like the Internet.
  - Because anyone can access this network, it comes with certain security risks. The data over this type of open connection is often unencrypted, which makes it an enticing target for hackers.
  - What's more, it takes almost no hacking skills to monitor or hijack communication over a public network, especially on unassuming users who don't take any precautions– which is one of the many reasons why you should consider getting a VPN.

- Private Network
  - A private network is a network that uses a private space and can only be accessed by approved devices.
  - Think of it as a members-only club.
  - An example of a private network is a home or an office network. These are configured in a way that only lets certain users in. They're purpose-built and might even restrict outbound connections.

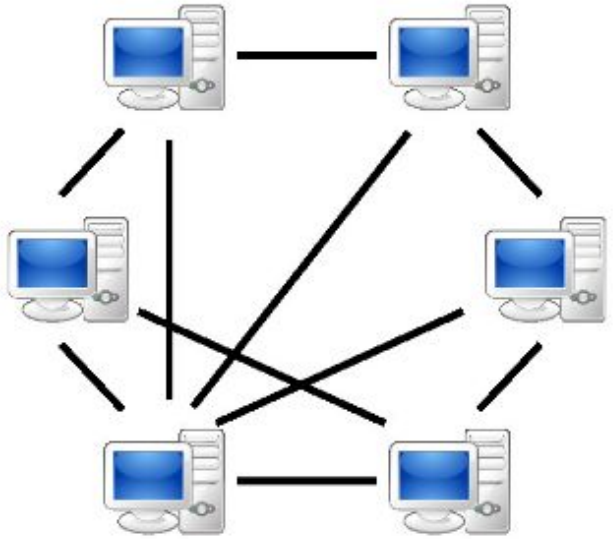
Other types of Networks

- Intranet – An intranet is a private LAN designed to use by everyone within an organization.
  - Protected from unauthorized external access by means of a network gateway and firewall
  - May be created simply by using private IP address ranges such as 192.168.0.0/16
- Extranet – a network that connects people within your company with people who are outside your company. All within a secure, password-protected network that can be accessed from anywhere.

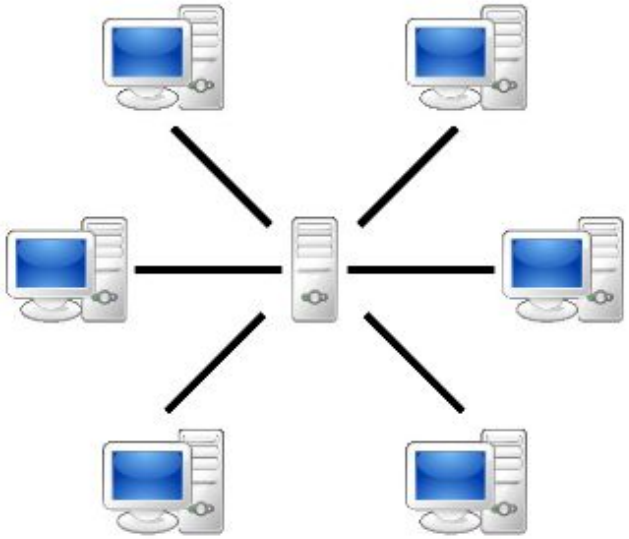
Networking Models

- Computer networks can logically be classified into two models.

1. Peer to Peer model
2. Client server model



Peer to Peer Model



Client Server Model

Peer to Peer network

- In a peer-to-peer network, a number of workstations are connected together for sharing devices, information or data.
- All the workstations are considered equal.
- A peer-to-peer network has no dedicated servers. Any one computer can act as client or server at any instance.
- This network is ideal for small networks where there is no need for dedicated servers, like home networks and small business networks.

Client Server Network

- In a server-based network, the server is the central location where users share and access network resources .
- This dedicated computer controls the level of access that users have to shared resources. Shared data is in one location, making it easy to back up critical business information. Each computer that connects to the network is called a client computer.
- Server operating systems are designed to handle the load when multiple client computers access server-based resources

Thank you!!!