Introduction to servers and networks

Agenda:

What is Server?

Types of servers(Hardware)?

Server/Client model and Best practices

Server Architecture

What is operating System?

Types of Operating system?

What is network?

Types of Networks?

What is IP Address?

What is subnet?

What is Gateway?

What is Router?

What is firewall?

What is failover/Load Balancer?

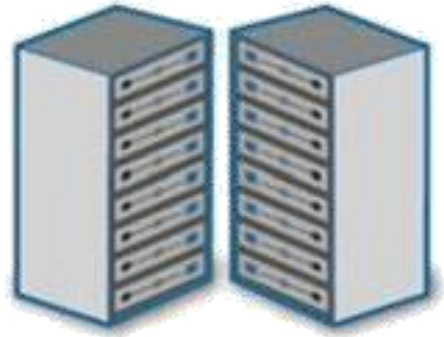
What is Server?

What is Server?

A **server** is a computer that serves information to other computers. Called clients, can connect to a **server** through either a local area network or a wide area network, such as the internet

Types of Server

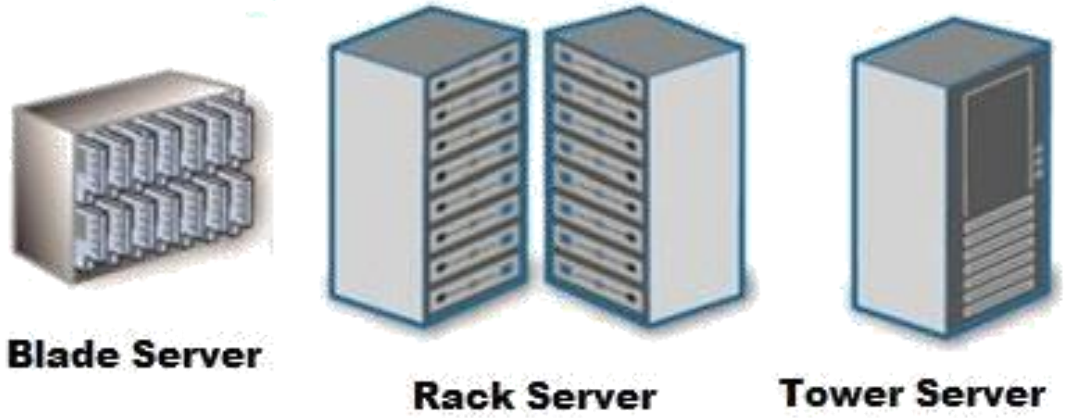
Blade Server



Rack Server

Tower Server

Types of Server

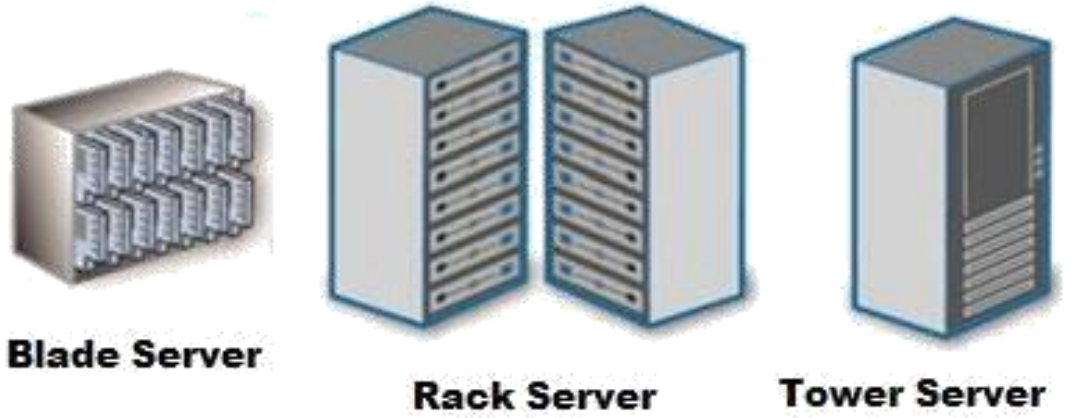


Blade Server:

A blade server is a modular server that allows multiple servers to be housed in a smaller area.

These servers are physically thin and typically only have CPUs, memory, integrated network controllers, and sometimes storage drives built in. ... Blade servers are often seen in large data centers.

Types of Server



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Rack Servers:

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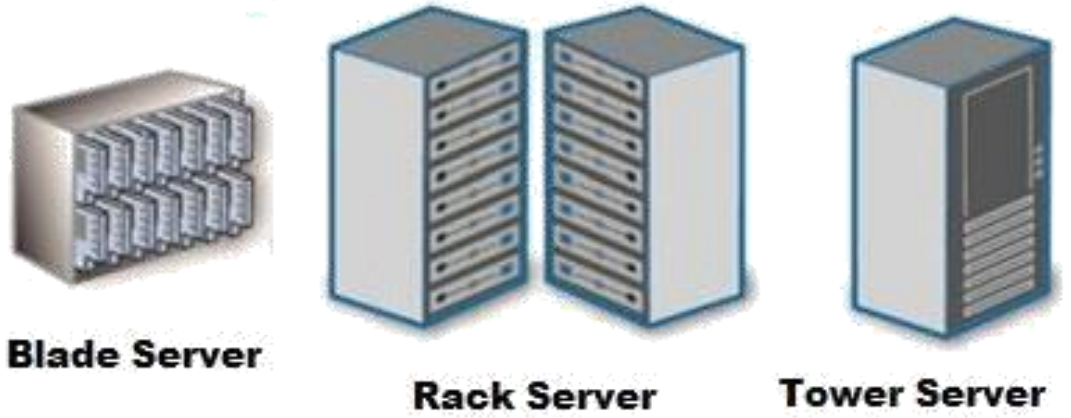
Types of Server



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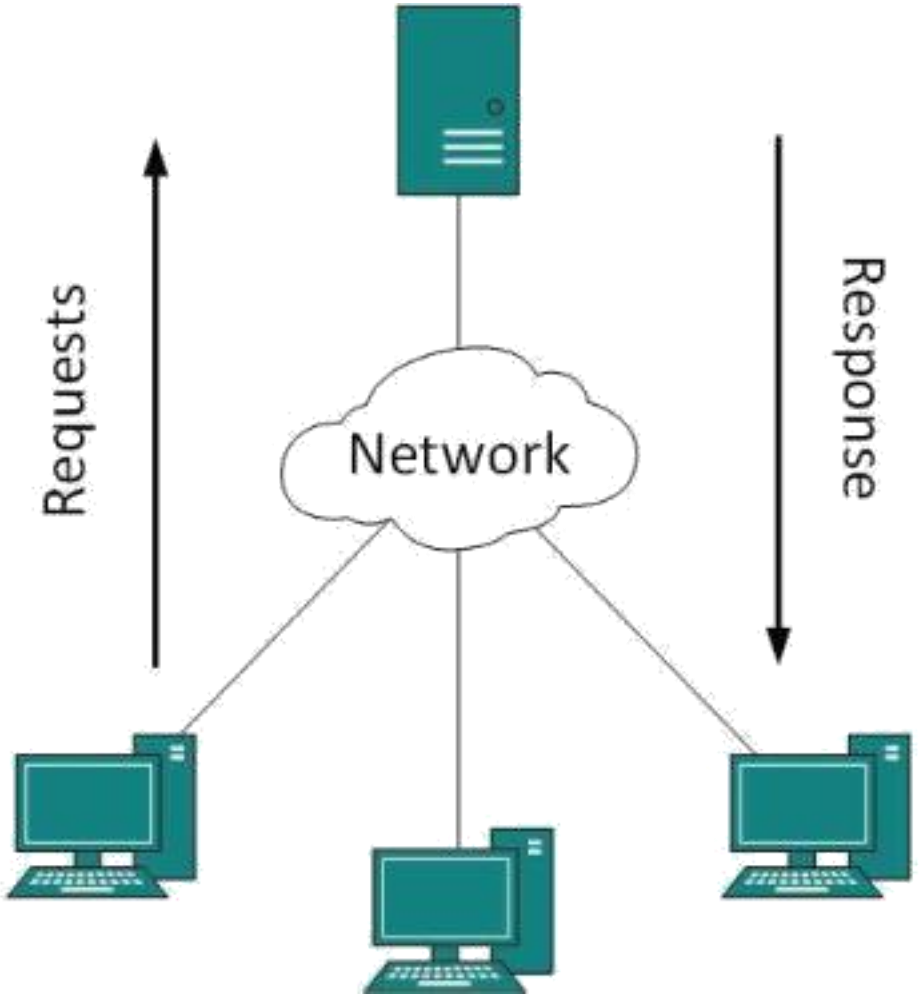
Tower Server:

A tower server is a computer that is built in an upright cabinet that stands alone and that is designed to function as a server

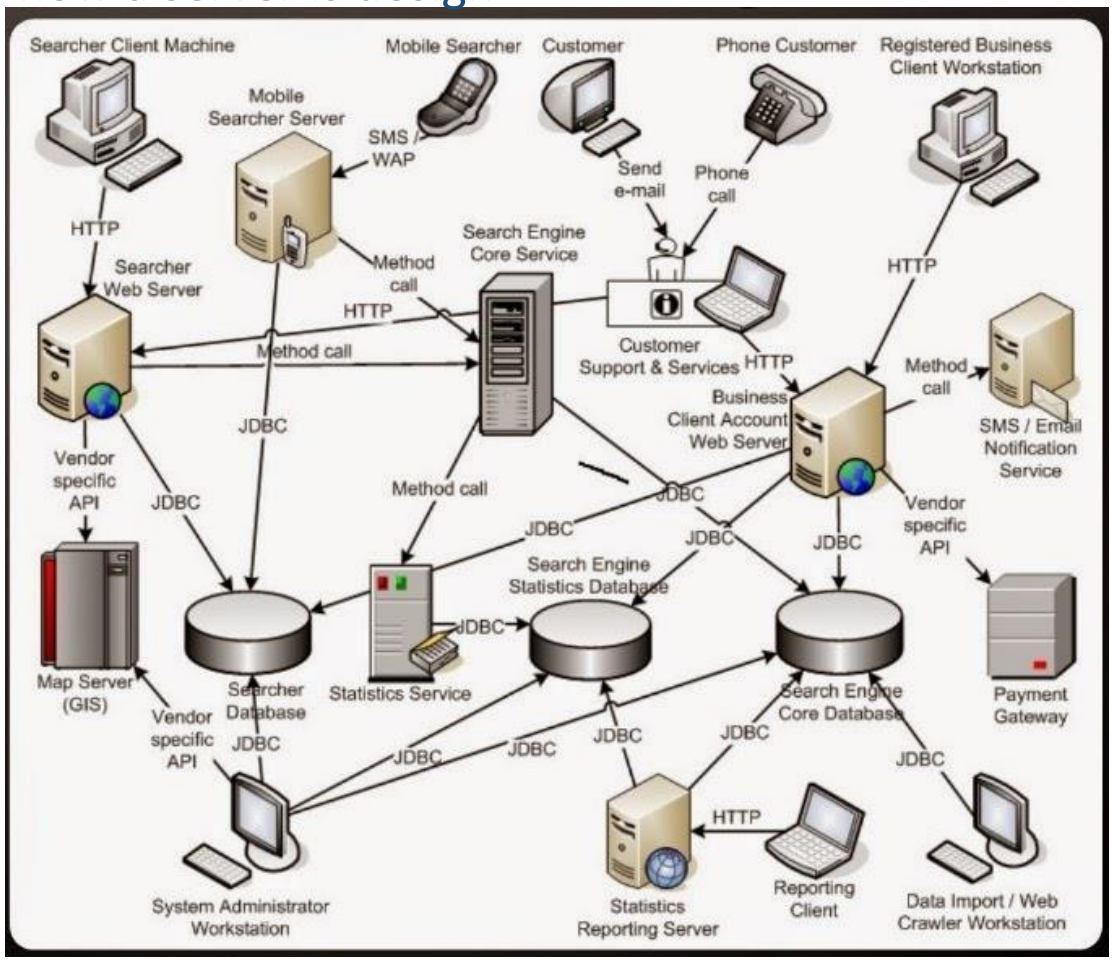
Client Server Model:




Client-Server Model
Clients
Internet
Server

Server Architecture:

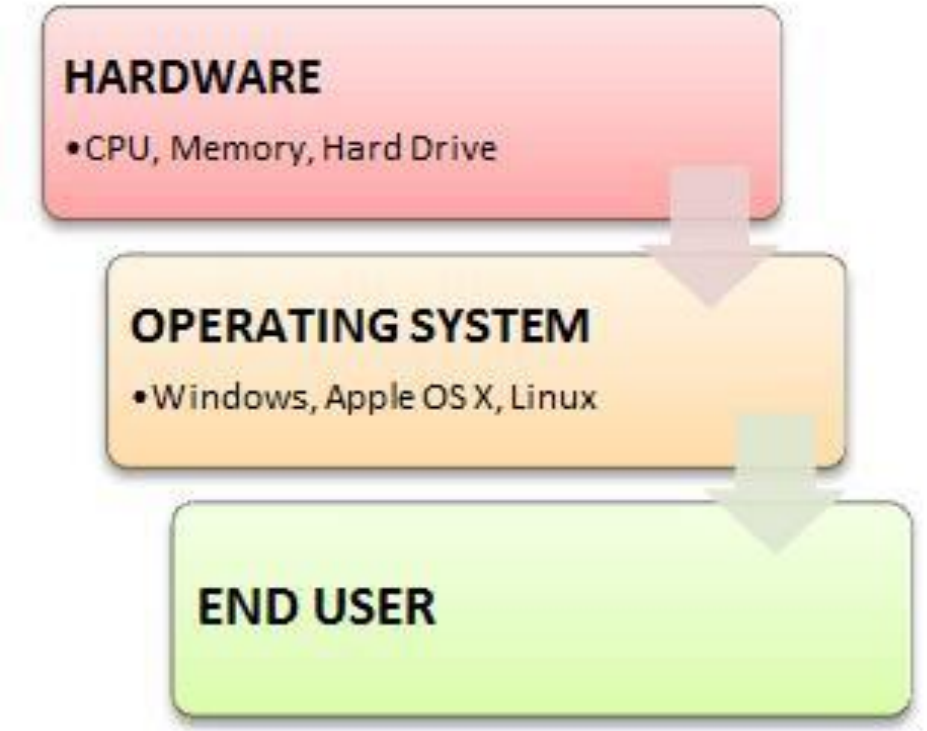
Server architecture is the foundational layout or model of a server, based on which a server is created and/or deployed. It defines how a server is design



What is Operating system?

Operating system is an interface between user and the computer hardware. The hardware of the computer cannot understand the human readable language as it works on binaries i.e. 0's and 1's

In such case we need an interface which can translate human language to hardware and vice-versa for effective communication



Types of Operating Systems:

1) Single user single tasking Operating

system Ex: MS-DOS

2) Single User Multi tasking Operating

system Ex: Windows

3) Multi-User Multi tasking Operating

System Ex: Linux/Unix

What is networking?

A **computer network** is a system in which multiple computers are connected to each other to share information and resources.

Characteristics of a Computer Network:

- Share resources from one computer to another.
- Create files and store them in one computer, access those files from the other computer(s) connected over the network.
- Connect a printer, scanner, or a fax machine to one computer within the network and let other computers of the network use the machines available over the network.

Following is the list of hardware's required to set up a computer network.

- Network Cables
- Distributors
- Routers
- Internal Network Cards
- External Network Cards

Network Cables:

- Network cables are used to connect computers. The most commonly used cable is Category 5 cable RJ-45.

Distributors:

- A computer can be connected to another one via a serial port but if we need to connect many computers to produce a network, this serial connection will not work.

Router:

- A router is a type of device which acts as the central point among computers and other devices that are a part of the network. It is equipped with holes called ports. Computers and other devices are connected to a router

  using network cables. Now-a-days router comes in wireless modes using which computers can be connected

  without any physical cable.

Network Card:

Network card is a necessary component of a computer without which a computer cannot be connected over a network. It is also known as the network adapter or Network Interface Card (NIC). Most branded computers have network card pre-installed. Network cards are of two types: Internal and External Network Cards.

Internal Network Cards:

Motherboard has a slot for internal network card where it is to be inserted. Internal network cards are of two types in which the first type uses Peripheral Component Interconnect (PCI) connection, while the second type uses Industry Standard Architecture (ISA). Network cables are required to provide network access.

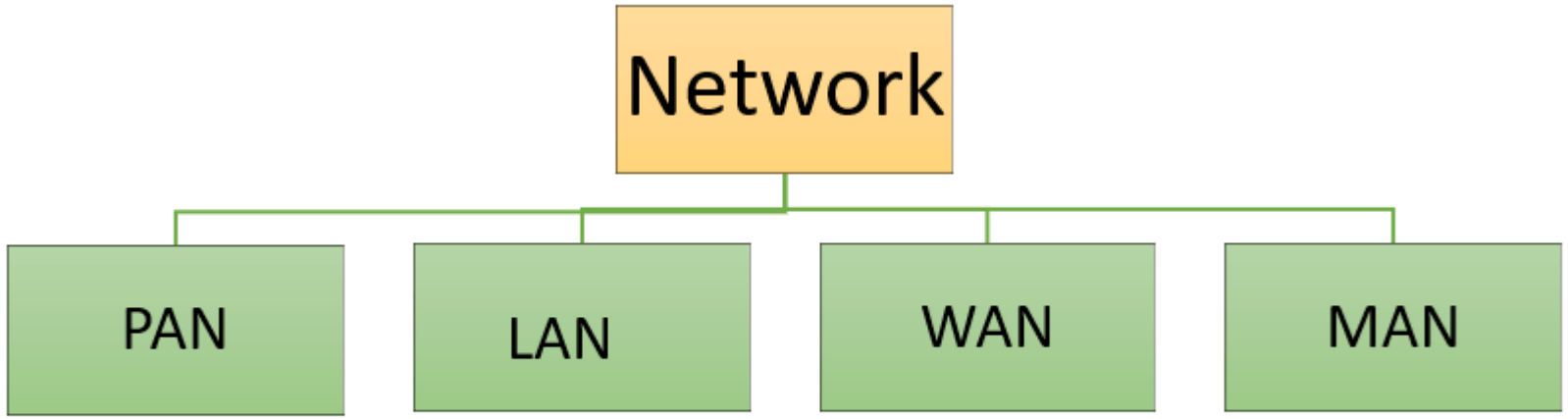
External Network Cards:

External network cards are of two types: Wireless and USB based. Wireless network card needs to be inserted into the motherboard, however no network cable is required to connect to the network.

Universal Serial Bus (USB):

USB card is easy to use and connects via USB port. Computers automatically detect USB card and can install the drivers required to support the USB network card automatically.

What Are the Important Types of Computer Networks?



What is PAN (Personal Area Network)?

PAN is a computer network formed around a person. It generally consists of a computer, mobile, or personal digital assistant. PAN can be used for establishing communication among these personal devices for connecting to a digital network and the internet.

Characteristics of PAN

It is mostly personal devices network equipped within a limited area.

Allows you to handle the interconnection of IT devices at the surrounding of a single user.

PAN includes mobile devices, tablet, and laptop.

Advantages of PAN

PAN networks are relatively secure and safe

It offers only short-range solution up to ten meters

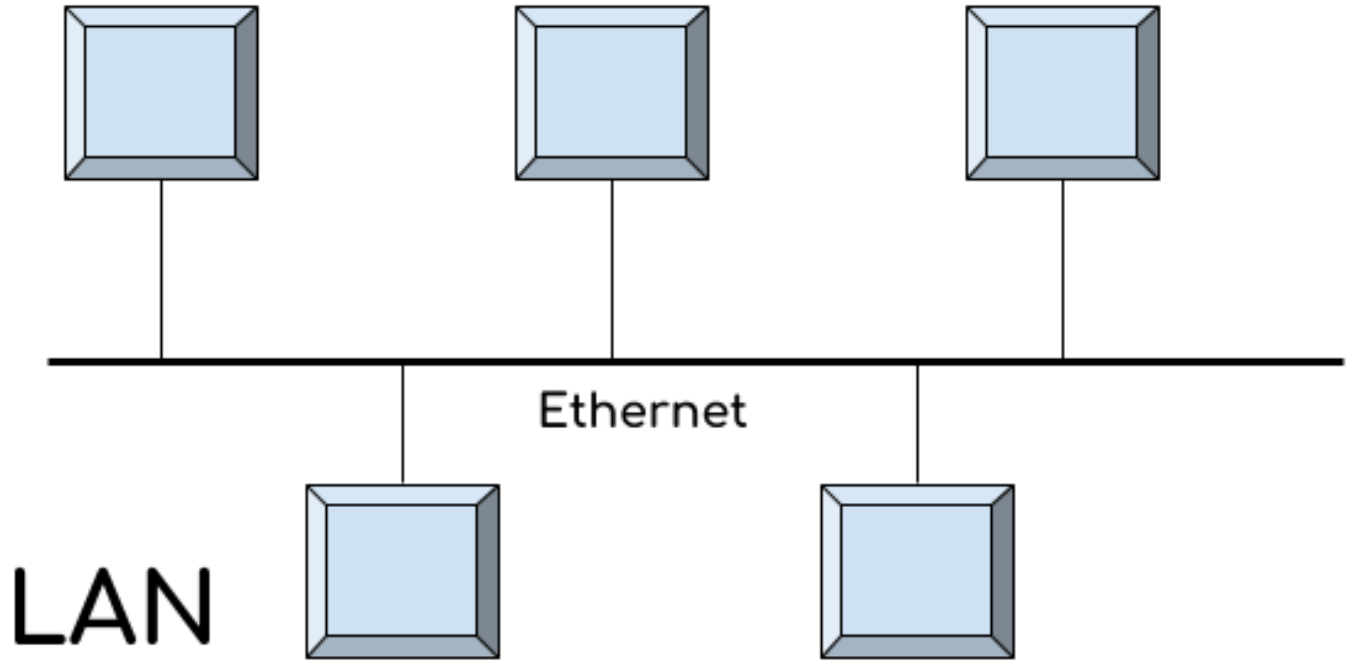
Strictly restricted to a small area

Disadvantages of PAN

Distance limits.

What is LAN?

LAN stands for local area network. It is a group of network devices that allow communication between various connected devices. It covers the smallest area such as colleges, schools, hospitals, and so on.



Characteristics of LAN

It is a private network.

LAN operates at a relatively higher speed compared to other WAN systems.

Advantages of LAN

Computer resources like hard-disks, DVD-ROM, and printers can share local area networks. This significantly reduces the cost of hardware purchases.

Data of all network users can be stored on a single hard disk of the server computer.

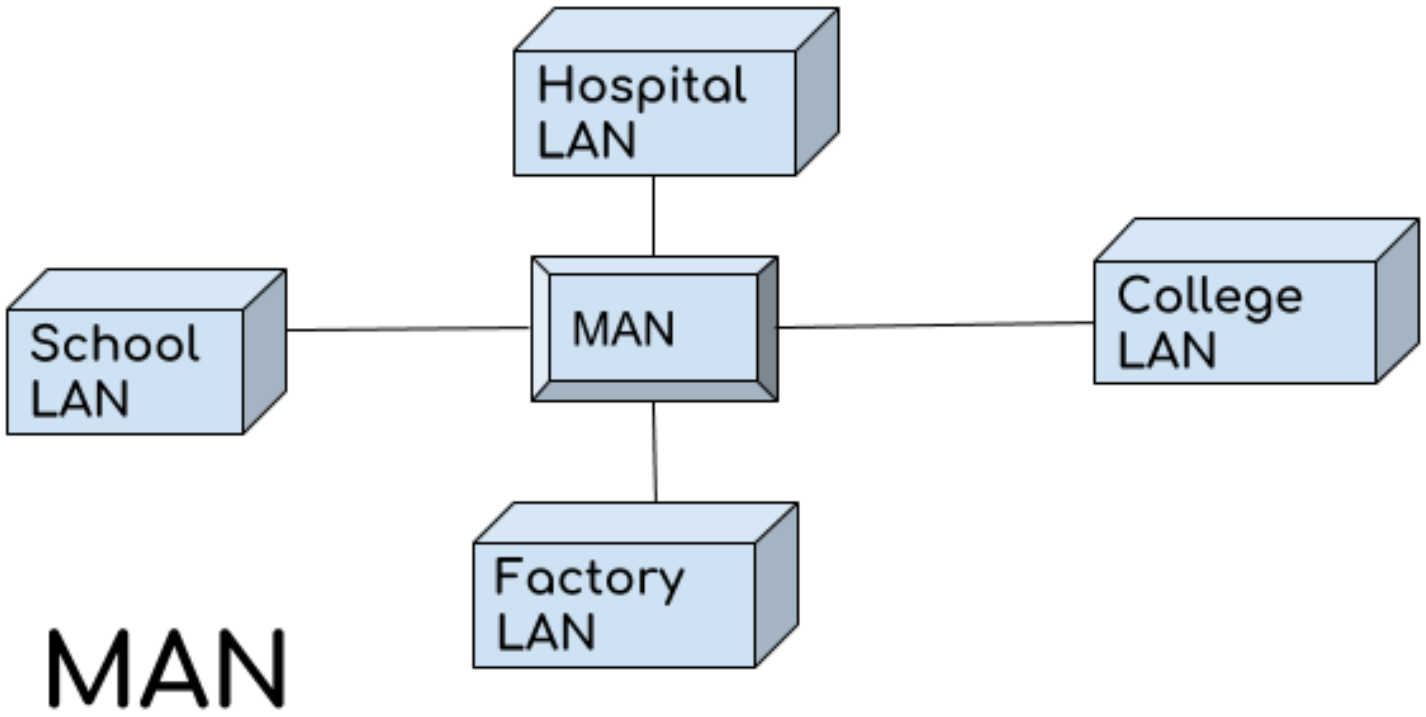
It will be easy to manage data at only one place, which makes data more secure.

Disadvantages of LAN

Unauthorized users can access critical data of an organization in case LAN admin is not able to secure centralized data repository.

What is MAN?

MAN stands for metropolitan area network. It covers the largest area than LAN such as small towns, cities, etc. MAN connects two or more computers that reside within the same or completely different cities.



Characteristics of MAN

It mostly covers towns and cities in a maximum 50 km

range Mostly used medium is optical fibers, cables

Advantages of MAN

It offers fast communication using high-speed carriers, like fiber optic cables.

It provides excellent support for an extensive size network and greater access to WANs.

A MAN network mostly includes some areas of a city or an entire city.

Disadvantages of MAN

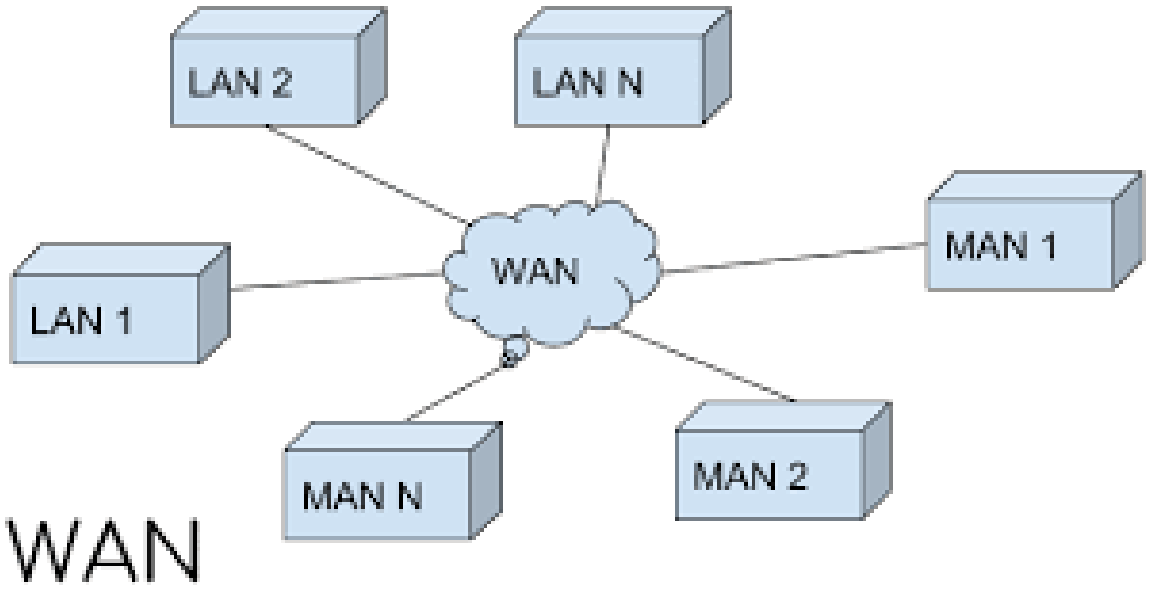
Here are drawbacks/ cons of using the MAN network:

You need more cable to establish MAN connection from one place to another.

In MAN network it is tough to make the system secure from hackers

What is WAN?

WAN stands for wide area network. It covers a large area than LAN as well as a MAN such as country/continent etc. WAN is expensive and should or might not be owned by one organization. Satellite medium is used for wide area networks.



Characteristics of WAN:

Any organization can form its global integrated network using WAN.

Advantages of WAN

WAN helps you to cover a larger geographical area. Therefore business offices situated at longer distances can easily communicate.

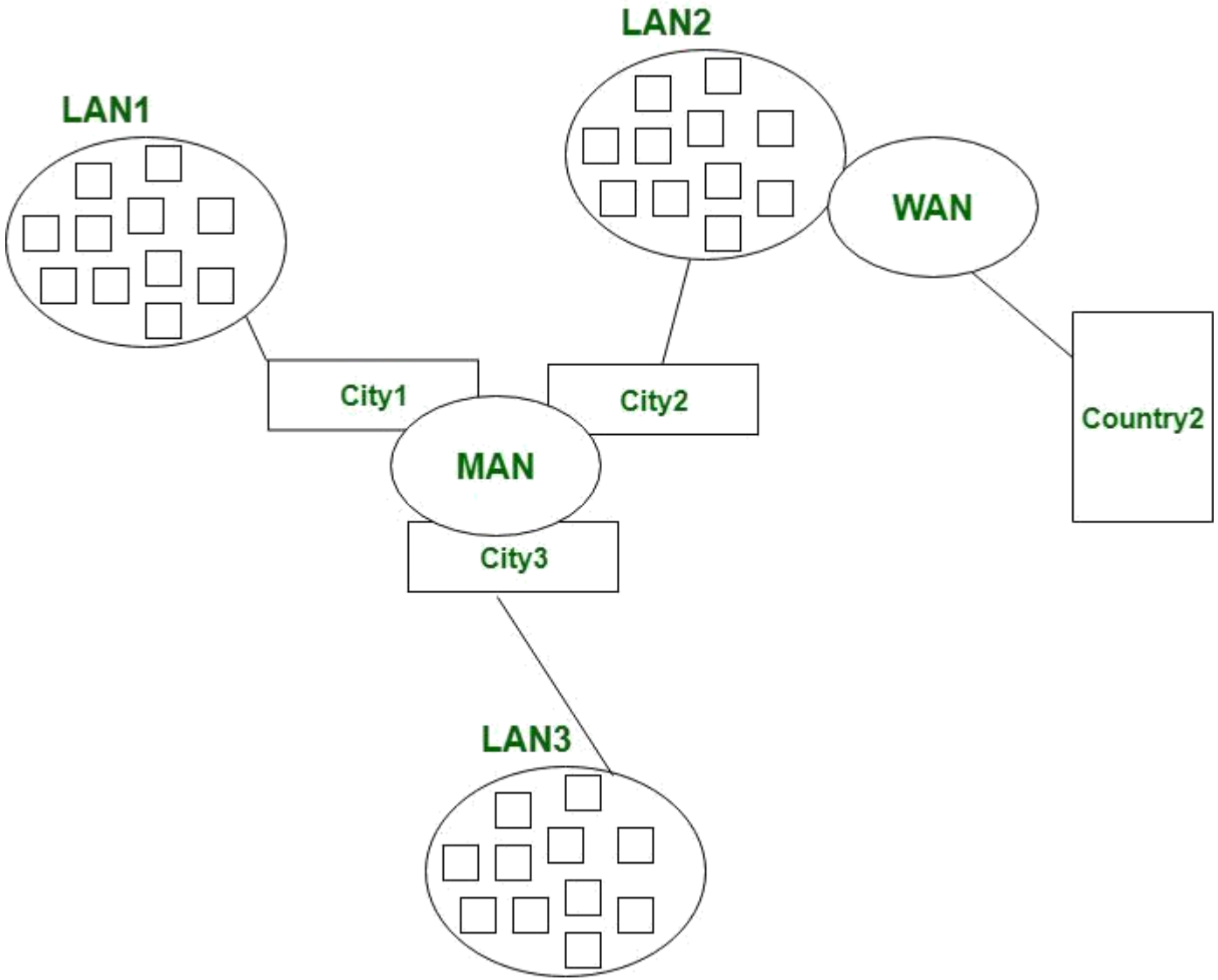
WLAN connections work using radio transmitters and receivers built into client devices.

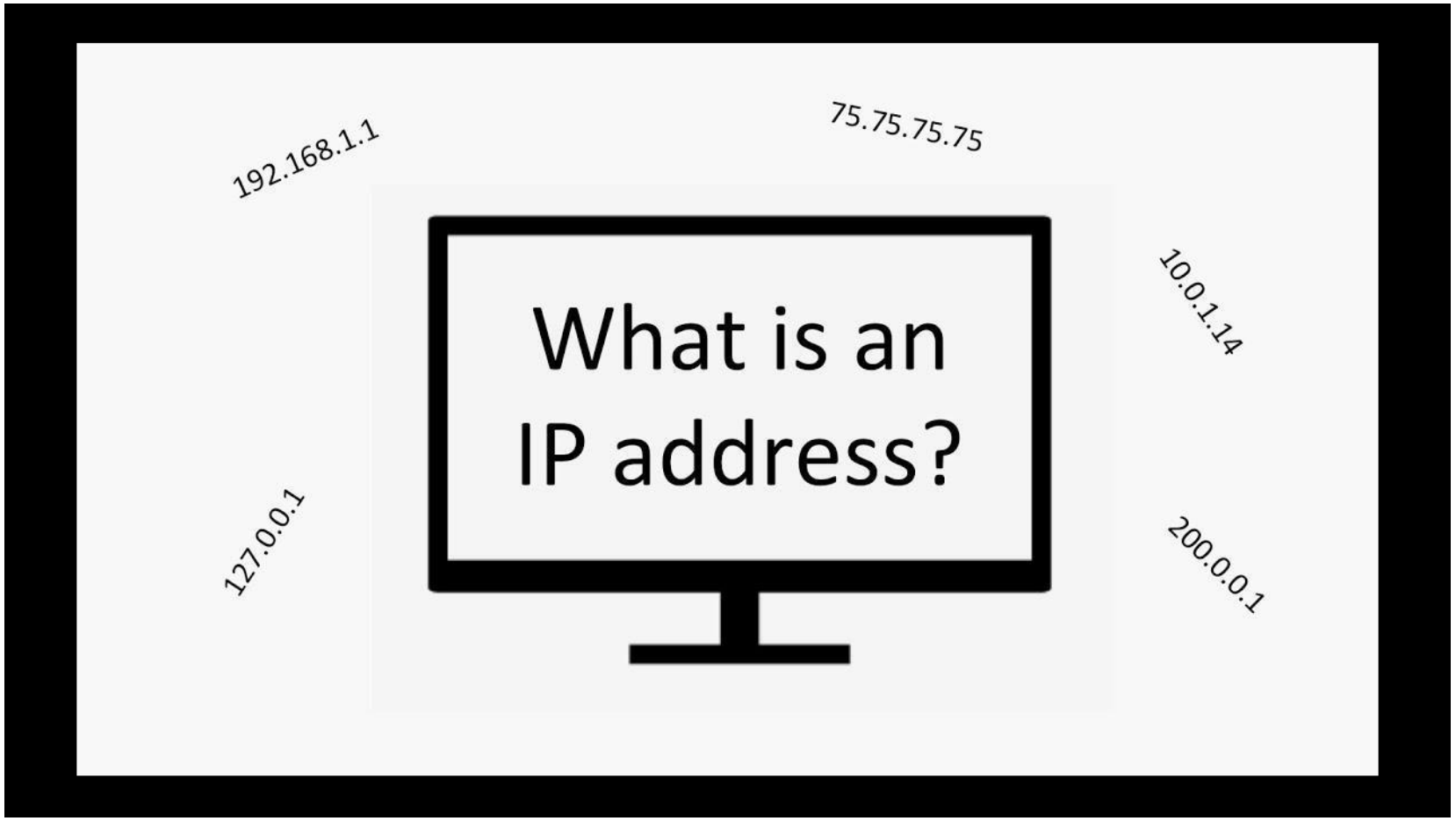
Disadvantage of WAN

The initial setup cost of investment is very high.

It is difficult to maintain the WAN network. You need skilled technicians and network administrators.

There are more errors and issues because of the wide coverage and the use of different technologies.


LAN2
LAN1
WAN
City1
City2
Country2
MAN
City3
LAN3



IP Address:

IP stands for "Internet Protocol” An IP address is a unique address that identifies a device on the internet or a local network. which is the set of rules governing the format of data sent via the internet or local network

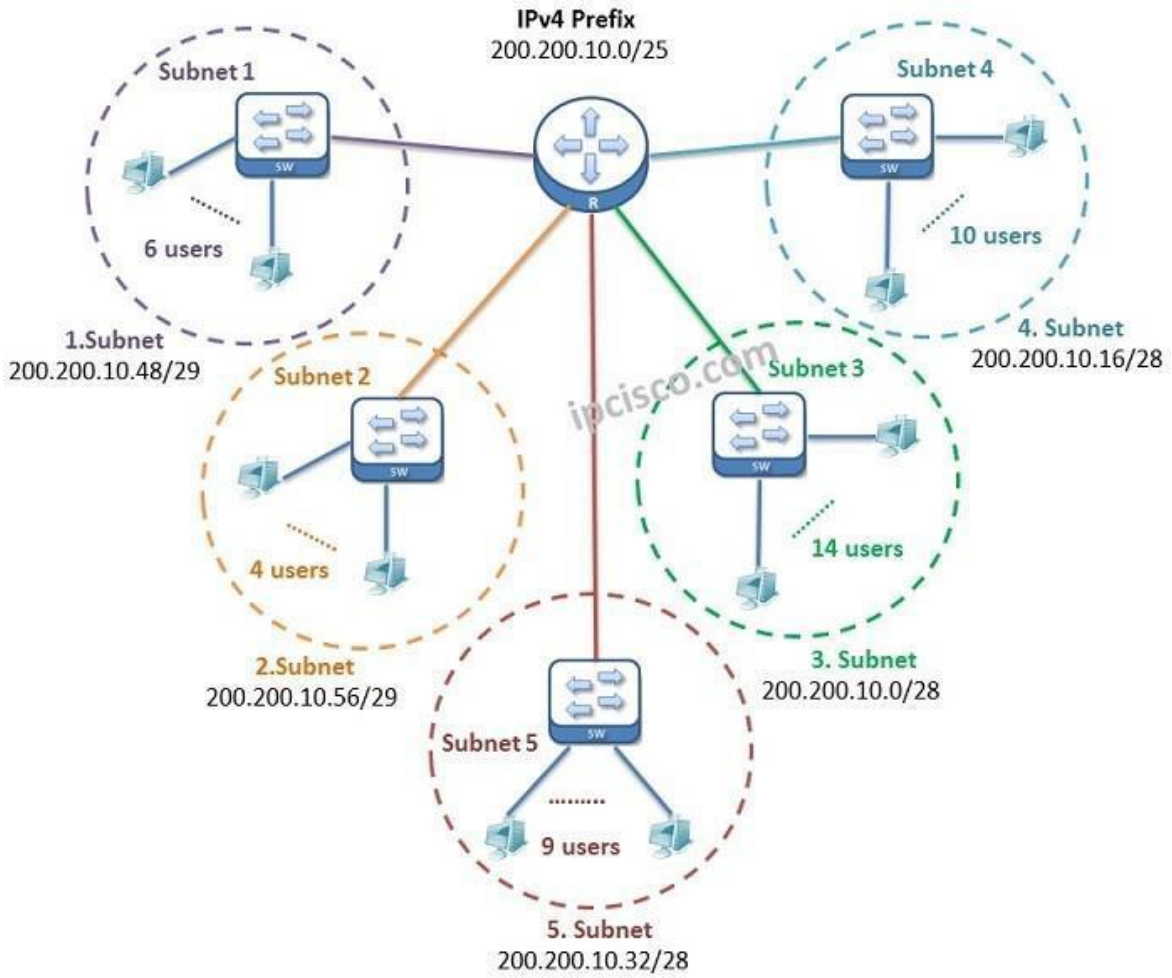
Types of IP addresses:

There are various classifications of IP addresses, and each category further contains some types.

1. Private IP addresses
2. Public IP addresses
    1. Dynamic IP addresses
    2. Static IP addresses

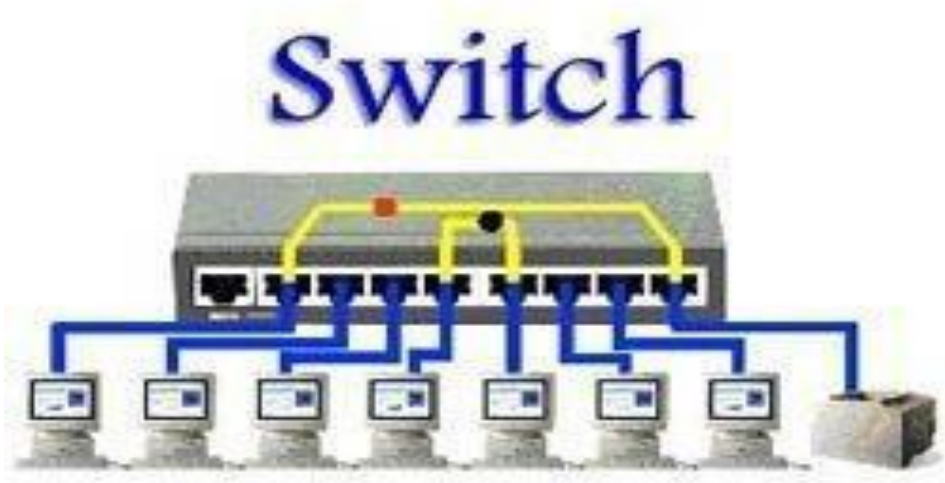
What is Subnet?

A **subnet** or subnetwork is a smaller network inside a large network.

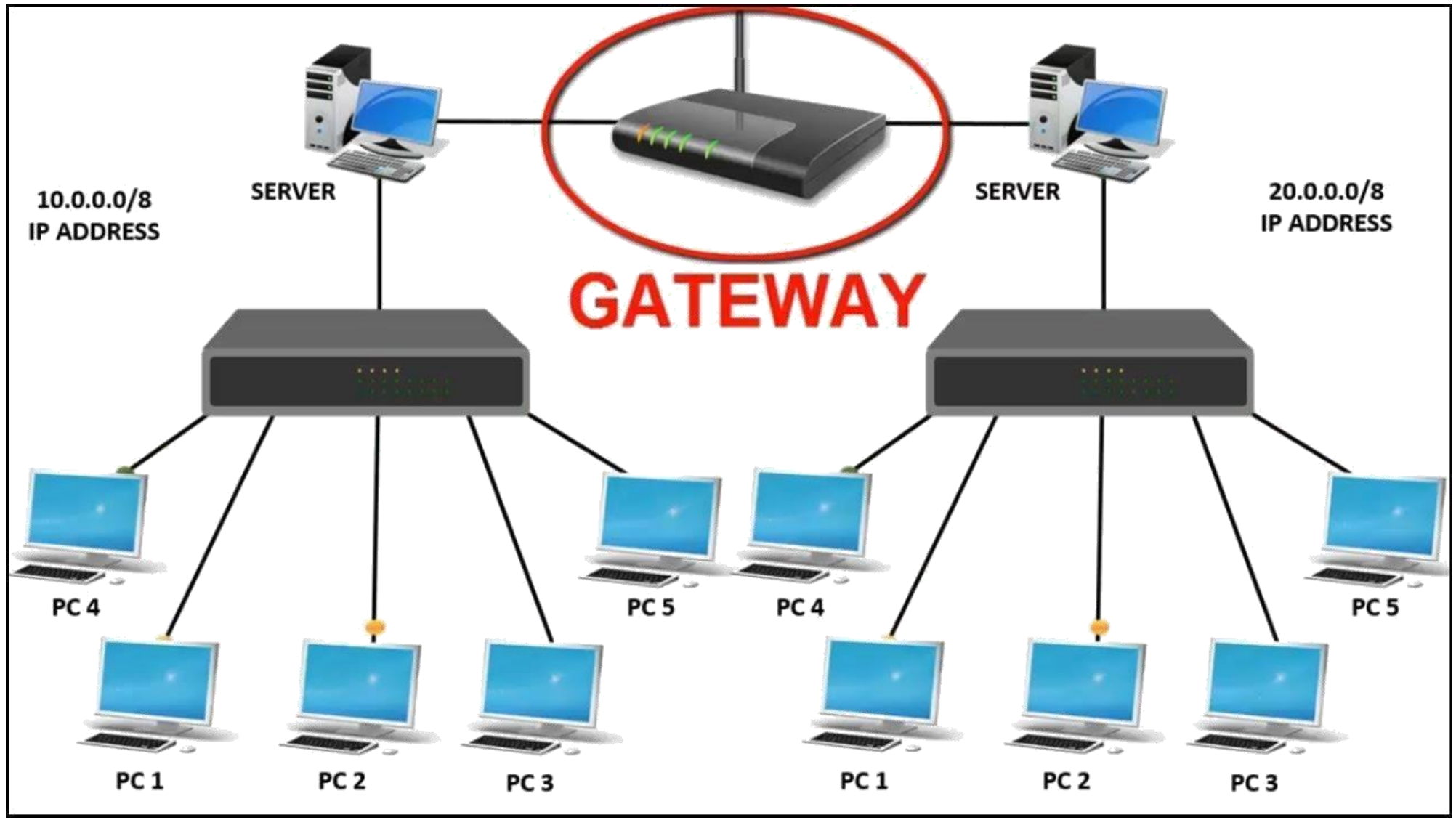


What is Network Switch?

A **switch** is a device in a computer network that connects other devices together. Multiple data cables are plugged into a **switch** to enable communication between different networked devices.

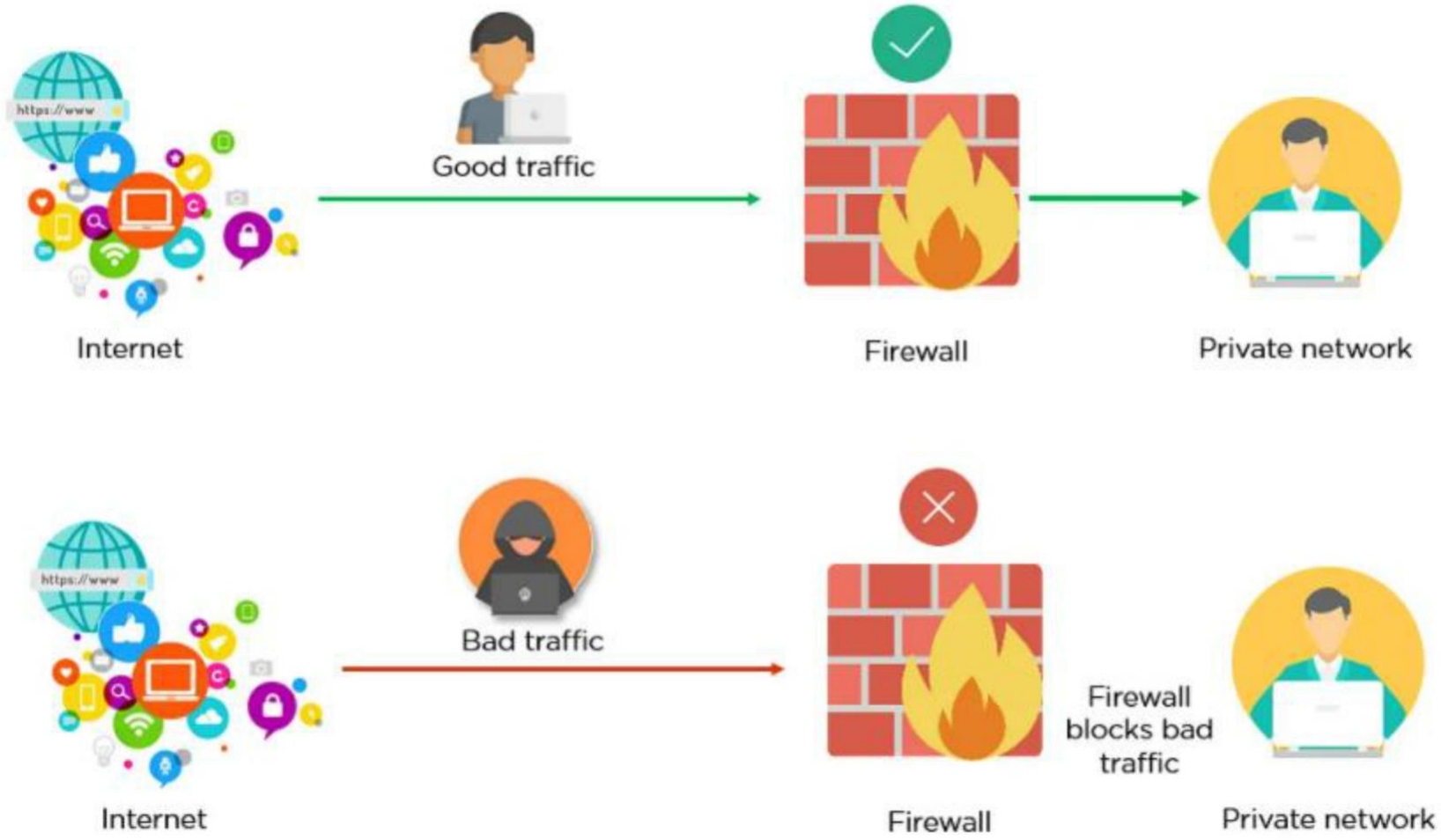


What is Gateway?


10.0.0.0/8
IP ADDRESS
SERVER
GATEWAY
SERVER
20.0.0.0/8
IP ADDRESS
PC 4
PC 5
PC 1
PC 2
PC 3
PC 4
PC 5
PC 1
PC 2
PC 3

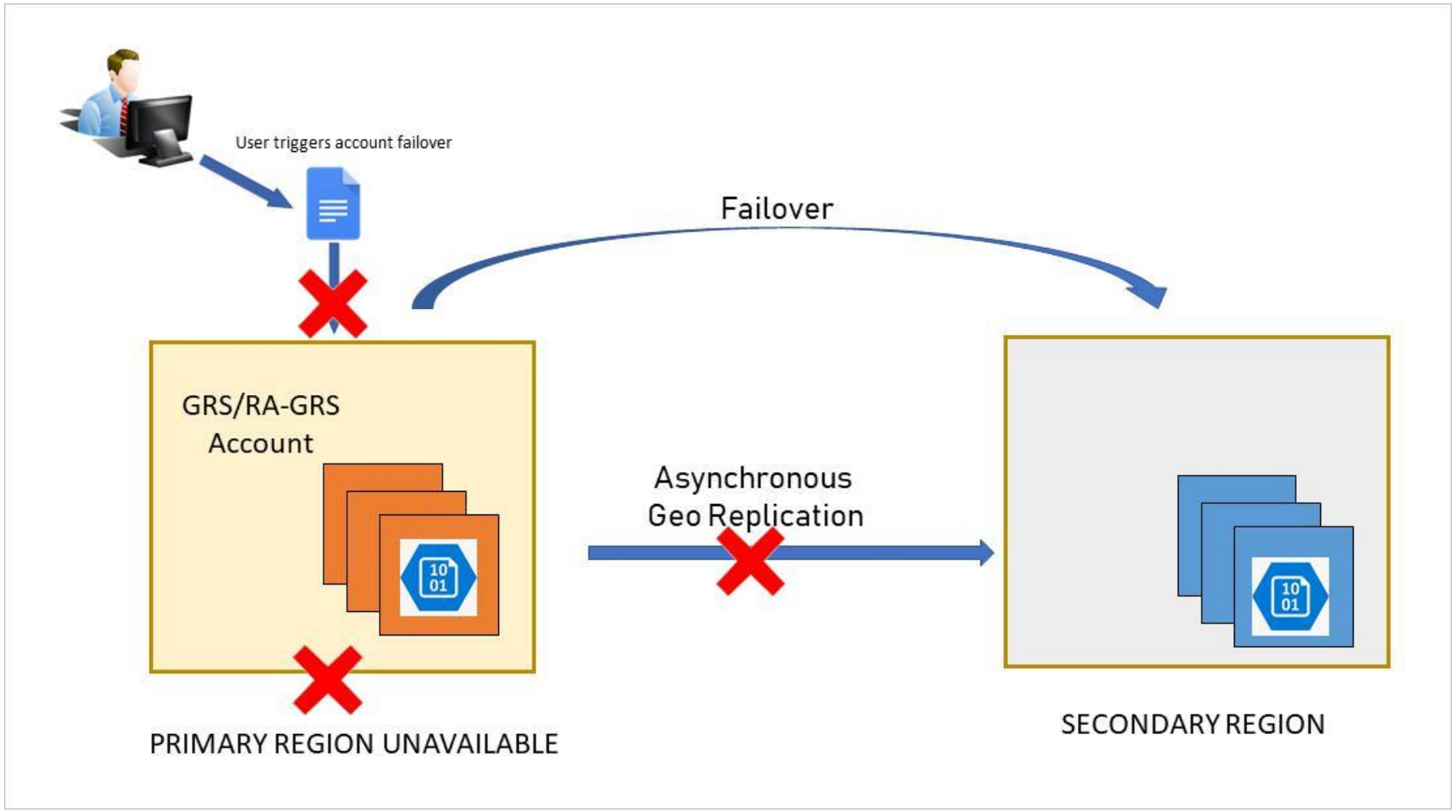
What is Firewall?

Firewalls are network security systems that prevent unauthorized access to a network. It can be a hardware or software unit that filters the incoming and outgoing traffic within the Network.



What is Replication/Failover/Load Balancer?

Replication is a technology for copying and distributing data and database objects from one database to another and then synchronizing between databases to maintain consistency and integrity of the data. In most cases, replication is a process of reproducing the data at the desired targets.




Why Linux?
Some reasons to choose Linux

Why Linux

Free
Open-source
Secure
Distributions
Fast Performance

Viruses
Malwares
Slow-downs
Crashes
Costly repairs