INTERNET TECHNOLOGIES

Intranet

- **Intranet is a network of computers within an organization.**

Extranet

- **Extranet is a network of computers between some related organizations.**

Internet

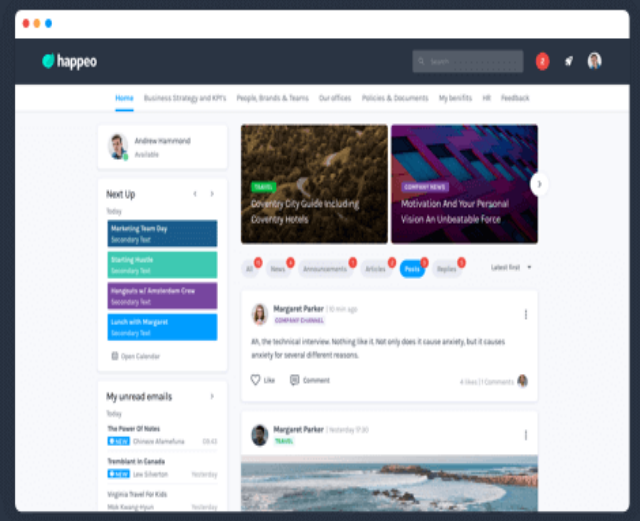
Public

Large number of
connected devices

Not owned by anyone

Information can be shared
across the world

Intranet



Private network

Limited amount of users
with access

Owned by an organization

Information shared within
an enterprise

Extranet

Private/VPN

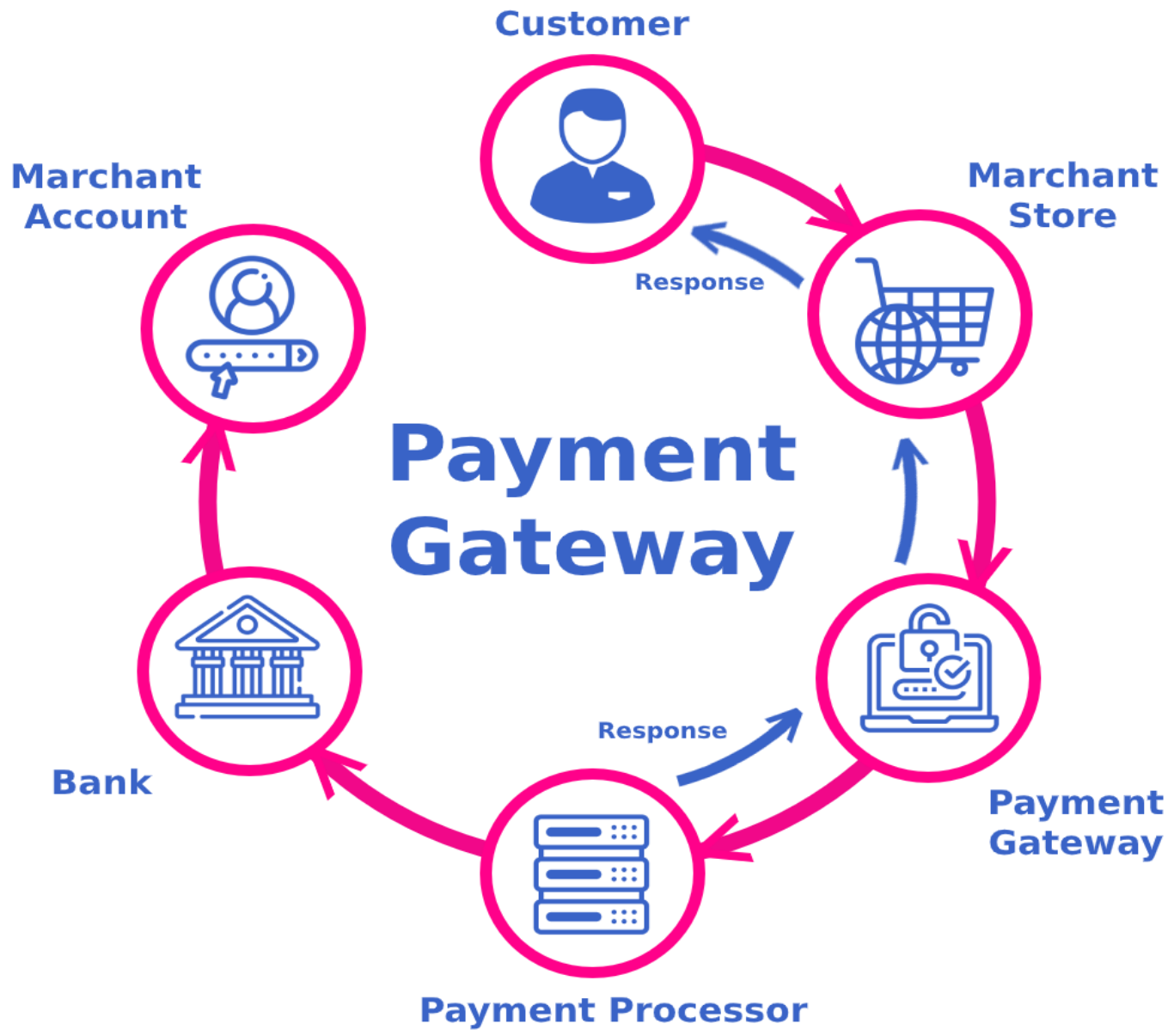
Limited amount of
users with access

Owned by one or more organizations

Information shared among
employees and external people

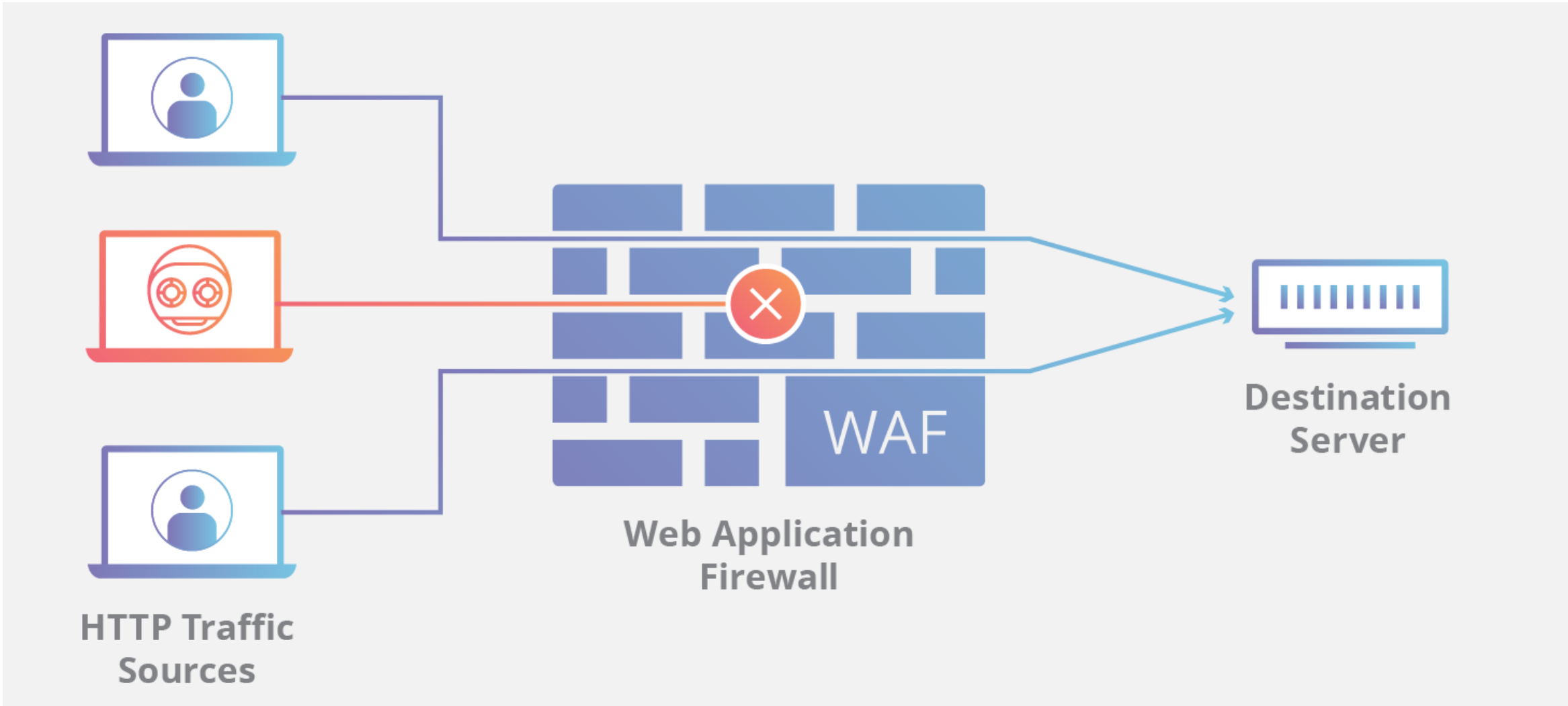
Gateway

- **Gateway is a particular point in a network that acts as an entrance to another network. For example, the 'payment gateway', if you've done any internet payment transaction you would have seen that from the merchant's site you are taken to a payment gateway, from where you are then taken to your bank's net banking site.**



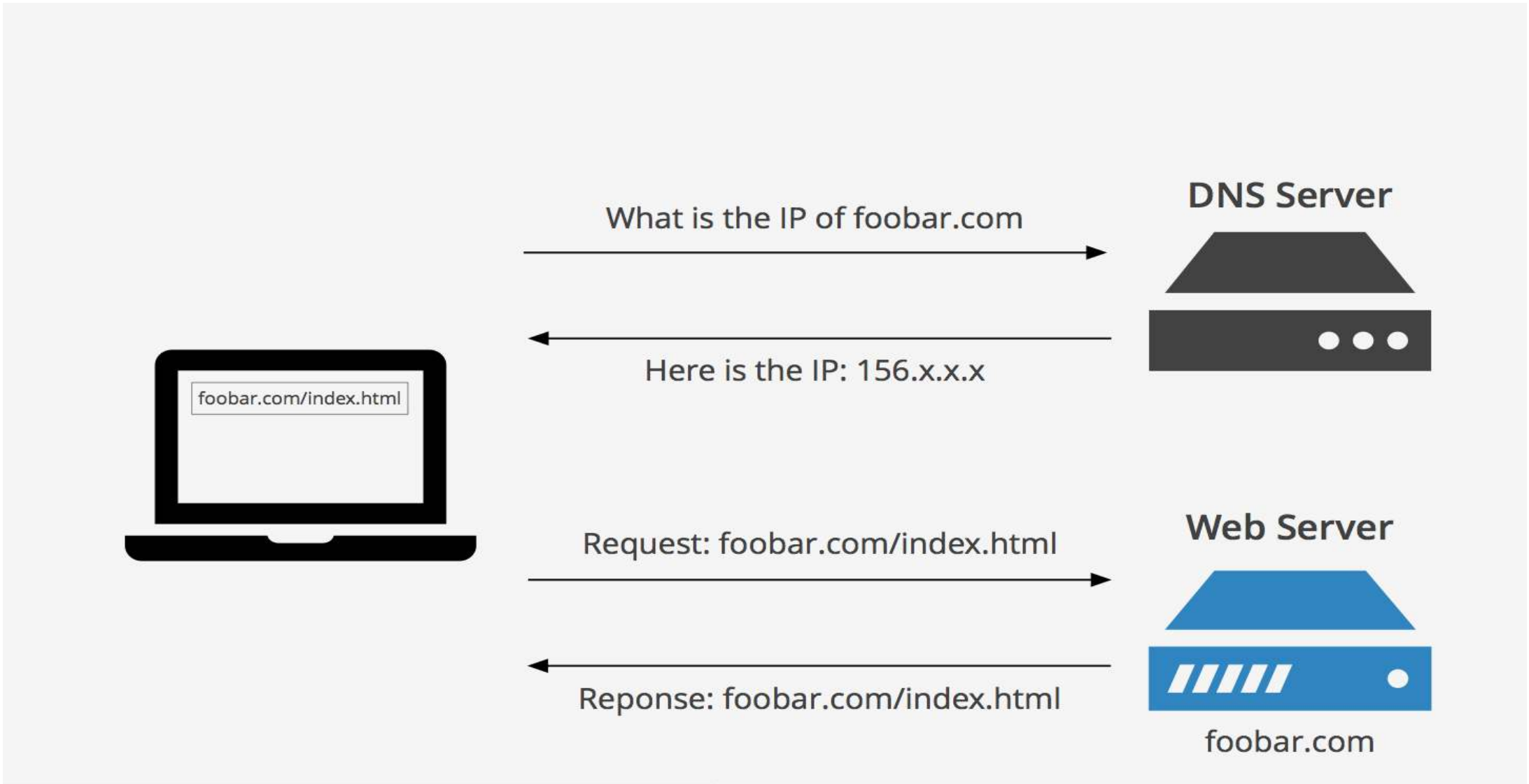
Firewall

- **Firewall** is a program in charge of rejecting unwanted incoming connection requests. A server with a firewall will keep other computers form connecting to the server. It is like a boundary wall to keep intruders at bay.



DNS

- **Domain name server – is a program which deals with computer addresses. You can look at it as a telephone directory, but for the Internet; it translates user friendly computer hostnames into IP addresses.**



Popular Domain names:

.jobs = Jobs	.org = organization
.gov = government agencies	.name = personal
.in = India	.edu = educational
.com = commercial business	.mil = military
.net = network organization	. biz = business organizations

Flash

- **Flash is an embedded animation software/program that displays small animations on web pages; like the how many ducks can you shoot!?**

URL

- **URL : Uniform Resource Locater – is nothing but a web page's address, or in other words URL specifies the address of every file on the internet.**

URL has three parts

(i) the protocol to be used to access the file = {http://}

(ii) the IP address = {www.gmail}

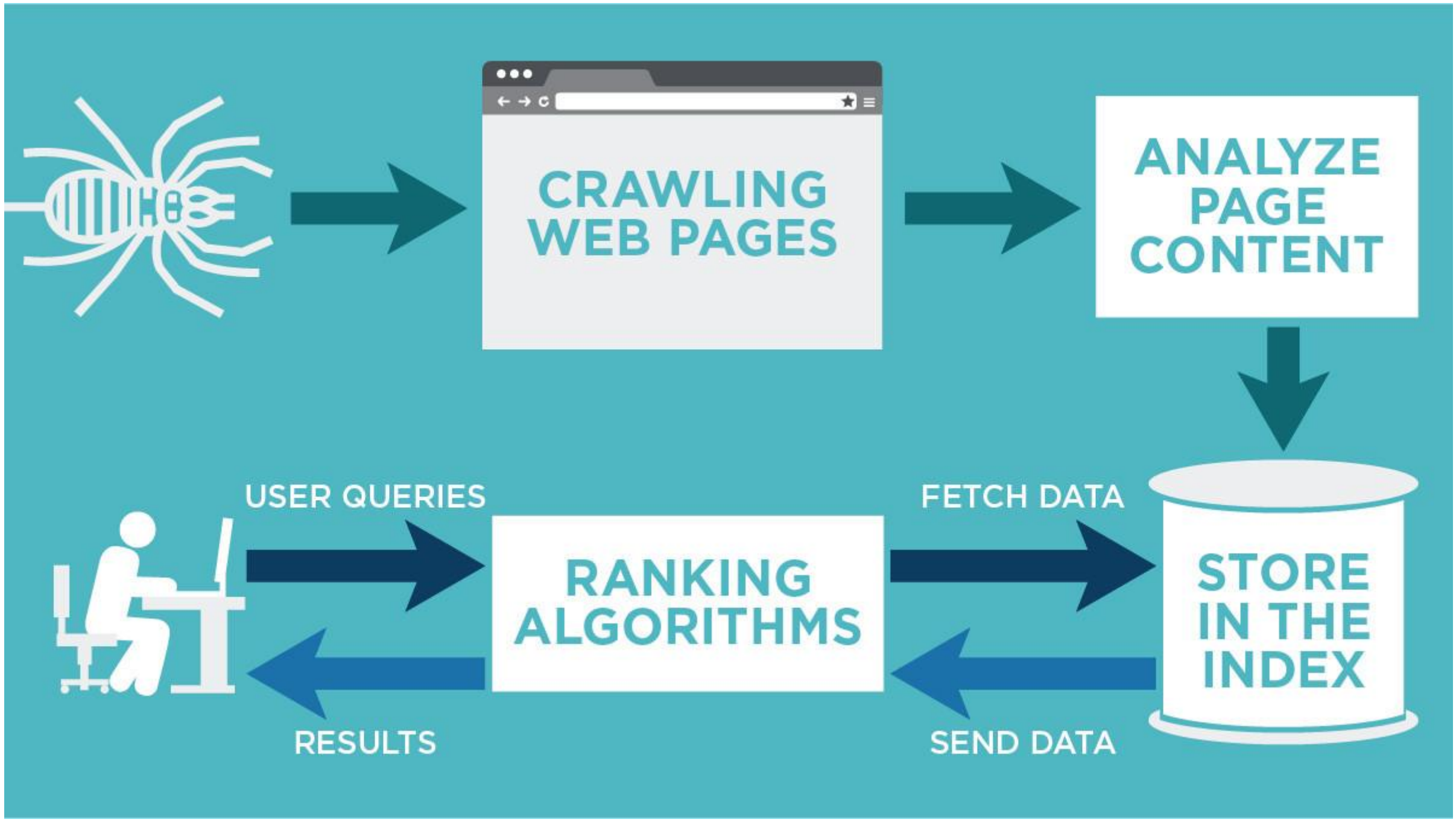
(iii) the domain name = {.com}

Browser

- **Browser** is the software or program that allows a computer to view web pages. Like Mozilla Firefox, Google Chrome, Internet Explorer, Safari, Opera.

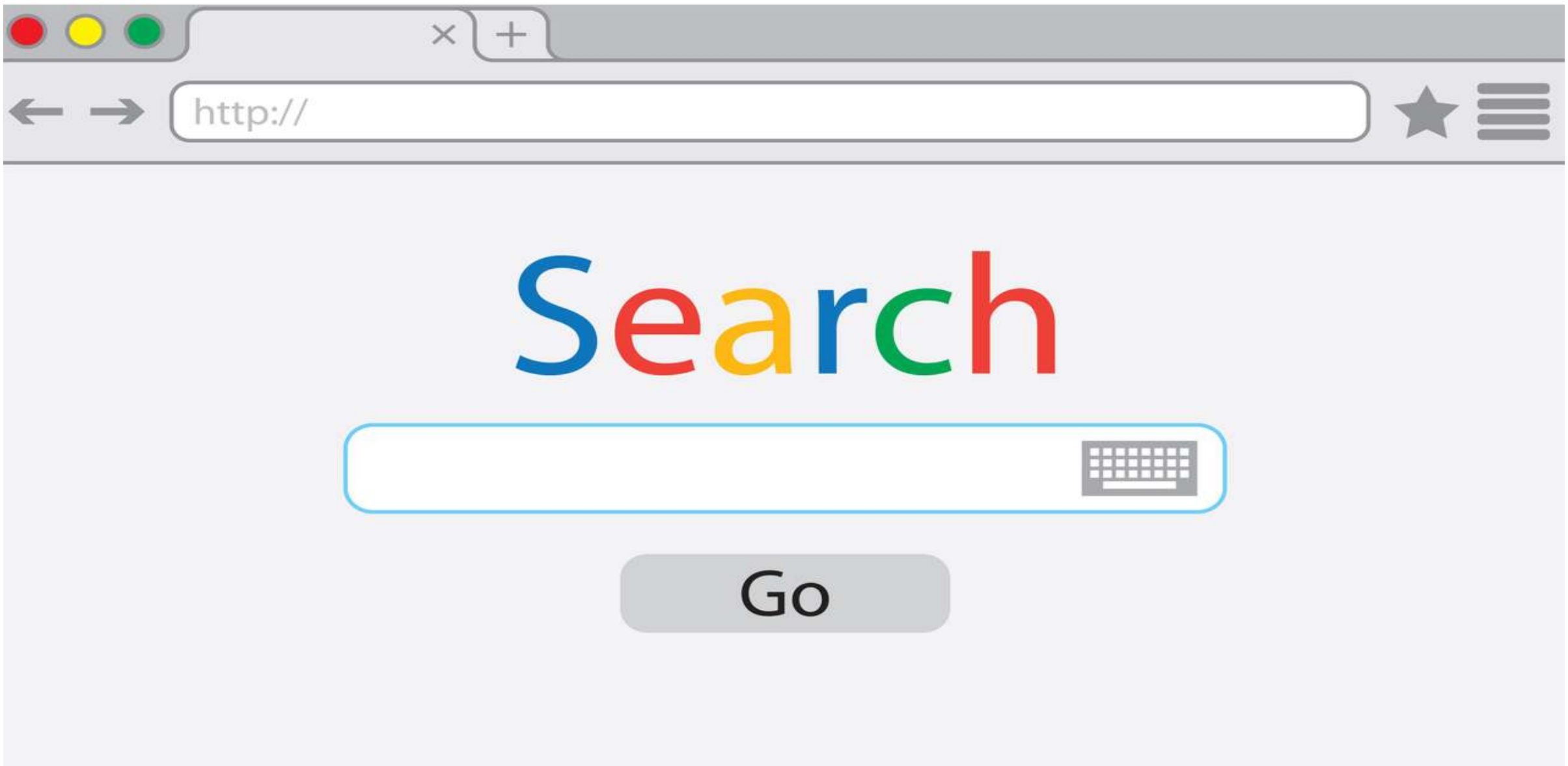
Web Crawler

- **Web Crawler is a program that visits web sites and reads their pages and other information in order to create entries for a search engine index.**



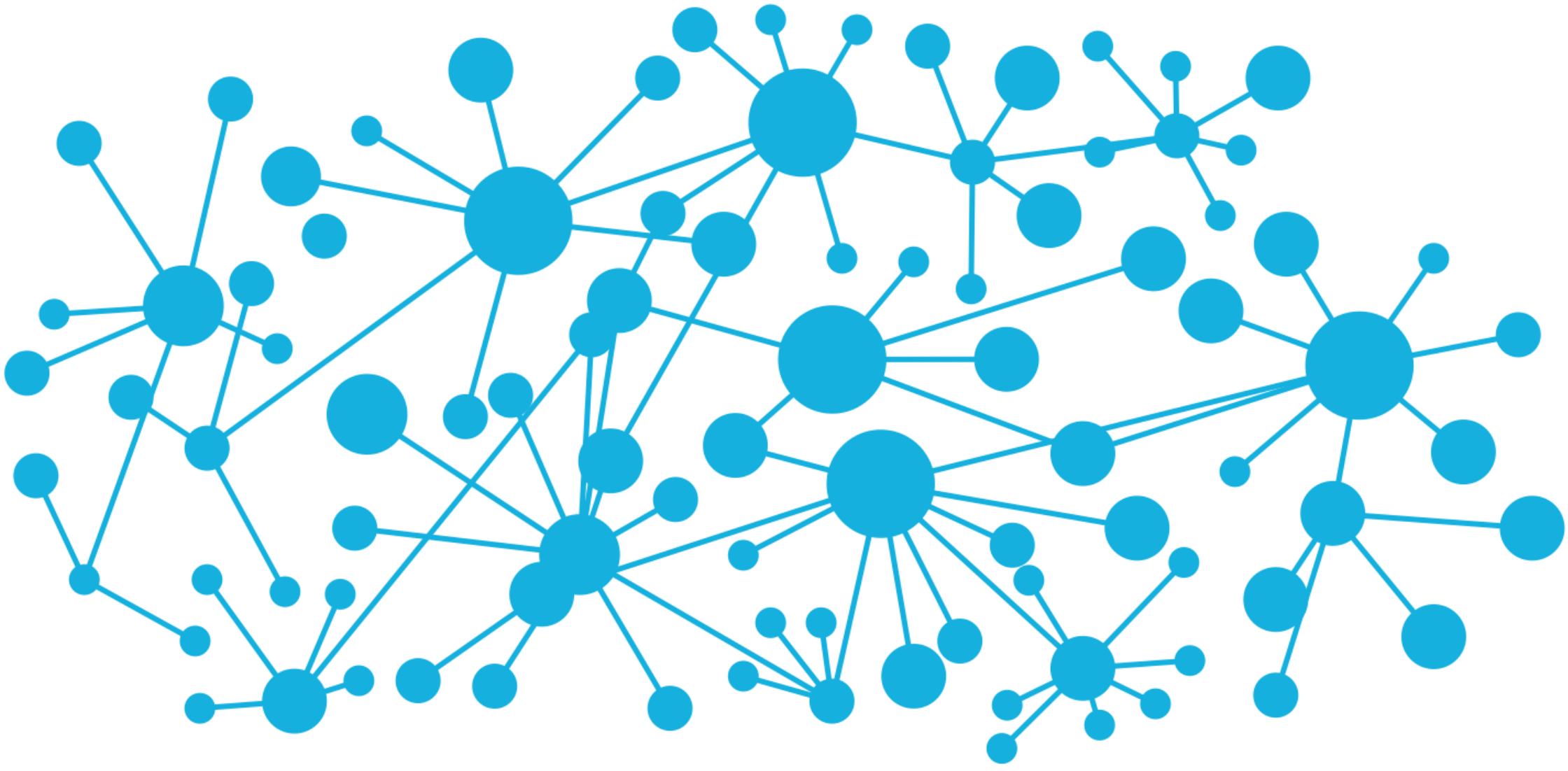
Search Engines

- **Search Engines are special program running on a website which offers user results of simultaneous searches of other websites for the required information. For example - Google**



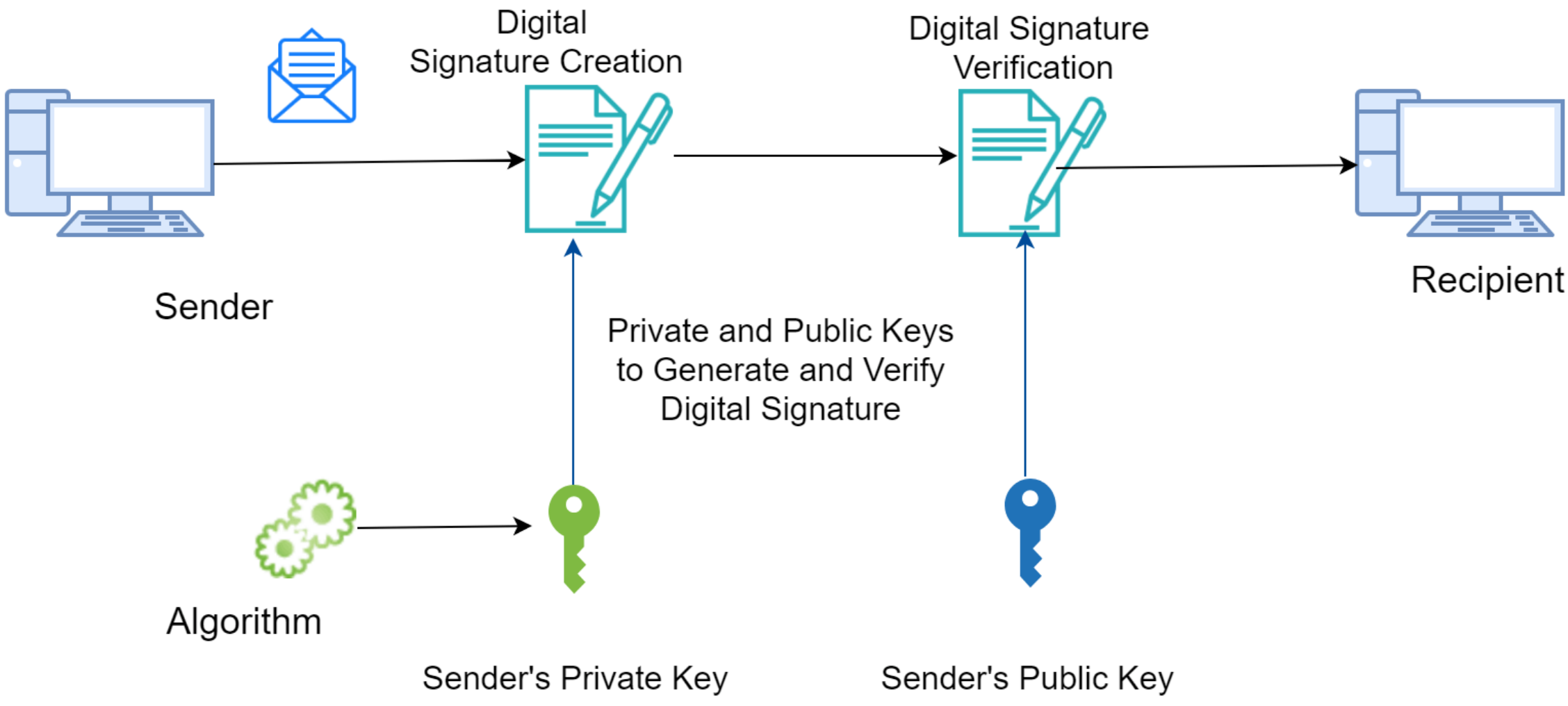
Traffic Congestion

- **Traffic Congestion is a phenomenon where too many users are connecting to the internet at the same time or the internet service provider's cables are not able to support the user's maximum speed; it really is like the traffic jam!**



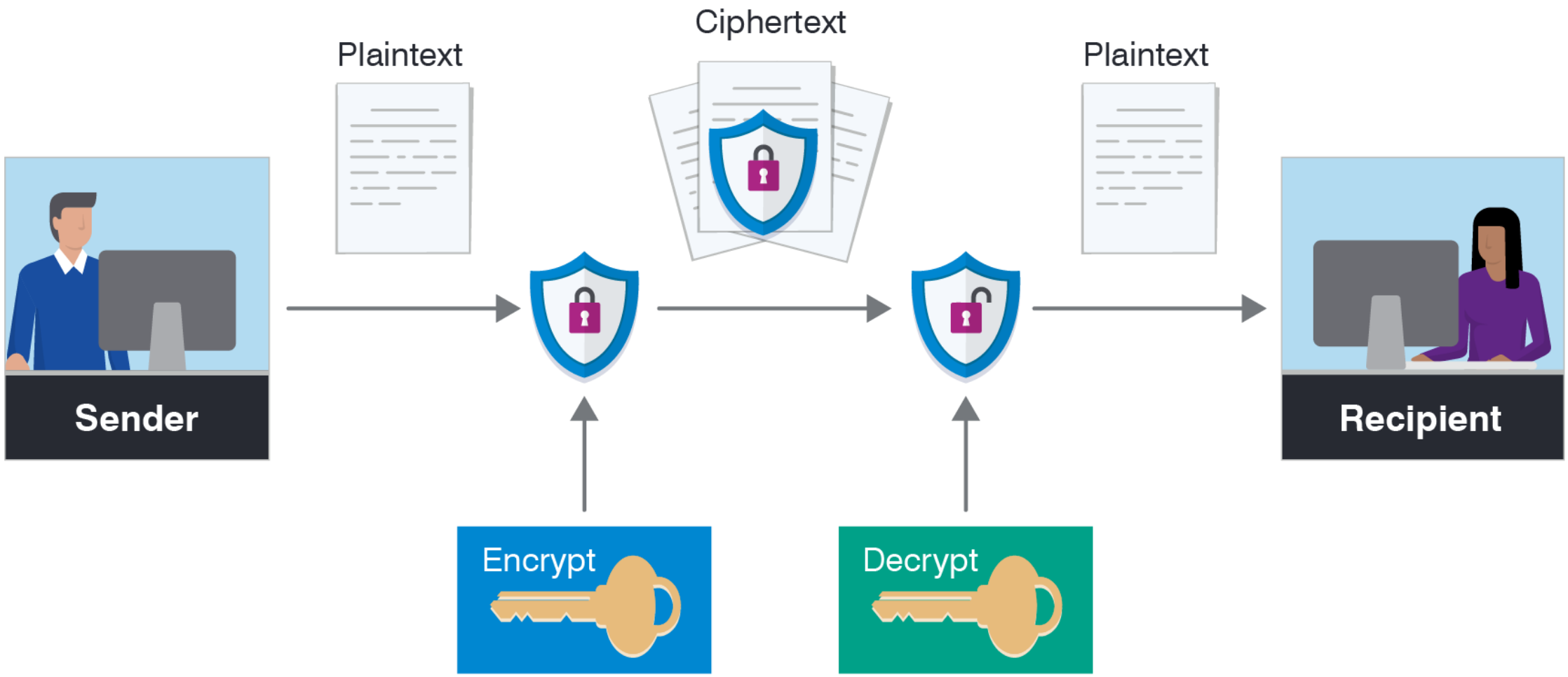
Digital Signature

- **Digital Signature also known as electronic signature is like an encryption technique for documents, which guarantees authenticity of the document and helps combat digital forgeries and frauds.**



Encryption/ Decryption

- **Encryption/ Decryption** **Encryption is a technique, derived from military use, to mask/disguise any information, which cannot be read by anyone who does not have the password/key.**



Different keys are used to encrypt and decrypt messages

Cloud Computing

- **Cloud Computing is a service provided, wherein one can obtain network based storage space with such service providers.**

- **User needs to open an account with the service provider, much like creating an e-mail id. E-mails are also cloud computing but on a smaller scale.**

Types of clouds:

- **Public Cloud: it can be accessed by any subscriber with an internet connection and access to the cloud space.**
- **Private Cloud: is where only an authorized group of individuals or organizations have limited access.**
- **Community Cloud: like the name suggests is a 'communal' thing, where the service is shared among two or more organizations or companies, that have similar cloud requirements.**
- **Hybrid Cloud: where a mixture of user interests are all catered to, i.e. a combination of public, private and community.**

IP Address

- **Internet Protocol (IP) Address – Just like we have a house address for reaching someone's house, a computer system on the internet has an IP Address. It is an address through which a computer is identified on a network/internet.**
- **Example of an IP Address– 192.168.1.1**

- **Types of IP Address (Versions)**

1. **IPv4**
2. **IPv6**

IPv4

- It is a 32 bit (4 bytes) unique address having an address space of 2^{32}
- It has four parts and each part can have values between 0 to 255. Example 255.255.255.255 is a valid IP Address, however, 192.168.256.123 is an invalid IP Address as the third part (256) is not valid.
- Note that the four parts in this IP address are separated by a dot (.)
- IP addresses are globally managed by Internet Assigned Numbers Authority(IANA) and regional Internet registries(RIR).
- IPv4 was the first version of IP which was deployed for production in the ARPANET in 1983

IPv6

Due to the rise in the number of devices that are connected on the internet the available IP Address on IPv4 (2^32) would soon get exhausted. Hence there was a need for a system of IP Address that could accommodate more devices.

- **It is 128-bit address space.**
- **It has eight 4-character.**
- **It is in hexadecimal.**
- **Example: 2001:0db8:0000:0000:0000:ff00:0042:7879**
- **IPv6 also called IPng (Internet Protocol next generation).**
- **IPv6 is the successor of IPv4.**

Classes of IP Address

- **IP Address is divided into 5 classes based on the address range. It is as follows:**

Class	From	To
Class A	1.0.0.0	127.255.255.255
Class B	128.0.0.0	191.255.255.255
Class C	192.0.0.0	223.255.255.255
Class D (Reserved for multicast groups.)	224.0.0.0	239.255.255.255
Class E (Reserved for future use, or research and development purposes.)	240.0.0.0	255.255.255.255

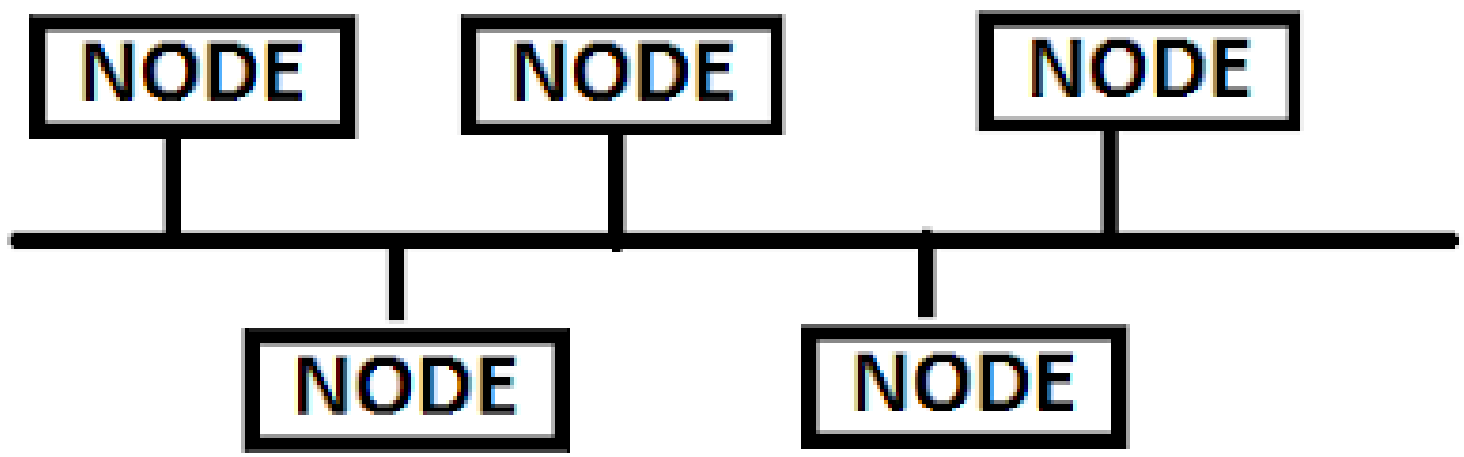
NETWORK TOPOLOGIES

- **Network Topologies describes the physical layout i.e. how cables, nodes and connection devices are linked or organised together.**

(1) Bus Network Topology

It is network topology in which set of nodes are connected by a single communication line, called a bus.

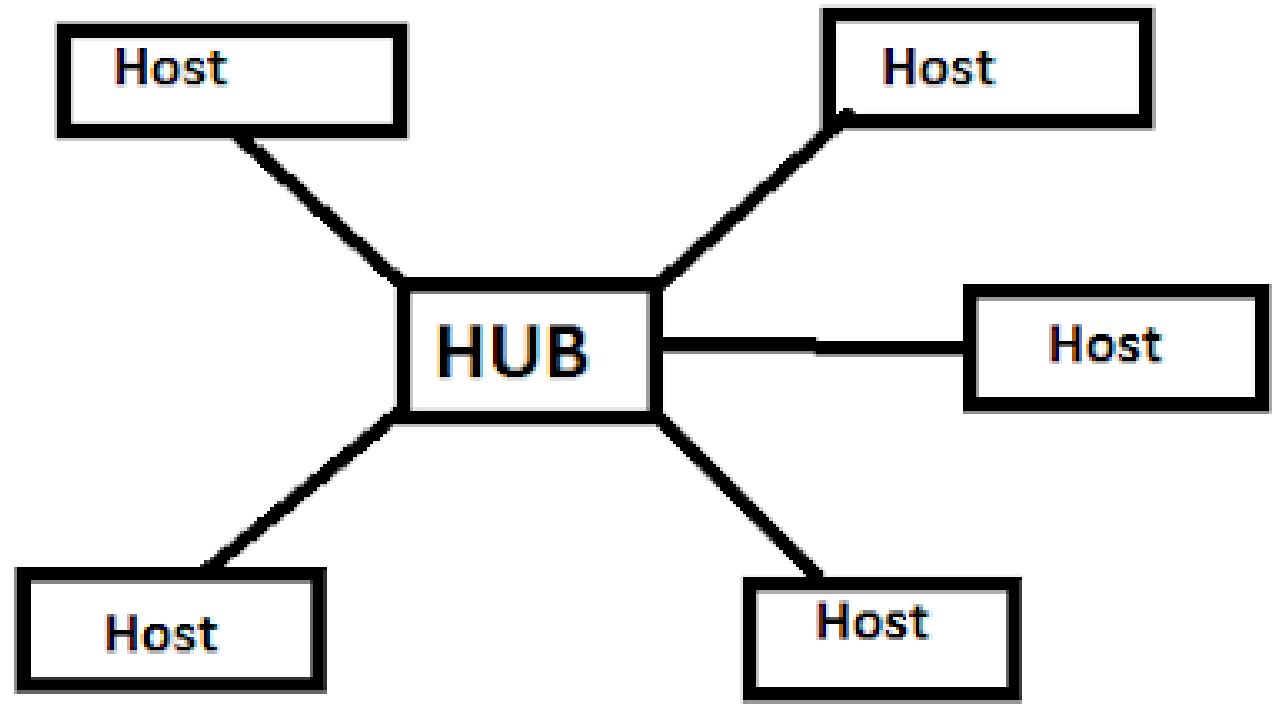
- **It is simplest way to connect multiple nodes**
- **At one time only one node can send data across the network**
- **The failure of one device does not affect the others.**



(2) Star Network Topology

In this, all the computers are connected to the central device called Hub. Node send electronics signal to the hub, and then to the remaining computers on the network.

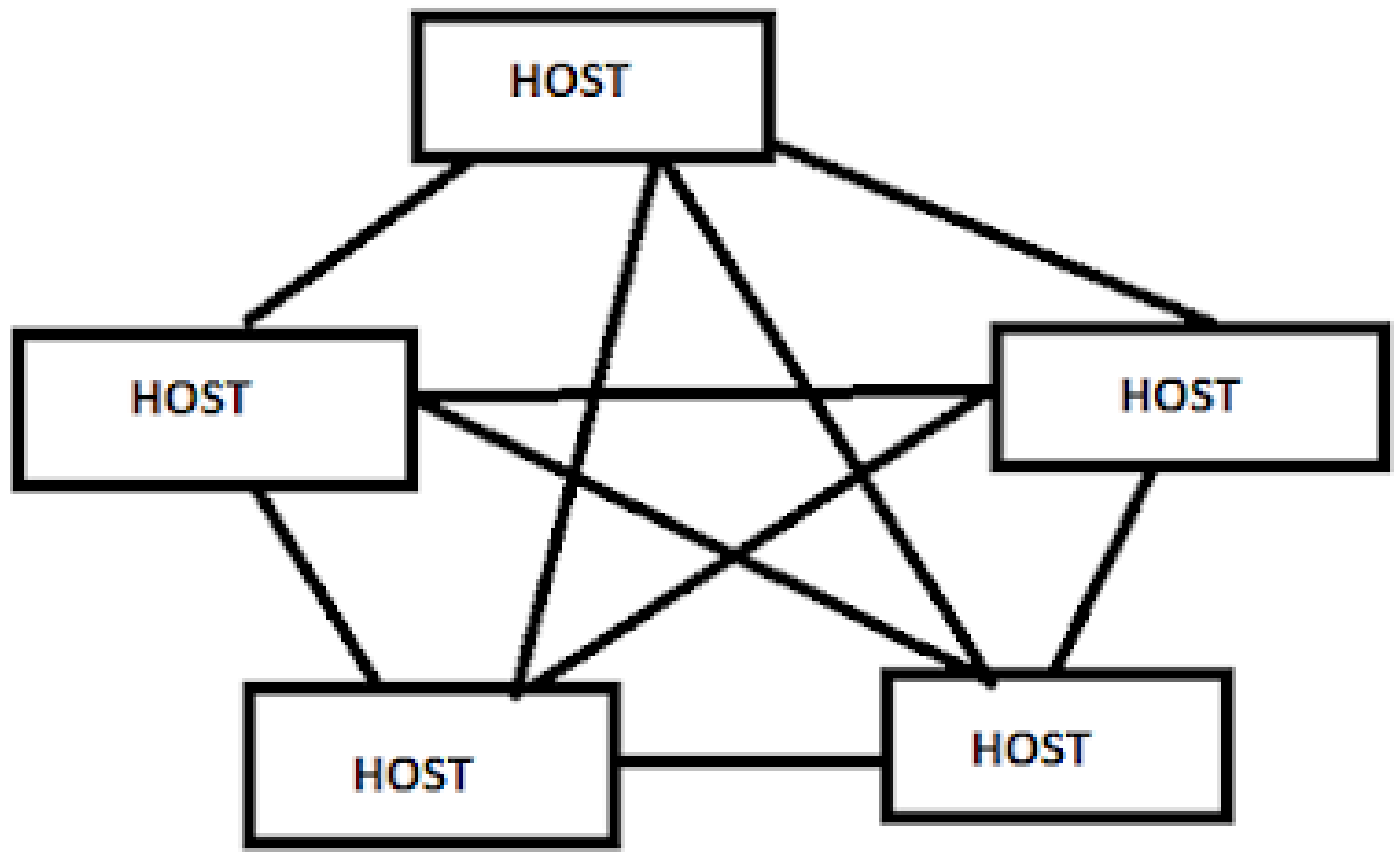
- **If Hub will fail then all other computer networks will also fail.**
- **If only one computer will fail, then it will not affect the other networks.**
- **It is not so expensive as it requires only one cable to connect more host.**



(3) Mesh Network Topology

In this, each node in the network has a connection with other node in the network.

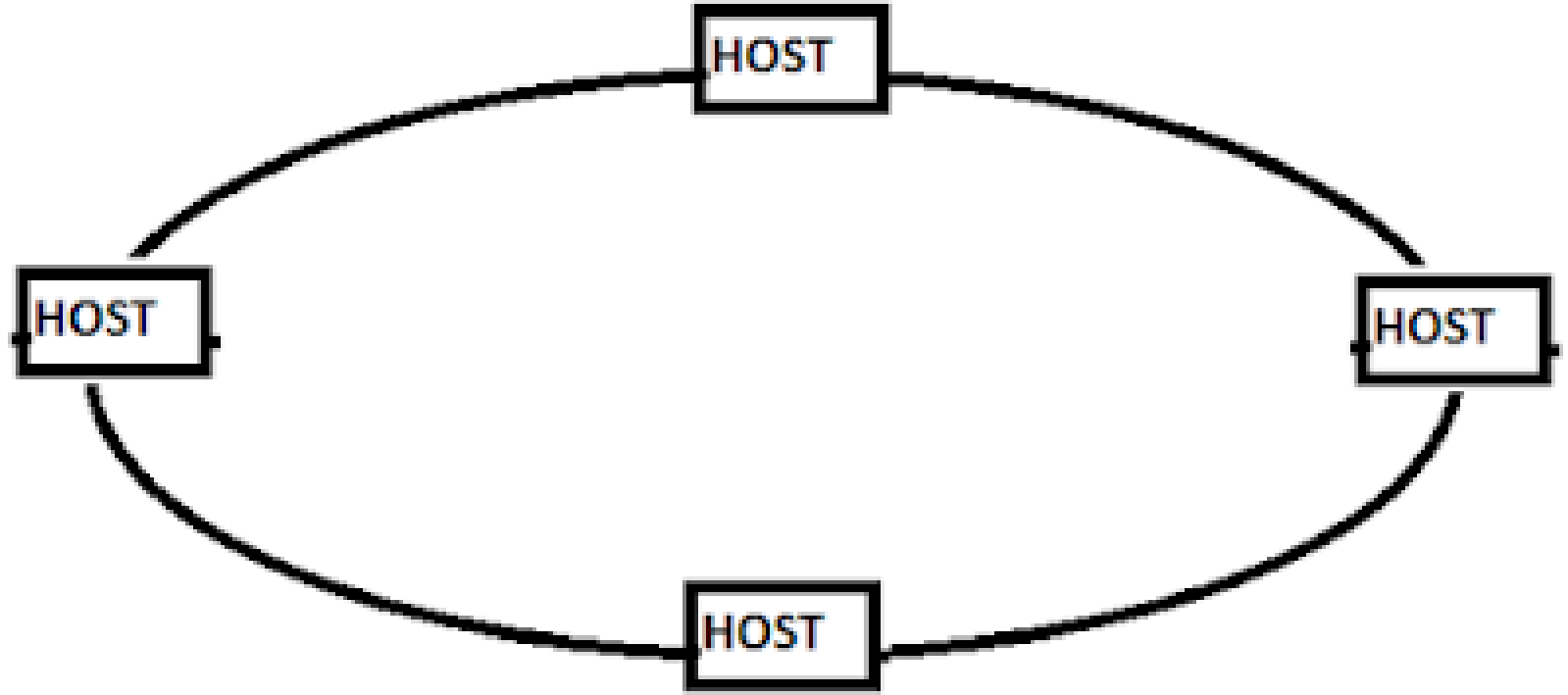
- **The cost of this network is high as it requires large amount of cables and each node require hub.**
- **It is more reliable as there is more than one path between a source and a destination in the network.**



(4) Ring Network Topology

It is a network topology each node connects to exactly two other nodes forming a single continuous pathway for signals through each node like a ring.

- **The failure of any node may result in failure of the whole ring network.**



MALWARE

- Malware is software used or created to disrupt computer operation, gather Sensitive information, or gain access to private computer systems.
- It can appear in the form of code, scripts, active content, and other software.
- 'Malware' is a general term used to refer to a variety of forms of hostile, intrusive, or annoying software.

TYPES OF MALWARE

WORMS

VIRUS

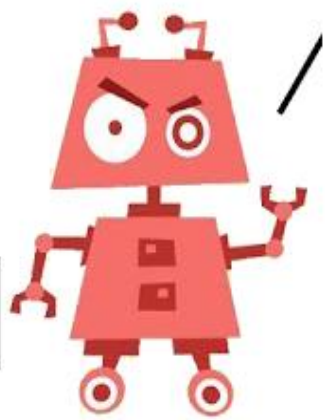
TROGAN

RANSOMWARE

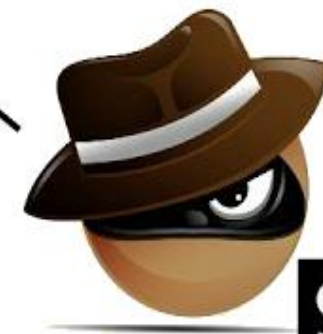
MALWARE TYPES

ADWARE

BOTS



SPAM



SPYWARE

TROJAN HORSE

- **Trojan horse is a program that acts as a malicious or harmful code. It designed to cause some malicious activity or to provide a backdoor to your system.**
- **Example - Beast, Rat, Net bus, Girlfriend etc.**

VIRUS

- **Computer viruses are small software programs that are designed to spread from one computer to another and to interfere with computer operation VIRUS Stands for “Vital Information Resource Under Seize”.**

Backdoor

- A program that allows a remote user to execute commands and tasks on your computer without your permission.
- These types of programs are typically used to launch attacks on other computers, distribute copyrighted software or media, or hack other computers

Hijackers

- A program that attempts to hijack certain Internet functions like redirecting your start page to the hijacker's own start page, redirecting search queries to a undesired search engine, or replace search results from popular search engines with their own information

WORM

- A computer worm is a standalone malware computer program that replicates itself in order to spread to other computers. Often, it uses a computer network to spread itself, relying on security failures on the target computer to access it.

Spyware

Spyware is software that aims to gather information about a person or organization without their knowledge and that may send such information to another entity without the consumer's consent, or that asserts control over a computer without the consumer's knowledge.

ADWARE

- **Adware or advertising - supported software, is any software package that automatically renders advertisements in order to generate revenue for its author. The advertisements may be in the user interface of the software or on a screen presented to the user during the installation process.**

ZOMBIE

- **Zombie programs take control of your computer and use it and its Internet connection to attack other computers or networks or to perform other criminal activities.**