Pre-security-notes "networking"

what is networking

> Networks are simply things connected together

> in computing network can be formed by anywhere from 2 devices to billions connected together

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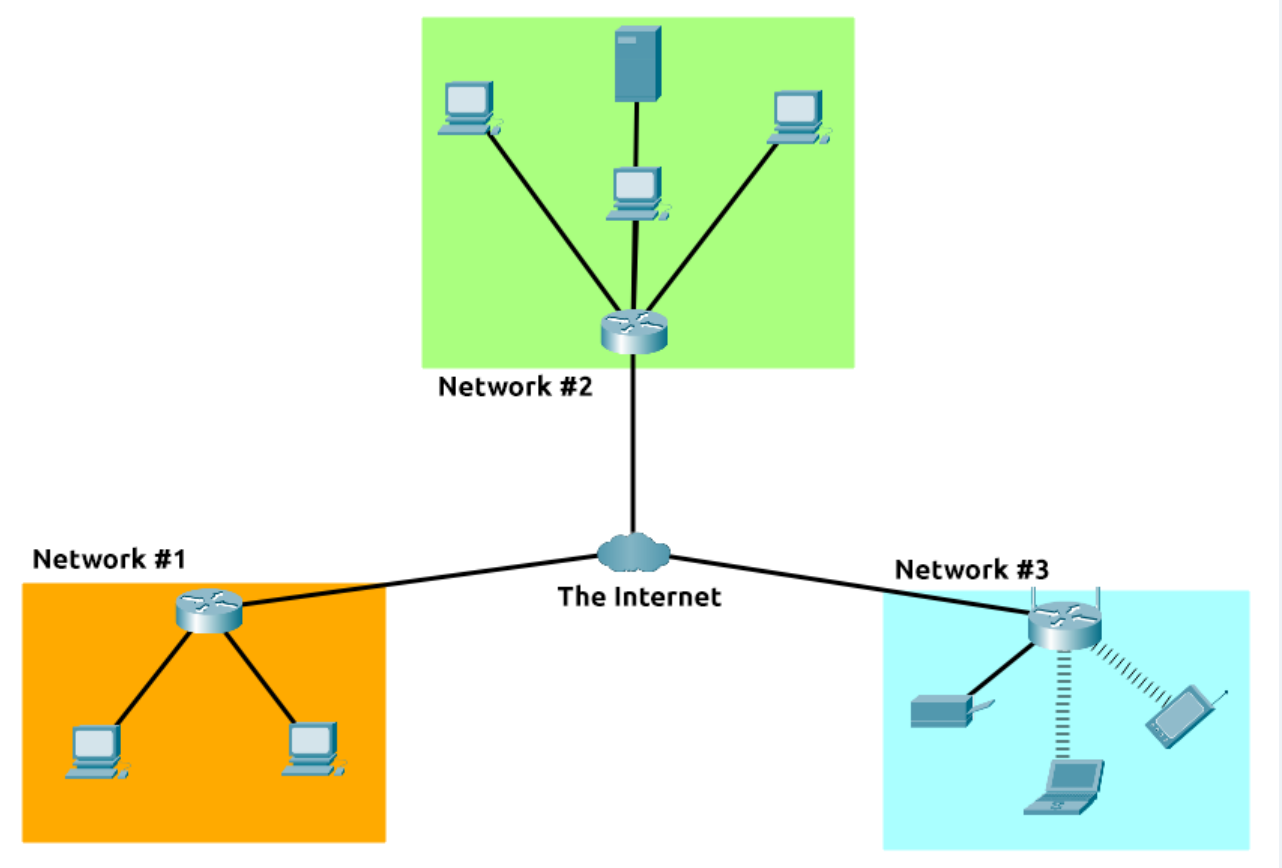
what is the internet ?

> simply a giant network that consist of many small networks

Fig



internet consist of many small netwoks

those small networks called **private networks** where networks connecting them called **public networks "internet"**

so , networks can be classified into :

- private network
- public network

identifying devices on a network

devices like humans have two things to being identified :

- name --> IP
- fingerprint --> MAC

IP address

IP address (or Internet Protocol) address can be used as a way of identifying a host on a network for a period of time

Figure

IP is a set of numbers divided into 4 pieces we call them 4 octets, IP change from device to another in the same network , it's illegal to having same IP for two different devices in the same network

to make a communicate understandable and more convenience IP Addresses follow a set of standards known as protocols. These protocols are the backbone of networking and force many devices to communicate in the same language,

A public address is used to identify the device on the Internet(public network), whereas a private address is used to identify a device among other devices in the private network

Note

if two devices in the same private network they will having a different IP address in the private network , but when go online to the internet they will communicate to the outside world with one same public IP address

that public IP address given by ISP (internet server provide) e.g. WE egypt (LOL)

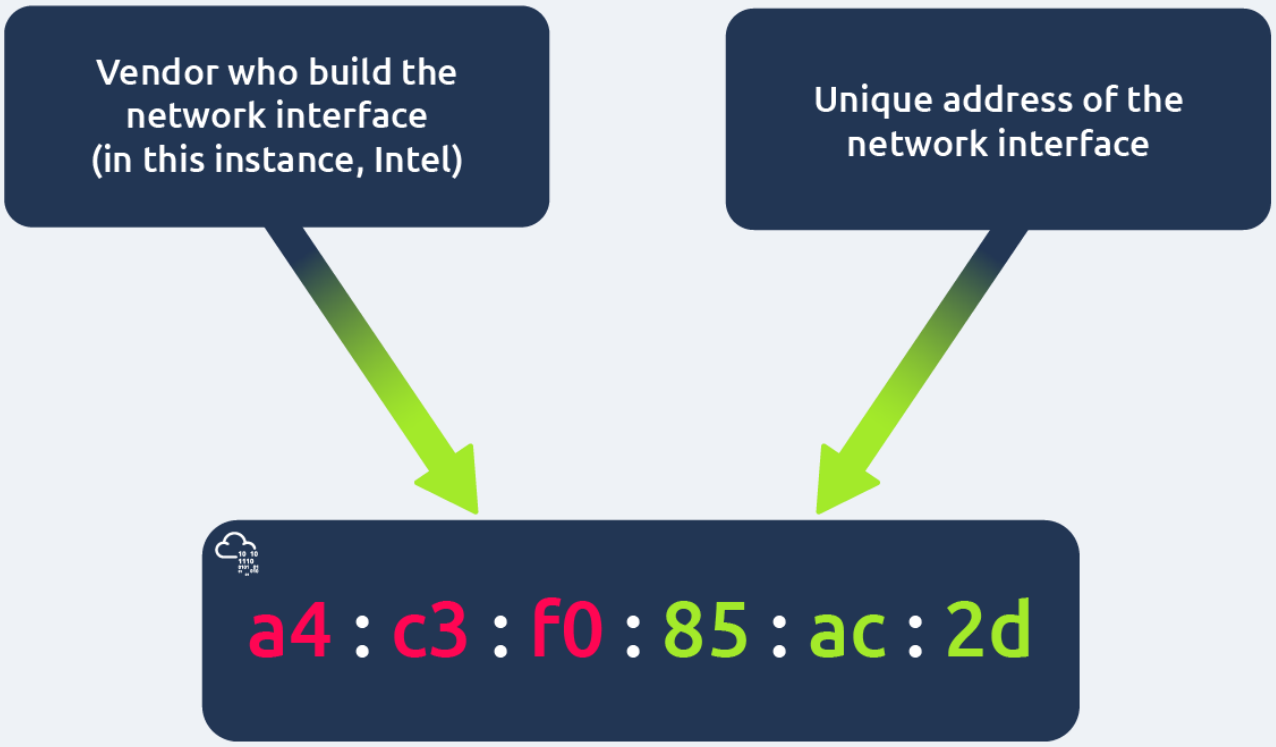
there's two types of IP versions : IPv4, IPv6
4 -> old one e.g. 86.157.52.21

6-> new one because many devices go online these days and there's no capacity in IPv4 for that e.g. 2a00:22c4:a531:c500:425f:cce6:c36b:f64d

version 6 have more IPs capacity

MAC address

Figure



devices have another address a physical one fixed address burned on NIC in the motherboard and it's **uniqe** wrote in hexadecimal

OH nooooo it's can be **spoofed** too !! "using that in hacking stuff" to make a firewall passing that MAC address

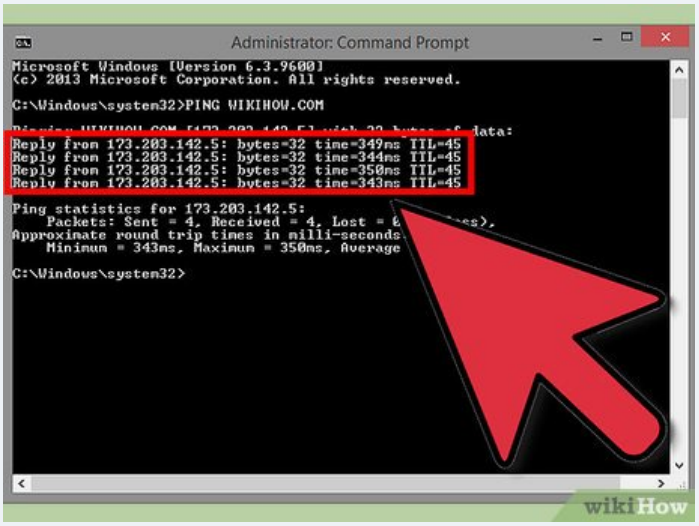
ping (ICMP)

it's a protocol send packets to check the performance of connection between two devices in the same network
the mechanism is simply the sender send a **ICMP echo packet** and waiting for **ICMP echo reply** from the target device

```
ping 192.168.1.254
```

Figure

the respond be like :



next --> intro to LAN