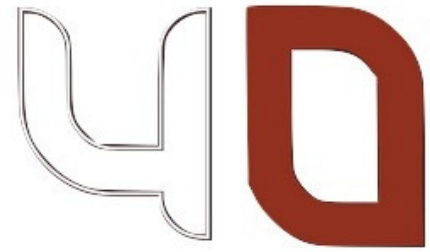

40
DAYS

Abbreviations :

IP	Internet Protocol address
DNS	Domain Name System
DHCP	Dynamic Host Configuration Protocol
SSH	Secure Shell
Nat	Network Address Translation

IP Address

WHAT IS IP ADDRESS ?

An IP address, unique number address, is an identifying number for network hardware connected to a network.

WHY WE NEED IP ADRESS ?

Having an IP address allows a device to communicate with other devices over an IP-based network like the internet.

IP VERSIONS (IPV4 VS IPV6)

IPV4	IPV6
32-bit number	128-bit number
dotted decimal notation :	Hexadecimal notation :
192.149.0.0/24	0123:4567:9801:ABCD

IP Address

Types of IP Addresses

PRIVATE IP ADDRESSES

These are used "inside" a network, like the one you probably run at home, used by things like WIFI, wireless printers, desktops, etc.

PUBLIC IP ADDRESSES

These are used on the outside of your network and are assigned by your ISP (internet service provider)

STATIC IP ADDRESSES

the static IP addresses are those types of IP address that never change once they are assigned to a device on a network.

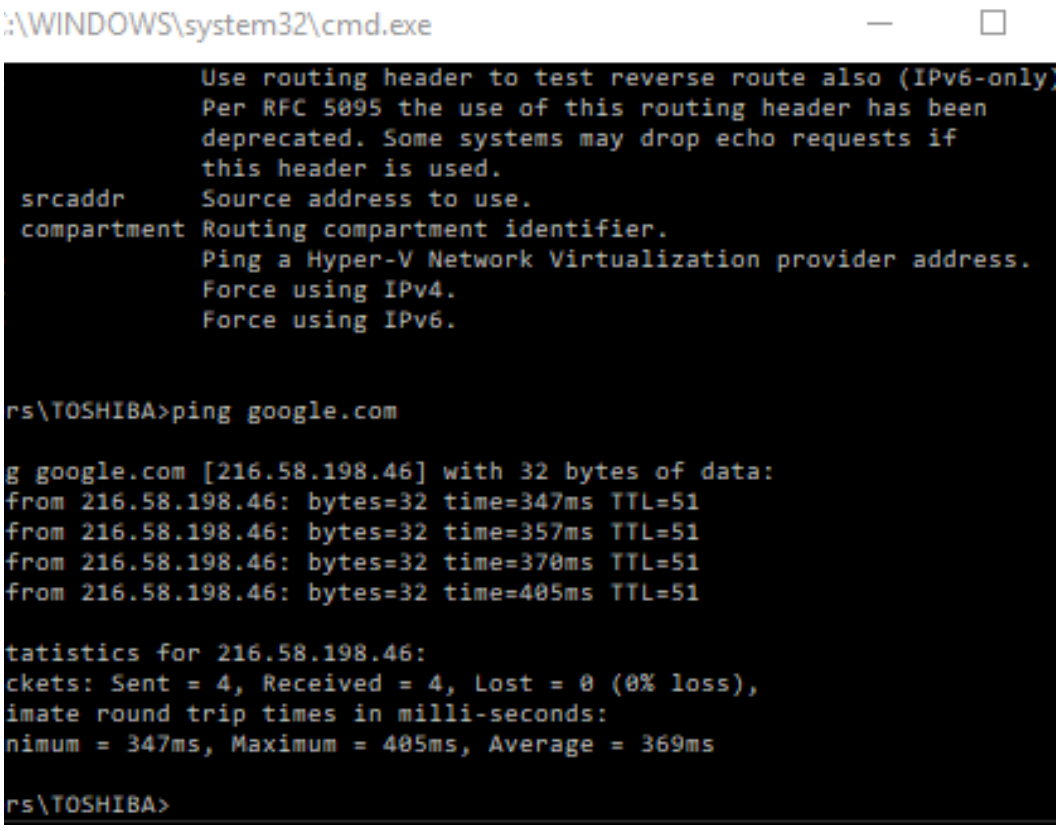
DYNAMIC IP ADDRESSES

Dynamic IP address changes each time the device logs in to a network.

Ping Command

The ping command is a network tool used to determine whether a certain IP address or host is accessible.

كيف يعمل :
يعمل أمر ping على فحص إمكانية الوصول إلى عنوان IP، مضيف أو خادوم انطلاقا من شبكتك. يكثُر استخدام الأمر للتدقيق في أخطاء الشبكة وتحديد مشاكلها. يقوم الأمر على مبدأ عمل سهل ولكنه مفيد؛ إذ يُرسِل حزم بيانات تحوي الرسالة PING إلى عنوان IP (أو المضيف) وينتظر الرد ثم يحسب الفترة الزمنية اللازمة لورود الجواب؛ يُشار لهذه المدّة بـRTT، وهي اختصار Round Trip Time أي زمن الذهاب والإياب؛ تُعرَف هذه المدة أيضا بزمن الوصول Latency.
تعود أهمية هذا الأمر لأنه يقوم باختبار وإدارة الشبكة من حيث الفحص الذاتي وتتبع الاعطال في البرامج .



طريقة التحقق من هذا الأمر

من خلال cmd
اكتب الأمر ping
متبوع بعنوان الموقع
المراد فحصه ثم
اضغط على Enter

Subnet mask

يستخدم للتواصل على الانترنت عناوين تتكون من 32 بت من النظام الثنائي اللي نقصد به IP .

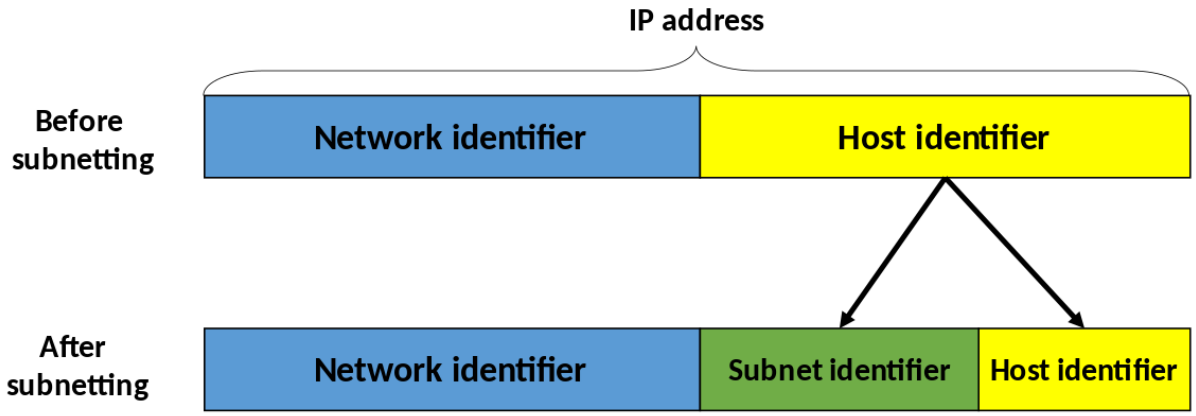
عند تعيين جهاز ما على الشبكة فإن IP بيتكون من 32 رقم جزء منها يمثل عنوان الشبكة والجزء الأخر يمثل host

نستخدم IP للوصول إلى host معين من خلال شبكة معينة .

جهاز الكمبيوتر لا يستطيع التمييز بين ip و رقم host فبالتالي نضيف 32 بت أخرى وهي مانسميها subnet mask

نستخدم subnet mask لكي نعرف كم بت لعنوان الشبكة وكم بت هو عنوان المستضيف

تتم كتابته على شكل واحدات متتالية أو أصفار متتالية subnet mask رقم 1 يمثل عنوان الشبكة و رقم 0 يمثل المستضيف .



DNS

The Domain Name Systems (DNS) is the phonebook of the Internet. Humans access information online through domain names . Web browsers interact through Internet Protocol (IP) addresses. DN S translates domain names to IP addresses so browsers can load Internet resources.

DHCP

Dynamic Host Configuration Protocol (DHCP) provides quick, automatic, and central management for the distribution of IP addresses in a network.
DHCP is also used to configure the correct subnet mask, default gateway, and DNS server information on a device.

SSH

The SSH protocol (also referred to as Secure Shell) is a method for secure remote login from one computer to another. It provides several alternative options for strong authentication, and it protects the communications security and integrity with strong encryption.

Is it dangerous ? NO

NAT

is the process where a network device, usually a firewall, assigns a public address to a computer (or group of computers) inside a private network. The main use of NAT is to limit the number of public IP addresses an organization or company must use, for both economy and security purposes.

NAT is a very important aspect of firewall security. It conserves the number of public addresses used within an organization, and it allows for stricter control of access to resources on both sides of the firewall.

Web server

A Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their computers' HTTP clients. Dedicated computers and appliances may be referred to as Web servers as well.

Web server

How dose it work ?
1- Obtaining the IP Address from domain name.

2- Browser requests the full URL : After knowing the IP Address, the browser now demands a full URL from the web server.
3- Web server responds to request: The web server responds to the browser by sending the desired pages, and in case, the pages do not exist or some other error occurs, it will send the appropriate error message.

4- Browser displays the web page: The Browser finally gets the web pages and displays it, or displays the error message.

Examples of famous web servers?

- Apache HTTP Server
- Microsoft Internet Information Service

What is load balancing ?

Load balancing helps make networks more efficient. It distributes the processing and traffic evenly across a network, making sure no single device is overwhelmed.