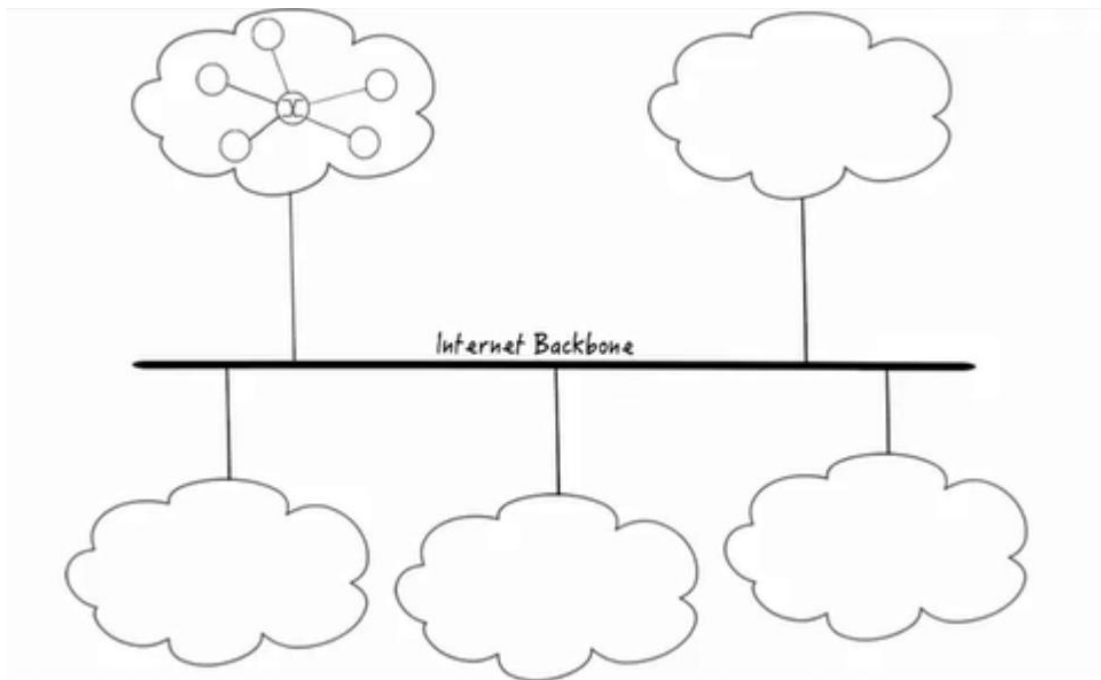


## Introduction

What happens if you type in your browser address bar `www.google.com`?

1. ISP will query about the IP address of the given domain name from the DNS attached to it (Domain Name Server).
2. DNS will match the given domain name to an IP address and returned back to the sender.
3. the message will be created and forward it using the source IP address and destination IP address (which is google server in our case) over the internet network through several routers.
4. the web server (google web server) will generate a response message containing the file requested (which could be `index.html` or any other file name) and send it to the sender.
5. the sender will render the file in HTML format and present it to the user.



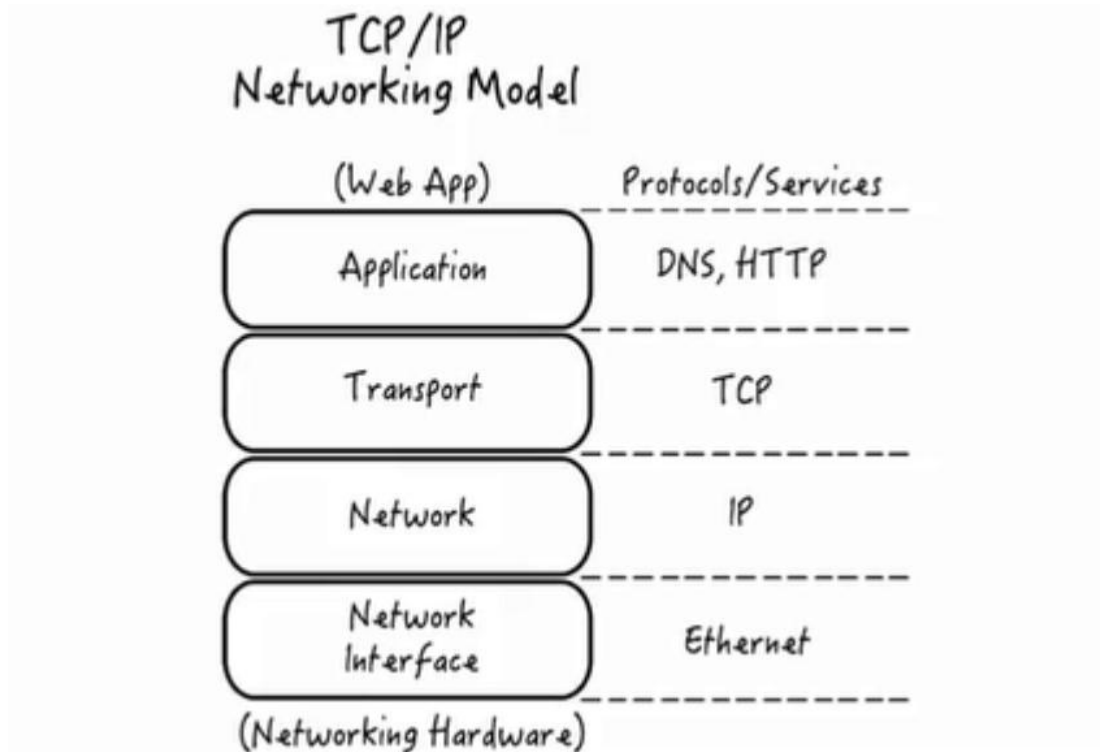
### TCP/IP Networking Model

TCP/IP networking model is a layered taxonomy of data communications protocols. The name TCP/IP refers to two of the most important protocols within the suite: TCP (Transmission Control Protocol) and IP (Internet Protocol), but the suite is comprised of many other significant protocols and services.

لكن المجموعة تتكون من العديد من البروتوكولات والخدمات الهامة الأخرى.

The protocol layers associated with TCP/IP (above the 'layer' of physical interconnection) are:

1. the Network Interface layer,
2. the Internet layer,
3. the Transport layer, and
4. the Application layer.



**The Network Interface layer:** is the layer responsible for the lowest level of data transmission within TCP/IP, facilitating communication with the underlying physical network.

تسهيل التواصل مع الشبكة المادية الأساسية.

**The Internet layer :** provides the mechanisms for intersystem communications, controlling message routing, validity checking, and message header composition/decomposition. The protocol known as IP (Internet Protocol) operates on this layer, as does ICMP (the Internet Control Message Protocol). ICMP handles the transmission of control and error messages between systems. Ping is an Internet service that operates through ICMP.

بروتوكول رسائل التحكم ICMP كما يفعل  
الرسائل بين الأنظمة في الإنترنت.

**The Transport layer:** provides message transport services between applications running on remote systems. This is the layer in which TCP (the Transmission Control Protocol) operates. TCP provides reliable, connection-oriented message transport. Most of the well-known Internet services make use of TCP as their foundation. However, some services that do not require the reliability (and overhead) associated with TCP make use of UDP (which stands for User

طبقة الإنترنت  
توفر آليات

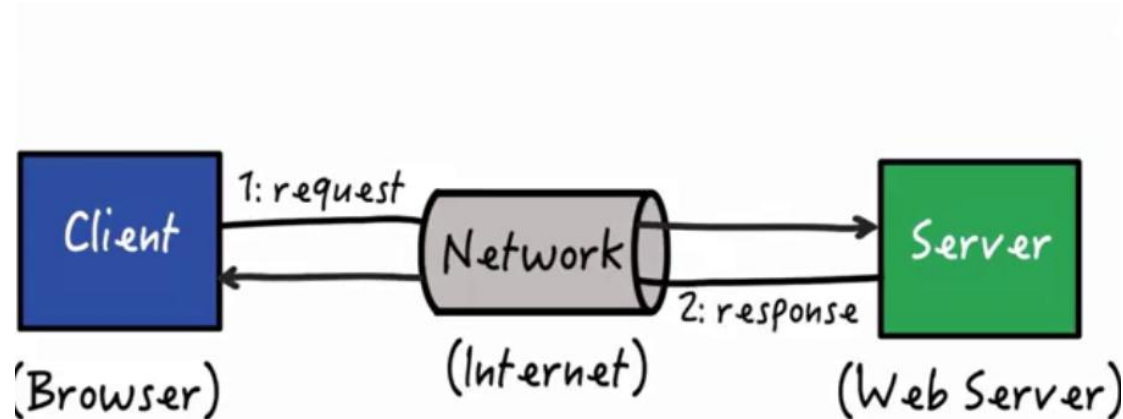
Datagram Protocol). For instance, streaming audio and video services would gladly sacrifice a few lost packets to get faster performance out of their data streams, so these services often operate over UDP, which trades reliability for performance.

*The Application layer*: is the highest level within the TCP/IP protocol stack. It is within this layer that most of the services we associate with 'the Internet' operate. This is the layer which HTTP and DNS protocols operate, we will talk about them next lecture.

## Web Applications

تطبيق الويب هو تطبيق خادم عميل يستخدم (بشكل عام) متصفح الويب كعميل له.

A Web application is a client-server application that (generally) uses the Web browser as its client. Browsers send requests to servers, and the servers generate responses and return them to the browsers. They differ from older client-server applications because they make use of a common client program, namely the Web browser



There are important advantages to using Web browsers as clients:

متصفحات الويب منتشرة في كل مكان.

1. Web browsers are ubiquitous. They are present on virtually every desktop and can be used to interact with many different Web applications. There is no need to install several specialized client programs on the desktop, dramatically reducing maintenance headaches.

تقليل صدادع الصيانة بشكل كبير.

2. Browsers provide mechanisms to securely download and execute more complex clients (e.g. applets, ActiveX components, and Flash movie players) when additional functionality that browsers alone cannot provide is required

WWW (Web) is a system of interlinked documents (web pages) accessed via the internet using the HTTP. WWW operates on top of the internet and uses HTTP protocol.

Web pages contain hypermedia (graphic, text, image, video) along with hyperlinks to other web pages and hyperlinks gives the web its structure.

Web application is built on top of the WWW and WWW is built on top of the internet.

## Advantages of web applications:

انتشار وراحة استخدام متصفح الويب كعميل يعمل على أي جهاز: سطح مكتب وجهاز لوحي وهاتف.

1. Ubiquity and convenience of using a web browser as client running on ever device: desktop, tablet and a phone.

2. Update and maintain web applications without installing software on thousands of client computers.

3. Reduction in IT cost. تخفيض تكلفة تكنولوجيا المعلومات.

**Disadvantages:**

1. Privacy/security issues associated with data on web application.

2. web applications are difficult to develop and debug from programmer's perspective as the programmer must have a knowledge of many things such as: HTML, Java script or any programming language.