WEB DESIGN INTRO

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Contents

1. Introduction

Web design is a Web development process for creating a website that focuses on **aesthetic factors** like <u>layout</u>, <u>user interface</u> and <u>other visual imagery</u> in order to make the website more visually appealing and easy to use. Web design makes use of various programs and tools in order to achieve the intended look, such as **Dreamweaver**, **Photoshop** and **many others**. In order to create a winning design, Web designers need to think about <u>their audience</u>, the <u>purpose of the website</u> and the <u>visual appeal of the design</u>.

2. History

Tim Berners-Lee, a <u>British scientist</u>, invented the World Wide Web (WWW) in <u>1989</u>, while working at <u>CERN</u>. The Web was originally conceived and developed to meet the demand for **automated information sharing** between <u>scientists in universities</u> and <u>institutes around the world</u>.

info.cern.ch was the address of the world's <u>first website and Web server</u>, running on a NeXT computer at CERN. The first Web page address was:

http://info.cern.ch/hypertext/WWW/TheProject.html

This page contained <u>links to information about the WWW project</u> itself, including a <u>description of hypertext</u>, technical <u>details for creating a Web server</u>, and <u>links to other Web servers</u> as they became available.

Thanks to the efforts of **Paul Kunz** and **Louise Addis**, the <u>first Web server</u> in the US came online in **December 1991**, once again in a particle physics laboratory: the **Stanford Linear Accelerator Center (SLAC) in California.**

3. What is world Wide Web?

The Web, or World Wide Web (W3), is basically a **system of Internet servers** that support specially **formatted documents**. The documents are formatted in a **markup language called HTML (HyperText Markup Language)** that supports <u>links</u> to <u>other documents</u>, as well as <u>graphics</u>, <u>audio</u>, and <u>video</u> files.

This means you can **jump from one document to another** simply by **clicking on hot spots**. <u>Not all Internet servers are part of the World Wide Web</u>.

There are several applications called **Web browsers** that make it easy to <u>access the World Wide Web</u>; Two of the most popular being **Firefox** and **Microsoft's Internet Explorer**.

4. How web Works?

This part provides a simplified view of what happens when you view a webpage in a web browser on your computer or phone.

4.1. Client and Server

Computers connected to the web are called **Clients** and **Servers**. A simplified diagram of how they interact might look like this:
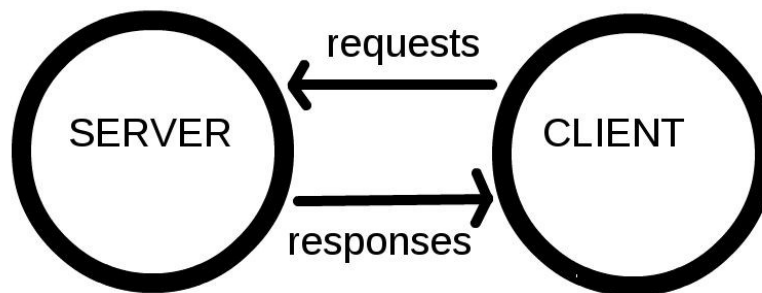

Picture1. Server and Client

- **Clients**: Typical web user's internet-connected devices (for example, your computer connected to your Wi-Fi, or your phone connected to your mobile network) and web-accessing software available on those devices (usually a web browser like Firefox).

- **Servers:** Computers that store webpages, sites, or apps. When a client device wants to access a webpage, a copy of the webpage is downloaded from the server onto the client machine to be displayed in the user's web browser.

- **Internet connection**: Allows you to send and receive data on the web. It's basically like the street between your house and the shop.

- **TCP**/**IP**: Transmission Control Protocol and Internet Protocol are communication protocols that define how data should travel across the web. This is like the transport mechanisms that let you place an order, go to the shop, and buy your goods. In our example, this is like a car or a bike (or however else you might get around).

- **DNS**: Domain Name Servers are like an address book for websites. When you type a web address in your browser, the browser looks at the DNS to find the website's real address before it can retrieve the website. The browser needs to find out which server the website lives on, so it can send HTTP messages to the right place (see below). This is like looking up the address of the shop so you can access it.

- **HTTP**: Hypertext Transfer Protocol is an application protocol that defines a language for clients and servers to speak to each other. This is like the language you use to order your goods.

- **Component files**: A website is made up of many different files, which are like the different parts of the goods you buy from the shop. These files come in two main types:
  - Code files: Websites are built primarily from HTML, CSS, and JavaScript, though you'll meet other technologies a bit later.
  - Assets: This is a collective name for all the other stuff that makes up a website, such as images, music, video, Word documents, and PDFs.

4.2. What happens, exactly?

When you type a web address into your browser (for our analogy that is like walking to the shop):
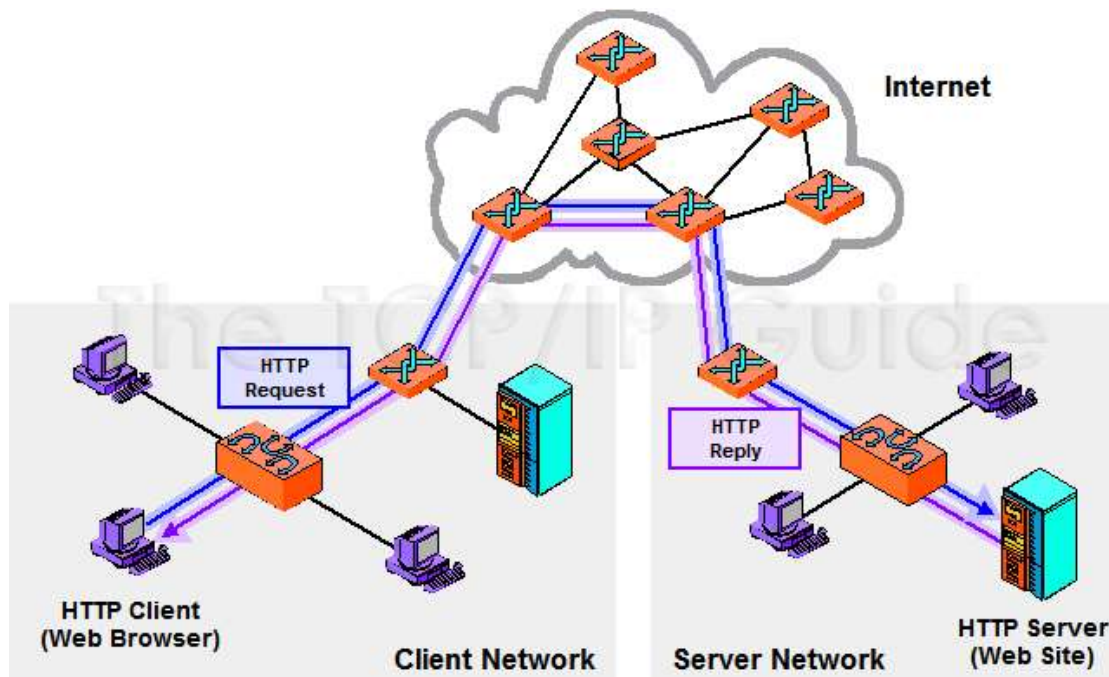
Picture 2. How Internet works

1. The browser goes to the DNS server, and finds the real address of the server that the website lives on (you find the address of the shop).

2. The browser sends an HTTP request message to the server, asking it to send a copy of the website to the client (you go to the shop and order your goods). This message, and all other data sent between the client and the server, is sent across your internet connection using TCP/IP.

3. If the server approves the client's request, the server sends the client a "200 OK" message, which means "Of course you can look at that website! Here it is", and then starts sending the website's files to the browser as a series of small chunks called **data packets** (the shop gives you your goods, and you bring them back to your house).

4. The <u>browser assembles the small chunks into a complete website</u> and displays it to you (the goods arrive at your door — new shiny stuff, awesome!).

5. TCP

TCP (<u>Transmission Control Protocol</u>) is a <u>standard that defines how to establish and maintain a network conversation</u> through which application programs can exchange data. **TCP** works with the <u>Internet Protocol (IP)</u>, which defines how computers send packets of data to each other (**TCP/IP**).

6. Packet

A data packet is a <u>unit of data</u>, which is transmitted through the Internet. This is wh<u>at the Internet Protocol (IP) uses</u>. Heavy networks data will also use the concept of a data packet to transmit information.
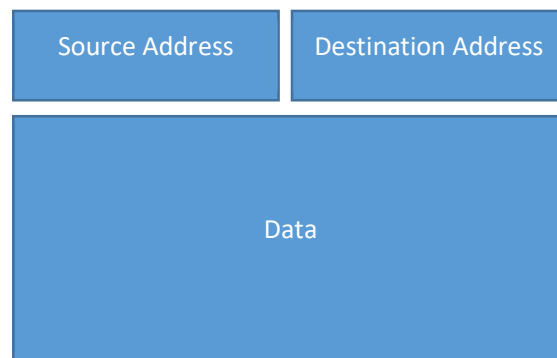
*Picture 3. Internet Packet*

7. IP, Port, Socket

Here we introduce some essential concepts about IP, Port and the combination of them.

7.1. IP

<u>On a TCP/IP network</u>, <u>every device must have an IP address</u>. The <u>IP address identifies the device e.g. computer</u>.

The "**IP**" stands for "<u>Internet Protocol</u>." The "**address**" part refers to a <u>unique number that gets linked to all online activity you do</u>, somewhat like a return address on a letter you'd send out.

When <u>you are connected to Internet</u>, for send and receive email, do shopping or chat, <u>your request has to be sent out to the right destination</u>, and the respo<u>nses and information you want need to come back directly to you</u>. As it is shown, this <u>request send out in format of a packet</u>, with <u>source Address</u> and <u>Destination Address</u>. These both addresses are at the type of **IP**.
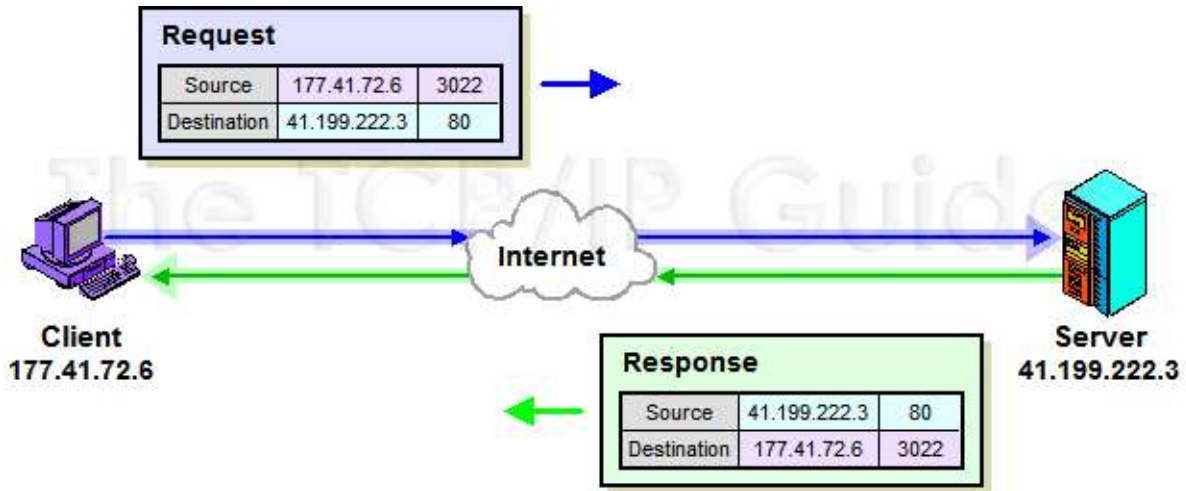
Picture 4. Sending and Receiving Data throw Internet using IP

IPv4 uses 32-bit addresses which limits the address space to 4294967296 (2^{32}) addresses.
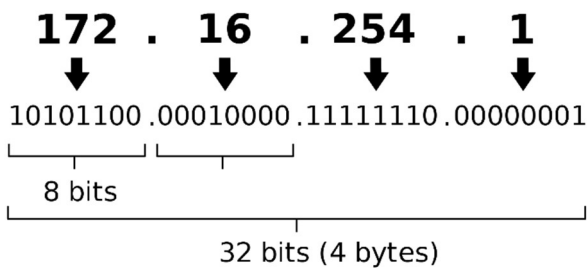
IPv6 is the successor to the first addressing infrastructure of the Internet, Internet Protocol version 4 (IPv4). In contrast to IPv4, which defined an IP address as a 32-bit value, IPv6 addresses have a size of 128 bits. Therefore, IPv6 has a vastly enlarged address space compared to IPv4.

7.2. PORT

IP address alone is not sufficient for running network applications, as a computer can run multiple applications and/or services.

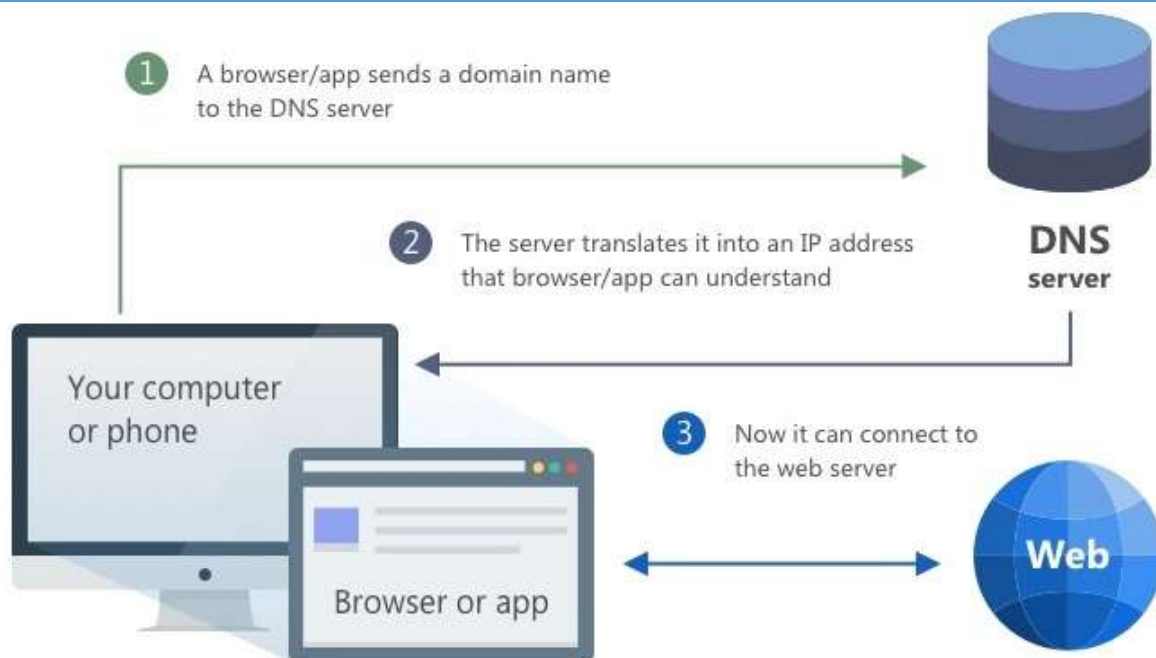Just as the IP address identifies the computer, the network **port** identifies the application or service running on the computer. They range is **0 to 65535**. Some of them are reserved such as: **80 for Web** and **21 for FTP**.The combination of **IP:Port** is known as **Socket**.
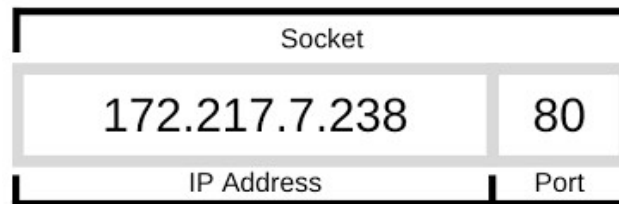
Picture 5. IP, Port, Socket

8. DNS Server

Picture 6. DNS Server

Also known as **Name Server**, **Nameserver**, or **Domain Name System Server** is a computer server that contains a database of **public IP addresses** and their **associated hostnames**, and in most cases serves to resolve, or translate those names to IP addresses as requested. DNS servers run special software and communicate with each other using special protocols.

It is easier to remember a domain or hostname like lifewire.com than it is to remember the site's IP address numbers 151.101.129.121.

Domain Name	IP
www.google.co.uk	209.85.229.104
www.bbc.co.uk	212.58.246.90
uk.msn.com	213.199.164.110
www.virginmedia.com	212.250.162.12
www.facebook.com	69.63.181.12

Picture. 7: Domain Name Table

8.1. URL

URL stands for **Uniform Resource Locator** and is used to specify addresses on the World Wide Web. A URL is the fundamental network identification for any resource connected to the web (e.g., hypertext pages, images, and sound files).
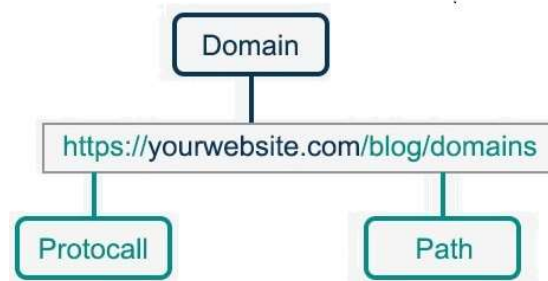
Picture 8. URL Separation

9. What is required to run a website?

There are some requirements for running a website in suitable way. One is **Software** and one is **Hardware**. In addition, there are some requirement you should by or provide from **Web Hosting Company**.

9.1. Software Requirements
- **Operating System** – Windows Server or Linux
- **Web Servers** – IIS or Apache Server

9.2. Hardware Requirements
- **Computer** - with sufficient memory and Hard disk space

9.3. Hosting Requirements

- **Domain**: Domain names are used to <u>identify one or more IP addresses</u>. For example, the domain name microsoft.com represents about <u>a dozen IP addresses</u>. Domain names are used in URLs to identify particular Web pages. For example, in the URL http://www.pcwebopedia.com/index.html, the domain name is pcwebopedia.com.

- **Host**: The <u>system that contains the data</u> is called the host. In the case of a Web server, it means that they <u>provide the hardware, software, and communications lines</u> required by the server, but the <u>content</u> on the server may be <u>controlled by someone else</u>.

10. What are Front-End and Back-end?

10.1. Back-end:

The <u>back end</u> refers to <u>parts of a computer application</u> or a <u>program's code</u> that allow it to operate and that <u>cannot be accessed by a user</u>. <u>Most data</u> and <u>operating syntax</u> are stored and accessed in the <u>back end of a computer</u> <u>system</u>. Typically, the code is comprised of one or more programming languages. The back end is also called the <u>data access</u> layer of software or hardware and includes any functionality that needs to be accessed and navigated to by digital means.

10.2. Front-end:

The <u>layer above the back end</u> is the front end and it includes <u>all software or hardware that is part of a user interface</u>. Human or digital users interact directly with various aspects of the front end of a program, including <u>user-entered data, buttons, programs, websites and other features</u>. Most of these features are designed by <u>user experience (UX) professionals</u> to be accessible, pleasant and easy to use.

A <u>back-end application or program</u> **supports** <u>front-end user services</u>, and interfaces with any required resources. <u>The back-end application may interact directly with the front end</u> or <u>it may be called from an intermediate program</u> that mediates front-end and back-end activities.

11. What is a sitemap?

A site map is a model of a website's content designed to help both users and search engines navigate the site. A site map can be a hierarchical list of pages (with links) organized by topic, an organization chart, or an XML document that provides instructions to search engine crawl bots.
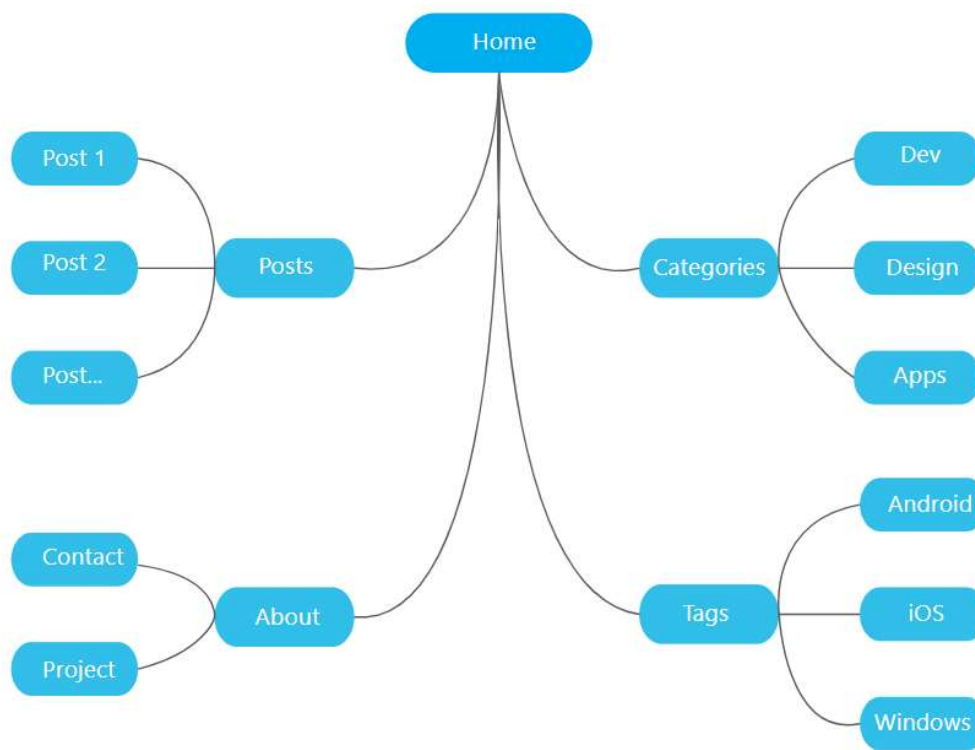
Example1. A sitemap

http://MyDomain.com/index.html
http://MyDomain.com/educations.html
http://MyDomain.com/publications.html
http://MyDomain.com/projects.html
http://MyDomain.com/paintings.html
http://MyDomain.com/webdesign.html
http://MyDomain.com/IQ.html
http://MyDomain.com/sitemap.html
http://MyDomain.com/photoblog/index.php
http://MyDomain.com/fa/index.html
http://MyDomain.com/fa/educations.html
http://MyDomain.com/fa/publications.html
http://MyDomain.com/fa/projects.html
http://MyDomain.com/fa/paintings.html
http://MyDomain.com/fa/webdesign.html

12. What are included in a website?

In a website folder, there should have an Index.XXX or Default.XXX as the entry point of a website. When you type the domain name of a website, after some processes, web hosting servers looks for these two files and send this page as the response of user request. So your website must have one of these pages entry point and all pages must have a path to this page if you want to have a standard website (except some hidden or configuration files).

Example.2: Website files, folders and its hierarchies
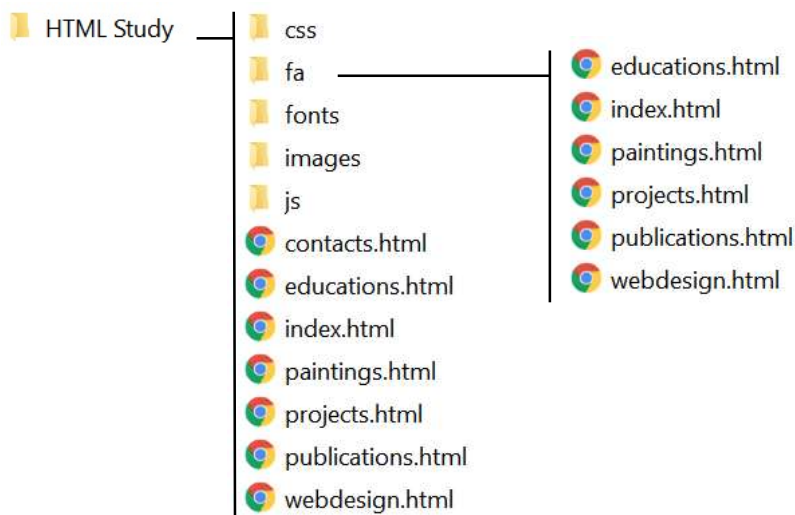
13. What is the next step after designing a website?

After testing a website ad check if everything is OK, you should upload the file into web hosting folder. Web Host server company usually make a dedicated disk space for you after payment. This is where you can do you stuff, build your homepage or a blog inside.

As usual, web-hosting company **provide** you at least one username and password, for ftp access of your website. By using them, you can get helpof some ftp utilities and applications for uploading your website.