

## ASSIGNMENT 1 FRONT SHEET



<b>Qualification</b>	<b>BTEC Level 5 HND Diploma in Computing</b>		
<b>Unit number and title</b>	10: Website Design & Development		
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### Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

	<b>Student's signature</b>	Tai
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### Grading grid

P1	P2	P3	P4	M1	M2	M3	D1

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<b>Grade:</b>	<b>Assessor Signature:</b>	<b>Date:</b>
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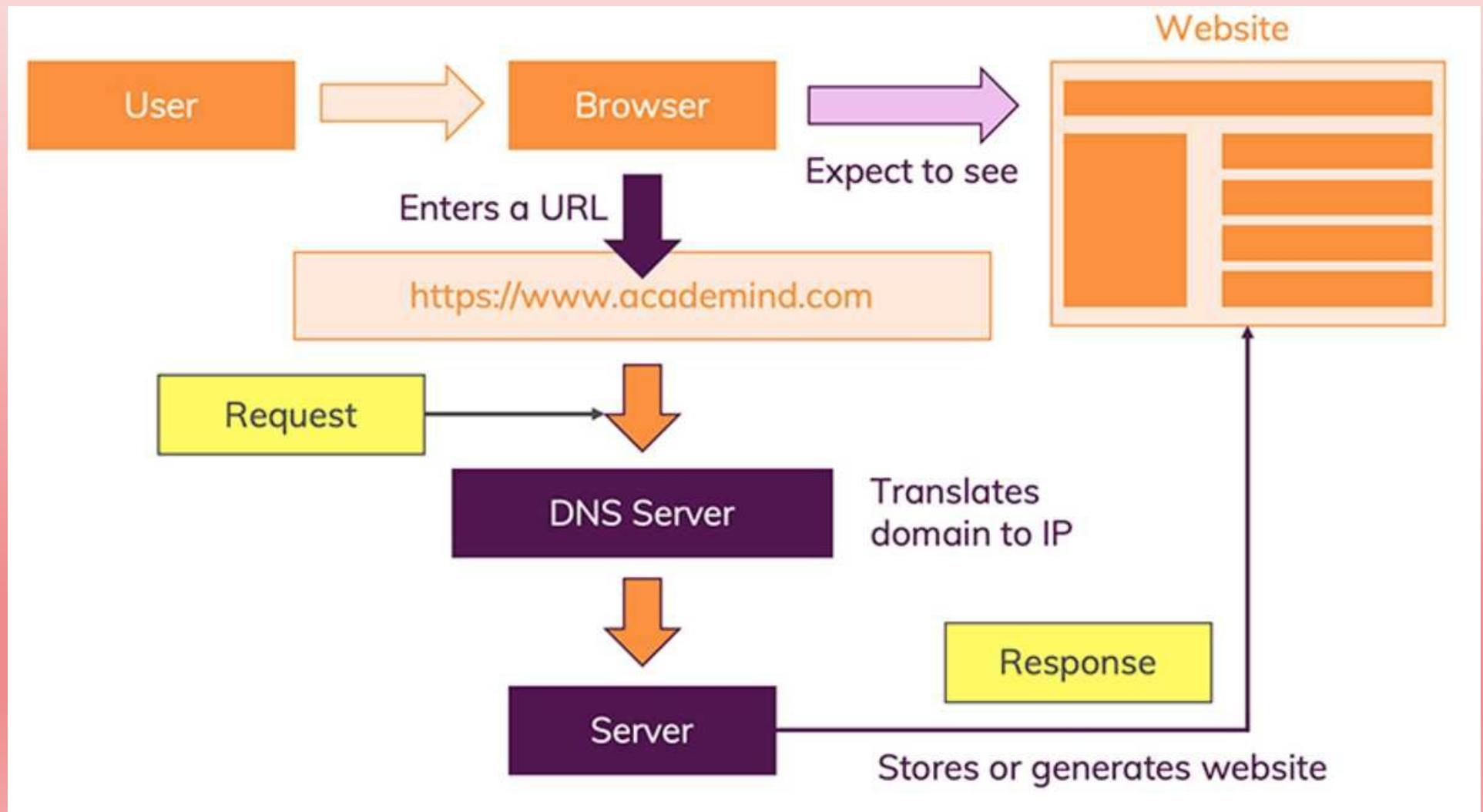


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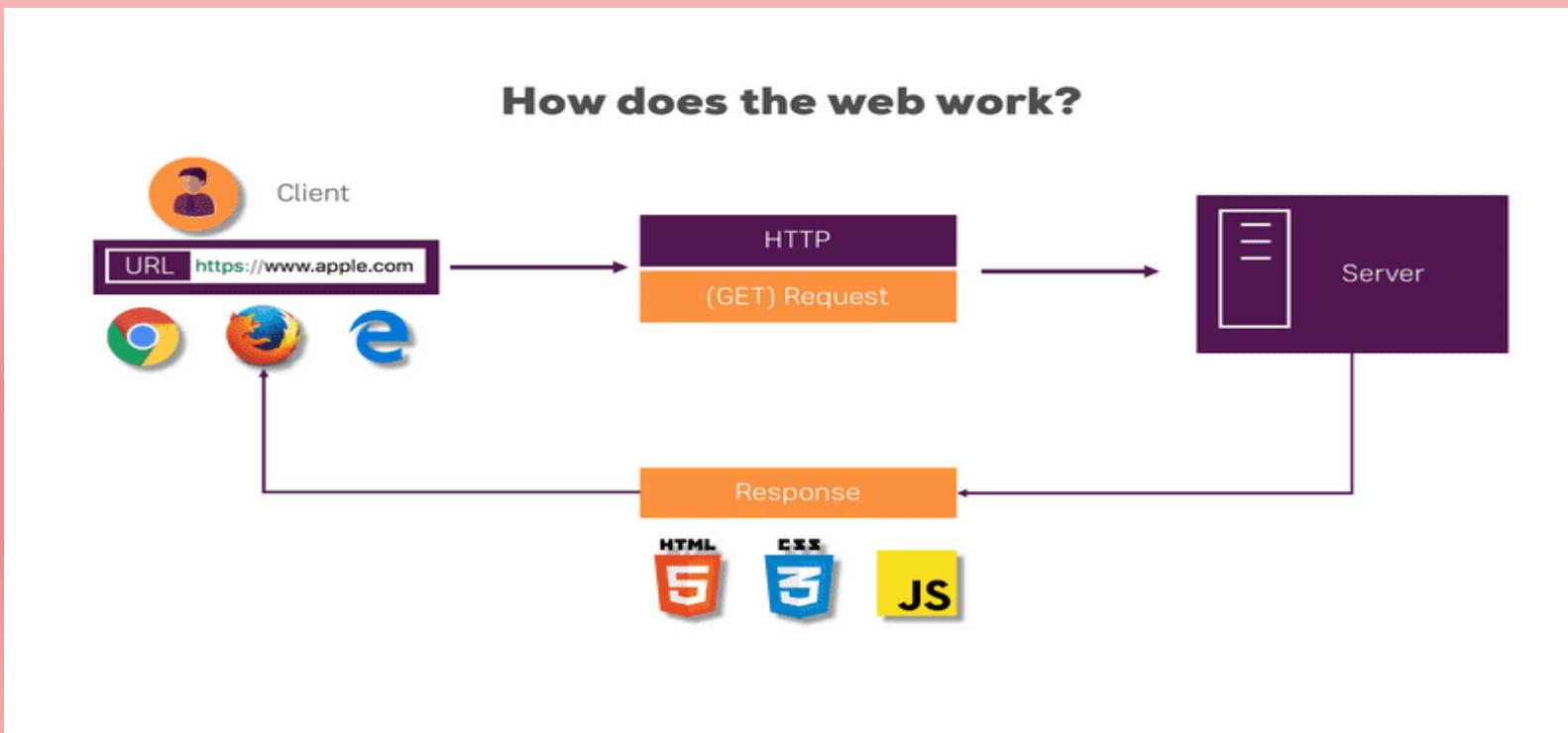
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# Web mechanism



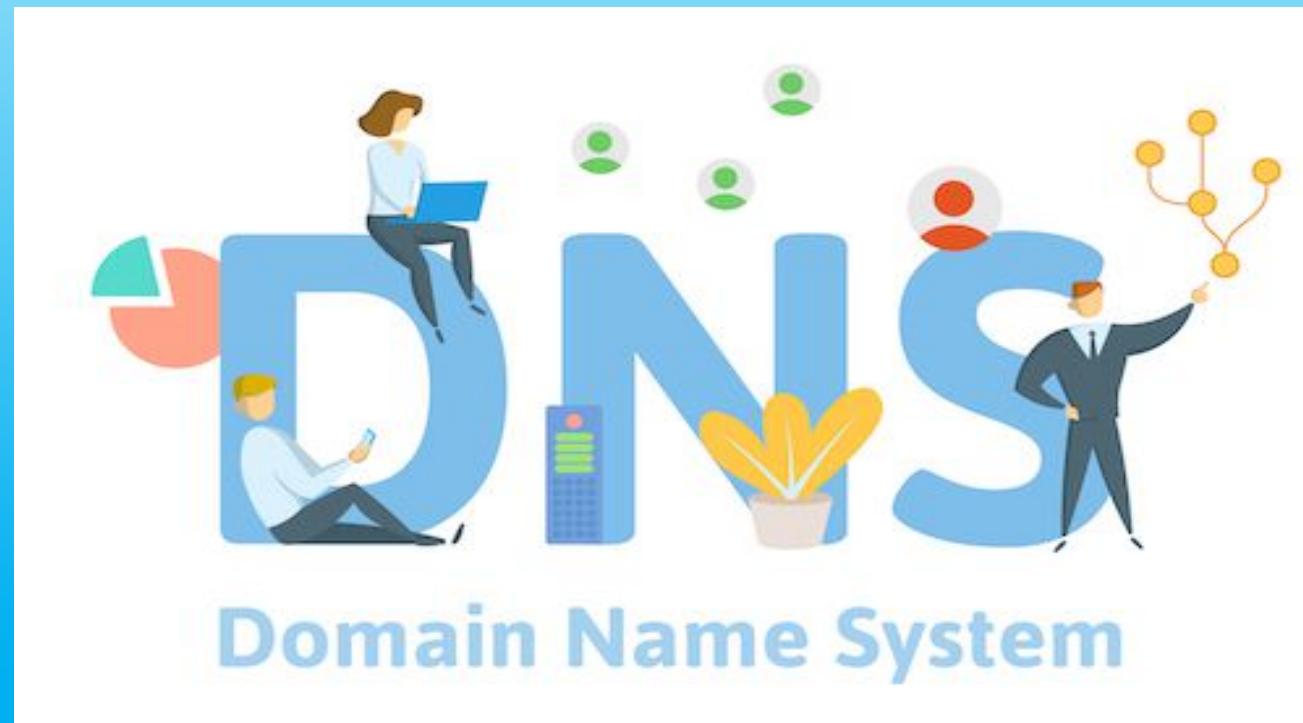
# How web works

- The computers that make up the Internet, “serve up” documents upon request are known as servers. More accurately, the server is the software (not the computer itself) that allows the computer to communicate with other computers.
- The role of server software is to wait for a request for information, then retrieve and send that information back as quickly as possible.
- In order for a computer to be part of the Web, it must be running special web server software that allows it to handle Hypertext Transfer Protocol transactions. Web servers are also called “HTTP servers.”



# 1. Introduction of DNS

The Domain Name System (DNS) is a central part of the internet, providing a way to match names (a website you're seeking) to numbers (the address for the website). Anything connected to the internet - laptops, tablets, mobile phones, websites - has an Internet Protocol (IP) address made up of numbers. Your favorite website might have an IP address like 64.202.189.170, but this is obviously not easy to remember. However a domain name such as bestdomainnameever.com is something people can recognize and remember. DNS syncs up domain names with IP addresses enabling humans to use memorable domain names while computers on the internet can use IP addresses.



# DNS

DNS, the abbreviation for Domain Name System, is a computer and network service naming system in form of domain hierarchy. DNS is designed for TCP/IP network to query for Internet domain names (e.g., www.xxxx.com) and translate them into IP addresses (e.g., 10.1.1.1) to locate related computers and services.

DNS provides the following functions:

- Server: Configures DNS servers and default domain names for the security appliance.
- Proxy: The security appliance acts as a DNS proxy server and provides proxy service for the connected PCs and other clients. Besides, the security appliance can also choose different DNS servers according to domain names.
- Resolver: Sets retry times and timeout for DNS service.
- Cache: Stores DNS mappings to cache to speed up query. You can create, edit and delete DNS mappings.
- NBT Cache: Displays NBT cache information.



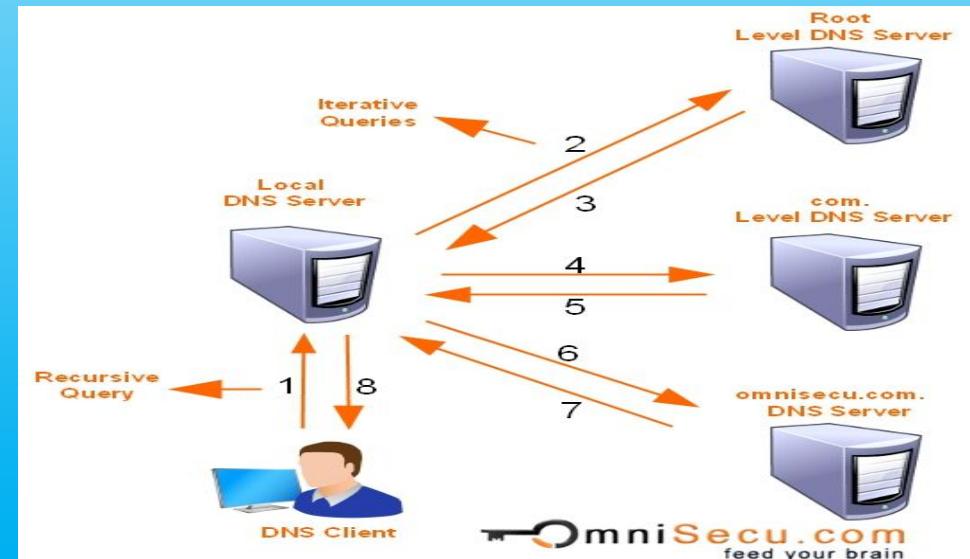
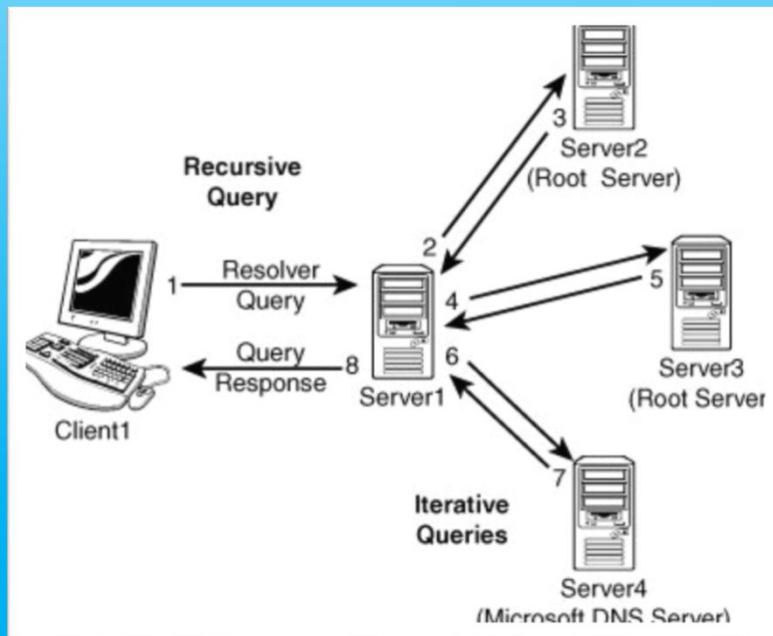
# Types of DNS: 3 DNS Query Types

## Recursive Query

In a recursive query, a DNS client provides a hostname, and the DNS Resolver “must” provide an answer—it responds with either a relevant resource record, or an error message if it can’t be found. The resolver starts a recursive query process, starting from the DNS Root Server, until it finds the Authoritative Name Server (for more on Authoritative Name Servers see DNS Server Types below) that holds the IP address and other information for the requested hostname.

## Iterative Query

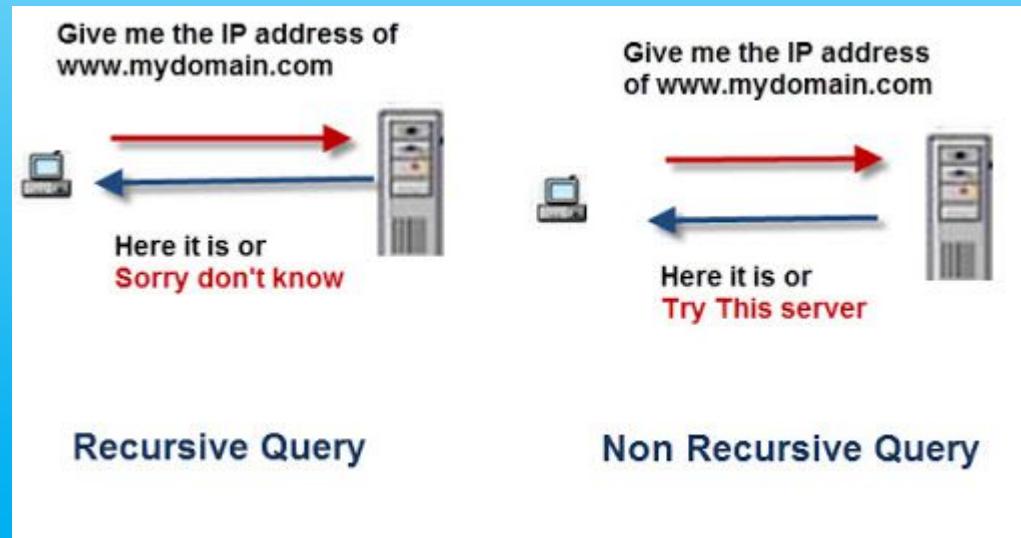
In an iterative query, a DNS client provides a hostname, and the DNS Resolver returns the best answer it can. If the DNS resolver has the relevant DNS records in its cache, it returns them. If not, it refers the DNS client to the Root Server, or another Authoritative Name Server which is nearest to the required DNS zone. The DNS client must then repeat the query directly against the DNS server it was referred to.



# Types of DNS: 3 DNS Query Types

## Non-Recursive Query

A non-recursive query is a query in which the DNS Resolver already knows the answer. It either immediately returns a DNS record because it already stores it in local cache, or queries a DNS Name Server which is authoritative for the record, meaning it definitely holds the correct IP for that hostname. In both cases, there is no need for additional rounds of queries (like in recursive or iterative queries). Rather, a response is immediately returned to the client.



# DNS Types: 3 Types of DNS Servers

## DNS Resolver

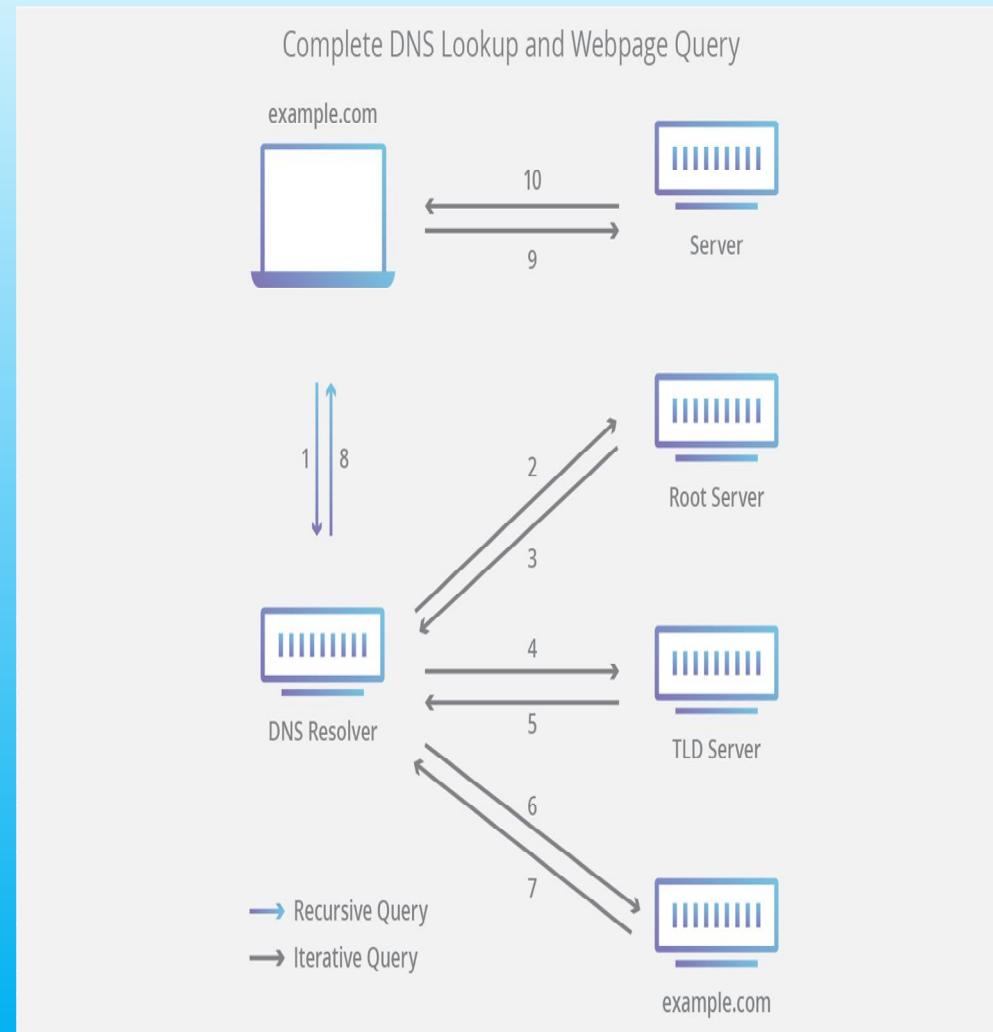
A DNS resolver (recursive resolver), is designed to receive DNS queries, which include a human-readable hostname such as “www.example.com”, and is responsible for tracking the IP address for that hostname.

## DNS Root Server

The root server is the first step in the journey from hostname to IP address. The DNS Root Server extracts the Top Level Domain (TLD) from the user’s query — for example, www.example.com —... provides details for the .com TLD Name Server. In turn, that server will provide details for domains with the .com DNS zone, including “example.com”.

## Authoritative DNS Server

Higher level servers in the DNS hierarchy define which DNS server is the “authoritative” name server for a specific hostname, meaning that it holds the up-to-date information for that hostname. The Authoritative Name Server is the last stop in the name server query—it takes the hostname and returns the correct IP address to the DNS Resolver (or if it cannot find the domain, returns the message NXDOMAIN).



# DNS Types: 10 Top DNS Record Types

DNS servers create a DNS record to provide important information about a domain or hostname, particularly its current IP address. The most common DNS record types are:

- Address Mapping record
- IP Version 6 Address record (AAAA Record)
- Canonical Name record (CNAME Record)
- Mail exchanger record (MX Record)
- Name Server records (NS Record)
- Reverse-lookup Pointer records (PTR Record)
- Certificate record (CERT Record)
- Service Location (SRV Record)
- Text Record (TXT Record)
- Start of Authority (SOA Record)

Common DNS Record Types	
Record	Description
A	Address record (IPv4)
AAAA	Address record (IPv6)
CNAME	Canonical Name record
MX	Mail Exchanger record
NS	Nameserver record
PTR	Pointer record
SOA	Start of Authority record
SRV	Service Location record
TXT	Text record

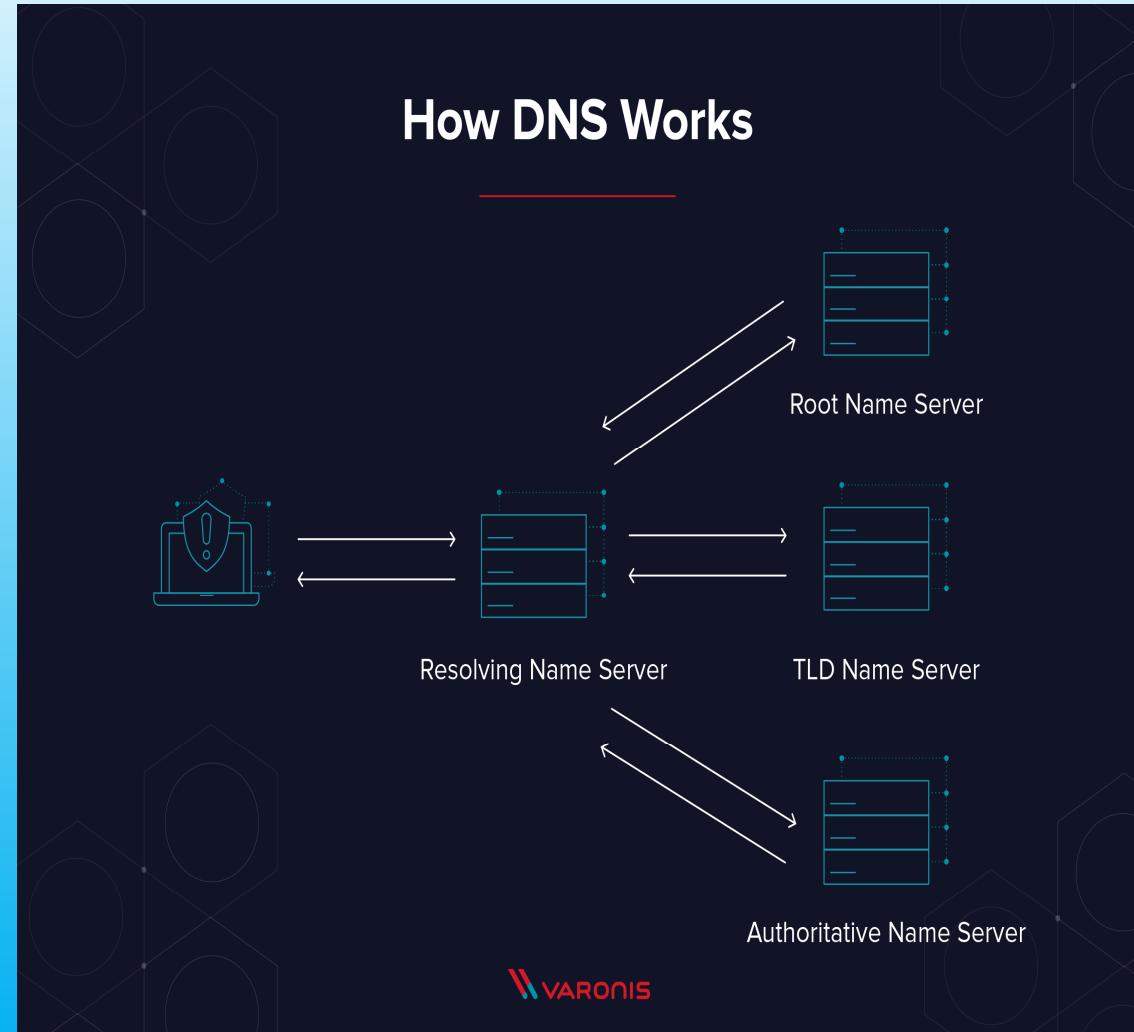
# How DNS works

When a user enters a human-readable address into a browser, the operating system's DNS client checks the information in its local cache. If the requested address is not there, it will look for the Domain Name System server in your local area network (LAN). When the local DNS server receives the query and finds the requested domain name, it returns the results.

If the name cannot be found, the local server forwards the query to the DNS cache server, usually provided by an Internet Service Provider (ISP). Since the DNS server cache contains a temporary repository of DNS records, it will quickly respond to requests. These DNS cache servers are known as unauthorized DNS servers because they provide a request resolution based on the cached value obtained from the authoritative DNS servers.

Root name servers are authorized to maintain and provide a list of authoritative name servers for each top-level domain (.com, .org, etc.).

The top-level name server is authorized to maintain and provide a list of authoritative name servers for all domains (gmail.com, wikipedia.org, etc.). Its job is to query the name server to find and return the authoritative name server for the requested domain.



# How domain names are organized

## Domain Names

A domain name is a human-readable name—like `amazon.com`—that we type in a web browser URL field. The Internet Corporation for Assigned Names and Numbers ([ICANN](#)) manages these domain names

## Top Level Domain (TLD)

TLD refers to the last part of a domain name. For example, the `.com` in `amazon.com` is the Top Level Domain. The most common TLDs include `.com`, `.net`, `org`, and `.info`. Country code TLDs represent specific geographic locations. For example: `.in` represents India. Here are some more examples:

**com** – Commercial businesses.

**gov** – U.S. government agencies.

**edu** – Educational institutions such as universities.

**org** – Organizations (mostly non-profit).

**mil** – Military.

**net** – Network organizations.

**eu** – European Union.

## Second Level Domain

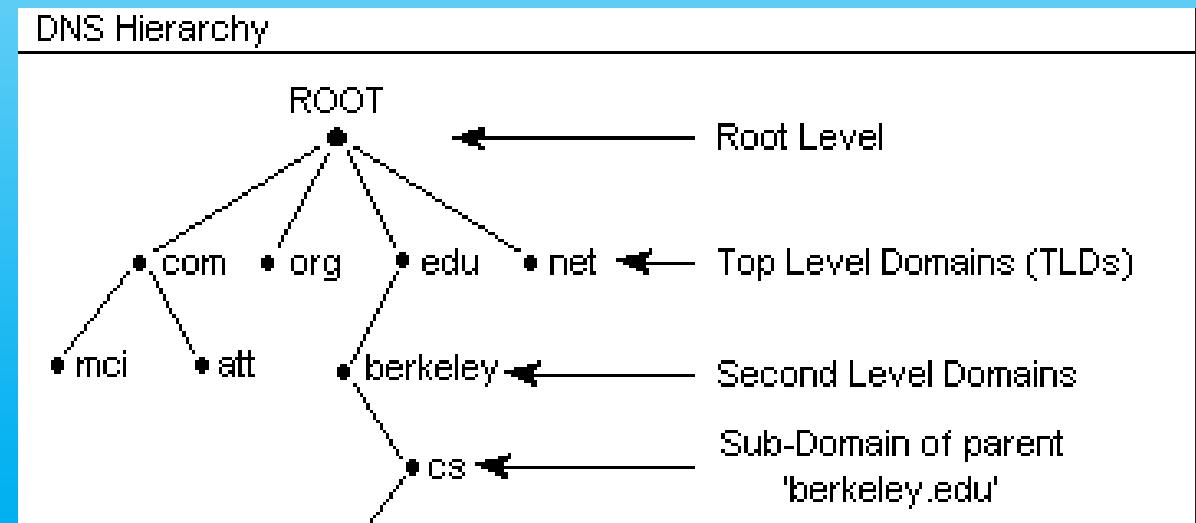
This is the part of a domain name which comes right before the TLD—`amazon.com`—for example.

## Sub Domain

A subdomain can be created to identify unique content areas of a web site. For example, the `aws` of `aws.amazon.com`.



# How domain names are organized

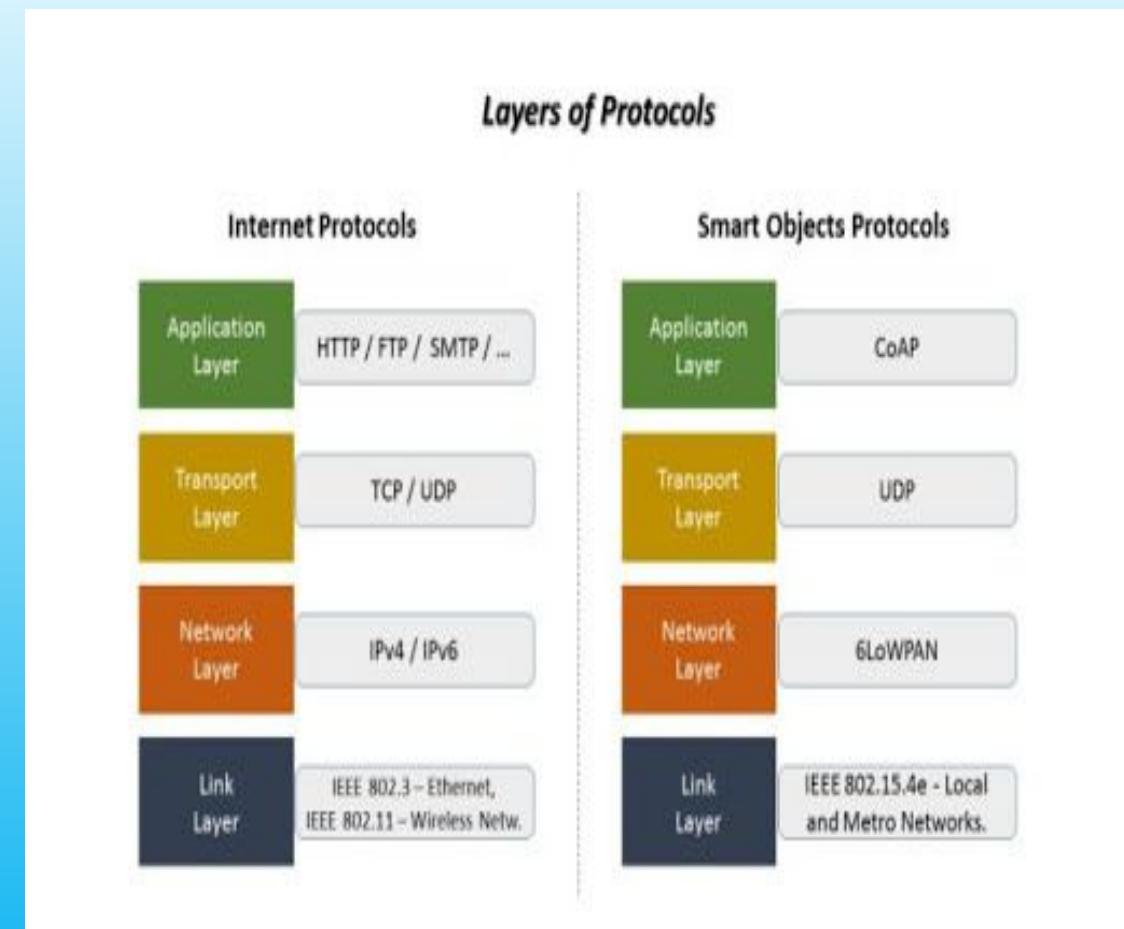


## 2. Explanation Of Web Element

### *Communication Protocol*

Communication protocols are formal descriptions of digital message formats and rules. They are required to exchange messages in or between computing systems. Communication protocols are important in telecommunications systems and other systems because they create consistency and universality for the sending and receiving of messages.

Popular protocols include: File Transfer Protocol (FTP), TCP/IP, User Datagram Protocol (UDP), Hypertext Transfer Protocol (HTTP), Post Office Protocol (POP3), Internet Message Access Protocol (IMAP), Simple Mail Transfer Protocol (SMTP).



## 2. Explanation Of Web Element

### *Server hardware*

A server is a complex system that stores data sources, processes and accesses information from other computers over the Internet. The server hardware for the complete setup is similar to that of the desktop computer (also known as the PC). However, the reliability and performance of the server is much higher than that of a conventional computer.

Server Hardware is the hardware of the device, the components that make up a complete device. With PCs, devices such as mouse, keyboard, monitor, hard drive, DVD drive... are hardware devices.



## 2. Explanation Of Web Element

### *Server hardware*

There are three common types of server hardware:

- *Tower servers*
- *Rack servers:*
- *Blade server*



## 2. Explanation Of Web Element

### *Server software*

Server software is a type of software that is designed to be used, operated and managed on a computing server. It provides and facilitates the harnessing of underlying server computing power for use with an array of high-end computing services and functions.

Server software is primarily built to interact with a server's hardware infrastructure, including the processor, memory, storage, input/output (I/O) and other communication ports. Depending on the type or usage of the server, server software may be classified into various forms, such as the following:

Web server software

Application server software

Database server software

Cloud computing server software

File server software



## 2. Explanation Of Web Element

### Server Operating System

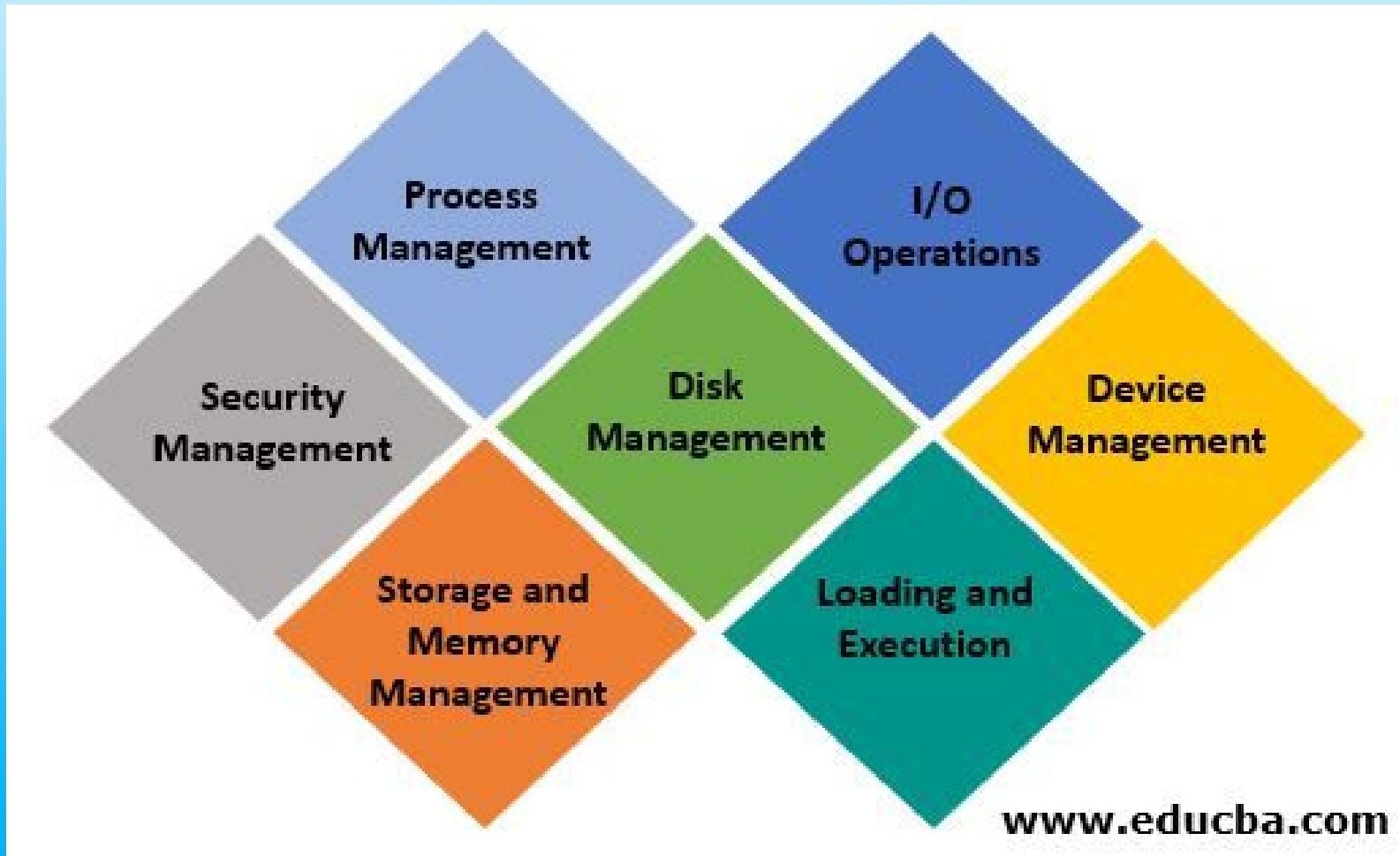
Operating system (OS) is an important software of computer that maintain computer's process and memory, manages hardware and other software, and provides services to applications so it can use. In other words, OS is the interface of the computer so that users can use the software and applications. Some well-known OS, such as: Window, macOS, Linux, ubuntu, android, etc.

### Some common operating systems:



## 2. Explanation Of Web Element

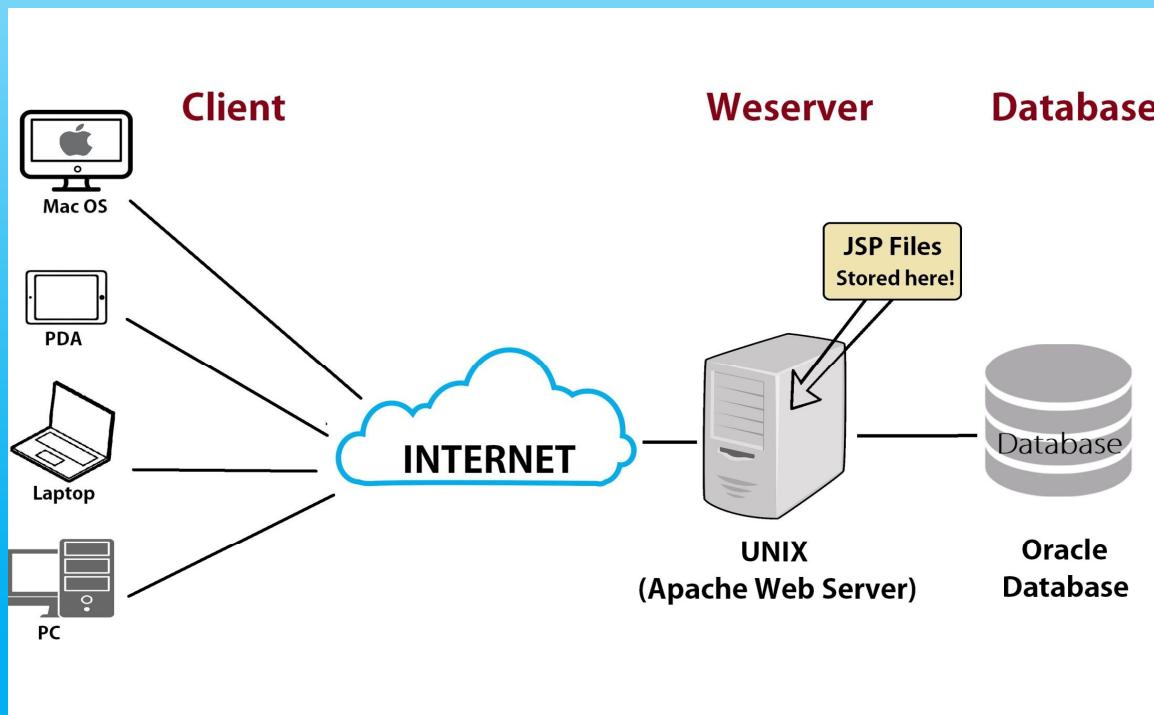
Function of OS:



## 2. Explanation Of Web Element

Web server:

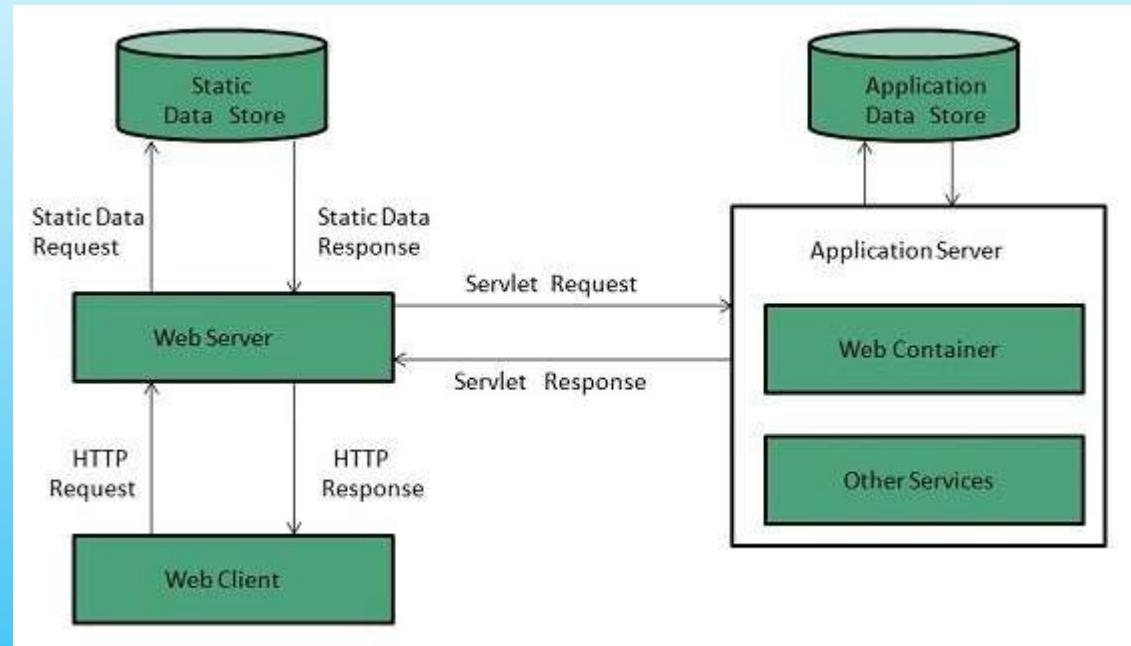
A **web server** is **server** software, or hardware dedicated to running this software, that can satisfy client requests on the World Wide **Web**. A **web server** can, in general, contain one or more websites. A **web server** processes incoming network requests over **HTTP** and several other related protocols.



## 2. Explanation Of Web Element

Web server architecture is the logical layout or design of a web server, based on which a web server is designed, developed and deployed.

It defines the architectural layout and components of a web server, essential for delivering the required web server-based operations and services.



## 2. Explanation Of Web Element

### Apache web server

Apache is an open-source and free web server software that powers around 40% of websites around the world. The official name is Apache HTTP Server, and it's maintained and developed by the Apache Software Foundation.

It allows website owners to serve content on the web — hence the name “web server.” When someone wants to visit a website, they enter a domain name into the address bar of their browser. Then, the web server delivers the requested files by acting as a virtual delivery man.



## 2. Explanation Of Web Element

### IIS web server

Internet Information Services (IIS) is a flexible, general-purpose web server from Microsoft that runs on Windows systems to serve requested HTML pages or files.

An IIS web server accepts requests from remote client computers and returns the appropriate response. This basic functionality allows web servers to share and deliver information across local area networks (LAN), such as corporate intranets, and wide area networks (WAN), such as the internet. A web server can deliver information to users in several forms, such as static webpages coded in HTML; through file exchanges as downloads and uploads; and text documents, image files and more.



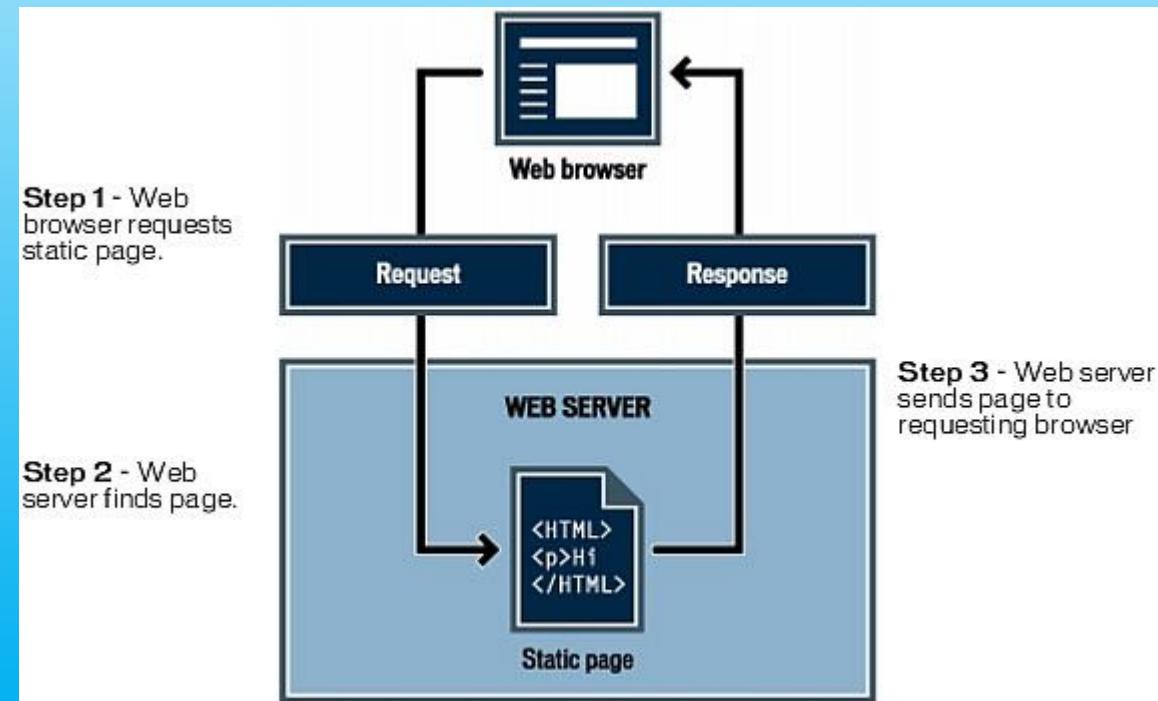
### 3. Website technologies

Website technology refers to the means by which computers communicate with each other using markup languages and multimedia packages. It gives us a way to interact with hosted information, like websites. Web technology involves the use of hypertext markup language (HTML) and cascading style sheets (CSS).



# Static web

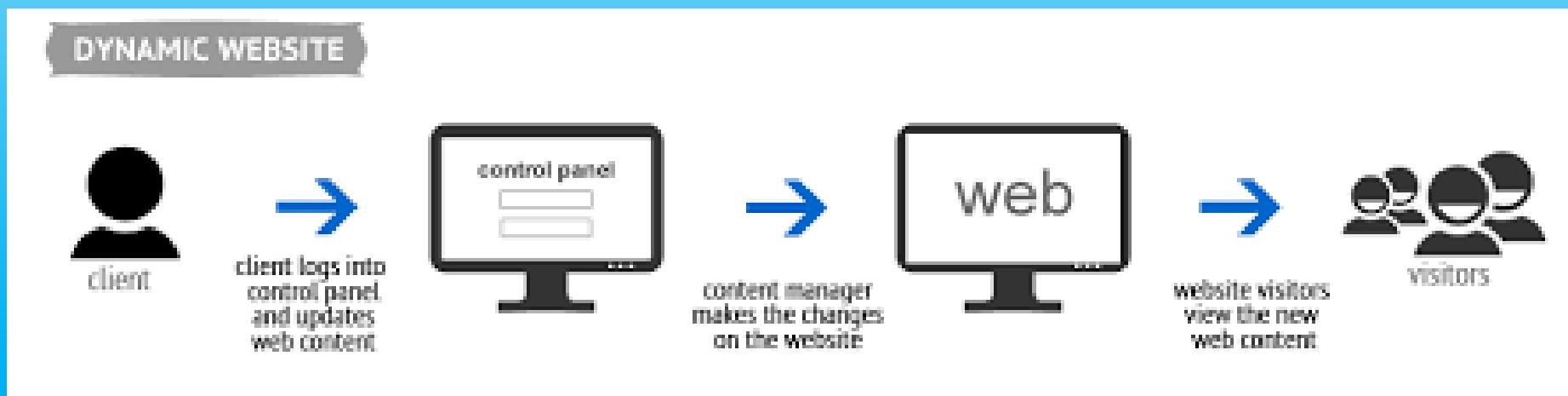
Static websites usually come with a fixed number of pages that have a specific layout. When the page runs on a browser, the content is literally static and doesn't change in response to user actions. A static website is usually created with HTML and CSS in simple text editors like Notepad.



# Dynamic web

Compared to static websites, which are purely informational, a dynamic website is more functional. It allows users to interact with the information that is listed on the page. Of course, that requires utilizing more than just HTML code.

Static websites use only client-side HTML and CSS code while dynamic websites rely on both client-side and server-side scripting languages such as JavaScript, PHP, or ASP. When a user accesses a dynamic website, the site can be changed through code that is run in the browser and/or on the server. The end result is the same as that on a static website: an HTML page displayed on the web



# Front-end technologies

Front end scripting languages are an essential subset of programming languages that perform specific functions within larger languages such as C# or Java. With the advent of HTML5, web application developers will have these scripting languages, particularly AJAX and Actionscript, incorporated in to the browser, as opposed to depending on 3rd party plug-ins. We are Plego Technologies, a software development company specializing in front end technologies.

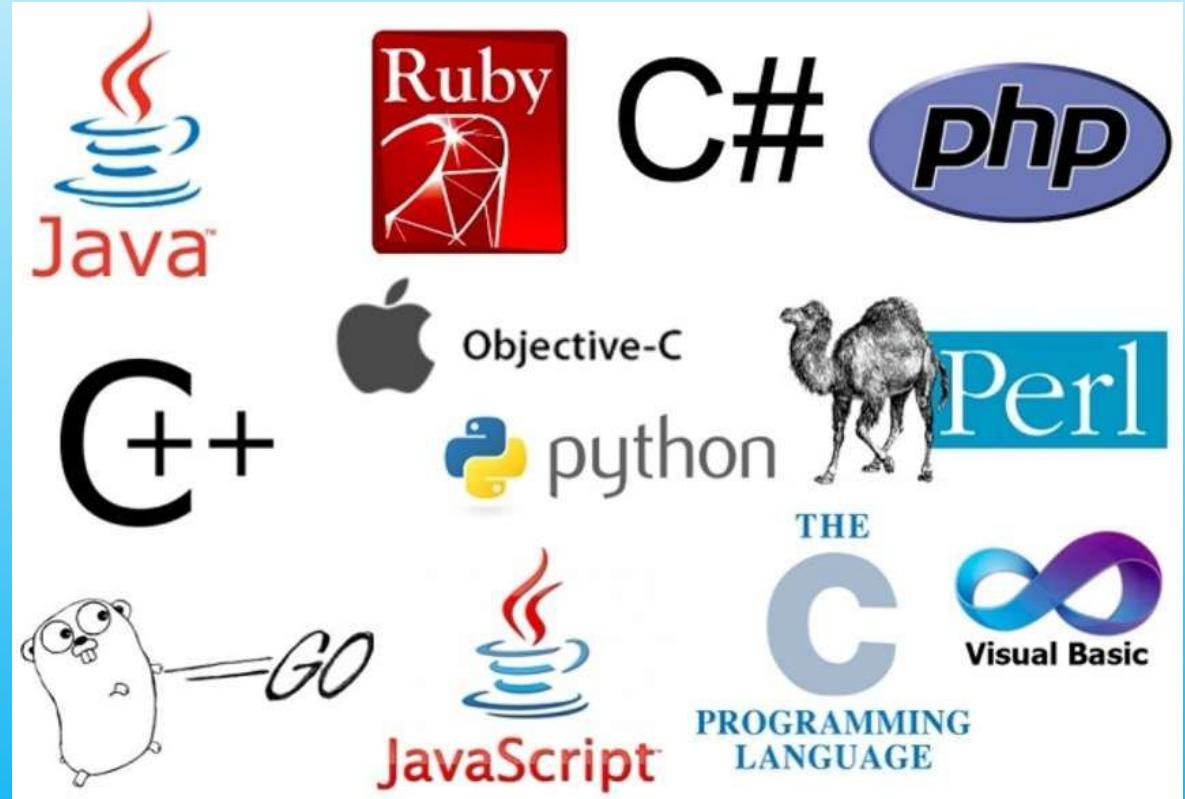
## Front-end Technologies

To craft awesome solutions



# Back-end technologies

The back end refers to parts of a computer application or a program's code that allow it to operate and that cannot be accessed by a user. ... The back end is also called the data access layer of software or hardware and includes any functionality that needs to be accessed and navigated to by digital means.



# Back-end vs Front technologies

If you want lists, for **back-end** languages (in order of my ability to recall):

- Java (and other JVM languages like Scala, Groovy, Clojure)
- PHP
- .NET (C#, VB)
- Ruby
- Python
- Perl
- Javascript (Node JS)
- Actionscript (Flash Media Server)
- CoffeeScript
- C (CGI)
- Erlang
- oh, and SQL for db queries

For **browser-based** front-end languages, you're somewhat limited in what the browser can support (excluding launching out-of-browser applications). We could talk about:

- HTML
- Javascript
- CSS
- Actionscript
- CoffeeScript (compiled to Javascript)
- XML-based languages (X3D, SMIL, SVG, DITA, some interpreted by the browser, others transformed using XSL)
- VBScript
- Silverlight
- Java (applets)



## Front End

- Markup and web languages such as HTML, CSS and Javascript
- Asynchronous requests and Ajax
- Specialized web editing software
- Image editing
- Accessibility
- Cross-browser issues
- Search engine optimisation

## Back End

- Programming and scripting such as Python, Ruby and/or Perl
- Server architecture
- Database administration
- Scalability
- Security
- Data transformation
- Backup

## Clarify Back-end andFront technologies

Frontend and backend development are quite different from each other, but still, they are two aspects of the same situation. The frontend is what users see and interact with and backend is how everything works.

Frontend is the part of the website users can see and interact with such as the graphical user interface (GUI) and the command line including the design, navigating menus, texts, images, videos, etc. Backend, on the contrary, is the part of the website users cannot see and interact with.

The visual aspects of the website that can be seen and experienced by users are frontend. On the other hand, everything that happens on the background can be attributed to the backend.

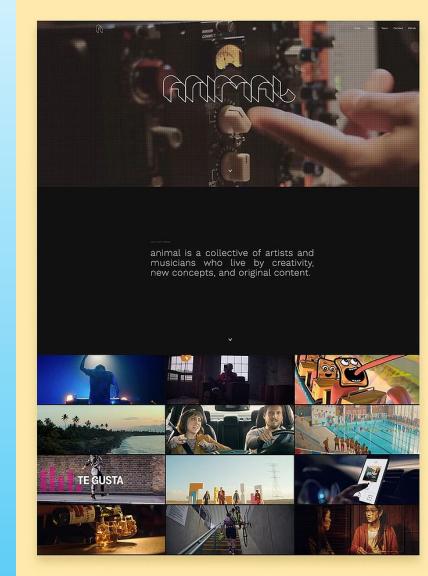
Languages used for front end are HTML, CSS, Javascript while those used for backend include Java, Ruby, Python, .Net .

## 4. Online creation tools and custom built

Examples of online creation tool (WIX.com)

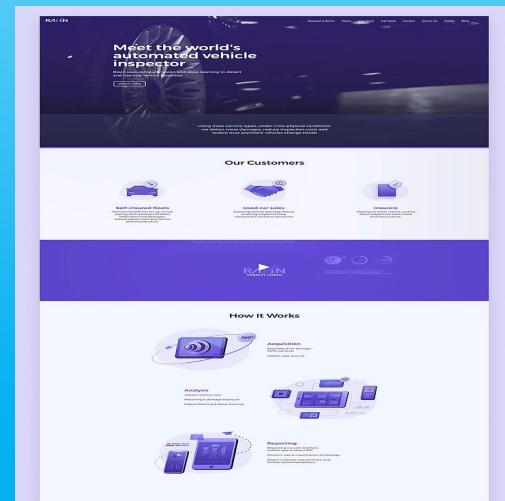
### Animal Music

Straightforward and to the point, Animal Music's website instantly shows you what they're capable of. Browse their video clips and you'll quickly find that their music and mixing is so pro that they've worked with brand giants such as Pepsi, Kia and Netflix.



### Ravin AI

The future is here. Proving that is this sleek website example that offers a peek into what our lives will look like when we start integrating AI into our daily routines. Ravin presents its groundbreaking automobile technology using a series of videos and vector art that balance engineering details with real-life implications.



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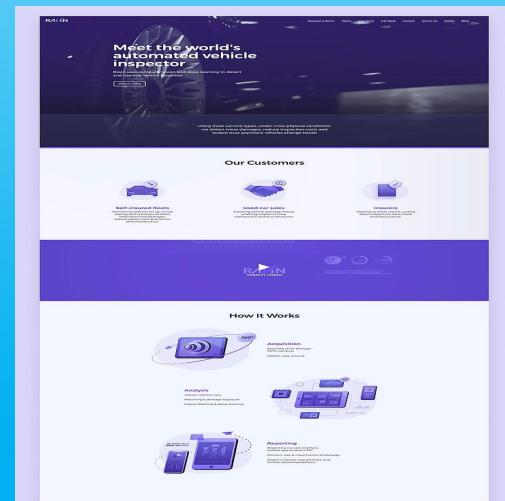
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## 4. Online creation tools and custom built

	<b>Online creation tools</b>	<b>Custom built website</b>
Design flexibility	Low flexibility with a little templates	High flexibility with unlimited template
Performance	High performance quality	Low performance quality and takes time for designing
Functionality	Limited	Unlimited
UX	Easy for newbie	Need more time to use it smoothly
UI	Easy to use and look professional	Complex and have many setting for professional designers

# References

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