Web Technology

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Marks

- Assignment :5   Lab report :8
- Attendance:5   Attendance: 5
- Assessment :15   Lab exam and project: 7
- Presentation:5

Theory: 30

Practical:20

What is

Inter-
net?

Internet

- A global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.

What is
Web?

World Wide Web(WWW)

- An information system on the Internet which allows documents to be connected to other documents by hypertext links, enabling the user to search for information by moving from one document to another.

Do you think Internet and Web are same?

Aspect	Web	Internet
Definition	A system of interconnected hypertext documents and resources accessed through the internet.	A global network of interconnected computers and networks.
Purpose	Facilitates the retrieval and display of information using web browsers.	Enables communication and the exchange of data between devices worldwide.
Components	Web pages, web servers, web browsers, web clients.	Computers, routers, servers, networking protocols.
Technology	Relies on protocols like HTTP, HTML, CSS, and JavaScript.	Relies on networking protocols like TCP/IP, DNS, and SMTP.
Functionality	Allows browsing websites, accessing online content, and interacting with web-based applications.	Supports various services like email, file sharing, messaging, and online gaming.
Interaction	Users interact with web content through web browsers and send requests to web servers.	Devices and networks communicate with each other using internet protocols.
Examples	Websites, web applications, online services like search engines and social media platforms.	Online services, email clients, file transfer protocols, online gaming platforms.

Difference

Internet

- Platform that connects computer together.

Web

- It is a layer built over the internet. It uses protocols of the internet to organized link and give access to content.

Web servers

A **web server** is server software, or hardware dedicated to running said software, that can satisfy World Wide Web client requests. 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.

A computer or software that hosts websites and serves webpages to client devices upon request. Web servers store and deliver web content, such as HTML, CSS, images, and other files, to web browsers.

Web Browser

- A **web browser** (commonly referred to as a **browser**) is a software application for accessing information on the World Wide Web.

- A software application that allows users to access and view websites on the World Wide Web. Web browsers interpret HTML, CSS, JavaScript, and other web technologies to render and display webpages to users.
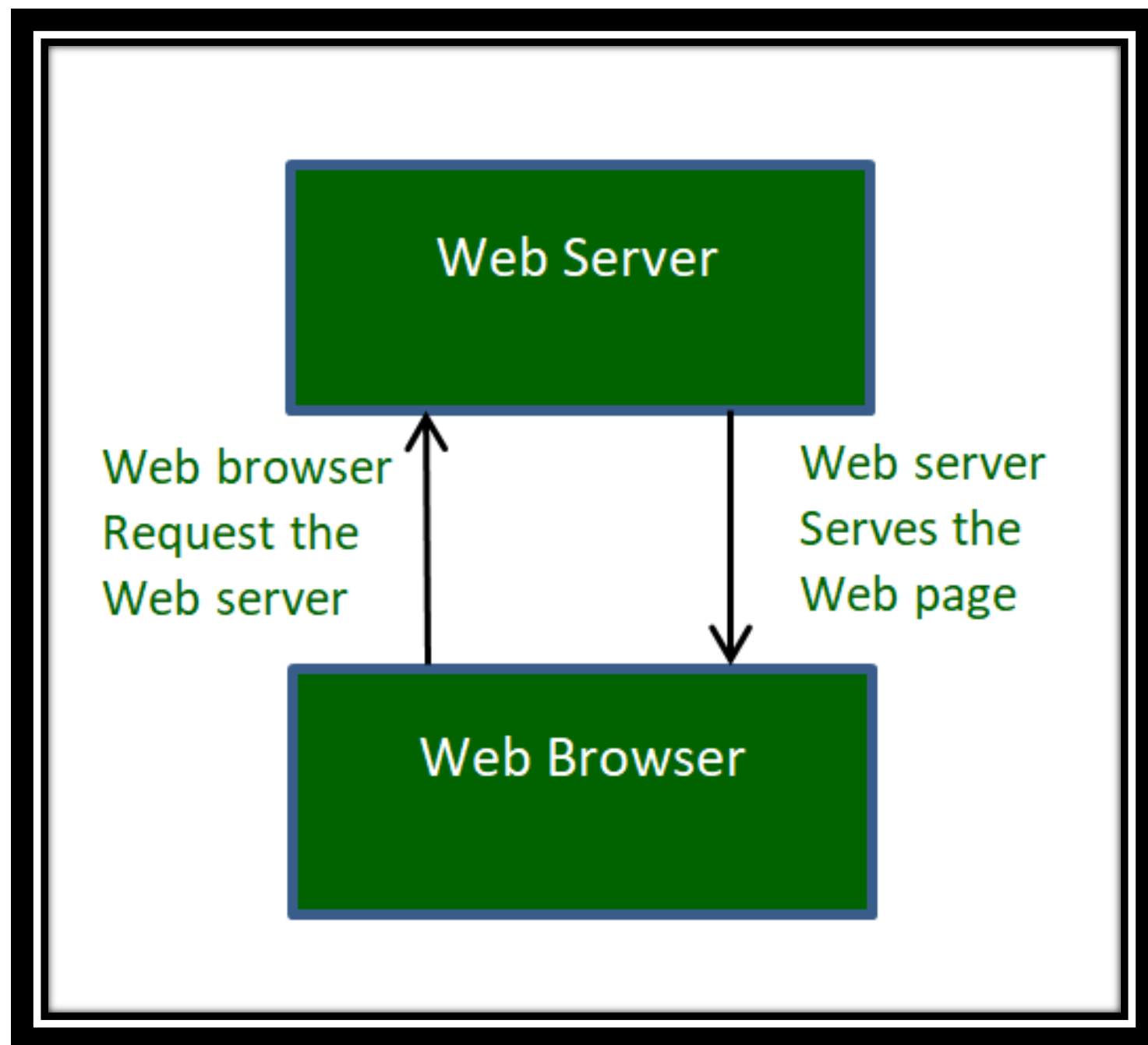
The files stored on web servers are read by browsers (such as Firefox, Safari, Chrome or Internet Explorer) which convert these files into images and text for you to view. Your browser communicates with web servers to bring you information from the internet.
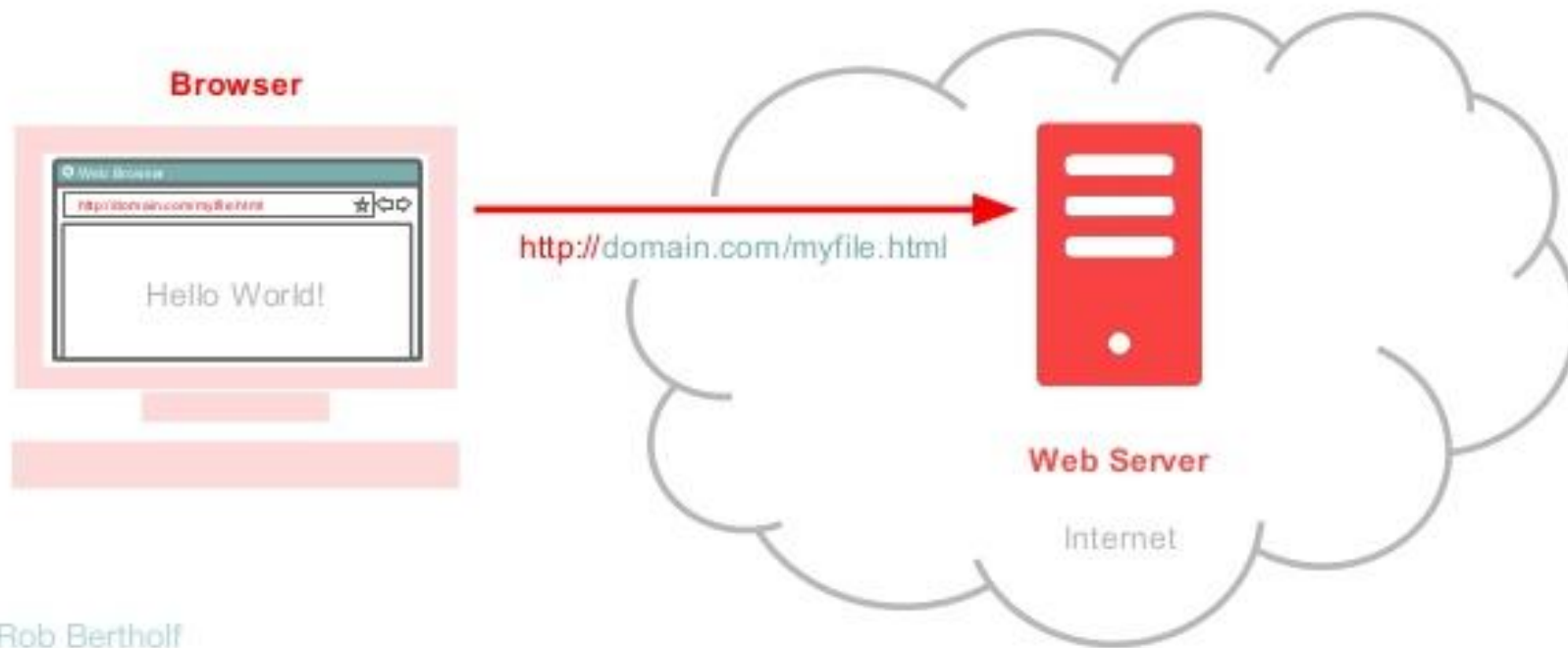
Web page

A single document or resource within a website. It is written in HTML and may include CSS and JavaScript. A web page can contain text, images, multimedia, links, and other elements.
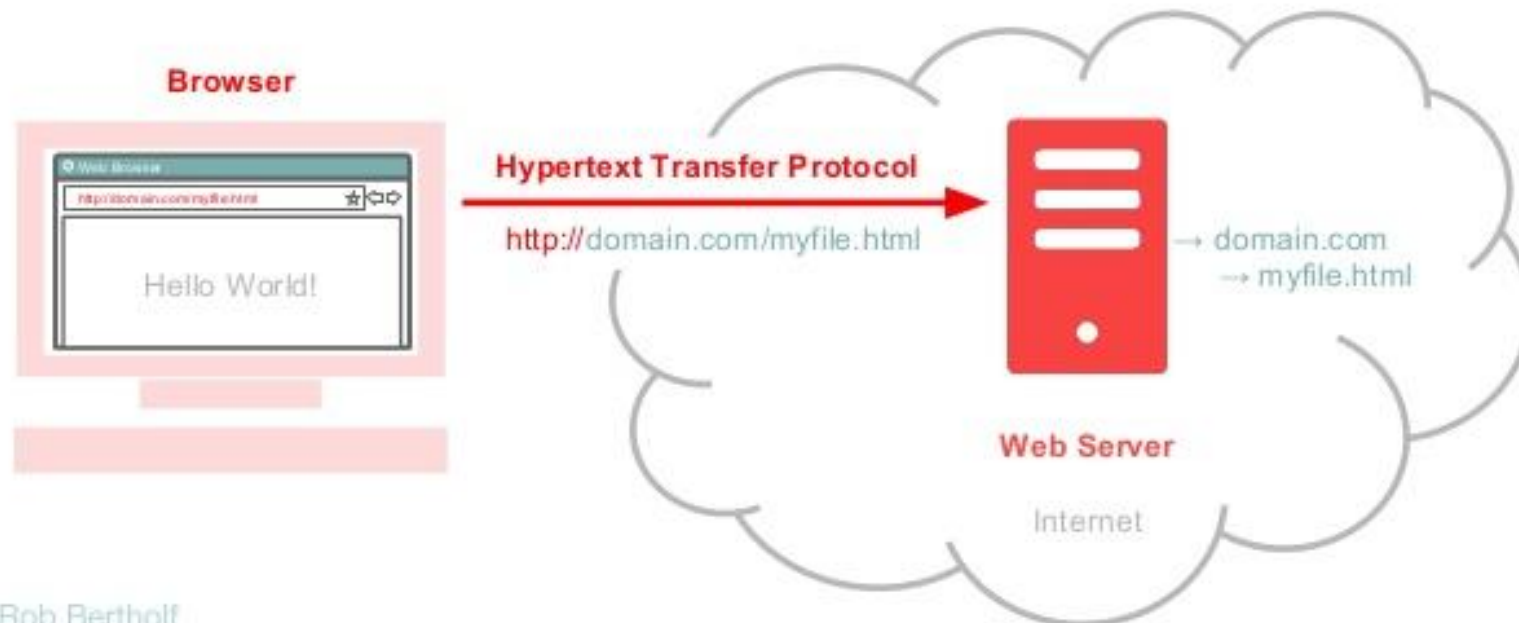It can be static and dynamic

Web site

A collection of related web pages and resources that are grouped under a common domain name or URL. Websites are accessible on the internet and provide information, services, or functionality to users.

HTTPS (Secure)

Browser
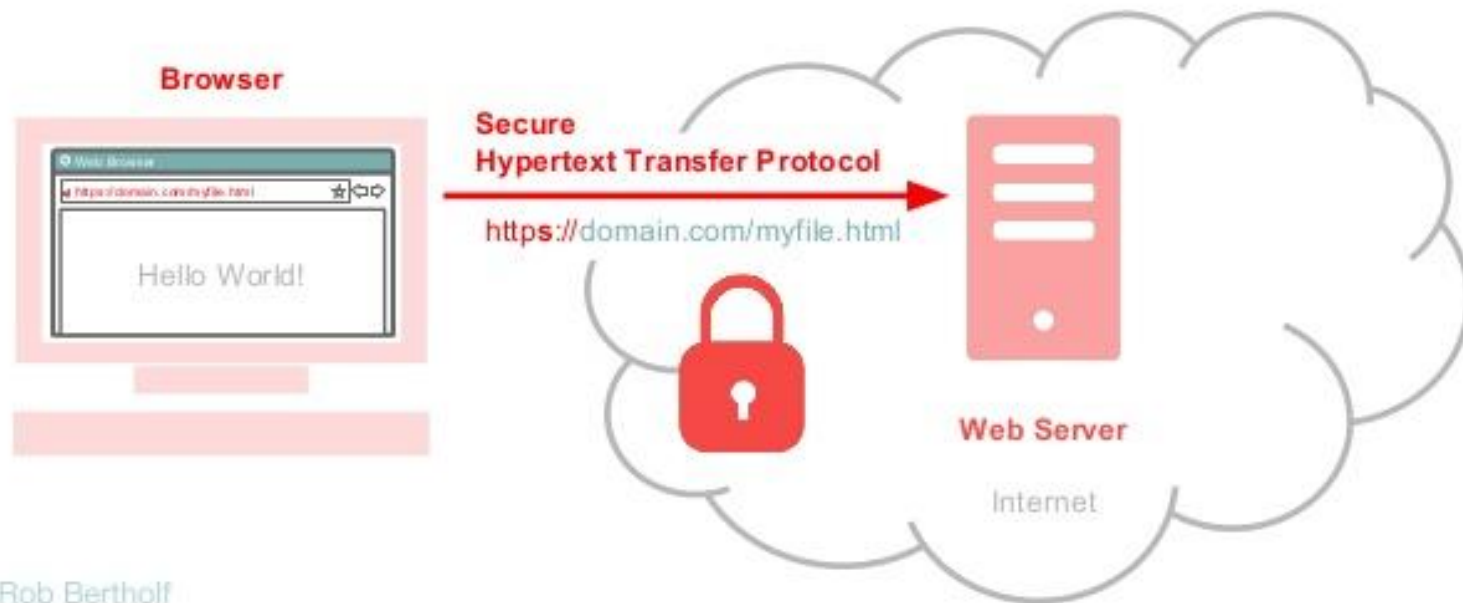
Hello World!

Secure Hypertext Transfer Protocol

https://domain.com/myfile.html

Web Server

Internet

@Rob Bertholf

Secure Sockets Layer (SSL) Certificate
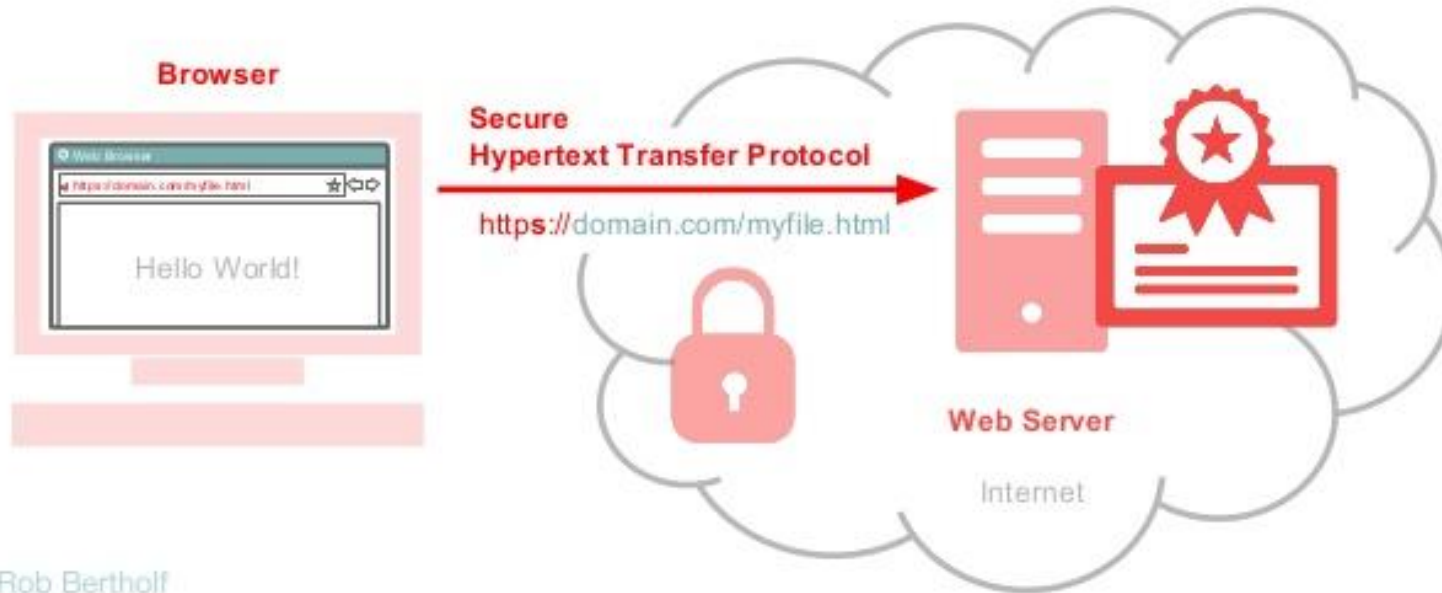
Browser

Secure Hypertext Transfer Protocol

https://domain.com/myfile.html

Hello World!

Web Server

Internet

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Internet Protocol (IP)

Internet

Internet Protocol (IP)

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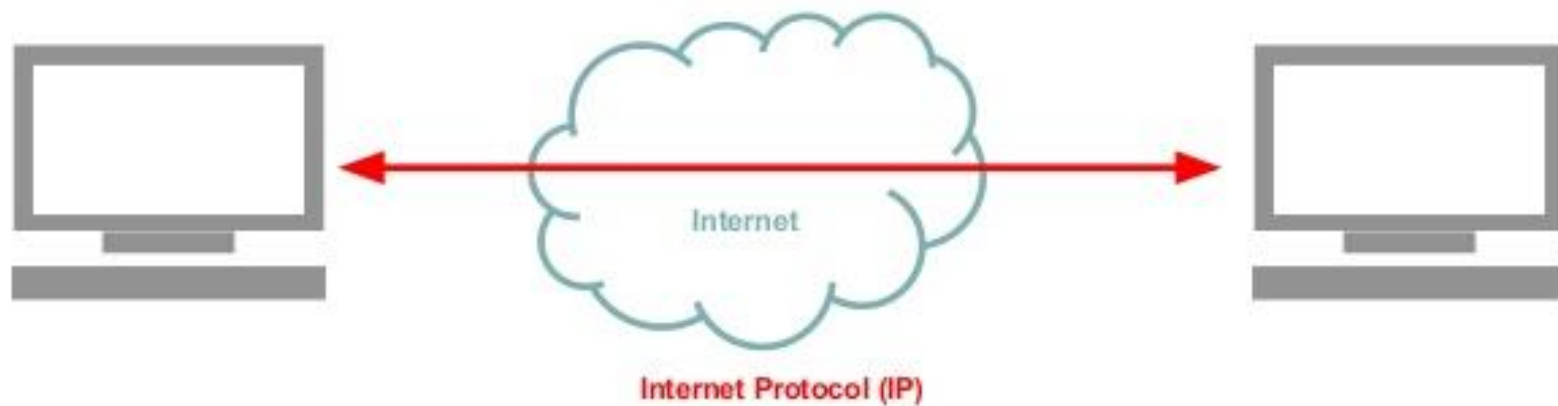
Transmission Control Protocol (TCP)

File Transfer Protocol (FTP)

FTP Request

File Transfer Protocol

ftp://domain.com

myfile.html

Web/File Server

Internet

@Rob Bertholf
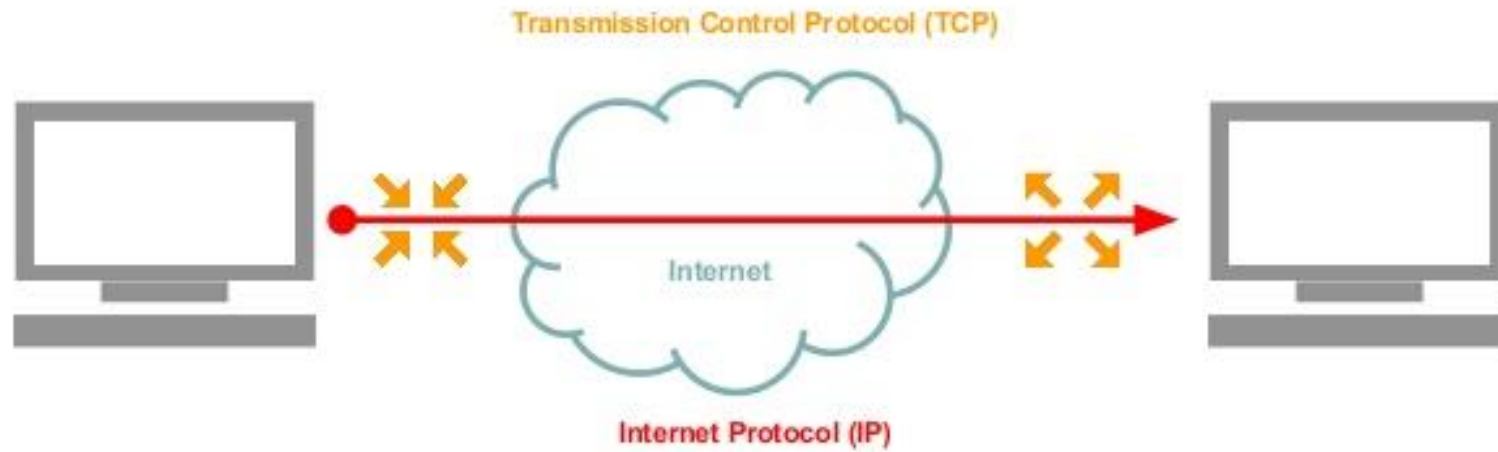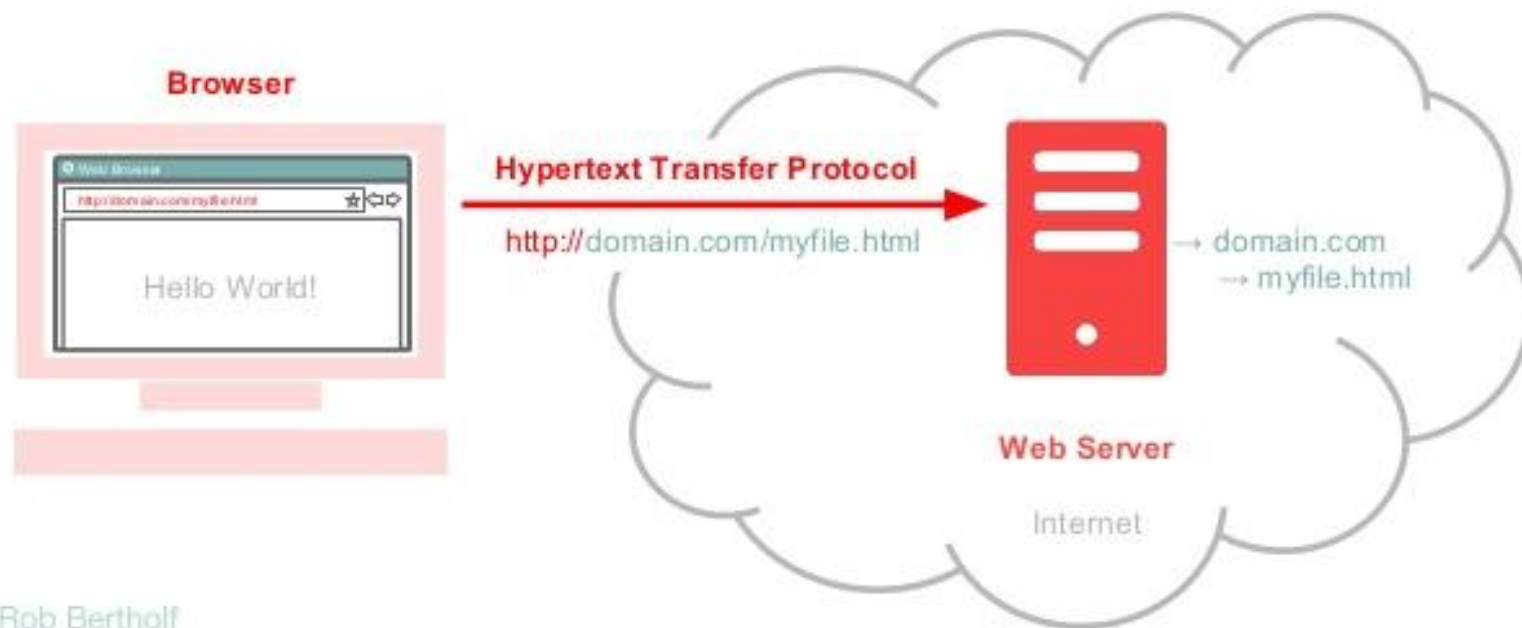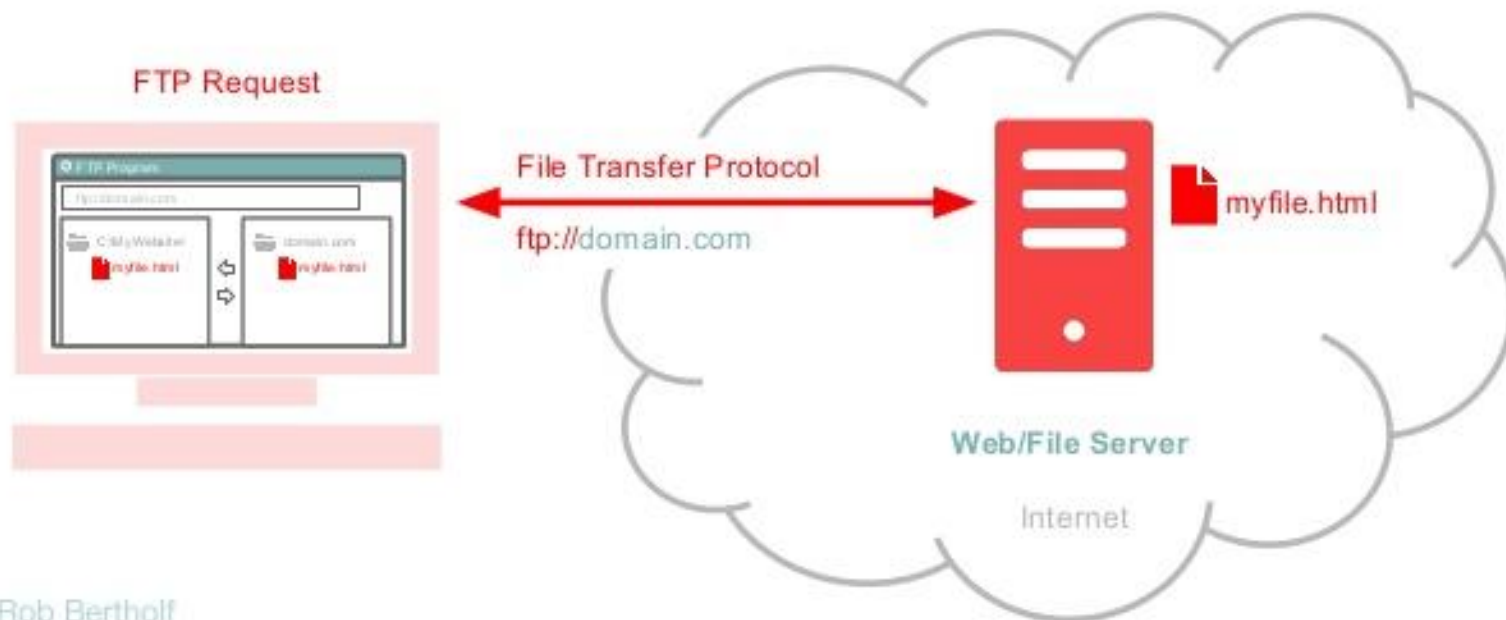
Protocol Recap

- We use Hypertext Transfer Protocol (http://) to access websites.
- We use File Transfer Protocol (ftp://) to store and retrieve files from the internet.
- SSL Certificates secure the HTTP protocol (https://) to guard data passed through.

@Rob Bertholf

Web Technology

- Communication between computers using markup language and multimedia packanges

View Source

What it sees

view-source:cat.html

```
<html>
<head>
 <title>Cat Page</title>
</head>
<body>
  <h1>Meow.</h1>
  <img src="cat.jpg" />
</body>
</html>
```

What we see

cat.html

Meow.

cat.jpg
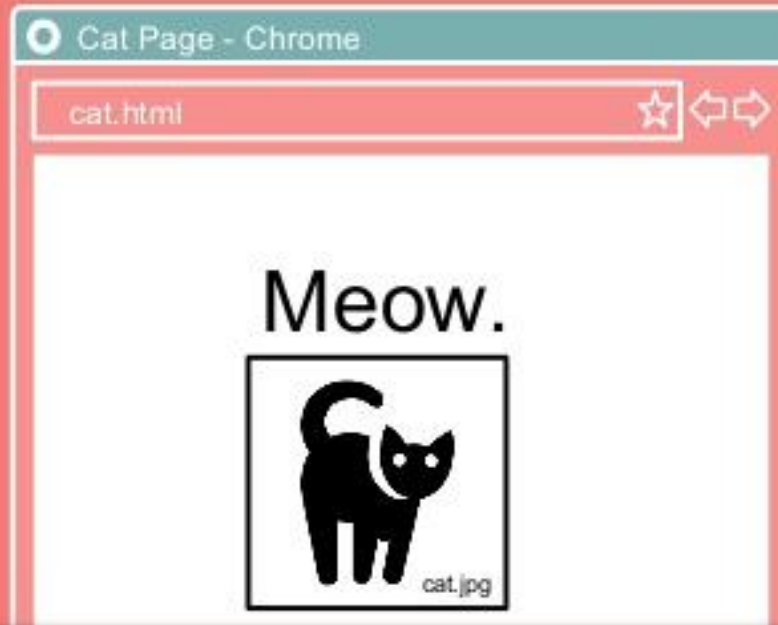
What is HTML?

Hypertext Markup Language

noun

1. HTML stands for Hypertext Markup Language, a standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages.

Anatomy of an HTML Document

```html
<!DOCTYPE>
<html>
<head>
  <title>Cat Page</title>
  <meta />
  <script></script>
</head>
<body>
  <h1>Meow.</h1>
  <img src="cat.jpg" />
</body>
</html>
```

Cat Page - Chrome

cat.html

Meow.

@Rob Bertholf
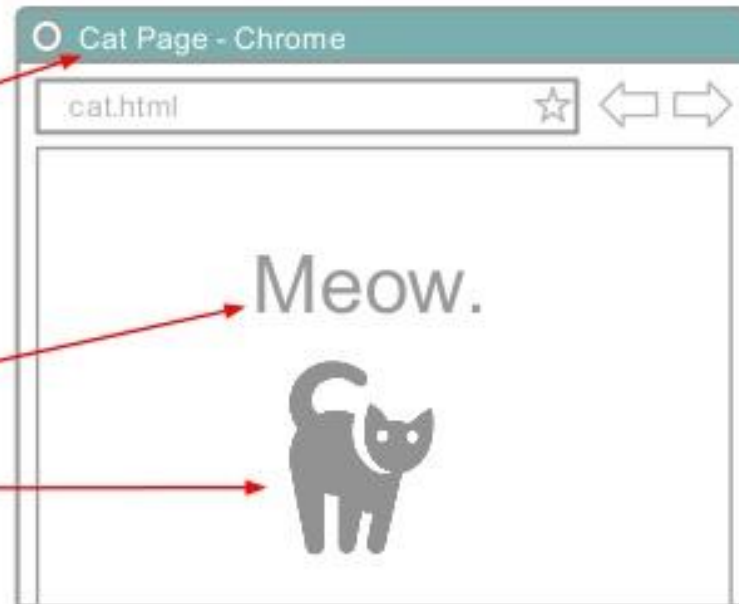
What is a Hyperlink?

Hyperlink

noun

1. A link from a hypertext file or document to another location or file, typically activated by clicking on a highlighted word or image on the screen.

@Rob Bertholf
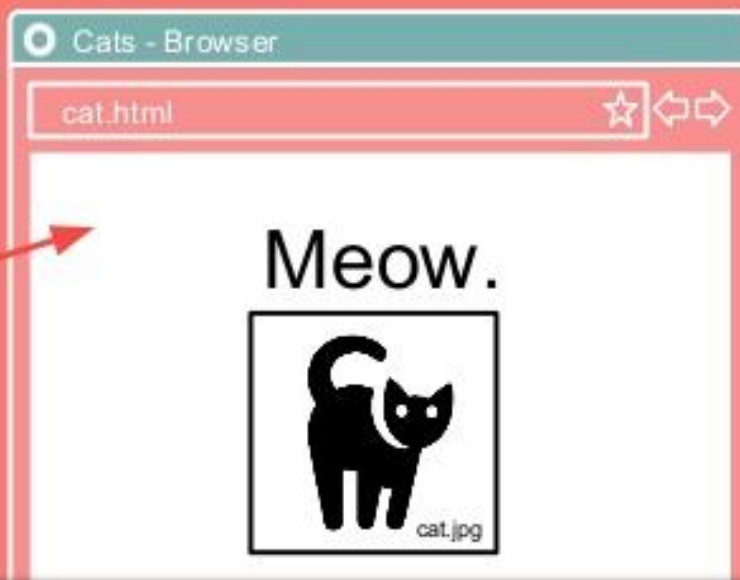
Hyperlink, Anchor Tag & Hypertext

```
<a href="somefile.html">
    Click Here (Hypertext)
</a>
```

Any queries?

Internet protocols

Prepared by: Er. Simanta Kasaju

SMTP

Simple Mail Transfer Protocol (SMTP)

Working of SMTP

Sender

User Agent

Sent Mail Queue

Mail Transfer Agent

Client

TCP Connection (Using Port 25)

SMPT Commands, Replies and Mails

Receiver

User Agent

User Mailboxes

Mail Transfer Agent

Server
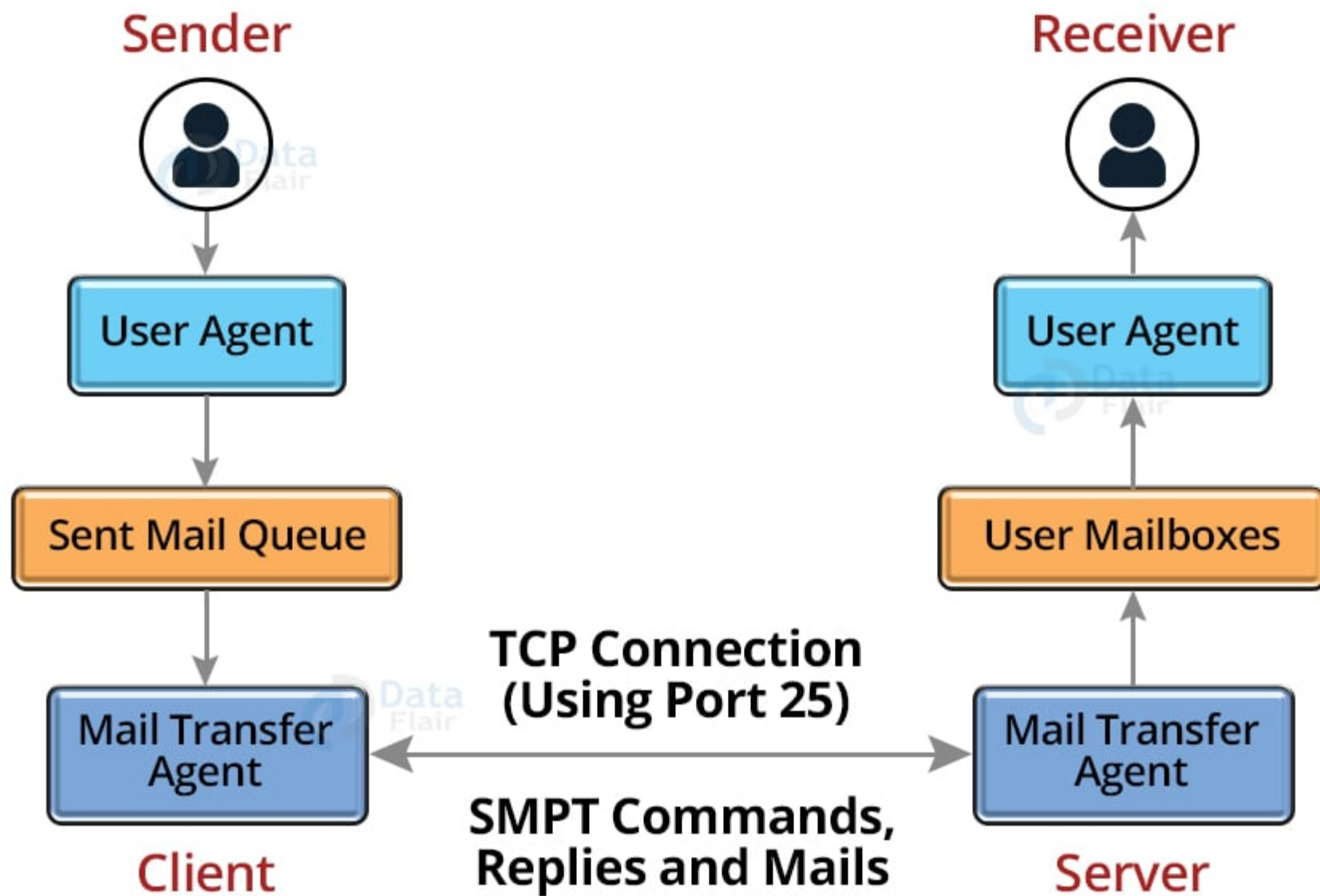
- **1. Mail Composition:**

- A user sends an e-mail by creating an electronic mail message with the help of a Mail User Agent (MUA). A Mail User Agent is software that allows you to send and receive emails. The message is divided into two parts: the body and the header. The body of the message is the most important section, whereas the header contains information such as the sender and recipient addresses. The header also provides descriptive information such as the message's topic.

- In this example, the message content is analogous to a letter, and the header is analogous to an envelope with the recipient's address.
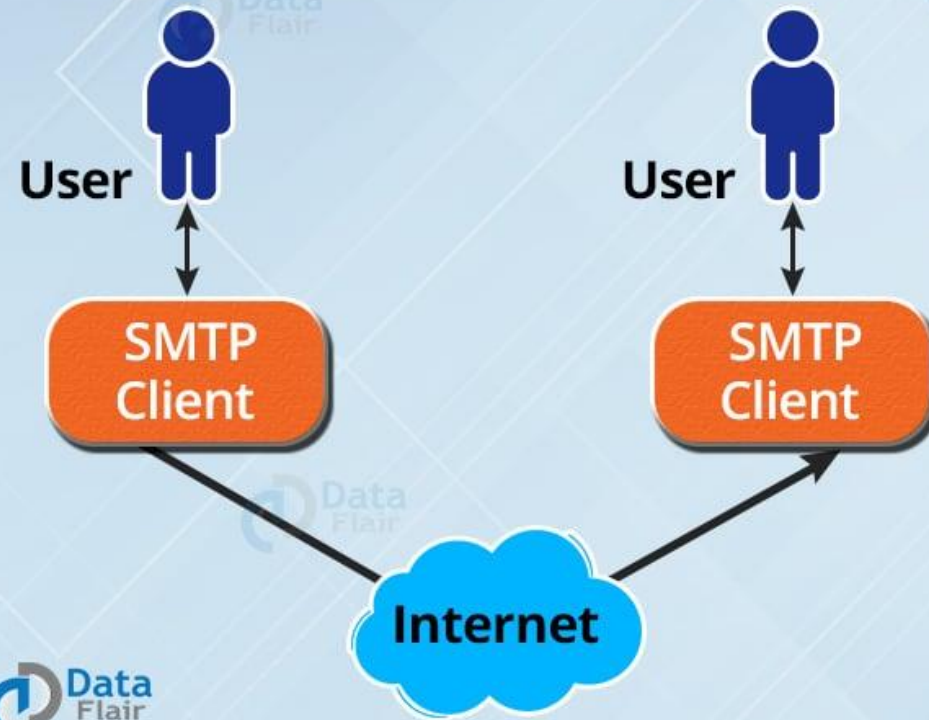
- **2. Mail Submission:**

- After drafting an email, the mail client sends the finished email to the SMTP server through SMTP on TCP port 25.

- **3. Mail Delivery:**

- E-mail addresses are made up of two parts: the recipient's username and the domain name. For instance, xyz@gmail.com, where "xyz" is the recipient's username and "gmail.com" is the domain name.

- If the domain name of the recipient's email address differs from the domain name of the sender, MSA will route the message to the Mail Transfer Agent (MTA).

- The MTA will locate the destination domain in order to transmit the email. It looks up the destination domain using the Domain Name System's MX record.

- The MX record comprises the recipient's domain name and IP address. After locating the record, MTA connects to the exchange server to transmit the message.

- **4. Receipt and Processing of Mail:**

- When an incoming message is received, the exchange server sends it to the incoming server (Mail Delivery Agent), which holds the email until the user retrieves it.

- **5. Mail Access and Retrieval:**

- MUA may be used to retrieve email saved in MDA (Mail User Agent). Login and password are required to access MUA.

Communication between receiver and sender:

- **1. Sending Email:**

- Mail is sent via a sequence of request and answer messages exchanged between the client and the server.

- The message is made up of two parts: a header and a body. The mail header is terminated with a null line, and everything following the null line is considered the message's body, which is a sequence of ASCII characters. The real information read by the receipt is included in the message body.

- **2. Receiving Email:**

- The server-side user agent scans the mailboxes at regular intervals. If any information is received, it notifies the user of the mail.

- When the user attempts to view the mail, a list of emails with a brief description of each mail in the inbox is displayed. Any of the mails may be seen on the terminal by choosing it.

- **SMTP Commands:**

- HELO — Identifies the client to the server using a fully qualified domain name that is only transmitted once per session.

- MAIL – Specifies the origin of the email.

- RCPT – Follows MAIL, identifies an addressee, and uses one RCPT for each addressee if there is more than one addressee.

- DATA – transmit data one line at a time.

- NOOP: empty message like ping to check responsiveness of other end.

- Quit: Terminates the protocol session.

How SMTP Works

- Every email has the sender's address (e.g. sender@sendermail.com) and the recipient's in the to field (e.g. recipient@recipientmail.com) and the content of the message.

- When an email is sent, the email client connects to the SMTP server of the sender's email service (e.g. mailserver@sendermail.com)

- Now, the SMTP server locates the domain name of the recipient email address i.e. recipientmail.com from the email address (e.g. recipient@recipientmail.com)

- Then, the SMTP server contacts the server where the registry is kept (the DNS server).

- The DNS server sends back the address to the SMTP server.

Cont..

- The SMTP server then proceeds to hand over the email to the SMTP server of the recipient's email service (i.e. mailserver.recipientmail.com). This SMTP checks and confirms that the mail addressed to recipient@recipientmail.com belongs to it and hands it over to its counterpart the POP3 server.

- If some error occurred to send the email, the emails will be delayed. There is a mail queue in every mail server.

- These mails will be pending in the mail queue. The mail server will keep trying to send the resend the email.

- Once the email sending fails permanently, the mail server may send a bounce-back email message to the sender's email address.

- An SMTP session consists of commands originated by an SMTP client (the initiating agent, sender or transmitter) and corresponding responses from SMTP server (the listening agent or receiver) so that the session is opened, and session parameters are exchanged.

- SMTP is used by Mail Transfer Agent (MTA)

- ## **SMTP Methods:**
- Store and Forward method: Within an organization, the store and forward approach is utilized.
- End-to-End Method: The end-to-end technique is mostly used to communicate across companies.
- An SMTP client is the one who wishes to send the email and will undoubtedly make direct contact with the destination's host SMTP in order to deliver the email to the destination.
- The SMTP server, on the other hand, will retain the email to itself until it is successfully duplicated to the SMTP at the receiver. The SMTP server mostly responds to session requests.
- Thus, the client-SMTP initiates the session, and the server-SMTP responds to the sender's request.

- **Advantages of SMTP:**
- In terms of outgoing email messages, SMTP provides dependability.
- Email is the most basic method of communication between computers in a network.
- In the event that a message is not successfully delivered, the SMTP server will constantly attempt to re-send the message until the transmission is successful.
- **Disadvantages of SMTP:**
- SMTP does not offer adequate security.
- It only supports 7-bit ASCII characters.
- SMTP servers reject email messages that exceed a certain length.
- The simplicity of SMTP limits its utility.
- Transmission of executable and binary files is not feasible via SMTP unless they are transformed into text files.

POP
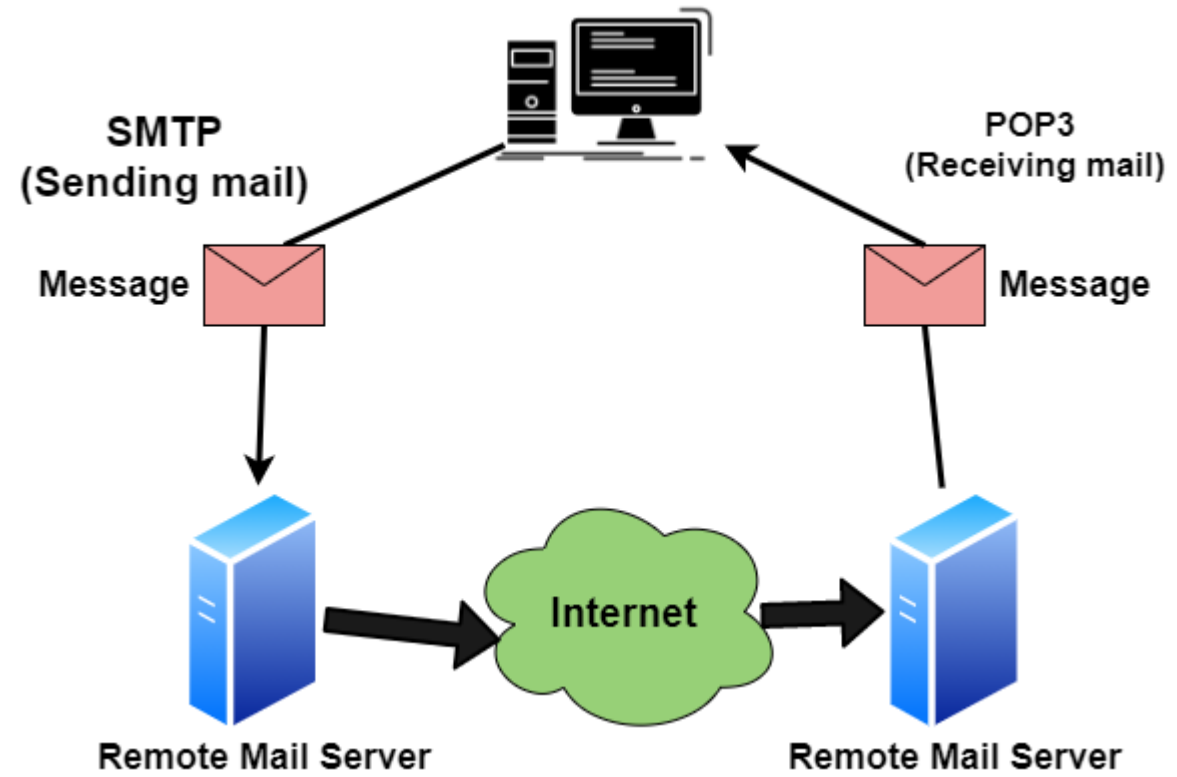
Introduction

- POP is a short form of Post Office Protocol. It is another protocol present at the Application Layer of the OSI reference model.

- POP is mainly a message access protocol.

- POP is basically an internet standard protocol and as we already told you it works on the application layer and is used by the local email software in order to retrieve emails from the remote email server over the TCP/IP connection.

- The Post office Protocol (POP) does not allow any search facility.

- This protocol mainly allows one protocol to be created on the server.

- As this protocol supports offline access to the messages and so less internet usage time is required by this.

- Non-email data is not accessed by this protocol.

- Some of the common clients that make use of POP3 are Gmail, Netscape, Internet Explorer, Eudora.

Working of POP

- All the incoming messages are stored on the POP server until the user login by using an email client and downloads the message to their computer. After the message is downloaded by the user it gets deleted from the server.

- As we know that the SMTP is used to transfer the email message from the server to the server, basically POP is used to collect the email with an email client from the server and it does not include means to send messages.

- If any user tries to check all the recent emails then they will establish a connection with the **POP3** at the server-side. The user sends the username and password to the server machine for getting the proper authentication. After getting the connection, users can receive all text-based emails and store them on their local terminal (machine), then finally discard all server copies and then breaks the connection from the server machine.

- In order to retrieve a message from the server following steps are taken;

- Firstly a TCP connection is established by the client using port 110.

- The client identifies itself to the server.

- After that client issues a series of POP3 commands.

Mail Server

Tom's Computer

POP3 Server

POP3 Client

User-name

OK

Password

OK

List

Email numbers and their sizes

retrieve 1

e-mail1

retrieve N

e-mail N
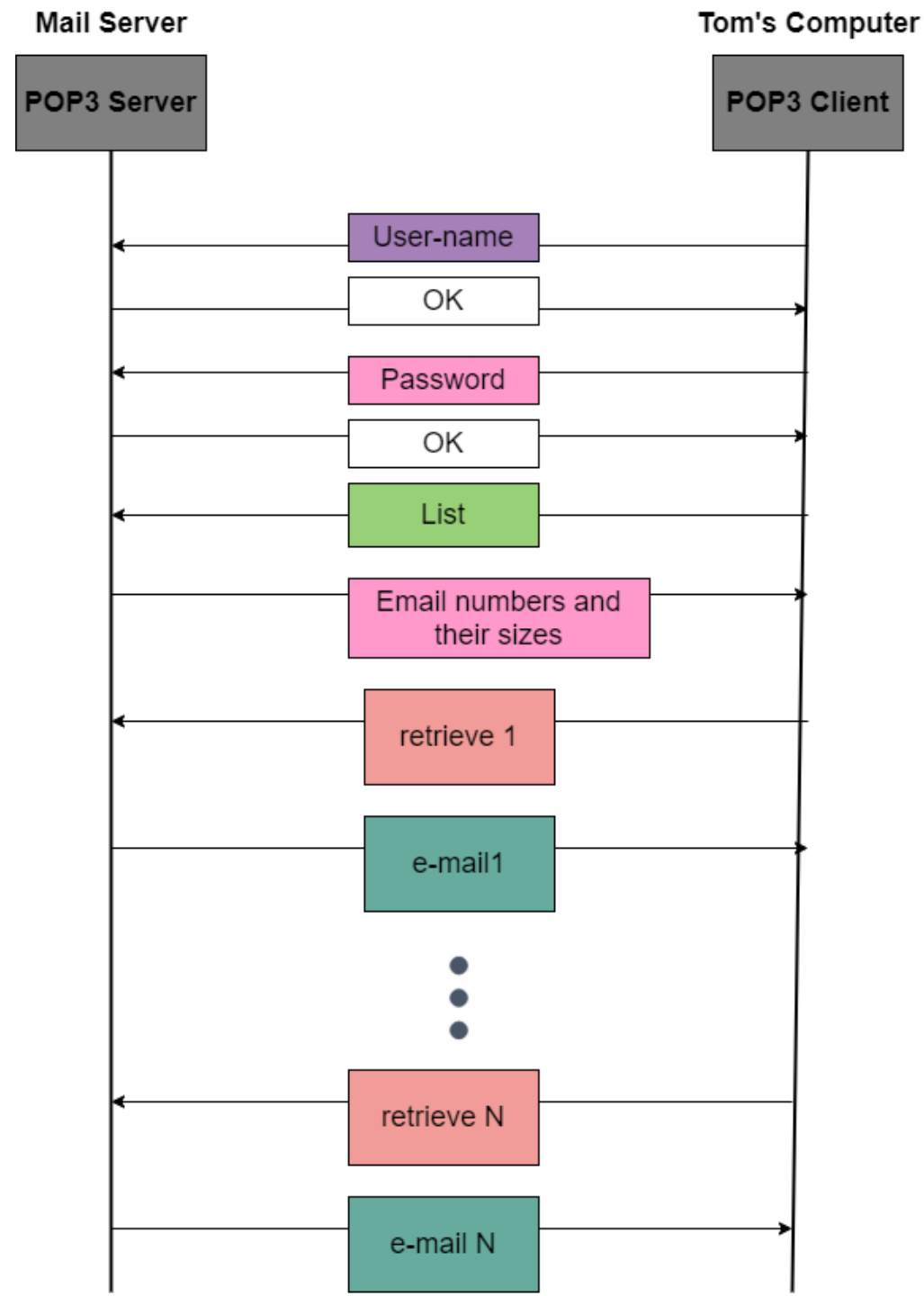
Features of POP protocol

- Given below are some of the features provided by the POP protocol:

- The POP protocol uses PORT 110.

- It makes the use of a Persistent TCP connection.

- It is a Pull protocol.

- It is a connection-oriented protocol.

- The POP protocol is a stateful protocol until the mail is downloaded and across the sessions, it is a stateless protocol.

POP commands

Commands	Description
LOGIN	This command is used to open a connection
STAT	This command is used to display the messages that are currently in the mailbox.
DELE	This command is used to delete a message.
RSET	This command is mainly used to reset the session to its initial state.
QUIT	This command is used to log off the session.
LIST	This command is mainly used to get the summary of each message where each message summary is shown.
RETR	This command is mainly used to select a mailbox in order to access the messages.

Advantages of POP

- This protocol does not require any internet connection in order to access the downloaded emails.

- In order to receive emails on a single device, POP3 is very useful.

- The Configuration of this protocol is simple and it is easy to use.

- Less storage space is needed in order to store emails on the hard disk.

- This protocol is much better for the ones who hardly check their email on any other computer.

Disadvantages of POP

- The same email account cannot be accessed from multiple computers or devices.

- The spread of the virus is easily using this protocol because it is possible that the file attached with the email contains the virus.

- The transfer of the local email folder to another email client terminal point is a difficult task.

IMAP

- IMAP stands for Internet Message Access Protocol.

- It is a standard protocol for accessing and managing email messages on a remote mail server.

- IMAP is widely used by email clients such as Microsoft Outlook, Apple Mail, and Thunderbird.

How IMAP works

- IMAP allows you to keep your email messages on the server and synchronize them with your email client.

- When you connect to an email account using IMAP, the email client downloads a copy of the message headers and body from the server.

- You can then read, reply, forward, or delete the messages using your email client.

- Any changes you make to the messages are reflected on the server, so you can access the same messages from multiple devices.

Advantages of using IMAP

- IMAP allows you to access your email messages from multiple devices.

- You can keep your email messages on the server and free up space on your local device.

- IMAP allows you to organize your email messages into folders on the server, so you can access them from any device.

- IMAP supports advanced features such as server-side searching, message flags, and message threading.

Potential drawbacks of using IMAP

- IMAP requires a stable internet connection to access your email messages.
- If your email provider has limited storage space on the server, you may need to periodically delete old messages or pay for additional storage.
- Some email clients may not fully support all of the advanced IMAP features.
- IMAP may be slower than POP3 when downloading large attachments or a large number of messages.
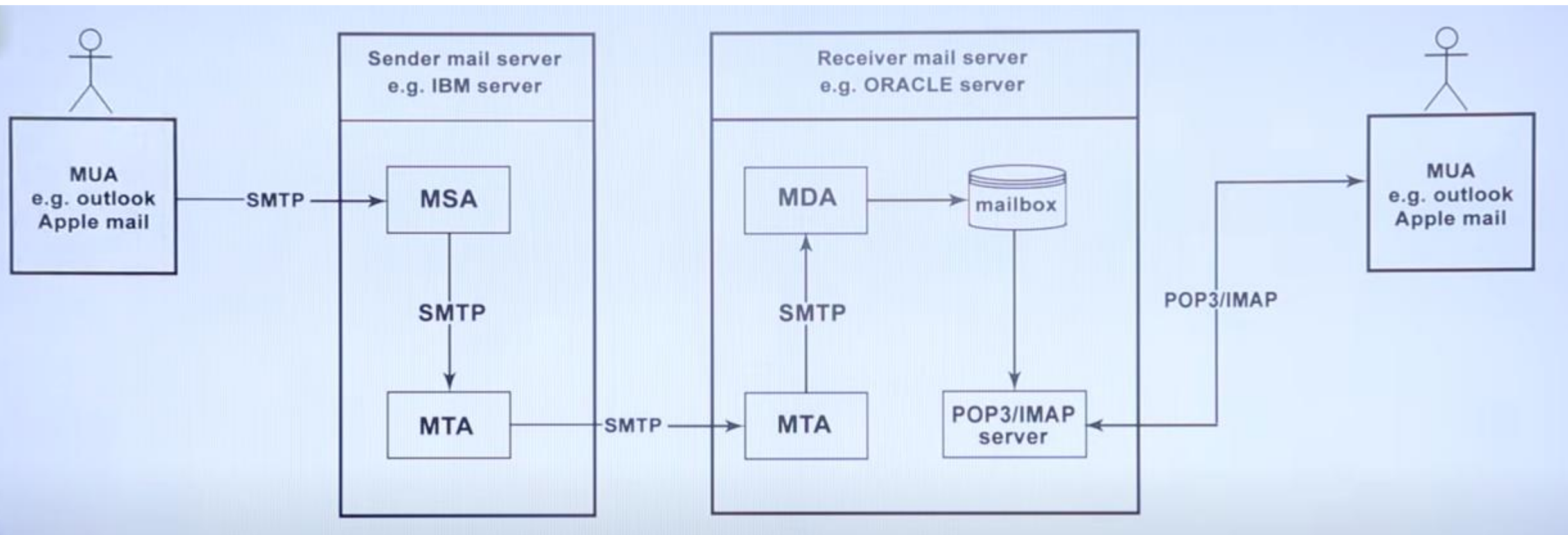
Feature	POP3	IMAP
Mail Retention	Download and delete from server	Synchronizes between server and client
Message Access	Downloads entire message to device	Downloads only header and body when needed
Message Management	Basic functionality to download and delete	Allows management of messages on the server, including moving and flagging
Storage Capacity	Requires less storage as messages are downloaded and deleted	Requires more storage as messages are stored on the server
Multiple Devices	Can only access email on one device	Allows access to email on multiple devices
Connection Stability	Does not require a stable internet connection to access downloaded messages	Requires a stable internet connection to access messages on the server
Offline Access	Can access downloaded messages offline	Requires an internet connection to access messages
Advanced Features Support	Does not support advanced features	Supports advanced features such as server-side searching, message threading, and sorting
Security	Limited security features	Supports advanced security features such as SSL encryption and two-factor authentication
Speed	Faster when downloading large attachments or a large number of messages	Slower when downloading large attachments or a large number of messages

Note: POP3 and IMAP are both protocols for email retrieval, but there are some differences in their features and capabilities. POP3 is simpler and more limited than IMAP, whereas IMAP is more flexible and feature-rich. The choice between the two largely depends on individual user needs and preferences.

FTP

- It is a client-server protocol that relies on two communication channels between client and server: - a command channel for controlling the conversation, and - a data channel for transmitting the file content.
- Client initiate conversations with servers by requesting to transfer a file.
- Using FTP, a client can upload, download, delete, and rename, move and copy files on the server.
- A user typically needs to login to FTP server with essential details (hostname, username, password, port number and accepting security certificates)
- FTP is often secured with SSL/TLS (FTPS), for secure transmission that protects the username and password and encrypts the content.
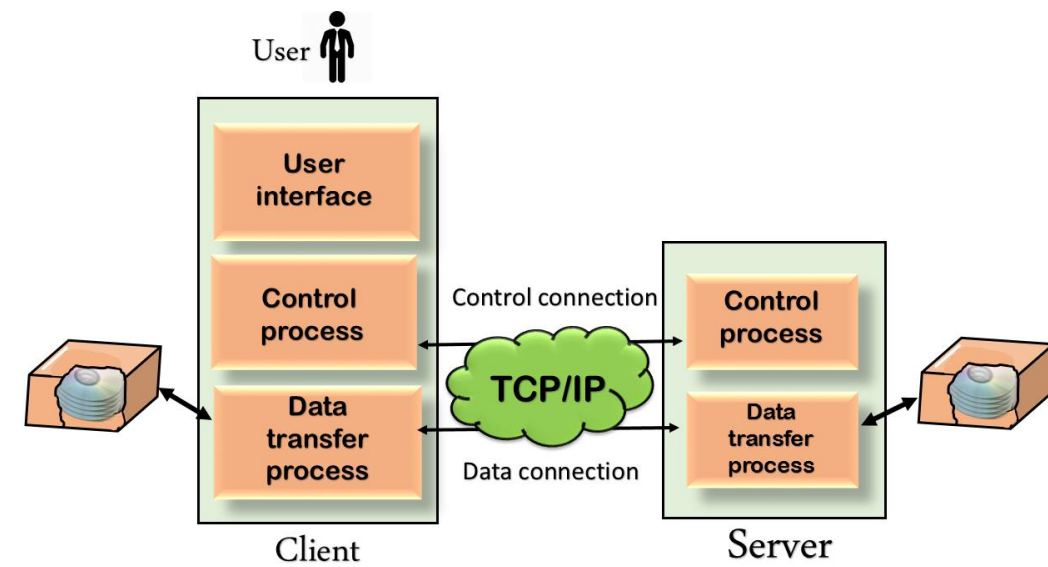
- FTP stands for File transfer protocol.
- FTP is a standard internet protocol provided by TCP/IP used for transmitting the files from one host to another.
- It is mainly used for transferring the web page files from their creator to the computer that acts as a server for other computers on the internet.
- It is also used for downloading the files to computer from other servers.

Objectives of FTP

- It provides the sharing of files.
- It is used to encourage the use of remote computers.
- It transfers the data more reliably and efficiently.
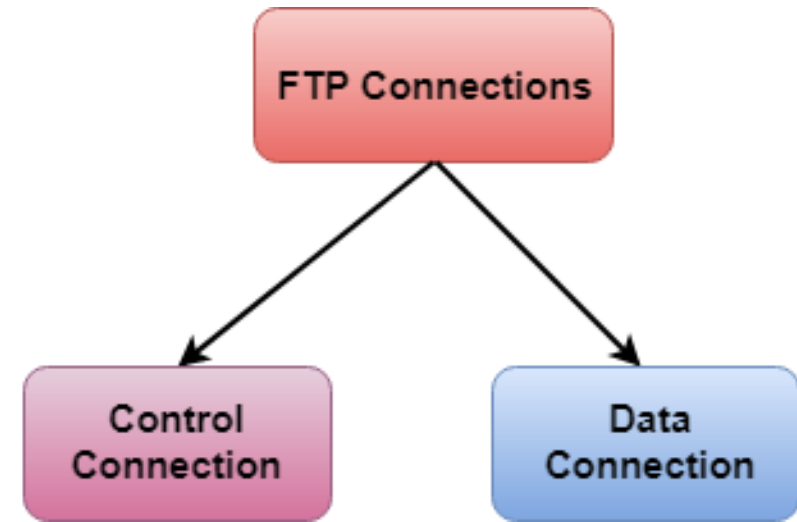
There are two types of connections in FTP:

•**Control Connection:** The control connection uses very simple rules for communication. Through control connection, we can transfer a line of command or line of response at a time. The control connection is made between the control processes. The control connection remains connected during the entire interactive FTP session.

•**Data Connection:** The Data Connection uses very complex rules as data types may vary. The data connection is made between data transfer processes. The data connection opens when a command comes for transferring the files and closes when the file is transferred.

FTP Clients

•FTP client is a program that implements a file transfer protocol that allows you to transfer files between two hosts on the internet.

•It allows a user to connect to a remote host and upload or download the files.

•It has a set of commands that we can use to connect to a host, transfer the files between you and your host and close the connection.

•The FTP program is also available as a built-in component in a Web browser. This GUI-based FTP client makes the file transfer very easy and also does not require remembering the FTP commands.

Advantages of FTP:

•**Speed:** One of the biggest advantages of FTP is speed. FTP is one of the fastest ways to transfer files from one computer to another.

•**Efficient:** It is more efficient as we do not need to complete all the operations to get the entire file.

•**Security:** To access the FTP server, we need to log in with the username and password. Therefore, we can say that FTP is more secure.

•**Back & forth movement:** FTP allows us to transfer the files back and forth. Suppose you are a manager of the company, you send some information to all the employees, and they all send information back on the same server.

Disadvantages of FTP:

•The standard requirement of the industry is that all FTP transmissions should be encrypted. However, not all FTP providers are equal, and not all providers offer encryption. So, we will have to look for FTP providers that provide encryption.

•FTP serves two operations, i.e., to send and receive large files on a network. However, the size limit of the file is 2GB which can be sent. It also doesn't allow you to run simultaneous transfers to multiple receivers.

•Passwords and file contents are sent in clear text, allowing unwanted eavesdropping. So, it is quite possible that attackers can carry out the brute force attack by trying to guess the FTP password.

•It is not compatible with every system.

HTTP

•HTTP stands for **HyperText Transfer Protocol**.

•It is a protocol used to access the data on the World Wide Web (www).

•The HTTP protocol can be used to transfer data in the form of plain text, hypertext, audio, video, and so on.

•This protocol is known as HyperText Transfer Protocol because of its efficiency which allows us to use in a hypertext environment where there are rapid jumps from one document to another document.

•HTTP is similar to FTP as it also transfers files from one host to another host. But, HTTP is simpler than FTP as HTTP uses only one connection, i.e., no control connection to transfer the files.

•HTTP is used to carry the data in the form of MIME(Multipurpose Internet Mail Extensions)-like format.

•HTTP is similar to SMTP as the data is transferred between the client and server. The HTTP differs from the SMTP in the way the messages are sent from the client to the server and from the server to the client. SMTP messages are stored and forwarded while HTTP messages are delivered immediately.

- It is an application protocol for distributed, collaborative, and hypermedia information systems.
- The Hypertext Transfer Protocol (HTTP) is designed to enable communications between clients and servers i.e. all Web communications transactions use the same protocol: HTTP
- HTTP consists of two phases: the request and the response.
- Each HTTP communication (request and response) between a browser and a Web server consists of two parts: a header and a body.
- The header contains information about the communication, while the body contains the data of the communication if there is any

The Request Phase: The general form of an HTTP request is as follows:
 i. HTTP method Domain part of the URL HTTP version
ii. Header fields
iii. Blank line
iv. Message body
Only a few request methods are defined by HTTP

Method	Description
GET	Returns the contents of the specified document
HEAD	Returns the header information for the specified document
POST	Executes the specified document, using the enclosed data
PUT	Replaces the specified document with the enclosed data
DELETE	Deletes the specified document

GET and POST are the most frequently used methods. POST is now most commonly used to send form data from a browser to a server.

The Response Phase

The general form of an HTTP response is as follows:

i. Status Line

ii. Response header fields

iii. Blank Line

iv. Response body

The status line includes the HTTP version used, a three-digit status code for the response, and a short textual explanation of the status code.

| First Digit	Category
1	Informational
2	Success
3	Redirection
4	Client error
5	Server error

Most common status codes are:

- 404 Not Found: means the requested file could not be found

- 200 OK : means the request was handled without error

- 500 the server encountered a problem : means server was not able to fulfill the request

Features of HTTP:

•**Connectionless protocol:** HTTP is a connectionless protocol. HTTP client initiates a request and waits for a response from the server. When the server receives the request, the server processes the request and sends back the response to the HTTP client after which the client disconnects the connection. The connection between the client and server exists only during the current request and response time only.

•**Media independent:** HTTP protocol is media independent as data can be sent as long as both the client and server know how to handle the data content. It is required for both the client and server to specify the content type in the MIME-type header.

•**Stateless:** HTTP is a stateless protocol as both the client and server know each other only during the current request. Due to the nature of the protocol, both the client and server do not retain the information between various requests of the web pages.

•Client server architecture

HTTP Transactions

This is a
request.

This is a
response.

HTTP Message
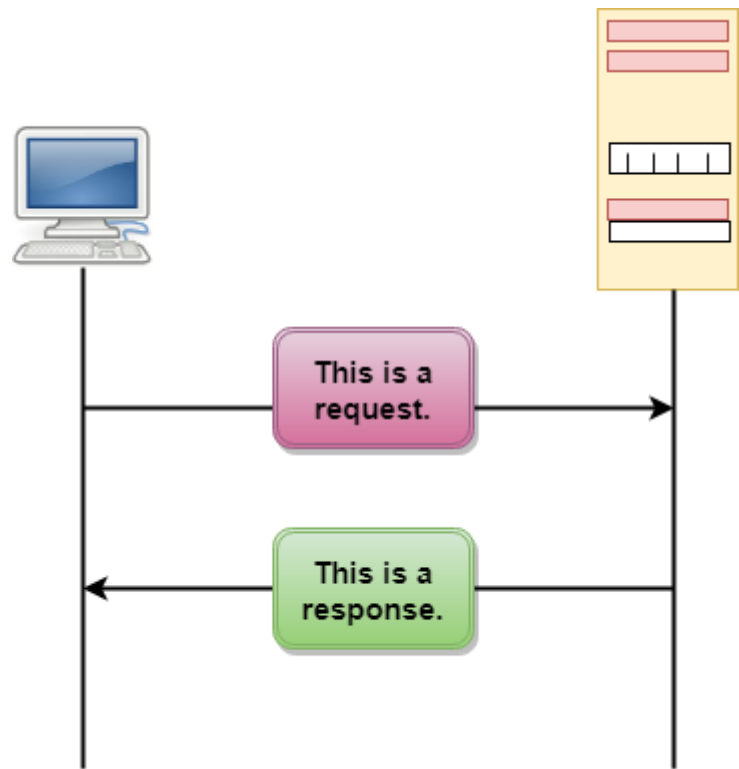
Messages
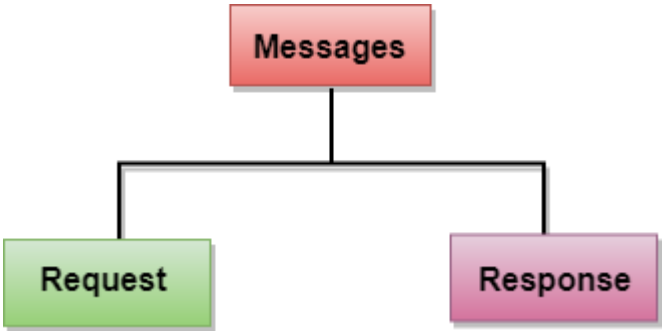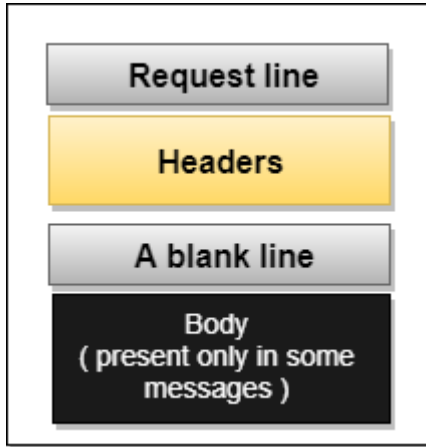
Request

Response
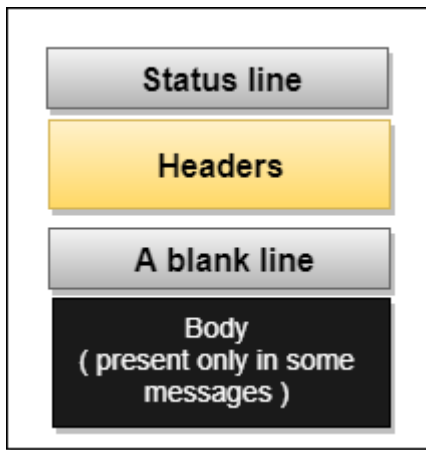
Request Message: The request message is sent by the client that consists of a request line, headers, and sometimes a body.
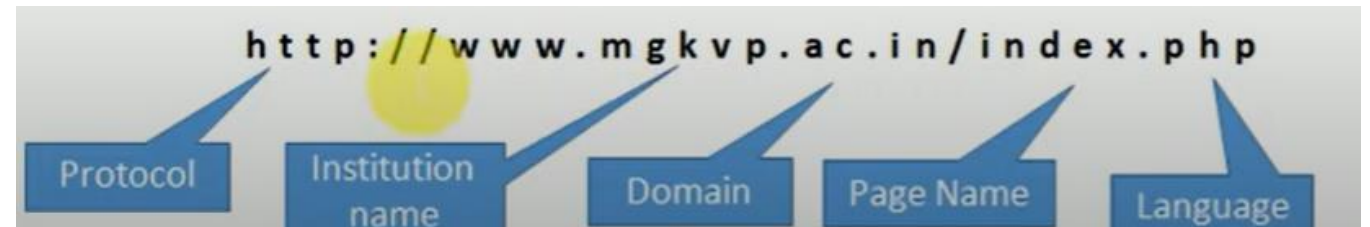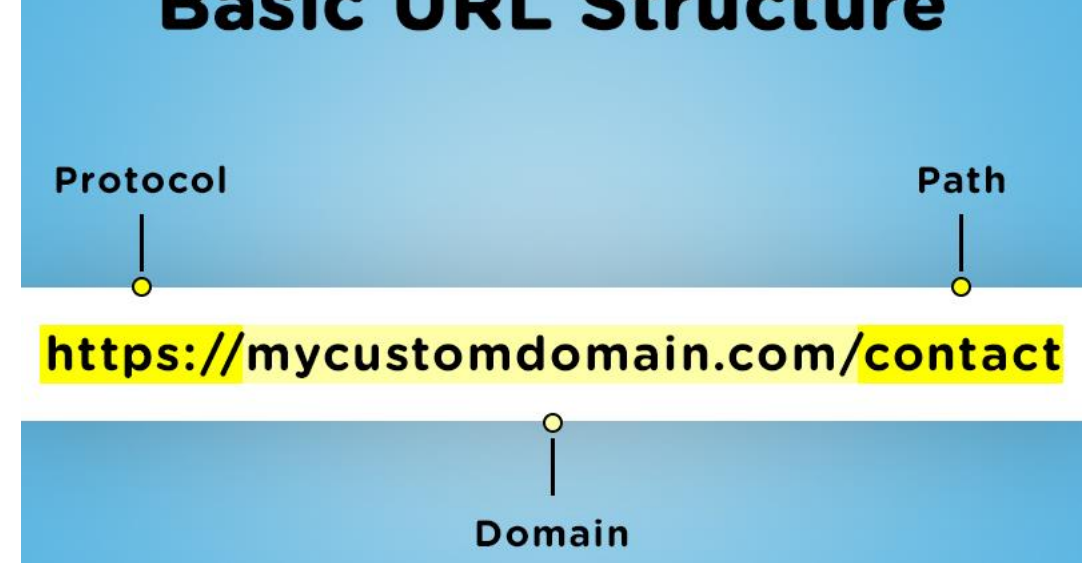

Response Message: The response message is sent by the server to the client that consists of a status line, headers, and sometimes a body.

Uniform Resource Locator (URL)

• A client that wants to access the document in an internet needs an address and to facilitate the access of documents, the HTTP uses the concept of Uniform Resource Locator (URL).

• The Uniform Resource Locator (URL) is a standard way of specifying any kind of information on the internet.

• The URL defines four parts: method, host computer, port, and path.

Basic URL Structure

Protocol   Path

https://mycustomdomain.com/contact

Domain

• **Method:** The method is the protocol used to retrieve the document from a server. For example, HTTP.

• **Host:** The host is the computer where the information is stored, and the computer is given an alias name. Web pages are mainly stored in computers and the computers are given an alias name that begins with the character "www". This field is not mandatory.

• **Port:** The URL can also contain the port number of the server, but it's an optional field. If the port number is included, then it must come between the host and path and it should be separated from the host by a colon.

• **Path:** Path is the pathname of the file where the information is stored. The path itself contain slashes that separate the directories from the subdirectories and files.

URL
Uniform Resource Locator

| Method | :// | Host | : | Port | / | Path |

http://www.mgkvp.ac.in/index.php

Protocol   Institution name   Domain   Page Name   Language

Types

Absoulte

It's the exact address of any website. We can click and move to absolute pages
http://www.facebook.com

Relative:

A relative URL represent to particular attachments like web pages,images ,pdf file in HTML program
HOMEAbsolute

URL Examples (Domain Name Bold)

- https://www.**harvard.edu**/about-harvard/harvard-glance
- https://en.**wikipedia.org**/wiki/World_Wide_Web
- https://www.**jal.co.jp**/en/information/
- https://**dublin.ie**/whats-on/
- https://www.**leadpages.net**/templates

Domain vs Website

A **website** is a collection of web pages grouped together under one name: the **domain name.**

So a website is like your house and (again) the domain name is its address. Domain names get associated with a website through a **registration process**; you'll need to register a domain name before anyone can use it to get to your site.

Domain vs Hosting

If your domain is the address, and your website is your house, then web hosting is the plot of land on which your house is built.

Websites are hosted on computers called **web servers,** which run special software (Apache and Nginx are two popular examples) that lets them find the website's data and send it to your web browser when you try to visit the site.

WAP

[WAP is] the de facto worldwide standard for providing Internet communications and advanced telephony services on digital mobile phones, pagers, personal digital assistants, and other wireless terminals –WAP Forum

WAP stands for **W**ireless **A**pplication **P**rotocol. The dictionary definition of these terms are as follows –

- **Wireless** – Lacking or not requiring a wire or wires pertaining to radio transmission.
- **Application** – A computer program or piece of computer software that is designed to do a specific task.
- **Protocol** – A set of technical rules about how information should be transmitted and received using computers.

WAP is the set of rules governing the transmission and reception of data by computer applications on or via wireless devices like mobile phones. WAP allows wireless devices to view specifically designed pages from the Internet using only plain text and very simple black-and-white pictures.

WAP is a standardized technology for cross-platform, distributed computing very similar to the Internet's combination of Hypertext Markup Language (HTML) and Hypertext Transfer Protocol (HTTP), except that it is optimized for:

- low-display capability
- low-memory
- low-bandwidth devices, such as personal digital assistants (PDAs), wireless phones, and pagers.

WAP is designed to scale across a broad range of wireless networks like GSM, IS-95, IS-136, and PDC.
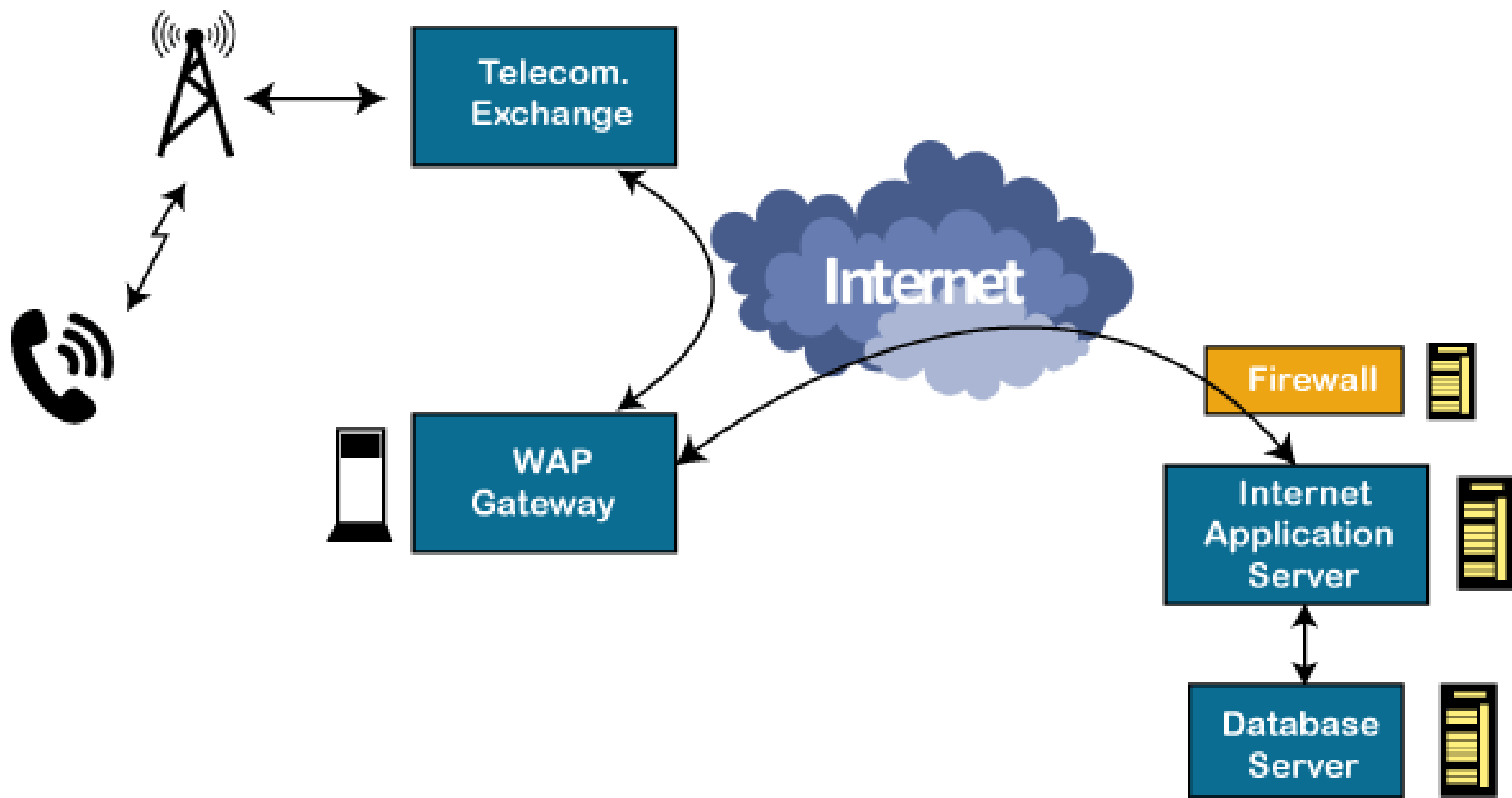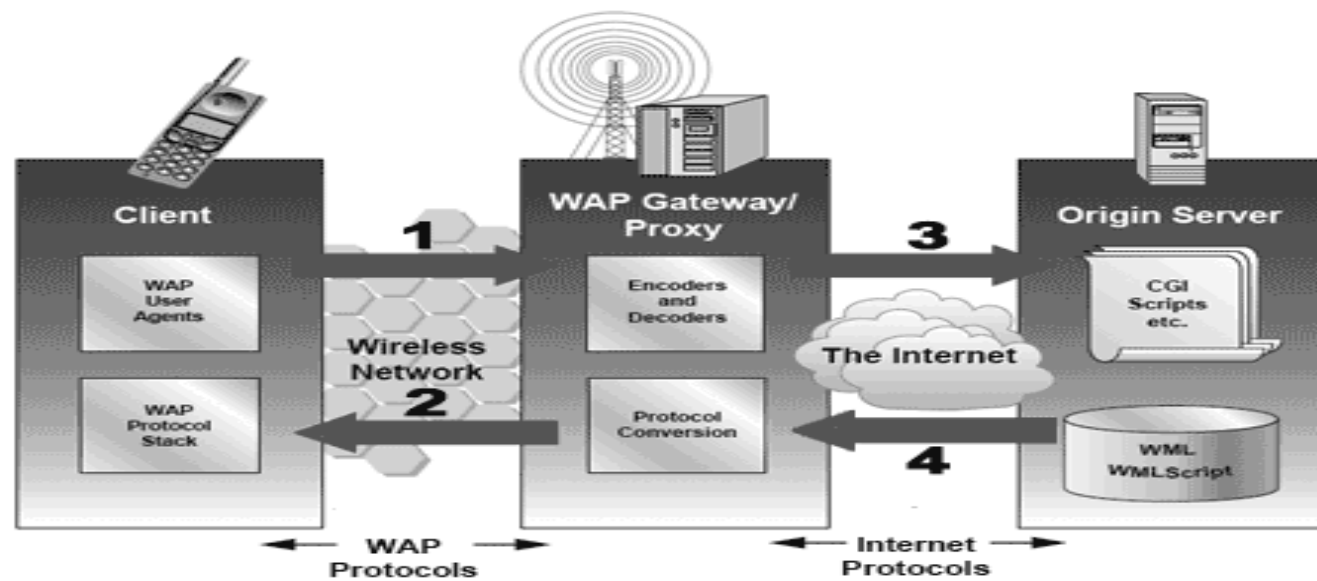
1 -- WSP Request (URL)
2 -- WSP Response (Binary WML)
3 -- HTTP Request (URL)
3 -- HTTP Response (WML)

Working mechanism

•The user selects an option on their mobile device that has a URL with Wireless Markup language (WML) content assigned to it.
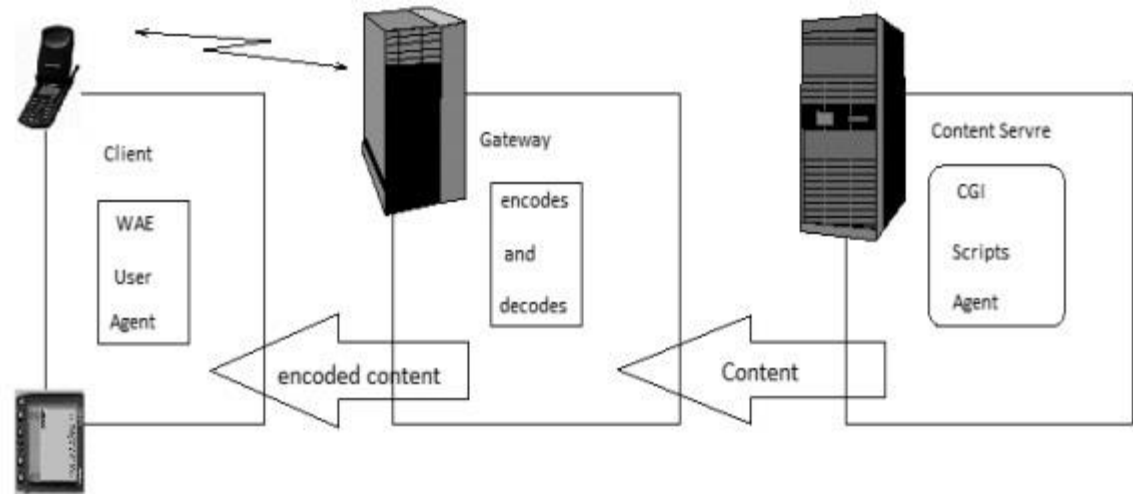
•The phone sends the URL request via the phone network to a WAP gateway using the binary encoded WAP protocol.

•The gateway translates this WAP request into a conventional HTTP request for the specified URL and sends it on to the Internet.

•The appropriate Web server picks up the HTTP request.

•The server processes the request just as it would any other request. If the URL refers to a static WML file, the server delivers it. If a CGI script is requested, it is processed and the content returned as usual.

•The Web server adds the HTTP header to the WML content and returns it to the gateway.

•The WAP gateway compiles the WML into binary form.

•The gateway then sends the WML response back to the phone.

•The phone receives the WML via the WAP protocol.

•The micro-browser processes the WML and displays the content on the screen.

Advantages of Wireless Application Protocol (WAP)

Following is a list of some advantages of Wireless Application Protocol or WAP:

•WAP is a very fast-paced technology.

•It is an open-source technology and completely free of cost.

•It can be implemented on multiple platforms.

•It is independent of network standards.

•It provides higher controlling options.

•It is implemented near to Internet model.

•By using WAP, you can send/receive real-time data.

•Nowadays, most modern mobile phones and devices support WAP.

Disadvantages of Wireless Application Protocol (WAP)

Following is a list of some disadvantages of Wireless Application Protocol or WAP:

•The connection speed in WAP is slow, and there is limited availability also.

•In some areas, the ability to connect to the Internet is very sparse, and in some other areas, Internet access is entirely unavailable.

•It is less secured.

•WAP provides a small User interface (UI).

Applications of Wireless Application Protocol (WAP)

The following are some most used applications of Wireless Application Protocol or WAP:

- WAP facilitates you to access the Internet from your mobile devices.
- You can play games on mobile devices over wireless devices.
- It facilitates you to access E-mails over the mobile Internet.
- Mobile handsets can be used to access timesheets and fill expense claims.
- Online mobile banking is very popular nowadays.
- It can also be used in multiple Internet-based services such as geographical location, Weather forecasting, Flight information, Movie & cinema information, Traffic updates, etc. All are possible due to WAP technology.

What is Domain

Domain names are (ideally) easy to remember words that are used to find and go to websites. In simple terms, a domain name is like **an address for your website.**

A domain name is the unique identity of one or more IP addresses; for example, the domain name google.com points to the IP address "74.125.127.147".

Domain names are invented as a name is easy to remember rather than a long string of numbers. It would be easy to enter a domain name in the search bar than a long sequence of numbers.

So, it is the web address of your website that people need to type in the browser URL bar to visit your website. In simple words, suppose your website is a house, then the domain name is its address.

A domain name cannot have more than sixty-three characters excluding .com, .net, .org, .edu, etc. The minimum length of a domain is one character excluding the extensions. It is entered in the URL after the protocol and subdomain as shown in the following example and the image:

Uniform Resource Locator(URL)

Protocol (HyperText Transfer)   domain (name)

http:// www .google . com

subdomain   Top Level Domain TLD
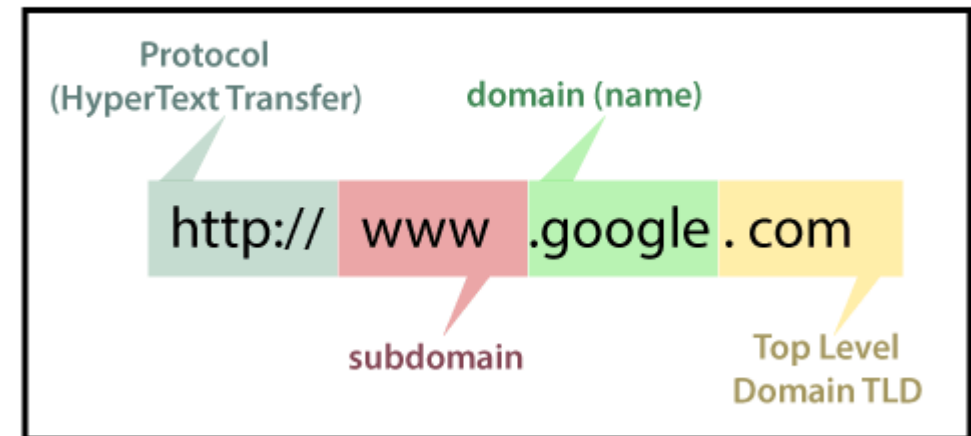
Types of domain

- Primary
- Subdomain
- Top-level

http://www.facebook.com

www:sub
Facebook: Primary
.com:top

HOW DOMAIN NAMES WORK

Successful Connection

Call

Response

Web Hosting Servers

DNS Servers

① I need directions to createaprowebsite.com

② That's in my cache! It maps to IP address 50.28.56.78

③ Thanks! Now to learn more about making websites.
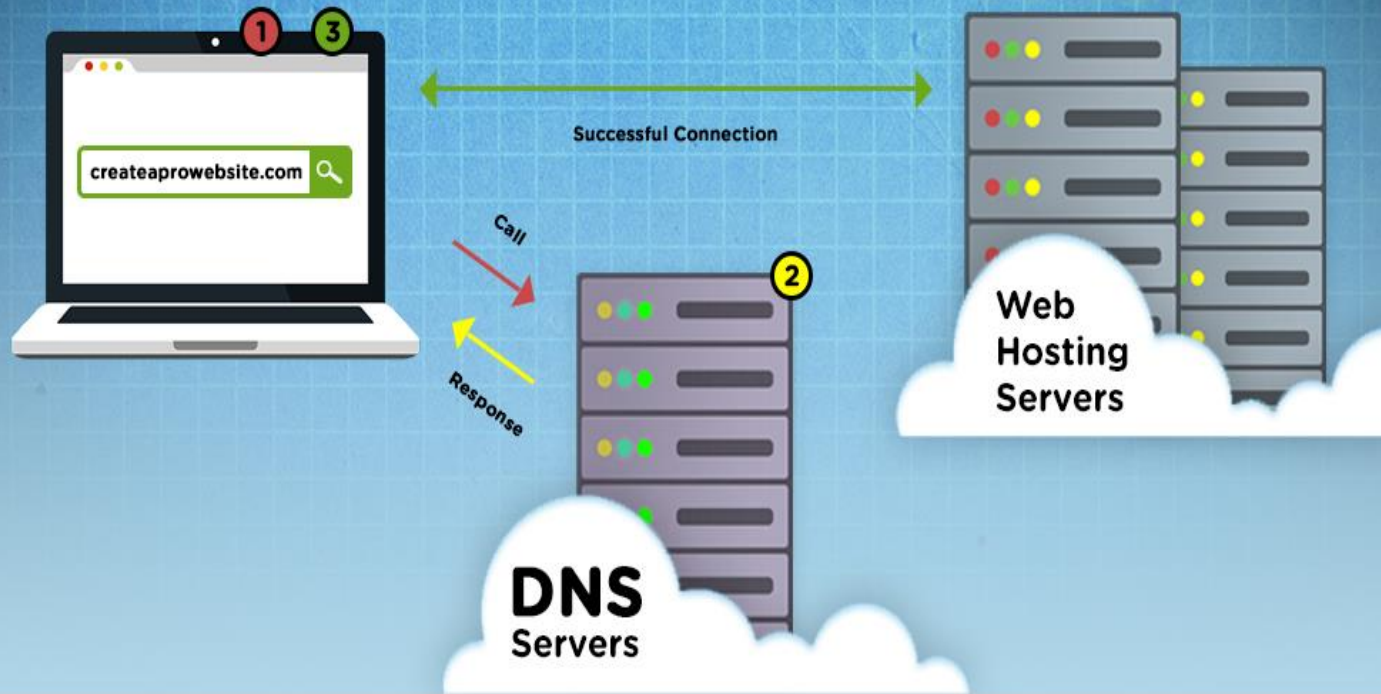
-When you enter a domain name into your browser to find a website, your computer sends a "**lookup request**" to a global network of servers called the **Domain Name System (DNS)**.
-The DNS is a massive database of millions of registered domain names, each associated with a particular website's nameserver and IP address.
-When the DNS gets your lookup request, it finds the nameserver associated with the domain name you're using; this is usually managed by your **hosting company.**

How Do Domain Names Work?

To get a little more technical (not too much we promise), the computers on the internet, from that laptop your reader is using to the servers that host your website has an **IP address**, which is a series of 4-12 numbers separated by dots (.) that let's computers identify and find each other.
For example, here's the IP address for my computer

What's my IP

110.44.118.28
Your public IP address
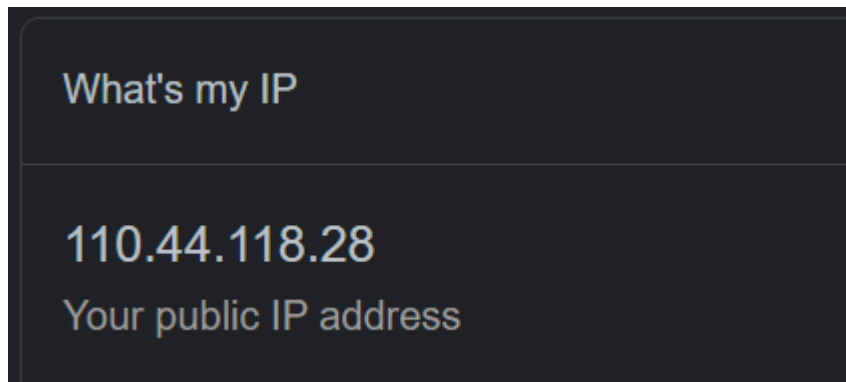
While these numbers are great for machines, it'd be hard to remember 12 digits for every website you want to go to. That's where domain names come in.
With a domain name, you can visit a website by typing in an easy-to-remember word or phrase, like **ncit.edu.np**
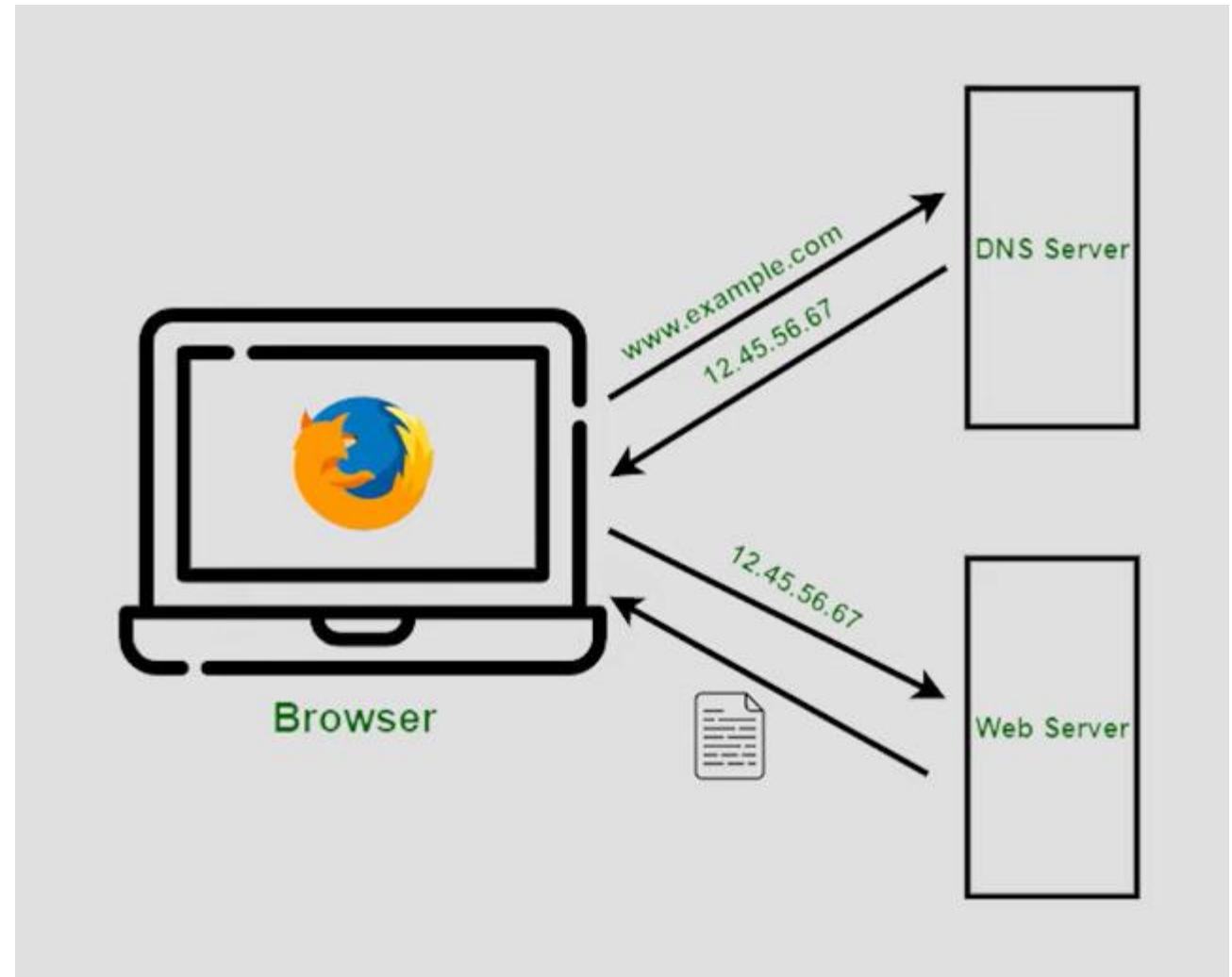
Where to buy domain

Domain Name system(DNS) or Domain name server

- The **Domain Name System (DNS)** can be thought of as the directory of the Internet.

- We find an online page or website by typing in the URL – like *acme.com* or *some-site.com.*

- Our web browsers, on the other hand, need to translate the URL to Internet Protocol (IP) addresses to find the correct site.

- **It is a DNS that translates domain names to IP addresses** so our browsers can resolve, or connect to, requested Internet resources.

- **Every single device on the Internet has a unique IP address** by which it can be **uniquely identified** by the other online devices.

- A DNS server eliminates the need for us to memorize these IP addresses every time we want to visit a site or connect to a device. It is much easier for us to type in a URL than IPv4 IP addresses (E.g. 192.168.1.1) or, worse, the more complex IPv6 addresses (E.g. 2400:cb00:2048:1::c629:d7a2).

- **The DNS architecture consists of a hierarchical and decentralized name resolution system** for computers, services or any other resources connected to the Internet or a private network. It stores the various associated information of the domain names assigned to each of the resources.

DNS lookup to find IP address

After hitting the URL, the first thing that needs to happen is to resolve IP address associated with the domain name. DNS helps in resolving this. **DNS is like a phone book** and **helps us to provide the IP address** that is associated with the domain name just like our phone book gives a mobile number which is associated with the person's name.

Browser — youtube.com — DNS — 199.223.232.0
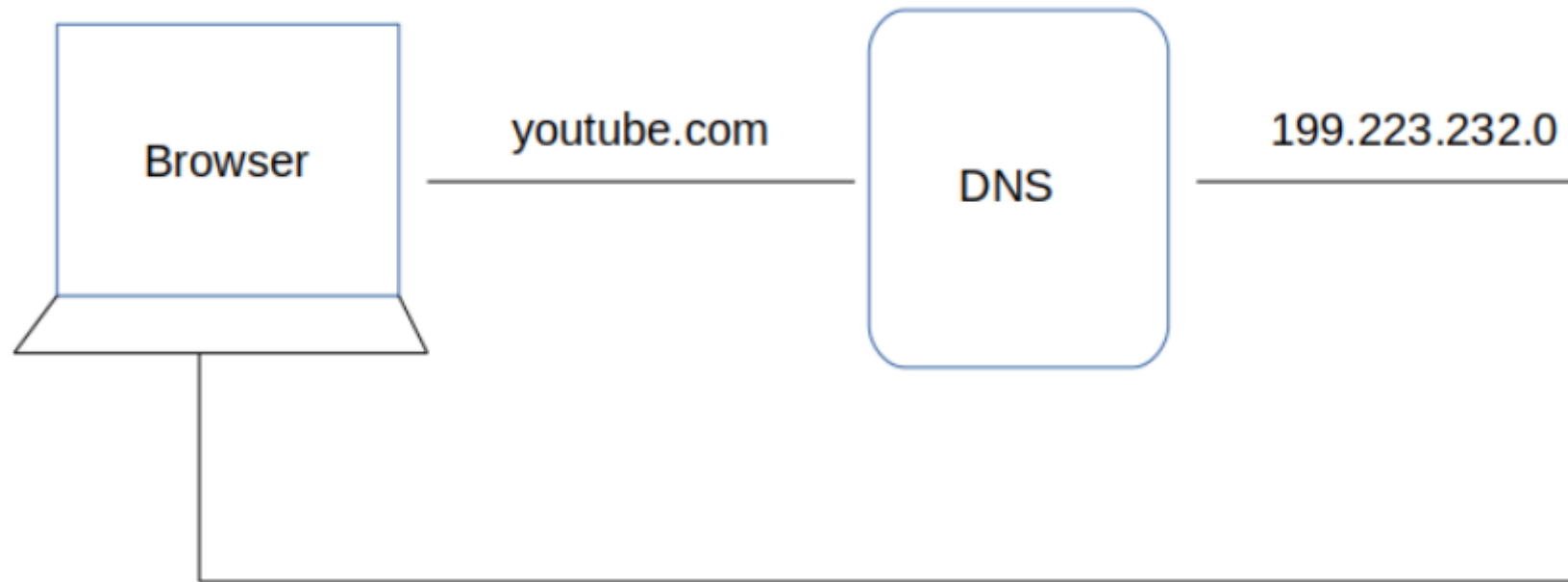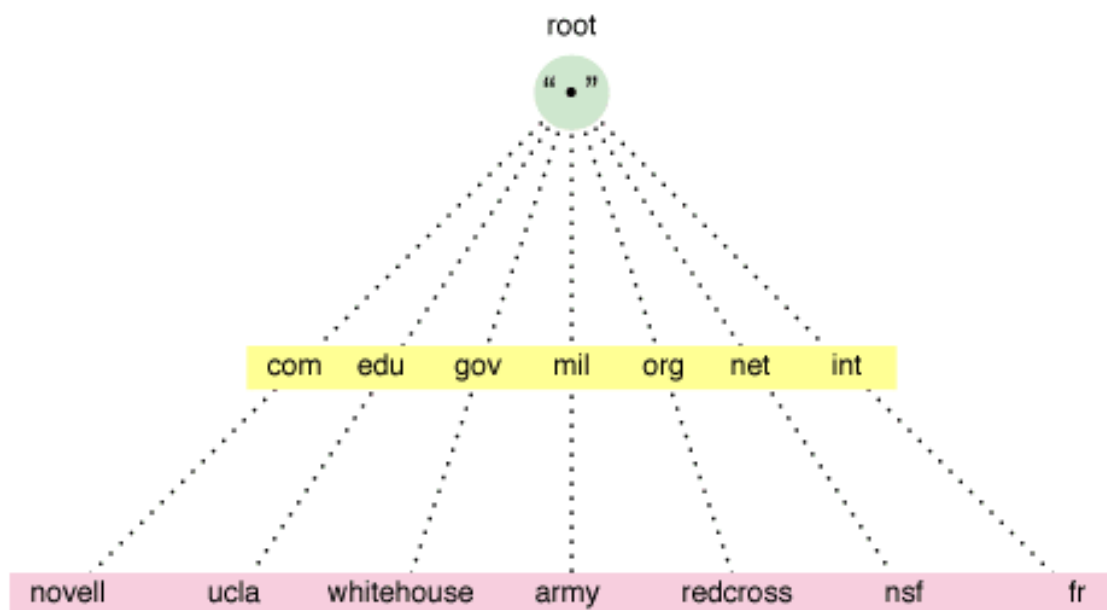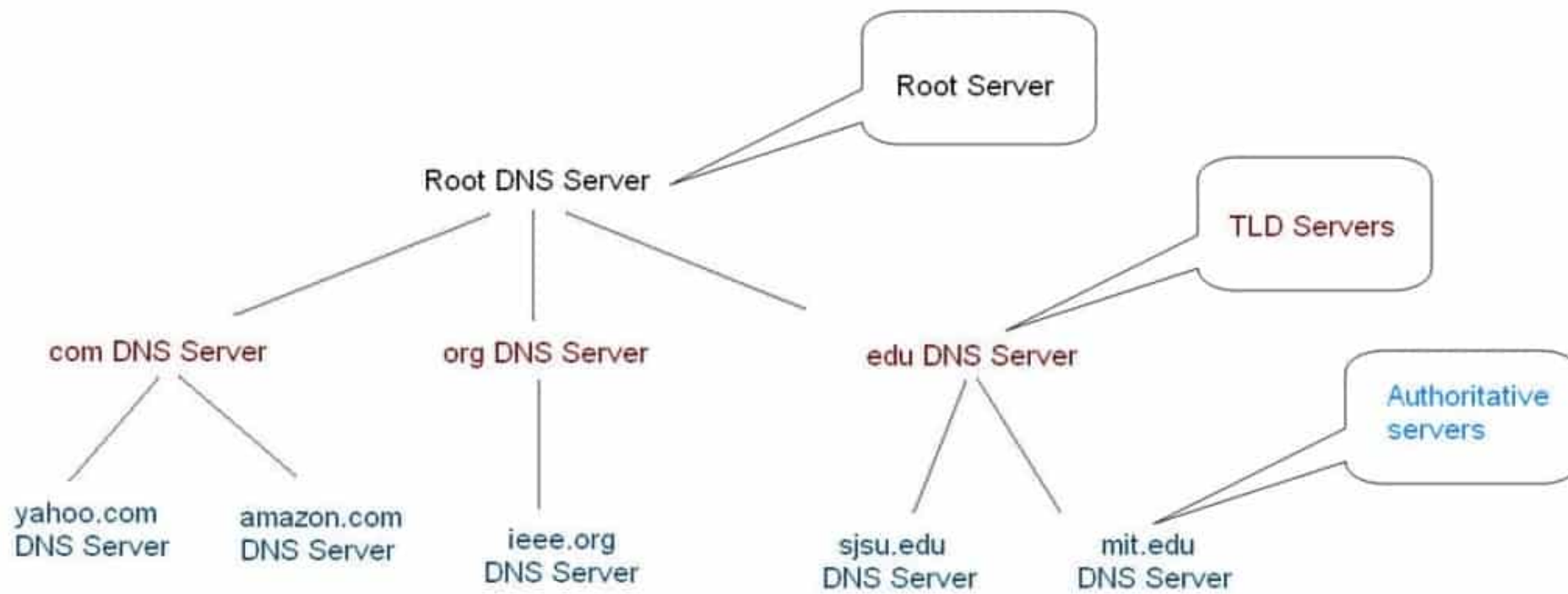
Domain	Used by
.com	Commercial organizations, as in novell.com
.edu	Educational organizations, as in ucla.edu
.gov	Governmental agencies, as in whitehouse.gov
.mil	Military organizations, as in army.mil
.org	Nonprofit organizations, as in redcross.org
.net	Networking entities, as in nsf.net
.int	International organizations, as in nato.int
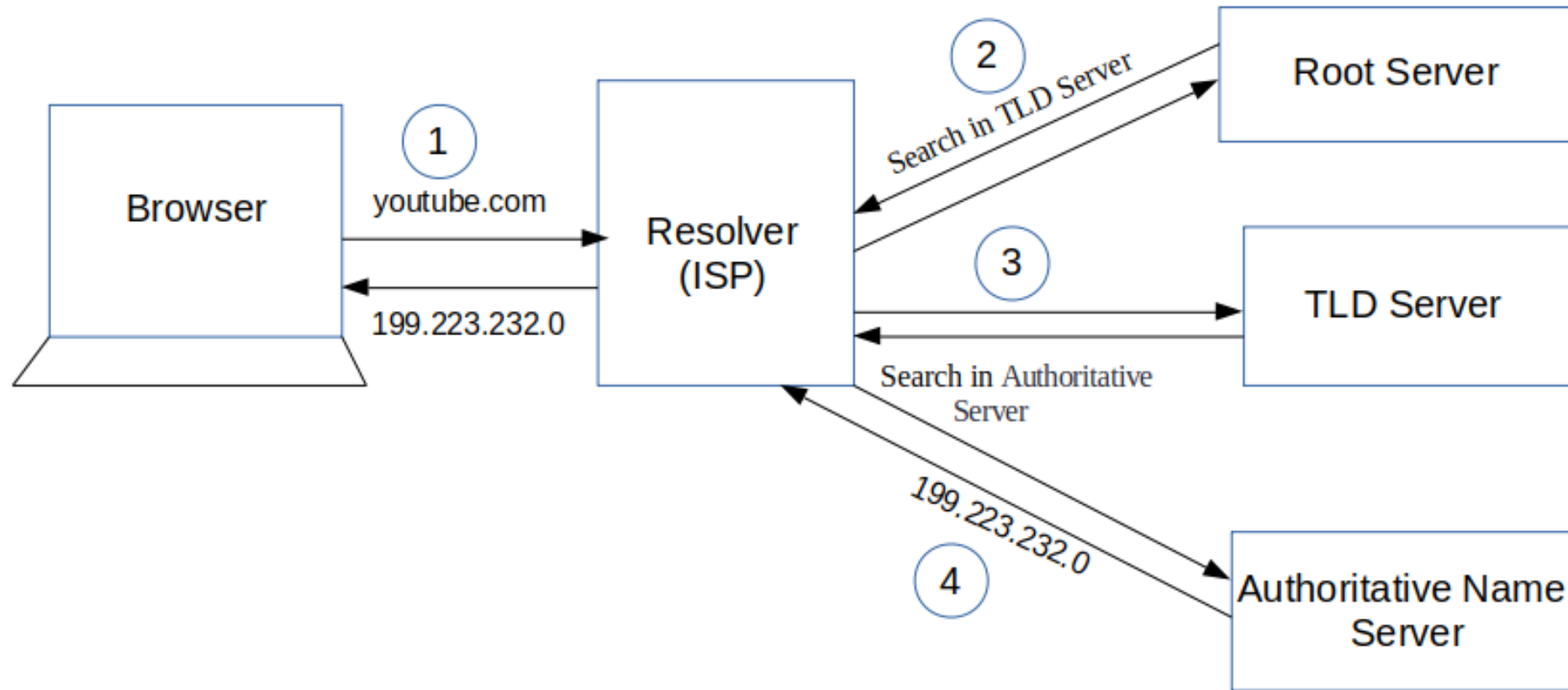
What happens when
you type some URL
in the browser
following the below
vlog
https://blog.ehoneahobed.com/what-happens-when-you-type-
wwwgooglecom-in-your-browser-and-press-enter

Fully Qualified Domain Name or FQDN?

It is:

•**The most complete domain name** that identifies a page, host, server or any other online resource.

•**A domain name that specifies its exact location in the DNS hierarchy tree**; it specifies all domain levels, including the Top-Level Domain and the Root Level.

The DNS hierarchy, also called the **domain name space**, is an inverted tree structure. The DNS hierarchy tree has a single domain at the top of the structure called the root domain – indicated by the "." as we have mentioned above. Below the root domain are the top-level domains that divide the DNS hierarchy into segments containing second-level domains, sub-domains, and hosts.

Hence, the DNS hierarchy is comprised of the following five levels:

•**Root Level Domain**

•**Top Level Domains (TLD)**

•**Second Level Domains (SLD)**

•**Subdomains**

•**Hosts**

FQDN components

api.aws.amazon.com.

- host
- SLD
- TLD
- root
- sub domain
- domain name

Protocol

http://www.tinydancinghorse.com

- Subdomain
- Domain Name
- Top-level Domain

Root Domain
(includes domain name and top-level domain)
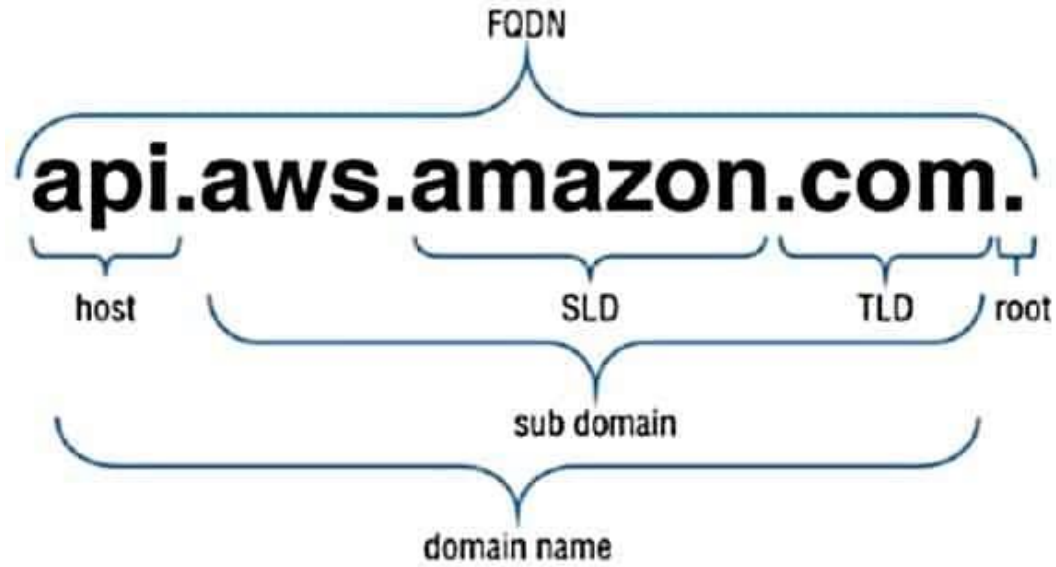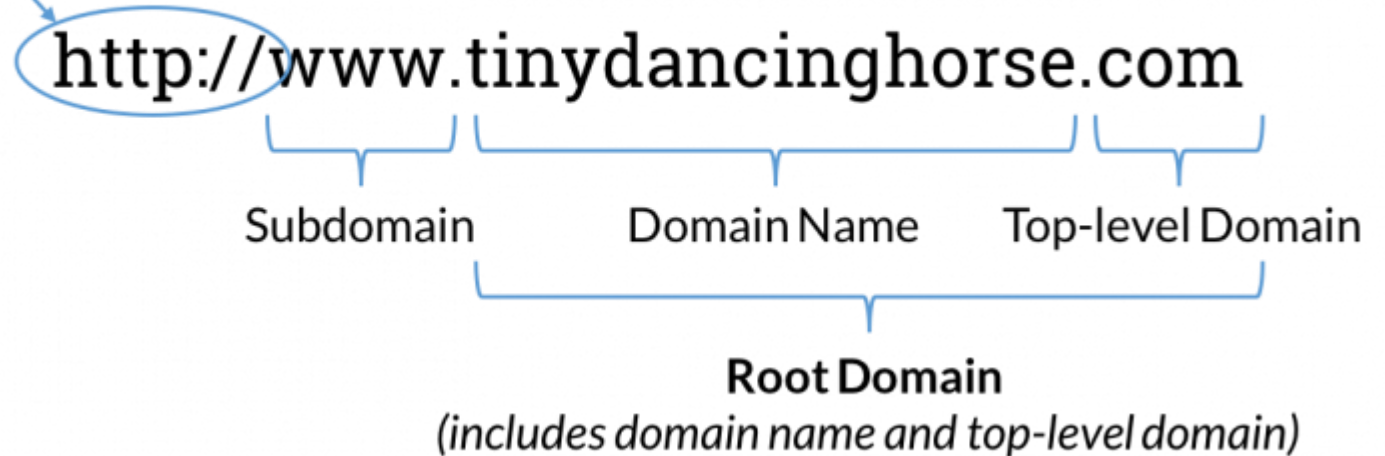
Root Level Domains

- The DNS root level is the highest in the DNS hierarchy tree because it is the first step in resolving a domain name. The root DNS server is the DNS for the root zone. It handles requests for records in the root zone and answers other requests by providing lists of authoritative name servers for the appropriate TLD (top-level domain). These are the authoritative nameservers that serve the DNS root zone. These servers contain the global list of the top-level domains. The root zone contains the following:

- Organizational hierarchy – such as .com, .net, .org, .edu.

- Geographic hierarchy – such as .ca, .uk, .fr, .pe.

- Currently, there are 13 root name servers specified, with logical names in the form "letter.root-servers.net", where letter ranges from "A" to "M" and represent companies like Verisign, University of Maryland, NASA, and The Internet Corporation for Assigned Names and Numbers (ICANN).

Top-Level Domains

- The next level in the DNS hierarchy is Top-Level Domains or TLDs, for short. There are over 1000 TLDs covering everything from "*.abb*" to "*.zw*" and still growing. As we have seen, the TLDs are classified into two subcategories: **organizational hierarchy** and **geographic hierarchy**.

- The organizational hierarchy is divided into domains for the likes of commercial enterprises ("*.com*"), government entities ("*.gov*"), educational institutions ("*.edu*"), and nonprofit organizations ("*.org*").

- The geographic hierarchy, meanwhile, represents the country where the domain is hosted. Examples include "*.ca*" for Canada, "*.uk*" for the United Kingdom, "*.au*" for Australia, and even "*.aq*" for Antarctica.

- Organizations that want to cater to their local customers can opt for TLDs that use both organizational and geographical hierarchies. Examples would be: "*.com.et*" for an Ethiopian business, "*.org.al*" for an organization in Albania, and "*.gov.it*" for the Italian government.

Second-Level Domains

- A domain is a second-level domain if it is contained within a top-level domain. A second-level domain is a label – usually, a name related to the website or the business that owns it – immediately to the left of the top-level domain, and separated by a dot.

- In the Domain Name System (DNS) hierarchy, a second-level domain (SLD or 2LD) is a domain that is directly below a top-level domain (TLD). For example, in "*myexample.com*", "my*example*" is the second-level domain of the "*.com*" TLD.

Subdomains

- A subdomain – sometimes referred to as "third-level domains." – is related to the root domain and is denoted on the left as a second-level domain. In the URL "blog.myexample.com" the subdomain address would be "blog."

- Trivia: the "WWW" in www.example.com is also a sub-domain, although <u>it isn't always necessary</u> to type it in a domain name.

Hosts

- The host part of an FQDN is used to identify an individual device – usually a server. In the FQDN "*myserver.example.com*" the hostname would be "*myserver.*"

Why are there only 13 DNS root server addresses?

- A common misconception is that there are only 13 root servers in the world.

- In reality there are many more, but still only 13 IP addresses used to query the different root server networks.

- Limitations in the original architecture of DNS require there to be a maximum of 13 server addresses in the root zone.

- In the early days of the Internet, there was only one server for each of the 13 IP addresses, most of which were located in the United States.

- Today each of the 13 IP addresses has several servers, which use <u>Anycast routing</u> to distribute requests based on load and proximity. Right now there are over 600 different DNS root servers distributed across every populated continent on earth.

Who operates DNS root servers?

- The Internet Corporation for Assigned Names and Numbers (ICANN) operates servers for one of the 13 IP addresses in the root zone and delegated operation of the other 12 IP addresses to various organizations including NASA, the University of Maryland, and Verisign, which is the only organization that operates two of the root IP addresses.

- Cloudflare actually helps provide DNS Anycast services to one of the root servers known as the F-Root; Cloudflare supplies additional F-Root instances under contract with ISC (the F-Root operator).

What is a domain registration?

A domain registration is a way to **capture your unique "online identity" on the Web**. The domain registration process consists of several steps:

1.**Think** of a good domain name
2.**Check** the availability of the domain name.
3.**Register the domain** at a internet service provider such as ACTIVE 24.
4.**Pay** the outstanding invoice for domain name registration.
5.**Confirm** the link from the ASCIO Email about your domain registration.

How to register a domain name?

1. Find a domain name registrar.
2. Search for your domain name.
3. Finalize your domain name choice.
4. Choose a domain name suffix, such as .com or .net.
5. Purchase the domain name.
6. Add Domain ID protection.
7. Verify onwership

1. Find a domain name registrar.

The non-profit Internet Corporation for Assigned Names and Numbers (ICANN) oversees the entire system of domain names, and it allows outside companies, called domain registrars, to sell and manage domain names. You will need to register your domain name through a registrar.

Some of the most popular domain registrars include GoDaddy, Bluehost, and Domain.com, although there are many more to choose from. Be sure to carefully consider pricing and policies for each one before choosing your domain registrar, as it will be managing your domain name.

2. Search for your domain name's availability.

Once you have found the right domain registrar for you, you'll need to search for your domain name using the registrar's search bar. There are millions of domain names out there, with thousands more added daily.

If you have your heart set on a domain name before doing a search, you might be disappointed to find it is already taken. Keep an open mind and incorporate important keywords into your domain when appropriate.

3. Finalize your domain name choice.

Once you've brainstormed several domain options, consider which ones are available and choose the one that fits your brand best and will also be easy for users to find.

4. Choose a domain name suffix, such as .com or .net.

After settling on the domain name, consider the suffix. The most popular suffix is .com, although .net and .org are also popular. These are considered to be top-level domains, or the highest-level domain suffixes in the domain naming system.

There are also other varieties to consider, such as country code top-level domains. These domain names end in a suffix that is particular to a specific country. A website in Germany might end in .de, for example.

Finally, there is another class of domain name suffixes called "sponsored, top-level domains," which are sponsored by a specific community related to the domain name. For example, .gov is for the U.S. government and .edu is for education organizations.

For most websites, .com is the best suffix for its ease of use, but if you have a specialized website, you might consider a country code or sponsored top-level domain.

5. Purchase the domain name.

When you have settled on the domain name and a suffix, you will pay to register the domain name with the domain registrar. This is not a one-time purchase, however. Typically, you will pay to own the domain name for one year, after which you can renew your registration for a fee. You can expect a registration fee of about $10 to $15.

Your Groovy Site
yourgroovydomain.com

yourgroovydomain.com
Domain Registration
$18

Renew Now

Replaces your site's free address, yourgroovysite.wordpress.com, with the domain, making it easier to remember and easier to share.

Domain Settings
Domain Registration Agreement

Owner	Price	Domain renews on	Payment method
You	$18 USD / year	September 13, 2019	VISA 1111

6. Add domain ID protection.

When you register a domain name with ICANN, you must provide your contact information including your name, phone number, physical address, and email address.

As soon as your domain name is registered, this contact information becomes available to the public — unless you pay for domain privacy through your domain registrar. This domain privacy will shield your information from view, keeping your personal information safe from spammers or worse, identity thieves.

🔒 **Domain WHOIS Privacy**

Did you know that when you register a domain, your personal information is available to everyone? This includes your name, address, phone number and email.

HostUpon offers Whois **Domain Privacy** from PrivacyProtect.org so that your personal information is protected if someone does a whois search on your domain. This means no solicitation from unwanted companies and spambots.

Without Domain Privacy
Registrant:
John Smith
123 Your Street
Your City, Your State 12345
Your Country
555-555-5555

With Domain Privacy
Registrant:
PrivacyProtect.org
PO Box 16
Queensland, QLD 4218
Australia
45+36946676

Note:WHOIS is a query and response protocol that is widely used for querying databases that store the registered users or assignees of an Internet resource, such as a domain name, an IP address block or an autonomous system, but is also used for a wider range of other information.

7. Verify ownership: After registering your domain, you'll receive an email confirmation with instructions to verify ownership of the domain.

Domain Registration Process

"Is it available?"

"Hi, Registrar. I want a domain name."

"Yes, it's available."

Registrar

"Is it available?"

"Yes, it's available."

Top Level Domain Registry

Register and Pay

Create Registration

WHOIS Record

DNS

TLD Registry Database
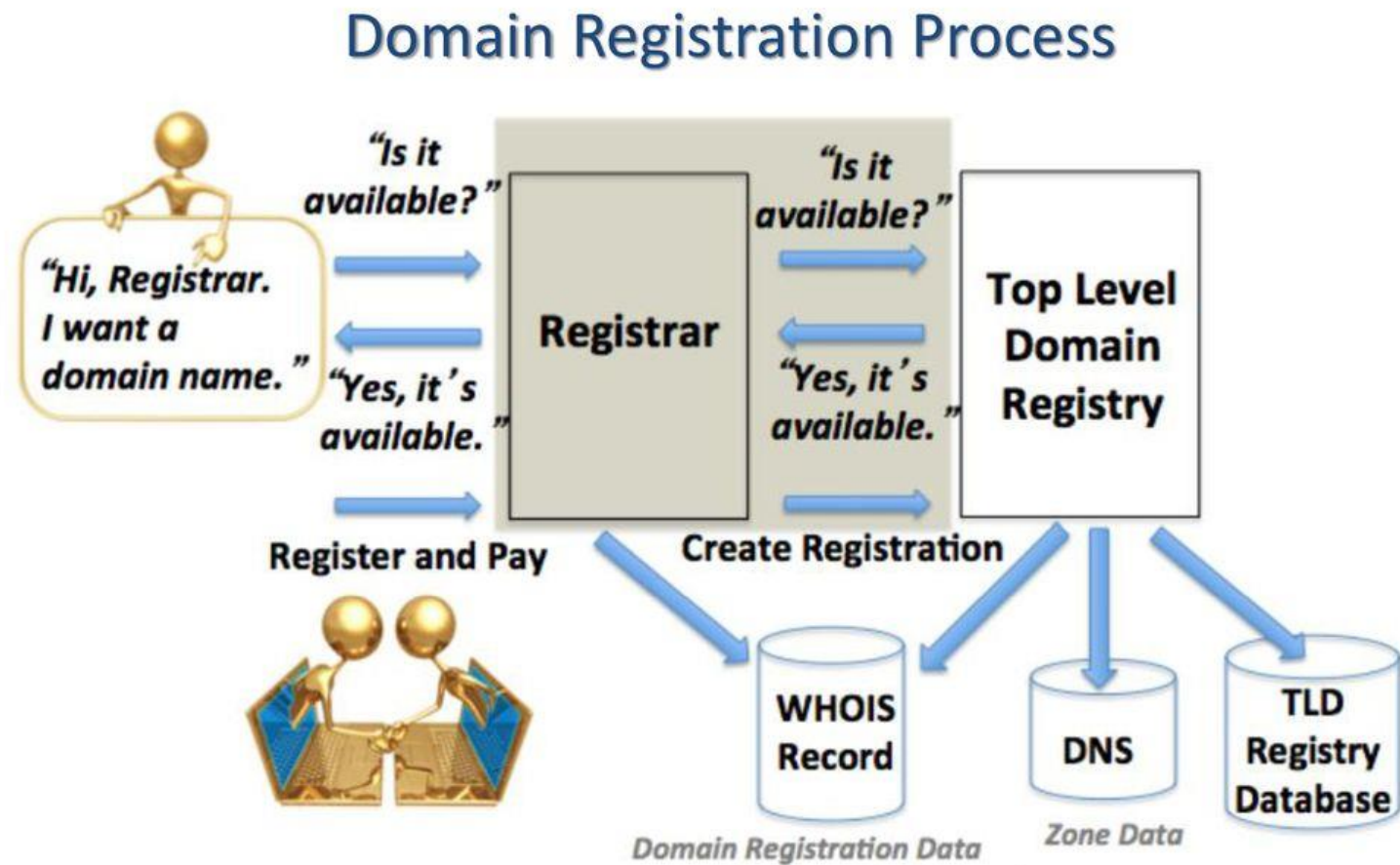
Domain Registration Data

Zone Data

Figure 2: Conceptual illustration of registering a domain name in the domain name life cycle. Note, in current deployments, multiple of the conceptual databases referenced in this illustration (WHOIS record, DNS, TLD registry Database) could be implemented as a single database.

Source: SAC054

Web hosting

Web hosting is a process and service through which web application or website files are stored in a Web server to publish to the Internet via World Wide Web. These files are primarily hosted to be publicly available around the world at any time.

A Web server is a high-configuration computer system that stores, processes, and serves website files and other media content (for example, HTML documents, images, CSS stylesheets, and JavaScript files) requested by the client (web browser).

Web hosting requires computers that can offer 24x7 uptime and serve multiple client requests simultaneously. Thus, if multiple clients request access to webpage files simultaneously, the server will be able to respond to them without any downtime.

It is also possible to set up your PC as a web server and run web applications or websites from it. But since web servers require 100% uptime, you have to keep your PC running at all times, and this is not a practical and cheap way of doing web hosting. On the other hand, hosting companies also provide many additional features with all these services, saving our time and effort.

Different types of Web hosting services are listed below:

Free Hosting
Virtual or Shared Hosting
Dedicated Hosting
Co-location Hosting

•**free Hosting:**This is a free non-paid web hosting service. This type of hosting is available with many prominent sites that offer to host some web pages for no cost, like <u>Hostinger</u>.

•Advantages :
- Free of cost
- Use websites to place advertisements. banners and other forms of advertising media

•Disadvantages:
- Customer support is missing
- Low bandwidth and lesser data transfer
- No control over your website

•**Shared/Virtual Hosting:**It's a web hosting service where many websites reside on one web server connected to the internet. This type of hosting is provided under one's own domain name, www.yourname.com. With a hosting plan with the wed b hosting company, one can present oneself as a fully independent identity to his/her web audience, like Lindo.

•Advantages:
- Easy and affordable
- Secured by hosting provider
- 24/7 Technical support

•Disadvantages:
- Shared resources can slow down the whole server
- Less flexible than dedicated hosting

•**Co-located Hosting:**This hosting lets you place your own web server on the premises of a service provider. It is similar to that of dedicated hosting except for the fact that the server is now provided by the user-company itself and its physical needs are met by the hosting company like AWS.

•Advantages:
  • Greater Bandwidth High Up-Time
  • Unlimited Software Options
  • High Security

•Disadvantages:
  • Difficult to configure and debug
  • Its expensive
  • Require high skills

•**Dedicated Hosting:**Hosted on a dedicated server, this type of hosting is best suited for large websites with high traffic. In this, the company wishing to go online rents an entire web server from a hosting company. This is suitable for companies hosting larger websites, maintaining others' sites or managing a big online mall, etc like Google Cloud.

•Advantages:
  • Ideal for large business
  • Strong database support
  • Unlimited software support
  • Powerful e-mail solutions
  • Complete root access to your servers

•Disadvantages:
  • Its very expensive
  • Requires superior skill sets

The remaining is for new syllabus

Web Application

- In simple words, a web app is a software application that runs on a web server. They are different from computer-based software programs that are stored locally on the OS or operating system of the device.

- Web apps are client-server apps that also include middleware systems, user interfaces, and databases. There are both client-side and server-side scripts in a web application. The server-side scripts deal with storing the data and the client-scripts present this data to the customer.

- It is a client-server application program, stored on a remote server that uses web browsers and web technology to perform specific function over the Internet through a browser interface.

- A web application is a software or program which is accessible using any web browser. Its frontend is usually created using languages like HTML, CSS, JavaScript, which are supported by major browsers. While the backend could use any programming stack like LAMP, MEAN, etc. Unlike mobile apps, there is no specific SDK for developing web applications.

- Web Applications came to prominence with the advent of Software as a Service (SaaS) movement.

- Some of the popular web applications are Google apps like Google Docs, Google Drive, Gmail, and Microsoft apps like Skype, One Drive, Microsoft 365. In fact, Yahoo and AOL are also web apps. Various online forms, shopping carts, file conversion, file scanning, word processors, spreadsheets, video, and photo editing apps are also examples of web apps.

Web application architecture

- Every developer must understand two things:

a. Architecture design is necessary.

b. Fancy architecture diagrams don't describe the real architecture of an application.

Web application architecture defines the interactions between applications, middleware systems and databases to ensure multiple applications can work together. When a user types in a URL and taps "Go," the browser will find the Internet-facing computer the website lives on and requests that particular page.

It is a framework that comprises of relationships and interactions between all the application components.
The Web Application Architecture constitutes all components, sub-components, and external application interchanges of the final web application. Basically, software engineers devised the architecture of an application to logically define application components.

Is websites and Web apps are same??

- Answer??

Differences

Parameter	Web Application	Website
Created for	A web application is designed for interaction with the end user	A website mostly consists of static content. It is publicly accessible to all the visitors.
User interaction	In a web application, the user not only read the page content but also manipulate the restricted data.	A website provides visual & text content which user can view and read, but not affect it 's functioning.
Authentication	Web applications need authentication, as they offer a much broader scope of options than websites.	Authentication is not obligatory for informational websites. The user may ask to register to get a regular update or to access additional options. This features not available for the unregistered website visitors.
Task and Complexity	Web application functions are quite higher and complex compared to a website.	The website displays the collected data and information on a specific page.
Type of software	The web application development is part of the website. It is itself not a complete website.	The website is a complete product, which you access with the help of your browser.
Compilation	The site must be precompiled before deployment	The site doesn't need to be pre-compiled
Deployment	All changes require the entire project to be re-compiled and deployed.	Small changes never require a full re-compilation and deployment. You just need to update the HTML code.

Web application has the following "concerns":

- It needs to process the user's input and return the correct response back to the user.

- It needs an exception handling mechanism that provides reasonable error messages to the user.

- It needs a transaction management strategy.

- It needs to handle both authentication and authorization.

- It needs to implement the business logic of the application.

- It needs to communicate with the used data storage and other external resources.

Web Layer

(controllers, exception handlers, filters, view templates, and so on)

Service Layer

(application services and infrastructure services)

Repository Layer

(repository interfaces and their implementations)

- We can fulfil all these concerns by using "only" three layers. These layers are:

- The web layer is the uppermost layer of a web application. It is responsible of processing user's input and returning the correct response back to the user. The web layer must also handle the exceptions thrown by the other layers. Because the web layer is the entry point of our application, it must take care of authentication and act as a first line of defense against unauthorized users.

- The **service layer** resides below the web layer. It acts as a transaction boundary and contains both application and infrastructure services. The application services provides the public API of the service layer. They also act as a transaction boundary and are responsible of authorization. The infrastructure services contain the "plumbing code" that communicates with external resources such as file systems, databases, or email servers. Often these methods are used by more than a one application service.

- The repository layer is the lowest layer of a web application. It is responsible of communicating with the used data storage.

Web Application Architecture
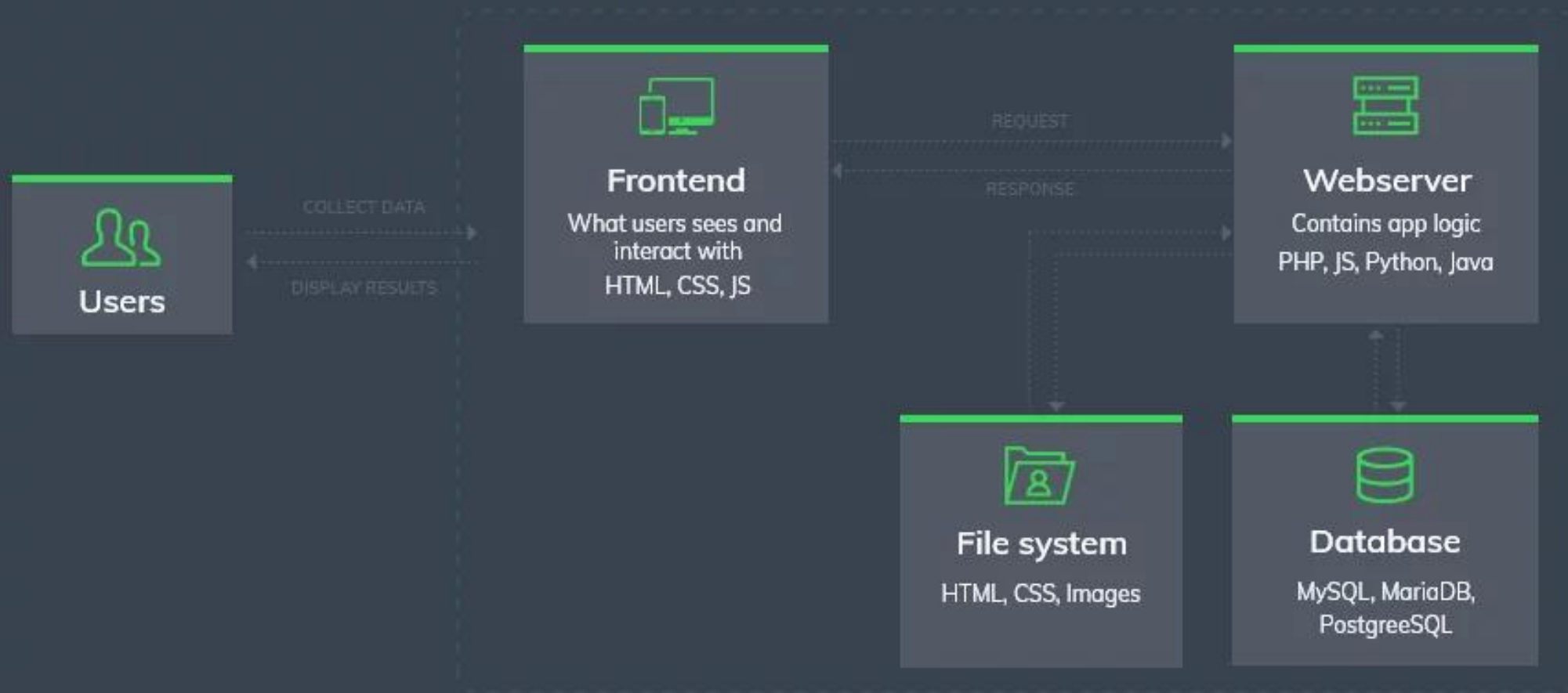
Components of Web Application Architecture
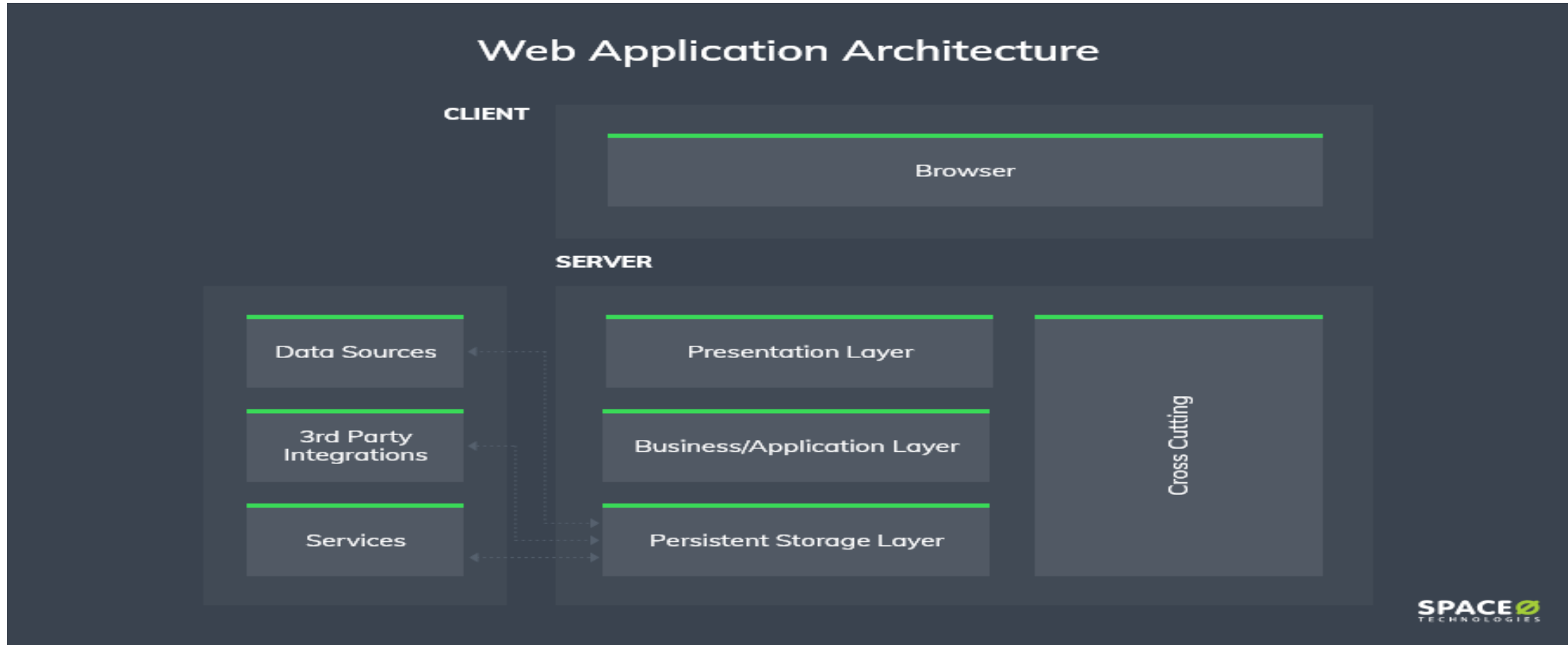
1. **User Interface App Components**

As the name suggests, these components are relevant to the user interface. Web pages displaying dashboards, logs, menus, notifications, configuration settings are interface components. They have little to do with the structural development of the application and are mostly user-experience oriented.

2. The Structural Components

They are responsible for the app development process.

A. The Presentation Layer
The presentation layer is accessible to users or clients via a web browser. This layer consists of UI process components that support communication with the system. This content delivered to the client can be developed using HTML, JavaScript, and CSS. HTML is the code that determines the content of your website, CSS controls the overall look and feel of the website, while JavaScript and its frameworks like Angular and React make your web apps responsive to a user's actions. In essence, the presentation tier manages how end-users interact with the web application.

B. The Business Layer
The main function of the business logic or architecture application layer is to accept user requests from the browser, process them, and determine how the data will be accessed. For instance, if your application is a chalet booking app like **Nuzhah**, business logic is accountable for the series of events a traveler goes through while booking a room. You will need to hire RoR(Ruby on Rails) and **PHP developers** to build a web application server as it is built using PHP, Python, Java, Ruby, .NET, Node.js.

C. Data Persistence Layer

The persistence layer consists of the database server that provides and stores relevant data for the application. It is closely connected to the business layer, so the logic knows which database to refer to and retrieve the data from.

Other than the two major web application architecture components, there are some components present in all web applications but are separate from the main tiers.

3. Cross-cutting code

This component handles application concerns such as security, communications, operational management. These concerns affect all parts of the system but the cross-cutting code never mixes them.

4.Third-party integrations

You can widen your functionality without coding from scratch. You can integrate third-party integrations via pieces of code called APIs. Some of the popular integrations include payment gateways, GPS maps, and social logins.

Characteristics Of Web Application

- Cloud-hosted and highly scalable

- Mostly Cross-platform

- Modular and loosely coupled

- It is easily tested with automated tests.

Why you need a Web Application?

Web applications are more popular because of the following reasons:

- Compared to desktop applications, web applications are easier to maintain by as they use the same code in the entire application. There are no compatibility issues.

- Web applications can be used on any platform: Windows, Linux, Mac… as they all support modern browsers.

- Mobile App store approval not required in web applications.

- Released any time and in any form. No need to remind users to update their applications.

- You can access these web applications 24 hours of the day and 365 days a year from any PC.

- You can either make use of the computer or your mobile device to access the required data.

- Web applications are a cost-effective option for any organization. Seat Licenses for Desktop software are expensive where SasS(S/w as a service), are generally, pay as you go.

- Web-Based Apps are Internet-enabled apps that are accessed through the mobile's web browser. Therefore, you don't require to download or install them.

Disadvantages of Web Application

- Security is not guaranteed, so it is vulnerable for unauthorized access.
- The web app may not support multiple browsers with equal precedence.
- The web application is built explicitly for a certain operating system, so it is difficult to discover from the app store.
- Limited scope to access the device's features.

Architectural issues of web layer

- The web layer is also referred to as the UI layer. The web layer is primarily concerned with presenting the user interface and the behavior of the application(handling user interactions/events).While the web layer can also contain logic ,core application logic is usually located in the services layer. The 3 layers within the web layer are:

- **HTML: The content layer** is where you store all the content that your customers want to read or look at. This includes text and images as well as multimedia. It's also important to make sure that every aspect of your site is represented in the content layer. That way, your customers who have Java-script turned off or cant view CSS will still have access to the entire site, if not all the functionality.

- **CSS: The styles layer :** Store all your styles for your web site in an external style sheet. This defines the way the pages should look and you can have separate style sheets for various media types. Store your CSS in an external style sheet so that you can get the benefits of the style layer across the site.

Architecting Web Application

- Web application architecture defines the interactions between applications, middleware systems and databases to ensure multiple applications can work together.

- When a user types in a URL and taps "Go," the browser will find the Internet-facing computer the website lives on and requests that particular page.

- The server then responds by sending files over to the browser. After that action, the browser executes those files to show the requested page to the user. Now, the user gets to interact with the website. Of course, all of these actions are executed within a matter of seconds. Otherwise, users wouldn't bother with websites.

- What's important here is the code, which has been parsed by the browser.

- This very code may or may not have specific instructions telling the browser how to react to a wide swath of inputs. As a result, web application architecture includes all sub-components and external applications interchanges for an entire software application.

- Of course, it is designed to function efficiently while meeting its specific needs and goals.

- Web application architecture is critical since the majority of global network traffic, and every single app and device uses web-based communication.

- It deals with scale, efficiency, robustness, and security.

Er. Simanta Kasaju

Best Practices for Good Web Application Architecture

- You may have a working app, but it also needs to have good web architecture.

- Here are several attributes necessary for good web application architecture: Solves problems consistently and uniformly

- Make it as simple as possible

- Supports the latest standards include Offers fast response times

- Utilizes security standards to reduce the chance of malicious penetrations

- Does not crash

- Heals itself

- Does not have a single point of failure

- Scales out easily

- Allows for easy creation of known data

- Errors logged in a user-friendly way

- Automated deployments