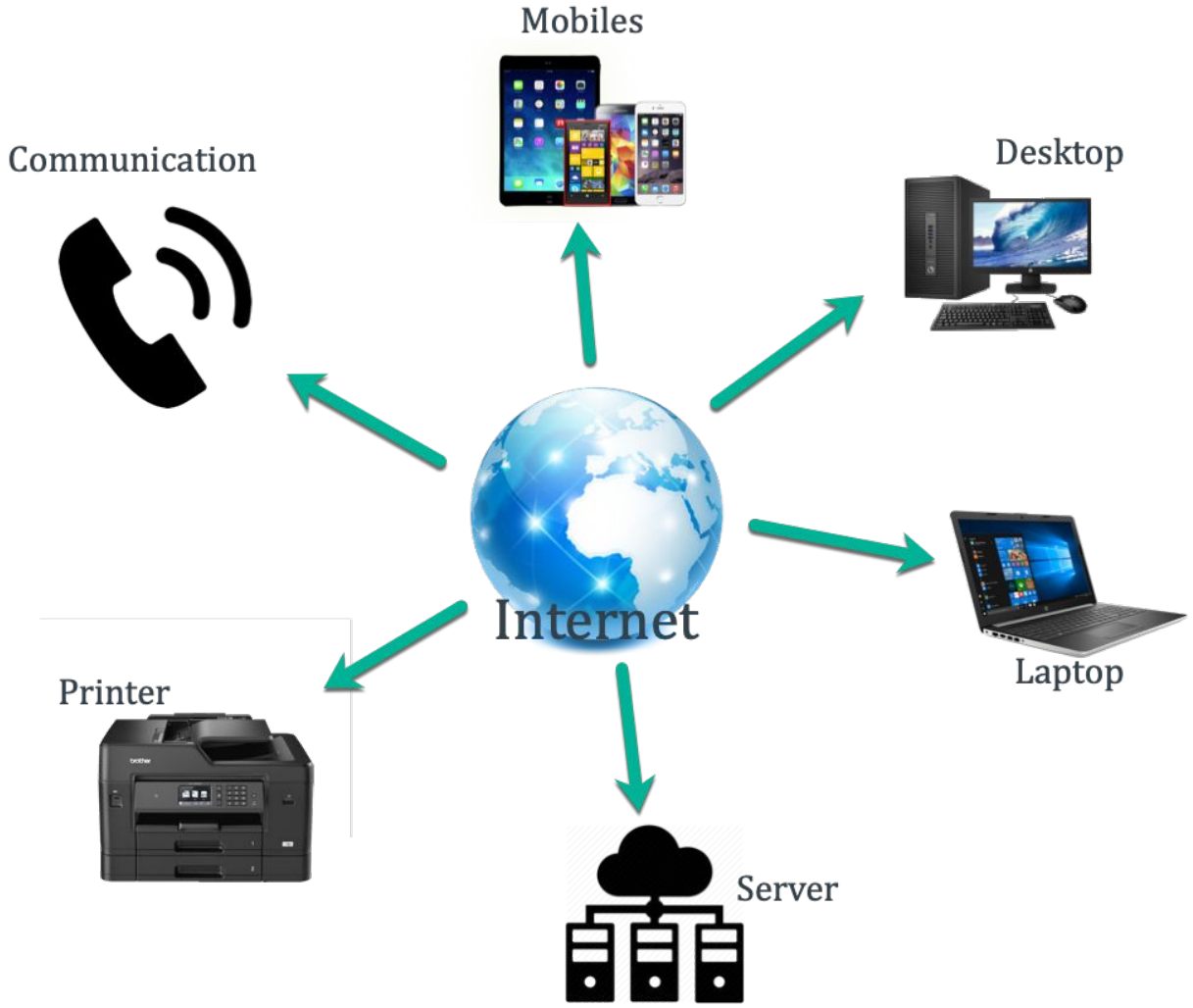
Internet and the World Wide Web (www)

- What is Internet?

- The Internet, **"the Net,"** is a worldwide system of computer networks -- a network of networks in which users at any one computer can, if they have permission, get information from any other computer.
- The Internet is a vast network that connects computers all over the world. Through the Internet, people can share information and communicate from anywhere with an Internet connection.

Internet and the World Wide Web (www)



Internet and the World Wide Web (www)

- The Internet consists of technologies developed by different individuals and organizations. Important figures include **Robert W. Taylor**, who led the development of the ARPANET (an early prototype of the Internet), and **Vinton Cerf and Robert Kahn**, who developed the **Transmission Control Protocol/Internet Protocol (TCP/IP)** technologies.

Internet and the World Wide Web (www)

- It consists of public, private, academic, business, and government networks of local to global scope, linked by a comprehensive arrangement of electronic, wireless, and optical networking technologies

Internet and the World Wide Web (www)

TCP/IP Protocol

- TCP/IP stands for Transmission Control Protocol/ Internet Protocol. It is a set of conventions or rules and methods that are used to interconnect network devices on the Internet.
- The internet protocol suite is commonly known as TCP/IP, as the foundational protocols in the suite are Transmission Control Protocol and Internet Protocol.
- It chooses how the information will be traded over the web through end-to-end communications that incorporate how the information ought to be organized into bundles (bundles of data), addressed, sent, and received at the goal.
- This communication protocol can also be utilized to interconnect organize devices in a private network such as an intranet or an extranet.

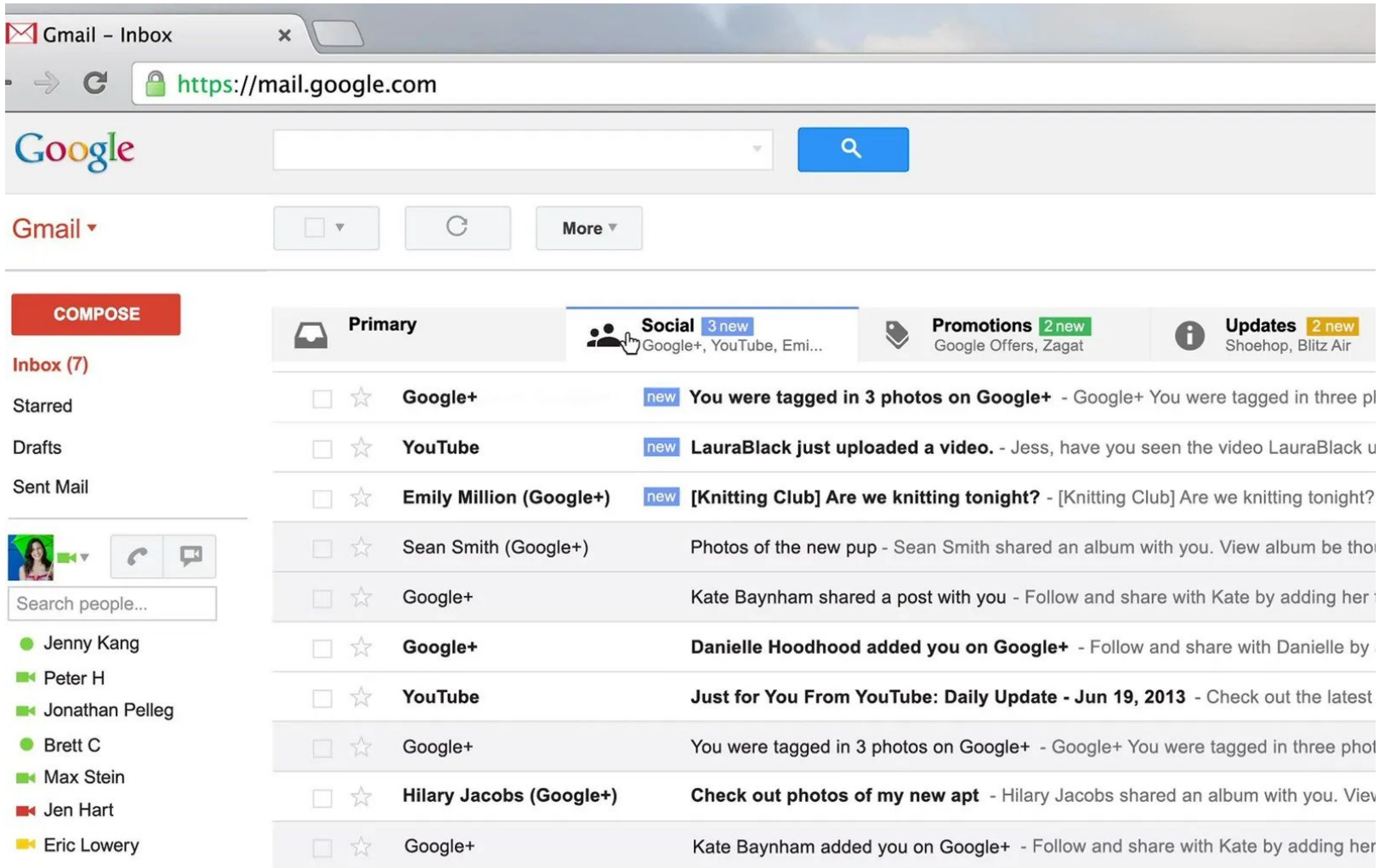
Application of Internet

- Sending and receiving email **– Gmail account**.
- Searching and browsing information archives – **Google**.
- Copying files between computers **– File Transfer**.
- Conducting financial transactions **– Online Payments**.
- Navigating **– Google Maps** (in your car, smart scooter, smart bike, or other)
- Playing interactive games **– Online/Multiplayer Games**.
- Video and music streaming **– You Tube**.

E-mail

- Electronic mail is a method of exchanging messages between people using electronic devices.
- Electronic mail (e-mail) is a computer-based application for the exchange of messages between users. A worldwide e-mail network allows people to exchange e-mail messages very quickly.

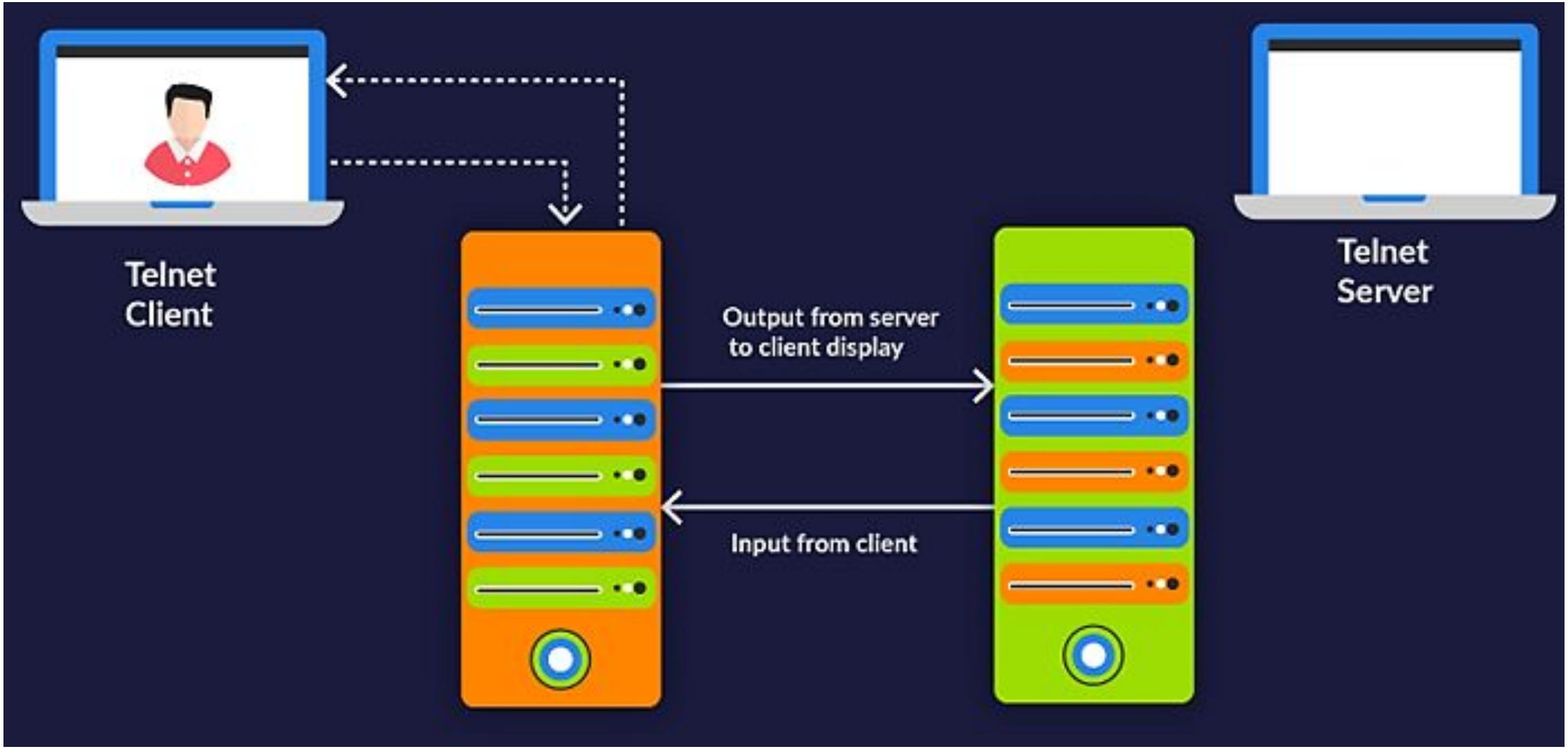
E-mail


Gmail – Inbox
https://mail.google.com
Google
Gmail
More
COMPOSE
Inbox (7)
Starred
Drafts
Sent Mail
Search people...
Jenny Kang
Peter H
Jonathan Pelleg
Brett C
Max Stein
Jen Hart
Eric Lowery
Primary
Social 3 new
Google+, YouTube, Emi...
Promotions 2 new
Google Offers, Zagat
Updates 2 new
Shoehop, Blitz Air
Google+ new You were tagged in 3 photos on Google+ - Google+ You were tagged in three pl
YouTube new LauraBlack just uploaded a video. - Jess, have you seen the video LauraBlack u
Emily Million (Google+) new [Knitting Club] Are we knitting tonight? - [Knitting Club] Are we knitting tonight?
Sean Smith (Google+) Photos of the new pup - Sean Smith shared an album with you. View album be tho
Google+ Kate Baynham shared a post with you - Follow and share with Kate by adding her
Google+ Danielle Hoodhood added you on Google+ - Follow and share with Danielle by
YouTube Just for You From YouTube: Daily Update - Jun 19, 2013 - Check out the latest
Google+ You were tagged in 3 photos on Google+ - Google+ You were tagged in three phot
Hilary Jacobs (Google+) Check out photos of my new apt - Hilary Jacobs shared an album with you. Viev
Google+ Kate Baynham added you on Google+ - Follow and share with Kate by adding her

TELNET

- A network protocol that allows a user on one computer to log into another computer that is part of the same network.
- TELNET is commonly used by terminal emulation programs that allow you to log into a remote host. However, TELNET can also be used for terminal-to-terminal communication and interprocess communication.
- TELNET is also used by other protocols (for example, FTP) for establishing a protocol control channel.

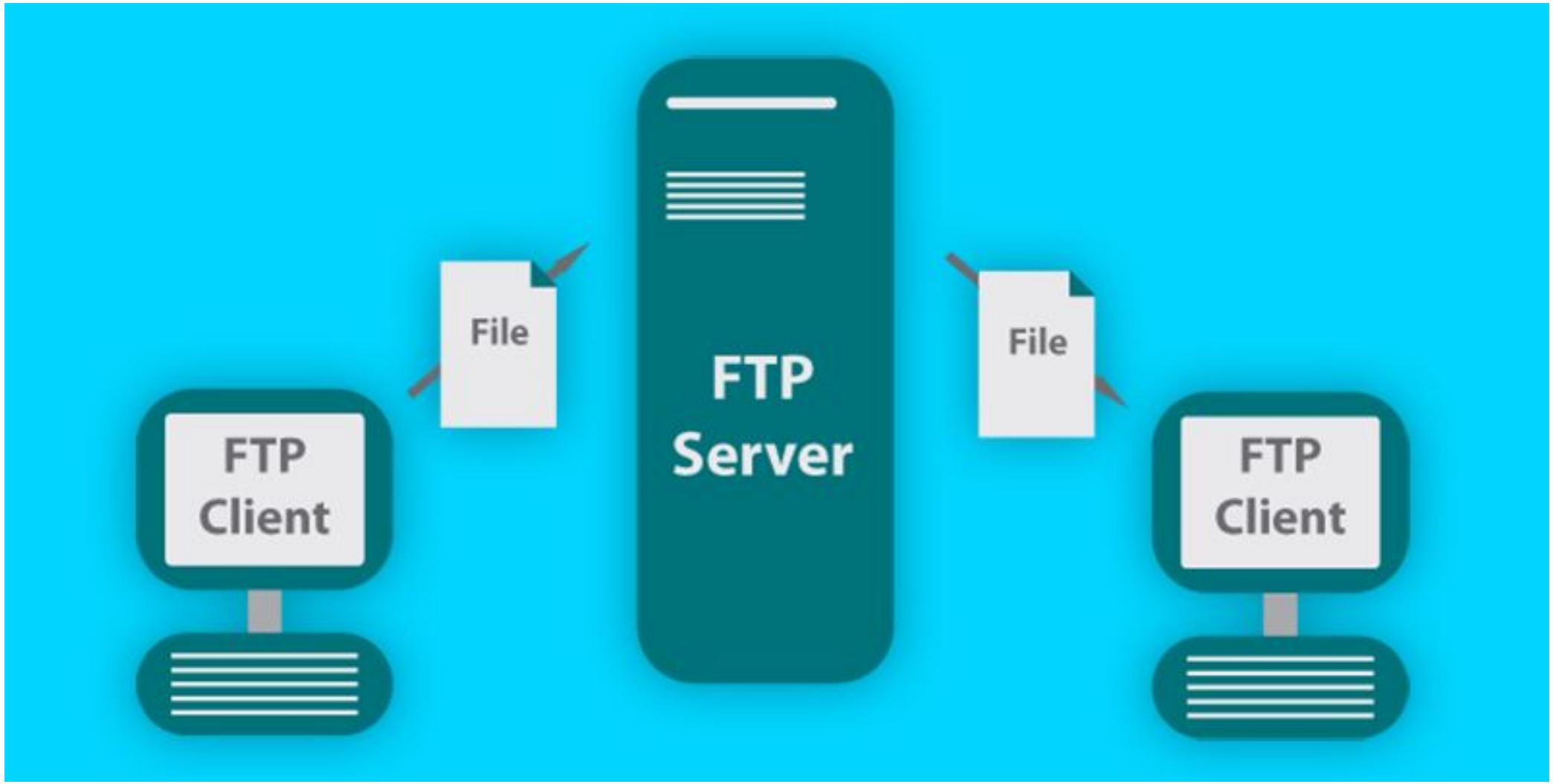
TELNET


Telnet
Client
Output from server
to client display
Input from client
Telnet
Server

File Transfer Protocol (FTP)

- The File Transfer Protocol (set of in rules, instructions or agreement) is a standard communication protocol used for the transfer of computer files from a server to a client on a computer network.
- FTP is built on a client–server model architecture using separate control and data connections between the client and the server.

File Transfer Protocol (FTP)



E-Commerce

- E-commerce (electronic commerce) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network.
- The most popular example of eCommerce is online shopping, which is defined as buying and selling of goods via the internet on any device.
- **Example:** Amazon, Flipkart.

E-Business

- E-Business (electronic business) is any process that a business organization conducts over a computer-mediated network. Business organizations include any for-profit, governmental, or non-profit entity. Their processes include production-, customer-, and internal- or management-focused business processes.
- Electronic business is any kind of business or commercial transaction that includes sharing information across the internet. Commerce constitutes the exchange of products and services between businesses, groups, and individuals and can be seen as one of the essential activities of any business. **Example:** UBER, OLA, ebay, OLX.in

Internet Service Provider (ISP)

- An Internet service provider is an organization that provides services for accessing, using, or participating in the Internet.
- ISPs can be organized in various forms, such as commercial, community-owned, non-profit, or otherwise privately owned.
- An ISP has the equipment and the telecommunication line access required to have a point of presence on the internet for the geographic area served.

Domain Name Server

- DNS is part of a domain name system. It is hierarchical naming system built on a distributed database for resource connected to the internet or a private network.
- The main purpose of this system is to translate domain names meaningful to humans into names or rather numeric streams which help the corresponding network devices to identify the resource or domain.
- Domain name system makes it possible to give or allot names to domains or group of networks irrespective of their physical locations.

Internet Address

- Internet address follows the TCP/IP suite hence, it is also known as the **IP address.** Internet address has a job of identifying a node on the network. In other words, it is a numeric label attached to every system (computer or any other device).
- The basic function of IP address are two–

i. Identification of computer or node or device and location addressing.

- The designers of the Internet Protocol defined an IP address as a **32-bit number** and this system, known as **Internet Protocol Version 4 (IPv4)**, is still in use today.

Internet Address

- However, due to the enormous growth of the Internet and the predicted depletion of available addresses, a new addressing system **(IPv6)**, using **128 bits** for the address, was developed in 1995, standardized as RFC 2460 in 1998, and is being deployed worldwide since themid-2000s.
- Both IPV4 as well as IPV6 have reserved addresses for private or internal networks. This is termed as private addressing.
- Both IPV4 and IPV6 have sub netting effect. That mean, IP networks can be divided into smaller groups or subnets.

Internet Address

IPv4	IPv6
IPv4 has a 32-bit address length	IPv6 has a 128-bit address length
It Supports Manual and DHCP address configuration	It supports Auto and renumbering address configuration
In IPv4 end to end, connection integrity is Unachievable	In IPv6 end to end, connection integrity is Achievable
It can generate 4.29×10^{9} address space	Address space of IPv6 is quite large it can produce 3.4×10^{38} address space
The Security feature is dependent on application	IPSEC is an inbuilt security feature in the IPv6 protocol
Address representation of IPv4 is in decimal	Address Representation of IPv6 is in hexadecimal
Fragmentation performed by Sender and forwarding routers	In IPv6 fragmentation performed only by the sender
In IPv4 Packet flow identification is not available	In IPv6 packet flow identification are Available and uses the flow label field in the header

Internet Address

In IPv4 checksum field is available	In IPv6 checksum field is not available
It has broadcast Message Transmission Scheme	In IPv6 multicast and anycast message transmission scheme is available
In IPv4 Encryption and Authentication facility not provided	In IPv6 Encryption and Authentication are provided
IPv4 has a header of 20-60 bytes.	IPv6 has header of 40 bytes fixed
IPv4 can be converted to IPv6	Not all IPv6 can be converted to IPv4
IPv4 consist of 4 fields which are separated by dot (.)	IPv6 consist of 8 fields, which are separated by colon (:)
IPv4's IP addresses are divided into five different classes. Class A , Class B, Class C , Class D , Class E.	IPv6 does not have any classes of IP address.
IPv4 supports VLSM(Variable Length subnet mask).	IPv6 does not support VLSM.
Example of IPv4: 66.94.29.13	Example of IPv6: 2001:0000:3238:DFE1:0063:0000:0000:FEFB

Internet Address

World Wide Web (www)

- **World Wide Web (www)**

- The worldwide web is a collection of all the web pages, web documents that you can see on the Internet by searching their URLs (Uniform Resource Locator) on the Internet. For example, https://www.patkarvardecollege.edu.in/ is a web sit.
- In other words, the world wide web is an information retrieval service of the web. It provides users a huge array of documents that are connected to each other by means of hypertext or hypermedia links.

Uniform Resource Locator (URL)

- Uniform Resource Locator (URL) is a Uniform Resource Identifier (URI) that specifies where an identified resource is available and the mechanism for retrieving it.
- An example of the use of URLs is the addresses of web pages on the World Wide Web, such as http://www.example.com/.
- The format is based on Unix file path syntax, where forward slashes are used to separate directory or folder and file or resource names.
- Conventions already existed where server names could be prepended to complete file paths, preceded by a double-slash

Browsers

- A web browser or Internet browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web.
- Web browsers can also be used to access information provided by Web servers in private networks or files in file systems.
- Some browsers can also be used to save information resources to file systems.
- Primary function of a browser is to identify the URI and brings the information resource to use.

Browsers

- **Types of Browser:**

- **Internet Explorer**
- **Mozilla Firefox**
- **Google Chrome**
- **Safari**
- **Opera**
- **Mobile browsers**

Web Server

- Apache HTTP Server is a free and open-source web server that delivers web content through the internet. It is commonly referred to as Apache and after development; it quickly became the most popular HTTP client on the web.
- The word, Apache, has been taken from the name of the Native American tribe ‘Apache’, famous for its skills in warfare and strategy making.
- Apache is the most widely used Web Server application in Unix-like operating systems but can be used on almost all platforms such as Windows, OS X, OS/2, etc

Web Server

- Features of Apache:
- Handling of static files
- Loadable dynamic modules
- Auto-indexing
- Compatible with IPv6
- Supports HTTP/2
- FTP connections
- Bandwidth throttling
- Load balancing
- Session tracking
- URL rewriting
- Geolocation based on IP address and many more

Internet and the World Wide Web (www)

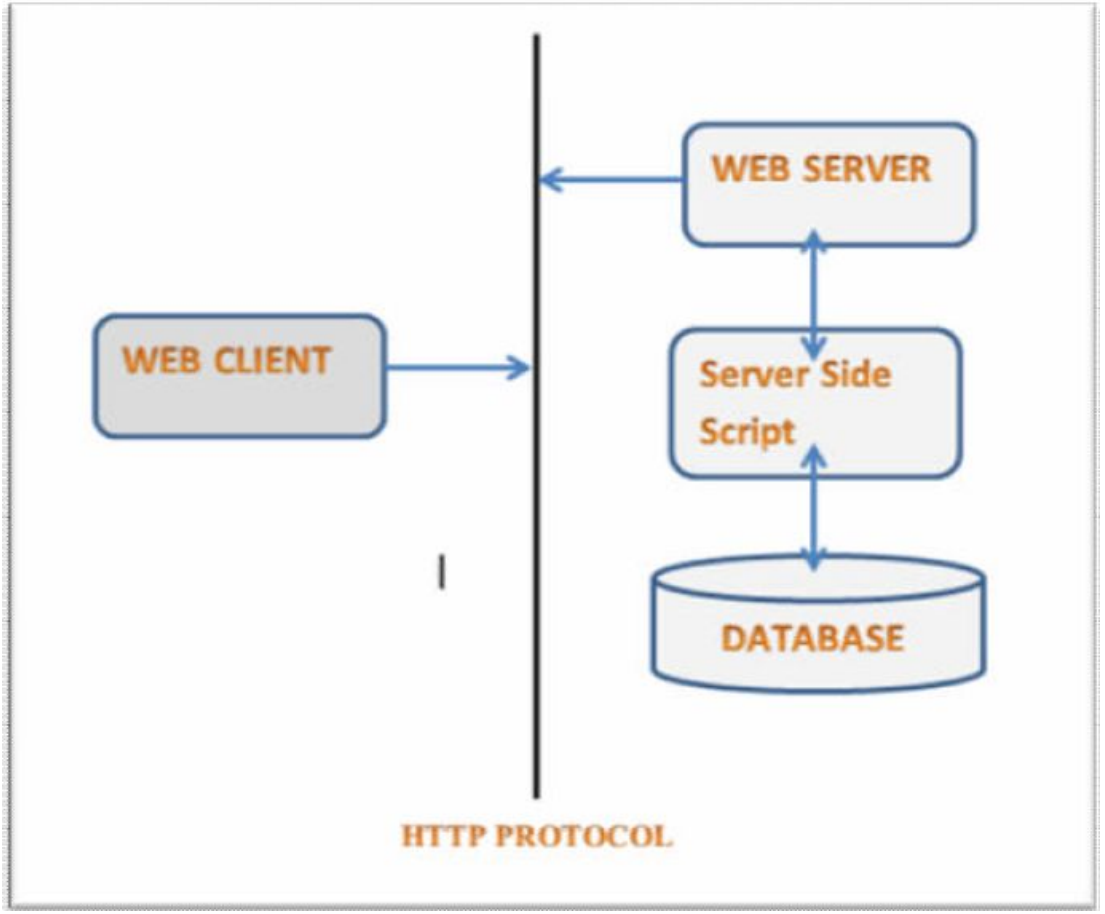
What is a Protocol?

- A protocol is the structured discussion that computers follow to negotiate resource-specific services. For example, the protocol that makes the Web possible is the Hypertext Transfer Protocol (HTTP).
- When you click a hyperlink in a Web document, your browser uses the HTTP protocol to contact a Web server and retrieve the appropriate document

HTTP Protocol

- HTTP stands for Hyper Text 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 the data in the form of plain text, hypertext, audio, video, and so on.
- This protocol is known as Hyper Text Transfer Protocol because of its efficiency that allows us to use in a hypertext environment where there are rapid jumps from one document to another document.
- The HTTP protocol is a request/response protocol based on the client/server based architecture where web browsers, robots and search engines, etc. act like HTTP clients and the Web server acts as a server.
- The following diagram shows a very basic architecture of a web application and depicts where HTTP :

HTTP Protocol



HTML 5 - Introduction

- A major focus of HTML5 was to give developers more flexibility, which in turn would lead to more engaging user experiences.
- There are various benefits of HTML5 and here's why it is the future.
- There is a new set of tags that works in enhancing your HTML code, helping make it increasingly meaningful.

HTML 5 - Formatting Text by using Tags

Tag	Description
<!DOCTYPE>	This tag is used to inform the browser about the version of HTML used in the document.
<article>	This element is used to define an independent piece of content in a document, that may be a blog, a magazine or a newspaper article.
<header>	It defines a header for a section.
<main>	It defines the main content of a document.
<section>	It defines a section in the document.
<figcaption>	It is used to define a caption for a <figure> element.
<figure>	It defines a self-contained content like photos, diagrams etc.
<footer>	It defines a footer for a section.

HTML 5 - Formatting Text by using Tags

- **<u><!DOCTYPE> tag:</u>**

- HTML <!DOCTYPE> tag is used to inform the browser about the version of HTML used in the document. It is called as the document type declaration (DTD).
- <!DOCTYPE> is not a tag/element, it just an instruction to the browser about the document type.
- It is a null element which does not contain the closing tag, and must not include any content within it.

HTML 5 - Formatting Text by using Tags

Syntax:

<!DOCTYPE html>

An example of HTML document with doctype declaration.

```
<!DOCTYPE html>
<html>
<head>
<title>This is the title</title>
</head>
<body>
This is the content of the document.
</body>
</html>
```

HTML 5 - Formatting Text by using Tags

 <article> tag :

- The HTML <article> tag defines an independent self-contained content in a document, page, application or a site.
- The article tag content makes sense on its own. It is independent and complete from other content shown on the page.
- It is used on News story, blog post, article, Social post, comment etc

HTML 5 - Formatting Text by using Tags

<article> tag :

Syntax:

<article> ... </article>

The example below shows the <article>tag .

<article>

<h1>Introduction to HTML5</h1>

. HTML5 is enriched with advance features which make it easy and interactive for developer and users..

</article>

HTML 5 - Formatting Text by using Tags

<article> tag :

Syntax:

<article> ... </article>

The example below shows the <article>tag .

<article>

<h1>Introduction to HTML5</h1>

. HTML5 is enriched with advance features which make it easy and interactive for developer and users..

</article>

HTML 5 - Formatting Text by using Tags

HTML5 <header> Tag:

The <header> element represents the header of a document or a section. A header should contain title and heading information about the related content.

- **Syntax**

<header> ... </header>

The example below shows the <header>tag .

```
<header>
<h2>Sports</h2>
<p>Cricket sport is World's no.1 sport all over the world</p>
</header>
```

HTML 5 - Formatting Text by using Tags

HTML5 <main> Tag:

- HTML <main> tag is used to represent the main content of the <body> tag.
- The <main> tag is written within <body> tag. It is used to accurately describe the primary content of a page.
- The content of the main tag is directly related to the central topic of the document.

HTML 5 - Formatting Text by using Tags

HTML5 <main> Tag:

- **Syntax**

<main> ... </main>

The example below shows the <main>tag .

```
<main>
<h1>Introduction to HTML5</h1>
<p>. HTML5 is enriched with advance features which make it easy and interactive for developer and users..</p>
</main>
```

HTML 5 - Formatting Text by using Tags

HTML5 <section> Tag

The<section> tag is used to define sections in a document. When you put your content on a web page, it may contains many chapters, headers, footers, or other sections on a web page.

- **Syntax**

The example below shows the <section>tag .

<section>

<h1>Introduction to HTML5</h1>

. HTML5 is enriched with advance features which make it easy and interactive for developer and users..

</section>

HTML 5 - Formatting Text by using Tags

HTML5 <figcaption> Tag

The <figcaption> element is used to provide a caption to an image.
It is an optional tag and can appear before or after the content within the <figure> tag.

- **Syntax**

The example below shows the <section>tag .

```
<figure>
<imgsrc="discovery.jpg" alt="Space Shuttle">
<figcaption>NASA - Space Shuttle Discovery</figcaption>
</figure>
```

HTML 5 - FORMATTING TEXT BY LISTS

 HTML lists allow web developers to group a set of related items in lists.HTML Lists are used to specify lists of information. All lists may contain one or more list elements. There are three different types of

- **HTML lists:**

1. **Ordered List or Numbered List (ol)**
2. **Unordered List or Bulleted List (ul)**
3. **Description List or Definition List (dl)**

HTML 5 - FORMATTING TEXT BY LISTS

- **Ordered List or Numbered List (ol)**

In the ordered HTML lists, all the list items are marked with numbers by default. It is known as numbered list also. The ordered list starts with <ol> tag and the list items start with <li> tag.

```
<ol>
<li>Sachin</li>
<li>Kapil</li>
<li>Rahul</li>
<li>Rohit</li>
</ol>
```

HTML 5 - FORMATTING TEXT BY LISTS

- **Unordered List or Bulleted List (ul)**

Unordered List or Bulleted List:

In HTML Unordered list, all the list items are marked with bullets. It is also known as bulleted list also. The Unordered list starts with <ul> tag and list items start with the <li> tag.

```
<ul>
<li>Sachin</li>
<li>Kapil</li>
<li>Rahul</li>
<li>Rohit</li>
</ul>
```

HTML 5 - FORMATTING TEXT BY LISTS

- **Description List or Definition List: (dl)**

Description List or Definition List::

HTML Description list is also a list style which is supported by HTML and XHTML. It is also known as definition list where entries are listed like a dictionary.

```
<dl>
    <dt>Definition List</dt>
    <dd>A list of terms and their definitions/descriptions.</dd>
    <dt>HTML</dt>
    <dd>An HTML tutorial.</dd>
    <dt>PHP</dt>
    <dd>An PHP tutorial.</dd>
</dl>
```

HTML 5 - FORMATTING TEXT BY LISTS

Bulleted and numbered lists can be styled by using a list-style-type: type attribute.

This is a type of style-based attribute that you will be seeing a lot more of later in this book, but for now we're using it as a standalone technique for changing the bullet character or numbering style.

To apply the attribute, place it in the opening **<ul>** or **<ol>** tag.

For example, to create a bulleted list that uses the square bullet character, start the list off this way:

<ul style="list-style-type: square">

To create a numbered list that uses uppercase Roman numerals, start the list this way:

<ol style="list-style-type: upper-roman">

HTML 5 - FORMATTING TEXT BY LISTS

Symbol	Entity Name	Entity Number
& (ampersand)	&amp;	&#38;
< (less than)	&lt;	&#60;
> (greater than)	&gt;	&#62;
(nonbreaking space)		
¢ (cent)	&cent;	&#162;
£ (pound)	&pound;	&#163;
¥ (yen)	&yen;	&#165;
© (copyright)	&copy;	&#169;
® (registered trademark)	&reg;	&#174;
° (degree)	&deg;	&#176;
± (plus or minus)	&plusmn;	&#177;
† (dagger)	&dagger;	&#8224;
™ (trademark)	&trade;	&#8482;

HTML 5 – Creating Table

 <table style="width:100%;border:1px solid black">
 <caption> Code With Harry</caption>
 <tr>
 <th>Name</th>
 <th>Role</th>
 <th>Company</th>
 </tr>

 <tr>
 <th>Harry</th>
 <th>Developer</th>
 <th>YouTube</th>
 </tr>

HTML 5 – Creating Table

<th>Naman</th>

<th>Developer</th>

<th>YouTube</th>

</tr>

<th>Rohan Das</th>

<th>CEO</th>

<th>YouTube</th>

</tr>

HTML 5 – Creating Table

<th>Skill F</th>

<th>CTO</th>

<th>YouTube</th>

</tr>

</table>

HTML 5 - Creating Hyperlinks and Bookmarks

- HTML links are hyperlinks. You can click on a link and jump to another document. The HTML <a> tag defines a hyperlink. To make a hyperlink in an HTML page, use the <a> and tags, which are the tags used to define the links.

- Syntax

Hyperlink Text

- The example below shows the < a > tag.

Next Page

- The HTML anchor tag defines a hyperlink that links one page to another page. It can create hyperlink to other web page as well as files location, or any URL. The href attribute is used to define the address of the file to be linked.

HTML 5 - Defining Metadata about an HTML Document

- The <meta> tag defines metadata about an HTML document. Metadata is data (information) about data.

- <meta> tags always go inside the <head> element, and are typically used to specify character set, page description, keywords, author of the document, and viewport settings.

- Metadata will not be displayed on the page, but is machine parsable.

- Metadata is used by browsers (how to display content or reload page), search engines (keywords), and other web services.

HTML 5 - Defining Metadata about an HTML Document

- The <meta> tag can also be used to redirect visitors to another page.
- For example, suppose you told everyone the address of your Web site, and then you needed to move it to another URL.
- You could place a “We’ve Moved” page at the original address and use the <meta> tag to redirect users to the new address after five seconds, like this:

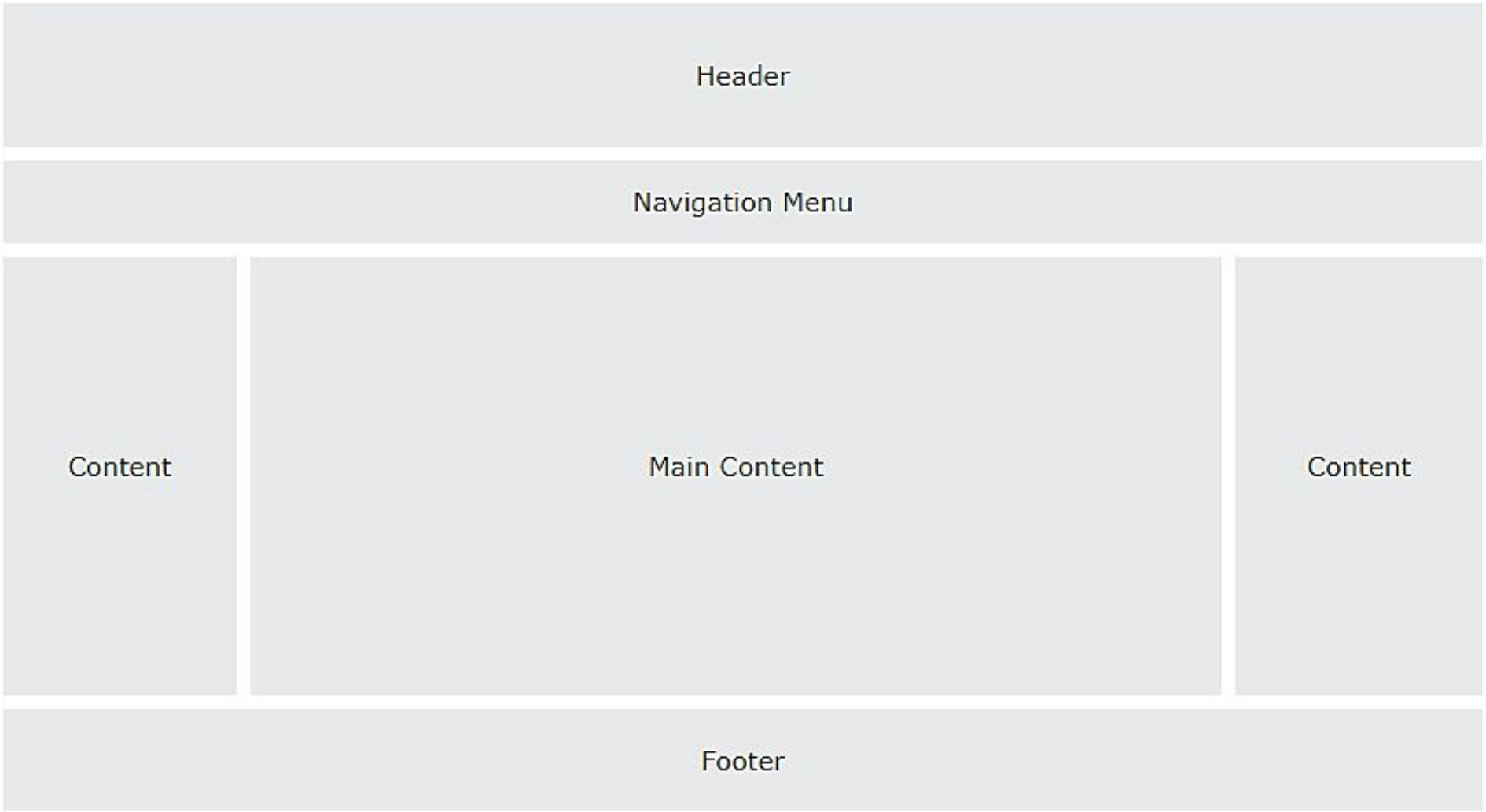
HTML 5 - Defining Metadata about an HTML Document

Attribute	Value	Description
charset	*character_set*	Specifies the character encoding for the HTML document
content	*text*	Specifies the value associated with the http-equiv or name attribute
http-equiv	content-security-policy content-type default-style refresh	Provides an HTTP header for the information/value of the content attribute
name	application-name author description generator keywords viewport	Specifies a name for the metadata

CSS - Implementing Styles using CSS

- Cascading Style Sheets (CSS) is a style sheet language used for describing the look and formatting of a document written in a markup language.
- CSS describes how HTML elements are to be displayed on screen.
- CSS is a formatting language used to provide more customized web pages and make it easier to make multiple pages use the same style.
- CSS is a web development technology that stands behind the look and-feel of every web page.

CSS - Implementing Styles using CSS



CSS - Implementing Styles using CSS

There are **three primary** way to use style sheets

1. **Inline style sheets**
2. **Embedded style sheets**
3. **Linked style sheets**

CSS - Implementing Styles using CSS