

## **INTERNET AND WEB TECHNOLOGIES**

### **UNIT 1**

#### **Internet**

The internet is a global network of computers that connects people, businesses, and organizations across the world. It is a collection of networks that share information and resources using a common set of protocols and technologies.

#### **Basic concepts of the internet include:**

1. **World Wide Web:** The World Wide Web, also known as the Web, is a collection of interconnected documents and resources that are accessed through the internet. The web is built on top of the internet and uses the HTTP protocol to transfer data between servers and clients.
2. **IP Address:** An IP address is a unique identifier assigned to every device connected to the internet. It is used to route data packets from one device to another over the internet.
3. **Domain Name System (DNS):** The DNS is a system that translates human-readable domain names, such as www.codechamp.online, into IP addresses that computers can understand. This makes it easier for users to access websites without having to remember complex IP addresses.
4. **Internet Service Provider (ISP):** An ISP is a company that provides internet access to individuals and organizations. ISPs typically offer different types of internet connections, such as broadband, DSL, and dial-up.
5. **Bandwidth:** Bandwidth refers to the amount of data that can be transmitted over a network in a given amount of time. It is usually measured in bits per second (bps) or megabits per second (Mbps).
6. **Router:** A router is a device that connects multiple devices to a network and routes data packets between them. It is an essential component of any home or office network.
7. **Protocol:** A protocol is a set of rules that governs how data is transmitted and received over a network. The most common internet protocols include TCP/IP, HTTP, and FTP.
8. **Search Engine:** A search engine is a website that allows users to search for information on the web. Examples of popular search engines include Google, Bing, and Yahoo.
9. **Social Media:** Social media platforms are websites and applications that allow users to create and share content with others. Examples of popular social media platforms include Facebook, Twitter, and Instagram.

- **Cloud Computing:** Cloud computing refers to the use of remote servers to store, manage, and process data. This allows users to access their data and applications from anywhere with an internet connection.

## **Communication on the Internet**

- The internet is a global network of computers and devices that are connected to each other through a series of servers and routers. It is an essential tool for communication and allows people to connect with each other regardless of their location.
- There are different ways to communicate on the internet, including email, instant messaging, social media, and video conferencing. These methods of communication have revolutionized the way people interact with each other and have made it easier to stay in touch with friends, family, and colleagues.
- Email is one of the most popular forms of internet communication. It allows users to send messages to each other using an email address. Email messages can be sent from one person to another or to a group of people, and they can be accessed from anywhere in the world using a computer or a mobile device.
- Instant messaging is another popular way to communicate on the internet. It allows users to send text messages in real-time to each other using a messaging app. This form of communication is great for people who want to have quick conversations or for those who prefer to communicate using short messages.
- Social media is also a popular way to communicate on the internet. Social media platforms like Facebook, Twitter, and Instagram allow users to connect with each other and share information and content. Social media is a great way to stay in touch with friends and family and to build new connections with people who share similar interests.
- Video conferencing is another form of internet communication that has become increasingly popular in recent years. Video conferencing allows users to have face-to-face conversations with each other using a webcam and an internet connection. This form of communication is great for people who want to have more personal interactions with each other and for businesses that need to conduct meetings with people who are in different locations.

In conclusion, the internet has revolutionized the way people communicate with each other. Email, instant messaging, social media, and video conferencing are just a few of the many ways that people can connect with each other on the internet. These methods of communication have made it easier to stay in touch with friends and family, build new connections, and conduct business from anywhere in the world.

## **Internet domains:**

An internet domain is a unique address that is used to identify websites and other online resources. It is part of a larger system called the Domain Name System (DNS), which is responsible for mapping domain names to IP addresses, which is the numerical address that computers use to identify each other on the internet.

*There are different types of internet domains, including top-level domains (TLDs), country-code top-level domains (ccTLDs), and subdomains.*

**Top-level domains (TLDs)** are the highest level of domain names in the DNS hierarchy. They are represented by the suffix at the end of a domain name, such as .com, .org, and .net. TLDs can be generic (gTLDs) or country-specific (ccTLDs).

**Generic top-level domains (gTLDs)** are used to identify general types of websites, such as .com for commercial websites, .org for non-profit organizations, and .edu for educational institutions. There are also more specialized gTLDs, such as .gov for government websites and .mil for military websites.

**Country-code top-level domains (ccTLDs)** are used to identify websites that are associated with a particular country or geographic region. They are represented by a two-letter code at the end of the domain name, such as .us for the United States, .uk for the United Kingdom, and .ca for Canada.

## **TCP/IP:**

TCP/IP stands for Transmission Control Protocol/Internet Protocol. It is a set of communication protocols that are used to connect devices to the internet and communicate with other devices on the internet.

TCP/IP consists of two main protocols: TCP and IP. TCP is responsible for ensuring that data is sent and received correctly between devices. It does this by breaking data down into smaller packets and sending them to the recipient device. Once the packets arrive at the recipient device, TCP ensures that they are reassembled in the correct order to form the original data.

IP is responsible for ensuring that data is sent to the correct destination device. It does this by assigning each device a unique IP address, which is a series of numbers that identifies the device on the internet. When data is sent, IP uses the destination IP address to ensure that it is sent to the correct device.

TCP/IP also includes other protocols, such as DNS (Domain Name System) and HTTP (Hypertext Transfer Protocol). DNS is responsible for translating domain names (such as [www.codechamp.online](http://www.codechamp.online)) into IP addresses. HTTP is used to transfer data over the internet, particularly for websites and web applications.

TCP/IP is essential for connecting devices to the internet and ensuring that they can communicate with each other. Without TCP/IP, it would be impossible for devices to send and receive data over the internet. TCP/IP has been the foundation of the internet since its inception and is still widely used today in both personal and business settings.

**TCP/IP provides a set of services that enable devices to connect to each other and communicate over the internet. These services include:**

Here are some of the main services provided by TCP/IP:

- **IP Addressing**: IP addressing is one of the primary services provided by TCP/IP. Each device on the internet is assigned a unique IP address that identifies it on the network. IP addressing allows devices to send and receive data to and from each other over the internet.
- **Routing**: TCP/IP provides a routing service that enables data packets to travel between devices on different networks. Routers use the destination IP address to determine the best path for the data to travel to reach its intended recipient.
- **Fragmentation**: TCP/IP provides fragmentation services that allow data to be broken down into smaller packets that can be transmitted more efficiently. This ensures that data is transmitted smoothly and that large files are not lost during transmission.
- **Error Checking**: TCP/IP provides error-checking services to ensure that data is transmitted correctly. Data packets are checked at each step of the transmission process to ensure that they have not been corrupted during transmission.
- **DNS**: The Domain Name System (DNS) is another service provided by TCP/IP. It converts domain names into IP addresses, allowing devices to easily find and communicate with each other over the internet.
- **Security**: TCP/IP provides a variety of security services to ensure that data transmitted over the internet is secure. These include encryption and authentication protocols, which are used to ensure that data is not intercepted by unauthorized users.

### **Web Server:-**

A web server is a computer program that is responsible for serving web pages to clients over the internet. When a user requests a web page using their web browser, the request is sent to the web server. The web server then retrieves the requested page and sends it back to the user's web browser, allowing them to view the page in their browser window.

Web servers can be both hardware and software, and they work together to ensure that web pages are delivered to clients in a fast and efficient manner. The hardware component of a web server is typically a powerful computer with a fast internet connection. The software component is the web server program, which is responsible for handling client requests, retrieving web pages, and sending them back to the clients.

There are many different types of web servers, including Apache, Nginx, and Microsoft IIS. These servers all use the HTTP protocol to communicate with clients and send web pages to them. The HTTP protocol is a standard protocol that is used to transfer data over the internet.

Web servers can be configured to serve static or dynamic web pages. Static web pages are pre-built web pages that are delivered to clients without any modification. Dynamic web pages are web pages that are generated on the fly based on client requests. Dynamic web pages typically use server-side scripting languages like PHP, ASP.NET, or Ruby on Rails to generate the page content.

### **Web Client:**

A web client is a software program or application that can access and display content from the internet. It is a user-side interface that interacts with web servers to fetch and display content. Common web clients include web browsers like Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

Web clients provide a graphical user interface that allows users to interact with web content, including text, images, videos, and other multimedia. Web clients use protocols like HTTP (Hypertext Transfer Protocol) to communicate with web servers and fetch content.

### **Domain Registration:**

Domain registration is the process of registering a domain name with a domain registrar. A domain name is a unique name that is used to identify a website on the internet. For example, "google.com" is a domain name.

Domain registration involves selecting a unique domain name and then paying a fee to register it for a set period. The domain registrar checks if the domain name is available, then registers it on behalf of the person or organization that wants to use it.

Once a domain is registered, the domain owner can use it to create a website or set up email addresses associated with the domain. Domain registration also involves providing contact information for the domain owner, which is used to manage the domain and ensure that it remains active.

Domain registration is an essential step in creating a website, as it provides a unique identity on the internet. It also helps to ensure that a website is accessible and easy to find for potential visitors.

### **Introduction to HTML:**

HTML (Hypertext Markup Language) is a markup language used to create web pages. It is the standard markup language for web content and is used to structure content on the web.

HTML consists of a series of tags that define the structure and content of a web page. Tags are surrounded by angle brackets (< >) and provide instructions to the web browser about how to display the content. For example, the <p> tag is used to create a paragraph, while the <h1> tag is used to create a heading.

### **HTML Tags:**

HTML tags are used to define the structure and content of a web page. They are enclosed in angle brackets (< >) and instruct the web browser how to display the content. Each tag has a specific purpose and can contain additional attributes to provide more information.

- <html>: The root tag that defines the beginning and end of an HTML document.
- <head>: The tag that contains information about the web page, such as the title and links to external stylesheets.
- <body>: The tag that contains the content of the web page.
- <h1> - <h6>: Heading tags used to create headings of different sizes.
- <p>: Paragraph tag used to create paragraphs of text.
- <a>: Anchor tag used to create hyperlinks to other pages or websites.
- <img>: Image tag used to insert images into a web page.
- <ul> and <li>: Unordered list and list item tags used to create bulleted lists.
- <ol> and <li>: Ordered list and list item tags used to create numbered lists.
- <div>: Division tag used to group content together for styling purposes.
- <span>: Inline tag used to apply styles to a specific piece of text.

### **Commonly Used HTML Commands:**

- <!DOCTYPE html>: The command that declares the document type and version of HTML being used.
- <title>: The command that sets the title of the web page.

- <meta>: The command used to provide additional information about the web page, such as keywords or a description for search engine optimization purposes.
- <link>: The command used to link to external stylesheets or other resources.
- <br>: The command used to insert a line break.
- <hr>: The command used to insert a horizontal line.

## **Text Formatting:**

HTML tags are used to define the structure and content of a web page. They are enclosed in angle brackets (<>) and instruct the web browser how to display the content. Each tag has a specific purpose and can contain additional attributes to provide more information.

<b>: Bold tag used to make text bold.

<i>: Italic tag used to make text italicized.

<u>: Underline tag used to underline text.

<em>: Emphasis tag used to emphasize text.

<strong>: Strong tag used to give text stronger emphasis.

## **Text style in HTML**

Text style in HTML refers to the visual appearance of text on a web page. Here are some of the most commonly used text style tags and their respective definitions:

- <b> - Bold text: The <b> tag is used to create bold text. Any text that is placed between the opening and closing <b> tags will appear in a bold font.
- <i> - Italic text: The <i> tag is used to create italic text. Any text that is placed between the opening and closing <i> tags will appear in an italic font.
- <u> - Underline text: The <u> tag is used to create underlined text. Any text that is placed between the opening and closing <u> tags will be underlined.
- <em> - Emphasized text: The <em> tag is used to emphasize text. It is typically displayed in italic font, but can also be displayed in bold or with an underline, depending on the browser's default settings.

- **<strong>** - Strong text: The **<strong>** tag is used to create text that is strongly emphasized. It is typically displayed in bold font, but can also be displayed in italic or with an underline, depending on the browser's default settings.
- **<sup>** - Superscript text: The **<sup>** tag is used to create superscript text. Any text that is placed between the opening and closing **<sup>** tags will be displayed as superscript.
- **<sub>** - Subscript text: The **<sub>** tag is used to create subscript text. Any text that is placed between the opening and closing **<sub>** tags will be displayed as subscript.

### **Lists:**

HTML provides two types of lists - ordered and unordered. An ordered list is a list in which the items are numbered sequentially, while an unordered list is a list in which the items are bulleted or marked with some other symbol. Both types of lists are created using the **<ol>** and **<ul>** tags, respectively. Each list item is defined using the **<li>** tag.

HTML provides several ways to create lists on a web page. Here are the three types of lists in HTML:

#### **Ordered Lists:**

Ordered lists are used when the items in the list need to be numbered or ordered. The **<ol>** tag is used to create an ordered list. Each item in the list is enclosed in an **<li>** tag.

#### **Unordered Lists:**

Unordered lists are used when the items in the list do not need to be numbered or ordered. The **<ul>** tag is used to create an unordered list. Each item in the list is enclosed in an **<li>** tag.

#### **Definition Lists:**

Definition lists are used when each item in the list needs to be defined or described. The **<dl>** tag is used to create a definition list. Each term or item is enclosed in a **<dt>** tag, and the definition or description is enclosed in a **<dd>** tag.

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#### **Graphics to HTML Documents:**

HTML provides a way to add graphics to your web pages. Here are the steps to add graphics to your HTML documents:

### **Save the image:**

The first step is to save the image you want to use in your web page in a suitable format, such as JPEG or PNG.

### **Create an image tag:**

To display the image on your web page, you need to create an image tag. The `<img>` tag is used for this purpose. The `<img>` tag requires the "src" attribute to specify the location of the image file. Here is an example:

```

```

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To display the image on your web page, you need to create an image tag. The `<img>` tag is used for this purpose. The `<img>` tag requires the "src" attribute to specify the location of the image file. Here is an example:

```

```

In the above example, "image.jpg" is the name and location of the image file, "Alternative text" is the text that will be displayed if the image is not available or the user is using a screen reader, and "width" and "height" specify the dimensions of the image in pixels.

#### **Add other attributes:**

In addition to the "src" attribute, you can also add other attributes to the `<img>` tag to specify things like the alignment, border, and caption of the image. Here are some common attributes:

- "align": specifies the alignment of the image within the surrounding content
- "border": specifies the size of the border around the image
- "title": adds a title or tooltip to the image
- "alt": specifies alternative text that will be displayed if the image is not available

**Upload the image:**

Once you have created the <img> tag, you need to upload the image file and the HTML document to your web server or hosting service so that they can be accessed by visitors to your web page.

**Tables:**

Tables are a great way to organize and display data on a web page. Here are the steps to create a table in HTML:

Create a table tag:

To start creating a table, you need to use the <table> tag. Here is an example:

```
<table>

<tr>

<td>Row 1, Column 1</td>

<td>Row 1, Column 2</td>

</tr>

<tr>

<td>Row 2, Column 1</td>

<td>Row 2, Column 2</td>

</tr>

</table>
```

In the above example, the <table> tag is used to create a table. Each row is enclosed in a <tr> tag, and each cell in the row is enclosed in a <td> tag. The content of each cell is placed between the opening and closing <td> tags.

**Add attributes:**

You can also add attributes to the <table>, <tr>, and <td> tags to control the appearance and behavior of the table. Some common attributes include:

"border": specifies the thickness of the border around the table

"cellpadding": specifies the space between the cell content and the cell border

"cellspacing": specifies the space between cells

"width": specifies the width of the table

"height": specifies the height of the table

#### ***Linking Documents:***

Hyperlinks are an essential part of the web. Here are the steps to create a hyperlink in HTML:

- Create an anchor tag: To create a hyperlink, you need to use the `<a>` tag. Here is an example: `<a href="http://www.example.com">Link text</a>`

In the above example, the "href" attribute specifies the URL of the web page or file that you want to link to. The text between the opening and closing `<a>` tags is the text that will be displayed as the hyperlink.

#### ***Add other attributes:***

You can also add other attributes to the `<a>` tag to control the appearance and behavior of the hyperlink. Some common attributes include:

- "target": specifies where the linked page should open (e.g. in a new window or tab)
- "title": adds a title or tooltip to the link
- "rel": specifies the relationship between the current document and the linked document

#### **Frames:**

Frames allow you to display multiple web pages within a single browser window. Here are the steps to create frames in HTML:

Create a frameset tag:

To start creating a frameset, you need to use the `<frameset>` tag. Here is an example:

```
<frameset cols="25%,75%">  
  <frame src="menu.html">  
  <frame src="content.html">  
</frameset>
```

## Frames:

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To start creating a frameset, you need to use the <frameset> tag. Here is an example:

php

Copy code

```
<frameset cols="25%,75%">  
    <frame src="menu.html">  
    <frame src="content.html">  
</frameset>
```

In the above example, the <frameset> tag is used to create a frameset with two columns. The "cols" attribute specifies the percentage of the window width that each column should take up. The <frame> tag is used to specify the source of each frame.

### Add attributes:

You can also add attributes to the <frameset> and <frame> tags to control the appearance and behavior of the frameset. Some common attributes include:

- "border": specifies the thickness of the border around the frameset
- "frameborder": specifies whether or not to display a border around each frame
- "scrolling": specifies whether or not to allow scrolling within each frame

## Forms:

Forms are used to collect data from users on a web page. Here are the steps to create a form in HTML:

### Create a form tag:

To create a form, you need to use the `<form>` tag. Here is an example:

```
<form action="submit.php" method="post">  
  <label for="name">Name:</label>  
  <input type="text" id="name" name="name" required>  
  <br>  
  <label for="email">Email:</label>  
  <input type="email" id="email" name="email" required>  
  <br>  
  <input type="submit" value="Submit">  
</form>
```

In the above example, the `<form>` tag is used to create a form. The "action" attribute specifies the URL of the script that will process the form data. The "method" attribute specifies the HTTP method to use when submitting the form data (usually "post" or "get"). The form contains two input fields for the user to enter their name and email address, and a submit button to submit the form.

### **Add other form elements:**

In addition to text fields and submit buttons, you can also add other form elements to your HTML forms, such as checkboxes, radio buttons, dropdown lists, and textareas. Each form element has its own HTML tag and attributes.

### **Image Maps:**

Image maps are used to add clickable areas to an image on a web page. Here are the steps to create an image map in HTML:

### **Create an image tag:**

To create an image map, you need to use the `<img>` tag. Here is an example:

```

```

In the above example, the `<img>` tag is used to display an image on the web page. The "usemap" attribute specifies the name of the map that will be used for the image.

## **Create a map tag:**

To create the map, you need to use the <map> tag. Here is an example:

```
<map name="map">  
  <area shape="rect" coords="0,0,50,50" href="page1.html">  
  <area shape="circle" coords="100,100,50" href="page2.html">  
  <area shape="poly" coords="150,150,200,150,175,200" href="page3.html">  
</map>
```

In the above example, the <map> tag is used to define the areas of the image that will be clickable. The <area> tags specify the shape



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