**Unit-1**

**Introduction to Web Technologies**

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**1.1 Working of Internet**

In a network application, two application programs participate in any communication: one application initiates communication and the other accepts it. This is known as the Client-Server interaction. This is the methodology used for internet communication

* The Internet is a global network of networks that enables computers of all kinds to directly and transparently communicate and share services throughout the world.
* In 1969 the precursor of Internet is born: ARPAnet.
* ARPA = Advanced Research Projects Agency sponsored by the American Department of Defense (DOD).
* Designed to connect military research centers.
* The Internet = a network of networks

**Client-Server**

Client and Server are two applications involved in communication. These components work together over a network. It involves the client requesting serve from the server. The Server provides the requested service.

The typical features of the Client are:

1. It is front-end of an application.
2. It manages user-interface portion.
3. It validates data entered by the user.
4. It dispatches requests to server program. The typical features of the Server are:
5. Performs a back-end task.
6. Receives requests from clients.
7. Executes database retrievals and updates.
8. Manages data integrity.

Dispatches response to clients

**Web Browsers**

A Web browser is a software program that is used to access the World Wide Web(WWW).

It allows users to view Web pages and navigate between them.

Examples of Web Browsers are: Mozilla, Microsoft Internet Explorer, Opera, Chrome, Netscape etc.

Web Browsers are known as Universal Clients because they act as the common Client for all Web-based applications. They are the Web Clients that request services from a Web Server, Which is located some where on the Internet or Intranet.

**Server Program & Server System**

Generally, the term `Server' refers to a program that waits for a request and provides service.

However, a Computer that runs many such Server programs is also known as a Server.

Computers that have fast CPUs, large memories and powerful operating systems are also called Server Machines (or Server Systems or Server Computers).

―A Server is the program that provides Service to a client".

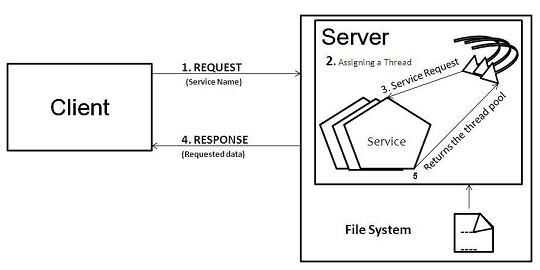
|  |  |  |
| --- | --- | --- |
| **1.2 World Wide Web(WWW)**  The World Wide Web (WWW) is an information sharing model that allows accessing information over the medium of the Internet. It is the collection of electronic documents that are linked together. These electronic documents are known as **~~`Web Pages'~~**. A collection of related **WebPages** is known as a `**Web Site**   * The World Wide Web allows computer users to locate and view multimedia-based documents (i.e., documents with text, graphics, animations, audios or videos) on almost any subject. * Even though the Internet was developed more than three decades ago, the introduction of the World Wide Web is a relatively recent event. In 1990, Tim Berners-Lee of CERN (the European |  |  |

**Working of Server**

A server offers one or more Services to clients. By default, it does not do any processing until a client sends in a request. It waits for a client to make a request. This is known as `listening mode of the server.

A typical client server interaction happens as follows:

1. The client sends a request for a server.
2. On receiving a request, the service assigns one of the threads in the pool to process the task and continues to wait for further request.
3. The thread executes the code for the requested service.
4. After execution, it sends the response back to the client.
5. It then returns to the thread pool.



***Figure 1.1: Working of Server***

The basic architecture is characterized by a Web Browser that displays information content and Web Server that transfer's information to the client. This architecture depends on three key standards for creating, publishing and finding Web documents on the Web:

**HTML:** Hyper Text Markup Language for creating and editing document content.

**URL:** Uniform Resource Locator for locating resource on the Internet.

**HTTP:** Hyper Text Transfer Protocol to transfer the data.

**1.2.1 HTML: Hyper Text Markup Language**

HTML is the authoring language used to create documents on the WWW. HTML makes documents readable across variety of computing platforms.

**1.2.2 URL: Uniform Resource Locator**

URL is the unique address that identifies each web page or a resource on the Internet. It indicates where the web pages are stored on the Internet. URL is the standard way of addressing resources on the Internet that are part of WWW.

The URL looks like

**Protocol://ServerDomainName/Path**

Examples

[**http://www.google.com**](http://www.google.com/)

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**Protocol** **Resource**

[**http://192.168.10.1/download**](http://192.168.10.1/download)

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**1.2.3 HTTP: Hyper Text Transfer Protocol**

Web browsers and Web Servers communicate with each other using the HTTP. It is a simple protocol, which standardizes the way requests are sent and processed. This allows different Clients to communicate with any vendor‘s server without compatibility problems.

HTTP is an application level protocol of the TCP/IP suite, which is used to deliver virtually all files and other data on WWW

**1.3. XAMPP (Bundle Server)**

XAMPP is a free and open-source cross platform Web Server Solution stack package, consisting mainly of Apache HTTP Server, MySQL database, and interpreter for scripts written in the PHP and Perl programming languages.

**X**: Cross-Platform

**A**: Apache

**M**: MySQL

**P**: PHP

**P**: Perl

Officially, XAMPP's designers intended it for use only as a development tool, to allow Website designers and programmers to test their work on their own computer without any access to the Internet. To make this as easy as possible many important security features are disabled by default. XAMPP sometimes used to actually Server Web Pages on the World Wide Web.

**Note:** XAMPP is also provided support for creating and manipulating databases in MySQL andSQL Lite among others.

**Benefits:**

1. Self contained, multiple instances of XAMPP can exist on a single computer, and any given instance can be copied from one computer to another.
2. It automatically starts at system logon.
3. You can start and stop Web Server and database stack with one command.
4. Run in back ground.
5. XAMPP is portable so you can carry it around on a thumb drive.
6. The security settings are strict by default, nobody but you will be able to access the WebServer.
7. PHP error reporting is enabled by default, which helps when debugging scripts.
8. Some of the bundle servers are:
9. **LAMP:L**inux, **A**pache, **M**ysql, **P**HP.
10. **SAMP:S**olaris, **A**pache, **M**ysql, **P**HP.
11. **MAMP:M**ac OS, **A**pache, **M**ysql, **P**HP

**1.5 HTML Introduction**

HTML is the standard markup language for creating Web pages.

1. HTML stands for Hyper Text Markup Language
2. HTML describes the structure of Web pages using markup
3. HTML elements are the building blocks of HTML pages
4. HTML elements are represented by tags
5. HTML tags label pieces of content such as "heading", "paragraph", "table", and so on A Simple HTML Document

Example

<!DOCTYPE <html> <html>head>

<title>Page Title</title>

</head>

<body>

<h1>My First Heading</h1>

<p>My first paragraph.</p>

</body>

</html>

Example Explained

1. The <!DOCTYPE html> declaration defines this document to be HTML5
2. The **<html>** element is the root element of an HTML page
3. The **<head>** element contains meta information about the document
4. The **<title>** element specifies a title for the document
5. The **<body>** element contains the visible page content
6. The **<h1>** element defines a large heading
7. The **<p>** element defines a paragraph

**HTML Headings**

HTML headings are defined with the **<h1>** to **<h6>** tags.

<h1> defines the most important heading. <h6> defines the least important heading:

**Example**

<h1>This is heading 1</h1>

<h2>This is heading 2</h2>

<h3>This is heading 3</h3>

**HTML Paragraphs**

HTML paragraphs are defined with the **<p>** tag:

**Example**

<p>This is a paragraph.</p>

<p>This is another paragraph.</p>

**HTML Links**

HTML links are defined with the **<a>** tag:

<!DOCTYPE html>

<html>

<body>

<a href="https://www.w3schools.com">This is a link</a>

</body>

</html>

The link's destination is specified in the **href attribute**.

Attributes are used to provide additional information about HTML elements.

**HTML Images**

HTML images are defined with the **<img>** tag.

The source file (src), alternative text (alt), width, and height are provided as attributes:

**Example**

<img src="w3schools.jpg" alt="W3Schools.com" width="104" height="142">

**HTML Elements**

An HTML element usually consists of a **start** tag and **end** tag, with the content inserted in between:

<tagname>Content goes here...</tagname>

The HTML **element** is everything from the start tag to the end tag:

<p>My first paragraph.</p>

**Empty HTML Elements**

HTML elements with no content are called empty elements.

<br> is an empty element without a closing tag (the <br> tag defines a line break).

Empty elements can be "closed" in the opening tag like this: <br />.

HTML5 does not require empty elements to be closed. But if you want stricter validation, or if you need to make your document readable by XML parsers, you must close all HTML elements properly.

**HTML Attributes**

All HTML elements can have **attributes**

1. Attributes provide **additional information** about an element
2. Attributes are always specified in **the start tag**
3. Attributes usually come in name/value pairs like: **name="value"**

**The width and height Attributes**

Images in HTML have a set of size attributes, which specifies the width and height of the image: Example

<img src="img\_bird.jpg" width="500" height="600">

**The style Attribute**

The style attribute is used to specify the styling of an element, like color, font, size etc. Example

<p style="color:red">I am a paragraph</p>

**HTML Headings**

Headings are defined with the <h1> to <h6> tags.

<h1> defines the most important heading. <h6> defines the least important heading. Example

<h1>Heading1</h1> <h2>Heading2</h2> <h3>Heading3</h3> <h4>Heading4</h4> <h5>Heading5</h5> <h6>Heading6</h6>

**Bigger Headings**

Each HTML heading has a default size. However, you can specify the size for any heading with the style attribute:

**Example**

<h1 style="font-size:30px;">Heading1</h1>

**HTML Horizontal Rules**

The <hr> tag defines a thematic break in an HTML page, and is most often displayed as a horizontal rule.

The <hr> element is used to separate content (or define a change) in an HTML page: Example

<h1>This is heading 1</h1> <p>This is some text.</p> <hr>

<h2>This is heading 2</h2> <p>This is some other text.</p> <hr>