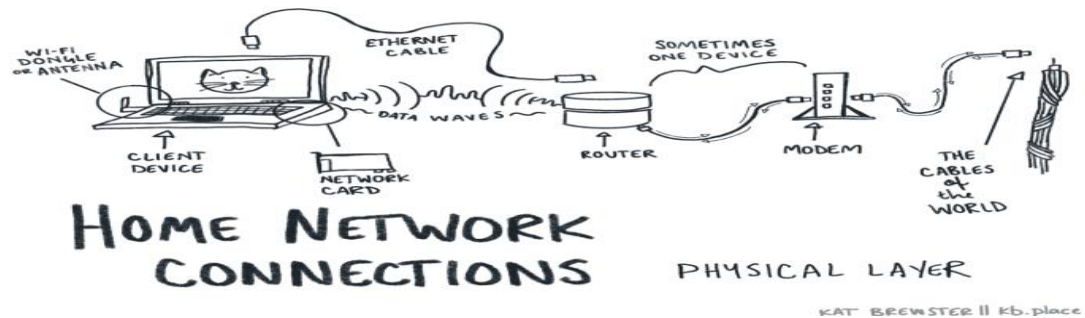


WEB TECHNOLOGIES

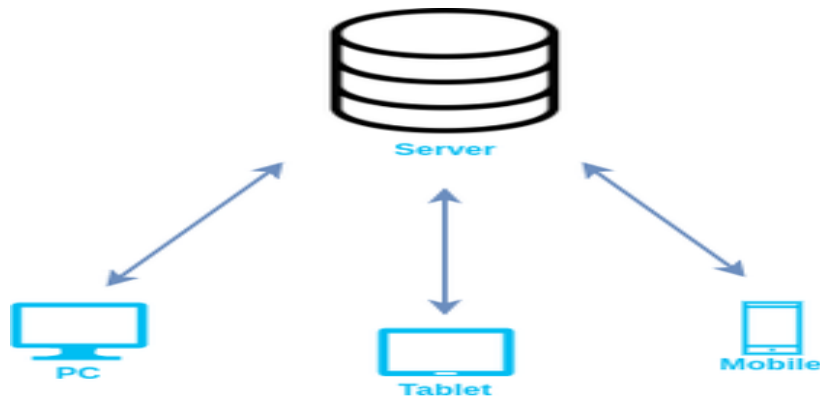
1. How internet works?

The internet works by connecting devices worldwide through a network of servers and routers. Data is transmitted in packets using various protocols (like TCP/IP), allowing devices to communicate and exchange information across different networks.



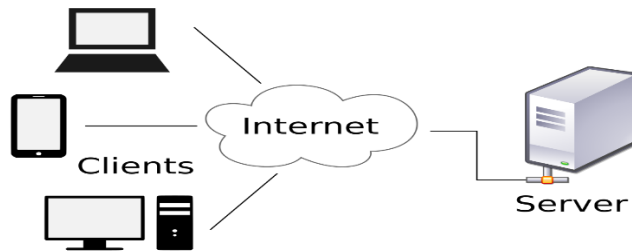
2. How browser works?

A browser retrieves and displays web pages on your device. It sends requests to web servers using protocols like HTTP or HTTPS, receives HTML, CSS, and JavaScript files, and renders them into a visual interface for you to interact with on your screen.



3. What is Server?

A server is a computer or software that provides functionality or resources to other computers, known as clients, over a network. Servers can serve data, applications, or perform tasks requested by clients, such as hosting websites, handling email, or storing files.



4. what are the types of server available?

The types of servers include:

1. **Web server:** Delivers web pages over the internet, like Apache or Nginx.
2. **File server:** Stores and manages files for network users, such as FTP or NAS servers.
3. **Database server:** Manages databases and provides data access, like MySQL or PostgreSQL.
4. **Mail server:** Handles email communication, such as Exchange Server or Postfix.
5. **Application server:** Executes applications and provides services to clients, like Tomcat or JBoss.

Types of Servers



 spiceworks

6. What is SEO? Importance of SEO?

SEO (Search Engine Optimization) is the practice of optimizing web pages and content to improve their visibility and ranking in search engine results pages (SERPs).

Importance of SEO:

1. **Increased visibility:** Helps websites appear higher in search results, increasing the likelihood of attracting visitors.
2. **Traffic generation:** Organic search results can drive significant traffic to websites.
3. **Cost-effectiveness:** Compared to paid advertising, SEO can provide long-term benefits with lower costs.
4. **Credibility and trust:** Higher rankings in search engines often lead to increased credibility and trust among users.

5. **User experience:** SEO practices often improve the usability and user experience of a website.
6. What is Accessibility?
Accessibility refers to the design of products, devices, services, or environments so that they are usable by people with disabilities. It aims to ensure that everyone, regardless of their physical, cognitive, or sensory abilities, can access and benefit from various systems and spaces.
7. What is Markup Language?
A markup language is a system for annotating a document in a way that is syntactically distinguishable from the text. It is used to define the structure and presentation of raw text. Examples include HTML (Hypertext Markup Language) used for web pages and XML (eXtensible Markup Language) used for data representation.
8. What is HTML?
HTML (Hypertext Markup Language) is the standard language used to create and design web pages. It structures web content by using a series of elements and tags to format text, images, links, and other media for display in web browsers.
9. What is browser engine?
A browser engine, also known as a rendering engine, is the core software component of a web browser responsible for rendering web pages. It interprets HTML, CSS, JavaScript, and other web technologies, converting them into the visual and interactive content that users see and interact with on their screens. Examples include Blink (used by Google Chrome) and Gecko (used by Mozilla Firefox).
10. What is rendering engine? share the available rendering engine?

A rendering engine is a software component of a web browser that interprets HTML, CSS, and JavaScript to display web pages on the screen. It converts the web content into a formatted and interactive visual representation.

Available rendering engines include:

1. **Blink:** Used by Google Chrome, Opera, and other Chromium-based browsers.
2. **Gecko:** Used by Mozilla Firefox.
3. **WebKit:** Used by Apple Safari and formerly by Google Chrome.

11. What is JavaScript Engine? share the available JS engine? Purpose of JS Engine?

A JavaScript engine is a software component that executes JavaScript code. It interprets and compiles JavaScript into machine code, enabling dynamic content on web pages.

Available JavaScript engines include:

1. V8: Used by Google Chrome and Node.js.
2. SpiderMonkey: Used by Mozilla Firefox.
3. JavaScriptCore (Nitro): Used by Apple Safari.
4. Chakra: Used by Microsoft Edge (legacy version).
5. ChakraCore: An open-source version of Chakra used by Microsoft.

Purpose of a JavaScript engine:

The primary purpose of a JavaScript engine is to execute JavaScript code efficiently, providing the dynamic and interactive functionality required for modern web applications.

12. How website works?

A website works through a series of interactions between a user's web browser and a web server. Here's a simplified process:

1. Request: The user enters a URL in their web browser, which sends a request to the web server.
2. Server Response: The web server receives the request and processes it, retrieving the necessary files (HTML, CSS, JavaScript, images, etc.).
3. Rendering: The web browser's rendering engine processes the HTML, CSS, and JavaScript to construct and display the web page.
4. Interaction: The user interacts with the web page, and the browser may send additional requests to the server for more data or updates, which the server processes and sends back.

This cycle allows for dynamic and interactive web experiences.

13. What is Data Structure?

A data structure is a way of organizing, managing, and storing data in a computer so that it can be accessed and modified efficiently. Different data structures are suited to different kinds of applications, and some are highly specialized to specific tasks. Common examples include arrays, linked lists, stacks, queues, trees, and graphs

14. Explain Tree Data Structure?

A tree data structure is a hierarchical organization of data in which elements are connected by edges. Each element, called a node, contains a value and may have child nodes. The top node is called the root, and nodes without children are called leaves. Trees are used to represent hierarchical relationships and are common in applications like file systems, databases, and organizational structures.

15. What is user agent? share the list and its purpose?

A user agent is a software application that acts on behalf of a user to access web content, typically a web browser or a web crawler. The user agent sends a string of text to web servers, identifying itself and its capabilities.

List of common user agents:

1. Web browsers:

- Google Chrome
- Mozilla Firefox
- Apple Safari
- Microsoft Edge
- Opera

2. Web crawlers:

- Googlebot
- Bingbot
- DuckDuckBot

3. Mobile browsers:

- Chrome for Android
- Safari for iOS

Purpose of user agents:

User agents identify themselves to web servers, allowing the server to provide appropriate content and formatting based on the capabilities and characteristics of the client device. This can include adapting to different screen sizes, optimizing for speed, or providing different content for search engines.

16. What is Hypertext?

"Hypertext" is not a widely recognized term in general computing, it does not have a standard definition. It might refer to a specific tool, framework, or concept within a particular software development context. If "Hypertext" is a term from a specific technology or platform, providing additional context or clarification would help in giving a precise definition.

17. What is HTML Tags?

HTML tags are the building blocks of HTML (Hypertext Markup Language) used to create and structure content on the web. They are enclosed in angle brackets (< >) and usually come in pairs, with an opening tag (<tagname>) and a closing tag (</tagname>). Some tags are self-

closing (`<tagname />`). Tags define elements such as headings, paragraphs, links, images, and other types of content and their attributes, helping browsers render the web page correctly.

18. What is HTML Attributes?

HTML attributes provide additional information about HTML elements. They are included within the opening tag and usually come in name-value pairs, like `name="value"`. Attributes modify the default behavior of elements or specify additional properties, such as the element's ID, class, style, or source URL

19. What is HTML Elements?

HTML elements are the basic building blocks of HTML. An HTML element typically consists of a start tag, content, and an end tag. Some elements are empty and self-closing. HTML elements define the structure and content of a web page, such as headings, paragraphs, links, images, and other multimedia.

20. How do convert elements to tree?

Converting elements into a tree structure, such as in the case of parsing HTML or XML, typically involves a process called "parsing." Here's a simplified overview of how this conversion works:

1. **Tokenization:** The HTML or XML document is first tokenized, breaking it down into a sequence of tokens such as start tags, end tags, attribute names, attribute values, text content, etc.
2. **Building the Tree:** Using the tokens generated from tokenization, a parsing algorithm constructs a tree structure known as the Document Object Model (DOM) tree in the case of HTML. Each element, attribute, and piece of text is represented as a node in this tree.
3. **Hierarchy:** Elements in the tree are arranged hierarchically based on their nesting in the HTML or XML document. Parent-child relationships are established where appropriate (e.g., a `<div>` containing a `<p>`).
4. **Attributes and Text:** Attributes of elements are added as properties of their respective nodes, and text content becomes nodes within the structure.

21. What is DOCTYPE?

The `<!DOCTYPE>` declaration, short for "document type declaration," is an instruction to the web browser about what version of HTML the page is written in. It ensures that the browser renders the page in standards-compliant mode rather than quirks mode, which can lead to inconsistencies in how web pages are displayed.

Example:

```
html
<!DOCTYPE html>
```

This declaration is for HTML5, the current standard. It should be the very first thing in an HTML document, before the `<html>` tag.

22. What are the ways we can save html file?

You can save HTML files using text editors like Notepad or specialized code editors such as Visual Studio Code. Simply write your HTML code, choose "Save As," select a directory, name your file with a `.html` extension (e.g., `index.html`), and save.

23. What is charset? why we need to use this?

Charset (character set) specifies the encoding used for representing characters in a document. It determines how characters are mapped to binary data for storage and transmission.

Why we need to use charset:

1. **Character Representation:** Charset ensures that characters in the document are correctly interpreted by browsers and other software. Different charsets support different languages and character sets (e.g., UTF-8 supports a wide range of characters).
2. **Compatibility:** Specifying a charset helps avoid rendering issues and ensures consistency across different platforms and browsers.
3. **Internationalization:** It supports multilingual content, allowing web pages to display text in various languages without garbled or incorrect characters.

24. What is meta data? what is the purpose of it?

Metadata refers to data that provides information about other data. In the context of web development and HTML, metadata typically refers to `<meta>` tags used to provide information about the HTML document itself rather than its content.

Purpose of metadata:

1. **SEO (Search Engine Optimization):** Metadata such as `<title>`, `<meta name="description">`, and `<meta name="keywords">` help search engines understand the content of the web page, improving its visibility in search results.
2. **Browser Behavior:** `<meta>` tags can control aspects of how browsers display or process the web page, such as setting the viewport for responsive design (`<meta name="viewport">`) or specifying the character encoding (`<meta charset="UTF-8">`).
3. **Social Media Integration:** Metadata like Open Graph tags (`<meta property="og:title">`, `<meta property="og:image">`) provide information when sharing pages on social media platforms, ensuring they display correctly.

4. **Accessibility:** `<meta>` tags can include accessibility-related information, such as `<meta name="robots">` for search engine crawling instructions or `<meta name="referrer">` for controlling referrer information.

25. Explain Web Application Architecture?

Web application architecture defines how components like client-side interfaces, server-side applications, databases, and communication protocols work together to deliver functionality to users over the internet. It includes client-side rendering with HTML/CSS/JavaScript, server-side processing with application servers and databases, and communication via HTTP/HTTPS and APIs, ensuring efficient, secure, and scalable application deployment and operation.
