

```
Extra, function  
y for outerHeight, outerWidth  
Name ] = function( margin, value ) {  
ble = arguments.length && ( defaultExtra || typeof arguments[0] === 'string' ? "margin" : "padding" );  
= defaultExtra || ( margin === true || value === true ? "margin" : "padding" );  
ccess( this, function( elem, type, value ) {  
doc;  
( jQuery.isWindow( elem ) ) {  
// S( window ).outerWidth/Height return w/h including scrollbar widths  
return funcName.indexOf( "outer" ) === 0 ?  
elem[ "inner" + name ] :  
elem.document.documentElement[ "client" + name ];  
}  
// Get document width or height  
if ( elem.nodeType === 9 ) {  
doc = elem.documentElement;  
// Either scroll(Width/Height) or offset(Width/Height) or client(Width/Height)  
// whichever is greatest  
return Math.max( doc.body[ "scroll" + name ], doc[ "scroll" + name ],  
doc.body[ "offset" + name ], doc[ "offset" + name ],  
doc.body[ "client" + name ], doc[ "client" + name ] );  
}
```

Session 2: Use of JavaScript in Creating Dynamic HTML Pages

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Java Script

JavaScript Programming Language

- JavaScript is a programming language that executes on the browser
- It turns static HTML web pages into interactive web pages by dynamically updating content, validating from data, controlling multimedia, animate images and almost everything else on the web pages
- JavaScript can be used to create web and mobile applications, build web servers, create games among others

History of JavaScript

1. **In early 1995, Brendan Eich from Netscape**
 - Designed and implemented a new language for non-Java programmers to give newly added Java support in Netscape navigator
2. **Initially named Mocha**
 - Then, Live Script and finally JavaScript
3. **JavaScript can execute**
 - Not only on browsers but also on the server or any device with a JavaScript engine
4. **Node.js is a framework**
 - Based on JavaScript that runs on the server

JavaScript and ECMAScript

Relation Between JavaScript and ECMAScript

JavaScript

1. Primarily developed to execute on browsers
2. Many different browsers from different companies
3. Execution of JavaScript code to achieve the same functionality in all the browsers
4. ECMAScript standards, which include features specified in the ECMA-262 specifications and

ECMAScript

1. A non-profit organisation that creates standards for technologies
2. Specifications for scripting languages are called 'ECMAScript'
3. ECMA-262 for creating a general-purpose scripting language

Advantages of JavaScript

1. JavaScript is the most popular language. Its syntax is easy to learn.
2. It is a light-weighted and interpreted language.
3. It is a case-sensitive language and supportable in several operating system including, Windows, macOS, etc.
4. It provides better control to the users over the web browsers as they provide built-in execution environments.

Application of JavaScript

Application of JavaScript are as follows.

Open the database2 from home tab.

- Client-side validation

- Dynamic drop-down menus
- Displaying date and time
- Displaying popup windows and dialog boxes like an alert dialog box, confirm dialog box, and a prompt dialog box
- Displaying clocks and
- Creating web, mobile app and game development

Web Applications

- Gained popularity for making robust web applications
- Just clicking and dragging mouse and user gets the details

Web Development

- JavaScript is used for creating web pages
- Add dynamic behaviour to the web page and add special effects to the web page
- Used for validation purposes

Mobile Application

- React Native is widely used JavaScript framework for creating mobile applications
- Used to build mobile applications for different operating systems
- Do not require writing different codes for the iOS and Android operating systems

Games

- Used in creating 2D or 3D games
- **PhysicsJS, Pixi.js** is used to create a web game
- **WebGL** (web graphics library) is the JavaScript API to render

Presentation

- **RevealJs** and **BespokeJs** are used to create a web-based slide deck
- **Reveal.js**- used to create interactive and beautiful slide decks with the help of HTML
- **BespokeJS**- includes animated bullet lists,

Web App Building Blocks

Web app building blocks include three components that build websites and apps.

JavaScript (JS)

- Creates dynamic activity on your app
- Controls functions when buttons are clicked

Hypertext Markup Language (HTML)

- Markup language that creates the skeleton of the web page
- All the paragraphs, sections, images, headings and text written in HTML
- Appears on the website in the order they are written in HTML

Cascading Style Sheets (CSS)

- Controls the style and the additional aspects of the layout
- Creates the design of the website creating the colours, fonts, columns, borders
- Takes the website from plain text elements to colourful

How JavaScript Works

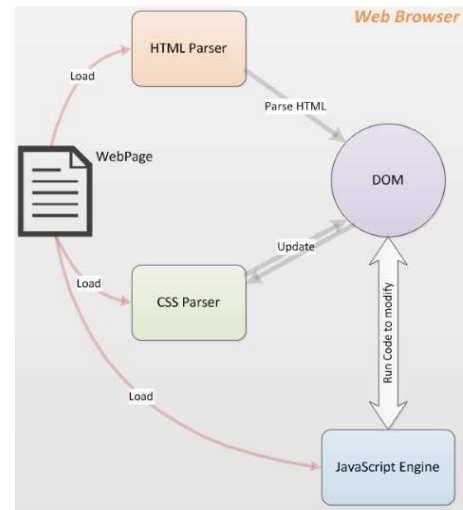
JavaScript Working

- Mostly every modern web browser nowadays has their JavaScript engines.
- For example, Google Chrome has its JavaScript engine called V8.
- Similarly, other web browsers have their own JavaScript engines as shown in the

| SL. No. | Web Browser | JavaScript engine |
|---------|-------------|-------------------|
| 1. | Edge | Chakra |
| 2. | Safari | JavaScript Core |
| 3. | Firefox | Spider monkey |

Working of JavaScript on a Web Page

- The web browser loads a web page, parses the HTML and creates what is known as a Document Object Model (DOM) from the contents.
- The DOM presents a live view of the web page to your JavaScript code.
- The browser will then grab everything linked to the HTML like images and CSS files.
- The CSS information comes from the CSS parser.
- The HTML and CSS are put together by the DOM to create the web page first.
- Then, the browsers' JavaScript engine loads JavaScript



Basic Use of JavaScript

Common Basic Uses of JavaScript While Developing a Web Application

Storing information using JavaScript

- JavaScript stores important values in variables.
- The variable is a container for a value.
- The values may be numbers, strings, Booleans, arrays and objects.
- Variables are not the values themselves; they are containers for values.
- Variables can also contain complex data and even entire functions to do amazing things.

Mathematical operations using JavaScript

- JavaScript can be used to perform mathematical operations like processing numerical data, calculating new values and so on.
- While developing web applications, on client-side, you might want to do many

Instant update of Information

- JS provides instant update of information like periodic or at a specific time or at a specific date something in your web page should be updated.
- JavaScript can be used to generate instant information without the need of user actions.
- For example, discount offers in e-commerce sites available till a certain time.

Loading information only when user chooses

- It means that with JavaScript, we can transfer the access to the user and the users can decide whatever content they want to see.
- For example, navigation menu of a website⁷ contains a few links but displays links to

Web Server

Common Basic Uses of JavaScript While Developing a Web Application

Web Server and Its Features

1. A web server is a computer program that distributes web pages according to the user's requisition.

2. Web server is a combination of hardware and software and its main objective is to store, process and deliver web pages to users.
3. Web server uses HTTP or Hypertext Transfer Protocol and other protocols for getting responses to each client request made over the WWW or World Wide Web.
4. A web server supports SMTP or Simple Mail Transfer Protocol and FTP or File Transfer Protocol for e-mailing, file transfer and storage.

Static and Dynamic Web Server

Static web server

A static web server consists of computer hardware with an HTTP server, that is, software. We call it "static" because the server sends its hosted files as-it-is to your browser.

Dynamic web server

- A dynamic web server consists of a static web server plus extra software, most commonly an application server and a database.
- It is called "dynamic" because the application server updates the hosted files before sending content to your browser via the HTTP server.

Software Edge and Hardware Edge of Web Server

Web Server

| | Hardware Edge | Software Edge |
|--|--|--|
| <ul style="list-style-type: none"> • Web server is a combination of hardware and software. • The main objective is to display the website content on the browser through the internet. | <ul style="list-style-type: none"> • A web server is a super-performing computer that helps to hold their software and website's data files like text, images, video and application data. • Web servers make a connection with the internet and interchange all data along with other devices, which are linked to the web. | <ul style="list-style-type: none"> • The web server enables various parts that help to manage all web users' access to hosted data like an HTTP server. • It is software that can understand all URLs or web addresses. • The HTTP server can be used by the Domain Name of the website and it renders all content of these hosted websites to the end user's system. |

How Web Server Works

1. In a nutshell, users can see the web page on the internet when a browser sends multiple requests to the web server for web pages. Then, the web server responds by serving those pages.
2. In first step, the web browser gets the IP or Internet Protocol from the domain name. The IP address can be received in two methods; finding IP address in Cache and requesting IP address in multiple DNS (Domain Name Servers).
3. In second step, web browser is fully aware of which IP address website is located at so it can send request to full URL from server-side.
4. Web server responds by sending the requested web page to the web browser. If those web pages do not present, then an appropriate error message will be displayed on the web browser.
5. Finally, the web browser receives the appropriate requested web page by the user and views it.

Features of Web Sever

Features of Web Sever are as follows:

1. Web server can provide enlarged data storage support, so it is capable to make multiple websites
2. Web server helps to configure log file set up and enables where to hold all log files
3. Web server helps to control bandwidth regulation network traffic. Hence, it can avoid downtime while high volume web traffic is flowing
4. It is easy to make FTP websites because it helps to move large files from one site to another site
5. It is easy to set up custom error pages configuration
6. It is easy to set up website configuration and directory security
7. It is easy to make virtual directories and then help to map them along with physical directories
8. Default documents can be specified to it
9. It is enabled with server-side web scripting. So, it allows users to make dynamic websites. A few types of server-side scripting languages are PHP, ASP, Ruby, Perl, Python and more

Advantages and Disadvantages of Web Sever

| Advantages | Disadvantages |
|--|--|
| Web server helps to implement server-side scripting languages like PHP, Ruby and so on | It may be more expensive compared to the use of electronic website hosting |
| Web server helps to monitor the download speed of any web App as well as performance | It is harder to customise hosting services |

| | |
|--|---|
| This gives permission to view URL construction and broken links among others | Due to the overwhelming of servers at any time, it can get down your website |
| It provides better transparency in a transaction between your website and server while hosting | It is comfortable to use only with online enterprises |
| It is more controllable and flexible and holds in protected infrastructure | It needs more protection to sites, like credit card; requires its own base for e-commerce store |
| It also delivers the best insight in way HTTP communication | |

Types of Web Server

Apache Web Server

- It is one of the most popular web servers developed by the Apache Software Foundation.
- Open-source software, Apache supports almost all operating systems such as Linux, Windows, Unix FreeBSD, Mac OS X and more. Approximately, 60% of the machines run on Apache Web Server.

Microsoft IIS Web Server

- A Microsoft product, IIS is a server that offers all the features as Apache.
- It supports all the platforms that run Windows operating system.
- Additionally, you also get good customer support, if there is an issue.

Nginx Web Server

- Nginx Web Server is an open-source web server after Apache. It comprises IMAP/POP3 proxy server.
- High performance, stability, simple configuration and low resource usage are features of Nginx.

LiteSpeed

- A high-performance Apache drop-in replacement, LiteSpeed (LSWS) is the 4th popular web server on

the internet and is a commercial web server.

- This server is compatible with the most common Apache features, such as .htaccess, mod rewrite and mod security.

Apache Tomcat

- Apache Tomcat is an open-source Java servlet container, functions as a web server.
- A Java program that expands the capabilities of a server is called a Java servlet.
- Servlets can respond to any type of request, but they most commonly implement applications hosted on web servers.

Node.js.

- This type of server provides the JavaScript environment on server edge that is implemented in network applications like a web server.

Lighttpd

- Lighttpd, pronounced as "lightly", was initially released in March 2003.
- It currently runs approximately 0.1% of all websites and is distributed under a BSD license.
- Lighttpd stands unique due to its small CPU load, low memory footprint and speed optimisations.

Other Types of Web Server

Mail Server:

- In a mail server, you get a centrally located pool of disk space to store and share different documents in the form of e-mails for network users.
- All the data is stored in a single location and administrators need to back up files only from one computer.

Application Server:

- It acts as a set of components that can be accessed by the software developer via an API defined by

the platform itself.

- These components are usually performed in an environment similar to its web servers for the web applications.

FTP Server:

- Separate control and data connections are used by the FTP between the client and the server.
- The FTP users can authorise themselves in the form of a username and password.

Database Server:

- It is a computer program that offers database services to other computer programs or computers with the use of client-server functionality.

Domain Name System (DNS) Server:

- It is a computer server that hosts a network service for offering responses to queries known as name server. It maps either an addressing component or numeric identification.

Recap:

- JavaScript is a programming language that executes on the browser
- HTML and CSS create the structure but they don't do anything from there. JavaScript creates dynamic activity on your app
- HTML elements can be customised using DOM
- A web server is a computer program that distributes web pages according to the user's requisition
- A dynamic web server consists of a static web server plus extra software, most commonly an application server and a database
- Apache web server is one of the most popular web servers developed by the Apache Software Foundation
