**HTTP/1.1 AND HTTP/2**

*HTTP/1.1 and HTTP/2 are both protocols used for transferring hypertext (text displayed on a computer display or other electronic devices with references (hyperlinks) to other text that the reader can immediately access). However, they have significant differences in terms of performance, efficiency, and features. Here's a breakdown:*

|  |  |  |
| --- | --- | --- |
| TOPICS | HTTP/1.1 | HTTP /2 |
| MULTIPLEXING | It uses single connection for each request-response cycle | It introduces multiplexing, allowing multiple requests |
| HEADER COMPRESSION | Headers are not compressed, leading to redundancy and increased overhead, especially for repeated headers across multiple request | It supports header compression, reducing overhead and improving performance, particularly for sites with many resources |
| BINARY PROTOCOL | It uses text-based protocols, which is human-readable but less efficient for machines to parse | It uses a binary protocol, which is more efficient for parsing by machines and reduces parsing complexity |
| SERVER PUSH | Servers can’t proactively send resources to clients without the client requesting them | It introduces server push, allowing servers to push additional resources to the client’s cache that they anticipate the client will need. |
| CONNECTION MANAGEMENT | Each request-response cycle requires opening and closing a separate TCP connection, incurring overhead in connection setup and teardown. | It uses a single long-lived connection between the client and server, reducing latency and connection overhead |
| PRIORITIZATION | No built-in support for request prioritization, leading to potential inefficiencies in resource loading | It supports request prioritization, allowing clients to indicate the relative importance of different resources, which can improve page loading times |

CONCLUSION:

Overall, HTTP/2 offers significant performance improvements over HTTP/1.1, Particularly for websites with many resources or complex page structures. However, adoption and implementation vary across different web servers and clients.

**OBJECTS AND ITS INTERNAL REPRESENTATION IN JS**

In simple terms. “A JavaScript object is a collection of named values having state and behaviour (properties and method)”.

For example: Person, car, pen, bike, Personal Computer, Washing Machine etc.

* Take the case of cars.

All cars have the same properties, but the property values differ from car to car. All cars have the same methods, but the methods are performed at different times.

Let’s have an example of my favourite car (MERCEDES) and list out its properties (Features):

1. Make: Mercedes
2. Model: C-Class
3. Colour: White
4. Fuel: Diesel
5. Weight: 850kg
6. Mileage: 8Kmpl
7. Rating: 4.5

Taking the above as reference, I'll stress up on objects, Object properties and Methods.

1)Objects:

The following code assigns a simple value (Mercedes) to a variable named car:

var car = "Mercedes";

Objects are variables too. But objects can contain many values.

The following code assigns many values (Mercedes, C-class, White and so on) to a variable named Car:

var car = {Make: “Mercedes”, Model: “C-Class”, Color: “White”, Fuel: Diesel, Weight: “850kg”, Mileage: “8Kmpl”, Rating: 4.5};

The values are written as name : value pairs (name and value separated by a colon).

Syntax:

var <object-name> = {key1: value1, key2: value2, ... keyN: valueN};

So, conclusion and definition for JS objects is “JavaScript objects are containers for named values”.

2)Object Properties

The name:values pairs (in JavaScript objects) are called properties.

var car = {Make: “Mercedes”, Model: “C-Class”, Color: “White”, Fuel: Diesel, Weight: “850kg”, Mileage: “8Kmpl”, Rating: 4.5};



The object properties can be different primitive values, other objects and functions.

Properties can usually be changed, added, and deleted, but some are read only.

3)Object Methods

An object method is an object property containing a function definition.

i.e.,

Let’s assume to start the car there will be a mechanical functionality.

function(){return ignition.on}.

IP ADDRESS, PORT, HTTP METHODS, MAC ADDRESS

1. IP Address: An IP Address or Internet Protocol Address, is a unique number that identifies a device on the internet or a local network. IP Addresses are typically assigned by an internet service provider (ISP).

-> IP Address serves two main functions:

1. Network Interface Identification

2. Location Addressing

-> IP Addresses are generated using two main versions of internet protocol (IP) IPV4 and IPV6. IPV6 addresses are longer and can have trillions available. IPV4 addresses are only 32bits, while IPV6 addresses are made up to 128bits.

2. Port: A port in computer networking is a number that identifies a connection endpoint and directs data to a specific service.

They help computers sort the network traffic they receive.

-> Ports are software based and managed by a computer’s operating system. Each port is associated with a specific process or service.

Port numbers are divided into three ranges.

1. Well-known ports: Also known as system ports, these are numbered from 0 to 1023. They are standardized and widely recognized across the networking industry. They are typically associated with commonly used services and applications.

For example, port 80 is used for HTTP web traffic.

2. Registered ports: One of the three ranges of port numbers.

3. Dynamic or private ports: One of the three ranges of port numbers

-> Other types of ports include:

4. Ephemeral ports: Temporary network communication endpoints used to establish a connection with a server application over internet/local network.

5. Serial ports: A serial communication interface through which information transfers in or out sequentially one bit at a time.

6. Ethernet ports: Used to connect ethernet cables to computer.

3. HTTP Methods: The HTTP is a collection of request methods that specify what action to perform on a specific resource.

The most commonly used HTTP methods are GET POST ,PUT,PATCH,DELETE. These methods correspond to create, read, update, delete(CRUD) operations.

-> GET method is used to retrieve data from a web server by specifying parameters in the URL portion of the request.

GET is one of the most popular HTTP request techniques.

-> POST is used to send data to a server to create or update a resource. POST requests are never cached and do not remain in the browser history.

-> PUT is used to replace all current representations of the target resources with request payload.

-> DELETE is used to remove data from a database. For example, a DELETE request to the /product/123 endpoint will permanently remove the product with an ID of 123 from database.

4. MAC Address: A MAC Address(Media Access Address) is a 12-character alphanumeric identifier that uniquely identifies a network interface controller(NIC).

-> MAC Address are used in many IEEE 802 networking technologies, including WI-FI, Ethernet, Bluetooth. They are often found on a device’s network Interface card (NIC).

-> A device can have multiple MAC Addresses because each network interface requires a different address.