**1.Write a blog on Difference between HTTP1.1 vs HTTP2**

**INTRODUCTION**

HTTP stands for HypertText Transfer Protocol. The HTTP is a data communication protocol and acts as the foundation of the world wide web and is used to load webpages using hypertext links. HTTP is an application layer protocol designed to transfer information between networked devices and runs on top of other layers of the network protocol stack.

Over time, HTTP has been updated to improve speed and efficiency. HTTP/1.1 has been the standard for a long time, but HTTP/2 is a newer version that brings significant improvements.

**HTTP 1.1 :**

HTTP/1.1 is a version of this HTTP that has been introduction in 1997. HTTP 1.1 brought several improvements over the initial version (HTTP/1.0) .

**HTTP 2 :**

HTTP/2, published in 2015, HTTP/2 was developed and introduced to address some of the limitations of HTTP/1.1**.**

**DIFFERENCES BETWEEN HTTP1.1 AND HTTP2**

**Data Format in HTTP 1.1 and HTTP 2**

* HTTP1.1:

Text-Based: Data is sent in a text format, which is easier to read but not as efficient for computers to process.

* HTTP 2:

Binary Format: Data is sent in a binary format, which is more efficient for computers to read and process, leading to faster data transfer.

**Speed and Efficiency in HTTP 1.1 and HTTP 2**

* HTTP 1.1:

**Single Request per Connection:** Each request (like loading an image or a script) uses its own connection. This can make the loading process slower because it has to wait for one request to finish before starting another.

* HTTP 2:

**Multiplexing:** Multiple requests can be sent at the same time over a single connection. This means your web browser can load multiple parts of a webpage simultaneously, making the page load faster.

**Header Compression in HTTP 1.1 and HTTP 2**

* **HTTP/1.1:**

Headers are sent as plain text, which can create significant overhead, especially with repetitive headers.

* **HTTP/2:**

HTTP/2 uses HPACK compression to reduce the size of headers, leading to decreased latency and better performance.

**Pushing Content in HTTP 1.1 and HTTP 2**

* HTTP/1.1:

**Client-Initiated:** Your browser has to request each piece of the webpage (like images and scripts) individually.

* HTTP/2:

**Server Push:** The server can send multiple pieces of the webpage to the browser before the browser even asks for them, which speeds up the loading process.

**Connection Management in HTTP 1.1 and HTTP 2**

* HTTP/1.1:

**Multiple Connections:** Since each request needs its own connection, multiple connections are opened and closed, which can be inefficient.

* HTTP/2:

**Single Connection:** One connection is used for all requests, reducing the overhead of opening and closing multiple connections.

**Adoption and Support**

* HTTP/1.1:

HTTP/1.1 has been the backbone of the web for decades and remains universally supported by all web servers and browsers.

* HTTP/2:

HTTP/2 is supported by most modern web browsers and web servers. Its adoption is growing as more organizations update their infrastructure to take advantage of its performance benefits.

**HTTP 2 Over HTTP 1.1**

**Limitations of HTTP/1.1**

* Performance Issues: Because requests are processed one after another, a delay in one request can hold up others (Head-of-Line blocking).
* Connection Overhead: Although it allows for multiple files to be sent over a single connection, there can still be overhead from managing multiple connections for different requests.
* Text-Based Headers: Sending headers as plain text can add a lot of extra data to each request, which isn’t very efficient

We have some limitations in HTTP 1 because of this limitation we chose HTTP 2 for better performance. HTTP/2 makes web pages load faster and more efficiently. It allows multiple requests to be sent at the same time over one connection, reduces the extra data by compressing headers, and can push important resources to the browser before it even asks for them. These improvements mean faster page loads, better use of network resources, and a smoother browsing experience.

**ADVANTAGES AND DISADVANTAGES**

**HTTP 1.1**

**Advantages:**

* Wide Compatibility: Supported by all web browsers and servers.
* Simplicity: Easier to understand and debug because it uses plain text.

**Disadvantages:**

* Slower Performance: Sequential request processing and multiple connections can slow down the loading of web pages.
* Header Overhead: Larger headers can add unnecessary data to each request.

**HTTP 2**

**Advantages:**

* Faster Loading: Multiplexing and server push significantly improve page load times.
* Efficient Use of Resources: Single connection and compressed headers make better use of network resources.

**Disadvantages:**

* Complexity: The binary format and advanced features can make it harder to debug and implement.
* Compatibility: While widely supported by modern browsers, some older systems may not support HTTP/2, requiring a fallback to HTTP/1.1.