Difference between HTTP1.1 vs HTTP2

Evolution of HTTP

HTTP (Hypertext Transfer Protocol) is a set of rules that runs on top of the TCP/IP suite of protocols and defines how files are to be transferred between clients and servers on the world wide web.

Created for Added Security

In 1994, Netscape Communications created HTTPS (Hypertext Transfer Protocol Secure) to be used with SSL for its web browser, Netscape Navigator.

HTTP1.1

HTTP/1.1 has been around for more than a decade. With Google's SPDY leading the way in 2015, the IETF (Internet Engineering Task Force) gave us HTTP/2, which introduces several features to reduce page load times.

Key Features of HTTP/1.0:

- The concept of headers both for requests (from the client machine) as well as responses (from servers) was introduced. The use of headers such as GET, POST, HEAD added extended flexibility.

- It allowed a single request/response for every TCP connection.

- Status codes were used to indicate successful requests and to indicate transmission errors.

- The content-type header made it possible to send files other than plain HTML, including scripts and media.

HTTP2

HTTP/2 achieves faster webpage loading without performance optimizations that require extensive human efforts in terms of development. It significantly reduces the complexities that had crept into HTTP/1.1 and gives us a robust protocol.

Key Features of HTTP/2:

- It introduces the concept of a server push where the server anticipates the resources that will be required by the client and pushes them prior to the client making requests.

- Introduces the concept of multiplexing that interleaves the requests and responses without head-of-line blocking and does so over a single TCP connection.

- It is a binary protocol i.e. only binary commands in the form of 0s and 1s are transmitted over the wire. The binary framing layer

divides the message into frames that are segregated based on their type – Data or Header.

- HTTP/2 uses HPACK header compression algorithm that is resilient to attacks like CRIME and utilizes static Huffman encoding.

Differentiator	HTTP/1.1	HTTP/2
Key Features	It supports connection reuse i.e., for every TCP connection there could be multiple requests and responses, and pipelining where the client can request several resources from the server at once.	Uses multiplexing, where over a single TCP connection resource to be delivered are interleaved and arrive at the client almost at the same time. It also provides a feature called server push that allows the server to send data
Status Code	Introduces a warning header field to carry additional information about the status of a message. Can define 24 status codes, error reporting is quicker and more efficient.	Underlying semantics of HTTP such as headers, status codes remain the same.

Caching	Expands on the caching support by using additional headers like cache-control, conditional headers like If-Match and by using entity tags.	HTTP/2 does not change much in terms of caching. With the server push feature if the client finds the resources are already present in the cache, it can cancel the pushed stream.
Web Traffic	HTTP/1.1 provides faster delivery of web pages and reduces web traffic as compared to HTTP/1.0. However, TCP starts slowly and with domain sharing.	HTTP/2 utilizes multiplexing and server push to effectively reduce the page load time by a greater margin along with being less sensitive to network delays.