**HTTP**

In the world of web development and internet communication, the hypertext transfer protocol (HTTP) plays a vital role.HTTP have evolved throughout the period to meet the demands of faster and efficient browsing. Two important versions of HTTP are HTTP/1.1 and HTTP/2

**HTTP/1.1**

**Key features:**

**Persistent connection :** (keep alive connections).Using this feature multiple requests and responses can be sent to a single TCP connection,reducing the tearing down connection for each request.

**Pipelining :**to improve the efficiency by reducing time spent waiting for round trips between the client and server .However the disadvantages are head of line blocking and server implementations.

**Chuncked transfer encoding:**This enables progressive rendering of web pages and efficient handling of large responses

**Host header field:** This allows servers to handle requests for multiple domains on a single IP address and facilitates virtual hosting.

**Caching:** it improves performance by allowing browsers to store and reuse previously retrieved resources, reducing the need for repeated requests to the server.

**Compression :** supports optional compression of response bodies using mechanisms like gzip or deflate. This reduces the amount of data transmitted over the network, improving performance.

**HTTP/2:**

**Key features:**

**Multiplexing:**multiple request can be sent and received simultaneously on a single tcp connection.This reduces latency as resources can be fletched in parallel.

**Header compression:** it uses a technique called HPACK,This reduces the overhead of header size,Resulting in more efficient use of bandwidth and improved performance,especially for websites with many requests.

**Server push:**  this allows server to proactively send resources to the client before they are explicitly requested. This can speed up the loading time.

**Stream Prioritization:**  by assigning priority to different requests, Allowing the client to specify the relative importance of each resources .

**Binary protocols:**  unlike HTTP/1.1 which uses plain text ,version 2 employs a binary protocol.this protocol simplifies parshing and improves efficiency in processing requests and response by both client and the server.

**Security Enhancement:**  There is an increasing push for websites to adoubt HTTP S which ensures encryption of data transmitted between client and server, enhancing security and privacy.

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|  | HTTP/1.1 | HTTP/2 |
| Server push | Servers only respond to client request .This limitation can result in suboptimal performances when loading web pages with multiple dependencies | Servers can push additional resources to the client witout waiting for explicit requests. This server push the number of round trips needed, Improving page load times and enhancing user experience |
| Stream prioritization | All requests have the same priority,There is no explicit way to specify the immportance of individual resources. | This introduces stream prioritization , which allows the client to assign priority levels to different resources. |