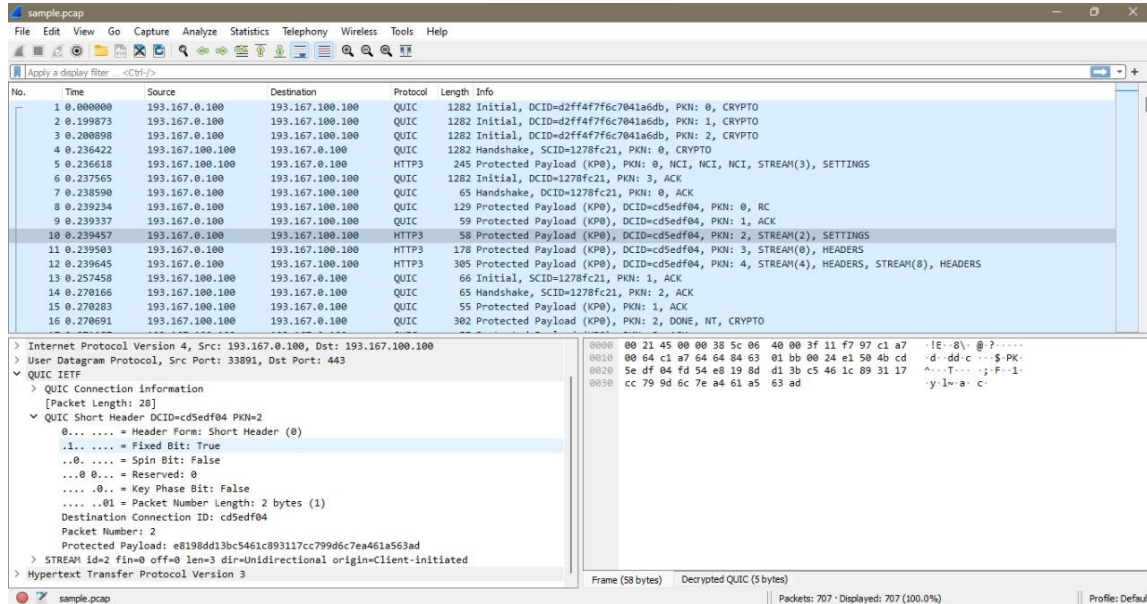


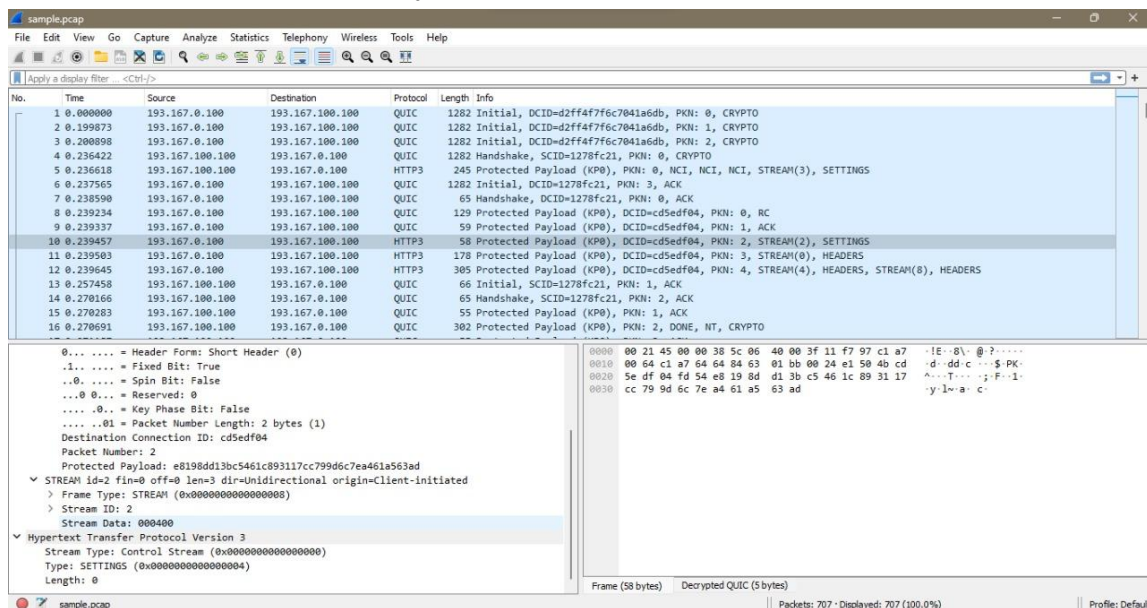
HyperText Transfer Protocol 3 (HTTP/3) is an application layer protocol that is built on QUIC transfer protocol over UDP.

Like previous versions of HTTP, HTTP/3 maintains a request-response model, supports status codes and relies on URLs. Further HTTP/3 has additional features of backward compatibility, ensuring smooth transitions for existing web infrastructure with multiplexing for concurrent data transfers.

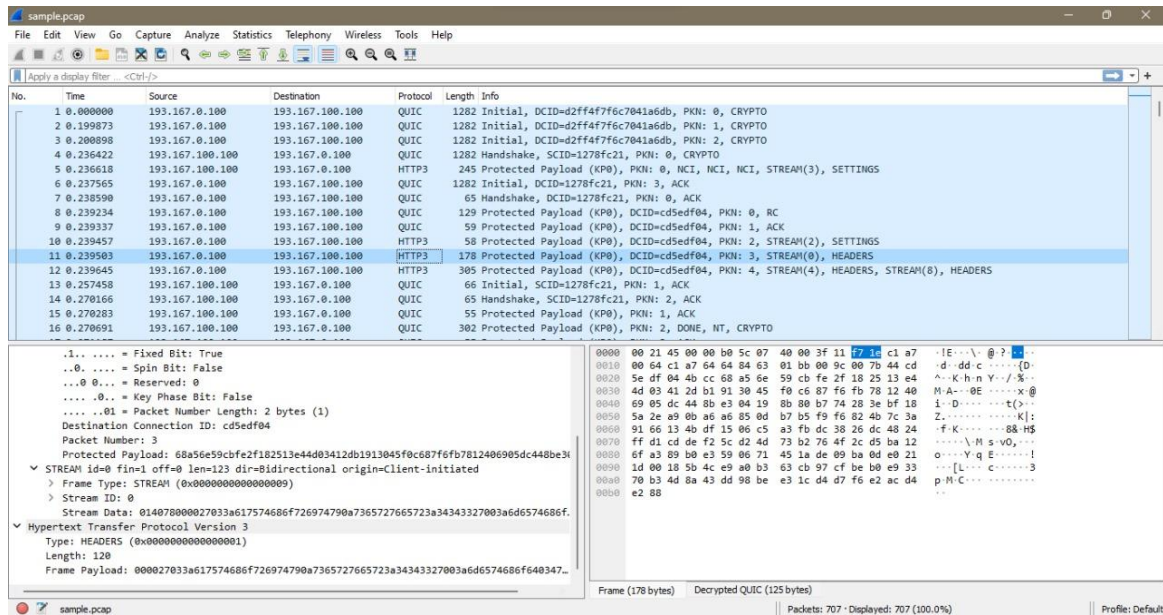
Demonstration:



Here we can see that http/3 uses QUIC over UDP. This increases the speed of loading web applications and reduces latency.



An HTTP/3 packet without payload.



An HTTP/3 packet with payload.

Impact on User Experience:

Faster loading time:

The use of QUIC reduces latency and speeds up the loading of web application resources. This results in faster page load time and overall improvement in performance. To establish a connection using HTTP/3, the client and the server need to exchange four packets: a QUIC Initial packet from the client, a QUIC Initial packet and a QUIC Handshake packet from the server, and a QUIC Handshake packet from the client.

Connection Migration:

HTTP/3 provides support for scenarios in which users may switch networks. The protocol ensures a more seamless experience during transitions between different network connections. QUIC can change the network address or port of a connection without breaking it, which is useful when a device switches from Wi-Fi to cellular network or when a server experiences a failover. This reduces the need to re-establish connections and resend data when an error occurs at the network layer.

Improved Error Handling:

QUIC uses a novel congestion control and loss recovery mechanism that can recover from packet loss faster than TCP, especially in high-latency networks. QUIC also avoids head-of-line blocking, which is a problem in TCP where a lost or delayed packet prevents the delivery of subsequent packets in the same connection. This allows web applications to recover more quickly from lost or corrupted packets. This gives the users a more robust and reliable user experience.

Impact on Web Applications:

Efficient Multiplexing:

HTTP/3 allows for more efficient multiplexing of streams and enables resources to be fetched more concurrently. For instance if a stream encounters a 404 error, it can be terminated without affecting other streams. This leads to better utilisation of available network resources and improved responsiveness in web applications.

Enhanced Security:

HTTP/3 mandates the use of Transport Layer Security (TLS). This reinforces the security of data exchange between users and applications. This helps protect against security threats and ensures the confidentiality and integrity of data.

Backward compatibility:

HTTP/3 is backward compatible with previous versions of HTTP. So, web applications can transition to HTTP/3 without disrupting current infrastructure. This also ensures compatibility with a wide range of clients and servers.

Reduced Head-of-Line Blocking:

The design of HTTP/3 significantly reduces head of line blocking. This allows independent streams to progress without being held back by the performance of other streams. This enhances the efficiency of data transfer in web applications.