

## NSCap hw6 report

### **HTTP/2 Under the Packet-dropping Condition**

Based on the given information, the client is sending requests using the stream\_id = 1, 3, 5, and 7 to the server. However, only two requests are received by the server instead of the expected four. The reason is the use of a TCP socket. TCP is a reliable and connection oriented protocol that guarantees the delivery of data in the order it was sent.

When the server does not receive the headers frame for stream 5, it does not recognize the subsequent requests sent on that stream. As a result, the server does not process those requests, leading to only two requests being received. The dropped headers frame disrupts the TCP connection's normal flow. As a consequence, the server is not able to correctly interpret the subsequent requests on stream 5 and stream 7.

```
root@p4:/home/p4/tutorials/exercises/http_drop# python3 http_2_0_server_demo.py
('10.0.2.2', 60584) is connected.
1 header frame send
1 data frame send
3 header frame send
3 data frame send finish
█
```

```
root@p4:/home/p4/tutorials/exercises/http_drop# python3 http_2_0_client_demo.py
1
3
../../target/file_03.txt begin
../../target/file_03.txt end
█
```

## HTTP/3 Under the Packet-dropping Condition

Due to the rejection of packets with stream\_id = 5 by the QUIC client, even though the server has sent a response, the client is unable to receive these responses and write them into a file. From the photo, it can be observed that "../../target/file\_08" remains incomplete.

In HTTP/3, the request with stream\_id=7 can be received by the server despite the dropped headers frame in stream 5. This is because HTTP/3 and the underlying QUIC protocol provide mechanisms for retransmission, independent stream handling, and reliable delivery of data. Each stream in HTTP/3 operates independently. If there is a failure or packet loss in one stream, it does not affect the other streams. This means that even if the header frame in stream 5 is dropped, it does not impact the other streams.

```
root@p4:/home/p4/tutorials/exercises/http_drop# python3 http_3_0_client_demo.py

drop id list: [5]
1 send request
3 send request
../../target/file_03.txt begin
5 send request
../../target/file_08.txt begin
7 send request
../../target/file_00.txt begin
../../target/file_03.txt end
../../target/file_00.txt end
```