Assignment - IV

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Topic : TCP vs QUIC perfomance Comparison On Mobile.

RETRANSMISSION DELAY

Retransmission delay is the time taken to resend a data packet after it is either lost or corrupted during transmission. This delay includes the time it takes to detect the loss.

SCENARIO:

TCP vs QUIC performance comparison on Mobile.

Parameters:

TCP: Requires a 1.5 RTT (Round Trip Time) handshake.

QUIC: Uses a 0-RTT handshake.

- If RTT = 120 ms, what is the connection time difference?

* TCP takes 1.5 RTT to establish a connection.

  1.5 x 120 ms = 180 ms

* QUIC uses 0-RTT, so the connection is estab instantly

* Connection time difference = 180 ms - 0 ms = 180 ms

Answer:

QUIC saves 180 ms in connection setup time compared to TCP.

2. How many packets are saved in QUIC?

* In TCP, a typical 3-way handshake involves 3 packets

1. SYN
2. SYN-ACK
3. ACK

* QUIC, with 0-RTT, combines connection setup and data transmission sending only 1 packet initally

* Packets saved = 3(TCP) - 1(QUIC) = 2 packets

QUIC saves 2 packets during the connection handshake phase.

3. what is the time saved over 100 connections?

- Time saved per connection = 180 ms.
- For 100 connections:

$100 \times 180 ms = 18,000 ms = 18$ seconds

using QUIC instead of TCP saves a total of 18 seconds over 100 connections.

~~connections~~:

conclusion:

QUIC significantly improves connection performance on mobile networks by eliminating handshake delays and reducing the number of packets exchanged.