# Homework 4 Sp25

- Due Apr 24 at 11:59pm
- Points 7
- Questions 7
- Available Apr 14 at 10am - May 1 at 11:59pm
- Time Limit None
- Allowed Attempts 5

Take the Quiz Again

## Attempt History

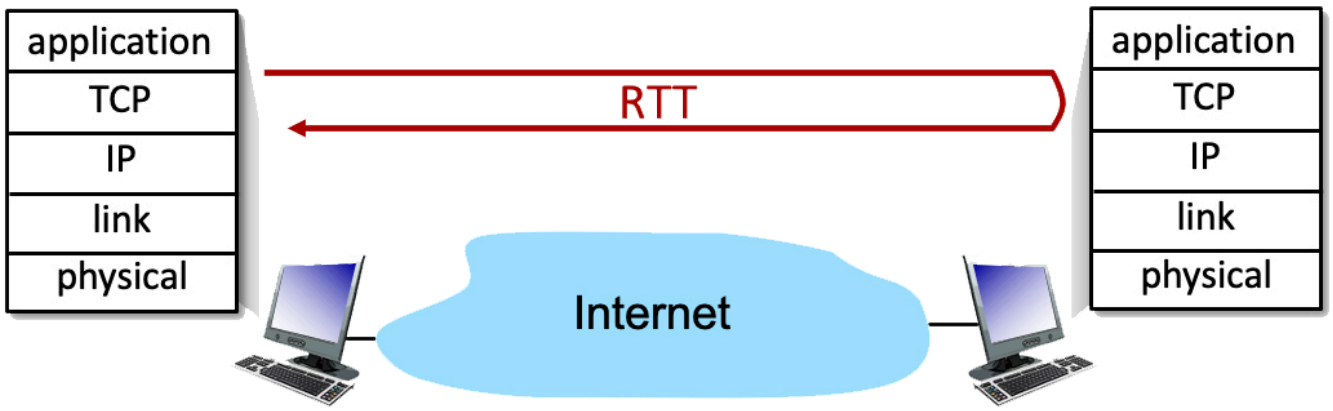
| | Attempt | Time | Score |
|---|---|---|---|
| KEPT | Attempt 2 | 519 minutes | 7 out of 7 |
| LATEST | Attempt 2 | 519 minutes | 7 out of 7 |
| | Attempt 1 | 842 minutes | 5 out of 7 |

Correct answers are hidden.

Score for this attempt: 7 out of 7
Submitted Apr 15 at 9:28am
This attempt took 519 minutes.

Question 1
1 / 1 pts

Suppose that TCP's current estimated values for the round trip time (estimatedRTT) and deviation in the RTT (DevRTT) are 360 msec and 40 msec, respectively. The next measured values of the RTT is 430.



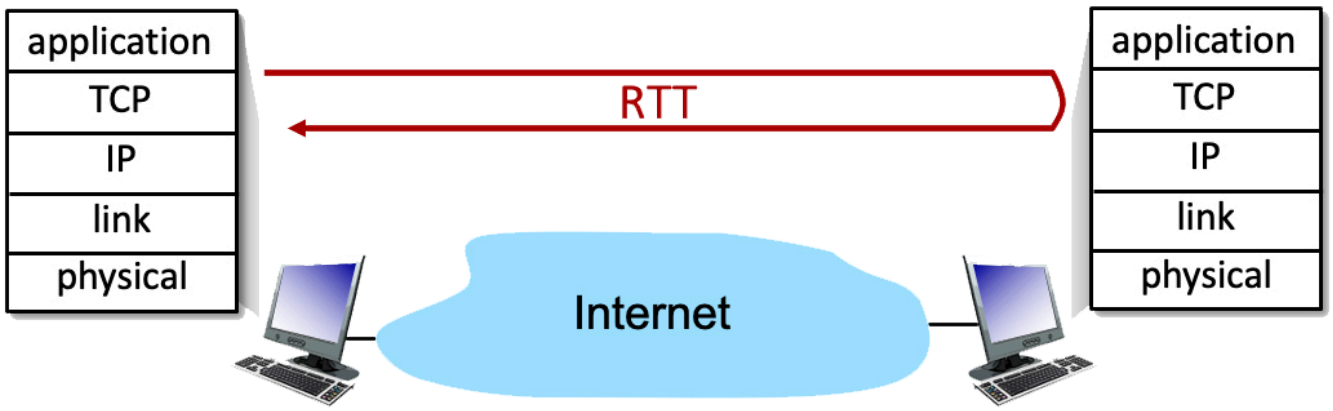

Compute TCP's new value of DevRTT, estimatedRTT, and the TCP timeout value after the measured RTT value is obtained. Use the values of $\alpha$ = 0.125, and $\beta$ = 0.25.

- estimatedRTT: 368.05 msec DevRTT: 47.50 msec Timeout: 558.05 msec
- estimatedRTT: 368.05 msec DevRTT: 40.75 msec Timeout: 531.05 msec
- estimatedRTT: 368.75 msec DevRTT: 47.50 msec Timeout: 558.75 msec
- estimatedRTT: 367.50 msec DevRTT: 45.00 msec Timeout: 547.50 msec
- estimatedRTT: 358.97 msec DevRTT: 66.01 msec Timeout: 623.01 msec
- estimatedRTT: 373.90 msec DevRTT: 44.31 msec Timeout: 515.15 msec
- estimatedRTT: 378.66 msec DevRTT: 48.58 msec Timeout: 572.98 msec
- estimatedRTT: 366.25 msec DevRTT: 42.50 msec Timeout: 536.25 msec
- estimatedRTT: 378.66 msec DevRTT: 41.04 msec Timeout: 542.80 msec
- estimatedRTT: 372.97 msec DevRTT: 45.31 msec Timeout: 554.22 msec
- estimatedRTT: 370.10 msec DevRTT: 46.24 msec Timeout: 555.07 msec

Question 2

1 / 1 pts

Suppose that TCP's current estimated values for the round trip time (estimatedRTT) and deviation in the RTT (DevRTT) are 360 msec and 40 msec, respectively. The next measured values of the RTT is 420.

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- estimatedRTT: 358.97 msec DevRTT: 66.01 msec Timeout: 623.01 msec
- estimatedRTT: 378.66 msec DevRTT: 48.58 msec Timeout: 572.98 msec
- estimatedRTT: 380.10 msec DevRTT: 48.24 msec Timeout: 573.07 msec

Question 3
1 / 1 pts

In the TCP windowing simulator described in the lecture, under what condition does the sender switch from the exponential “slow start” phase to linear “congestion avoidance”?

- When the round-trip time suddenly increases

- [x] When the congestion window (cwnd) is equal to or greater than the slow start threshold
- [ ] When a packet loss is detected
- [ ] When the receiver window size is exceeded

Question 4
1 / 1 pts

If a TCP sender experiences a timeout, what is the typical adjustment made to the congestion window?

- [ ] It is decreased multiplicatively (e.g., halved)
- [ ] It remains unchanged
- [x] It is set to one Maximum Segment Size
- [ ] It is increased exponentially (slow start)

Question 5
1 / 1 pts

In the context of TCP reliable transport, what is the purpose of setting a retransmission timeout (RTO)?

- [x] To ensure that lost segments are eventually retransmitted if acknowledgements are not received within a certain period
- [ ] To provide the receiver with a deadline for acknowledging packets
- [ ] To allow the sender to proactively reduce its sending rate to avoid congestion
- [ ] To signal the receiver to close the connection if packets are delayed

Question 6
1 / 1 pts

Besides reducing the congestion window to one MSS, what is a fundamental aspect of how TCP Tahoe reacts upon detecting a packet loss due to a timeout?

- [ ] It signals the application layer about the detected loss and potential data corruption.

- It immediately enters a fast recovery phase to aggressively resume transmission
- It generally assumes a more severe network congestion scenario compared to a 3DA event
- It sends a probe packet to the receiver to assess the current network conditions

Question 7
1 / 1 pts

**Scenario:** Consider a TCP connection where the sender and receiver communicate over a link with a 20 ms round-trip delay. The sender's initial sequence number is **3000**, and it sends an initial window of **3 segments**, each segment containing **600 bytes** of data. All three segments are transmitted back-to-back at time **t = 0 ms**:

1. Segment 1 has sequence numbers **[3000 : 3599]**
2. Segment 2 has sequence numbers **[3600 : 4199]**
3. Segment 3 has sequence numbers **[4200 : 4799]**

Suppose **Segment 2** is lost in the network, while Segments 1 and 3 arrive at the receiver. Assume each arriving segment is processed immediately upon arrival.

- Segment 1 arrives at the receiver at **t = 10 ms**, and the receiver sends an ACK for bytes up to **3599**.
- Segment 3 arrives at **t = 11 ms**, but it has sequence numbers **[4200 : 4799]**, which are "out of order."
  What **ACK number** does the receiver send to the sender upon receiving Segment 3 out of order?

3600

Quiz Score: 7 out of 7