

L11-Introduction to Computer Networking

Homework 10 Answers

Due Date: Jan.30, 2017 by 23:59PM on Google Drive

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Problem 1 (20 pts, 10 pts for each correct answer):

Give 2 examples of protocol or service that use TCP. Explain why those protocols/services use TCP.

Example:

- Hyper Text Transfer Protocol (HTTP)
- Simple Mail Transfer Protocol (SMTP)

Explain:

For example, if applications like Web browser or mail software losses some packet of web page data or contents of email, it's not practical services. These software or services are needed to transfer data correctly. In the protocol TCP, It can handle those essential data exactly, so these protocols use TCP.

Problem 2 (25 pts): What are TCP well-known ports, give 5 examples of well-known port and applications that use the port.

Application name	Well-known port number
FTP (File Transfer Protocol)	21
SSH (SSH remote login Protocol)	22
SMTP (Simple Mail Transfer Protocol)	25
HTTP (www-http)	80
SFTP (Simple File Transfer Protocol)	115

Problem 3 (20 pts). Support $\alpha=0.1$ and the ACKs have been returned

with RTTs:

RTT for the 1st ACK is 80 msec;

RTT for the 2nd ACK is 70 msec;

RTT for the 3rd ACK is 100 msec;

RTT for the 4th ACK is 90 msec;

RTT for the 5th ACK is 60 msec;

Determine the value of EstimatedRTT after each of the acknowledgements

(The first RTT sample can be considered as the initial value of EstimatedRTT)

Answer:

1st ACK: 80 msec

2nd ACK: $(1 - 0.1) \times 80.0 + 0.1 \times 70 = 79.0$ msec

3rd ACK: $(1 - 0.1) \times 79.0 + 0.1 \times 100 = 81.1$ msec

4th ACK: $(1 - 0.1) \times 81.1 + 0.1 \times 90 = 81.99$ msec

5th ACK: $(1 - 0.1) \times 81.99 + 0.1 \times 60 = 79.791$ msec

Problem 4 (25pts). Suppose host A and host B are using a TCP connection, and host B has just received from host A all the bytes up to 219.

- ① The acknowledgement number sent from host B to host A
- ② The sequence number of the next segment from A to B.
- ③ Following above ① and ②, if B receives segment with sequence number 300, what acknowledgement number should host B send back to host A
- ④ Following above ① and ②, if B receives 50 byte segment with sequence number 220 from A, what acknowledgement number should host B send back to host A
- ⑤ If in 50 byte segment with sequence number 220 sent from A to B, there are source port 2000 and to destination port 6000 in the header of the segment, what will be the source port and destination port in the ACK segment sent from B to A.

Answers:

① 220

② 220

③ 520

④ 270

⑤ Source port: 6000

Destination port: 2000