CS4392/5376: Computer Networks/Communication Networks
Summer II 2021

Quiz #2 Solution

- Full name only: _____
- Release date: July 13th, 2021 (Tuesday)
- Due date: **July 15th, 2021 (Thursday) before midnight, 11:59 PM**
- Total 5 points

1. [True or False]: With non-persistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages.

[1 pt]

- False

2. We consider sending real-time voice from Host A to Host B over a packet-switched network (VoIP). Host A converts analog voice to a digital 64 kbps bit stream on the fly. Host A then groups the bits into 56-byte packets. There is one link between Hosts A and B; its transmission rate is 2 Mbps and its propagation delay is 10 msec. As soon as Host A gathers a packet, it sends it to Host B. As soon as Host B receives an entire packet, it converts the packet's bits to an analog signal. How much time elapses from the time a bit is created (from the original analog signal at Host A) until the bit is decoded (as part of the analog signal at Host B)?

[2 pts]

- Consider the first bit in a packet. Before this bit can be transmitted, all of the bits in the packet must be generated. This requires
  - $\frac{56 \cdot 8}{64 \times 10^3}$ sec = 7msec.
- The time required to transmit the packet is
  - $\frac{56 \cdot 8}{2 \times 10^6}$ sec = 224μ sec.
- Propagation delay = 10 msec.
- The delay until decoding is
  - 7msec + 224μ sec + 10msec = 17.224msec
- A similar analysis shows that all bits experience a delay of 17.224 msec.

3. Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use the UDP or TCP?

[1 pt]

- You would use the UDP. With the UDP, the transaction can be completed in one roundtrip time (RTT) - the client sends the transaction request into a UDP socket, and the server sends the reply back to the client's UDP socket. With the TCP, a minimum of two RTTs are needed - one to set-up the TCP connection, and another for the client to send the request, and for the server to send back the reply.

4. What is the 8-bit checksum based on the following two 8-bit data?

[1 pt]

```
  1 1 1 0 0 1 1 0
  1 1 0 1 0 1 0 1

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  1 1 0 1 1 1 0 1 1
Carryout                  1

    Sum   1 0 1 1 1 1 0 0
Checksum  0 1 0 0 0 0 1 1
```