CS 447-003 Networks and Data Communications
Spring 2024
Quiz #8 on March 26, 2024 (SOLUTIONS)

Your Last Three Digits: _____
(please do NOT write all of your student ID or your name)

Grade: _____

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(1) How does "non-persistent algorithm" work?

The non-persistency algorithm works in the following way:

- Listen to the cable (①)
- If you do not see anyone in the middle of its transmission, immediately start transmission (②)
- If you see someone in the middle of its transmission, immediately give up (③)
- After you give up at ③, wait for a set time interval, Δ, without listening to the cable (④)
- After you wait for Δ-time interval, go back to ① (⑤)

Note: since this question asks a definition of a particular algorithm, all of the five above (① through ⑤) are required for full credit.

(2) How does "p-persistent algorithm" work?

The non-persistency algorithm works in the following way:

- Listen to the cable (①)
- If you do not see anyone in the middle of its transmission, you transmit at a probability of ***p*** (②)
- If you see someone in the middle of its transmission, continuously listen to the cable until the one who is currently transmitting finishes (③)
- When you see the current transmitting host finishes (its transmission), go back to ① (④)
- If you chose not to transmit at ② above, wait for a set time interval, Δ, without listening to the cable (⑤). Then, go back to ① (⑥)

Note: since this question asks a definition of a particular algorithm, all of the six above (① through ⑥) are required for full credit.

(3) What is the major problem in CSMA/CD?

The major problem in CSMA/CD is the guaranteed packet collisions after a packet collision is detected.

When a packet collision is detected, transmitting host computers will start their re-transmissions (of the collided packets) as soon as a collision is over. Since two (or more) host computers will start their retransmissions almost at the same timing, the next round of packet collision(s) is guaranteed (which means that transmitting host computers will never be able to successfully transmit their packets after a packet collision occurs).

(4) What particular problem in CSMA/CD does BEB solve and how?

BEB solves that problem of the guaranteed packet collisions after a collision in CSMA/CD by inserting random delay at each host computer for retransmitting their collided packets after a collision is detected (to avoid the guaranteed packet collisions after a collision is detected)..

(5) If you have (too) many packet collisions in your LAN, what should you do (to alleviate the negative impacts from a large number of packet collisions)? Tell me what. Tell me why it is a reasonable solution.

When a large number of packet collisions are (frequently) observed (taking place), the ***p*** value in the p-persistent algorithm (CSMA/CD uses the p-persistent algorithm by default) should be lowered.