Assignment #6 for Computer Networks (CNT 4004) for Fall 2018

Due November 15, 2018 at the start of class

This assignment primarily covers material from chapters 6 and 7 (with the exception of material related to data center networking in chapter 6 – we will cover this later) of the textbook and from class lecture. Each problem is worth 10 points.

**Problem #1**

Answer the following questions coming from your Chapter 6 reading.

a) What is the correct term for a Layer 2 “packet”?

b) Where is the link layer implemented?

c) What is another term for “adapter”

d) What is the simplest form of error detection?

e) Can single bit parity detect if three bits are in error?

f) What type of arithmetic does CRC use

g) What is a “broadcast link”

h) Protocols for regulating transmission on a shared broadcast link are called what?

i) What are the three categories of multiple access protocols (according to the book)?

j) Ethernet’s CSMA/CD protocol has roots in what protocol?

**Problem #2**

Answer the following questions coming from your Chapter 6 reading.

a) What problem (or question does BEB solve?

b) What is the definition of efficiency for CSMA/CD?

c) Name two standards for “taking turn protocols”

d) Do LAN switches recognize IP addresses and use routing protocols?

e) How are switch tables built? (answer is two words)

f) Does a Layer-2 frame have a trailer? If so, what is it used for?
g) Through 30+ years of changes to Ethernet, what has remained as an enduring constant?

h) How do LAN switches eliminate collisions?

i) Are switches “plug and play”? Are routers?

j) What protocol effectively blends Virtual Circuit (VC) techniques into a routed datagram network?

**Problem #3**

Answer the following questions coming from your Chapter 7 reading.

a) What key part of a wireless network has not counterpart in a wired network? Give two examples of this key part.

b) What is SNR? Describe it briefly. What is the unit of measure of SNR?

c) The higher the SNR the _____ the BER. Fill in the blank (one word).

d) Give the maximum data rate (the “speed”) for 802.11a, 802.11b, 802.11g, 802.11n, and 802.11ac. Be ready to memorize this if you intend to take the CompTIA Network+ certification exam.

e) What does AP stand for (in the context of Wi-Fi)? What does SSID stand for?

f) What are the non-overlapping channels for IEEE 802.11b?

g) What does “associate” mean in the context of Wi-Fi?

h) What does a Beacon frame contain? Who (or what) sends a Beacon frame?

i) “Typically, the devices chooses the AP whose beacon frame is received with the _____.” (fill in the blank with multiple words)

j) What does “CA” in CSMA/CA student for?

**Problem #4**

Answer the following questions coming from your Chapter 7 reading.

a) Why does Wi-Fi (IEEE 802.11) use link-level acknowledgement?

b) What are DIFS and SIFS the abbreviation for?

c) What scheme does the IEEE 802.11 MAC protocol have to help avoid collisions even in the presence of hidden terminals?

d) What does Address 3 of an IEEE 802.11 frame contain?
e) Bluetooth and Zigbee are called _____ Area Networks, at least by the textbook (fill-in the blank with one word).

f) Answer true or false for the following statement. “Zigbee is targeted at higher-powered, higher data-rate, higher-duty-cycle applications than Bluetooth.”

g) “The 4G systems being deployed today are based on _____ technology, feature an _____ core network, and provide integrated _____ and _____ at multi-Megbit speeds.” (fill in each blank with one word).

h) What roles does the Mobile Switching Center (MSC) play in a cellular network?

i) There are two IP addresses associated with a mobile IP host. What are they?

j) Finish the follow sentence with regards to GSM, “A handoff occurs when a mobile station ____.” (more than one word)

**Problem #5**

Do Review Questions R4 and R9 (pages 507 and 508) in the textbook. For R9 give the answer in decimal (not just power of 2).

**Problem #6**

Do Review Questions R10 and R11 (page 508) in the textbook. For R11, might there be a benefit to sending the ARP reply with a broadcast MAC address (think carefully!). Explain it.

**Problem #7**

Do Problem P26 (page 513) in the text book.

**Problem #8**

Do Problem P27 (page 514) in the text book.

**Problem #9**


**Problem #10**

Do Problem P6 (page 585) in the text book. The problem is referring to the steps given on page 539 of the textbook.