

**CSCE 560 Homework 6**  
**Chapter 7 – Wireless and Mobile Networks**  
**Fall 18**

**Assigned: Monday, 28 Nov**  
**Due: Wednesday, 5 Dec, 1400**

You must include these questions in your submitted solution. In other words, your submission must include the question listed followed by your solution with the answer clearly indicated (e.g., put a box or circle around the final answer).

Problem 1. Chapter 7, R3. What are the differences between the following types of wireless channel impairments: path loss, multipath propagation, interference from other sources?

Problem 2. Chapter 7, R5. Describe the role of the beacon frames in 802.11?

Problem 3. Chapter 7, R6. Explain why the following statement is either true or false: Before an 802.11 station transmits a data frame, it must first send an RTS frame and receive a corresponding CTS frame. [Question has been modified from the text version.]

Problem 4. Chapter 7, R7. Why are acknowledgements used in 802.11 but not in wired Ethernet?

Problem 5. Chapter 7, R8. True or False. Ethernet and 802.11 use the same frame structure.

Problem 6. Chapter 7, R10. Suppose the IEEE 802.11 RTS and CTS frames were as long as the standard DATA and ACK frames. Would there be any advantage to using the CTS and RTS frames? Why or why not? [Question has been modified from the text version.]

Problem 7. Chapter 7, R11. Section 7.3.4 discusses 802.11 mobility, in which a wireless station moves from one BSS to another within the same subnet. Assume two APs are interconnected with a switch and the wireless station moves from BSS1 to BSS2. An AP may need to send a frame with a spoofed MAC address to get the switch to forward the frame properly. Why? Which AP sends the spoofed frame? [Question has been modified from the text version.]

Problem 8. Chapter 7, P1. Consider the single-sender CDMA example in Figure 7.5. What would be the sender's output (for the 2 data bits shown) if the sender's CDMA code were (1, -1, 1, -1, 1, -1, 1, -1)? Fill in the blanks: d1 = \_\_\_\_\_ d0 = \_\_\_\_\_

Problem 9. Chapter 7, P7. Suppose an 802.11b station is configured to always reserve the channel with the RTS/CTS sequence. Suppose this station suddenly wants to transmit 1,000 bytes of data, and all other stations are idle at this time. As a function of SIFS and DIFS (i.e., your answer will contain the variables "SIFS" and "DIFS"), and ignoring propagation delay and assuming no bit errors, calculate the time required to transmit the frame and receive the acknowledgment. Assume a transmission rate of 11 Mbps.

## Wireshark Lab

Complete the lab in 06 - Wireshark\_802.11\_v7.0.pdf.

### ERRATA:

Question 10: Replace the question

*“How many AUTHENTICATION messages are sent from the wireless host to the linksys\_ses\_24086 AP (which has a MAC address of Cisco\_Li\_f5:ba:bb) starting at around t=49?”*

with

*“When is the first AUTHENTICATION message sent from the wireless host to the linksys\_ses\_24086 AP (which has a MAC address of Cisco\_Li\_f5:ba:bb) starting at around t=49?”*

Question 11: Replace the question

*“Does the host want the authentication to require a key or be open?”*

with

*“Does the host want the authentication from question 10 to require a key or be open?”*

Also, there is an inconsistency in the Wireshark capture file. The destination MAC address in the SYN-ACK packet is not as expected. Assume the address 91:2a:b0:49:b6:4f is equivalent to 00:13:02:d1:b6:4f.

The author doesn't explain this other than to say “Curiously, this [SYN-ACK MAC] is different from the MAC address of the host used in the frame that sends the TCP SYN. The host wireless interface is behaving as if it has two interface addresses - interesting!”

You should know this is not uncommon. We see some rather unique behavior in the wireless world that isn't always explainable. In this case, we're not sure where he is running Wireshark. If it is running on a host other than 00:13:02:d1:b6:4f, it could see a corrupt frame while 00:13:02:d1:b6:4f receives a correct frame.

Hope this helps.