**COMPUTER NETWORKS**

**Lab 7**

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**Answer the questions:**

1. What are the SSIDs of the two access points that are issuing most of the beacon

frames in this trace?

**Answer:** They are 30 Munroe St and linksys12.

2. What are the intervals of time between the transmissions of the beacon frames the

linksys\_ses\_24086 access point? From the 30 Munroe St. access point? (Hint: this

interval of time is contained in the beacon frame itself).

**Answer:** For both 0.102400 seconds reported in 802.11 wireless LAN Management frame.

3. What (in hexadecimal notation) is the source MAC address on the beacon frame

from 30 Munroe St? Recall from Figure 7.13 in the text that the source,

destination, and BSS are three addresses used in an 802.11 frame. For a detailed

discussion of the 802.11 frame structure, see section 7 in the IEEE 802.11

standards document (cited above).

**Answer:** 00:16:b6:f7:1d:51

4. What (in hexadecimal notation) is the destination MAC address on the beacon

frame from 30 Munroe St??

**Answer:** ff:ff:ff:ff:ff:ff

5. What (in hexadecimal notation) is the MAC BSS id on the beacon frame from 30

Munroe St?

**Answer:** The same as source address: 00:16:b6:f7:1d:51

6. The beacon frames from the 30 Munroe St access point advertise that the access

point can support four data rates and eight additional “extended supported rates.”

What are these rates?

**Answer:** The support rates are 1.0, 2.0, 5.5, 11.0 Mbps. The extended rates are 6.0, 9.0, 12.0, 18.0, 24.0, 36.0, 48.0, 54.0 Mbps.

7. Find the 802.11 frame containing the SYN TCP segment for this first TCP session

(that downloads alice.txt). What are three MAC address fields in the 802.11 frame?

Which MAC address in this frame corresponds to the wireless host (give

the hexadecimal representation of the MAC address for the host)? To the access

point? To the first-hop router? What is the IP address of the wireless host

sending this TCP segment? What is the destination IP address? Does this

destination IP address correspond to the host, access point, first-hop router, or

some other network-attached device? Explain.

**Answer:** The TCP SYN is sent at t = 24.811093s into the traces. MAC address fields: 00:13:02:d1:b6:4f, 00:16:b6:f4:eb:a8, 00:16:b6:f7:1d:51 perspectively. IP address of the wireless host: 192.168.1.109. IP address of destination: 128.199.245.12.

8. Find the 802.11 frame containing the SYNACK segment for this TCP session.

What are three MAC address fields in the 802.11 frame? Which MAC address in

this frame corresponds to the host? To the access point? To the first-hop router?

Does the sender MAC address in the frame correspond to the IP address of the

device that sent the TCP segment encapsulated within this datagram? (Hint:

review Figure 6.19 in the text if you are unsure of how to answer this question, or

the corresponding part of the previous question. It’s particularly important that

you understand this).

**Answer:** The TCP SYNACK is received at t = 24.827751sinto the trace. The MAC address for the sender is 00:16:b6:f4:eb:a8. The MAC address for the destination is 91:2a:b0:49:b6:4f. The MAC address for the BSS is 00:16:b6:f7:1d:51. The IP address of the server sending the TCP SYNACK is 128.199.245.12. The destination address is 192.168.1.109.

9. What two actions are taken (i.e., frames are sent) by the host in the trace just after

t=49, to end the association with the 30 Munroe St AP that was initially in place

when trace collection began? (Hint: one is an IP-layer action, and one is an

802.11-layer action). Looking at the 802.11 specification, is there another frame

that you might have expected to see, but don’t see here?

**Answer:** DHCP release.

10. Examine the trace file and look for AUTHENICATION frames sent from the host

to an AP and vice versa. 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?

**Answer:** The first AUTHEN message from the host was sent at t = 49.638857.

11. Does the host want the authentication to require a key or be open?

**Answer:** Not sure because can’t find any reply from the AP.

12. Do you see a reply AUTHENTICATION from the linksys\_ses\_24086 AP in the

trace?

**Answer:** Not sure either.

13. Now let’s consider what happens as the host gives up trying to associate with the

linksys\_ses\_24086 AP and now tries to associate with the 30 Munroe St AP. Look

for AUTHENICATION frames sent from the host to and AP and vice versa. At

what times are there an AUTHENTICATION frame from the host to the 30

Munroe St. AP, and when is there a reply AUTHENTICATION sent from that AP

to the host in reply? (Note that you can use the filter expression “wlan.fc.subtype

== 11and wlan.fc.type == 0 and wlan.addr == IntelCor\_d1:b6:4f” to display only

the AUTHENTICATION frames in this trace for this wireless host.)

**Answer:** At t = 63.168087 a AUTHENTICATION frame was sent from 00:13:02:d1:b6:4f to 00:16:b7:f7:1d:51. At 63.169071 a AUTHENTICATION was sent from reverse direction from BSS to the host

14. An ASSOCIATE REQUEST from host to AP, and a corresponding ASSOCIATE

RESPONSE frame from AP to host are used for the host to associated with an AP.

At what time is there an ASSOCIATE REQUEST from host to the 30 Munroe St

AP? When is the corresponding ASSOCIATE REPLY sent? (Note that you can

use the filter expression “wlan.fc.subtype < 2 and wlan.fc.type == 0 and

wlan.addr == IntelCor\_d1:b6:4f” to display only the ASSOCIATE REQUEST

and ASSOCIATE RESPONSE frames for this trace.)

**Answer:** At t = 63.168087 a AUTHENTICATION frame was sent from 00:13:02:d1:b6:4f to 00:16:b7:f7:1d:51. At 63.169071 a ASSOCIATE RESPONSE was sent from reverse direction from BSS to the host

15. What transmission rates is the host willing to use? The AP? To answer this

question, you will need to look into the parameters fields of the 802.11 wireless

LAN management frame.

**Answer:** 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 Mbps.