Data Communications Laboratory
Wireless Networks — 802.11

Name: Jai Carey

SID: 45188416

Exercise 1: Beacon Frames

1. What are the SSIDs of the three access points that are issuing the beacon frames in this trace? (Hint: the filter rule "wlan.fc.type_subtype == 0x8" will show only beacon frames).

   30 Munroe St
   linksys12
   linksys_SES_24086

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).

   0.102400 seconds (Beacon Interval)

3. What (in hexadecimal notation) is the source MAC address on the beacon frame from *30 Munroe St*? Recall 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).

   00:16:B6:F7:1D:51 (Source address of 30 Munroe St)

4. What (in hexadecimal notation) is the destination MAC address on the beacon frame from *30 Munroe St*?

   FF:FF:FF:FF:FF:FF (Destination Address)

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

   00:16:B6:F7:1D:51 (BSS ID)

6. The beacon frames from the *30 Munroe St* AP advertise that the access point can support four data rates and eight additional "extended supported rates." What are these rates?

Data Rates (Supported Rates): 1, 2, 5.5, 11 (MB/s)
Extended Supported Rates: 6, 12, 24 (MB/s), 9, 18, 36, 48, 54 (Mb/s)

Exercise 2: Data Transfer

7. Find the 802.11 frame containing the SYN TCP segment for this first TCP session (that downloads alice.txt).

The first SYN frame is packet number 474 and occurs at time 24.811093

What are three MAC address fields in the 802.11 frame?

```
Receiver address: Cisco-Li_f7:1d:51 (00:16:b6:f7:1d:51)
Transmitter address: IntelCor_d1:b6:4f (00:13:02:d1:b6:4f)
Destination address: Cisco-Li_f4:eb:a8 (00:16:b6:f4:eb:a8)
```

Which MAC address in this frame corresponds to the wireless host (give the hex-adecimal representation of the MAC address for the host)?

```
Transmitter address: IntelCor_d1:b6:4f (00:13:02:d1:b6:4f)
```

To the access point?

```
Receiver address: Cisco-Li_f7:1d:51 (00:16:b6:f7:1d:51)
```

To the first-hop router?

```
Destination address: Cisco-Li_f4:eb:a8 (00:16:b6:f4:eb:a8)
```

What is the IP address of the wireless host sending this TCP segment?

The IP Address of the wireless host sending this TCP segment is 192.168.1.109

```
Internet Protocol Version 4, Src: 192.168.1.109,
```

What is the destination IP address?

The IP Address of the wireless host sending this TCP segment is 128.119.245.12

```
Internet Protocol Version 4, Src: 192.168.1.109, Dst: 128.119.245.12
```

Does this destination IP address correspond to the host, access point, first-hop router, or some other network-attached device?

The Destination IP Address is of some other network-attached device.

Explain.

In previous packets we perform a DNS request of gaia.cs.umass.edu. This DNS address matched the destination address. This destination IP address is the server of gaia.cs.umass.edu website address.

8. Find the 802.11 frame containing the SYN+ACK segment for this TCP session.

This frame is at packet 1013 and occurs at 32.825631

What are three MAC address fields in the 802.11 frame?

```
Transmitter address: Cisco-Li_f7:1d:51 (00:16:b6:f7:1d:51)
Destination address: IntelCor_d1:b6:4f (00:13:02:d1:b6:4f)
Source address: Cisco-Li_f4:eb:a8 (00:16:b6:f4:eb:a8)
```

Which MAC address in this frame corresponds to the host?

Assuming host means the PC we are one (which would be IP address 192.168.1.109)

```
Destination address: IntelCor_d1:b6:4f (00:13:02:d1:b6:4f)
```

To the access point?

Assuming access point means the access point of 30 Munroe St

```
Transmitter address: Cisco-Li_f7:1d:51 (00:16:b6:f7:1d:51)
```

To the first-hop router?

```
Source address: Cisco-Li_f4:eb:a8 (00:16:b6:f4:eb:a8)
```

Does the transmitter's MAC address in the frame correspond to the IP address of the device that sent the TCP segment encapsulated within this datagram? If not, which device has this IP address?

No, the transmitters MAC address in this frame is our local AP (most likely the Linksys router of 30 Munroe St).

The device that has this IP address of the device that sent this TCP segment is the network-attached device for http://www.cs.umass.edu website server.