

```
8 22:05:07.261491
9 22:05:07.362741 Cisco-Li
10 22:05:07.366889 LinksysG
11 22:05:07.465631 Cisco-Li
12 22:05:07.469147 00:ae:93:
13 22:05:07.567489 Cisco-Li
14 22:05:07.571654 LinksysG
15 22:05:07.669839 Cisco-Li
16 22:05:07.674144 LinksysG
17 22:05:07.772304 Cisco-Li
18 22:05:07.874683 Cisco-Li
19 22:05:07.977076 Cisco-Li
20 22:05:08.079472 Cisco-Li
21 22:05:08.083406 LinksysG
22 22:05:08.181863 Cisco-Li
23 22:05:08.186148 LinksysG

> Frame 185: 90 bytes on wire (72
> Radiotap Header v0, Length 24
> 802.11 radio information
> IEEE 802.11 Beacon frame, Flags
> IEEE 802.11 wireless LAN
> Fixed parameters (12 bytes)
> Tagged parameters (26 bytes)
  > Tag: SSID parameter set:
  > Tag: Supported Rates 1(B)
  > Tag: DS Parameter set: Cu
  > Tag: Traffic Indication M

C:\Users\Guamaral>
```

2:40 AM  
4/6/2019

- (For each of these questions, take a screenshot of Wireshark, and attach it to your answer) - Questions without Full Screenshot will not be graded. A lab submission template is available on canvas. Your screenshot should indicate the time and date on your computer.
- Include a terminal screenshot showing your computer IP address on the front page before Question 1, and a full PRINT of the HTTP OK message as the last page.

Lab will NOT be graded if either of these two is missing.

#### Questions:

1. What are the SSIDs of the two access points that are issuing most of the beacon frames in this trace? **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).
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).
4. What (in hexadecimal notation) is the destination MAC address on the beacon frame from *30 Munroe St*??
5. What (in hexadecimal notation) is the MAC BSS id on the beacon frame from *30 Munroe St*?

◀ Previous

Next ▶

Wireshark\_802\_11.pcap

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=
2	22:05:07.134558	b6:78:c1:ae:c0 (- 65:a8:d5:b2:c1:99 (- 802.11		802.11	1624	802.11 Block Ack Req, Flags=op.P...T.
3	22:05:07.157931	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855, FN=0, Flags=.....C, BI=
4	22:05:07.260376	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2856, FN=0, Flags=.....C, BI=
5	22:05:07.260557	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1482, FN=0, Flags=
6	22:05:07.260658	IntelCor_d1:b6:4f (- 802.11		802.11	38	Acknowledgement, Flags=.....C
7	22:05:07.261392	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1483, FN=0, Flags=
8	22:05:07.261491	IntelCor_d1:b6:4f (- 802.11		802.11	38	Acknowledgement, Flags=.....C
9	22:05:07.362741	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2857, FN=0, Flags=.....C, BI=
10	22:05:07.366889	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=....., BI=
11	22:05:07.465631	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=
12	22:05:07.469147	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90	Association Response, SN=3073, FN=0, Flags=.....
13	22:05:07.567489	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=
14	22:05:07.571654	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3074, FN=0, Flags=....., BI=
15	22:05:07.669839	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=

< >

> Frame 185: 90 bytes on wire (720 bits), 90 bytes captured (720 bits)

> Radiotap Header v0, Length 24

> 802.11 radio information

> IEEE 802.11 Beacon frame, Flags: .....C

> IEEE 802.11 wireless LAN

- > Fixed parameters (12 bytes)
- > Tagged parameters (26 bytes)
  - > Tag: SSID parameter set: linksys12
  - > Tag: Supported Rates 1(B), 2(B), 5.5, 11, [Mbit/sec]
  - > Tag: DS Parameter set: Current Channel: 6
  - > Tag: Traffic Indication Map (TIM): DTIM 0 of 0 bitmap

0020 ff ff 00 06 25 67 22 94 00 06 25 67 22 94 f0 c4 ...%g" ...%g"...

0030 52 d3 1a 06 ac 08 00 00 64 00 11 00 00 09 6c 69 R.....d.....11

0040 6e 6b 73 79 73 31 32 01 04 82 84 0b 16 03 01 06 nksys12.....

0050 05 04 00 03 00 00 4a 70 56 a1 .....3p V

Tag (wlan.tag), 6 bytes

Packets: 2364 • Displayed: 2364 (100.0%)

Profile: Default

Wireshark\_0011.pcap

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

frame[60:14] == 00:0c:33:30:20:4d:75:6e:72:6f:65:20:53:74

Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
3	22:05:07.157931	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
4	22:05:07.260376	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2856, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
9	22:05:07.362741	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2857, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
11	22:05:07.465631	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
13	22:05:07.567489	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
15	22:05:07.669839	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
17	22:05:07.772304	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
18	22:05:07.874683	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
19	22:05:07.977076	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
20	22:05:08.079472	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
22	22:05:08.181863	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2865, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
24	22:05:08.284300	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2866, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
27	22:05:08.284642	Cisco-Li_f7:1d:51	IntelCor_d1:b6:4f	802.11	177	Probe Response, SN=2867, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
32	22:05:08.386680	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2868, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
33	22:05:08.489050	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2869, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
35	22:05:08.591466	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2870, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
36	22:05:08.693879	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2871, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
37	22:05:08.796488	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2872, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
38	22:05:08.898650	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2873, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
39	22:05:09.001056	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2874, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
40	22:05:09.103364	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2875, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
42	22:05:09.205799	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2876, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St

> Frame 1: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits) on 0

> Radiotap Header v0, Length 24

> 802.11 radio information

> IEEE 802.11 Beacon frame, Flags: .....

> IEEE 802.11 wireless LAN

> Fixed parameters (12 bytes)

> Tagged parameters (119 bytes)

> Tag: SSID parameter set: 30 Munroe St

> Tag: Supported Rates 1(B), 2(B), 5.5(B), 11(B), [Mbit/sec]

> Tag: DS Parameter set: Current Channel: 6

> Tag: Traffic Indication Map (TIM): DTIM 0 of 0 bitmap

> Tag: Country Information: Country Code US, Environment Indoor

> Tag: EDCA Parameter Set

> Tag: ERP Information

> Tag: Extended Supported Rates 6(B), 9, 12(B), 18, 24(B), 36, 48, 54, [Mbit/sec]

> Tag: Vendor Specific: Airgo Networks, Inc.

> Tag: Vendor Specific: Microsoft Corp.: WMM/WME: Parameter Element

Wireshark - Print

Packet Format

☒ Summary line

☒ Include column headings

☒ Details

☐ All collapsed

☒ As displayed

☐ All expanded

☐ Bytes

☐ Print each packet on a new page

Packet Range

☒ All packets

☐ Selected packets only

☐ Marked packets only

☐ First to last marked

☐ Range:

☐ Remove ignored packets

2364

848

1

0

0

0

0

Page Setup...

Print...

Cancel

Help

Filtered by SSID (30 Munroe St) and result came out 848

0030 82 e1 38 96 28 00 00 00 64 00 01 06 00 0c 33 30 ..8.(... d....30

0040 20 4d 75 6e 72 6f 65 20 53 74 01 04 82 84 8b 96 Munroe St.....

0050 03 01 06 05 04 00 01 00 00 07 06 55 53 49 01 0b .....USI..

0060 1a 0c 12 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e .....BC^

0070 00 62 32 2f 00 2a 01 00 32 08 8c 12 98 24 b0 48 ..b2/.\*. 2....\$H

0080 60 6c dd 15 00 0a f5 0a 02 40 c0 00 03 01 03 05 ..l.....@.....

Tag (wlan.tag), 14 bytes

Packets: 2364 · Displayed: 848 (35.9%)

Profile: Default

2:45 AM 4/6/2019

```
> Frame 31: 90 bytes on wire (720 bits), 90 bytes captured (720 bits)
```

```
> 802.11 radio information
```

- IEEE 802.11 wireless LAN

- Tagged parameters (26 bytes)

Tag Number: SSID param

```
SSID: linksys12
```

Tag Number: Supported Rates (1)

Supported Rates: 1(B) (0x82)

Supported Rates: 5.5 (0x0b)

Tag: DS Parameter set: Current

Tag length: 1



▼ Tag: Traffic Indication Map (TIM):

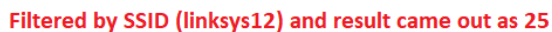
Tag Number: Traffic Indication Map (TIM) (5)

```
0020 ff ff 00 06 25 67 22 94 00 06 25 67 22 94 90 c0
```

```
0040 6e 6b 73 79 73 31 32 01 04 82 84 0b 16 03 01 06 nksys12: .....
0050 05 04 01 03 00 00 a7 07 af b6
```

Top (index top) 11 bytes

  Type here to search



```
> Frame 31: 90 bytes on wire (720 bits), 90 bytes captured (720 bits)
> Radiotap Header v0, Length 24
> 802.11 radio information
> IEEE 802.11 Beacon frame, Flags: .....C
```

2. What are the intervals of time between the transmissions of the beacon frames the linksys\_ses\_24086access point? From the30 Munroe St. access point? (Hint: this interval of time is contained in the beacon frame itself).

Tag (wlan.tag), 11 bytes | Packets: 2364 · Displayed: 2364 (100.0%) | Profile: Default



Wireshark\_802.11.pcap

FileEditViewGoCaptureAnalyzeStatisticsTelephonyWirelessToolsHelp

Apply a display filter ... <Ctrl-/>

Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
2	22:05:07.134558	b6:78:8c:c1:ae:c0 (...	65:a8:d5:b2:c1:99 (...	802.11	1624	802.11 Block Ack Req, Flags=op.P...T.
3	22:05:07.157931	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
4	22:05:07.260376	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2856, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
5	22:05:07.260557	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1482, FN=0, Flags=.....TC
6	22:05:07.260658	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (...	802.11	38	Acknowledgement, Flags=.....C
7	22:05:07.261392	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1483, FN=0, Flags=...P...TC
8	22:05:07.261491	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (...	802.11	38	Acknowledgement, Flags=.....C
9	22:05:07.362741	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2857, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
10	22:05:07.366889	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=....., BI=62, SSID=li\357\277\275\001\004\357\277[Malformed Packet]
11	22:05:07.465631	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
12	22:05:07.469147	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90	Association Response, SN=3073, FN=0, Flags=.....
13	22:05:07.567489	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
14	22:05:07.571654	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3074, FN=0, Flags=....., BI=100, SSID=linksys12
15	22:05:07.669839	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
16	22:05:07.674144	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12
17	22:05:07.772304	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
18	22:05:07.874683	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
19	22:05:07.977076	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
20	22:05:08.079472	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
21	22:05:08.083406	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3079, FN=0, Flags=....., BI=100, SSID=linksys12
22	22:05:08.181863	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2865, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
23	22:05:08.186148	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3080, FN=0, Flags=....., BI=100, SSID=, \357\277\275nksys

> Frame 1: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits)

> Radiotap Header v0, Length 24

802.11 radio information

> IEEE 802.11 Beacon frame, Flags: .....

Type/Subtype: Beacon frame (0x0008)

> Frame Control Field: 0x8000

.000 0000 0000 0000 = Duration: 0 microseconds

Receiver address: Broadcast (ff:ff:ff:ff:ff:ff)

Destination address: Broadcast (ff:ff:ff:ff:ff:ff)

Transmitter address: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

Source address: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

BSS Id: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

.... .. 0000 = Fragment number: 0

1011 0010 0110 .... = Sequence number: 2854

Frame check sequence: 0x057e2608 [correct]

[FCS Status: Good]

> IEEE 802.11 wireless LAN

> Fixed parameters (12 bytes)

> Tagged parameters (119 bytes)

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).

0020	ff ff 00 16 b6 f7 1d 51	00 16 b6 f7 1d 51 60 b2	..Q.....Q^
0030	82 e1 38 96 28 00 00 00	64 00 01 06 00 0c 33 30	..8.(...d....30
0040	20 4d 75 6e 72 6f 65 20	53 74 01 04 82 84 8b 96	Munroe St....
0050	03 01 06 05 04 00 01 00	00 07 06 55 53 49 01 0b	.....USI...
0060	1a 0c 12 0f 00 03 a4 00	00 27 a4 00 00 42 43 5e	.....BC^
0070	00 62 32 2f 00 2a 01 00	32 08 8c 12 98 24 b0 48	..b2/*..2....\$..H

Source Hardware Address (wlan.sa), 6 bytes

Packets: 2364 · Displayed: 2364 (100.0%)

Profile: Default

2:52 AM 4/6/2019

Wireshark\_802.11.pcap

FileEditViewGoCaptureAnalyzeStatisticsTelephonyWirelessToolsHelp

Apply a display filter ... <Ctrl-/>

Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
2	22:05:07.134558	b6:78:8c:c1:ae:c0 (.. 65:a8:d5:b2:c1:99 (..	802.11	1624	802.11 Block Ack Req, Flags=op.P...T.	
3	22:05:07.157931	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2855, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
4	22:05:07.260376	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2856, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
5	22:05:07.260557	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54 QoS Null function (No data), SN=1482, FN=0, Flags=.....TC	
6	22:05:07.260658	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (..	802.11	38 Acknowledgement, Flags=.....C	
7	22:05:07.261392	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54 QoS Null function (No data), SN=1483, FN=0, Flags=...P...TC	
8	22:05:07.261491	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (..	802.11	38 Acknowledgement, Flags=.....C	
9	22:05:07.362741	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2857, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
10	22:05:07.366889	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3072, FN=0, Flags=....., BI=62, SSID=li\357\277\275\001\004\357\277[Malformed Packet]	
11	22:05:07.465631	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
12	22:05:07.469147	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90 Association Response, SN=3073, FN=0, Flags=.....	
13	22:05:07.567489	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
14	22:05:07.571654	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3074, FN=0, Flags=....., BI=100, SSID=linksys12	
15	22:05:07.669839	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
16	22:05:07.674144	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12	
17	22:05:07.772304	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
18	22:05:07.874683	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
19	22:05:07.977076	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
20	22:05:08.079472	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
21	22:05:08.083406	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3079, FN=0, Flags=....., BI=100, SSID=linksys12	
22	22:05:08.181863	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2865, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
23	22:05:08.186148	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3080, FN=0, Flags=....., BI=100, SSID=.\357\277\275nksys	

> Frame 1: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits)

> Radiotap Header v0, Length 24

802.11 radio information

> IEEE 802.11 Beacon frame, Flags: .....

Type/Subtype: Beacon frame (0x0008)

> Frame Control Field: 0x8000

.000 0000 0000 0000 = Duration: 0 microseconds

Receiver address: Broadcast (ff:ff:ff:ff:ff:ff)

Destination address: Broadcast (ff:ff:ff:ff:ff:ff)

Transmitter address: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

Source address: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

BSS Id: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

.... .. 0000 = Fragment number: 0

1011 0010 0110 .... = Sequence number: 2854

Frame check sequence: 0x057e2608 [correct]

[FCS Status: Good]

> IEEE 802.11 wireless LAN

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

0010	52 00 00 47 08 26 7e 05	80 00 00 00 ff ff ff ff	R..G.&w. ....
0020	ff ff 00 16 b6 f7 1d 51	00 16 b6 f7 1d 51 60 b2	.....Q.....Q^
0030	82 e1 38 96 28 00 00 00	64 00 01 06 00 0c 33 30	..8.(...d.....30
0040	20 4d 75 6e 72 6f 65 20	53 74 01 04 82 84 8b 96	Munroe St....
0050	03 01 06 05 04 00 01 00	00 07 06 55 53 49 01 0b	.....USI...
0060	1a 0c 12 0f 00 03 a4 00	00 27 a4 00 00 42 43 5e	.....BC^

Destination Hardware Address (wlan.da), 6 bytes

Packets: 2364 · Displayed: 2364 (100.0%)

Profile: Default

2:56 AM 4/6/2019

Wireshark\_802.11.pcap

FileEditViewGoCaptureAnalyzeStatisticsTelephonyWirelessToolsHelp

Apply a display filter ... <Ctrl-/>

Expression...

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
2	22:05:07.134558	b6:78:8c:c1:ae:c0 (.. 65:a8:d5:b2:c1:99 (..	802.11	1624	802.11 Block Ack Req, Flags=op.P...T.	
3	22:05:07.157931	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2855, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
4	22:05:07.260376	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2856, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
5	22:05:07.260557	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54 QoS Null function (No data), SN=1482, FN=0, Flags=.....TC	
6	22:05:07.260658	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (..	802.11	38 Acknowledgement, Flags=.....C	
7	22:05:07.261392	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54 QoS Null function (No data), SN=1483, FN=0, Flags=...P...TC	
8	22:05:07.261491	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (..	802.11	38 Acknowledgement, Flags=.....C	
9	22:05:07.362741	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2857, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
10	22:05:07.366889	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3072, FN=0, Flags=....., BI=62, SSID=li\357\277\275\001\004\357\277[Malformed Packet]	
11	22:05:07.465631	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
12	22:05:07.469147	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90 Association Response, SN=3073, FN=0, Flags=.....	
13	22:05:07.567489	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
14	22:05:07.571654	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3074, FN=0, Flags=....., BI=100, SSID=linksys12	
15	22:05:07.669839	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
16	22:05:07.674144	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12	
17	22:05:07.772304	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
18	22:05:07.874683	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
19	22:05:07.977076	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
20	22:05:08.079472	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
21	22:05:08.083406	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3079, FN=0, Flags=....., BI=100, SSID=linksys12	
22	22:05:08.181863	Cisco-Li_f7:1d:51	Broadcast	802.11	183 Beacon frame, SN=2865, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St	
23	22:05:08.186148	LinksysG_67:22:94	Broadcast	802.11	90 Beacon frame, SN=3080, FN=0, Flags=....., BI=100, SSID=.\357\277\275nksys	

> Frame 1: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits)

> Radiotap Header v0, Length 24

802.11 radio information

> IEEE 802.11 Beacon frame, Flags: .....

Type/Subtype: Beacon frame (0x0008)

> Frame Control Field: 0x8000

.000 0000 0000 0000 = Duration: 0 microseconds

Receiver address: Broadcast (ff:ff:ff:ff:ff:ff)

Destination address: Broadcast (ff:ff:ff:ff:ff:ff)

Transmitter address: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

Source address: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

BSS Id: Cisco-Li\_f7:1d:51 (00:16:b6:f7:1d:51)

.... 0000 = Fragment number: 0

1011 0010 0110 .... = Sequence number: 2854

Frame check sequence: 0x057e2608 [correct]

[FCS Status: Good]

> IEEE 802.11 wireless LAN

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

0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 60 b2 .....Q .....Q..

0030 82 e1 38 96 28 00 00 00 64 00 01 06 00 0c 33 30 ..8.(... d....30

0040 20 4d 75 6e 72 6f 65 20 53 74 01 04 82 84 8b 96 Munroe St....

0050 03 01 06 05 04 00 01 00 00 07 06 55 53 49 01 0b .....USI..

0060 1a 0c 12 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e ..... ' .BC^

0070 00 62 32 2f 00 2a 01 00 32 08 8c 12 98 24 b0 48 .b2/.\*.. 2....\$-H

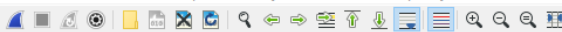
Basic Service Set ID (wlan.bssid), 6 bytes

Packets: 2364 · Displayed: 2364 (100.0%)

Profile: Default

2:57 AM 4/6/2019





Apply a display filter ... <Ctrl-/> Expression... +

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
2	22:05:07.134558	b6:78:8c:c1:ae:c0 (...	65:a8:d5:b2:c1:99 (...	802.11	1624	802.11 Block Ack Req, Flags=op.P...T.
3	22:05:07.157931	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
4	22:05:07.260376	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2856, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
5	22:05:07.260557	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1482, FN=0, Flags=.....TC
6	22:05:07.260658	IntelCor_d1:b6:4f (...	802.11	38	Acknowledgement, Flags=.....C	
7	22:05:07.261392	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1483, FN=0, Flags=...P...TC
8	22:05:07.261491	IntelCor_d1:b6:4f (...	802.11	38	Acknowledgement, Flags=.....C	
9	22:05:07.362741	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2857, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
10	22:05:07.366889	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=307
11	22:05:07.465631	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855
12	22:05:07.469147	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90	Association Response
13	22:05:07.567489	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855
14	22:05:07.571654	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=307
15	22:05:07.669839	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=286
16	22:05:07.674144	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=307
17	22:05:07.772304	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=286
18	22:05:07.874683	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=286
19	22:05:07.977076	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=286
20	22:05:08.079472	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=286
21	22:05:08.083406	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=307
22	22:05:08.181863	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=286
23	22:05:08.186148	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=308

Wireshark · Print

Packet Format

☒ Summary line

☒ Include column headings

☒ Details:

☐ All collapsed

☒ As displayed

☐ All expanded

☐ Bytes

☐ Print each packet on a new page

> Frame 1: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits)  
> Radiotap Header v0, Length 24  
> 802.11 radio information  
> IEEE 802.11 Beacon frame, Flags: .....C  
> IEEE 802.11 wireless LAN

```

0000 00 00 18 00 ee 58 00 00 10 02 85 09 a0 00 e3 9c  ....X.....
0010 52 00 00 47 08 26 7e 05 80 00 00 00 ff ff ff ff  R..G.&.....
0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 60 b2  ...Q.....Q..
0030 82 e1 38 96 28 00 00 00 64 00 01 06 00 0c 33 30  ..8.(...d....30
0040 20 4d 75 6e 72 6f 65 20 53 74 01 04 82 84 8b 96  Munroe St....
0050 03 01 06 05 04 00 01 00 00 07 06 55 53 49 01 0b  ....USI..

```

Wireshark · Print

?

×

Packet Format

☒ Summary line
 ☒ Include column headings

☒ Details:
 

☐ All collapsed
 ☒ As displayed
 ☐ All expanded

☐ Bytes

☐ Print each packet on a new page
 

+ and - zooms, 0 resets

Packet Range

☐ All packets
 ☒ Selected packets only
 ☐ Marked packets only
 ☐ First to last marked
 ☐ Range:
 
☐ Remove ignored packets

☐ Captured
 ☒ Displayed

2364	2364
1	1
0	0
0	0
0	0

Page Setup...

Print...

Cancel

Help

Wireshark\_802\_11.pcap Packets: 2364 · Displayed: 2364 (100.0%) Profile: Default

Type here to search 2:59 AM 4/6/2019

No.	Time	Source	Destination	Protocol	Length	Info
1	22:05:07.072457	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St

Frame 1: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits)  
Radiotap Header v0, Length 24  
802.11 radio information  
IEEE 802.11 Beacon frame, Flags: .....C  
IEEE 802.11 wireless LAN