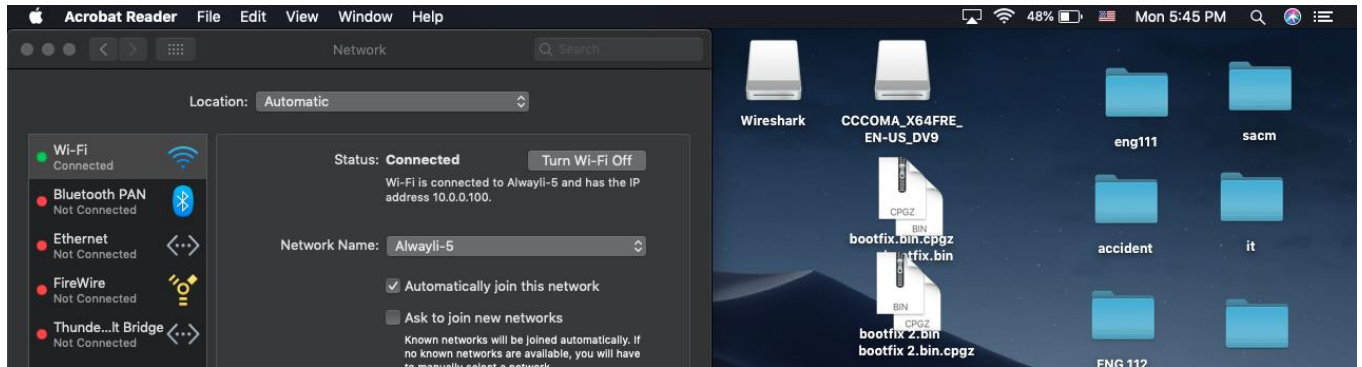


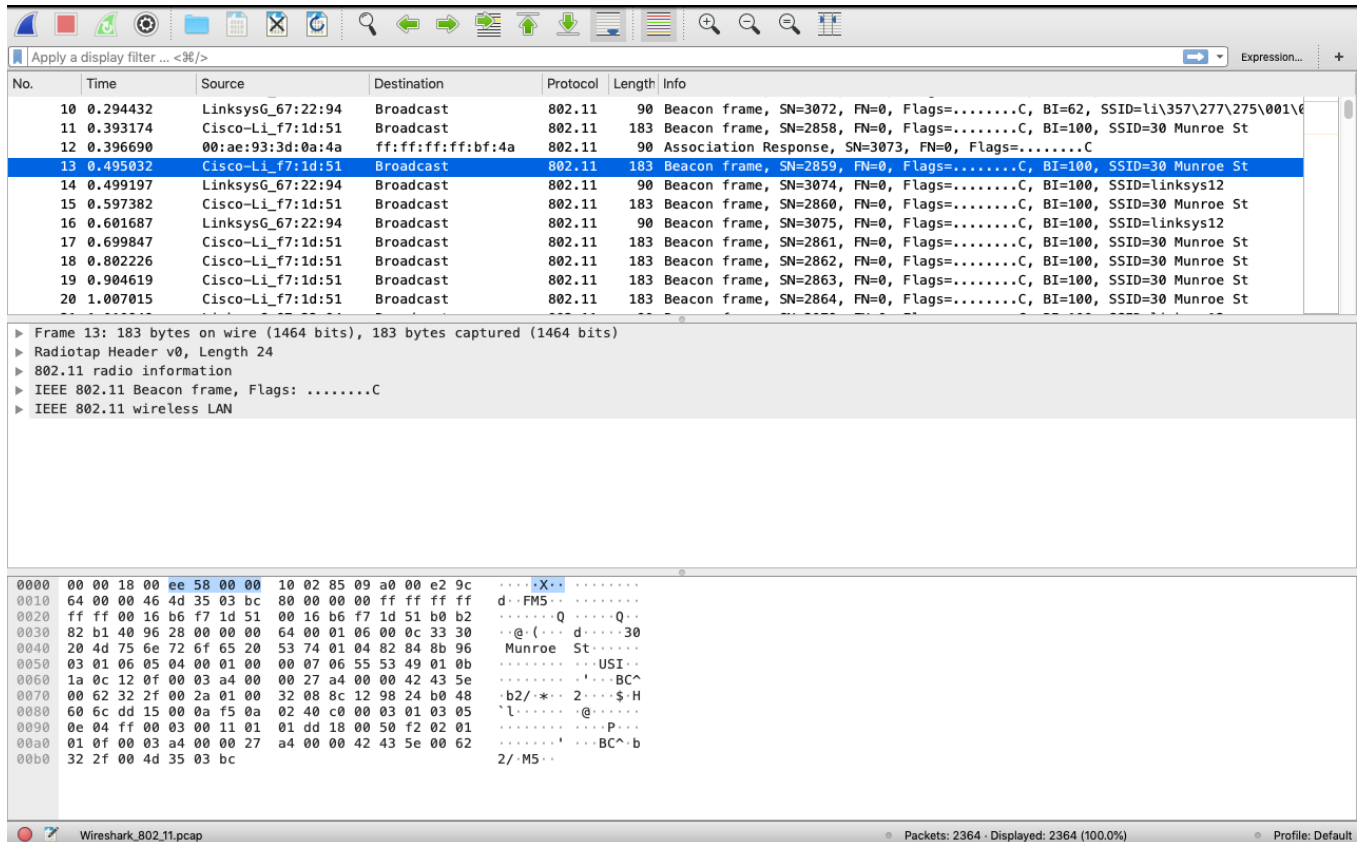
Faisal Alwayli  
Lab7  
IT 520



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?



- 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).

They are both 0.102400 seconds

The image shows a Wireshark packet capture interface. The top pane displays a list of packets. The middle pane shows the details of the selected packet (Frame 13), highlighting the 'Beacon Interval: 0.102400 [Seconds]' field. The bottom pane shows the raw packet data in hexadecimal and ASCII.

No.	Time	Source	Destination	Protocol	Length	Info
10	0.294432	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=.....C, BI=62, SSID=li\357\277\275\001\6
11	0.393174	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
12	0.396690	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90	Association Response, SN=3073, FN=0, Flags=.....C
13	0.495832	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
14	0.499197	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3074, FN=0, Flags=.....C, BI=100, SSID=linksys12
15	0.597382	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
16	0.601687	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12
17	0.699847	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
18	0.802226	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
19	0.904619	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
20	1.007015	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St

Frame 13: 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
  - Fixed parameters (12 bytes)
    - Timestamp: 174319513986
    - Beacon Interval: 0.102400 [Seconds]**
  - Capabilities Information: 0x0601
  - Tagged parameters (119 bytes)

```

0000  00 00 18 00 ee 58 00 00 10 02 85 09 a0 00 e2 9c  ....X.....
0010  64 00 00 46 4d 35 03 bc 80 00 00 00 ff ff ff ff  d..FM5.....
0020  ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 b0 b2  ....Q.....Q...
0030  82 b1 40 96 28 00 00 00 64 00 01 06 00 0c 33 30  @.(...d....30
0040  20 4d 75 6e 72 f1 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.....@...P...
0090  0e 04 ff 00 03 00 11 01 01 dd 18 00 50 f2 02 01  ....P....
00a0  01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62  ....!....BC^..b
00b0  32 2f 00 4d 35 03 bc 2/-M5...

```

Beacon Interval (wlan.fixed.beacon), 2 bytes

Packets: 2364 · Displayed: 2364 (100.0%)

Profile: Default

- 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).

The source MAC address on the beacon frame is 30 munroe st ( 00:16:b6:f7:1d:51)

The image shows a Wireshark capture of 802.11 beacon frames. The packet list at the top shows several beacon frames from '30 Munroe St' (Source: Cisco-Li\_f7:1d:51, Destination: ff:ff:ff:ff:ff:ff). Packet 13 is selected, and its details pane shows the structure of the IEEE 802.11 beacon frame, including the Fixed parameters (12 bytes) and Tagged parameters (119 bytes). The packet bytes pane at the bottom shows the raw data in hexadecimal and ASCII.

No.	Time	Source	Destination	Protocol	Length	Info
10	0.294432	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=.....C, BI=62, SSID=li\357\277\275\001\000
11	0.393174	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
12	0.396690	00:ae:93:3d:0a:4a	ff:ff:ff:ff:ff:ff	802.11	90	Association Response, SN=3073, FN=0, Flags=.....C
13	0.495032	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
14	0.499197	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3074, FN=0, Flags=.....C, BI=100, SSID=linksys12
15	0.597382	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
16	0.601687	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12
17	0.699847	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
18	0.802226	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
19	0.904619	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
20	1.007015	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St

Frame 13: 183 bytes on wire (1464 bits), 183 bytes captured (1464 bits) on interface 0

- 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)
    - Timestamp: 174319513986
    - Beacon Interval: 0.102400 [Seconds]
    - Capabilities Information: 0x0601
    - Tagged parameters (119 bytes)

0000 00 00 18 00 ee 58 00 00 10 02 85 09 a0 00 e2 9c X.....  
 0010 64 00 00 46 4d 35 03 bc 80 00 00 00 ff ff ff ff d..FM5.....  
 0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 b0 b2 .....Q.....Q..  
 0030 82 b1 40 96 28 00 00 00 64 00 01 06 00 0c 33 30 ..@:(...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.....@.....  
 0090 0e 04 ff 00 03 00 11 01 01 dd 18 00 50 f2 02 01 .....P..  
 00a0 01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62 .....BC^b  
 00b0 32 2f 00 4d 35 03 bc 2/M5..

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

The destination MAC address on the beacon frame is 30 munroe st ( ff:ff:ff:ff:ff:ff)

Wireshark 802\_11.pcap

Apply a display filter ... <36/>

No.	Time	Source	Destination	Protocol	Length	Info
10	0.294432	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=.....C, BI=62, SSID=li\357\277\275\001\6
11	0.393174	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
12	0.396690	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90	Association Response, SN=3073, FN=0, Flags=.....C
13	0.495032	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
14	0.499197	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3074, FN=0, Flags=.....C, BI=100, SSID=linksys12
15	0.597382	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
16	0.601687	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12
17	0.699847	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
18	0.802226	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
19	0.904619	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
20	1.007015	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St

IEEE 802.11 Beacon frame, Flags: .....C  
 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 1011 .... = Sequence number: 2859

0000 00 00 18 00 ee 58 00 00 10 02 85 09 a0 00 e2 9c .....X.....  
 0010 64 00 00 46 4d 35 03 bc 80 00 00 00 ff ff ff ff d...FM5...  
 0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 b0 b2 .....Q.....  
 0030 82 b1 40 96 28 00 00 00 64 00 01 06 00 0c 33 30 ..@.(...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...@...P...  
 0090 0e 04 ff 00 03 00 11 01 01 dd 18 00 50 f2 02 01 .....P...  
 00a0 01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62 .....BC^b  
 00b0 32 2f 00 4d 35 03 bc 2/M5...

Destination Hardware Address (wlan.da), 6 bytes

Packets: 2364 · Displayed: 2364 (100.0%)

Profile: Default

5. What (in hexadecimal notation) is the MAC BSS id on the beacon frame from *30 Munroe St*?  
 The MAC BSS ID on the beacon frame from 30 munroe st is (00:16:b6:f7:1d:51)

Wireshark packet capture interface showing a list of packets and a detailed view of a selected IEEE 802.11 Beacon frame.

**Packet List:**

No.	Time	Source	Destination	Protocol	Length	Info
10	0.294432	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=.....C, BI=62, SSID=li\357\277\275\001\6
11	0.393174	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2858, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
12	0.396690	00:ae:93:3d:0a:4a	ff:ff:ff:ff:bf:4a	802.11	90	Association Response, SN=3073, FN=0, Flags=.....C
13	0.495032	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
14	0.499197	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3074, FN=0, Flags=.....C, BI=100, SSID=linksys12
15	0.597382	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2860, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
16	0.601687	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3075, FN=0, Flags=.....C, BI=100, SSID=linksys12
17	0.699847	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2861, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
18	0.802226	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2862, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
19	0.904619	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2863, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
20	1.007015	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2864, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St

**Packet 13 Details:**

- IEEE 802.11 Beacon frame, Flags: .....C
- Type/Subtype: Beacon frame (0x0008)
- Frame Control Field: 0x8000
- 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)
- Fragment number: 0
- Sequence number: 2859

**Packet 13 Hex Data:**

```
0000 00 00 18 00 ee 58 00 00 10 02 85 09 a0 00 e2 9c .....X.....
0010 64 00 00 46 4d 35 03 bc 80 00 00 00 ff ff ff ff d..FM5.....
0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 b0 b2 .....Q.....Q..
0030 82 b1 40 96 28 00 00 00 64 00 01 06 00 0c 33 30 ..@.(...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.....@.....
0090 0e 04 ff 00 03 00 11 01 01 dd 18 00 50 f2 02 01 .....P.....
00a0 01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62 .....'.BC^..b
00b0 32 2f 00 4d 35 03 bc 2/.M5..
```

Acrobat Reader interface showing a PDF document titled "Wireshark\_802\_11.pcap.pdf". The document content displays the details of a selected packet (No. 13) from the Wireshark capture.

**Document Content:**

```
/Users/faisal/Downloads/wireshark-traces/Wireshark_802_11.pcap 2364 total packets, 2364 shown

No.      Time      Source      Destination      Protocol Length Info
   13    0.495032    Cisco-Li_f7:1d:51    Broadcast      802.11    183    Beacon frame,
SN=2859, FN=0, Flags=.....C, BI=100, SSID=30 Munroe St
Frame 13: 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 e2 9c .....X.....
0010 64 00 00 46 4d 35 03 bc 80 00 00 00 ff ff ff ff d..FM5.....
0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 b0 b2 .....Q.....Q..
0030 82 b1 40 96 28 00 00 00 64 00 01 06 00 0c 33 30 ..@.(...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.....@.....
0090 0e 04 ff 00 03 00 11 01 01 dd 18 00 50 f2 02 01 .....P.....
00a0 01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62 .....'.BC^..b
00b0 32 2f 00 4d 35 03 bc 2/.M5..
```

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