

Πολυμέσα και Ασύρματη Δικτύωση

Ενότητα Ασύρματης Δικτύωσης
Τρίτη Εργαστηριακή Άσκηση

<https://eclass.uoa.gr/courses/DI570/>

Άσκηση Β3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

Στόχοι:

- Εξοικείωση με την ανάλυση ιχνών πακέτων
- Μελέτη παραμέτρων λειτουργίας του ασύρματου τοπικού δικτύου
- Μελέτη διαδικασιών ανακάλυψης και συσχέτισης σημείων πρόσβασης
- Σύγκριση απόδοσης ασύρματων τοπικών δικτύων

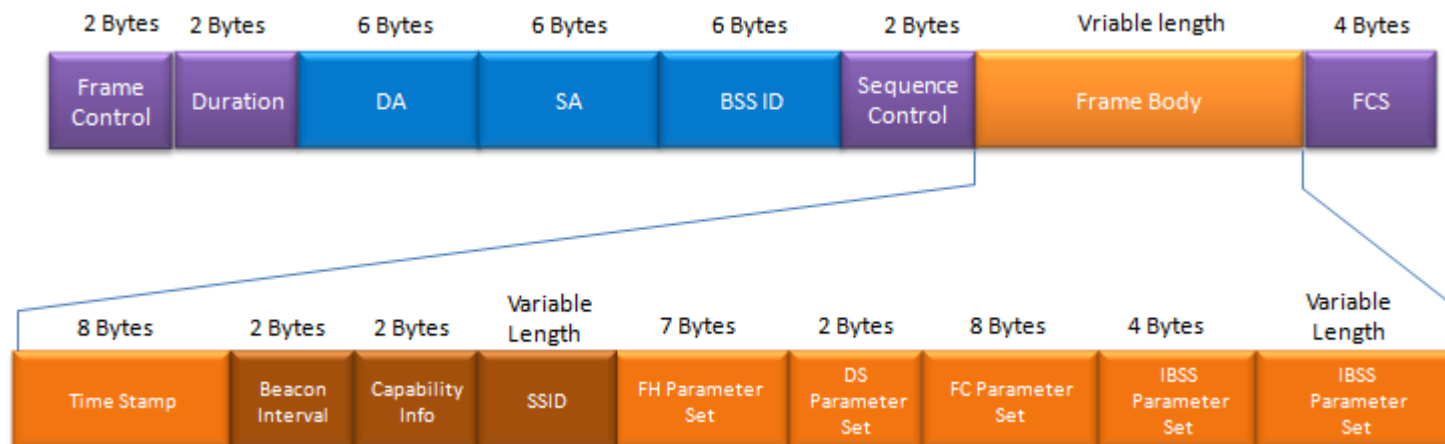
Άσκηση Β3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

1. Πλαίσια-Φάροι
2. Μεταφορά Δεδομένων (http)
3. Συσχέτιση/Αποσυσχέτιση
4. Άλλοι τύποι πλαισίων (active probe)
5. Συμπεράσματα

Άσκηση Β3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

1) Πλαίσια-Φάρσι

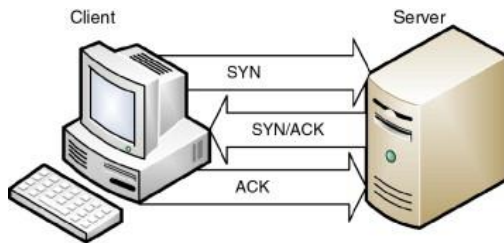
- Με χρήση εφαρμογών ανάλυσης των ιχνών πακέτων WiFi ([Wireshark](#)), απαντήστε στα παρακάτω ερωτήματα
 - SSID των δύο σημείων πρόσβασης που στέλνουν τα περισσότερα πλαίσια-φάρους
 - Μεσοδιαστήματα μεταξύ των πλαισίων-φάρων για συγκεκριμένα σημεία πρόσβασης
 - Μελέτη MAC διευθύνσεων που περιλαμβάνονται σε ένα πλαίσιο-φάρο
 - Υποστηριζόμενοι ρυθμοί μετάδοσης



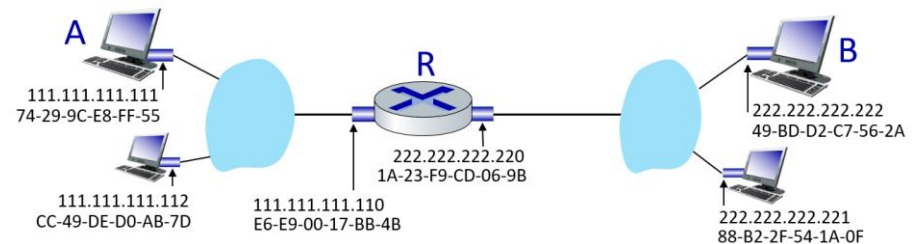
Άσκηση Β3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

2) Μεταφορά Δεδομένων

- Βρείτε τα πλαίσια WiFi που περιέχουν τμήματα SYN TCP και SYNACK TCP για συγκεκριμένη αίτηση HTTP
 - Αναλύστε τις τρεις διευθύνσεις MAC στο πλαίσιο WiFi που περιέχει το τμήμα SYN TCP και τις αντιστοιχίες τους με τις IP διευθύνσεις
 - Αναλύστε τις τρεις διευθύνσεις MAC στο πλαίσιο WiFi που περιέχει το τμήμα SYNACK TCP και τις αντιστοιχίες τους με τις IP διευθύνσεις



TCP three-way handshake



Άσκηση B3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

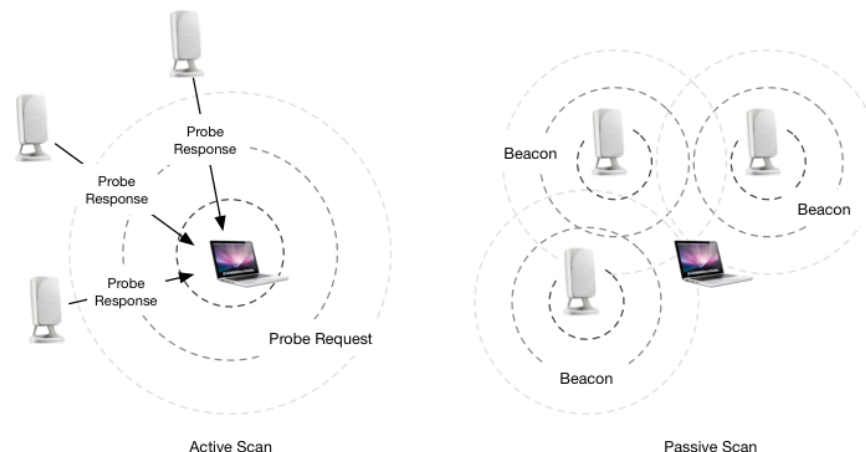
3) Συσχέτιση/Αποσυσχέτιση

- Ο τερματικός σταθμός αποφασίζει να συσχετιστεί με ένα νέο σημείο πρόσβασης
 - Ενέργειες από τον τερματικό σταθμό για να λήξει η υπάρχουσα συσχέτιση
 - Εξετάστε τα πλαίσια AUTHENTICATION
 - Αναζητήστε αποκρίσεις στα πλαίσια AUTHENTICATION
- Ο τερματικός σταθμός επιστρέφει στο προηγούμενο σημείο πρόσβασης
 - Εξετάστε τα πλαίσια AUTHENTICATION
 - Εξετάστε τα πλαίσια ASSOCIATE REQUEST και ASSOCIATE RESPONSE
 - Μελετήστε τους υποστηριζόμενους ρυθμούς μετάδοσης

Άσκηση Β3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

4) Άλλοι τύποι πλαισίων

- Εντοπίστε τα πλαίσια PROBE REQUEST και PROBE RESPONSE.
 - Ποιες είναι οι διευθύνσεις MAC του αποστολέα, του παραλήπτη και του BSS id σε αυτά τα πλαίσια;
 - Ποιος είναι ο σκοπός αυτών των πλαισίων;



Άσκηση B3: Επιθεώρηση πακέτων ασύρματου τοπικού δικτύου

5) Συμπεράσματα

Καταλήξτε σε συμπεράσματα

- Χρησιμοποιούμενοι ρυθμοί δεδομένων
- Ποιότητα σήματος
- Χρησιμοποιούμενη μπάντα και χρησιμοποιούμενη έκδοση πρωτοκόλλου
- Σύγκριση των παραπάνω με την άσκηση B1

Wireshark_802.11.pcap

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No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2854, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
2	0.062101	8c:c1:ae:c0:ea:2c	8c:c1:ae:c0:ea:2c	802.11	1624	PV1 Management [Malformed Packet]
3	0.085474	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2855, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
4	0.187919	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2856, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
5	0.188100	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1482, FN=0, Flags=.....TC
6	0.188201	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f	802.11	38	Acknowledgement, Flags=.....C
7	0.188935	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	0.189034	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f	802.11	38	Acknowledgement, Flags=.....C
9	0.290284	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2857, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
10	0.294432	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3072, FN=0, Flags=.....C, BI=62, SSID=6c69ee8104e2273a32 [Malformed Packet]
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	00:ae:93:3d:0a:4a	802.11	90	PV1 Reserved
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	0.699047	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"
21	1.010949	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3076, FN=0, Flags=.....C, BI=100, SSID="linksys12"
22	1.109406	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2865, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
23	1.113691	LinksysG_67:22:94	Broadcast	802.11	90	Beacon frame, SN=3080, FN=0, Flags=.....C, BI=100, SSID=2cdc6e6b7379733132
24	1.211843	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2866, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
25	1.211992	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1484, FN=0, Flags=.....TC
26	1.212089	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f	802.11	38	Acknowledgement, Flags=.....C
27	1.212185	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"
28	1.212282	Cisco-Li_f7:1d:51	Cisco-Li_f7:1d:51	802.11	38	Acknowledgement, Flags=.....C
29	1.312041	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1485, FN=0, Flags=.....P...TC

> Frame 1: 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 Management

```
0000 00 00 18 00 ee 50 00 00 10 02 85 09 a0 00 e3 9c .....X.....
0010 ff ff 00 47 08 26 7e 05 80 00 00 00 ff ff ff ff R-G-B-.....
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
0080 60 6c dd 15 00 0a f5 0a 02 40 c0 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 43 5e 00 62 .....C-b
00b0 32 2f 00 08 26 7e 05 2f-8-
```

Wireshark_802_11.pcap

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No.	Time	Source	Destination	Protocol	Length	Info
58	2.440572	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2880, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
59	2.453941	Cisco-Li_f7:1d:51	IntelCor_1f:57:13	802.11	177	Probe Response, SN=2881, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
60	2.542945	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2882, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
61	2.645319	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2883, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
62	2.747697	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2884, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
63	2.850114	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2885, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
64	2.952572	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2886, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
65	3.054945	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2887, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
66	3.157343	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2888, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
67	3.260366	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2889, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
68	3.260500	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1488, FN=0, Flags=.....TC
69	3.260599	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (- 802.11	38	Acknowledgement, Flags=.....C	
70	3.261440	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1489, FN=0, Flags=...P...TC
71	3.261539	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (- 802.11	38	Acknowledgement, Flags=.....C	
72	3.362149	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2890, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
73	3.465563	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2891, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
74	3.566068	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2892, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
75	3.669297	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2893, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
76	3.771739	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2894, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
77	3.874104	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2895, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
78	3.975901	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2896, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
79	4.078852	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2897, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
80	4.181257	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2898, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
81	4.283592	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2899, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
82	4.283737	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (- 802.11	38	Acknowledgement, Flags=.....C	
83	4.283835	Cisco-Li_f7:1d:51	IntelCor_d1:b6:4f	802.11	177	Probe Response, SN=2900, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
84	4.283933	Cisco-Li_f7:1d:51	IntelCor_d1:b6:4f (- 802.11	38	Acknowledgement, Flags=.....C	
85	4.284692	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function (No data), SN=1491, FN=0, Flags=...P...TC
86	4.284701	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f (- 802.11	38	Acknowledgement, Flags=.....C	

> Frame 76: 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:

> IEEE 802.11 Wireless Management

- Fixed parameters (12 bytes)
 - Timestamp: 174322790786
 - Beacon Interval: 0.102400 [Seconds]
 - Capabilities Information: 0x0001
- 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 of 1 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: Airo Networks, Inc.
 - Tag: Vendor Specific: Microsoft Corp.: WPA/WME: Parameter Element

0000 00 00 18 00 ee 50 00 00 10 02 05 09 a0 00 e4 9cX.....
0010 50 00 00 48 cf ad 3f ba 00 00 00 ff ff ff ff X..H.M?.....
0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 e0 b4Q.....
0030 02 b1 72 96 28 00 00 00 64 00 01 06 00 0c 33 30d.....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 0bUSI.....
0060 1a 0c 12 0f 00 03 a4 00 00 27 a4 00 00 42 43 5eBC.....
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 01P.....
00a0 01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62BC^b
00b0 32 2f 00 cf ad 3f ba2f..H?

Wireshark_802.11.pcap

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Open Ctrl+O
Open Recent
Merge...
Import from Hex Dump...
Close Ctrl+W
Save Ctrl+S
Save As... Ctrl+Shift+S
File Set
Export Specified Packets...
Export Packet Dissections
Export Packet Bytes... Ctrl+Shift+X
Export PDUs to File...
Strip Headers...
Export TLS Session Keys...
Export Objects
Print... Ctrl+P
Quit Ctrl+Q

Destination	Protocol	Length	Info
Broadcast	802.11	183	183 Beacon frame, SN=2880, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
IntelCor_1f:57:13	802.11	177	177 Probe Response, SN=2881, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2882, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2883, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2884, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2885, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2886, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2887, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2888, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2889, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Cisco-Li_f7:1d:51	802.11	54	54 QoS Null function (No data), SN=1488, FN=0, Flags=.....TC
IntelCor_d1:b6:4f (- 802.11	802.11	38	38 Acknowledgement, Flags=.....C
Cisco-Li_f7:1d:51	802.11	54	54 QoS Null function (No data), SN=1489, FN=0, Flags=...P...TC
IntelCor_d1:b6:4f (- 802.11	802.11	38	38 Acknowledgement, Flags=.....C
Broadcast	802.11	183	183 Beacon frame, SN=2890, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2891, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2892, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2893, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2894, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2895, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2896, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2897, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2898, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Broadcast	802.11	183	183 Beacon frame, SN=2899, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
IntelCor_d1:b6:4f (- 802.11	802.11	38	38 Acknowledgement, Flags=.....C
IntelCor_d1:b6:4f	802.11	177	177 Probe Response, SN=2900, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
Cisco-Li_f7:1d:51 (- 802.11	802.11	38	38 Acknowledgement, Flags=.....C
Cisco-Li_f7:1d:51	802.11	54	54 QoS Null function (No data), SN=1491, FN=0, Flags=...P...TC
IntelCor_d1:b6:4f (- 802.11	802.11	38	38 Acknowledgement, Flags=.....C

> Frame 76: 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 Management
Fixed parameters (12 bytes)
Timestamp: 174322790786
Beacon Interval: 0.102400 [Seconds]
Capabilities Information: 0x0001
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 of 1 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: Airo Networks, Inc.
Tag: Vendor Specific: Microsoft Corp.: WPA/WME: Parameter Element

0000 00 00 18 00 ee 58 00 00 10 02 85 09 a0 00 e4 9cX.....
0010 58 00 00 48 cf 4d 3f ba 80 00 00 00 ff ff ff ff X..H.M?.....
0020 ff ff 00 16 b6 f7 1d 51 00 16 b6 f7 1d 51 e0 b4Q.....
0030 02 b1 72 96 28 00 00 00 64 00 01 06 00 0c 33 30d....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 0bUSI..
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 01P.....
00a0 01 0f 00 03 a4 00 00 27 a4 00 00 42 43 5e 00 62*....BC^..b
00b0 32 2f 00 cf 4d 3f ba 2f..H?..

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
58	2.440572	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2880, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
59	2.453941	Cisco-Li_f7:1d:51	IntelCor_1f:57:13	802.11	177	Probe Response, SN=2881, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
60	2.542945	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2882, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
61	2.645319	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2883, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
62	2.747697	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2884, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
63	2.850114	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2885, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
64	2.952572	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2886, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
65	3.054945	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2887, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
66	3.157343	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2888, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
67	3.260366	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2889, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
68	3.260500	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function
69	3.260599	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f	802.11	38	Acknowledgement
70	3.261440	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function
71	3.261539	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f	802.11	38	Acknowledgement
72	3.362149	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2890, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
73	3.465563	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2891, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
74	3.566068	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2892, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
75	3.669297	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2893, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
76	3.771739	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2894, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
77	3.874104	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2895, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
78	3.975501	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2896, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
79	4.078852	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2897, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
80	4.181257	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2898, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
81	4.283592	Cisco-Li_f7:1d:51	Broadcast	802.11	183	Beacon frame, SN=2899, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
82	4.283737	IntelCor_d1:b6:4f	IntelCor_d1:b6:4f	802.11	38	Acknowledgement
83	4.283835	Cisco-Li_f7:1d:51	IntelCor_d1:b6:4f	802.11	177	Probe Response, SN=2900, FN=0, Flags=.....C, BI=100, SSID="30 Munroe St"
84	4.283933	Cisco-Li_f7:1d:51	IntelCor_d1:b6:4f	802.11	38	Acknowledgement
85	4.284692	IntelCor_d1:b6:4f	Cisco-Li_f7:1d:51	802.11	54	QoS Null function

> Frame 76: 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 Management

> Fixed parameters (12 bytes)

Timestamp: 174322790786

Beacon Interval: 0.102400 [Seconds]

> Capabilities Information: 0x0001

> 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 1 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: Airo Networks, Inc.

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

Wireshark - Print

Packet Format

☒ Summary line

☒ Include column headings

☒ Details:

☐ All collapsed

☒ As displayed

☐ All expanded

☐ Bytes

☐ Include secondary data sources

☐ Print each packet on a new page

☒ Capture information header

+ and - zoom, 0 resets

Packet Range

☐ Captured ☒ Displayed

☐ All packets

☒ Selected packets only

☐ Marked packets only

☐ First to last marked

Range:

☐ Remove ignored packets

Page Setup... Print... Cancel Help

10 02 05 09 00 00 e4 9cX.....
80 00 00 00 ff ff ff ffX..H.M?.....
00 16 b6 f7 1d 51 e0 b4Q.....
64 00 01 06 00 0c 33 30d....30
53 74 01 04 82 84 8b 96Munroe St.....
00 07 06 55 53 49 01 0bUSI..
00 27 a4 00 00 42 43 5eBCA..
32 08 8c 12 98 24 b0 48 ..b2/..2...\$ H
02 40 c0 00 03 01 03 05 ..l.....@.....
01 dd 18 00 50 f2 02 01P.....
a4 00 00 42 43 5e 00 62BCA..b
2/-H?..

