WirelessBuff
Chase the Beacon..

802.11k – Radio Resource Management

The 802.11k protocol provides mechanisms for APs and clients to dynamically measure the available radio resources by sending neighbor reports, beacon reports, and link measurement reports to each other. This allows the APs and clients to understand the RF environment and helps the client to take improved roaming decisions.

Neighbor Report Request/Response

Neighbor Requests are sent by an 802.11K-capable client to its 802.11K-capable AP. The AP responds with a Neighbor Report. The Neighbor Report contains the details of the neighboring BSSIDs heard by the AP (using Aruba's proprietary algorithm Adaptive Radio Management in controllers).

For each neighbor, the Neighbor Report also includes a BSS Transition Preference IE. This field conveys a comparative transition preference of the neighbor AP from the point of view of resources available on it – that is, how suitable a particular neighbor AP would be for the client to transition to it.

Beacon Request

An 802.11K-capable AP will send Beacon Requests to its 802.11K clients (Don't confuse this with the regular beacon frame). These are not beacon frames, instead these are unicast Measure Requests type known as Beacon Request which are sent less frequent than Beacon frames. On Aruba controllers the default timer to send these frames are 60 seconds.
This frame includes the measurement parameters (like channel number, measurement mode and duration, various subelements).

Attached snippet of Beacon Request (later in the blog)

Link Measurement Request/Report:

TPC Report : This report contain the transmit power and link margin

information which helps to understand the attenuation in the link.

Access Points (in my case) also sends a Link Measurement Request frame to request Clients so they can respond with a frame (Link Measurement Report) containing a TPC report. The Link Measurement Report also contains antenna ID and signal quality.

Below is how the Aruba config for 802.11k looks like.

```
(Standalone) [MDC] *#show wlan dot11k-profile 11k-Enabled

802.11k Profile "11k-Enabled"
-----------------------------
Parameter                                                          Value
---------                                                          -----
Advertise 802.11k Capability                                       Enabled
Forcefully disassociate on-hook voice clients                      Disabled
Measurement Mode for Beacon Reports                                beacon-table
Channel for Beacon Requests in 5GHz band                           36
Channel for Beacon Requests in 2.4GHz band                         1
Channel for AP Channel Reports in 5GHz band                        36
Channel for AP Channel Reports in 2.4GHz band                      1
Channel for AP Channel Reports in 6GHz band                        1
Time duration between consecutive Beacon Requests                  60 sec
Time duration between consecutive Link Measurement Requests        60 sec
Time duration between consecutive Transmit Stream Measurement Requests  90 sec
RRM IE Settings Profile                                            default
Beacon Report Request Settings                                     default
TSM Report Request Settings                                        default
Advertise Wide Bandwidth IE in Neighbor Report Responses           Enabled
(Standalone) [MDC] *#show wlan rrm-ie-profile default

RRM IE Profile "default"
------------------------
Parameter                          Value
---------                          -----
Advertise Enabled Capabilities IE  Enabled
Advertise Country IE               Enabled
Advertise Power Constraint IE      Enabled
Advertise TPC Report IE            Enabled
Advertise QBSS Load IE             Enabled
Advertise BSS AAC IE               Enabled
Advertise Quiet IE                 Enabled
```

```
(Standalone) [MDC] *#show wlan bcn-rpt-req-profile default

Beacon Report Request Profile "default"
---------------------------------------
Parameter                                Value
---------                                -----
Beacon Request BSSID                     ff:ff:ff:ff:ff:ff
Interface                                1
Regulatory Class                         auto
Channel                                  255
Randomization Interval                   0
Measurement Duration                     0
Measurement Mode for Beacon Reports      beacon-table
Reporting Condition                      0
ESSID Name                               N/A
Include SSID IE                          Yes
Reporting Detail                         Disabled
Last Beacon Report Indication            Disabled
Measurement Duration Mandatory           Disabled
Request Information values               N/A
```

For both the AP's we can see the controller displays the flag set to K which indicates 802.11K is enabled.

```
(Standalone) [mynode] #show ap bss-table essid Saturn-VHT

fm (forward mode): T-Tunnel, S-Split, D-Decrypt Tunnel, B-Bridge (s-standard, p-persistent, b-backup, a-always), n-anyspot

cluster (cluster role): U-UAC, A-AAC, sU-Standby UAC, sA-Standby AAC

Aruba AP BSS Table
------------------
bss                ess         port  ip            band/ht-mode/bandwidth  ch/EIRP/max-EIRP  type  cur-cl  ap name  in-t(s)  tot-t       mtu   acl-
state  acl  fm  flags  cluster  datazone
---                ----        ----  --            ----------------------  ----------------  ----  ------  -------  -------  -----       ---   ----
-----  ---  --  -----  -------  --------
1c:28:af:7d:eb:f0  Saturn-VHT  N/A   10.1.140.102  5GHz/VHT/80MHz          149E/15.0/31.7    ap    0       CAP-515  0        1h:59m:34s  1500  -
       90   T   Kr             no
00:4e:35:c7:06:50  Saturn-VHT  N/A   10.1.140.103  5GHz/VHT/80MHz          149E/15.0/30.5    ap    0       CAP-535  0        1h:59m:0s   1500  -
       90   T   Kr             no

Channel followed by "*" indicates channel selected due to unsupported configured channel.
"Spectrum" followed by "^" indicates Local Spectrum Override in effect.

Num APs:2
Num Associations:0

Flags:       a = Airslice policy; A = Airslice app monitoring; c = MBO Cellular Data Capable BSS; d = Deferred Delete Pending; D = VLAN Discovered;
 E = Enhanced-open BSS without transition mode; I = Imminent VAP Down; K = 802.11K Enabled; m = Agile Multiband (MBO) BSS; M = WPA3-SAE mixed mode
BSS; o = Enhanced-open transition mode open BSS; O = Enhanced-open BSS with transition mode; r = 802.11r Enabled; t = Broadcast TWT Enabled; T = In
dividual TWT Enabled; W = 802.11W Enabled; x = MBSSID Tx BSS; 3 = WPA3 BSS;
```

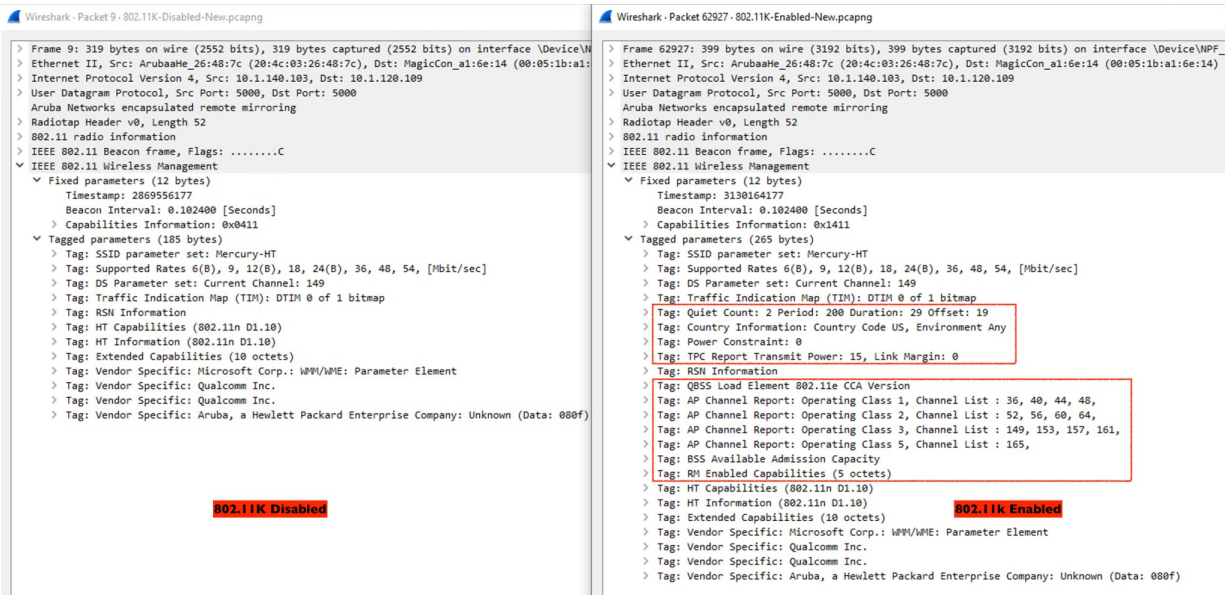
Here is my setup :

AP BSSID – 94:64:24:8a:36:81
Client MAC – fc:d9:08:17:59:66

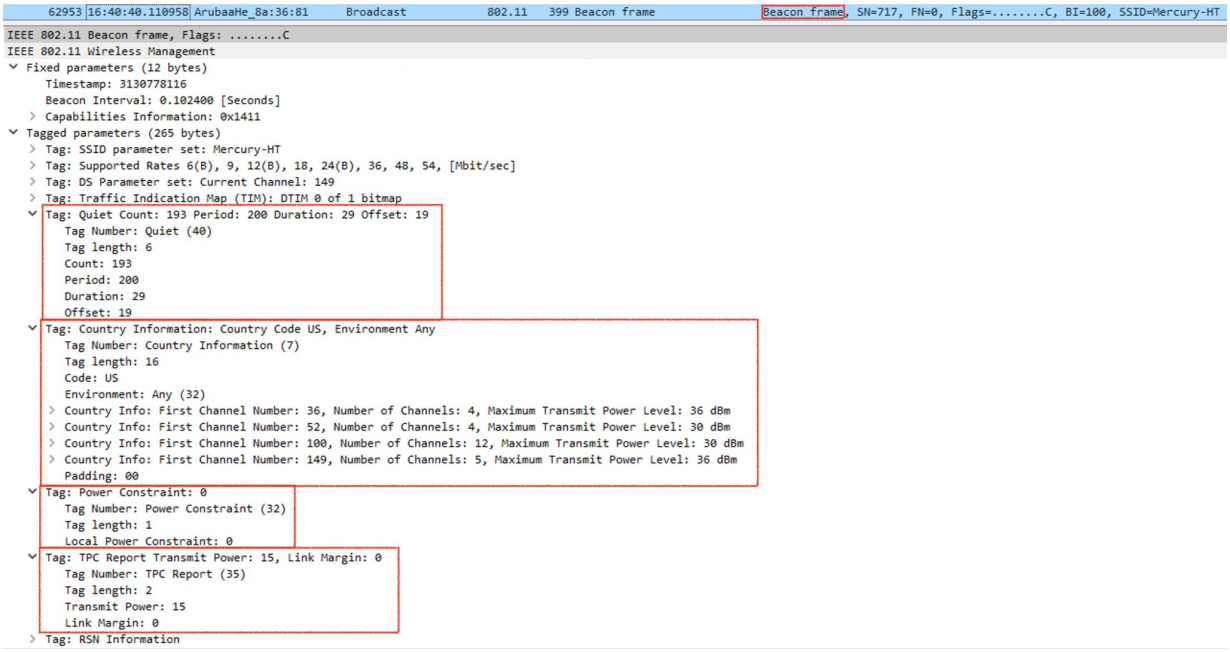
After enabling 802.11k on the Aruba controller's virtual AP profile, the beacon frame starts advertising its capability of Radio Resource Management features.

Beacon Frame

I have captured and attached a snippet of beacon frame with the 802.11K enabled and disabled to highlight the the addition capabilities that we can notice.



Expanded Beacon Capabilities



Additional Beacon fields

```
62953 16:40:40.110958 ArubaaHe_8a:36:81   Broadcast   802.11   399 Beacon frame   Beacon frame, SN=717, FN=0, Flags=........C, BI=100, SSID=Mercury-HT
Tag: QBSS Load Element 802.11e CCA Version
   Tag Number: QBSS Load Element (11)
   Tag length: 5
   QBSS Version: 2
   Station Count: 1
   Channel Utilization: 19 (7%)
   Available Admission Capacity: 29062 (929984 us/s)
Tag: AP Channel Report: Operating Class 1, Channel List : 36, 40, 44, 48,
   Tag Number: AP Channel Report (51)
   Tag length: 5
   Operating Class: 1
   Channel List: 36
   Channel List: 40
   Channel List: 44
   Channel List: 48
Tag: AP Channel Report: Operating Class 2, Channel List : 52, 56, 60, 64,
   Tag Number: AP Channel Report (51)
   Tag length: 5
   Operating Class: 2
   Channel List: 52
   Channel List: 56
   Channel List: 60
   Channel List: 64
Tag: AP Channel Report: Operating Class 3, Channel List : 149, 153, 157, 161,
Tag: AP Channel Report: Operating Class 5, Channel List : 165,
Tag: BSS Available Admission Capacity
   Tag Number: BSS Available Admission Capacity (67)
   Tag length: 6
 > Available Admission Capacity Bitmask: 0x0c00
   AC2: 29062
   AC3: 29062
Tag: RM Enabled Capabilities (5 octets)
   Tag Number: RM Enabled Capabilities (70)
   Tag length: 5
```

Additional Beacon fields :

```
62953 16:40:40.110958 ArubaaHe_8a:36:81   Broadcast   802.11   399 Beacon frame   Beacon frame, SN=717, FN=0, Flags=........C, BI=100, SSID=Mercury-HT
Tag: RM Enabled Capabilities (5 octets)
   Tag Number: RM Enabled Capabilities (70)
   Tag length: 5
 v RM Capabilities: 0x73 (octet 1)
     .... ...1 = Link Measurement: Enabled
     .... ..1. = Neighbor Report: Enabled
     .... .0.. = Parallel Measurements: Disabled
     .... 0... = Repeated Measurements: Disabled
     ...1 .... = Beacon Passive Measurement: Enabled
     ..1. .... = Beacon Active Measurement: Enabled
     .1.. .... = Beacon Table Measurement: Supported
     0... .... = Beacon Measurement Reporting Conditions: Disabled
 v RM Capabilities: 0xd0 (octet 2)
     .... ...0 = Frame Measurement: Disabled
     .... ..0. = Channel Load Measurement: Disabled
     .... .0.. = Noise Histogram Measurement: Disabled
     .... 0... = Statistics Measurement: Disabled
     ...1 .... = LCI Measurement: Enabled
     ..0. .... = LCI Azimuth capability: Disabled
     .1.. .... = Transmit Stream/Category Measurement: Supported
     1... .... = Triggered Transmit Stream/Category Measurement: Enabled
 v RM Capabilities: 0x01 (octet 3)
     .... ...1 = AP Channel Report capability: Enabled
     .... ..0. = RM MIB capability: Disabled
     ...0 00.. = Operating Channel Max Measurement Duration: 0
     000. .... = Nonoperating Channel Max Measurement Duration: 0
 v RM Capabilities: 0x00 (octet 4)
     .... .000 = Measurement Pilotcapability: 0
     .... 0... = Measurement Pilot Transmission Information: Disabled
     ...0 .... = Neighbor Report TSF Offset: Disabled
     ..0. .... = RCPI Measurement capability: Disabled
     .0.. .... = RSNI Measurement capability: Not supported
     0... .... = BSS Average Access Delay capability: Disabled
 v RM Capabilities: 0x0d (octet 5)
     .... ...1 = BSS Available Admission Capacity capability: Enabled
     .... ..0. = Antenna capability: Disabled
     .... .1.. = FTM Range Report Capability: Enabled
     .... 1... = Civic Location Measurement Capability: Enabled
     0000 .... = Reserved: 0x0
```

Probe Request :

The client first tries to connect to Saturn-VHT SSID, so broadcasting a probe request.

Probe Response

Clients gets response from all the AP's that heard the client's Probe Request and the response frame as well AP advertises its capability of supporting Radio Management capabilities.

Association Request

Clients decides to connect to the BSSID – 1c:28:af:7d:eb:f0, and defines it capabilities of Radio Management under the tagged parameters.

```
1522 16:38:39.958246 XiaomiCo_17:59:66    ArubaaHe_8a:36:81    802.11    301 Association Request    Association Request, SN=120, FN=0, Flags=........C, SSID=Mercury-HT
Tag: RM Enabled Capabilities (5 octets)
   Tag Number: RM Enabled Capabilities (70)
   Tag length: 5
 RM Capabilities: 0x7b (octet 1)
      .... ...1 = Link Measurement: Enabled
      .... ..1. = Neighbor Report: Enabled
      .... .0.. = Parallel Measurements: Disabled
      .... 1... = Repeated Measurements: Enabled
      ...1 .... = Beacon Passive Measurement: Enabled
      ..1. .... = Beacon Active Measurement: Enabled
      .1.. .... = Beacon Table Measurement: Supported
      0... .... = Beacon Measurement Reporting Conditions: Disabled
 RM Capabilities: 0x00 (octet 2)
      .... ...0 = Frame Measurement: Disabled
      .... ..0. = Channel Load Measurement: Disabled
      .... .0.. = Noise Histogram Measurement: Disabled
      .... 0... = Statistics Measurement: Disabled
      ...0 .... = LCI Measurement: Disabled
      ..0. .... = LCI Azimuth capability: Disabled
      .0.. .... = Transmit Stream/Category Measurement: Not supported
      0... .... = Triggered Transmit Stream/Category Measurement: Disabled
 RM Capabilities: 0x02 (octet 3)
      .... ...0 = AP Channel Report capability: Disabled
      .... ..1. = RM MIB capability: Enabled
      ...0 00.. = Operating Channel Max Measurement Duration: 0
      000. .... = Nonoperating Channel Max Measurement Duration: 0
 RM Capabilities: 0x00 (octet 4)
      .... .000 = Measurement Pilotcapability: 0
      .... 0... = Measurement Pilot Transmission Information: Disabled
      ...0 .... = Neighbor Report TSF Offset: Disabled
      ..0. .... = RCPI Measurement capability: Disabled
      .0.. .... = RSNI Measurement capability: Not supported
      0... .... = BSS Average Access Delay capability: Disabled
 RM Capabilities: 0x00 (octet 5)
      .... ...0 = BSS Available Admission Capacity capability: Disabled
      .... ..0. = Antenna capability: Disabled
      .... .0.. = FTM Range Report Capability: Disabled
      .... 0... = Civic Location Measurement Capability: Disabled
      0000 .... = Reserved: 0x0
```

Association Response

```
1526 16:38:39.960992 ArubaaHe_8a:36:81    XiaomiCo_17:59:66    802.11    242 Association Response    Association Response, SN=0, FN=0, Flags=........C
Tag: RM Enabled Capabilities (5 octets)
   Tag Number: RM Enabled Capabilities (70)
   Tag length: 5
 RM Capabilities: 0x73 (octet 1)
      .... ...1 = Link Measurement: Enabled
      .... ..1. = Neighbor Report: Enabled
      .... .0.. = Parallel Measurements: Disabled
      .... 0... = Repeated Measurements: Disabled
      ...1 .... = Beacon Passive Measurement: Enabled
      ..1. .... = Beacon Active Measurement: Enabled
      .1.. .... = Beacon Table Measurement: Supported
      0... .... = Beacon Measurement Reporting Conditions: Disabled
 RM Capabilities: 0xd0 (octet 2)
      .... ...0 = Frame Measurement: Disabled
      .... ..0. = Channel Load Measurement: Disabled
      .... .0.. = Noise Histogram Measurement: Disabled
      .... 0... = Statistics Measurement: Disabled
      ...1 .... = LCI Measurement: Enabled
      ..0. .... = LCI Azimuth capability: Disabled
      .1.. .... = Transmit Stream/Category Measurement: Supported
      1... .... = Triggered Transmit Stream/Category Measurement: Enabled
 RM Capabilities: 0x01 (octet 3)
      .... ...1 = AP Channel Report capability: Enabled
      .... ..0. = RM MIB capability: Disabled
      ...0 00.. = Operating Channel Max Measurement Duration: 0
      000. .... = Nonoperating Channel Max Measurement Duration: 0
 RM Capabilities: 0x00 (octet 4)
      .... .000 = Measurement Pilotcapability: 0
      .... 0... = Measurement Pilot Transmission Information: Disabled
      ...0 .... = Neighbor Report TSF Offset: Disabled
      ..0. .... = RCPI Measurement capability: Disabled
      .0.. .... = RSNI Measurement capability: Not supported
      0... .... = BSS Average Access Delay capability: Disabled
 RM Capabilities: 0x0d (octet 5)
      .... ...1 = BSS Available Admission Capacity capability: Enabled
      .... ..0. = Antenna capability: Disabled
      .... .1.. = FTM Range Report Capability: Enabled
      .... 1... = Civic Location Measurement Capability: Enabled
      0000 .... = Reserved: 0x0
```

Neighbor Report Request – Action Frame (Client to AP)

Here we can see that the client requested for the neighbor report from the AP

The Neighbor Report Request frame uses the Action frame and is transmitted by a STA requesting information in the Neighbor Report about neighboring APs.

```
1530 16:38:39.968520 XiaomiCo_17:59:66   ArubaaHe_8a:36:81   802.11   137 Action   Action, SN=121, FN=0, Flags=........C, SSID=Mercury-HT

Frame 1530: 137 bytes on wire (1096 bits), 137 bytes captured (1096 bits) on interface \Device\NPF_{6DB6E852-2B12-4E96-B767-7628AE460EA3}, id 0
Ethernet II, Src: ArubaaHe_26:48:7c (20:4c:03:26:48:7c), Dst: MagicCon_a1:6e:14 (00:05:1b:a1:6e:14)
Internet Protocol Version 4, Src: 10.1.140.103, Dst: 10.1.120.109
User Datagram Protocol, Src Port: 5000, Dst Port: 5000
Aruba Networks encapsulated remote mirroring
Radiotap Header v0, Length 52
802.11 radio information
IEEE 802.11 Action, Flags: ........C
IEEE 802.11 Wireless Management
  Fixed parameters
    Category code: Radio Measurement (5)
    Action code: Neighbor Report Request (4)
    Dialog token: 1
  Tagged parameters (12 bytes)
    Tag: SSID parameter set: Mercury-HT
      Tag Number: SSID parameter set (0)
      Tag length: 10
      SSID: Mercury-HT
```

Neighbor Report Response – Action Frame (AP to Client) :

Now AP responds to the Neighbor request frame from the client with a Neighbor response frame, stating all the information it was able to gather about the neighboring AP/AP's (in this case I am only using 2 AP's, so AP1 shares all the information about AP2- BSSID-00:4e:35:c7:06:50).

```
1534 16:38:39.969037 ArubaaHe_8a:36:81   XiaomiCo_17:59:66   802.11   305 Action   Action, SN=1, FN=0, Flags=.....

Fixed parameters
  Category code: Radio Measurement (5)
  Action code: Neighbor Report Response (5)
  Dialog token: 1
Tagged parameters (180 bytes)
  Tag: Neighbor Report                                                    AP 1
    Tag Number: Neighbor Report (52)
    Tag length: 28
    BSSID: HewlettP_c7:06:52 (00:4e:35:c7:06:52)
    BSSID Information: 0x0000000f
      .... .... .... .... .... .... .... ..11 = AP Reachability: Reachable (0x3)
      .... .... .... .... .... .... .... .1.. = Security: True
      .... .... .... .... .... .... .... 1... = Key Scope: True
      .... .... .... .... .... ..00 0000 .... = Capability: 0x00
      .... .... .... .... .... .0.. .... .... = Mobility Domain: False
      .... .... .... .... .... 0... .... .... = High Throughput Control (+HTC): False
      .... .... .... .... ...0 .... .... .... = Very High Throughput (+VHT): False
      .... .... .... .... ..0. .... .... .... = Fine Timing Measurement (FTM): False
      .... .... .... .... .0.. .... .... .... = High Efficiency (HE AP): False
      .... .... .... .... 0... .... .... .... = Extended Range BSS: False
      0000 0000 0000 0000 .... .... .... .... = Reserved: 0x0000
    Operating Class: 125
    Channel Number: 149 (iterative measurements on that Channel Number)
    PHY Type: 0x04
    Subelement: RM Enabled Capabilities
      ID: 70
      Length: 5
      Data: 0000000000
    Subelement: BSS Transition Candidate Preference
      ID: 3
      Length: 1
      Preference: 254
    Subelement: Wide Bandwidth Channel
      ID: 6
      Length: 3
      Data: 000000
  Tag: Neighbor Report
  Tag: Neighbor Report                                                    AP 2,3,4,5
  Tag: Neighbor Report
  Tag: Neighbor Report
```

Beacon Request – Action Frame (NOT A BEACON FRAME)

```
33849 16:39:40.926472 ArubaaHe_8a:36:81   XiaomiCo_17:59:66   802.11   154 Action   Action, SN=8, FN=0, Flags=........C

Aruba Networks encapsulated remote mirroring
Radiotap Header v0, Length 52
802.11 radio information
IEEE 802.11 Action, Flags: ........C
IEEE 802.11 Wireless Management
  Fixed parameters
    Category code: Radio Measurement (5)
    Action code: Radio Measurement Request (0)
    Dialog token: 1
    Repetitions: 0
  Tagged parameters (27 bytes)
    Tag: Measurement Request
      Tag Number: Measurement Request (38)
      Tag length: 25
      Measurement Token: 0x01
      Measurement Request Mode: 0x00
        .... ...0 = Parallel: False
        .... ..0. = Measurement Request Mode Field: Disabled
        .... .0.. = Measurement Reports: Not Accepted
        .... 0... = Autonomous Measurement Reports: Not Accepted
        ...0 .... = Duration Mandatory: Not Accepted
        000. .... = Reserved: 0x0
      Measurement Request Type: Beacon Request (0x05)
        Operating Class: 3
        Measurement Channel Number: 149 (iterative measurements on that Channel Number)
        Randomization Interval: 0x0000
        Measurement Duration: 0x0000
        Measurement Mode: Beacon Table (0x02)
        BSSID: Broadcast (ff:ff:ff:ff:ff:ff)
        SubElement ID: Beacon Reporting Information (1)
          Length: 2
          Reporting Condition: Report to be issued after each measurement. (0x00)
          Threshold/Offset: 0x00
        SubElement ID: Reporting Detail (2)
          Length: 1
          Reporting Detail: No fixed length fields or elements (0x00)
        SubElement ID: SSID (0)
          Length: 0
          SSID:
```

Link Measurement Request – Action Frame (AP to Client) :

```
33853 16:39:40.927025 ArubaaHe_8a:36:81   XiaomiCo_17:59:66   802.11   139 Action   Action, SN=9, FN=0, Flags=........C, SSID=Mercury-HT

Frame 33853: 139 bytes on wire (1112 bits), 139 bytes captured (1112 bits) on interface \Device\NPF_{6DB6E852-2B12-4E96-B767-7628AE460EA3}, id 0
Ethernet II, Src: ArubaaHe_26:48:7c (20:4c:03:26:48:7c), Dst: MagicCon_a1:6e:14 (00:05:1b:a1:6e:14)
Internet Protocol Version 4, Src: 10.1.140.103, Dst: 10.1.120.109
User Datagram Protocol, Src Port: 5000, Dst Port: 5000
Aruba Networks encapsulated remote mirroring
Radiotap Header v0, Length 52
802.11 radio information
IEEE 802.11 Action, Flags: ........C
IEEE 802.11 Wireless Management
  Fixed parameters
    Category code: Radio Measurement (5)
    Action code: Link Measurement Request (2)
    Dialog token: 1
    Transmit Power Used: 15 dBm
    Max Transmit Power: 36 dBm
  Tagged parameters (12 bytes)
    Tag: SSID parameter set: Mercury-HT
      Tag Number: SSID parameter set (0)
      Tag length: 10
      SSID: Mercury-HT
```

Link Measurement Response – Action Frame (Client to AP) :

```
33859 16:39:40.928482 XiaomiCo_17:59:66   ArubaaHe_8a:36:81   802.11   133 Action   Action SN=171, FN=0, Flags=........C

Frame 33859: 133 bytes on wire (1064 bits), 133 bytes captured (1064 bits) on interface \Device\NPF_{6DB6E852-2B12-4E96-B767-7628AE460EA3}, id 0
Ethernet II, Src: ArubaaHe_26:48:7c (20:4c:03:26:48:7c), Dst: MagicCon_a1:6e:14 (00:05:1b:a1:6e:14)
Internet Protocol Version 4, Src: 10.1.140.103, Dst: 10.1.120.109
User Datagram Protocol, Src Port: 5000, Dst Port: 5000
Aruba Networks encapsulated remote mirroring
Radiotap Header v0, Length 52
802.11 radio information
IEEE 802.11 Action, Flags: ........C
IEEE 802.11 Wireless Management
  Fixed parameters
    Category code: Radio Measurement (5)
    Action code: Link Measurement Report (3)
    Dialog token: 1
    TPC Report
      TPC Element ID: 35
      TPC Length: 2
      TPC Transmit Power: 15
      TPC Link Margin: 0
    Receive Antenna ID: 1
    Transmit Antenna ID: 1
    Received Channel Power: 110
    Received Signal to noise indication: 68
```

Here are some useful Aruba specific commands :

```
(Standalone) [mynode] (config) #show rrm dot11k beacon-report station-mac fc:d9:08:17:59:66

802.11K Beacon Report Details
-----------------------------


Channel  BSSID              Reg Class  Antenna ID  RSNI  RCPI  Meas. Mode
-------  -----              ---------  ----------  ----  ----  ----------
149      dc:8d:8a:81:eb:71  3          1           255   79    Passive
36       1c:28:af:7d:c2:72  3          1           255   96    Passive
1        3c:bd:c5:7d:85:3e  3          1           255   86    Passive
11       44:48:c1:1f:11:d1  3          1           255   84    Passive
36       20:a6:cd:cd:5e:b1  3          1           255   111   Passive
36       20:a6:cd:cd:5e:b0  3          1           255   111   Passive
36       20:a6:cd:cd:5e:b3  3          1           255   111   Passive
36       00:4e:35:c6:f4:f3  3          1           255   114   Passive
149      20:a6:cd:c3:a2:d1  3          1           255   102   Passive
149      94:64:24:89:87:90  3          1           255   102   Passive
149      20:a6:cd:c3:a2:d2  3          1           255   102   Passive
149      00:4e:35:c7:06:51  3          1           255   108   Passive
149      94:64:24:89:87:91  3          1           255   102   Passive
149      00:4e:35:c7:06:52  3          1           255   107   Passive
11       44:48:c1:1f:11:d0  3          1           255   83    Passive
149      94:64:24:8a:36:81  3          1           255   110   Passive
1        20:c0:47:5f:4e:fa  3          1           255   66    Passive
149      1c:28:af:7d:eb:f1  3          1           255   112   Passive
149      00:4e:35:c7:06:50  3          1           255   107   Passive
1        20:c0:47:35:5e:6a  3          1           255   75    Passive
6        b8:2c:a0:08:24:80  3          1           255   79    Passive
```

```
(Standalone) [mynode] (config) #show rrm dot11k neighbor-report ap-name CAP-635  essid Mercury-HT

802.11K Neighbor Report Details
-------------------------------

Flags: A: APSD, K: 802.11K Enabled, Q: QoS, S: Spectrum Management


ESSID       BSSID              AP Name    Channel  Flags
-----       -----              -------    -------  -----
Mercury-HT  94:64:24:89:87:91  CAP-635-2  149      QAK
Mercury-HT  00:4e:35:c7:06:52  CAP-535    149      QAK
```

ansh1410 **January 2, 2022** **Uncategorized**

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