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| CR for CIDs relevant to use case 4.8  |
| Date: 2023-9-7 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Jay Yang | ZTE Corporation |  |  | Yang.zhijie@zte.com.cn |
| Yan Li | ZTE Corporation |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for the following CIDs:

20,89

R0: initial CR document

R1：minor change according to the offline discussion with group memebers.

R2：defer CID 98, and minor change on other place.

R3：minor change according to the comments in the reflector

R4：minor change according to the Graham’s comments in the reflector

R5：minor change according to the feedback during the call in 26th Sep.

R6: update the resolution on CID 98

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbh D1.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbh D1.0 Draft. (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbh Editor: Editing instructions preceded by “TGbh Editor” are instructions to the TGbh editor to modify existing material in the TGbh draft. As a result of adopting the changes, the TGbh editor will execute the instructions rather than copy them to the TGbh Draft.***

|  |  |  |  |
| --- | --- | --- | --- |
| **CID** | **Comment** | **Proposed Change** | **Resolution** |
| 20 | It's not clear how IRM address the use case 4.8 in the approved use case tracking document.In use case 4.8, AP should give some indication in Beacon request when the probe carrying IRM. | AP should give some indication when the probe carrying IRM to the non-AP sta in use case 4.8 | Revised—Agree in principle.The details can be found indiscussion part.TGbh editor: please incorporate the proposed text change label with Opt.2 shown in **1314r5** |
| 89 | It seems that the current IRM operation can not address the use case 4.8 defined in the 'Issues Tracking' document. Please clarify it | as in comment | Revised—Agree in principle.The details can be found indiscussion part.TGbh editor: please incorporate the proposed text change label with Opt.2 shown in **1314r5** |
| 98 | If the non-AP STA is not doing FILS or PASN then it had to authenticate itself \*somehow\* for it to even be at the point of the 4way handshake. Given that authentication involves identification there seems to be a chicken-and-egg situation going on here. One must be identified and authenticated in order to be able to indicate a device ID. Seems pointless. | The passing of the device ID in the 4way HS is merely to allow the network to generate a new one. The device id needs to be included in more frames earlier in order to make this protocol have a point. For instance, even when not doing FILS or PASN, putting the device ID in an association frame or authentication frame would allow for the device to be identified as part of the authentication process. Then when it's over, a new device ID can be assigned in the 4way HS. | Rejected--This topic was discussed in 23/1453r1, but the group didn’t reach consensus.SP: The Device ID shall be added to 802.11 authentication frames to facilitate identification when an 802.11 state machine enters State 2. SP results: Y:8; N:8  |

**Discussion**

Kinds of radio measurement frames are defined in 802.11k, by which the measuring STA can help the request STA to gather data on radio link performance and on the radio environment.

E.g.,as shown in Figure 1,in a multi-AP network(assuming STA1 associates with AP1 operating on CH X at the beginning),and AP2 operates on CH Y. The network may request AP1 to send Beacon request frame, to trigger STA1 to send Probe Request frame with RCM on AP2’s operating channel, so that AP2 can gather channel information between STA1 and AP2 for client steering,load balance（see details in <https://mentor.ieee.org/802.11/dcn/22/11-22-0818-02-00bh-use-case-further-discussion-and-rule-based-random-mac-identification-proposal.pptx> ） or Wi-Fi sensing purpose. And the probe request should be identified by the network. That’s,the Probe Request frame with RCM should carry the identifier defined by 11bh SPEC in this scenario).

According to 11bh draft1.0, STA decides when and how to use the identifier in the probe. E.g. AP1 send a Beacon request to trigger STA1 send a Probe Request frame in which the 11bh identifier may be not included, AP2 can’t filter out the target Probe Request frame based on the certain identifier, which cause this use case become meaningless.

A simple approach is to indicate the use of 11bh identifier in Beacon request frame, and STA can follow such instruction to carry the certain identifier in the probe request once accepting the beacon request.

Besides, Beacon request frame belongs to the category of the robust action frame. That’s, Beacon request frame will be encrypted by default once PMF enabled. The 3rd party has no chance to detect such indication.

However, some members have different opinions on reusing current Device ID element or define a new measurement ID element. We provides two options and pick up one of them according to the group decision.

The group lively discussed the topic when the MAC address is fixed in the contribution [1453r1](https://mentor.ieee.org/802.11/dcn/23/11-23-1453-01-00bh-when-is-an-id-fixed.pptx)(Dan) in 5th Sep.The author and most of the group member agreed that the STA can use any RMA in the probe request after the STA associates with an AP based on the SP results (A probe made in response to a Beacon Request is not a transactional exchange per Std IEEE 802.11-2020 section 12.2.10 and the STA can use a MAC to probe that differs from the MAC it received the Beacon Request on? 10Y,3N,3A).

**Do you agree to incorporate the proposed resolution for CID20,89 and 98 with Opt2 in 1314r5?**



Figure 1 multi-AP network topology

**Proposed text change**

**Opt1: reuse current Device ID**

**9.3.3.9 Probe Request frame format**

The frame body of a Probe Request frame contains the information shown in Table 9-66 (Probe Request frame body).

**TGbh editor: please insert the following one item into Table 9-66 in appropriate place.**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| <ANA> | Device ID | The Device ID element is optionally present if dot11DeviceIDActivated is true |

**9.4.2.19.7 Beacon request**

**TGbh editor: please insert the following two items into Table 9-140 in appropriate place.**

**Table 9-140—Optional subelement IDs for Beacon request**

|  |  |  |
| --- | --- | --- |
| **Subelement ID** | **Name** | **Extensible** |
| **<ANA>** | **IRM recommendation** | **No** |
| **<ANA>** | **Device ID** | **No** |

**TGbh editor: please insert the following paragraph in 9.4.2.19.7 in appropriate place.**

The Last Beacon Report Indication Request subelement has the format defined in Figure 9-1002

(Subelement format), with a Length field set to 1. When included in a Beacon request with the Data field set to 1, it indicates that the requesting STA asks the responding STA to include an indication in the Beacon report to indicate the last frame of the sequence of frames generated as a response to a Beacon request.

When included in a Beacon request with the Data field set to other than 1, it indicates that the requesting STA asks the responding STA not to include such an indication

The IRM recommendation subelement has the format defined in Figure 9-1002 (Subelement format),with a Length field set to 1. When IRM recommendation subelement is included in a Beacon request, it

 indicates the request STA asks the responding STA to include an IRM in RA filed in the Probe Request frame. The IRM recommendation subelement is optionally present in a Beacon request. Otherwise, it is not present.

 The Device ID element has the format defined in 9.4.2.307a (Device ID element).When Device ID subelement is present in a Beacon request, it indicates the request STA asks the responding STA to include the Device ID element in the Probe Request frame. The Device ID subelement is optionally present in a Beacon request. Otherwise, it is not present.

Note: the device ID in Device ID element exchanged between ESS and STA in radio measurement procedure is a transient device ID, which assigned by ESS/AP is different each time, and both the ESS and STA should drop it immediately after each radio measurement session.

**TGbh editor: please incorporate the following proposed change in 11.10.9.1.1**

**11.10.9.1 Beacon report**

**11.10.9.1.1 General**

If dot11RMBeaconActiveMeasurementActivated is true and the Measurement Mode in the measurement request is Active, the measuring STA shall perform the following procedure (or an equivalent procedure) on the requested channel, if permitted (e.g. the channel is not subject to DFS)(#3402):

— If the channel is not the operating channel, wait for dot11RMMeasurementNavSync, or until a PHYRXSTART. indication primitive has been received.

— Using the basic access protocol in 10.3.4.2 (Basic access), send a Probe Request frame to the

broadcast address(#1313). The BSSID field in the Probe Request frame shall be set to the BSSID

field in the measurement request. The SSID element in the Probe Request frame shall be set to the SSID element in the measurement request. The RA field in the Probe Request frame shall be set to the IRM if dot11IRMActivated is true and if IRM recommendation subelement is present in the measurement request . The Device ID element in the Probe Request frame shall be set to the Device ID element in the measurement request if dot11DeviceIDActivated is true.

— Set a measurement duration timer.

— At the end of the measurement duration, process all received Probe Response and Beacon frames with the requested SSID and BSSID to compile the measurement report. (#1691)The STA shall use the Reporting Detail field(#1502) specified in the measurement request, or the default if not present, to determine the data to be included in the measurement report. If no Beacons or Probe Response frames were received in the measurement duration and Measurement Pilot frames with the requested BSSID were received in the measurement duration, then process all these Measurement Pilot frames to compile the measurement report. Otherwise, compile an empty Beacon report.

**Opt2: define a new measurement ID**

**9.3.3.9 Probe Request frame format**

The frame body of a Probe Request frame contains the information shown in Table 9-66 (Probe Request frame body).

**TGbh editor: please insert the following one item into Table 9-66 in appropriate place.**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| <ANA> | Measurement ID | The Measurement ID element is optionally present if dot11DeviceIDActivated is true |

**9.4.2.19.7 Beacon request**

**TGbh editor: please insert the following two items into Table 9-140 in appropriate place.**

**Table 9-140—Optional subelement IDs for Beacon request**

|  |  |  |
| --- | --- | --- |
| **Subelement ID** | **Name** | **Extensible** |
| **<ANA>** | **IRM recommendation** | **No** |
| **<ANA>** | **Measurement ID** | **No** |

**TGbh editor: please insert the following paragraph in 9.4.2.19.7 in appropriate place.**

The Last Beacon Report Indication Request subelement has the format defined in Figure 9-1002

(Subelement format), with a Length field set to 1. When included in a Beacon request with the Data field set to 1, it indicates that the requesting STA asks the responding STA to include an indication in the Beacon report to indicate the last frame of the sequence of frames generated as a response to a Beacon request.

When included in a Beacon request with the Data field set to other than 1, it indicates that the requesting STA asks the responding STA not to include such an indication

The IRM recommendation subelement has the format defined in Figure 9-1002 (Subelement format),with a Length field set to 1. When IRM recommendation subelement is included in a Beacon request, it

 indicates the request STA asks the responding STA to include an IRM in RA filed in the Probe Request frame. The IRM recommendation subelement is optionally present in a Beacon request. Otherwise, it is not present.

 The Measurement ID element has the format defined in 9.4.2.307c (Measurement ID element).When Measurement ID subelement is present in a Beacon request, it indicates the request STA asks the responding STA to include the Measurement ID element in the Probe Request frame. The Measurement ID subelement is optionally present in a Beacon request. Otherwise, it is not present.

The measurement ID in measurement ID element exchanged between ESS and STA in radio measurement procedure is a one time measurement ID, which assigned by ESS/AP is different each time, and both the ESS and STA should drop it immediately after each radio measurement session.

Note: When Measurement ID subelement is present in a Beacon request,IRM recommendation subelement shall be not present in the same Beacon request, or vice versa.

**TGbh editor: please add the following paragraph in 9.4.2.307c.**

**9.4.2.307c Measurement ID element**

The Measurement ID element contains a measurement ID. The format of the Measurement ID element is shown in Figure 9-XXX (Measurement ID element format).

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

|  |  |  |  |
| --- | --- | --- | --- |
| **Element ID** | **Length** | **Element ID Extension** | **Measurement ID** |

**Octets: 1 1 1 variable**

**Figure 9-XXX** Measurement ID element format

The Measurement ID field contains a measurement ID ~~or an opaque identifier (see Annex AD.1)~~.

**TGbh editor: please incorporate the following proposed change in 11.10.9.1.1**

**11.10.9.1 Beacon report**

**11.10.9.1.1 General**

If dot11RMBeaconActiveMeasurementActivated is true and the Measurement Mode in the measurement request is Active, the measuring STA shall perform the following procedure (or an equivalent procedure) on the requested channel, if permitted (e.g. the channel is not subject to DFS)(#3402):

— If the channel is not the operating channel, wait for dot11RMMeasurementNavSync, or until a PHYRXSTART. indication primitive has been received.

— Using the basic access protocol in 10.3.4.2 (Basic access), send a Probe Request frame to the

broadcast address(#1313). The BSSID field in the Probe Request frame shall be set to the BSSID

field in the measurement request. The SSID element in the Probe Request frame shall be set to the SSID element in the measurement request. If dot11IRMActivated is true and the IRM recommendation subelement is present in the measurement request, then the RA field in the Probe Request frame shall be set to the IRM . If dot11DeviceIDActivated is true and the Measurement ID element is present in the measurement request, then the Measurement ID element shall be included in the Probe Request frame .

— Set a measurement duration timer.

— At the end of the measurement duration, process all received Probe Response and Beacon frames with the requested SSID and BSSID to compile the measurement report. (#1691)The STA shall use the Reporting Detail field(#1502) specified in the measurement request, or the default if not present, to determine the data to be included in the measurement report. If no Beacons or Probe Response frames were received in the measurement duration and Measurement Pilot frames with the requested BSSID were received in the measurement duration, then process all these Measurement Pilot frames to compile the measurement report. Otherwise, compile an empty Beacon report.