IEEE P802.11
Wireless LANs

|  |
| --- |
| DMG comments resolution part five |
| Date: 2022-09-06 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Solomon Trainin | Qualcomm |  |  | strainin@qti.qualcomm.com |
|  |  |  |  |  |

Abstract

Resolution for CIDs 338, 340

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Must Be Satisfied** | **Clause Number(C)** | **Page(C)** | **Line(C)** | **Comment** | **Proposed Change** | **Resolution**  |
| 338 | No | 9.6.19, 9.6.21 | 62 | 10 | Table 9-540--DMG Action field values and Table 9-569--Unprotected DMG Action field values. Refer to 9.6.10 Protected Dual of Public Action framesDefine and provide separate text for DMG Sensing Measurement Setup Request/Response, DMG Protected Sensing Measurement Setup Request/Response, and keep commonality between non-protected and protected to use one definition.Define and provide separate text for DMG SBP Request/Response, DMG Protected SBP Request/Response, and keep commonality between non-protected and protected to use one definition.Append DMG Sensing Measurement Setup Termination and DMG SBP Termination to Table 9-569. Append DMG Protected Sensing Measurement Setup termination and DMG Protected SBP termination to Table 9-540. Define the frames by keeping commonality with non-DMG definition. | Prepare submission to define the frames in the mentioned categories | ***Revised*** 11-22-1945-00-00bf cc40-comments DMG comments resolution part five |
| 340 | No | 9.6.19.1 | 62 | 11 | Append BRP frame to Table 9-540--DMG Action field to enable protection of the frame | Provide the change as explained in the comment | ***Rejected***11-22-1945-00-00bf cc40-comments DMG comments resolution part five |

**CID 338**

Proposed resolution: **Revise**

Discussion:

The CID addresses three group of frames:

1. The DMG Sensing Measurement Setup Request/Response frames and protected variant of the frames. It is already resolved and IEEE P802.11bf/D0.2, July 2022 contains the new text. No more changes are needed.
2. Define and provide separate text for DMG SBP Request/Response, DMG Protected SBP Request/Response, and keep commonality between non-protected and protected to use one definition. The resolution of this part is provided in the document
3. Append DMG Sensing Measurement Setup Termination and DMG SBP Termination to Table 9-569. Append DMG Protected Sensing Measurement Setup termination and DMG Protected SBP termination to Table 9-540. Define the frames by keeping commonality with the non-DMG definition. The resolution of this part is provided in the document.

**TGbf editor, provide the following changes**

***TGbf editor,*** *Append the Table 9-540:*

**Table 9-540—DMG Action field values (#263, #215, #262, #377, #219, #338)**

|  |  |
| --- | --- |
| **DMG Action field values** | **Meaning** |
| <ANA> | Protected DMG Sensing Measurement Setup Request. |
| <ANA> | Protected DMG Sensing Measurement Setup Response. |
| <ANA> | Protected DMG SBP Request. **#338** |
| <ANA> | Protected DMG SBP Response. **#338** |
| <ANA> | Protected DMG SBP Termination **#338** |
| <ANA> | Protected DMG SBP Report **#338** |

***TGbf editor,*** *Append the Table 9-569:*

**Table 9-569—Unprotected DMG Action field values (#263, #215, #262, #377, #219, #338)**

|  |  |
| --- | --- |
| **Unprotected DMG Action field values** | **Meaning** |
| <ANA> | DMG Sensing Meaurment Report |
| <ANA> | DMG Sensing Measurement Setup Termination #338 |
| <ANA> | DMG SBP Request #338 |
| <ANA> | DMG SBP Response #338 |
| <ANA> | DMG SBP Termination #338 |
| <ANA> | DMG SBP Report #338 |

***TGbf editor,*** *Append the Table 9-623k*

**Table 9-623k—Protected Sensing Action field values #338**

|  |  |
| --- | --- |
| **Value** | **Meaning** |
| 4 | Protected DMG Sensing Measurement Setup Termination **#338** |

***TGbf editor, provide the following changes***

***P74L21***

*Replace the text 9.6.21.8 (DMG Sensing Measurement Setup Request frame format) as follows:*

The DMG Measurement Setup ID field indicates a DMG Measurement Setup ID that identifies assigned parameters in the DMG Sensing Measurement Setup element to be used in the corresponding DMG sensing measurement instances as shown in Figure 9-xyz1 (DMG Measurement Setup ID field format).

|  |  |  |
| --- | --- | --- |
|  | DMG Measurement setup ID | Reserved |
| Bits | 4 | 4 |

**Figure 9-xyz1 — DMG Measurement Setup ID field format**

**9.4.2.1 General**

***TGbf editor,*** *Insert the following row in Table 9-128 (Element IDs):*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element** | **Element ID** | **Element ID extension** | **Extensible** | **Fragmentable** |
| DMG SBP Parameters element (see9.4.2.331 (DMG SBP Parameters element)) | 255 | <ANA> | Yes | No |

***TGbf editor,*** *Append new sub clause*

**9.4.2.331 DMG SBP Parameters element**

The SBP Parameters element indicates operational parameters associated with a requested SBP procedure. The format of the SBP Parameters element is defined in Figure 9-x1 (DMG SBP Parameters element format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | DMG SBP Parameters Conrol | DMG Sensing Responder Addresses | DMG Sensing Responder IDs |
| Octets: | 1 | 1 | 1 | 2 | *n* × 6 | *n*  |

**Figure 9-x1—DMG SBP Parameters element format**

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

The format of the DMG SBP Parameters field is defined in Figure 9-x2 (SBP Parameters Control field format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 B5 | B6 | B7 | B8 | B9 B15 |
|  | DMG SBP Request/Response | DMG Sensing Responder | DMG Number of Sensing Responders | DMG Mandatory Number Responders | DMG Preferred Responder List | DMG Mandatory Responder List |  Reserved |
| Bits: | 1 | 1 | 4 | 1 | 1 | 1 | 8 |

**Figure 9-x2—DMG SBP Parameters Control field format**

The DMG SBP Request/Response subfield set to 1 indicates that the DMG SBP Parameters element is delivered by the DMG SBP Request frame, overwise the subfield is set to 0.

The DMG Sensing Responder subfield set to 1 indicates that the DMG SBP initiator requests to participate as a sensing responder in the DMG sensing procedure used by the DMG SBP responder to satisfy the DMG SBP request. The DMG Sensing Responder subfield set to 0 indicates that the DMG SBP initiator requests to not participate in the DMG sensing procedure used by the DMG SBP responder to satisfy the DMG SBP request. The subfild is reserved when the DMG SBP Request/Response subfiled is set to 0.

When the DMG SBP Request/Response subfield is set to 1

* The value of the DMG Number of Sensing Responders subfield indicates the number of DMG sensing responders to participate in the DMG sensing procedure used by the DMG SBP responder to satisfy the DMG SBP request. If the DMG Sensing Responder subfield is set to 1, the value indicated in the Number of Sensing Responders subfield includes the SBP initiator.

When the DMG SBP Request/Response subfield is set to 0

* The value of the DMG Number of Sensing Responders subfield indicates the actual number of DMG Sensing Responders ready to participate in the DMG SBP procedure.

The DMG Mandatory Number Responders subfield indicates whether the requested number of sensing responders indicated in the DMG Number of Sensing Responders subfield is interpreted as mandatory by the DMG SBP responder. A value of 0 indicates that the requested number of sensing responders is a maximum number, and the DMG SBP initiator accepts measurements taken with a smaller number of sensing responders. A value of 1 indicates that the requested number of sensing responders is a mandatory number.

When the DMG SBP Request/Response subfield is set to 1

* The DMG Preferred Responder List subfield set to 1 indicates that the DMG SBP initiator provides the field of the DMG Sensing Responder Addresses for which the DMG SBP responder is requested to include in the DMG sensing procedure used to satisfy the DMG SBP request. (n= DMG Number of Sensing Responders). Otherwise, the DMG Preferred Responder List subfield is set to 0, and the DMG Sensing Responder Addresses field is not presented.

When the DMG SBP Request/Response subfield is set to 0

* The DMG Preferred Responder List subfield set to 1 indicates that the DMG SBP Responder provides the MAC Addresses of DMG Sensing Responders for which the DMG SBP Responder has set the DMG measurement setup for the DMG discovery procedure used to satisfy the DMG SBP request. (n= DMG Number of Sensing Responders). Otherwise, the DMG Preferred Responder List subfield is set to 0, and the DMG Sensing Responder Addresses field is not presented.

If the DMG Sensing Responder subfield and the DMG Preferred Responder List subfields are both set to 1, the MAC address of the DMG SBP initiator is included in the DMG Sensing Responder Addresses field.

The DMG Mandatory Responder List subfield is reserved if the DMG Preferred Responder List subfield is 0. If the DMG Preferred Responder List subfield is 1, the DMG Mandatory Responder List subfield indicates whether the set of preferred sensing responders is interpreted as mandatory by the DMG SBP responder. A value of 1 indicates that the DMG SBP responder is requested to only include DMG STAs listed in the DMG Sensing Responder Addresses field within the DMG SBP Request frame in the DMG sensing procedure used to satisfy the DMG SBP request. A value of 0 indicates that the DMG SBP responder may include DMG STAs that are not listed in the DMG Sensing Responder Addresses field within the DMG SBP Request frame in the DMG sensing procedure used to satisfy the DMG SBP request.

The DMG Sensing Responder IDs subfield contains the list of the AID/USID of the DMG sensing responders’ participating in the DMG SBP procedure, when the DMG SBP Request/Response subfield is set to 0, and the DMG Preferred Responder List subfield is set to 1. The AIDs/USIDs are presented in the same order as the related MAC addresses in the DMG Sensing Responder Addresses field (n= DMG Number of Sensing Responders). Overwise the subfiled is not presented.

***TGbf editor,*** *append new sub clauses after 9.6.21.10 DMG Sensing Measurement Report frame format*

**9.6.21.11 DMG Sensing Measurement Setup Termination** **frame** #338

The DMG Sensing Measurement Setup Termination frame is an Action frame. The format of the DMG Sensing Measurement Setup Termination Action field is defined in Table 9-576d (DMG Sensing Measurement Setup Termination frame Action field format).

**Table 9-576d— DMG Sensing Measurement Setup Termination** **Action field format**

|  |  |
| --- | --- |
| Order | Information |
| 1 | Category |
| 2 | Unprotected DMG Action |
| 3 | DMG Measurement Setup ID |
| 4 | DMG Sensing Measurement Setup Termination control |

The Category field is defined in 9.4.1.11 (Action field).

The Unprotected DMG Action field is defined in 9.6.21.1 (Unprotected DMG Action field).

The DMG Measurement Setup ID field indicates the DMG measurement setup to be terminated. The format of the filed is shown in Figure 9-xyz1 (DMG Measurement Setup ID field format).

The DMG Sensing Measurement Setup Termination control field indicates the sensing measurement

setup(s) to be terminated. The format of the DMG Sensing Measurement Setup Termination control field is shown in Figure 9-xyz2 DMG Sensing Measurement Setup Termination control field format)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Terminate all Coordinated Monostatic setups  | Terminated all Bistatic setups  | Terminate all Multistatic setups  | Reserved |
| Bits | 1 | 1 | 1 | 5 |

**Figure 9-xyz2 — DMG Sensing Measurement Setup Termination control field format**

The Terminate all Coordinated Monostatic setups subfield is set to 1 to indicate that the STA requests to terminate all established sensing measurement setups of the sensing type Coordinated Monostatic; otherwise, it is set to 0.

The Terminate all Bistatic setups subfield is set to 1 to indicate that the STA requests to terminate all established sensing measurement setups of the sensing type Bistatic; otherwise, it is set to 0.

The Terminate all Multistaic setups subfield is set to 1 to indicate that the STA requests to terminate all established sensing measurement setups of the sensing type Multistatic; otherwise, it is set to 0.

If the measurement setup indicated in the Measurement Setup ID field belongs to the sensing type whose subfield Termination all is set to 1, the Measurement Setup ID field is ignored.

***TGbf editor,*** *append after 9.6.36.3 Protected DMG Sensing Measurement Report frame*

**9.6.36.x Protected DMG Sensing Measurement Setup Termination** **frame** #338

The Category field is defined in 9.4.1.11 (Action field).

The DMG Action field is defined in 9.6.36.1 (Protected Sensing Action field)

The format of the frame after the action field is identical to the format of the DMG Sensing Measurement Setup Termination frame (9.6.21.11 (DMG Sensing Measurement Setup Termination frame)).

**9.6.21.12 DMG SBP Request frame format #338**

The DMG SBP Request frame is an Action frame. It is transmitted by a SBP sensing initiator to a SBP sensing responder to request a DMG SBP. The format of the DMG DMG SBP Request frame Action field is defined in Table 9-576e (DMG SBP Request frame Action field format).

**Table 9-576e—DMG SBP Request frame Action field format**

|  |  |
| --- | --- |
| **Order** | **Information** |
| 1 | Category |
| 2 | Unprotected DMG Action |
| 3 | Dialog Token |
| 4 | DMG Measurement Setup ID  |
| 5 | DMG Sensing Measurement Setup element |
| 6 | DMG SBP Parameters element |

The Category field is defined in 9.4.1.11 (Action field).

The Unprotected DMG Action field is defined in 9.6.21.1 (Unprotected DMG Action field).

The Dialog Token field is set to a value chosen by the STA sending the frame to uniquely identify the

transaction.

The DMG Measurement Setup ID field is shown in Figure 9-xyz1 (DMG Measurement Setup ID field format).

The DMG Sensing Measurement Setup element is defined in 9.4.2.322 (DMG Sensing Measurement Setup element). The Report Type subfield in the DMG Sensing Measurement Setup element is set to one of the following types: DMG Sensing Image Direction, DMG Sensing Image Range-Doppler, DMG Sensing Image Range-Direction, DMG Sensing Image Doppler-Direction, DMG Sensing Image Range-Doppler Direction, or Target.

The DMG SBP Parameters element is defined in 9.4.2.331 (DMG SBP Parameters element)

The DMG SBP Request/Response subfield is set to 1 to indicate that the DMG SBP Parameters element is delivered by the DMG SBP Request frame,

**9.6.19.27 Protected DMG SBP Request frame format** #338

The Category field is defined in 9.4.1.11 (Action field).

The DMG Action field is defined in 9.6.19.1 (DMG Action field).

The format of the frame after the action field is identical to the format of the DMG SBP Request frame (9.6.21.12 (DMG SBP Request frame format)).

**9.6.21.13 DMG SBP Response frame format #338**

The DMG SBP Response frame is an Action frame. It is transmitted by a DMG sensing responder in response to a DMG SBP Request frame. The format of the DMG SBP Response frame Action field is defined in Table 9-576f (DMG SBP Response frame format)

**Table 9-576f—DMG SBP Response frame format**

|  |  |
| --- | --- |
| **Order** | **Information** |
| 1 | Category |
| 2 | Unprotetcted DMG Action |
| 3 | Dialog Token |
| 4 | DNG Measurement Setup ID |
| 5 | Status code |
| 6 | DMG SBP Parameters element  |
| 7 | DMG Sensing Measurement Setup element |
| 8 | DMG Sensing Image Range Axis LUT |
| 9 | DMG Sensing Image Doppler Axis LUT targets |

The Category field is defined in 9.4.1.11 (Action field).

The Unprotected DMG Action field is defined in 9.6.21.1 (Unprotected DMG Action field).

The Dialog Token field is defined in 9.4.1.12 (Dialog Token field) and is set to the value in the corresponding DMG Sensing Measurement Setup Request frame.

The DMG Measurement Setup ID field in the DMG Sensing Measurement Setup Response frame is shown in Figure 9-xyz (DMG Measurement Setup ID field format) and is set to the value allocated for the DMG SBP procedure.

The Status Code is defined in 9.4.1.9 (Status Code field). The status codes SUCCESS, REQUEST\_DECLINED, and PREFERRED\_MEASURMENT\_SETUP\_PARAMETERS\_SUGGESTED are used in the frame.

The DMG SBP Parameters element is defined in 9.4.2.330 (SBP Parameters element). It is optionally present in the Sensing Measurement Setup Response frame if the Status Code is set to

PREFERRED\_MEASURMENT\_SETUP\_PARAMETERS\_SUGGESTED. Otherwise, it is not present.

The DMG Sensing Measurement Setup element is defined in 9.4.2.322 (DMG Sensing Measurement Setup element). It is optionally present in the Sensing Measurement Setup Response frame if the Status Code is set to

PREFERRED\_MEASURMENT\_SETUP\_PARAMETERS\_SUGGESTED. Otherwise, it is not present.

The DMG Sensing Image Range Axis LUT element is defined in 9.4.2.323 (DMG Sensing Image Range Axis LUT element). It is present in the present in the Sensing Measurement Setup Response frame if the Status code is set to SUCCESS. Otherwise, it is not present.

The DMG Sensing Image Doppler Axis LUT element is defined in 9.4.2.324 (DMG Sensing Image Doppler Axis LUT element). It is present in the present in the Sensing Measurement Setup Response frame if the Status code is set to SUCCESS. Otherwise, it is not present

**9.6.19.28 Protected DMG SBP Response frame format #338**

The Category field is defined in 9.4.1.11 (Action field).

The DMG Action field is defined in 9.6.19.1 (DMG Action field).

The format of the frame after the action field is identical to the format of the DMG SBP Response frame (9.6.21.13 (DMG SBP Response frame format)).

***TGbf editor****, change Figure 9-1002bq as follows (IEEE P802.11bf/D0.2, July 2022)*

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B7 | B8 B22 | B23 |
|  | AID/USID | Sequence Number | Last Sequence Number |
| Bits: | 8 | 15 | 1 |

**Figure 9-1002bq—DMG Sensing Report Control field format**

**P57L38**

The AID/USID subfield uniquely identifies the DMG sensing responder to whom the DMG measurement report belongs.

The Sequence Number subfield contains the sequence number of the DMG Sensing Report element. The

first Sequence Number is 0 and it is incremented every DMG Sensing Report element sent that has the same

AID/USID, DMG Measurement Setup ID, Measurement Burst ID, and Sensing Instance SN.

The Last Sequence Number subfield is set to 1 in the last DMG Sensing Report element sent that has the same AID/USID, DMG Measurement Setup ID, Measurement Burst ID, and Sensing Instance SN.

***TGbf editor,*** *append new subclause*

**9.6.21.14 DMG SBP Report frame format** #338

The DMG SBP Report frame is an Action frame. The format of the DMG SBP Report frame Action field is defined in Table 9-576h (DMG SBP Report frame Action field format).

**Table 9-576h—DMG SBP Report frame Action field format**

|  |  |
| --- | --- |
| **Order** | **Information** |
| 1 | Category |
| 2 | Unprotected DMG Action |
| 3 | Dialog Token |
| 4 | DMG sensing report control element |
| 5 | DMG Sensing Report element(s)  |

The Category field is defined in 9.4.1.11 (Action field).

The Unprotected DMG Action field is defined in 9.6.21.1 (Unprotected DMG Action field).

The Dialog Token field is set to a value chosen by the STA sending the frame to uniquely identify the transaction.

The DMG sensing report control element is defined in 9.4.2.325 (DMG Sensing Report Control element).

The Report Type subfield of the Report Control field in the DMG Sensing Report Control element is set to 1 for DMG Sensing Report.

The DMG Sensing Report element is defined in 9.4.2.326 (DMG Sensing Report element). The DMG SBP report can contain DMG Sensing Report elements of multiple sensing responders participating in the SBP procedure,

***TGbf editor,*** *append new sub clause*

**9.6.19.29 Protected DMG SBP Report frame format #338**

The Category field is defined in 9.4.1.11 (Action field).

The DMG Action field is defined in 9.6.19.1 (DMG Action field).

The format of the frame after the action field is identical to the format of the DMG SBP Report frame (9.6.21.14) DMG SBP Report frame format))

**9.6.21.15 DMG SBP Termination** **frame format** #338

The DMG SBP Termination frame is an Action frame. The format of the DMG SBP Termination Action field is defined in Table 9-576d (DMG SBP Termination frame Action field format).

**Table 9-576d— DMG SBP Termination** **Action field format**

|  |  |
| --- | --- |
| Order | Information |
| 1 | Category |
| 2 | Unprotected DMG Action |
| 3 | Measurement Setup ID |
| 4 | DMG SBP Termination control |
| 5 | DMG SBP Parameters element |

The Category field is defined in 9.4.1.11 (Action field).

The Unprotected DMG Action field is defined in 9.6.21.1 (Unprotected DMG Action field).

The DMG Measurement Setup ID field indicates the measurement setup to be terminated. The DMG Measurement Setup ID field is shown in Figure 9-xyz1 (DMG Measurement Setup ID field format).

The DMG SBP Termination control field indicates the sensing measurement setup(s) to be terminated. The format of the DMG SBP Termination control field is shown in Figure xyz1 (DMG SBP Termination control field format)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Terminate all Coordinated Monostatic setups  | Terminated all Bistatic setups  | Terminate all Multistatic setups  | DMG SBP Setup unsuccess | Reserved |
| Bits | 1 | 1 | 1 | 1 | 4 |

**Figure xyz1 — DMG SBP Termination control field format**

The Terminate all Coordinated Monostatic setups subfield is set to 1 to indicate that the STA requests to terminate all established sensing measurement setups of the sensing type Coordinated Monostatic; otherwise, it is set to 0.

The Terminate all Bistatic setups subfield is set to 1 to indicate that the STA requests to terminate all established sensing measurement setups of the sensing type Bistatic; otherwise, it is set to 0.

The Terminate all Multistaic setups subfield is set to 1 to indicate that the STA requests to terminate all established sensing measurement setups of the sensing type Multistatic; otherwise, it is set to 0.

If the measurement setup indicated in the Measurement Setup ID field belongs to the sensing type whose subfield Termination all is set to 1, the Measurement Setup ID field is ignored.

If the DMG SBP Setup unsuccess subfield is set to 1, the DMG SBP Parameters element is optionally present. Overwise it is not present.

The DMG SBP Parameters element is defined in 9.4.2.331 (DMG SBP Parameters element).

***TGbf editor,*** *append after 9.6.36.3 Protected DMG Sensing Measurement Report frame*

**9.6.36.z Protected DMG SBP Termination** **frame format** #338

The Category field is defined in 9.4.1.11 (Action field).

The DMG Action field is defined in 9.6.36.1 (Protected Sensing Action field)

The format of the frame after the action field is identical to the format of the DMG SBP Termination frame (9.6.21.15) DMG SBP Termination frame format))

**CID 340**

Proposed resolution: **Reject**

Discussion:

The comment suggests appending the BRP frame to Table 9-540--DMG Action field to enable protection of the frame.

The BRP frame is an Action No Ack frame. It belongs to the Unprotected DMG category. Depending on the BRP Request field, the frame's functionality can be very different. For example, it can be used in the BRP setup phase for the request and the response, and in the beam refining phase. The same frame can trigger and can be triggered in the handshake of the BRP frames. The response to the handshake is immediate, limited by the BRPIFS. The frame is retransmitted in the case of no response.

Attempting to define a frame encryption rule encounters differences in requirements for its various uses. For example, it should be defined in the Protected Sensing category for the case it is used for responses or reports. It may not work well when the frame is used by the initiator and may be retransmitted. The suggestion in the comment may work in this case.

Due to the inability to meet conflicting requirements, it is proposed to leave the frame in the unprotected DMG category.

**References:**