IEEE P802.11
Wireless LANs

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| CC40 CR for Topic Threshold – Part 3 |
| Date: 2022.11.10 |
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Abstract

This submission contains the proposed comment resolutions for the following 9 CIDs in the Topic “Threshold” shown in 22/0820 IEEE 802.11bf CC40 comments.

CIDs 284, 285, 433, 434, 560, 766, 767, 886, 890.

Revision Notes

|  |  |
| --- | --- |
| R0-R2 | Initial version |
| R3 | To be consistent with 22/1577r3, move “CSI Variation Threshold subfield” and the related subfield description from “Sensing Measurement Parameters field” into TB Specific subelement, and the Reserved field in the Sensing field format in CID 890 is updated. |

## CIDs 284, 285, 766, 767, 886, 434, 560, 433

CID 284: Add the description of CSI variation

CID 285: Add the description of immediate and delayed feedback

CID 767: Add one sentence saying that no trigger no report

CID 766 and 886: Add the description of the previous CSI in the CSI variation

CID 434 and 560: “When negotiated” is not clear

CID 433: General description

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CID | Page.Line | Clause Number | Comment | Proposed Chang | Resolution |
| CID284 | 70.64 | 11.21.18.6.5 | Need to add details about how to calculate and quantify the CSI variation. | As in the comment. | REVISED. Add sentences describing the CSI variation.***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| CID285 | 71.36 | 11.21.18.6.5 | Need to add details about the immediate feedback and delayed feedback in this phase. | As in the comment. | REVISED. Add sentences describing the immediate and delayed feedback.***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| CID767 | 71.17 | 11.21.18.6.5 | The text "the sensing initiator should transmit a Sensing Trigger Frame C to the sensingresponder SIFS after the reception of the Frame B" implies that sensing initiator can in some instances not send the trigger frame C in which case we would need a normative text to have the receiver responder to delete the report so that the next round is based on the new NDP sounding frame. | As per comment | REVISED. Even if the sensing responder does not receive the Sensing Report Trigger frame in the threshold-based reporting phase, it may still keep the result for the calculation of CSI variation. Thus I only mention that there is no need to send the report, instead of mentioning that it shall delete the result. ***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| CID766 | 70.64 | 11.21.18.6.5 | Change the text "CSI variation indicates the quantified difference between the current measured CSI and the previous measuredCSI at a sensing receiver" to reflect the previously reported CSI as that is the measured result that initiator has obtained | CSI variation indicates the quantified difference between the current measured CSI and the previously reported CSI at a sensing receiver | REVISED. Add the description of the previous CSI in the CSI variation. ***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| CID886 | 70.64 | 11.21.18.6.5 | In the sentence "CSI variation indicates the quantified difference between the current measured CSI and the previous measuredCSI at a sensing receiver", it is not clear how "CSI", "difference" and "previous" are defined. The should be defined clearly. | as in comment | REVISED. Add the description of the “previous CSI” in the CSI variation. The “difference” of CSIs is also described.***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| 434 | 70.10 | 11.21.18.6.5 | "When negotiated, the sensing initiator shall send" - what does "when negotiated" mean? is related to a capability exchange? Is something neotiated in the measurement setup? | Add the following paragraph before P71L10: "A threshold based reporting STA is a STA that has set to 1 field XXX1 of element XXX2 in frame XXX3". Replace "When negotiated, the sensing initiator shall send a Sensing Trigger frame A in the CSI variation reportingsub-phase to the sensing responder that supports threshold-based reporting" with "A sensing initiator sends a Sensing Trigger frame A in the CSI variation reportingsub-phase to a threshold based reporting sensing responder" | REVISED. Agree with the commenter. “When negotiated” is changed into a more detailed description.***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| 560 | 70.10 | 11.21.18.6.5 | In the sensing procedure, the negotiation does not exist. So, the text" When negociated" should be modified with other text. | In the sensing procedure, the negotiation does not exist. So, the text" When negociated" should be modified with other text. | REVISED. “When negotiated” is changed into a more detailed description.***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |
| 433 | 70.54 | 11.21.18.6.5 | Add some sentence that defines the general concept behind threshold based reporting | Give a general description of what threshold based reporting is about. | REVISED. A general description of what the threshold-based reporting is about is given.***Instructions to the editor:*** **Please make the changes as shown under CID 433 in 11-22/1861r3.** |

***Instructions to the editor: please make the following changes to the subclause 11.21.18.6.6 Threshold-based reporting phase in D0.4 as shown below:***

Threshold-based reporting is optional and may be present in a TB sensing measurement instance in which the sensing responder is in the role of sensing receiver. A sensing intiator may implement the threshold-based reporting for the purpose of finding out the sensing responder(s) with their CSI variation values greater than or equal to the CSI variation threshold values assigned to them, and triggering the feedbacks from those sensing responder(s). (# 433)

Threshold-based reporting phase shall include a CSI variation reporting sub-phase and may additionally include a measurement reporting sub-phase. Only the sensing responders that report their CSI variation value greater than or equal to the CSI variation threshold assigned to them participate in the measurement reporting sub-phase.

The CSI variation value determined by a sensing responder indicates the quantified difference between the current measured CSI and the latest reported CSI at the sensing responder, if the Sensing Measurement Report frame of the sensing responder corresponds to the SI2SR NDP in the current measurement instance (Case A); and indicates the quantified difference between the measured CSI of the previous measurement instance and the latest reported CSI, if the Sensing Measurement Report frame of the sensing responder corresponds to the SI2SR NDP in the previous measurement instance (Case B). In the the threshold-based reporting, a responder shall be either in Case A or in Case B consistently throughout all the subsequent TB measurement instances corresponding to the same measurement setup. (# 285, 766, 886)

* The selection method of the CSI variation value is implementation specific, but it shall follow the following rules:The CSI variation value shall be within the closed interval [0, 1].
* A larger CSI variation value shall reflect a larger CSI variation.
* The CSI variation value equal to 0 indicates the cases that the CSI variations are smaller than a certain degree which is kept unchanged throughout all the subsequent measurement instances corresponding to the same measurement setup.
* The CSI variation value equal to 1 indicates the cases that the CSI variations are larger than a certain degree which is kept unchanged throughout all the subsequent measurement instances corresponding to the same measurement setup.

NOTE — How to define the larger CSI variation, and which case corresponds to the CSI variation value equal to 0 or 1, are implementation specific. (# 284)

The CSI variation threshold for each sensing responder to be compared with the CSI variation value is determined by the sensing initiator, and is transmitted to each sensing responder within a Sensing Measurement Setup Request frame. Different sensing responders may have different threshold values set by the sensing initiator.

When the CSI Variation Threshold subfield in the Sensing Measurement Setup Request frame sent by the sensing initiator is set to a value between 0 and 10 and the Status Code field in the corresponding Sensing Measurement Setup Response frame sent by the sensing responder is set to SUCCESS, (# 434, 560) the sensing initiator shall send a Sensing Threshold-Based Report Poll Trigger frame in the CSI variation reporting sub-phase to the sensing responder(s) that supports threshold-based reporting to obtain a CSI variation feedback value(s). The sensing responder that supports threshold-based reporting shall send a Sensing CSI Variation Feedback frame containing the CSI variation feedback value a SIFS after receiving the Sensing Threshold-Based Report Poll Trigger frame in the assigned RU.

In the measurement reporting sub-phase, if the reported CSI variation feedback value is greater than or equal to the CSI variation threshold, the sensing initiator should transmit a Sensing Report Trigger frame to the sensing responder SIFS after the reception of the Sensing CSI Variation Feedback frame; otherwise, the sensing initiator shall not send a Sensing Report Trigger frame to the sensing responder. The sensing responder that provided the CSI variation feedback value greater than or equal to the threshold shall transmit a Sensing Measurement Report frame to the sensing initiator in the assigned RU when triggered by a Sensing Report Trigger frame. The sensing responder not receiving the Sensing Report Trigger frame in the threshold-based reporting phase shall not send a Sensing Measurement Report frame to the sensing initiator. (#767)

An example of the threshold-based reporting phase is shown in Figure 11-41h (Threshold-based reporting phase in a TB sensing measurement instance).



**Figure 11-41h—Threshold-based reporting phase in a TB sensing measurement instance**

***Instructions to the editor: please make the following changes to the subclause Sensing Measurement Parameters element on the basis of 22/1577r3 as shown below:***

Move “CSI Variation Threshold subfield” and the related subfield description from “Sensing Measurement Parameters field” into TB Specific subelement as shown below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SubelementID | Length | AID/USID | Poll Assigned | CSI Variation Threshold | Reserved | Availability Window |

Bits: 8 8 16 1 4 3 64

**Figure 9-1002yy TB Specific subelement format**

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The CSI Vairation Threshold subfield values are defined in Table x-xx (CSI Variation Threshold subfield Definition).

Table x-xx CSI Variation Threshold subfield Definition

|  |  |
| --- | --- |
| Value | Meaning |
| 0 | CSI variation threshold = 0 |
| 1 | CSI variation threshold = 0.1 |
| 2 | CSI variation threshold = 0.2 |
| 3 | CSI variation threshold = 0.3 |
| 4 | CSI variation threshold = 0.4 |
| 5 | CSI variation threshold = 0.5 |
| 6 | CSI variation threshold = 0.6 |
| 7 | CSI variation threshold = 0.7 |
| 8 | CSI variation threshold = 0.8 |
| 9 | CSI variation threshold = 0.9 |
| 10 | CSI variation threshold = 1 |
| 11-14 | Reserved |
| 15 | Basic reporting  |

The CSI Variation Threshold subfield value between 0 and 10 indicates that the threshold-based reporting phase is used in the corresponding TB sensing measurement instances, and indicates the corresponding CSI variation threshold value set by the sensing initiator. The CSI Variation Threshold subfield value equal to 15 indicates that the basic reporting subphase (see 11.21.18.6.5 (Basic reporting phase)) is used in the corresponding TB sensing measurement instances.

Discussion for CID 284:

To make it clear, a figure is given here to describe the above rules.



Note: This CID was deferred in 22/1758r2 CC40 CR for Topic Instance – Part 2. After some offline discussions, the text is updated accordingly.

Discussion for CID 434 and 560:

Move “CSI Variation Threshold subfield” to TB Specific subelement.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Sensing Transmitter | Sensing Receiver | Sensing Measurement Report Requested | Sensing Measurement Report Type | Measurement Setup Expiry Exponent | CSI Variation Threshold | TBD |
| Bits | 1 | 1 | 1 | 3 | 4 | 4 | TBD |

**Figure 9-1002av— Sensing Measurement Parameters field format**

Table x-xx CSI Variation Threshold subfield Definition

|  |  |
| --- | --- |
| Value | Meaning |
| 0 | CSI variation threshold = 0 |
| 1 | CSI variation threshold = 0.1 |
| 2 | CSI variation threshold = 0.2 |
| 3 | CSI variation threshold = 0.3 |
| 4 | CSI variation threshold = 0.4 |
| 5 | CSI variation threshold = 0.5 |
| 6 | CSI variation threshold = 0.6 |
| 7 | CSI variation threshold = 0.7 |
| 8 | CSI variation threshold = 0.8 |
| 9 | CSI variation threshold = 0.9 |
| 10 | CSI variation threshold = 1 |
| 11-14 | Reserved |
| 15 | Basic reporting  |

In the latest version 1577r3:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element ID  | Length  | Element ID Extension  | Measurement SensingParameters | Sensing subelements |

Octets: 1 1 1 4 variable
**Figure 9-1002au— Sensing Measurement Parameters element format(#7, #470, #509)**

If the sensing initiator and the responder negotiate a non-TB sensing measurement agreement or TB sensing measurement, then the Non-TB Specific subelement or the TB specific subelement respectively is included in the Sensing Measurement Request frame to describe the set of parameters that the initiator assigns for that agreement.

Discussion ends.

## CID 890 (Capability bit)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Page.Line | Clause Number | Comment | Proposed Change | Resolution |
| 70.50 | 11.21.18.6.5 | Is Threshold-based sensing mandatory or optional? Need to specify, and add capability bit if needed. | as in the comment. | REVISED. The threshold-based sensing is optional. Add one-bit capability indication for the threshold-based reporting in the Sensing element.***Instructions to the editor:*** **Please make the changes as shown under CID 890 in 11-22/1861r3.** |

***Instructions to the editor: please make the following changes to the Reserved subfield in the Sensing field of the Sensing element shown in 22/1577r3:***

|  |  |  |
| --- | --- | --- |
| … | Threshold-Based Reporting | Reserved |
| … | 1 | 6 |

**Figure 9-1002cj—Sensing field format**

…

The Threshold-Based Reporting subfield is set to 1 to indicate the threshold-based reporting is supported by the transmitter STA, and is set to 0 to indicate the threshold-based reporting is not supported by the transmitter STA.

Discussion:

The following text in D0.3 shows that the threshold-based reporting is optional.



Agree with the commenter that a capability indication is needed, and it can be added into the Sensing element.

The details of the Sensing element can be found in 22/1577, some of which can are shown below:



In the Sensing element, now there exists 7 reserverd bits in the Sensing field.

Discussion ends.

## SP

Do you support the proposed resolutions to the following CIDs and incorporate the text changes into the latest TGbf draft: 284, 285, 433, 434, 560, 766, 767, 886, 890?

Y/N/A