### IEEE P802.11Wireless LANs

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| 11ax D7.0 CR for Miscellaneous CIDs in SA2 |
| Date: 2020-09-24 |
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Abstract

This submission proposes resolutions for the following CIDs:

25045, 25048, 25065, 25070, 25093

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Revision after offline discussion with the commenter.
* Rev 2: Revision based on the discussion in the teleconference call.
* Rev 3: Revision to have a better editor instruction and reasons for the resolution of CID 25048 based on the feedback received offline.
* Rev 4: Revision to add additional bug fix for HE SM power save capability indication

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 TGax D7.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D7.0 Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

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

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 25045 | Seok, Yongho | 337.26 | 26.2.1 | The comment requested by a non-member of this TGax SA Ballot (Young-hoon Kwon). "can" is not a normative text. | Modify the text "An HE AP can configure a non-AP HE STA …" to "An HE AP may configure a non-AP HE STA …". | Accepted - |
| 25048 | RISON, Mark | 468.06 | 26.14.4 | "The STA switches to the multiple receive chain mode if it responds to the Trigger frame addressed to it" is just duplication of "shall also enable its multiple receive chains if it responds to a Trigger frame [that starts a frame exchange sequence] that satisfies the following conditions" above | Delete "switches to the multiple receive chain mode if it responds to the Trigger frame addressed to it and " | Revised –Agree with the commenter that there is repetitive information which is removed by this resolution. Also, there need not be a requirement for the non-AP STA to switch back to a single chain immediately, though doing so maximises the PS. Finally, the SM Power Save subfield in the HE 6 GHz Band Capabilities element is supposed to be a replicate of the SM Power save subfield in HT capabilities element (spec text shown below) to indicate operation for legacy SM power save.*9.4.2.263 HE 6 GHz Band Capabilities element**The SM Power Save subfield is defined in defined in Table 9-184 (Subfields of the HT Capabilities Information field)*However, various places in the spec treats the SM Power Save subfield in the HE 6 GHz Band Capabilities element as the capability indication for HE SM power save, which is then not correct.Baseline description to use the the SM Power Save subfield in the HE 6 GHz Band Capabilities element for legacy SM power save mode indication should also be added. We propose change to resolve the points above. TGax editor to make the changes shown in 11-20/1531r4 under all headings that include CID 25048. |
| 25065 | RISON, Mark | 468.13 | 26.14.4 | "cannot distinguish between a Trig-ger frames that precedes a MIMO transmission and a Trigger frames that does not precede a MIMO transmission" grammar wrong | Change "frames" to "frame" (2x) | Accepted -  |
| 25070 | RISON, Mark | 382.42 | 26.5.2.5 | "NAV is considered" is confusing. You could consider and ignore. The actual requirement is not clearly expressed | At 382.60 change "The intra-BSS NAV is not considered in virtual CS" to "The intra-BSS NAV is not taken into account for the purposes of virtual CS". At 382.63 change "The basic NAV is considered in virtual CS" to "The basic NAV is taken into account for the purposes of virtual CS". At 383.1 change "A NAV is considered in virtual CS" to "The NAV is taken into account for the purposes of virtual CS". At 383.6 change "The intra-BSS NAV is considered in virtual CS" to "The intra-BSS NAV is taken into account for the purposes of virtual CS". At 383.18 change "If no NAV is considered" to "If no NAV is taken into account" | Revised – In revmd D4.0, “considers the NAV” is used in determining CTS response to RTS frame. As a result, usage of “consider” itself does not mean that the NAV will be ignored. Further explanation about how to determine busy or idle is then described in the following paragraph.*A STA that receives an RTS frame addressed to it considers the NAV in determining whether to respondwith CTS, unless the NAV was set by a frame originating from the STA sending the RTS frame (see10.23.2.2 (EDCA backoff procedure)).*After discussion with the commenter, we do editorial change to revise “NAV is considered” as “consider the NAV” to align with the baseline description. TGax editor to make the changes shown in 11-20/1531r4 under all headings that include CID 25070. |
| 25093 | RISON, Mark | 456.61 | 26.11.5 | "If the calculated dura-tion information is smaller than 8448 µs, the TXVECTOR parameter TXOP\_DURATION shall be set to thecalculated duration information. Otherwise, the TXVECTOR parameter TXOP\_DURATION shall be set to8448." duplicates "A STA that transmits a frame with a Duration field in an HE PPDU with the TXVECTOR parameter TXO-P\_DURATION not set to UNSPECIFIED shall set the TXVECTOR parameter TXOP\_DURATION to thesmaller of the duration information indicated by the Duration field and 8448." just a few lines up | Delete "If the calculated dura-tion information is smaller than 8448 µs, the TXVECTOR parameter TXOP\_DURATION shall be set to thecalculated duration information. Otherwise, the TXVECTOR parameter TXOP\_DURATION shall be set to8448." | Rejected – The sentence “A STA that transmits a frame with a Duration field in an HE PPDU with the TXVECTOR parameter TXOP\_DURATION not set to UNSPECIFIED shall set the TXVECTOR parameter TXOP\_DURATION to the smaller of the duration information indicated by the Duration field and 8448.” is for the case that the frame has a Duration field. The cited case is for the case that the frame does not have a Duration field, i.e., the Ps-Poll frame. As a result, the cited sentence is still needed and can not be deleted. The full context of the cited text is shown below.*If a STA transmits either an* ***HE TB feedback NDP*** *or an HE TB PPDU* ***carrying a PS-Poll frame*** *with the TXVECTOR parameter TXOP\_DURATION not set to UNSPECIFIED, it shall calculate the duration information and set the TXVECTOR parameter TXOP\_DURATION for the HE TB feedback NDP or HE TB PPDU to the value of the computed duration information. The TXOP responder shall calculate duration information equal to the duration information indicated by the Duration field of the frame that solicits the response minus the time, in microseconds, between the end of the PPDU carrying the frame that soliciting the HE TB PPDU and the end of the HE TB PPDU. If the calculated duration information includes a fractional microsecond, the duration information is rounded up to the next higher integer. If the calculated duration information is smaller than 8448 µs, the TXVECTOR parameter TXOP\_DURATION shall be set to the calculated duration information. Otherwise, the TXVECTOR parameter TXOP\_DURATION shall be set to 8448.* |

**Discussion:** *None.*

**Propose:**

***TGax editor: Change 26.5.2.5 UL MU CS mechanism as follows (track change on):***

* UL MU CS mechanism

The ED-based CCA and virtual CS functions are used to determine the state of the medium if CS is required before responding to a received Trigger frame. ED-based CCA for the UL MU CS mechanism is defined in 27.3.20.6.4 (CCA sensitivity for signals not occupying the primary 20 MHz channel) and virtual CS is defined in 10.3.2.1 (CS mechanism).

If the CS Required subfield in a received Trigger frame is 0 or a frame that includes a TRS Control subfield and solicits a response is received, then the non-AP STA may respond without regard to the busy/idle state of the medium.

NOTE—Responding without regard to the busy/idle state of the medium means that a non-AP STA can respond without the need to check the medium indication from physical CS and virtual CS (i.e., basic NAV and intra-BSS NAV).

A non-AP STA does not consider the intra-BSS NAV in determining whether to respond to a Trigger frame sent by the AP with which the non-AP STA is associated.(#25070)

A non-AP STA considers the basic NAV in determining whether to respond to a Trigger frame sent by the AP with which the non-AP STA is associated.(#24232) (#25070)

A non-AP STA considers the NAV in determining whether to respond to a Trigger frame sent by an AP with which the non-AP STA is not associated, through the UORA procedure (see 26.5.4 (UL OFDMA-based random access (UORA))) unless the NAV was set by a frame originating from the AP sending the Trigger frame.(#25070)(#24232)

NOTE 1—A non-AP STA associated with an AP considers the intra-BSS NAV in determining whether to respond to a Trigger frame with RU allocations for unassociated STAs sent by another AP. (#25070)

NOTE 2—The details of how a non-AP STA is solicited by the Trigger frame for transmission are described in 26.5.2.2.4 (Allowed settings of the Trigger frame fields and TRS Control subfield).

NOTE 3—If a non-AP STA responds to a Trigger frame from an AP with which it is not associated through the UORA procedure, the method to identify that a NAV was set by a frame originating from the AP sending the Trigger frame is implementation specific. For example, the non-AP STA can save the TXOP holder address and match the saved TXOP holder address with the TA field of the Trigger frame.

For a non-AP STA that is solicited by a Trigger frame for transmission, the indication of the virtual CS is described as follows. If the non-AP STA does not consider any NAV, then the virtual CS indicates idle. If all NAVs that the non-AP STA considers have their NAV counter equal to 0, then the virtual CS indicates idle.(#24232) Otherwise, the virtual CS indicates busy. (#25070)

(… existing texts….)

***TGax editor: Change 11.2.6 SM power save as follows (track change on):***

**11.2.6 SM power save**

 ***Insert the following after the 2nd paragraph:***

The basic rules for a STA are defined below. Additional rules for an HE STA in dynamic SM power save mode that sets the HE Dynamic SM Power Save subfield to 1 in the HE MAC Capabilities Information field in the HE Capabilities element it transmits are defined in 26.14.4 (HE dynamic SM power save).(#25048)

Change the 3rd and 4th paragraph as follows:

In dynamic SM power save mode, the STA enables its multiple receive chains when it receives the start of a frame exchange sequence addressed to it. Such a frame exchange sequence shall start with a single-spatial stream individually addressed frame that requires an immediate response and that is addressed to the STA in dynamic SM power save mode. An RTS/CTS sequence may be used for this purpose. The STA shall, subject to its spatial stream capabilities (see 9.4.2.55.4 (Supported MCS Set field) and 9.4.2.157.3 (Supported VHTMCS and NSS Set field)) and operating mode (see 11.41 (Notification of operating mode changes)), be capable of receiving a PPDU that is sent using more than one spatial stream a SIFS after the end of its response frame transmission. The STA may switch back to the single receive chain mode immediately after the end of the frame exchange sequence.(#25048) (#24044)

(..existing texts…)

Change the 6th paragraph as follows:

The STA may use the SM Power Save frame to communicate its SM power save state. The STA may also use SM Power Save subfield in the HT Capabilities element of its (Re)Association Request frame or the SM Power Save subfield in the HE 6 GHz Band Capabilities element of its (Re)Association Request frame to achieve the same purpose. The latter allows the STA to use only a single receive chain immediately after (re)association.(#25048)

Change the 8th paragraph as follows:

Changes to the number of active receive chains are made only after the SM power save mode indication has been successfully delivered (i.e., by acknowledgment of a frame carrying the HT Capabilities element or by acknowledgment of a frame carrying the HE 6 GHz Band Capabilities element or by acknowledgment of a SM Power Save frame). The SM power save mode indication shall be transmitted using an individually addressed frame. (#25048)

***TGax editor: Change 26.14.4 HE dynamic SM power save as follows (track change on):***

* HE dynamic SM power save

A STA that supports HE dynamic SM power save has dot11HEDynamicSMPowerSaveOptionImplemented set to true and shall set the HE Dynamic SM Power Save subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities element it transmits to 1.(#25048)

A non-AP HE STA in dynamic SM power save mode (see 11.2.6 (SM power save)) that sets the HE Dynamic SM Power Save subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities element it transmits to 1 shall follow the dynamic SM power save procedures defined in 11.2.6 (SM power save) and shall also enable its multiple receive chains if it responds to a Trigger frame that starts a frame exchange sequence that satisfies the following conditions: (#25048)(#24054)

* The Trigger frame is transmitted with a single spatial stream.
* The Trigger frame is from the associated AP or from the AP corresponding to the transmitted BSSID if the non-AP HE STA is associated with an AP corresponding to a nontransmitted BSSID(#24108) and has indicated support for receiving Control frames with TA set to the transmitted BSSID by setting the Rx Control Frame To MultiBSS subfield to 1 in the HE Capabilities element that the non-AP HE STA transmits.
* The Trigger frame is an MU-RTS Trigger frame, BSRP Trigger frame or BQRP Trigger frame that includes a User Info field with the AID12 subfield equal to the 12 LSBs of the AID of the non-AP HE STA (see 26.5.2.2.1 (General)).

The non-AP HE STA shall, subject to its spatial stream capabilities (see 9.4.2.55.4 (Supported MCS Set field), 9.4.2.157.3 (Supported VHT-MCS and NSS Set field) and 9.4.2.248 (HE Capabilities element)) and operating mode (see 11.41 (Notification of operating mode changes) and 26.9 (Operating mode indication)), be capable of receiving a PPDU that is sent using more than one spatial stream a SIFS after the end of the PPDU that it sends in response(#24054). The STA may switch back to the single receive chain mode immediately after the end of the frame exchange sequence.(#25048)(#24044)

NOTE 1—A Trigger frame always solicits an immediate response.

NOTE 2—A non-AP HE STA that is in dynamic SM power save mode and that sets the HE Dynamic SM Power Save subfield in the HE MAC Capabilities Information field in(#Ed) the HE Capabilities element it transmits to 1 cannot distinguish between a Trigger frames that precedes a MIMO transmission and a Trigger frames that does not precede a MIMO transmission and, therefore, always enables its multiple receive chains if it responds to an MU-RTS Trigger frame, BSRP Trigger frame, or BQRP Trigger frame that has a User Info field addressed to it.(#25048)

NOTE 3—The STA determines the end of the frame exchange sequence as described in 11.2.6 (SM power save).