### IEEE P802.11Wireless LANs

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| 11ax D0.1 Comment Resolution for UL MU CS NAV |
| Date: 2016-07-24 |
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Abstract

This submission proposes resolutions for comments in clause 25.5.2.4 of TGax Draft 0.1 with the following CIDs:

* 1467, 635, 2648, 2708, 1544, 1545, 2649, 437, 1542, 990, 2256, 1543, 599

Revisions:

* Rev 0: Initial version of the document.

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 D0.1 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D0.1 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** |
| 1467 | Mark RISON | 59.11 | 25.5.2.4 | "The NAV was set by a frame originating from an intra-BSS STA" -- what's an intra-BSS STA? | Change to "The NAV was set by an intra-BSS frame" | Accepted –Agree with the commenter. Revise the condition according to the suggestion. |
| 635 | Geonjung Ko | 59.11 | 25.5.2.4 | If NAV was set by a frame originating from a STA associated with BSS identified by multiple BSSID element, NAV should not be considered (for the similar reason for the third condition). Although the third condition mentions an "intra-BSS STA", there is no definition of "intra-BSS STA" in this draft specification. Instead, "Intra-BSS frame" is defined in 25.9.2. | Change the sentence of the third condition.From: "The NAV was set by a frame originating from an intra-BSS STA."To: "The NAV was set by an intra-BSS frame." | Accepted –As discussed in CID 1467, the condition is revised. |
| 2648 | Young Hoon Kwon | 59.07 | 25.5.2.4 | The first bullet is a subset of the third bullet. | Delete the first bullet. | Accepted –Agree with the commenter. Revise the condition according to the suggestion. |
| 2708 | Yuichi Morioka | 59.07 | 25.5.2.4 | "The NAV was set by a frame originating from the AP". This implies that STAs need to keep track of who set the NAV. The rule in line 12 "The NAV was set by a frame originating from an intra BSS STA" should be enough. | Remove; "The NAV was set by a frame originating from the AP sending the Trigger frame" | Accepted –As discussed in CID 2648. Revise the condition according to the suggestion. |
| 1544 | Mark RISON | 59.04 | 25.5.2.4 | "a STA that is polled from a Trigger frame" -- what does polling refer to here? The term is used nowhere else | Clarify | Revised –Agree in principle with the commenter. Change the temr “polled” to “solicited” so that the terminology can align with the description for response to Trigger frame. |
| 1545 | Mark RISON | 59.04 | 25.5.2.4 | "a STA that is polled from a Trigger frame" -- what about STAs that are, er, polled from a MAC header? | Clarify | Revised –Based on the passed motion in 15/1123, the trigger information in a MAC header is used to trigger acknowledgement, and transmission of acknowledgement does not require CS. Since the paragraph is used to describe NAV consideration in response to a Trigger frame, we do not revise the description here. Note that the normative behaviour of UL MU CS in response to trigger information in a MAC header will be provided in separate resolution document for UL MU CS CCA and CS Required Bit in 16/876. |
| 2649 | Young Hoon Kwon | 59.09 | 25.5.2.4 | ACK/BA can be triggered by either Trigger information in MAC header or a separate Trigger frame. In case it is triggered by the Trigger information in MAC header, NAV will not be considered regardless of the HE trigger-based PPDU duration. If it is triggered by separate Trigger frame, it will just follow CS Required subfield in the Trigger frame, regardless of the HE trigger-based PPDU duration. Therefore, the second bullet is not needed in any case. Rather, it's better to explain the case that ACK/BA is triggered by the Trigger information in MAC header. | Delete the second bullet, and add the following sentence in line 16. "A NAV is not considered in virtual CS for a STA that is polled from Trigger Information Field info in MAC header TBD of the eliciting DL PPDU." | Revised –Agree in principle with the commenter. As discussed in CID 1545, the trigger information in a MAC header is used to trigger acknowledgement, and transmission of acknowledgement does not require CS. Since the paragraph is used to describe NAV consideration in response to a Trigger frame, we do not revise the description here. Note that the normative behaviour of UL MU CS in response to trigger information in a MAC header will be provided in separate resolution document for UL MU CS CCA and CS Required Bit in 16/876.The second bullet “The response generated by the STA contains an Ack frame or a BlockAck frame and the duration ofthe HE trigger-based PPDU is less than a TBD value” is for the response solicited by the Trigger frame, and we still needed the second bullet due to the following reason. The CS Requied bit is set to 0 if all the response satisfy the condition. If one of the response does not satisfy the condition, say in cascading case, then the CS Required bit is still set, and we still need the second bullet for UL MU CS.   |
| 437 | Brian Hart | 59.13 | 25.5.2.4 | Bullet 4 is "The CS Required subfield in the Trigger frame is 0" but this should only be true if bullet 1 or 2 are true so why do we need bulelt 4? See also P59L33 which says the same thing | Delete bullet 4 | Rejected –Note that Bullet 4 “The CS Required subfield in the Trigger frame is 0” is currently only true if all solicited HE trigger-based PPDU(s) contain an ACK/BA frame, and the length duration of the HE trigger-based PPDU is below a TBD threshold. Hence, it is correct that if bullet 4 is true, then bullet 2 is true for each STA. However, it is possible that in the future, other conditions may come up for setting CS required bit to 0. Hence, we still keep bullet 4.  |
| 1542 | Mark RISON | 58.57 | 25.5.2.4 | "if one or both of the NAVs are considered" -- what does this mean? Ah, it's on the next page | Move the definition of "considered NAV" to be before its use | Revised –Agree with the commenter. Adjust the sequence of the description accordingly based on the suggestion. |
| 990 | kaiying Lv | 58.57 | 25.5.2.4 | Two NAVs for CS should be further clarified "When two NAVs are supported by a STA, if one or both of the NAVs are considered and the considered NAV's counter is nonzero, then the virtual CS indicates busy. Otherwise, the virtual CS is idle." What does it mean by "one or both of the NAVs are considered"? How to indicate whether one or both of the NAVs should be considered? | Please clarify it | Revised –As discussed in CID 1542, to clarify the operation of considering a NAV, move the condition of determining whether a NAV shall be considered before the term “considered” is used for other descrptions.  |
| 2256 | Weimin Xing | 59.04 | 25.5.2.4 | change "A NAV is considered in virtual CS..." to "A NAV is considered busy in virtual CS..." | as the comments | Rejected –The description in P59L4 is used to determine if a NAV needs to be considered in virtual CS.The sentences in P58L57 and P58L61 then describe when virtual CS indicates busy for UL MU CS. Specifically, the NAV coutner needs to be nonzero so that virtual CS will indicate busy. Hence, the suggested change is not accurate. |
| 1543 | Mark RISON | 58.60 | 25.5.2.4 | "When only one NAV is supported by a STA, if the NAV is considered and the NAV counter is nonzero, then virtual CS is busy. Otherwise, the virtual CS is idle." -- how does this differ from existing behaviour? | Delete this para | Revised –The behaviour specified in 25.5.2.4 is different from the existing behaviour. First, the virtual CS for Trigger frame response is new. Second, the condition to consider a NAV for Trigger frame response is also new.To clarify, add the sentence to reflect the fact that the consideration of NAV is mainly used in the time when a STA is solicited by the Trigger frame for transmission. |
| 599 | EVGENY KHOROV | 58.58 | 25.5.2.4 | The last two paragraphs on page 58 correspond to any transmission, not only UL MU | Move to another section, e.g. 25.2.1 | Revised –The last two paragraphs on page 58 is only needed for UL MU response because for transmission that need contention, all the NAV(s) maintained by the STA needs to be considered by default. Hence, we do not have the case that we need to determined if a NAV needs to be considered or not. As discussed in CID 1543, sentences are revised to clarify the difference. |

**Discussion:** *None.*

**Propose:**

Revised for CID 1467, 2648, 1544, 1542, 1543 per discussion and editing instructions in 11-16/0885r0.

***TGax editor: Modify the Paragraph on page 58 line 57 as the following:***

~~When two NAVs are supported by a STA, if one or both of the NAVs are considered and the considered
NAV’s counter is nonzero, then the virtual CS indicates busy. Otherwise, the virtual CS is idle.~~ (#1542)

 ~~When only one NAV is supported by a STA, if the NAV is considered and the NAV counter is nonzero, then
virtual CS is busy. Otherwise, the virtual CS is idle.~~ (#1542)

***~~Editor’s Note: The previous sentence is only needed if support for two NAVs is optional. Mandatory or~~******~~optional support for two NAVs is still TBD.~~*** (#1542)

A NAV is considered in virtual CS for a STA that is ~~polled from a Trigger frame for UL MU transmission~~solicited by the Trigger frame for transmission(#1544) unless one of the following conditions is met:
— ~~The NAV was set by a frame originating from the AP sending the Trigger frame~~(#2648)
— The response generated by the STA contains an Ack frame or a BlockAck frame and the duration of
the HE trigger-based PPDU is less than a TBD value
— The NAV was set by ~~a frame originating from~~(#1467) an intra-BSS ~~STA~~frame(#1467)
— The CS Required subfield in the Trigger frame is 0
— Other condition TBD

NOTE 1-- The details of how a STA is solicited by the Trigger frame for transmission are described in 25.5.2.2.1.(#1544)

The medium indicaton of virtual CS for a STA solicited by the Trigger frame for transmission is described as follows.(#1543)

(#1542)When two NAVs are supported by a STA, if one or both of the NAVs are considered and the considered
NAV’s counter is nonzero, then the virtual CS indicates busy. Otherwise, the virtual CS ~~is~~ indicates(#1543) idle.

(#1542)When only one NAV is supported by a STA, if the NAV is considered and the NAV counter is nonzero, then virtual CS ~~is~~ indicates(#1543) busy. Otherwise, the virtual CS ~~is~~ indicates(#1543) idle.

***(#1542)Editor’s Note: The previous sentence is only needed if support for two NAVs is optional. Mandatory or***
***optional support for two NAVs is still TBD.***