IEEE P802.11
Wireless LANs

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| LB 200 Comment Resolution for Clauses 9.3.2.1 and 9.3.2.4 |
| Date: 2013-12-12 |
| Author(s): |
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Abstract

This submission proposes resolutions for comments in clauses 9.3.2.1, and 9.3.2.4 of TGah Draft 1.0 with the following CIDs:

1707, 1838, 1839, 1840, 2340, 2648, 2649

1176, 1347, 1708, 1841, 2513

1465, 1709, 1710, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 2450, 2451, 2514, 1177, 1348

1711, 2341, 2515, 2516, 2647, 2742

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 TGah Draft. This introduction is not part of the adopted material.

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

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

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1707 | 152.30 | 9.3.2.1 | The "response indication deferral" mechanism is not a frame, field, etc., so its name does not take initial caps. | Replace "as Response Indication Deferral (RID), and" with "as the response indication deferral (RID) mechanism, and" | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1707 to 2649. |
| 1838 | 174.20 | 9.3.2.1 | Please see my other comments on not changing PS-Poll but introducing SF-Poll. Delete the added words. If these have to added everywhere that PS Poll is mentioned it is another reason to not do it. | Delete added words "...with a Duration/ID field that contains an AID value." | Agree with the commenter. Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1707 to 2649. |
| 1839 | 174.20 | 9.3.2.1 | "In addition" is superfluous. | Delete "In addition" | Agree with the commenter.Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1707 to 2649. |
| 1840 | 174.30 | 9.3.2.1 | "The second virtual CS mechanism is referred to as Response Indication Deferral (RID), and this mechanism is only applicable to S1G STAs", is clumsy and repeats "mechanism". | Reword as "The second virtual CS mechanism is only applicable to S1G STAs and is referred to as Response Indication Deferral (RID)". | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1707 to 2649. |
| 2340 | 152.16 | 9.3.2.1 | "Two virtual CS mechanisms shall be provided by the MAC." This is confusing, since the second one is only required for S1G MACs, but it doesn't say that until the next paragraph. | Change the sentence to, "A first CS mechanism shall be provided by all MAC entities, and an additional, second CS mechanism shall be provided by an S1G MAC entity." | Agree with the commenter.Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1707 to 2649. |
| 2648 | 152.18 | 9.3.2.1 | NAV is not set or adjusted when hearing an RTS it is only set when hearing a CTS | Change RTS/CTS to CTS | Rejected –According to subclauses 9.3.2.4-5, the NAV is set when hearing an RTS. Also, the comment refers to existing text which is present in the Baseline (ref. 802.11REVmc 1.1) and is not an addition due to D1.0 of .11ah. |
| 2649 | 152.23 | 9.3.2.1 | NAV is not set or adjusted when hearing an RTS it is only set when hearing a CTS | Change RTS/CTS to CTS | Rejected –According to subclauses 9.3.2.4-5 the NAV is set when hearing an RTS. Also, the comment refers to existing text which is present in the Baseline (ref. 802.11REVmc 1.1) and is not an addition due to D1.0 of .11ah.  |

**Discussion:** *Note that the proposed comment resolution under this heading includes renaming a PS-Poll that includes a Duration value in the Duration/ID field (i.e. a PS-Poll that is the initial frame of a SF exchange) as an SF-Poll which is the proposed resolution for CID 2511 of subclause 8.2.5.2.*

* **CS mechanism**

**Instructions to TGah Editor*: Change these two paragraphs as follows:***

~~A~~ A first virtual CS mechanism shall be provided by all MAC entities, and an additional, second virtual CS mechanism shall be provided by an S1G MAC entity. ~~This~~ The first mechanism is referred to as the NAV. The NAV maintains a prediction of future traffic on the medium based on duration information that is announced in RTS/CTS frames prior to the actual exchange of data. The duration information is also available in the MAC headers of all frames sent during the CP other than short MAC frames and PS-Poll frames.

For S1G STAs, the duration information is also available in SF-Poll frames, NDP CTS frames, in NDP ACK frames with Duration Indication field equal to 0, and in NDP Modified ACK (≥2 MHz) frames with Duration Indication field equal to 0.(#961)

**Instructions to TGah Editor*: Change this paragraph as follows:***

The second virtual CS mechanism is only applicable to S1G STAs and is referred to as response indication deferral (RID). The mechanism for setting the RID is described in 9.3.2.4a (Setting and resetting the RID).

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1176 | 152.45 | 9.3.2.1 | " when any of them is nonzero" - grammar. "Any" only applies to >2. | "when either of them is nonzero" | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1176 to 2513. |
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| 1347 | 152.45 | 9.3.2.1 | change "... when any of them is nonzero the indication is busy." to "... when any of them is nonzero the indication is that the medium is busy". | As in the comment | Agree with the commenter. Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1176 to 2513. |
| 1708 | 152.44 | 9.3.2.1 | "when any of them is nonzero": any of what. | Replace "when any of them is nonzero the" with "when either the NAV counter or the RID counter is nonzero, the" | Agree with the commenter.Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1176 to 2513. |
| 1841 | 174.44 | 9.3.2.1 | "For S1G STAs, when both NAV and RID counters are 0, the virtual CS indication is that the medium is idle; when any of them is nonzero the indication is busy". Any should be 'either' | Change 'any of them' as follows: "For S1G STAs, when both NAV and RID counters are 0, the virtual CS indication is that the medium is idle; when either of them is nonzero, the indication is busy." | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1176 to 2513. |
| 2513 | 152.44 | 9.3.2.1 | Wrong word choice. | change "when any of them is nonzero to "when either of them is non-zero" | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1176 to 2513. |

**Discussion:** *None.*

* **CS mechanism**

**Instructions to TGah Editor*: Change this paragraph as follows:***

For non-S1G STAs, ~~T~~the CS mechanism combines the NAV state and the STA's transmitter status with physical CS to determine the busy/idle state of the medium. For S1G STAs, the CS mechanism combines the NAV state, RID state and the STA's transmitter status with physical CS to determine the busy/idle state of the medium. The NAV and RID may be thought of as ~~a~~ counters, which count~~s~~ down to 0 at a uniform rate. For non-S1G STAs, ~~W~~when the NAV counter is 0, the virtual CS indication is that the medium is idle; when nonzero, the indication is busy. For S1G STAs, when both NAV and RID counters are 0, the virtual CS indication is that the medium is idle; when either the NAV counter or the RID counter is non-zero the indication is that the medium is busy. (#254,841,985)The medium shall be determined to be busy when the STA is transmitting.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1465 | 152.65 | 9.3.2.4 | "... then a STA may disregard the Duration field of ..." is not very precise. Which STA? | Replace "a STA" with "the receiving STA" in line 65 of page 152. Also in line 5 of page 153 replace "their NAV" with "its NAV" as description refers to single STA. | Agree with the commenter. Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1709 | 152.59 | 9.3.2.4 | "An S1G STAs" has a number problem. | Replace with "An S1G STA" | Agree with the commenter.Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1710 | 152.64 | 9.3.2.4 | "if th received PSDU": clause 9 is a MAC clause, so it receives MPDUs, not PSDUs -- in fact Beacon frames are MPDUs. | Replace "PSDU" with "MPDU". | In subclause 9.3.2.4 of 802.11REVmc D2.0 either PSDU or frame is used. Proposed resolution is to replace “PSDU” with “frame”.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1842 | 174.59 | 9.3.2.4 | A S1G STA, not STAs | Change STAs to STA | Agree with the commenter. Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1843 | 174.60 | 9.3.2.4 | NDP ACK 'and' NDPModified ACK should be 'or' | Replace 'and' with 'or' | Agree with the commenter.Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1844 | 174.60 | 9.3.2.4 | Needs 'the' before Duration Indication field | add 'the' before "Duration Indication field | Agree with the commenter.Proposed change is included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1845 | 174.61 | 9.3.2.4 | "..., except for those NDP MAC frames that are addressed to the STA as described in 9.3.2.6 (CTS procedure) for NDP CTS frames and in 9.3.2.8 (ACK procedure) for NDP (Modified) ACK frames." Confusing, suggest rewrite. | Replace with "..., except for NDP CTS frames and NDP (Modified) ACK frames that are addressed to the STA as described in 9.3.2.6 (CTS procedure) and in 9.3.2.8 (ACK procedure)." | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1846 | 174.63 | 9.3.2.4 | Is "NDP (Modified) ACK frames"supposed to be read as "NDP Modified ACK" or as NDP Modified ACK and ACK frames"? | Use "NDP Modified ACK frames" or "NDP Modified ACK and ACK frames" as is correct. | Agree with the commenter. Resolution accounts for proposed changes.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1847 | 174.64 | 9.3.2.4 | Is (Short) Beacon frame either a Beacon frame or a Short Beacon frame? | Use "...if the received PSDU is a Beacon Fame or a Short Beacon frame ..." Simlarly for P175L1 (2 places), P2175L3, P175L5. | Agree in principle with the commenter. See discussion. Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1848 | 174.59 | 9.3.2.4 | All the added text form P174L59 to P175L5 I assume is pnly for S1G STAs. If so then this should be a lcear separate paragraph . | Insert paragraph breaks around the added text to make it clear that all this is only for the S1G STA. | Agree with the commenter.Resolution takes into account the proposed change. Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 2450 | 152.59 | 9.3.2.4 | The new rules would appear to contradict the simple old rule "shall update NAV if > current and RA != STA" | Put enough caveats in the original text to not contradict the new text | Agree with the commenter.Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 2451 | 152.50 | 9.3.2.4 | The rules are completely incomprehensible | Make it a nested table or something, saying something like "The NAV shall be updated if ... except if ..."? | Agree with the commenter. Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 2514 | 152.59 | 9.3.2.4 | Unclear sentence. The sentence: "An S1G STAs shall update its NAV with the information received in the Duration field of a received NDP CTS, NDP ACK and NDP Modified ACK (>=2MHz) with Duration Indication field set to 0, except for those NDP MAC frames that are addressed to the STA as described in 9.3.2.6 (CTS procedure) for NDP CTS frames and in 9.3.2.8 (ACK procedure) for NDP (Modified) ACK frames" is confusing, especially beginning with "for NDP CTS frames" | fix the sentence to reveal its hidden meaning | Agree with the commenter. Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1177 | 152.59 | 9.3.2.1 | Congratulations on turning an already-long para into one that spans roughly half a page. This will surely aid comprehension. | But if you want to allow mere mortals to read it, suggest finding places to split the para up. Or add visual structure such as a list. | This comment incorrectly refers to subclause 9.3.2.1. The page/line (and context) actually point to 9.3.2.4. Agree with the commenter. Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |
| 1348 | 152.59 | 9.3.2.1 | From P152L59 to P153L16, the cases where NAV shall not be updated for S1G devices has become too many to follow clearly. It might be a good idea to make a separate paragraph and make an itemized list of where NAV shall and shall not be updated for S1G devices. | As in the comment | This comment incorrectly refers to subclause 9.3.2.1. The page/line (and context) actually point to 9.3.2.4. Agree with the commenter. Resolution takes into account the proposed change.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1465 to 1348. |

**Discussion:** *CIDs 2450, 2451, 1177, and 1348- Proposed resolution is inline with commenters’ suggestions to add rules for S1G STAs in a single paragraph and clarify the cases when an S1G STA does not update the NAV. These cases are: STA is the intended receiver of the frame; STA is paged according to signalling in the Beacon that sets the NAV; STA receives a broadcast NDP CTS frame from its AP as described in 9.3.2.6.*

* **Setting and resetting the NAV**

**Instructions to TGah Editor: *Change the 1st paragraph of the subclause as follows:***

A STA that receives at least one valid frame within a received PSDU shall update its NAV with the information received in any valid Duration field from within that PSDU for all frames where the new NAV value is greater than the current NAV value, except for those where the RA is equal to the MAC address of the STA. (#15,59,168)

**Instructions to TGah Editor*: Insert the following as a new paragraph immediately after the 1st paragraph:***

An S1G STA shall also update its NAV with the information received in the Duration field of a frame of type: NDP CTS, NDP ACK, NDP Modified ACK (≥2 MHz), and Short Beacon, except when the received frame is an:

* NDP CTS that is either addressed to the S1G STA, or that has the Address Indicator field equal to 1 and the RA/PBSSID field equal to the AP with which the S1G STA is associated (see 9.3.2.6 (CTS procedure)).
* NDP ACK that is either addressed to the S1G STA, or that has the Duration Indication field equal to 1 (see 9.3.2.8 (Ack procedure)).
* NDP Modified ACK (≥2 MHz) that is either addressed to that S1G STA, or that has the Duration Indication field equal to 1 (see 9.3.2.8 (Ack procedure).
* Short Beacon that includes TIM elements in which there is an indication of available BUs for the receiving STA in at least one of the TIM elements.
* Short Beacon that includes at least one TIM element and at least one RPS element that indicates that the receiving S1G STA is allowed to access the first RAW immediately following the Short Beacon frame as specified in at least one of the RPS elements.

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 1711 | 153.13 | 9.3.2.4 | The hyphenated text on this and the next line confuse the requirement. | Delete "- calculated depending on additional RXVECTOR's parameters as described in 9.3.2.4a (Setting and resetting the RID) -" and add a sentence following this one: "The NDPTxTime is calculated according to the RXVECTOR parameters (see 9.3.2.4a (Setting and resetting the RID))." And also replace "RXVECTOR's parameter" on line 12 with "the RXVECTOR parameter" | Agree with the commenter.Proposed changes are included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1711 to 2742. |
| 2341 | 152.58 | 9.3.2.4 | "An S1G STAs shall update its NAV with the information received in the Duration field of areceived NDP CTS ..." | Can only an S1G STA receive these NDP frames? I don't see that limitation anywhere. | Agree in principle with the commenter. See discussion.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from from 1711 to 2742. |
| 2515 | 153.13 | 9.3.2.4 | Incorrect wording. | change "shall update its NAV settings using" to "shall update its NAV using" | Agree with the commenter.Proposed changes are included in this resolution.Revised – TGah Editor to make changes shown in 13/1531r0 under the heading for CIDs from 1711 to 2742. |
| 2516 | 153.15 | 9.3.2.4 | Extra words not needed - the term "update NAV" already includes the idea that the NAV is only replaced if the new value is greater than the current value. | Remove "but only when the new NAV value is greater than the current NAV value" | Rejected –The same terminology which can be found in the baseline has been used in that sentence. Please refer to Page 1107 Line 15 of REVmc D2.0. Also, based on the standard, the term “update NAV” alone does not mean “only replaced if the new value is greater than the current value”. |
| 2647 | 153.25 | 9.3.2.4 | NAV is not set or adjusted when hearing an RTS it is only set when hearing a CTS | Change RTS when used in multiple places to CTS | Rejected –The comment refers to text which is already present in the Baseline (ref. 802.11REVmc 1.1) and is not an addition of D1.0 of .11ah. And that statement actually indicates that the RTS sets the NAV at the receiver, provided that a PHY-RXSTART.indication primitive is detected during a period of time (during which the intended receiver is expected to transmit a CTS). |
| 2742 | 153.11 | 9.3.2.4 | The text needs clarification | Change to "Upon receipt of a PS-Poll frame with its Duration/ID field set to AID and with RXVECTOR's parameter RESPONSE\_INDICATION set to NDP Response, an S1G STA,shall update its NAV settings using a duration value equal to NDPTxTime plus one SIFSinterval, but only when the new NAV value is greater than the current NAV value. NDPTxTime is calculated depending on additional RXVECTOR's parameters as described in 9.3.2.4a (Setting and resetting the RID). If the calculated duration includes a fractional microsecond for ACK or a fractional 40microsecond for NDP ACK, that value is rounded up to the next higher integer." | Rejected –The calculated NAV duration cannot be a fraction of a 40 microsecond unit because the NDPTxTime is equal to 560us for 1MHZ NDP PPDU and 240us for >=2MHz NDP PPDU and SIFS time is 160us. These values give a NAV duration of 720us and 400us for 1MHz and >=2MHz NDP PPDUs respectively which is a multiple of 40us. |

**Discussion:** *CID 2341 - The following statements can already be found in D1.0: in P156L25 “A non-S1G STA shall not transmit NDP CTS frames.”, in P157L63 – “A non-S1G STA shall not transmit NDP ACK frames.”, in P218L65 – “A non-S1G STA shall not transmit NDP PS-Poll frames.” Proposed resolution is to add missing statements for the remaining frames: NDP Modified ACK, NDP BlockAck, NDP Paging, and, and NDP Probe Request. (Note: For NDP Beamforming Report Poll the statement is added in comment resolutions for subclause 8.3.5 as part of the resolution for CID 2019.)*

* **Setting and resetting the NAV**

**Instructions to TGah Editor*: Start a new paragraph with the text below and make the following changes:***

Upon receipt of a PS-Poll frame, a STA, except for an S1G STA for which the RXVECTOR parameter RESPONSE\_INDICATION of the received PS-Poll frame is set to NDP Response,(#963) shall update its NAV settings as appropriate under the data rate selection rules using a duration value equal to the time, in micro-seconds, required to transmit one ACK frame plus one SIFS interval, but only when the new NAV value is greater than the current NAV value.(#963) If the calculated duration includes a fractional microsecond, that value is rounded up to the next higher integer. Various additional conditions may set or reset the NAV, as described in 9.4.3.3. When the NAV is reset, a PHY-CCARESET.request primitive shall be issued. This NAV update operation is performed when the PHYRXEND.indication primitive is received.

An S1G STA that receives a PS-Poll frame with the RXVECTOR parameter RESPONSE\_INDICATION equal to NDP Response shall update its NAV using a duration value equal to NDPTxTime plus one SIFS interval, but only when the new NAV value is greater than the current NAV value and the RA is not equal to the MAC address of the S1G STA. The NDPTxTime is calculated according to additional RXVECTOR parameters as described in 9.3.2.4a (Setting and resetting the RID)).

An S1G STA that receives an SF-Poll frame shall update its NAV using the value of the Duration/ID field in the received frame, but only when the new NAV value is greater than the current NAV value and the RA is not equal to the MAC address of the STA.

**Instructions to TGah Editor: *Change the following paragraph of subclause 9.3.2.8:***

A non-S1G STA shall not transmit NDP ACK and NDP Modified ACK frames.

**Instructions to TGah Editor: *Change the following paragraph of subclause 9.22.1:***

An asymmetric Block Ack operation may be used when the S1G non-AP STA cannot satisfy data selection rules for control response frames when transmitting to the S1G AP(#914). An S1G non-AP STA may initiate an asymmetric Block Ack negotiation with an S1G AP if it has received from the AP a frame containing an S1G Capabilities element with the Asymmetric Block Ack Supported set to true; otherwise it shall not initiate an asymmetric Block Ack negotiation. A non-S1G STA shall not transmit NDP BlockAck frames and shall not initiate an asymmetric Block Ack negotiation.

**Instructions to TGah Editor: *Add this sentence at the end of the 1st paragraph of subclause 10.1.4.3.3b:***

A non-S1G STA shall not transmit NDP Probe Request frames.

**Instructions to TGah Editor: *Add this sentence at the end of the 3rd paragraph of subclause 9.41.5:***

A non-S1G STA shall not transmit NDP Paging frames.