IEEE P802.11
Wireless LANs

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| LB 205 Comment Resolution for Miscellaneous part 1 |
| Date: 2014-11-01 |
| Author(s): |
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Abstract

This submission proposes resolutions for multiple comments of TGah Draft 3.0 with the following CIDs (TOT 18 CIDs):

* 5074, 5099, 5100, 5101, 5198, 5266, 5267, 5268, 5270, 5299, 5308, 5399, 5403, 5404, 5405, 5445, 5446, 5474

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 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** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5074 | MARC EMMELMANN | 181.07 |  | More than one bit in the bitmap can be set to 1. -- Value of bit important, not changing it to 1. set to --> equals to | Change set to equal | Revised –Both “set” and “equal” can be used in this case. For example refer to the use of set to in P1124L64 of REVmc D3.0:“The ResponderAP Address field is the MAC address of the responding AP. The length of this field is6 octets. This field can be set to the broadcast address if the request is sent to multiple APs.” In this case the proposed resolution is to accept the suggested change as it reads better.TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5074. |

**Discussion:** *None.*

8.4.2.170y SST Operation element

**TGah Editor: *Change the paragraph below as follows (#5074):***

The SST Enabled Channel Bitmap field is 8 bits and contains a bitmap indicating which channels are enabled for SST operation. Each bit in the bitmap corresponds to one channel of width equal to the value of SST Channel Unit field, with the least significant bit corresponding to the lowest numbered subchannel in the SST Enabled Channel Bitmap. The channel number of each of the channels in the SST Enabled Channel Bitmap is equal to PCN minus OPC plus POS, where PCN is the value of the Primary Channel Number subfield in the most recently transmitted S1G Operation element, OPC is the offset of the primary channel relative to the lowest numbered subchannel in the bitmap as specified by the value of the Primary Channel Offset field and POS is the position of the channel in the bitmap. A value of 1 in a bit position in the bitmap indicates that the subchannel is enabled for SST operation but transmissions from SST STAs in that subchannel are allowed subject to the rules defined in 9.42f (Subchannel Selective Transmission (SST)). More than one bit in the bitmap can be equal to 1.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5099 | Adrian Stephens | 282.24 |  | """the VHT MU PPDU and the S1G MU PPDU""This kind of conjunction is very awkward. Fortunately, it is not necessary." | Change cited text to "the PPDU" | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5099. |

**Discussion:** *None.*

9.28.4 Rules for RD responder

**TGah Editor: *Change the paragraph below as follows (#5099):***

During an RD response burst any PPDU transmitted by an RD responder shall contain at least one MPDU with an Address 1 field that matches the MAC address of the RD initiator, and the inclusion of traffic to STAs other than the RD initiator in a VHT MU PPDU or an S1G MU PPDU shall not increase the duration of the PPDU beyond that required to transport the traffic to the RD initiator. The RD responder shall not transmit any frame causing a response after SIFS with an Address 1 field that does not match the MAC address of the RD initiator. The RD responder shall not transmit any PPDUs with a CH\_BANDWIDTH that is wider than the CH\_BANDWIDTH of the PPDU containing the frame(s) that delivered the RD grant.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5100 | Adrian Stephens | 283.21 |  | "has value 0" - it isn't English | Change either to "has the value 0", or "is 0" | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5100. |

**Discussion:** *None.*

9.31.3 Link adaptation using the VHT variant HT Control field

**TGah Editor: *Change the paragraph below as follows (#5100):***

An S1G STA that sets the +HTC VHT Capable to 1 and supports sending normal control response frames for link adaptation shall set Link Adaptation per Normal Control Response Capable bit in the S1G Capabilities element to 1. Otherwise it shall set it to 0. An S1G STA shall not elicit normal control frame for link adaptation from another S1G STA when the received Link Adaptation per Normal Control Response Capable subfield in the received S1G Capabilities element from the STA is0.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5101 | Adrian Stephens |  |  | """The S1G STA that"" -- this phrase is wrong, and creates ambiguity about what conditions are active.""The"" implies conditions have been established (i.e. there is an antecedent cited by ""The""), ""that"" attempts to establish them""." | Review the 8 instances and either reword "An S1G STAf that" or "The STA" (not followed by that) | Revised –Agree with the comment. Proposed resolution revises the instances identified by the proposed change and clarifies the phrases as suggested. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5101. |

**Discussion:** *None.*

9.3.2.9 Ack procedure

**TGah Editor: *Change the paragraph below as follows (#5101):***

An S1G STA that satisfies any of the first three exceptions above shall transmit an Ack, TACK, or STACK frame instead of an NDP Ack frame as a response to an eliciting PPDU for which the RXVECTOR parameter RESPONSE\_INDICATION is equal to Normal Response. The control response frame shall be carried in a 32 Octet PSDU if the eliciting PPDU contains a VHT Single MPDU. An example of a 32 Octet PSDU is an Ack frame carried in an A-MPDU whose overall length is equal to 32 octets.

9.42d.2 Rules for BDT

**TGah Editor: *Change the sentence below as follows (#5101):***

An S1G STA that transmits this PPDU is known as the BDT Initiator.

9.42i Multicast AID

**TGah Editor: *Change the paragraph below as follows (#5101):***

An S1G AP that has negotiated a multicast AID shall indicate the presence of group addressed BUs corresponding to the multicast AID in the TIM included in the S1G Beacon frame that is sent every multicast listen interval. An S1G STA that has negotiated a multicast AID shall wake up every multicast listen interval that corresponds to the multicast AID to receive the S1G Beacon frame.

10.1.4.3.4c Active scanning using Short Probe Response

**TGah Editor: *Change the paragraph below as follows (#5101):***

An S1G STA that responds with a Short Probe Response frame shall include the following information in the frame:

—The elements that are requested by the requesting STA as indicated in the Short Probe Response Option element contained in the received Probe Request frame.

—If a bit in a Probe Response Option bitmap in the Short Probe Response Option element is equal to 1, then the corresponding information element is requested and it shall be included in the Short Probe Response frame (see 8.4.2.170t (Short Probe Response Option element)).

—If the S1G Beacon Compatibility element is included in the Short Probe Response frame, then it shall be included as the first optional element and shall be generated no later than the Timestamp field of the frame and not earlier than 231 -1 microseconds.

—Either the SSID element or the compressed SSID field.

—If the Request Full SSID bit in the Short Probe Response Option element is equal to 1, then the SSID element shall be present in the Short Probe Response frame and the Compressed SSID shall not be present. If it is equal to 0, then the Compressed SSID shall be present and the SSID element shall not be present.

—The 1 MHz Channel Primary Location field in the Frame Control field shall indicate the location of the 1 MHz primary channel within the 2 MHz primary channel.

**TGah Editor: *Change the paragraph below as follows (#5101):***

Upon reception of a Short Probe Response frame that includes an S1G Beacon Compatibility element an S1G STA that included the Short Probe Response Option element in a previously transmitted Probe Request frame or that set the Requested Probe Response Type to 0 in a previously transmitted NDP Probe Request frame, may update its TSF timer using the same TSF timer update procedure described in 10.1.3.10.3 (TSF timer accuracy with S1G Beacon) for S1G Beacon frames.

10.2.2.6 AP operation during the CP

**TGah Editor: *Change the paragraph below as follows (#5101):***

An S1G AP that sends an acknowledgement frame of type (NDP) Ack or NDP PS-Poll-Ack in response to an (NDP)PS-Poll/trigger frame that is received from an S1G STA shall set the More Data subfield of the acknowledgement frame to 0 when no BU is buffered for the STA; otherwise, it shall set it to 1. The successful reception of the acknowledgement frame provides the following indications to the S1G STA:

—If the More Data subfield is equal to 0 it indicates that no service period starts for the STA and that it may enter the doze state,

—If the More Data subfield is equal to 1 it indicates that a service period starts for the STA after a time T, starting from the end of the acknowledgement frame, after which the S1G STA shall remain in the awake state until a frame is received from the S1G AP that has the EOSP subfield equal to 1. The time T is equal to:

—0 if the acknowledgment frame is an Ack frame or is an NDP(PS-Poll-)Ack frame with the Idle Indication subfield equal to 0

—the value indicated in the Duration field of the frame if the frame is an NDP (PS-Poll-)Ack frame with the Idle Indication subfield equal to 1.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5198 | Liwen Chu | 179.43 | 8.4.2.170x | "Change""The Store A3 subfield is set to 1 to request the intended receiver of the Header Compression request to store the A3 field. It is set to 1 in the Header Compression response to confirm storing of the A3 field.""to""The Store A3 subfield is set to 1 in the Header Compression request to request the intended receiver of the Header Compression request to store the A3 field. It is set to 1 in the Header Compression response to confirm storing of the A3 field.""" | As in comment | Revised –Agree in principle with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5198. |

**Discussion:** *None.*

8.4.2.170x Header Compression element

**TGah Editor: *Change the paragraph below as follows (#5198):***

The Store A3 subfield is set to 1 in the Header Compression request to request the intended receiver of the frame to store the A3 field. It is set to 1 in the Header Compression response to confirm storing of the A3 field. Otherwise, it is set to 0 to indicate either no storage request or unsuccessful storage response of the A3 field.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5266 | Alfred Asterjadhi | 164.23 | 8.4.2.170o | In the figure that precedes this description this field is called "No More Relay Flag". Replace "No More Relay Indicator" with "No More Relay Flag" throughout the draft. | As in comment. | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5266. |

**Discussion:** *None.*

8.4.2.170o Relay element

**TGah Editor: *Change the paragraph below as follows (#5266):***

The No More Relay Flag subfield is set to 1, to indicate that the AP does not accept any more requests for operating as relays from its associated non-AP STAs. Otherwise it is set to 0.

9.42h.2 Relay operation

**TGah Editor: *Change the paragraph below as follows (#5266):***

A non-AP STA shall not transmit a Relay Activation element that has the Enable Relay Function and the Request subfields equal to 1 if the most recently received Relay element from the AP to which it is associated had the No More Relay Flag subfield equal to 1.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5267 | Alfred Asterjadhi | 164.31 | 8.4.2.170p | A sentence that refers to the element format is missing. Add one. Similar observation for the next subclause. | Insert as the first sentence of this subclause: " The format of the Reachable Address element is shown in Figure 8-575a39 (Reachable Address element format)". Insert in P165L25: "The format of the Relay Activation element is shown in Figure 8-575a41 (Relay Activation element format)". | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5267. |

**Discussion:** *None.*

8.4.2.170p Reachable Address element

**TGah Editor: *Insert as the 1st paragraph of this subclause (#5267):***

The format of the Reachable Address element is shown in Figure 8-575a39 (Reachable Address element format).

8.4.2.170q Relay Activation element

**TGah Editor: *Insert as the 1st paragraph of this subclause (#5267):***

The format of the Relay Activation element is shown in Figure 8-575a41 (Relay Activation element format).

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5268 | Alfred Asterjadhi | 164.49 | 8.4.2.170p | A STA does not initiate an element. Rather it transmits it. Replace "initiates" with "transmits" | As in comment. | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5268. |

**Discussion:** *None.*

8.4.2.170p Reachable Address element

**TGah Editor: *Change the paragraph below as follows (#5268):***

The Initiator MAC Address field indicates the MAC address of the relay STA that transmits the Reachable Address element.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5270 | Alfred Asterjadhi | 176.23 | 8.4.2.170u | Recovery time is the name of a field. Replace "Recovery time" with Recovery Time" | As in comment. | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5270. |

**Discussion:** *None.*

8.4.2.170u Activity Specification element

**TGah Editor: *Change the paragraph below as follows (#5270):***

The Recovery Time field indicates a time in units of 40 microseconds, used as defined in 10.44d (Support for energy limited STAs).

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5299 | Alfred Asterjadhi | 277.01 | 9.24.2 | Note that an S1G AP does not have a type (such as sensor, non sensor etc). But it does declare support for sensor STA, non-sensor STA, etc. see 10.44c.7) So the statement need to be rephrased to clarify this ambiguity. | Remove "and an S1G STA that is a non-sensor STA" from the first sentence and insert the following sentence immediately after it: " An S1G non-AP STA that is a non-sensor STA and an S1G AP that declares a non-sensor BSS or mixed BSS (see 10.44c.7 (S1G BSS type and STA type)) shall support the HT-immediate block ack extension". | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. Annex B is updated as well.TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5299. |

**Discussion:** *None.*

9.24.1 Introduction

**TGah Editor: *Change the paragraph below as follows (#5299):***

A DMG STA shall support the HT-immediate block ack extension. A DMG STA shall not use the HT-delayed block ack extension. An S1G non-AP STA that is a non-sensor STA and an S1G AP that supports non-sensor STAs (see 10.44c.7 (S1G BSS type and STA type)) shall support the HT-immediate block ack extension. An S1G STA that sets the A-MPDU Supported field in the S1G Capabilities element to 1 shall support the HT-Immediate block ack extension. An S1G STA that sets the HT-Delayed Block Ack field in the S1G Capabilities element to 1 shall support the HT-delayed block ack extension.

* HT MAC features

**TGah Editor: *Change the row below of the table as follows (#5299):***

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| HTM5.3 | HT-immediate block ack extensions | 9.24.7 (HT-immediate block ack extensions) | (CF16 AND NOT CF32):MCF32:O(CF32 AND (S1GM20.2 OR S1GM20.3 OR S1GM20.5)): M | Yes  No  N/A  |

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5308 | Alfred Asterjadhi | 292.59 | 9.42a.6 | This parameter "Minimum Awake Duarion" is actually "Nominal Minimum TWT Wake Duration". Similar issue also in P297L36. Also I noticed a few occurrences of "Partial AID" throughout this subclause which is not the name of a field so replace "Partial AID" with "partial AID". Similar observation for "Partial BSSID". | Replace "Minimum Awake Duration" with "Nominal Minimum TWT Wake Duration". Replace "Partial AID" with "partial AID" and "Partial BSSID" with "partial BSSID" throughout the draft when they are not part of the name of a field/subfield/frame/element. | Revised –Agree with the comment. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5308. |

**Discussion:** *None.*

9.42a.6 NDP Paging Setup

**TGah Editor: *Change the paragraph below as follows (#5308):***

If no NDP Paging frame is received during the TWT, the TWT requester STA may transition to Doze state at the end of the Nominal Minimum TWT Awake Duration for the TWT. If an NDP Paging frame is received, the TWT requester STA may transition to Doze state immediately after receiving the NDP Paging frame, unless Min Sleep Duration was equal to 0 and Action subfield equal to 1 in the NDP Paging Response frame that successfully completed the NDP Paging setup, in which case the STA shall be in active mode.

**TGah Editor: *Change the paragraph below as follows (#5308):***

The P-ID field of the NDP Paging frame shall be set to the same value as P-ID field in the NDP Paging Response if and only if there are BUs for the STA identified by the partial AID indicated in the P-ID field of the NDP Paging Request. The value of the P-ID field shall be set to 0 to indicate the presence of group addressed BUs.

**TGah Editor: *Change the paragraph below as follows (#5308):***

If the Direction field of the NDP Paging frame is equal to 0, the Partial AID field of NDP Paging frame indicates the partial AID of the STA transmitting the NDP Paging frame.

**TGah Editor: *Change the paragraph below as follows (#5308):***

An AP sending an NDP Paging Request to a non-AP STA should set the P-ID field of the NDP Paging Request to the partial BSSID.

8.8.5.4 Resource Allocation frame format

**TGah Editor: *Change the paragraph below as follows (#5308):***

The Partial AID subfield indicates a partial AID for an assigned STA.

**24.3.17.5.4 CCA sensitivity for signals occupying the Primary 2 MHz and/or Primary 1 MHz channel**

**TGah Editor: *Change the paragraph below as follows (#5308):***

Additionally, when a STA detects an S1G\_SHORT or S1G\_LONG PPDU with a Partial AID field of its SIG field indicating a partial AID or COLOR value that matches its own partial AID or BSSID, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) for the remaining duration of the PPDU as indicated in its preamble.

**24.3.17.5.4.1 CCA sensitivity for devices in Type 2 channels implementing intended 8 or 16 MHz transmit channel width channel access procedure**

**TGah Editor: *Change the paragraph below as follows (#5308):***

Additionally, when a STA detects an S1G\_SHORT or S1G\_LONG PPDU with a Partial AID field of its SIG field indicating a partial AID or COLOR value that matches its own partial AID or BSSID, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) for the remaining duration of the PPDU as indicated in its preamble.

8.9.1.7.1 NDP\_2M Beamforming Report Poll

**TGah Editor: *Change the paragraph below as follows (#5308):***

The AP Address field indicates the partial BSSID of the AP as described in 9.20a (Group ID, partial AID, Uplink Indication and COLOR in S1G PPDUs).

**TGah Editor: *Change the paragraph below as follows (#5308):***

The Non-AP STA Address field indicates the AID of the non-AP STA.

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| **CID** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 5399 | Mitsuru Iwaoka |  |  | A term "BDT" is used in two meaning. One is a name of the feature and another is a frame exchange sequence within BDT. They shall be distinguished. | "Replace following occurrences of ""BDT"" by ""BDT sequence"":- P84L2 and L44- P85L20- P298L59 and L61- P299L20, L21, L49 (NOTE 2), L51 (NOTE 3), and L57- B300L16 (Last one), L20, L53 (NOTE 1)," | Revised –Agree in principle with the comment. The proposed resolution clarifies that a BDT exchange is transmitted during a Bidirectional TXOP and that the BDT exchange consists of one or more BDT sequences. TGah editor to make the changes shown in 11-14/1471r0 under all headings that include CID 5399. |
| 5403 | Mitsuru Iwaoka |  |  | According to the 802.11 Style Guide (11-09/1034r9) subclause 2.12 (Hyphenation), "nonzero" should be used. | "Replace the following occurrences of ""non-zero"" by ""nonzero"".- P141L11- P323L58- P269L1- P289L26, L29, L42, L46, and L48- P290L10, L16, L19, L23, L25, and l28- P305L19- P309L20- P351L57- P362L18- P388L4, L11, L28, L32, and L44- P431L50 and L52- P433L36, L39, L43, and l48- P442L6" | Accepted –Note to the TGah editor: This is an inline instruction. |
| 5404 | Mitsuru Iwaoka |  |  | There are several "SIG" (es-ai-ge) that shall be "S1G" (es-one-ge). | "Replace the following occurrences of ""SIG"" by ""S1G"":- P354L45- P375L9" | Accepted –Note to the TGah editor: This is an inline instruction (in P375L9 the instruction refers to **SIG**\_DUP\_2M). |
|  5405 | Mitsuru Iwaoka |  |  | "SIGA" should be "SIG-A". | "Replace following occurrences of ""SIGA"" by ""SIG-A"".- P68L52 (2 occurrence) and L54- P424L37- P426L32, L35, L43, L47, L48, and L51- P432L31- P434L27- P445L48- P462L54" | Accepted –Note to the TGah editor: This is an inline instruction. |
| 5445 | David Hunter | 149.24 | 8.4.2.1700k.2 | The "S1G Capabilities Info" name is the name of a field, and so should be in initial caps whenever it is referencing that field. | Replace "info" with "Info" in the heading of this subclause. | Accepted –Note to the TGah editor: This is an inline instruction. |
| 5446 | David Hunter | 156.19 | 8.4.2.170k.2 | "BDT Operation" is not the name of a defined frame, field, etc., so "Operation" does not need the initial cap. | Replace "Operation" with "operation". | Accepted –Note to the TGah editor: This is an inline instruction. |
| 5474 | Peter Ecclesine |  |  | 0.5 MHz channel bandwidth operation should be defined for use in bands with fewer than 5 MHz total bandwidth e.g., 860-863 MHz. | Add 0.5 MHz channel bandwidth operation. | Rejected –The comment fails to identify a specific issue to be addressed. It fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined.Additionally the comment is out of scope: i.e., it is not on changed text, text affected by changed text or text that is the target of an existing valid unsatisfied comment. |

**Discussion:** *None.*

8.2.5.2 Setting for single and multiple protection under enhanced distributed channel access (EDCA)

**TGah Editor: *Change the paragraph below as follows (#5399):***

1)For an RTS frame that is not part of a dual clear-to-send (CTS) exchange and is not part of a BDT exchange, the Duration/ID field is set to the estimated time, in microseconds, required to transmit the pending frame, plus one CTS frame, plus one Ack or BlockAck frame if required, plus any NDPs required, plus explicit feedback if required, plus applicable IFSs.

**TGah Editor: *Change the paragraph below as follows (#5399):***

For a PS-Poll+BDT frame and an RTS frame generated by an S1G STA as part of a BDT exchange the Duration/ID field value is determined as follows:

**8.2.5.8 Setting for other response frames**

**TGah Editor: *Change the paragraph below as follows (#5399):***

For any frame that includes a Duration/ID field, transmitted by an S1G STA as a response to Short frames which are not part of a BDT exchange, the Duration/ID field of the frame is set to 0. For any frame transmitted by a BDT Initiator as a response to Short frames, the Duration/ID field of the frame is set to the value of the TXNAV timer minus the estimated time required to transmit the frame.

**TGah Editor: *Change the subclause below as follows (#5399):***

* **Bidirectional**(#3429) **TXOP**
* **Overview**

Bidirectional(#3429) TXOP (BDT) allows an S1G AP and an S1G non-AP STA to exchange a sequence of uplink and downlink PPDUs separated by SIFS. This operation combines both uplink and downlink channel access into a continuous frame exchange sequence between a pair of S1G STAs. S1G STAs that participate in BDT use information that is present in the Frame Control field, PLCP Header Signal field and NDP CMAC(#3027) frames to signal an undergoing BDT as described in 9.42d.2 (Rules for BDT). The objective of this operation is to minimize the number of contention-based channel accesses, improve channel efficiency by reducing the number of frame exchanges, and reduce S1G STA power consumption by shortening Awake times.

An S1G STA with dot11BDTCapable equal to true shall set the BDT Capable field in the S1G Capabilities element to 1. An S1G STA with dot11BDTCapable equal to false shall set the BDT Capable field in the S1G Capabilities element to 0. An(#3581) S1G STA shall not use the BDT(#3105) procedure to transmit frames to another S1G STA whose BDT Capable field is equal to 0.

* **Rules for BDT**

Throughout this subclause, a Response Indication of Long Response is signaled by setting the TXVECTOR's parameter RESPONSE\_INDICATION to Long Response for non-NDP frames and by setting the Idle Indication field to 1 and the Duration field to 0 for NDP (PS-Poll-)Ack. A Response Indication of No Response is signaled by setting the TXVECTOR's parameter RESPONSE\_INDICATION to No Response for non-NDP frames and by setting the Idle Indication field to 0 and the Duration field to 0 for NDP (PS-Poll-)Ack. The reception of NDP BlockAck signals a Response Indication of No Response. A Response Indication of Normal Response is signaled by setting the TXVECTOR's parameter RESPONSE\_INDICATION to Normal Response for non-NDP frames.

An S1G AP may initiate a BDT exchange with an NDP PS-Poll-Ack frame that is sent as a response to a received NDP PS-Poll frame. An S1G non-AP STA shall not initiate a BDT exchange with a PS-Poll frame unless it is a PS-Poll+BDT frame with the More Data field equal to 1. A BDT exchange consists of one or more BDT sequences.(#3820)

A(#3103, Ed) BDT sequence comprises the following:

* The transmission of one PPDU that is either an NDP PS-Poll-Ack frame or that satisfies the following conditions:
* contains a Response Indication of Long Response
* follows the same rule as the initial frame for TXOP as defined in 9.22.2 (HCF contention based channel access (EDCA)) for initial frame sent by BDT Initiator(#3662)
* contains a Duration/ID field that sets the NAV

The S1G STA that transmits this PPDU is known as the BDT Initiator.

* The transmission of one or more PPDUs (BDT response burst) by the S1G STA addressed in the PPDUs transmitted by the BDT Initiator, separated by SIFS. Only the last (or only) PPDU of the BDT response burst may contain any MPDU requiring an immediate response. All the other PPDUs in the BDT response burst (if there are any) except the last one shall indicate "No Response" in the response indication field. The S1G STA that transmits the BDT response burst is known as the BDT Responder.
* The transmission of one PPDU by the BDT Initiator containing an immediate response (the BDT Initiator final PPDU), if so required by the last PPDU of the BDT response burst.

NOTE 1—A BDT Initiator can include multiple BDT sequences, separated by SIFS, within a single TXOP.

NOTE 2—A BDT sequence cannot(#3102) be started with a PPDU that can not signal a Response Indication, e.g., an NDP PS-Poll frame.

NOTE 3—A (#Ed)BDT sequence can be started with a PS-Poll+BDT frame.

The total duration of the BDT Initiator PPDUs shall not exceed the TXOP limit as described in 9.22.2.3 (EDCA TXOPs)(#3287). The BDT responder PPDU transmission(s) and any expected responses shall fit entirely within the remaining TXOP or SP duration, as indicated in the Duration/ID field of the latest MPDU transmitted by the BDT initiator(#Ed). A BDT exchange is subject to TXOP duration limits for the current AC.(#3522, 3107, 3106)

A BDT Responder sending a(#3103) BDT response burst containing an immediate response to an eliciting PPDU that had the More Data field equal to 1 shall set the Response Indication to Long Response for each PPDU in the BDT response burst.

A BDT Responder sending a BDT response burst containing an immediate response to an eliciting PPDU that had the More Data field equal to 0, shall not set the Response Indication of the last PPDU of the BDT response burst to Long Response.

A non-AP STA shall remain in the Awake state until the end of the current TXOP when one of the following conditions is met:

* It is the intended receiver of a frame with More Data field equal to 1 that is sent by the AP.
* It is a BDT Initiator of a BDT sequence within a single TXOP.

A non-AP STA may transition to the Doze state if it is the intended receiver of a frame with More Data field equal to 0 that is sent by the AP.

Figure 9-92 (Example of BDT exchange) illustrates an example of BDT signaling. STA A initiates the BDT exchange(#3105) by setting the Response Indication to Long Response in the PS-Poll+BDT frame and in the preamble of two PV0 PPDUs to allow STA B to transmit its BUs. At the end, STA B sends a PPDU with the Response Indication 2 (Normal Response)(#3664) and STA A will terminate the BDT exchange by sending a PPDU with the Response Indication equal to 0 (No response).

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| * **Example of BDT exchange**
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(#3522, 3107)NOTE 1—For error recovery, a STA participating in a BDT exchange can transmit the next frame when the CS mechanism (see 9.3.2.1 (CS mechanism)) indicates that medium is idle at TxPIFS slot boundary (defined in 9.3.7 (DCF timing relations)).