IEEE P802.11
Wireless LANs

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| LB 203 Comment Resolution for 8.3.4.2 |
| Date: 2014-08-01 |
| Author(s): |
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Abstract

This submission proposes resolutions for comments in clause 8.3.4.2 of TGah Draft 2.0 with the following CIDs (TOT 5 CIDs):

* 3242, 3709, 4131, 4132, 3165

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** |
| 3242 | Alfred Asterjadhi | 93.36 | 8.3.4.2 | The Frame Control field for PV0 frames and its content is listed in subclause 8.2.4.1 (Frame Control field. | Make the appropriate changes to move the contents of the Frame Control field description to 8.2.4.1.1 following the baseline structure where each subfield of the frame control field is a subclause of 8.2.4.1. | Revised –Agree with the commenter. TGah editor to make the changes shown in 11-14/1062r0 under all headings that include CID 3242. |
| 3709 | Liwen Chu | 95.14 | 8.3.4.2 | Add FMS to Beacon is not enough for FMS support in 11ah. | The following changes may be required:1), Define MCS rules for 11ah.2), Optimize FMS TX which is presented in less Beacon. | Revised –FMS support is indicated in the Extended Capabilities element which can be exchanged between S1G STAs. . Item 1 identifies the issue that the Rate Identification field defined in 8.4.1.32 needs to be redefined for S1G MCSs and rates and this resolutions proposes changes that resolve this issue.With respect to the item 2, the likely intent is that less DTIM beacons may carry the FMS Descriptor element. However, this may not be trivial because the FMS Descriptor tells the STA the DTIM Beacon counts for the various FMS streams. The change may also not cause a lot of efficiency enhancement, because the descriptor is present only in DTIM beacons and these DTIM beacons can be sent at TSBTT in which case only a minimum set of elements are included in the beacon. However, the commenter is invited to resubmit the comment and provide a proposed change that can be discussed in the group if this is still believed to be an issue."TGah editor to make the changes shown in 11-14/1062r0 under all headings that include CID 3709. |
| 4131 | Stephen Mccann | 94.28 | 8.3.4.2 | Is the "sleep mode" in this sentence referring to WNM-Sleep Mode or mesh sleep mode (see P73L30)? The sentence does not currently make sense, as it appears to be using a mesh term | Please clarify the use of the term "sleep mode" or delete it. | Revised:Agree with the commenter. Proposed resolution is to use the same terminology of 10.2.2.20 (AP Power Management): ““The AP with dot11APPMActivated equal to true may indicate that it is operating in Power Save mode setting the AP PM bit in the Frame Control field of the S1G Beacon frame to 1””TGah editor to make the changes shown in 11-14/1062r0 under all headings that include CID 4131. |
| 4132 | Stephen Mccann | 94.28 | 8.3.4.2 | There are several uses of the word "sleep" in this document, for example: "mesh sleep" P73L30, "sleep" P94L28, "WNM-sleep" P122L47, "paging sleep" P141L50, "TWT sleep" P273L20. I suspect that these are not all the same time of sleep. | Please can qualifiers be added to every occurance of the word sleep in this document to clarify which type of sleep is being referred to. | Revised –Agree with the comment. Proposed resolution is to use the appropriate terminology “Doze” throughout the draft. Note that we did not apply these changes when the term “sleep” appears in the Subclause heading or as part of the name of a field.TGah editor to make the changes shown in 11-14/1062r0 under all headings that include CID 4132. |
| 3165 | Alfred Asterjadhi | 316.55 | 10.1.3.10.1 | An S1G Beacon frame may include all the optional elements of the Table 8-27 (Beacon frame body). But Table 8-27 is intended for Beacon frames which makes it somewhat confusing when these elements are called for S1G Beacons (not all elements are ported in S1G). | Probably the best way to clarify this part is to: add a new table e.g., Table 8.41.b1(Full set of optional elements) in subclause 8.3.4.2 (S1G Beacon frame format) which includes all the elements that are added in Table 8-27; change this reference to point to the new table, add any other eventual elements that are not listed in current 8-27 to this new Table (check which features are defined, or imported in S1G and add their elements accordingly. Then remove Table 8-27 from the TGah draft and change its references to the new table. | Revised –Agree in principle with the comment. Proposed resolution is inline with the comment. However instead of creating a new table, the proposed change uses the already existing table in 8.3.4.2 to indicate the list of elements in the full set (the table is structured similar to the table for DMG Beacon).TGah editor to make the changes shown in 11-14/1062r0 under all headings that include CID 3165. |

**Discussion:** *CID 3165: Note that S1G Beacon Compatibility element was added to the Full set of elements (not present in the table for Beacon frame body. Also Change Sequence element was not included in the Full set of elements (present in the table for Beacon frame body) because S1G Beacon has the Change Sequence field.*

* S1G Beacon frame format

The format of the S1G Beacon is shown in Figure 8-61a (S1G Beacon frame format(#3022)).

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|  | Frame Control | Duration | SA | Timestamp | Change Sequence | Next TBTT(optional) | Compressed SSID(optional) | Access Network Options(optional) | Optional Elements | FCS |
| Octets:  | 2 | 2 | 6 | 4 | 1 | 0 or 3 | 0 or 4 | 0 or 1 | variable | 4 |
| * S1G Beacon frame format(#3022)
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***TGah Editor: Remove the paragraphs below as follows (#3242):***

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The Duration field is set to the duration of time, in microseconds, required by the paged STAs to transmit any pending QoS Null, PS-Poll or NDP PS-Poll frames as specified in 8.2.5.2 (Setting for single and multiple protection under enhanced distributed channel access (EDCA)).

The SA field is the address of the STA transmitting the S1G Beacon frame.

The Timestamp field contains the 4 least significant octets of the transmitting STA’s TSF timer at the time that the start of the data symbol, containing the first bit of the Timestamp, is transmitted by the PHY plus the transmitting STA’s delays through its local PHY from the MAC-PHY interface to its interface with the WM.

The Change Sequence field is defined as an unsigned integer, initialized to 0, that increments when a critical update to the Beacon frame has occurred (see 10.44b (System information update procedure)).

The Next TBTT field is present if the Next TBTT Present field in the Frame Control field is 1 and indicates the most significant 3 octets of the 4 least significant octets of the next TBTT. Otherwise, it is not present.

The Compressed SSID field is present if the Compressed SSID Present field in the Frame Control is 1 and indicates a 32-bit CRC calculated as defined in 8.2.4.8 (FCS field), wherein the *calculation fields* is the SSID field in the S1G Beacon frame. Otherwise, it is not present.

The Access Network Options field is present if the ANO field in the Frame Control field is 1 and it is defined in 8.4.2.91 (Interworking element) (see Figure 8-435 (Access Network Options field format)). Otherwise, it is not present.

***TGah Editor: Change the paragraph below and the table as follows (#3165):***

The Optional Elements field contains the set of optional information elements, as defined in Table 8-49b (Minimum and full set of optional elements). The minimum set of optional elements is included in an S1G Beacon frame transmitted at a TSBTT that is not a TBTT and the full set of optional elements is included in an S1G Beacon frame that is transmitted at a TBTT (see and 10.1.3.10.1 (General)).

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| Minimum and full set of optional elements  |
| **Order** | **Information** | **Notes** | **Allowed in minimum set** | **Allowed in full set** |
| 1 | Traffic indicationmap (TIM) | The TIM element is present within S1G Beacon frames generated by APs at TBTTs and is optionally present otherwise. | YES | YES |
| 2 | FMS Descriptor | The FMS Descriptor element is present if dot11FMSActivated is true. | YES | YES |
| 3 | RPS | The RPS element is optionally present if dot11RAWOptionActivated is true. | YES | YES |
| 4 | Subchannel Selective Transmission | The Subchannel Selective Transmission element is optionally present if dot11SubchannelSelectiveTransmissionActivated is true.  | YES | YES |
| 5 | Relay | The Relay element is optionally present if dot11RelaySupport is true. | YES | YES |
| 6 | S1G Beacon Compatibility | The S1G Beacon Compatibility element is present within S1G Beacon frames generated at TBTTs.  | NO | YES |
| 7 | Page Slice | The Page Slice element is optionally present if dot11PageSlicingSupported is true. | NO | YES |
| 8 | S1G Sector Operation | The S1G Sector Operation element is optionally present if dot11S1GSectorizationActivated is true. | NO | YES |
| 9 | Authentication Control | The Authentication Control element is optionally present when dot11S1GCentralizedAuthenticationControlActivated is true or dot11S1GDistributedAuthenticationControlActivated is true. | NO | YES |
| 10 | TSF Timer Accuracy | The TSF Timer Accuracy element is optionally present when dot11TSFTimerAccuracyImplemented is true. | NO | YES |
| 11 | Relay Discovery | The Relay Discovery element is optionally present if dot11RelayDiscoveryOptionImplemented is true. | NO | YES |
| 12 | S1G Capabilities | The S1G Capabilities element is present if dot11S1GOptionImplemented is true; otherwise, it is not present. | NO | YES |
| 13 | S1G Operation | The S1G Operation element is present when dot11S1GOptionImplemented is true; otherwise, it is not present. | NO | YES |
| 14 | Short Beacon Interval | The Short Beacon Interval element is present if dot11ShortBeaconInterval is true. | NO | YES |
| 15 | SST Operation element | The SST Operation element is present if dot11SelectiveSubchannelTransmissionPermitted is true. | NO | YES |
| Last - 1 | One or more elements can appear in this frame. | These elements are optionally present and follow all other elements that are not vendor-specific elements and precede all other elements that are vendor-specific elements that are part of the Last field in the frame. | NO | YES |
| Last | Vendor Specific | One or more vendor-specific elements are optionally present. These elements follow all other elements. | NO | YES |

**10.1.3.10.1 General**

An S1G AP schedules an S1G Beacon frame at intervals given by the dot11BeaconPeriod or dot11ShortBeaconPeriod as described in 10.1.2 (TSF for infrastructure and PBSS networks). The Timestamp field of the S1G Beacon frame shall be set to the 4 least significant octets of the transmitting STA’s TSF timer at the time that the start of the data symbol, containing the first bit of the Timestamp field, is transmitted by the PHY plus the transmitting STA’s delays through its local PHY from the MAC-PHY interface to its interface with the WM.

***TGah Editor: Change the paragraph below as follows (#3165):***

An S1G Beacon frame scheduled at TSBTT that is not a TBTT may include the elements from the minimum set of elements shown in Table 8-41b (Minimum and full set of optional elements). An S1G Beacon frame scheduled at TBTT shall include the S1G Beacon Compatibility element and may include all the other elements from the full set of elements shown in Table 8-41b (Minimum and full set of optional elements). Note that the S1G Beacon Compatibility element replaces the following fields of the Beacon frame body: Timestamp, Beacon Interval and Capability which are not included in an S1G Beacon frame. The S1G Beacon Compatibility element shall be generated no later than the Timestamp field of the S1G Beacon frame that carries the element. A STA can reconstruct the 8 octet TSF timer at the AP by concatenating the 4 octet TSF Completion field in the S1G Beacon Compatibility element with the Timestamp field in the S1G Beacon frame as described in 10.1.3.10.3 (TSF timer accuracy with S1G Beacon).

***TGah Editor: Remove subclause 8.3.3.2 (Beacon frame format) from the TGah draft (#3165):***

**8.2.4.1.1 General**

***TGah Editor: Insert the following paragraphs at the end of this subclause (#3242, 4131):***

When the value of the Type subfield is equal to 3 and the value of the Subtype subfield is equal to <ANA>, the remaining subfields within the Frame Control field are: Next TBTT Present, Compressed SSID Present, ANO Present, BSS BW, Security, AP PM. In this case, twhen Type is equal to 3 and subtype is equal to <ANA>(#

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| * when Type is equal to 3 and Subtype is equal to <ANA>
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***Note to editor: The paragraph below is also changed as part of resolution for CID 4131:***

Power SavePower Save modePower Save mode

8.4.2.170j TWT element

***TGah Editor: Change the paragraph below as follows (#4132):***

The Min(#3645) Sleep Duration field in the NDP Paging Request indicates in units of SIFS the minimum duration that STA will be in the Doze state after receiving an NDP Paging with matching P-ID.

8.4.2.170z MAD element

***TGah Editor: Change the paragraph below as follows (#4132):***

The Max Away Duration field indicates the maximum duration that the AP may be out of reach for the STA (operating in other channels, enter power save mode, or operating in other RAWs). The value of the Max Away Duration field is expressed in units of microseconds.(#3477)

9.42a.1 TWT overview

***TGah Editor: Change the paragraph below as follows (#4132):***

An AP with dot11TWTOptionActivated equal to true shall transmit a TWT element to a STA with which it is associated and from which it received a frame containing a TWT element that contained a value of Request TWT, Suggest TWT or Demand TWT in the TWT Command field and a value of 1 in the TWT Request field. The transmitted TWT element shall be included in the frame that is the appropriate response frame to the received frame. The AP shall include a value of Accept TWT, Alternate TWT, Dictate TWT or Reject TWT in the TWT Command field of the response and shall set the TWT Request field to 0. If the AP response’s TWT Command field includes anything other than Accept TWT or Reject TWT, the STA should send a new request for a TWT value by sending another frame that contains a TWT element, modifying the parameters of the request to indicate, for example,(#3546) an acceptance of a proposed alternate TWT or dictated TWT value. If the STA receives a TWT response to a TWT request with the TWT Command value of Accept TWT, then the STA has successfully completed a TWT setup with that STA for the TWT Flow Identifier indicated in the TWT response and the STA becomes a TWT STA and the STA may enter the Doze state until the TSF matches the next TWT value of the STA, provided that the STA has indicated that it is in a power save mode and no other condition requires the STA to remain awake. The AP becomes a TWT peer STA of the TWT STA. The receipt of a TWT command value of Suggest TWT implies that the STA sending the command will consider accepting a proposed TWT that differs from the value found in the TWT field of the element. The receipt of a TWT command value of Demand TWT implies that the STA sending the command will not consider accepting a proposed TWT that differs from the value found in the TWT field of the element. The receipt of a TWT command value of Alternate TWT implies that the STA sending the command will consider accepting a proposed TWT that differs from the value found in the TWT field of the element. The receipt of a TWT command value of Dictate TWT implies that the STA sending the command will not consider accepting a proposed TWT that differs from the value found in the TWT field of the element.

9.42b.2 Rescheduling of awake/doze cycle

***TGah Editor: Change the paragraph below as follows (#4132):***

The S1G AP shall set More Data field to 1 in the responding control frame if there is BU buffered for the non-TIM S1G STA. If the non-TIM S1G STA receives the responding control frame in which the Idle Indication field is equal to 1 and the Duration field is a nonzero value, there is no frame transmission for the STA in the indicated duration in which the S1G STA may enter the Doze state. After the amount of time that is equal to the value in the Duration field, it shall be in the Awake state.

**10.2.2.9 Receive operation for STAs in PS mode during the CFP**

***TGah Editor: Change the item below as follows (#4132):***

e) An S1G STA may enter the Doze state after receiving from an S1G AP, and in response to a PS-Poll frame sent to the S1G AP, an (NDP) Ack frame with the More Data subfield equal to 0.

**8.4.1.32 Rate Identification field**

***TGah Editor: Insert the following immediately after the 3rd paragraph of this sublause (#3709):***

In frames transmitted by an S1G STA, the MCS Selector field value 2 indicates that the MCS Index field specifies values that are taken from Table 24-38 (S1G MCSs for 2 MHz, Nss = 1) to Table 24-41 (S1G MCSs for 1 MHz, Nss = 4), indicating an S1G MCS for a 1 MHz channel width.

***TGah Editor: Insert the following immediately after the 4th paragraph of this sublause (#3709):***

In frames transmitted by an S1G STA, the MCS Selector field value 3 indicates that the MCS Index field specifies values that are taken from Table 24-42 (S1G MCSs for 2 MHz, Nss = 1) to Table 24-45 (S1G MCSs for 2 MHz, Nss = 4), indicating an S1G MCS for a 2 MHz channel width.

***TGah Editor: Insert the following immediately after the 6th paragraph of this sublause (#3709):***

In frames transmitted by an S1G STA, the MCS Selector field value 4 indicates that the MCS Index field specifies values that are taken from Table 24-46 (S1G MCSs for 4 MHz, Nss = 1) to Table 24-49 (S1G MCSs for 4 MHz, Nss = 4), indicating an S1G MCS for a 4 MHz channel width.

***TGah Editor: Insert the following immediately after the 8th paragraph of this sublause (#3709):***

In frames transmitted by an S1G STA, the MCS Selector field value 5 indicates that the MCS Index field specifies values that are taken from Table 24-50 (S1G MCSs for 8 MHz, Nss = 1) to Table 24-53 (S1G MCSs for 8 MHz, Nss = 4), indicating an S1G MCS for an 8 MHz channel width.

***TGah Editor: Insert the following immediately after the 10th paragraph of this sublause (#3709):***

In frames transmitted by an S1G STA, the MCS Selector field value 6 indicates that the MCS Index field specifies values that are taken from Table 24-54 (S1G MCSs for 16 MHz, Nss = 1) to Table 24-57 (S1G MCSs for 16 MHz, Nss = 4), indicating an S1G MCS for a 16 MHz channel width.

***TGah Editor: Change the last two paragraphs of this subclause as follows (#3709):***

If MCS Selector is 3, 4, 5, or 6, the MCS Index field format is as shown in Figure 8-99 (MCS Index field format when the MCS Selector field is 3, 4, 5, or 6). In frames transmitted by an S1G STA, the MCS Index field format is also valid when MCS Selector is 2.The NSS subfield indicates the number of spatial streams, and the VHT-MCS Index Row subfield indicates a value from the “VHT-MCS Index” column of

Table 22-30 (VHT-MCSs for mandatory 20 MHz, NSS = 1) to Table 22-61 (VHT-MCSs for optional 160

MHz and 80+80 MHz, NSS = 8) in 22.5 (Parameters for VHT-MCSs) or from the “MCS Index” column of Table 23-26 (TVHT MCSs for TVHT\_MODE\_1, NSS = 1) to Table 23-37 (TVHT MCSs for

TVHT\_MODE\_4C and TVHT\_MODE\_4N, NSS = 4) in 23.5 (Parameters for TVHT MCSs) that corresponds to the channel width and NSS values, or from the “MCS Idx” column of Table 24-38 (S1G MCSs for 1 MHz, Nss = 1) to Table 24-57 (S1G MCSs for 16 MHz, Nss = 4) that corresponds to the channel width and NSS values.

For non-S1G STAs the Rate field contains a 2-octet unsigned integer that specifies the PHY rate in 0.5 Mb/s units. It is reserved otherwise.