IEEE P802.11
Wireless LANs

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| LB 203 Comment Resolution for 9.42.6, and 8.9.1.8 |
| Date: 2014-08-01 |
| Author(s): |
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Abstract

This submission proposes resolutions for comments in clause 9.42.6 and 8.9.1.8 of TGah Draft 2.0 with the following CIDs (TOT 11 CIDs):

* 3039, 3358, 3359, 3360, 3361, 3659, 3660, 3800, 3801, 3802,
* 3307

Revisions:

* Rev 0: Initial version of the document
* Rev 1: Included suggested changes during and after the presentation: Moved the added exception to a note because the paragraph that precedes it already describes the normative behaviour related to this case. In addition fixed some minor inconsistencies in one of the paragraphs as per received feedback (changes are highlighted in green in this 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** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3039 | 279.28 | 9.42.6 | "value indicated by the 8 MSB of APDI field of the NDP Paging frame"The behavioural clauses should not embed structure.Also "value indicated by" is somewhat roundable. The units are not clear. | Split the APDI field, or find some way of naming the 8 MSBs in clause 8 and refer to that name from here. Clarify the units of T, or how to convert the 8 MSBs to a time value. | Revised –Agree in principle with the commenter. The proposed resolution solves the issues pointed by the commenter by clarifying that the T is expressed in units of SIFS (which is the same unit as the two components which summation provides the value of T), and specifies that the APDI field consists of a PTSF/ASD subfields and Check Beacon Flag subfield.  TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3039. |
| 3358 | 277.57 | 9.42.6 | the "receiving STA" should be "requesting STA" | As in comment | Revised -- Agree in principle with the commenter. Proposed resolution solves the inconsistency by clarifying that the partial AID is assigned to it (i.e., the requesting STA) by the intended receiver of the NDP Paging Request.TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3358. |
| 3359 | 278.26 | 9.42.6 | Tthe sentence here seems redundent with the sentence that follows on line 30. Please remove. | As in comment | Revised –Agree in principle with the commenter. However, both the sentences are needed because the former one indicates that the STA may send an NDP Paging frame in any of the scheduled TWTs while the second sentence imposes to the STA to transmit an NDP Paging frame as the first frame in a scheduled TWT if it plans to transmit any frame in that TWT.Proposed resolution is to change sentences making it clearer and removing any redundancy.TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3359. |
| 3360 | 278.50 | 9.42.6 | there are two types of "check beacon field" in the sentence. First one is one bit in the APDI field in NDP page frame. The second is one byte in the beacon and tim broadcast. Please remove "The Check Beacon field is initialized to 0 and incremented after each critical update to the Beacon frame;" and change the first remaining instance of "check beacon field" to "Check beacon bit" | As in comment | Revised –Agree in principle with the commenter. Proposed resolution accounts for the suggested changes while clarifying that the S1G Beacon frame contains the Change Sequence field rather than Check Beacon field (which is contained in a TIM Broadcast frame). TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3360. |
| 3361 | 279.33 | 9.42.6 | "wake at the next TSBTT" -->"wake at the next T(S)BTT" | As in comment | Revised –Proposed resolution accounts for the suggested change. TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3361. |
| 3659 | 279.17 | 9.42.6 | change "in the NDP paging response" to "in the NDP paging frame" | as comment | Rejected –The comment refers to the following text: “the STA shall be in the Awake state at the first TBTT that occurs after a time indicated by the Min Sleep Duration field in the NDP Paging Response after the end of reception of the NDP Paging frame to receive the S1G Beacon”.Note that the current text is correct because the Min Sleep Duration is a field of the NDP Paging Response not of the NDP Paging frame. |
| 3660 | 279.21 | 9.42.6 | change "in the NDP paging response" to "in the NDP paging frame" | as comment | Rejected –The commenter refers to the following text: “the STA shall be in the Awake state at the first DTIM that happens after a time indicated by the Min Sleep Duration field in the NDP Paging Response after the end of reception of the NDP Paging frame to receive the DTIM Beacon.”.Note that the current text is correct because the Min Sleep Duration is a field of the NDP Paging Response not of the NDP Paging frame. |
| 3800 | 277.56 | 9.42.6 | "A non-AP STA sending an NDP Paging Request to another STA, shall set the P-ID field of the NDP Paging Request to one of the partial AIDs assigned to the receiving STA"Who is receiving STA. I think it is the partial AID assigned to the STA that sends NDP paging Request. | Change the text to make it clear. | Revised –Agree in principle with the commenter. Proposed resolution is the same as for CID 3358, and inline with this coment, where we solve the inconsistency by clarifying that the partial AID is assigned to it (i.e., the requesting STA) by the intended receiver of the NDP Paging Request.TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3800. |
| 3801 | 278.40 | 9.42.6 | "The value of the P-ID field shall be set to 0 to indicate the presence of group addressed Bus"If an AID is used for group addressed frames, does the present indication of such group addressed frames use 0 in P-ID field? | Clarify it. | Revised –Agree in principle with the comenter. Proposed resolution clarifies this aspect by specifying that an exception exists to the rule i.e.,, except when a multicast AID is assigned to the group MAC address in which case the corresponding partial AID is used.TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3801. |
| 3802 | 279.33 | 9.42.6 | I assume that the non-AP STA will get the critical management information that has changed and will not need to decode TIM element. The reason is that a non-TIM STA may be a TWT STA. Also the non-AP STA may select to get the management information through Probe procedure. | Change the text per the comment. | Revised –Agree in principle with the commenter. In the proposed resolution we clarify that the STA either wakes up to receive the beacon or transmits a probe request (inline with the description in 10.46 (System information update procedure).TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3802. |

**Discussion:***None.*

* **NDP Paging Setup**

This subclause defines a protocol for power saving at a STA by using the TWT protocol to setup scheduled wakeup intervals and by defining an efficient signalling for the presence of BUs and synchronization.

For the purpose of this clause, a frame including a TWT element with the NDP Paging field present is referred to as NDP Paging Request or NDP Paging Response as clarified later. A STA sending an NDP Paging Request is referred to as NDP Paging requester. A STA sending an NDP Paging Response in a response to an NDP Paging Request is referred to as NDP Paging responder.

A STA requests an NDP Paging TWT by sending an NDP Paging Request. A non-S1G STA shall not transmit NDP Paging frames.

The setup procedure follows the protocol described in 9.42.1 (TWT overview), unless otherwise described in this subclause.

***TGah Editor: Change the paragraph below as follows (#3358, 3800):***

A non-AP STA sending an NDP Paging Request shall set the P-ID field of the NDP Paging Request to one of the partial AIDs assigned to it by the intended receiver of the NDP Paging Request (see 9.19a (Group ID, partial AID, Uplink Indication and COLOR in S1G PPDUs)).

***Note to TGah Group: The change below are mainly editorial and fix some inconsistency but are not related to any CID:***

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.

Upon receiving an NDP Paging Request, the recipient STA shall respond with an NDP Paging Response with the NDP Paging fields set as follows:

* The P-ID subfield should be set to the same value as the P-ID subfield of the NDP Paging Request.
* The Max NDP Paging Period subfield shall be set to any value that is less than or equal to the Max NDP Paging Period subfield of the NDP Paging Request.
* The Action subfield shall be set to one of the values in Table 8-240e (Action field).
* The Partial TSF Offset subfield and Min Sleep Duration subfield are reserved.

The NDP Paging setup is successful if the TWT Setup Command subfield of the Request Type field in the NDP Paging Response is equal to 4 (Accept TWT), otherwise the setup is considered as failed.

A STA that has sent an NDP Paging Response with the TWT Setup Command field equal to 4 (Accept TWT) shall schedule an NDP Paging frame as the first frame for transmission at the TWTs indicated by the NDP Paging Response, if any of the following conditions is satisfied:

* There are BUs for the requesting STA
* No NDP Paging frame was sent in the *N* consecutive preceding TWT(s), where *N* is equal to the value of the Max NDP Paging Period subfield in the NDP Paging Response.

***TGah Editor: Change the paragraph below as follows (#3359):***

The AP shall schedule an NDP Paging frame if there are critical updates to the S1G Beacon frame as defined in 10.46 (System information update procedure) and 10.2.2.17 (TIM Broadcast). An AP may additionally send an NDP Paging frame at any of the TWTs indicated by the NDP Paging Response. If the NDP Paging frame is sent by the AP to the NDP Paging requester then this frame shall precede any frame that is sent by the AP to itduring its indicated TWT SP and shall have the Direction field equal to 1.

If any frame is sent by a non-AP STA to an NDP Paging requester during its indicated TWT SP then the first frame sent shall be an NDP Paging frame with the Direction field equal to 0.

***TGah Editor: Change the paragraph below as follows (#3801):***

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.

NOTE--When a multicast AID is assigned to the corresponding group MAC address as described in 9.42i (Multicast AID) then the P-ID field can be set to the partial AID that corresponds to the multicast AID as defined in 9.19a (Group ID, partial AID, Uplink Indication and COLOR for S1G PPDUs).

***TGah Editor: Change the paragraph below as follows (#3360):***

If the Direction field of the NDP Paging frame is equal to 1, the subfields of the APDI field of the NDP Paging frame shall be set as follows:

* The PTSF subfield is set to TSF[Partial TSF Offset+4: Partial TSF Offset+11] (inclusive), where TSF is the 8 octets value of the TSF timer and Partial TSF Offset is the value of the Partial TSF Offset field in the NDP Paging Request.
* The Check Beacon Flag subfield shall be set tothe LSB of the Change Sequence field in the most recently transmitted S1G Beacon frame or of the Check Beacon field in the most recently transmitted TIM Broadcast frame, if any was sent before the NDP Paging frame.

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.

If no NDP Paging frame is received during the TWT, the TWT requester STA may transition to Doze state at the end of the Minimum 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 field 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.

Upon reception of an NDP Paging frame with the P-ID field matching the value of the P-ID field in the NDP Paging Response, the NDP Paging requester STA shall behave as follows:

* If the Action subfield of the NDP Paging Response is 0:
* If the NDP Paging requester STA is a non-AP STA, it shall send a (NDP) PS-Poll or uplink trigger frame addressed to the NDP Paging responder.
* If the NDP Paging requester STA is an AP, it shall send an NDP CTS to self with the duration field equal to zero.
* If the Action subfield of the NDP Paging Response is 1, the STA shall be in the Awake state starting at a time indicated by the Min Sleep Duration field after the end of reception of the NDP Paging frame, and it shall remain in the Awake state until a frame is received from the NDP Paging responder with the EOSP subfield equal to 1.
* If the Action subfield of the NDP Paging Response is 2, the STA shall be in the Awake state at the first TBTT that occurs after a time indicated by the Min Sleep Duration field in the NDP Paging Response after the end of reception of the NDP Paging frame to receive the S1G Beacon.
* If the Action subfield of the NDP Paging Response is 3, the STA shall be in the Awake state at the first DTIM that happens after a time indicated by the Min Sleep Duration field in the NDP Paging Response after the end of reception of the NDP Paging frame to receive the DTIM Beacon.

***TGah Editor: Change the paragraph below as follows (#3039):***

* If the Action subfield of the NDP Paging Response is 4, the STA shall be in the Awake state starting at a time *T* after the end of reception of the NDP Paging frame and it shall remain in the Awake state until a frame is received from the NDP Paging responder with the EOSP subfield equal to 1. The value of T is in units of SIFS and is equal to the value of the Min Sleep Duration field of the NDP Paging Request plus the value of the ASD subfield in the APDI field of the NDP Paging frame.

If the NDP Paging requester is an AP, values 2-7 (inclusive) of the Action subfield are reserved.

***TGah Editor: Change the paragraph below as follows (#3361, 3802):***

A non-AP STA that has setup NDP Paging and receives an NDP Paging frame with Direction field equal to 1 and the Check Beacon Flag subfield value different from the LSB of the most recently received Change Sequence value shall either be awake to receive the next S1G Beacon frame that is transmitted at a T(S)BTT or shall queue for transmission a Probe Request frame to obtain the updated system information as described in 10.46 (System information update procedure).

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3307 | 216.10 | 8.9.1.8.1 | Check Beacon field. This terminology is used only in TIM Broadcast frames. While S1G Beacon and other S1G frame have a Change Sequence field that indicates critical updates. | Make sure there is consistency in the descriptions of these sublcauses with subclauses 9.42 and 10.46. | Revised –Agree in principle with the commenter. Proposed resolution resolves the inconsistency by specifying that this subfield of the NDP Paging frame is the “Check Beacon Flag” TGah editor to make the changes showin in 11-14/1018r1 under all headings that include 3307. |

* **NDP Paging**
* **NDP\_1M Paging**

The format of the NDP MAC frame body field of the NDP\_1M Paging frame is illustrated in Figure 8-710 (NDP MAC frame body field of the NDP\_1M Paging frame).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B2 | B3         B11 | B12                    B20 | B21 | B22                    B24 |
|  | NDP MAC Frame Type | P-ID | APDI/partial AID | Direction | Reserved |
| Bits: | 3 | 9 | 9 | 1 | 3 |
| * **NDP MAC frame body field of the NDP\_1M Paging frame**
 |

The NDP MAC Frame Type field is set to 6.

The P-ID field is the identifier of the NDP Paging Requester, as described in 9.42.6 (NDP Paging Setup).

***TGah Editor: Change the paragraph below as follows (#3360, 3039, 3307):***

***Note to Editor: Organizating the paragraph as multiple items is also an instruction to be excecuted.***

If the Direction field is 1 the APDI/partial AID field indicates the APDI (AP Direction Information) where:

* The 8 MSBs of the APDI, depending on the value of the Action subfield of the NDP Paging Response, contain:
* The PTSF subfield if the Action subfield is not equal to 4.The PTSF subfield is set to the value of the partial TSF of the transmitting STA as defined in 9.42.6 (NDP Paging Setup).
* The ASD subfield if the Action subfield is equal to 4. The ASD subfieldis the additional sleep duration and is set to the time, in units of SIFS, after which the receiver STA is in Awake state as described in 9.42.6 (NDP Paging Setup).
* The LSB of the APDI is the Check Beacon Flag subfield and is an indicator of critical changes in the beacon as described in 9.42.6 (NDP Paging Setup).

If the Direction field is 0, the APDI/partial AID field indicates the partial AID of the NDP Paging Responder STA.

The Direction field is set to 1, if the NDP Paging Responder is an AP, otherwise it is set to 0.

* **NDP\_2M Paging**

The format of the NDP MAC frame body field of the NDP\_2M Paging frame is illustrated in Figure 8-711 (NDP MAC frame body field of the NDP\_2M Paging frame).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B2 | B3           B11 | B12                    B20 | B21 | B22                    B36 |
|  | NDP MAC Frame Type | P-ID | APDI/partial AID | Direction | Reserved |
| Bits: | 3 | 9 | 9 | 1 | 15 |
| * **NDP MAC frame body field of the NDP\_2M Paging frame**
 |

The NDP MAC Frame Type field is set to 6.

The P-ID field is the identifier of the NDP Paging Requester, as described in 9.42.6 (NDP Paging Setup).

***TGah Editor: Change the paragraph below as follows (#3360, 3039, 3307):***

***Note to TGah Editor: Organizating the paragraph as multiple items is also an instruction to be excecuted.***

If the Direction field is 1, the APDI/partial AID field indicates the APDI (AP Direction Information) where:

* The 8 MSBs of the APDI, depending onthe value of the Action subfield of the NDP Paging Response, contain:
	+ The PTSF subfield if the Action subfield is not equal to 4. The PTSF subfield is set to the value of the partial TSF of the transmitting STA as defined in 9.42.6 (NDP Paging Setup).
* The ASD subfield if the Action subfield is equal to 4.The ASD subfieldis the additional sleep duration and is set to the time, in units of SIFS, after which the receiver STA is in Awake state as described in 9.42.6 (NDP Paging Setup).The LSB of the APDI is the Check Beacon Flag subfield and is an indicator of critical changes in the beacon as described in 9.42.6 (NDP Paging Setup).

If the Direction field is 0, the APDI/partial AID field indicates the partial AID of the NDP Paging Responder STA.

The Direction field is set to 1, if the NDP Paging Responder is an AP, otherwise it is set to 0.

***TGah Editor: Change the table below in 8.4.2.170i (TWT element) as follows (#3039):***

|  |
| --- |
| * **Action field**
 |
| **Action**  | **Options** |
| 0 | Send a PS-Poll or uplink trigger frame |
| 1 | Wake up at the time indicated by Min Sleep Duration |
| 2 | STA to receive the Beacon |
| 3 | STA to receive the DTIM Beacon |
| 4 | Wakeup at the time indicated by the sum of the Min Sleep Duration field and the ASD subfield inthe APDI field of the NDP Paging frame |
| 5-7 | Reserved |