IEEE P802.11
Wireless LANs

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| LB 200 Comment Resolution for Clauses 8.4.2.170c and 9.45 |
| Date: 2014-01-20 |
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Abstract

This submission proposes resolutions for comments in clause 8.4.2.170c and 9.45 of TGah Draft 1.1 with the following CIDs:1129, 1130, 1131, 1253, 1254, 1255, 1256, 1257, 1422, 1527, 1528, 1955, 1956, 1957, 2148, 2297, 2298, 2567, 2916, 2917, 2934, 2935, 2937, 2951, 2959, 2960, 2961, and 2967.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1129 | 8.4.2.170c | 90 | 38 | "The Information field contains Page Period, Page Index, Page Segment Length, Page Segment Count, Page Offset, TIM Offset, and Page Bitmap fields. The total length of the Information field is 6-10 octets . " We already know this from the figure. | Delete cited text. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 1130 | 8.4.2.170c | 90 | 59 | "This field is of length 2 bits." -- this is already specified in the figure | Delete in this subclause any specification of length already defined in a figure. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 1131 | 8.4.2.170c | 91 | 12 | "16th Block" I dislike these forms, and prefer the simpler "Block 16". OK, here's it's not a big deal but it can get ugly and complicated, which is why I dislike the form. | Replace with "Block 16". | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 1253 | 9.45 | 192 | 42 | "in a BSS with large amount of associated STA" - grammar | "in a BSS with large nubmer of associated STAs" | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1254 | 9.45 | 192 | 43 | " in a Page in the" - I don't know what Page this is. Is this "page" as in "paging a sleeping STA", or "Page" as in a structure of the TIM? | Clarify. If relating to a structure quote exactly names of fields/subfields. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1255 | 9.45 | 192 | 59 | "Multiple such TIM segments may be assigned within a Page Period and" -- only frames, elements, fields, subfields & enumeration values are capitalized. | Either follow "Page Period" by field/subfiled/element etc.. or lower case it. Do this globally.Likewise other terminiology in this subclause: "Page segment", "Page Segment", "Page Offset" | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1256 | 9.45 | 193 | 50 | This equation (and others below) should be cast into something closer to the IEEE-SA style. Use short variable names, and use a where clause to define them. The issue is that by trying to include the definition of what the variable is in the variable name itself: 1. You end up with names with spaced in them, which results in ugly unnecessary parentheses, 2. You limit the amount of information you provide, in particular you are no specific as to the field and frame in which these occur. | As in comment. For example, the "Page Offset" becomes O<subscript>p</subscript>.And the "where" entry for this saysO\_p is the value of the Page Offset subfield of the xyz field of the abc element in the last Beacon frame received by the STA from its AP.OK, perhaps that level of detail is not necessary. But hopefully you can understand what I'm getting at. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CID 1256, 1257, 2960, 2961.  |
| 1257 | 9.45 | 193 | 54 | "segment end may be computed" -- please reserve normative verbs for their intended normative effect.You need not give permission (may = "is allowed to") to a device to compute anything. | either "segment end might be computed" or "segment end is computed". | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CID 1256, 1257, 2960, 2961.   |
| 1422 | 8.4.2.170c | 91 | 16 | it is not clear that the next segment count IE comes in the beacon indicated by the page period or the next DTIM. | correct the definition of the TIM offset if the next Segment count will come in the beacon indicated by the page period.In that case, TIM Segmentation IE should be also added to the table 8-39 | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 1527 | 9.45 | 192 | 61 | the last TIM Segment may not be the equal size | change the line to the following: "Each TIM segment, except the last segment, shall use a fixed length Page segment within one Page Period." | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1528 | 9.45 | 194 | 01 | How the TIM bitmap of non-supporting STAs is advertised is not clear | change the line to the following: "If a STA does not support the segmentation, it's corresponding bit in the TIM shall be included in a separate TIM element in all the Beacons irrespective of segmentation." | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1955 | 9.45 | 216 | 01 | it's" means "it is" drop the ' | replace 'it's" with "its" | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1956 | 9.45 | 216 | 05 | "... TIM Segmentation, wake up...". Drop the comma | "... TIM Segmentation, wake up...". Delete the comma | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 1957 | 9.45 | 216 | 19 | "they compute the Length of the Page segment and the corresponding TIM segment to wake up." Wake up when? Straightaway or based upon some computation? Needs a further expalnation of what is meant by "wake up". | Expand on 'wake up" | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 2148 | 8.4.2.170c | 91 | 29 | "Further, the bit sequence indicates that there is no downlink buffered data for any STA in blocks 1 to 6 and STAs in these blocks may enter doze state, avoiding waking up for the assigned TIM segment to check for downlink buffered data." The STAs need to check broadcast data before entering doze state. | Add a pre-requisite on broadcast data checking for a STA that may enter doze state | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 2297 | 8.4.2.170c | 90 | 33 | 1), It is not clear which DTIM Beacon is starting Beacon for a specific page.2), The reason that the Segment Count element in DTIM beacon may be that different segment is serviced in different period. But this makes period unnecessary. If in each period the Page Segmant Count is always same, it is not necessary to put Segment Count element in each DTIM Beacon. | Clarify it. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 2298 | 8.4.2.170c | 93 | 53 | Where is DTIM interval response for group frame reception? | Clarify it. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 2567 | 9.45 | 194 | 13 | According to 802.11 Style Guide (11/09-1034r7), the term "multicast" is deprecated in favor of "group addressed". | Replace "broadcast/multicast" by "group addressed" in 9.45. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 2916 | 9.45 | 192 | 59 | Definition, role, and difference between a TIM segment and a Page segment is not clearly explained. It needs further clarification. | As mentioned in the Comment. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 2917 | 9.45 | 193 | 41 | There are two "is" in a sentence. | Modify the sentence from "The length of Page segment assigned to each TIM segment is except for the last TIM segment is indicated by the Page Segment Length." to "The length of Page segment assigned to each TIM segment except for the last TIM segment is indicated by the Page Segment Length.". | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 2934 | 8.4.2.170c | 90 | 36 | TIM interval is undefined. Beacon interval may be a better term to use. | Change 'TIM intervals' to 'beacon intervals'. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 2935 | 8.4.2.170c | 90 | 39 | Total length of the information field should be 4-8 octets | Change the total length of the information field to 4-8 octets for each page. | RejectedResponse: The referred text is deleted due to the resolution made for CID 1129 |
| 2937 | 8.4.2.170c | 91 | 17 | Each TIM offset indicates offset for one specific page corresponding to the Segment Count element, instead of multiple pages. | Change 'the pages' to 'the associated page'. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |
| 2951 | 9.45 | 193 | 04 | It may be helpful to state that the TIM offset is zero for the case of Fig. 9-90 | As in comment. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 2959 | 9.45 | 193 | 00 | Redunant 'is' in the sentence | Delete 'is' after "...assigned to each TIM segment" | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, 2959  |
| 2960 | 9.45 | 193 | 00 | Page Segment Length is related to Length of Page Segment as: Length of Page Segment = Page Segment Length +1. The variable in the equations should the Length of Page Segment. | Change 'Page Segment Length' to 'Length of Page Segment' in the equations. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CID 1256, 1257, 2960, 2961.  |
| 2961 | 9.45 | 193 | 64 | It is helpful to add that the value of Length of Page Segmetn is obtained from the Page Segment Length field. | As in comment. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CID 1256, 1257, 2960, 2961.  |
| 2967 | 8.4.2.170c | 90 |  | The ordering of the fields is not optimum. | Reorder the fields to make them at least byte aligned. | Revised- TGah editor to make changes shown in 11-14/0090r1 under the heading for CIDs 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967  |

**CID 1129, 1130, 1131, 1422, 2148, 2297, 2298, 2934, 2937, 2967:**

***Discussions:***

CID 1129, 1130, 1131, 1422, 2148, 2297, 2967: Agree with the comments and revised accordingly.

CID 2297 clarification:

1) The beacon that carries the TIM Page Slice Count element is the starting beacon. The clarification has been added.

2) The TIM Page Slice Count is not necessarily carried by every DTIM beacon. For a page slice, it is carried by two beacons separated by the Page Period.

**Instruction to TGah Editor: make the following changes to the following subclauses:**

***Modify Table 8-24 at Page 42 Line 11 in Subclause* 8.3.3.2 *as follows:***

**Table 8-24—Beacon frame body**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 68 | ~~Segment~~ Page Slice ~~Count~~  |

|  |
| --- |
| The ~~Segment~~ Page Slice ~~Count~~ element is used for indication of ~~TIM and~~ Page ~~segment~~slices served in DTIM intervals.This element is present if dot11~~TIMSegment~~PageSlicingSupported is true. |

 |

***Modify Table 8-31 at Page 46 Line 58 in Subclause* 8.3.3.10 *as follows:***

**Table 8-31—Probe Response frame body**

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 69 | ~~Segment~~ Page Slice ~~Count~~  |

|  |  |
| --- | --- |
|

|  |
| --- |
| The ~~Segment~~ Page Slice ~~Count~~ element is used for indication of ~~TIM and~~ Page ~~segment~~slices present in DTIM intervals |

This element is present if dot11PageSlicingSupported is true. |

 |

***Modify Table 8-55 at Page 67 Line 61 in Subclause* 8.4.2.1 *as follows:***

**Table 8-55—Element IDs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Element**  | **Element ID** | **Length of indicated element (in octets)** | **Extensible** |
| ~~Segment~~ Page Slice ~~Count~~ | <ANA> | 4 to 8 |  |

**8.4.2.6 TIM element**

***Please remove the underlines below the text indicated in red and modify the paragraph starting at Page 68 Line 57 as follows:***

The Bitmap Control field is a single octet. Bit 0 of the field contains the Group Addressed Traffic Indicator bit associated with AID 0. This bit is set to 1 in TIM elements with a value of 0 in the DTIM Count field when one or more group addressed MSDUs/MMPDUs are buffered at the AP or the mesh STA. When dot11S1GOptionImplemented is false, ~~T~~the remaining 7 bits of the field form the Bitmap Offset. When dot11S1GOptionImplemented is true, bit 1 to bit 5 of the field form the ~~TIM Segment~~ Page Slice Number subfield and bit 6 and bit 7 of the field form the Page Index subfield as shown in Figure 8-109a (Bitmap Control field (when dot11S1GOptionImplemented is true)).

***Modify Figure 8-109a at Page 69 Line 10 as follows:***

B0 B1 B5 B6 B7

Group Addressed Traffic Indicator

~~TIM Segment~~ Page Slice Number

Page Index

 Bits: 1 5 2

**Figure 8-109a** -- **Bitmap Control field (when dot11S1GOptionImplemented is true)**

***Modify the paragraph starting at Page 69 Line 19 as follows:***

The ~~TIM Segment~~ Page Slice Number subfield indicates ~~the index of the~~ ~~TIM segment~~ which page slice is encoded in the Partial Virtual Bitmap field (see 9.45 (~~TIM and~~ Page Slicing~~segmentation~~)), when the value in the subfield is in the range of 0 to 30. If the value of the Page Slice Number subfield is 31, then the entire page indicated by the Page Index subfield value is encoded in the Partial Virtual Bitmap field.

**8.4.2.170c Page ~~Segment~~ Slice ~~Count~~ element**

***Modify the paragraph starting at Page 90 Line 35 as follows:***

The Page ~~Segment~~ Slice ~~Count~~ element contains ~~the~~a ~~list~~ subset of blocks from a single page, called a ~~Page~~page ~~segments~~ slice. ~~included in~~ ~~TIM~~ ~~segments~~. The STAs included in a page slice and indicated by the Page Slice element ~~that~~ ~~will be~~ are served during the ~~TIM~~beacon intervals within a ~~Page Period~~ page period, starting from the beacon that carries the Page Slice element for the page (see 9.45 (~~TIM and~~ Page Slicing~~segmentation~~)). ~~The Information field contains Page Period, Page Index, Page Segment Length, Page Segment Count, Page Offset, TIM Offset, and Page Bitmap fields. The total length of the Information field is 6-10 octets.~~ The frame format of the ~~Segment~~ Page Slice ~~Count~~ element is defined in Figure 8-401cq (~~Segment~~ Page Slice ~~Count~~ element format).

***Insert the following paragraph before the paragraph at Page 90 Line 57 as follows:***

The Page Period field indicates the number of beacon intervals between successive beacons that carry the ~~Segment~~ Page Slice ~~Count~~ element for the associated ~~Page~~ page.

***Modify the paragraph starting at Page 90 Line 57 as follows:***

The Page Index field indicates the ~~Page~~ page whose ~~segments~~ slices are served during ~~TIM~~beacon intervals within a ~~Page Period~~ page period. ~~This field is of length 2 bits.~~ A value of 01 in the Page Index ~~of 01~~ field indicates the second ~~Page~~ page out of the four pages defined in the hierarchical AID addressing (see 8.4.2.6).

The Page ~~Segment~~ Slice Length field indicates the number of blocks included in each TIM ~~segment~~ for the associated page except for the last TIM ~~segment~~. ~~This field is of length 5 bits.~~ The number of blocks in each page slice is equal to the value of the Page Slice Length field. ~~A Page Segment Length of 3 indicates the length of page segment is 4.~~ For the last TIM, the size of the last page slice, PSlast is computed as

Plength = (PBlength)\*8

PSlast = Plength - (PScount - 1)\*PSlength

where Plength is the length (in bits) of a page indicated in the Page Bitmap field, PBlength is the length of the page (in octets) indicated in the Page Bitmap field, , PScount is the value indicated in the Page Slice Count field, PSlength is the value indicated in the Page Slice Length field. For example, with a Page Bitmap field of 2 octets, a value in the Page Slice Length set to 3, and a value in the Page Slice Count set to 5, the page slice shall consists of 5 (16 – 3\*4) blocks for the last TIM, i.e., a value greater than the value indicated in the Page Slice Length field. Again, for example, with a Page Bitmap field of 2 octets, a value in the Page Slice Length set to 6, and a value in the Page Slice Count set to 3, the page slice consists of 5 (16 – 6\*2) blocks for the last TIM, *i.e*., a value lesser than the value indicated in the Page Slice Length field.

The number of blocks assigned to all the TIMs, except the last TIM, within a DTIM interval, Prem is computed as

Prem = Plength - PSlast

For every TIM, a STA computes whether its sub-block is included within a page slice using the following equation:

SBSTA = floor(AID[7:11]- BO)

where SBSTA is the sub-block with the STA AID and BO is the value indicated in the Block Offset field of the Page Slice element.

If the SBSTA is greater than the Plength or less than zero, the STA is not included in the Page Slice for the Page Period, otherwise:

* if SBSTA is greater than Prem, the page slice number for the STA indicated in the Page Slice Number field of the TIM element is equal to the value indicated in the Page Slice Count field of the Page Slice element
* otherwise, the page slice number for the STA, PSnumber, is computed as

PSnumber = floor(SBSTA/ PSlength)

***Change Figure 8-401cq in Page 90/L 47 as follows:***

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits:** |  |  |  | 2 | 5 | 5 | 5 | 4 |  3 |  |
|  | Element ID | Length | Page Period | Page Index | Page ~~Segment~~ SliceLength | Page ~~Segment~~ Slice Count | ~~Page~~ BlockOffset | TIM offset | Reserved | Page Bitmap |
| **Octets:**  | 1 | 1 | 1 |   |  | 3  |

**Figure 8-401cq—Page Slice~~Segment Count~~ element format**

***Modify the paragraphs starting at Page 91 Line 1 as follows:***

~~The Page Period field indicates the number of beacon intervals between successive beacons that carry the~~

~~Segment Count element for the associated Page page.~~

The Page ~~Segment~~ Slice Count field indicates the number of TIMs ~~segments~~ scheduled in one ~~Page Period~~ page period. This field ~~is of length 5 bits~~ ~~indicating~~ indicates a maximum of 31~~2~~ TIMs ~~segments~~ in a ~~Page Period~~ page period. ~~A Page Segment Count of 3 indicates 4 TIM segments in the Page Period~~. The maximum permitted value for the Page Slice Count field is 31.

The ~~Page~~ Block Offset field indicates the offset of the ~~Block~~  block in the first ~~Page~~  page ~~segment~~ slice from the first ~~Block~~  block in the ~~Page~~  page assigned within the ~~Page Period~~ page period. ~~This field is of length 5 bits.~~ A value of 01000 in the ~~Page~~ Block Offset field ~~of 01000~~ indicates that the first ~~Page~~ page ~~segment~~ slice starts at ~~the 16th~~ ~~Block~~ block 16, *i.e*., STAs in the second half of the ~~Page~~ page are assigned within this ~~Page Period~~ page period.

The TIM O~~o~~ffset field indicates the TIM Beacon offset for the first ~~Page~~page ~~segment~~ slice of a specific ~~Page~~page to the DTIM Beacon ~~which~~ that carries the ~~segment~~ Page Slice ~~Count~~ element~~s~~ of the assigned page~~s~~. ~~This field is of length 4 bits.~~

The Page Bitmap field indicates presence of buffered data for each of the one or more blocks in all the

assigned ~~Page~~ page ~~segments~~ slices within a ~~Page Period~~page period. A bit in the Page Bitmap field indicates information of buffered data for STAs in one ~~Block~~ block ~~in~~ of a ~~Page~~ page ~~segments~~ slice corresponding to the location of the bit in the ~~Bitmap~~bitmap. The first ~~Block~~ block indicated in the Page Bitmap field is the ~~Block~~ block indicated in the ~~Page~~ Block Offset field. Based on the number of ~~Page~~ page ~~segment~~ slices assigned to the TIMs ~~segments~~, this field is of variable length from 0-4 octets. A value of 10000001 in the Page Bitmap field ~~of 10000001~~ indicates that there is buffered data for at least one STA in the first ~~Block~~ block and at least one STA in the last ~~Block.~~block. The bit sequence also indicates that only a ~~Page~~ page ~~segment~~ slice of 8 blocks is assigned within a ~~Page Period~~page period. Further, the bit sequence indicates that there is no downlink buffered data for any STA in blocks 1 to 6 and STAs in these blocks ~~may~~ enter doze state when they have no group addressed frames, avoiding them to waking up for the assigned TIM ~~segment~~ to check for downlink buffered data. If the STAs have group addressed frames, they receive the data within the DTIM interval before entering the doze state.

**8.4.2.170k.2 S1G Capabilities info field**

***Modify Figure 8-401dg at* *Page 103, Line 3 as follows:***

 B48 B49 B50 B51 B52 B53 B54 B55

OBSS Mitigation Support

VHT Link Adaptation Capable

Fragment BA Support

Multicast ID Support

TXOP Sharing Implicit ACK S~~s~~upport

NDP PS-Poll Support~~ed~~

RAW Operation Support

~~TIM~~ ~~Segmentation~~ Page Slicing Support

Bits 1 1 1 1 1 1 1 1

**Figure 8-401dg—S1G Capabilities Info field**

***Modify Table 8-191d at* *Page 107, Line 13 as follows:***

**Table 8-191d—Subfields of the S1G Capabilities Info field *(continued)***

|  |  |  |
| --- | --- | --- |
| ~~TIM Segmentation~~ Page Slicing Support | This bit indicates support of ~~TIM~~ ~~Segmenta­tion~~ Page slicing as described in section 9.45 (~~TIM and~~ Page ~~segmentation~~Slicing). | Set to 1 if dot11~~TIMSegmentation~~PageSlicingCapa­bility is true. Set to 0 otherwise. |

|  |  |  |
| --- | --- | --- |
|  |  |  |

**CIDs 1253, 1254, 1255, 1527, 1528, 1955, 1956, 1957, 2567, 2916, 2917, 2951, and 2959:**

***Discussions:***

Agree with the comments and revised accordingly

Since the Page Slice Number field is only present in the TIM element bitmap control field for S1G STA, the entire TIM page slicing discussion must be restricted to S1G STA.

**9.45 ~~TIM and~~ Page ~~Segmentation~~Slicing**

***Modify the paragraph starting at Page 193 Line 41:***

An STA that is not an S1G STA shall not set dot11PageSlicingSupported to true.

The TIM element indicates downlink buffered data for all STAs in the BSS. However, in an S1G BSS with a large

~~amount~~ number of associated STAs corresponding to a single TIM and page, ~~it is not viable to indicate~~ a single TIM element indicating the downlink buffered data for all STAs in ~~a~~ ~~Page~~ the page can be quite large. ~~in the TIM element~~. ~~Hence, when~~ To reduce the size of the element needed to communicate buffered data status to power save S1G STAs, an S1G AP may send one portion of a page in the TIM element virtual bitmap of each Beacon if dot11~~TIMSegment~~PageSlicingSupported is true ~~an AP may fragment the~~ ~~TIM element into~~ ~~TIM segments consisting~~ as described in this subclause.

The traffic-indication virtual bitmap in a TIM includes a subset of the blocks from a single page. This subset of blocks is called a page slice and the size of the subset is indicated in the Page Slice Length field of the Page Slice element (8.4.2.170c). An example with 4 TIMs and their 4 assigned page slices ~~only of Page page segment with a subset of STA AIDs a~~is depicted in Figure 9-90 (Illustration of ~~TIM and~~ Page ~~Segmentation~~Slicing with ~~Segment~~ Page Slice ~~Count~~ element). All ~~TIM segments~~ page slices corresponding to a single Page Slice element shall have equal size except for the last ~~segment~~ page slice.

An S1G STA for which dot11PageSlicingSupported is true shall process all received TIM elements that include a Page Slice Number that matches its Page Slice Number and a page index that matches its Page Index it shall follow the rules of 10.2.2.7 (STA Operation during the contention period) if the partial virtual bitmap of any of the processed TIM elements included the value of 1 in the position corresponding to any of its AIDs.

***Modify the paragraphs starting at Page 193 Line 55 as follows:***

An S1G STA with dot11~~TIMSegmentation~~PageSlicingSupported~~Capability~~ set to true shall follow the ~~TIM~~ ~~Segmentation~~ page slicing rules as described in this subclause. An AP shall not include the bit corresponding to an S1G STA with dot11PageSlicingSupported set to false within a TIM element that has a value for the Page Slice Number field that is in the range of 0-30. An AP that has dot11PageSlicingSupported set to false shall not transmit a TIM element that has a value for the Page Slice Number field that is in the range of 0-30.

An AP with a value of true for dot11PageSlicingSupported that has any STA(s) associated that has a value of false for dot11PageSlicingSupported within a page shall include in all the short Beacons, a TIM element with Page Index field set to the corresponding page index and Page Slice Number set to 31, if there is buffered traffic for at least one of the STA(s), and shall set the bits in the virtual bitmap of that TIM for those STAs, according to the rules described in 10.2.2.6 AP Power Save operation during the CP.

For each page from which an AP with a value of false for dot11TIMPageSlicingSupported has assigned at least one AID corresponding to STA(s) for which there is buffered traffic, the AP shall include in all the short Beacons, a TIM element for that page, with Page Slice Number set to 31 and shall set the bits in the virtual bitmap of that TIM for all the STAs indicated by the Page Index field, according to the rules described in 10.2.2.6 AP Power Save operation during the CP.

An AP may include more than one ~~Multiple such~~ TIM ~~segments~~ representing different page slices within a Beacon. ~~may be assigned within a Page Periodpage period and the Segment Count element~~

~~indicates the sequence of Page page segments among scheduled TIM segments.~~ ~~The Segment Count element is~~

~~only transmitted in DTIM beacon frames.~~ An AP shall not transmit the Page Slice element in any frame other than a Beacon that has DTIM count equal to 0. Each ~~TIM~~ ~~segment~~ page slice corresponding to a TIM, except the last TIM, shall ~~use a fixed length Page segment within one Page Period~~ have a size that is equal to the Page Slice Length field indicated in the Page Slice element. However, the length of ~~Page~~ page segment may vary over multiple ~~Page Periods~~page periods. ~~Each ordered Page segment is assigned sequentially to TIM segments, where the first Page segment of a specific Page may be assigned to the DTIM segment or TIM segment indicated by~~ The AP shall transmit the first page slice in the N-th Beacon after the DTIM in which the Page Slice element appears, where N is equal to the TIM offset field. Subsequent page slices indicated in the Page Slice element appear sequentially in the following Beacons, e.g., the second slice appears in (N+1)-th Beacon after the DTIM that contained the Page Slice element. The value of zero for TIM offset corresponds to the DTIM beacon. ~~to the DTIM, second Page segment in the next TIM segment, and so on.~~ The TIMs can be flexibly scheduled for ~~Page~~page ~~segment~~slices of different pages over beacon intervals. Figure 9-90 (Illustration of ~~TIM and~~ Page ~~Segmentation~~ Slicing with Page Slice ~~Segment~~ ~~Count~~ element) is an illustration with 4 ~~Page~~ page ~~segment~~slices ~~that are assigned to~~ which appear in the DTIM Beacon ~~segment~~ and the three ~~TIM~~ ~~segments~~ following Beacons when the value in the TIM Offset field of the Page Slice element is set to 0.

***Replace Figure 9-90 in Page 194/L 12 with the following figure:***



Figure 9-90—Illustration of ~~TIM and~~ Page slicing~~Segmentation~~ with Page Slice~~Segment~~ ~~Count~~ element

***Modify the paragragph starting at Page 194 Line 34 as follows:***

The ~~Segment~~ Page Slice ~~Count~~ element indicates assignment of STAs in ~~Page~~ page ~~segment~~slices corresponding to their assigned TIMs s~~egment~~s. STAs within the assigned ~~Page~~ page segment wake up at corresponding TIM ~~segment~~ sequentially to receive buffered data from AP and access medium for uplink traffic. In order to wake up at the appropriate TBTT to receive the ~~TIM~~ Page Slice element~~segment~~, ~~the~~ a STA~~s~~ may compute the ~~Page~~ page slice ~~segment~~ assignment to the TIMs ~~segments~~ using the length of the Page Bitmap field and the value in the Page ~~Segment~~ Slice Length and Page ~~Segment~~ Slice Count fields of the Page Slice~~Segment~~ ~~Count~~ element. The length of the ~~Page~~ page ~~segment~~ slice ~~assigned~~ that appears ~~to~~ in each TIM ~~segment~~, ~~is~~ except for the last TIM ~~segment~~ identified by a Page Slice element, is indicated ~~by~~ in the Page ~~Segment~~ Slice Length field. ~~In t~~The last TIM ~~segment,~~ includes ~~all~~ the ~~remaining~~ blocks ~~that are~~ indicated by the ~~values in each corresponding~~ bits of the Page Bitmap field that have not appeared in the previous TIMs ~~shall be supported~~.

***Modify the paragragph starting at Page 195 Line 1 as follows:***

~~If a STA does not support the segmentation, it's corresponding bit in the TIM shall be included in all the Beacons irrespective of segmentation.~~

***Modify the paragragphs starting at Page 195 Line 5 as follows:***

~~The~~ An S1G STA~~s~~ supporting ~~TIM~~ ~~Segmentation~~Page Slicing, wakes up to receive ~~the~~ DTIM beacon frame ~~that~~ which contains the Page Slice~~Segment~~ ~~Count~~ element for its ~~their~~ associated ~~Page~~ page slice from the AP. The STAs check the DTIM frame comprising of the Page Bitmap field and the Block ~~bitmap~~ Bitmap fields in Page Slice~~Segment~~ ~~Count~~ element and TIM, respectively. The Page Bitmap field in the Page Slice~~Segment~~ Count element provides an early indication of buffered data for all blocks in the assigned ~~Page~~ page ~~segment~~slices. If a bit in the Page Bitmap field of the Page Slice element is set to 0, it indicates that there is no buffered data for STAs with AIDs located in the ~~Block~~ block corresponding to that bit. These STAs may return to ~~Doze~~ doze state immediately when there is no buffered group addressed data or after receiving buffered broadcast/multicast data as indicated in the DTIM. If the ~~Block~~ block bit in the Page Bitmap field is set to 1, then it indicates that there is buffered data at the AP for at least one of the STAs with AIDs in that ~~Block~~block.

For STAs that have their AIDs that correspond to a block for which the ~~with their~~ ~~Block~~ bit in the Page Bitmap field of the Page Slice element is set to 1, they compute the ~~Length~~ length of the ~~Page~~ page ~~segment~~slice and the corresponding TIM ~~segment~~ to wake up. If they are not assigned in ~~Page~~page ~~segment~~ slice 1 that is allocated to DTIM ~~segment~~, then these STAs may return to ~~Doze~~ doze state immediately or after receiving buffered broadcast/multicast data as indicated in the DTIM till their scheduled TIM ~~segment~~.

**CID 1256, 2960, 2961:**

***Discussions***:

Agree with the comment and revise accordingly.

***Modify the paragragphs starting at Page 193 Line 47 as follows:***

~~At every TIM segment except for the last TIM segment, the STAs may compute a TIM segment start and a TIM segment end values (in terms of blocks) based on the following equations:~~

~~TIM segment start = Page Offset + (Page Segment Length) × (TIM Segment Number)~~

~~TIM segment end = TIM segment start + Page Segment Length- 1~~

~~For the last TIM segment, the TIM segment start and TIM segment end may be computed based on the following equations:~~

~~TIM segment start = Page Offset + (Page Segment Length) × (TIM Segment Number)~~

~~TIM segment end = Page Offset + 8 × N -1~~

~~where N is the number of octets in the page bitmap in the Segment Count element for the associated page value of the obtained from the Page Offset field in the Segment Count element (8.4.2.170c) and the value of the TIM Segment Number obtained from the TIM Segment Number field in the Bitmap Control field of the TIM element (8.4.2.6).~~