IEEE P802.11  
Wireless LANs

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| LB203 MAC Resolution to Comments in D2.0 Subclauses 8.4.2.6 | | | | |
| Date: 2014-9-2 | | | | |
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Abstract

This submission proposes resolution to comments in subclauses 8.4.2.6. There are 8 CIDs: 3006, 3285, 3286, 3712, 3713, 3714, 3715, 3716

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** | **Page.Line** | **Clause** | **Comment** | **Propose Change** | **Resolution** |
| 3285 | 105.29 | 8.4.2.6 | Why is this "Group Addressed" added? Consider removing it. In addition, for symmetry add a figure for the Bitmap control field when dot11S1GOptionImplemented is false. | As in comment. | Revised.  Agree to the commenter in principle.  TGah editor to make the changes show in 11-14/1110r0 under all headings that include CID 3285. |
| 3714 | 105.30 | 8.4.2.6 | When AID for group addressed frames can indicate all buffered group addressed frames in the AP, it is not necessary to set bit0 to 1. | Change the text accordingly to solve the question in the comment. | Revised.  Agree to the commenter in principle.  TGah editor to make the changes show in 11-14/1110r0 under all headings that include CID 3714. |
| 3006 | 106.18 | 8.4.2.6 | "individually addressed MSDUs/MMPDUs"  The terminology REVmc uses for "MSDU or bufferable MMPDU" is "BU". | Replace with "individually addressed BUs"  Similar change at lines 22 and 26. | Reject.  The latest REVmc D3.0 is the baseline for LB203 at this time and it still contains the same terminology. However, it would be updated in the future should the terminology is changed in a later version of REVmc. |
| 3712 | 106.16 | 8.4.2.6 | AID for multicast is missing here | Change to "Bit number N indicates the status of buffered, individually addressed MSDUs/MMPDUs for the STA whose AID is N or group addressed MSDUs for the STAs who have AID with value N for the group address. | Revised.  Agree to the commenter in principle.  TGah editor to make the changes show in 11-14/1110r0 under all headings that include CID 3712. |
| 3286 | 105.62 | 8.4.2.6 | the partial virtual bitmap is sometimes called S1G Partial virtual bitmap and sometimes the dot11S1GOptionImplemented equal to true is used to refer to the same. Be consistent and use the S1G terminology when possible. Idem for the field that carries it. | As in comment. | Revised –  Agree in principle with the commenter. Proposed resolution accounts for the suggested change.  TGah editor to make the changes shown in 11-14/1110r0 under all headings that include CID 3286. |
| 3713 | 107.12 | 8.4.2.6 | Add the following sentence to the end of the paragraph: When dot11S1GOptionImplementated is true and all bits in virtual bitmap are 0 and all the bits of the Bitmap Control field are 0, the AP can select to not include the TIM element in the Beacon. | As proposed | Revised.  Agree to the commenter in principle.  TGah editor to make the changes show in 11-14/1110r0 under all headings that include CID 3713. |
| 3715 | 108.07 | 8.4.2.6 | Change "the Page Index subfield is equal to any value." to "the Page Index indicates the page of the TIM that the AIDs belong to." | As proposed | Agree to the commenter in principle.  TGah editor to make the changes show in 11-14/1110r0 under all headings that include CID 3715. |
| 3716 | 108.14 | 8.4.2.6 | "while for Method C the Partial Virtual Bitmap field is not present in the TIM element and the Length field is 3."  This may need multiple TIM elements which is not good | Change to "while for Method C the Partial Virtual Bitmap field and Bitmap Control field are not present in the TIM element and the Length field is 2." | Agree to the commenter in principle.  TGah editor to make the changes show in 11-14/1110r0 under all headings that include CID 3716. |

**[CID 3285, 3286, 3714]**

***Instruction to TGah editor: Please Change the 6th paragraph and Figure 8-122a—Bitmap Control field (when dot11S1GOptionImplemented is true) of subclause 8.4.2.6 (TIM element) in TGah D2.1 as follows:***

The Bitmap Control field is a single octet. Bit 0 of the field contains the traffic indication virtual bitmap 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 and they are not to be delivered using Multicast AID as described in 9.42i (Multicast AID). When the TIM is carried in a non-S1G PPDU, ~~T~~the remaining 7 bits of the field form the Bitmap Offset as shown in Figure 8-124a (Bitmap Control field (when the TIM is carried in a non-S1G PPDU”). When the TIM is carried in an S1G PPDU , bit 1 to bit 5 of the field form the Page Slice Number(#3386) subfield and bit 6 and bit 7 of the field form the Page Index subfield as shown in Figure 8-124b (Bitmap Control field (when TIM is carried in an S1G PPDU)).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 | B1 | B7 |
|  | Traffic Indicator | Bitmap Offset | |
| Bits: | 1 | 7 | |
| Figure 8-124a—Bitmap Control field (when the TIM is carried in a non-S1G PPDU”) | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 | | B1 B5 | B6 B7 |
|  | Traffic Indicator | | Page Slice Number | Page Index |
| Bits: | | 1 | 5 | 2 |
| **Figure 8-124b—Bitmap Control field (when dot11S1GOptionImplemented is true)** | | | | |

**TGah Editor: *Change the paragraph in D2.1 below as follows highlighted in red (#3286):***

When the TIM is carried in a non-S1G PPDU,~~T~~the traffic-indication virtual bitmap, maintained by the AP or the mesh STA that generates a TIM, consists of 2008 bits, and is organized into 251 octets such that bit number *N* (0 £ *N* £ 2007) in the bitmap corresponds to bit number (*N* mod 8) in octet number ë*N* / 8û where the low-order bit of each octet is bit number 0, and the high order bit is bit number 7. When the TIM is carried in an S1G PPDU is true, the traffic-indication virtual bitmap consists of 64*NPNB* bits and is organized into *NP* Pages where each Page consists of *NB* Blocks, each Block consists of eight Subblocks, and each Subblock consists of 8 bits (*NP*=4 and *NB*=32). Bit number *N* in the bitmap corresponds to bit number *dec*(*N*[0:2]) of the *dec*(*N*[3:5])-th Subblock of the *dec*(*N*[6:5+*n*1])-th Block of the *dec*(*N*[6+*n*1:12])-th Page, where *n*1 is log2*N*B and *N*B is power of 2. *N*[*a*:*b*] represents bits *a* to *b* inclusive of the bit number *N* and *dec*(*N*[*a*:*b*]) is the cast to decimal operator where *a* is scaled by 20 and *b* is scaled by 2*b*-*a*. The hierarchical structure of the traffic-indication virtual bitmap is as shown in Figure 8-124b (Hierarchical structure of traffic-indication virtual bitmap). Each bit in the traffic-indication virtual bitmap corresponds to traffic buffered for a specific neighbor peer mesh STA within the MBSS that the mesh STA is prepared to deliver or STA within the BSS that the AP is prepared to deliver at the time the Beacon frame is transmitted. Bit number *N* indicates the status of buffered, individually addressed MSDUs/MMPDUs for the STA whose AID is *N.* It is determined as follows:

* If the STA is not using APSD, and any individually addressed MSDUs/MMPDUs for that STA are buffered and the AP or the mesh STA is prepared to deliver them, then bit number *N* in the traffic indication virtual bitmap is 1.
* If the STA is using APSD, and any individually addressed MSDUs/MMPDUs for that STA are buffered in at least one nondelivery-enabled AC (if there exists at least one nondelivery-enabled AC), then bit number *N* in the traffic-indication virtual bitmap is 1.
* If the STA is using APSD, all ACs are delivery-enabled, and any individually addressed MSDUs/MMPDUs for that STA are buffered in any AC, then bit number *N* in the traffic-indication virtual bitmap is 1.
* Otherwise, bit number *N* in the traffic-indication virtual bitmap is 0.

**TGah Editor: *Change the paragraph in D2.1 below as follows highlighted in red (#3286):***

When dot11MultiBSSIDActivated is false and the TIM is carried in a non-S1G PPDU, the Partial Virtual Bitmap field consists of octets numbered *N*1 to *N*2 of the traffic indication virtual bitmap, where *N*1 is the largest even number such that bits numbered 1 to (*N*1× 8) - 1 in the traffic indication virtual bitmap are all 0 and *N*2 is the smallest number such that bits numbered (*N*2 + 1) × 8 to 2007 in the traffic indication virtual bitmap are all 0. In this case, the Bitmap Offset subfield value contains the number *N*1/2, and the Length field is set to (*N*2 - *N*1) + 4.

NOTE—The bit numbered 0 in the traffic indication virtual bitmap need not be included in the Partial Virtual Bitmap field even if that bit is set.

**TGah Editor: *Change the paragraphs in D2.1 below as follows highlighted in red (#3286):***

When the TIM is carried in a non-S1G PPDU, ~~I~~in the event that all bits other than bit 0 in the traffic indication virtual bitmap are 0, the Partial Virtual Bitmap field is encoded as a single octet equal to 0, the Bitmap Offset subfield is 0, and the Length field is 4. When the TIM is carried in an S1G PPDU , if all bits in virtual bitmap are 0, the Partial Virtual Bitmap field is not present in the TIM element and the Length field of the TIM element is set to 3. If all bits in virtual bitmap are 0 and all the bits of the Bitmap Control field are 0, both the Partial Virtual Bitmap field and the Bitmap Control field is not present in the TIM element and the Length field of the TIM element is set to 2.

When dot11MultiBSSIDActivated is true, the Partial Virtual Bitmap field of the TIM element is constructed as follows, where the maximum possible number of BSSIDs is an integer power of 2, *n* = log2 (maximum possible number of BSSIDs), *k* is the number of actually supported nontransmitted BSSIDs, and *k* £ (2*n* - 1).

* The bits 1 to *k* of the bitmap are used to indicate that one or more group addressed frames are buffered for each AP corresponding to a nontransmitted BSSID and are called BSS assigned identifiers (BSS AIDs). The AIDs from 1 to *k* are not allocated to a STA (in each page for an S1G STA). The AIDs from (*k* + 1) to (2*n* - 1) are reserved and set to 0 (in each page for an S1G STA). The remaining AIDs are shared by the BSSs corresponding to the transmitted BSSID and all nontransmitted BSSIDs.
* When the DTIM Count field is 0 for a BSS that has a nontransmitted BSSID, and one or more group addressed frames are buffered at the AP for this BSS, the corresponding bits from bit 1 to bit *k* is set to 1.
* Each bit starting from bit 2*n* in the traffic-indication virtual bitmap corresponds to individually addressed traffic buffered for a specific STA within any BSS corresponding to a transmitted or nontransmitted BSSID at the time the Beacon frame is transmitted. The correspondence is based on the AID of the STA.
* Based upon its knowledge of the capability of associated stations to support the multiple BSSID capability, as indicated by the corresponding field in the Extended Capabilities element and the content of the traffic indication virtual bitmap, an AP encodes the Partial Virtual Bitmap and the Bitmap Control field of the TIM element using one of the ~~two~~ three(#3130) following methods. Specifically, a~~n~~ non-S1G AP uses Method B when it determines that the bit for each associated non-AP STA in the traffic indication virtual bitmap that is reconstructed by each non-AP STA from the received TIM element encoded using Method B is set correctly. Otherwise, a~~n~~ non-S1G AP uses Method A while an S1G AP uses Method C.

Method A, ~~and~~ Method B, and Method C are described as follows:

* Method A: The Partial Virtual Bitmap field consists of octets numbered 0 to *N*2 of the traffic indication virtual bitmap, where *N*2 is the smallest number such that bits numbered (*N*2 + 1) × 8 to 2007 in the traffic indication virtual bitmap are all 0. If such a value *N*2 does not exist, that is, when not all bits in the last octet of the traffic indication virtual bitmap are equal to 0, *N*2 = 250. When using this method, the Bitmap Offset subfield value always contains the number 0, and the Length field is *N*2 + 4.
* Method B: The Partial Virtual Bitmap field consists of a concatenation of octets numbered 0 to *N*0 – 1 and octets numbered *N*1 to *N*2 of the traffic indication virtual bitmap, where *N*0 is the smallest positive integer such that *N*0 × 8 – 2*n* < 8. If *N*0 is an odd number, then *N*1 is the largest odd number such that *N*0 < *N*1 and each of the bits *N*0 × 8 to (*N*1 × 8 – 1) is equal to 0. When *N*0 is an even number, *N*1 is the largest even number such that *N*0 < *N*1 and each of the bits *N*0 × 8 to (*N*1 × 8 – 1) is equal to 0. If such a value *N*1 > *N*0 does not exist, *N*1 = *N*0. Additionally, *N*2 is the smallest integer value for which the values for bit (*N*2+1) × 8 to 2007 in the traffic indication virtual bitmap are all 0. If such a value *N*2 does not exist, that is, when not all bits in the last octet of the traffic indication virtual bitmap are equal to 0, *N*2 = 250. When using this method, the Bitmap Offset subfield contains the value of (*N*1 – *N*0)/2, and the Length field is *N*0 + *N*2 – *N*1 + 4.
* Method C: The Partial Virtual Bitmap field of the TIM that is carried in an S1G PPDU consists of a concatenation of Encoded Block subfields that contain BSS AIDs and Encoded Block subfields that contain AIDs(#3287). When using this method, the Page Slice Number subfield is equal to 31, and the Page Index subfield is equal to any value.

NOTE—When *N*1 = *N*0, Method B reduces to Method A.

**TGah Editor: *Change the paragraph in D2.1 below as follows highlighted in red (#3286):***

When the TIM is carried in an S1G PPDU, the Partial Virtual Bitmap field is constructed with one or more Encoded Block subfields if at least one bit in the traffic indication virtual bitmap is equal to 1 as shown in Figure 8-124c (Partial Virtual Bitmap field). The Encoded Block subfield consists of the Block Control subfield, the Block Offset subfield, and the Encoded Block Information subfield as shown in Figure 8-124d (Encoded Block subfield). When dot11MultipleBSSIDActivated is true, the Partial Virtual Bitmap field contains zero or more Encoded Block subfields that contain BSS AIDs.

**[CID 3712]**

***Instruction to TGah editor: Please Change the following sentence in Line 16 of page 109 in subclause 8.4.2.6 (TIM element) in TGah D2.1 as follows:***

…

Bit number *N* indicates the status of buffered, either individually addressed MSDUs/MMPDUs for the STA whose AID is *N or* group addressed MSDUs/MMPDUs for the STAs whose Mulitcast AID is *N.* It is determined as follows:

…

**[CID 3713]**

***Instruction to TGah editor: Please add the following sentence at the end of first paragraph (Line 12) of page 110 in subclause 8.4.2.6 (TIM element) in TGah D2.1 as follows:***

… An S1G AP can choose not to include a TIM element in an S1G Beacon that is transmitted at a TSBTT when all the bits in the partial virtual bitmap are 0.

**[CID 3715]**

***Instruction to TGah editor: Please Change the item c) in page 111 under subclause 8.4.2.6 (TIM element) in TGah D2.1 as follows:***

* Method C: The S1G Partial Virtual Bitmap field consists of a concatenation of Encoded Block subfields that contain BSS AIDs and Encoded Block subfields that contain AIDs(#3287). When using this method, the Page Slice Number subfield is equal to 31, and the Page Index subfield is equal to the page index of the TIM that the AIDs belong to.

**[CID 3716]**

***Instruction to TGah editor: Please Change the following sentence in Line 14-15 of page 111 in subclause 8.4.2.6 (TIM element) in TGah D2.1 as follows:***

* …
* equal to 0, the Bitmap Offset subfield is 0, and the Length field is 4 while for Method C when the Partial Virtual
* Bitmap field is not present in the TIM element then the Length field is 3 and when both the Partial Virtual Bitmap field and the Bitmap Control field are not present in the TIM element then the Length field is 2

…