IEEE P802.11
Wireless LANs

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| LB 200 comment resolutions for subclauses 8.3.4.3 and 9.20.5.6 |
| Date: 2014-03-03 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Kaiying Lv | ZTE Corp. | #9 Xifeng Road, Xi’an, Chian | +86-15319738598 | lv.kaiying@zte.com.cn |
| Bo Sun | ZTE Corp |  |  |  |
| Chittabrata Ghosh | Nokia | 2075 Allston Way, Suite 200, Berkeley, CA 94704 | +1-650-200-7566 | chittabrata.ghosh@nokia.com |

Abstract

This submission proposes comment resolutions for comments in clause 8.3.4.3 and 9.20.5.6 of TGah Draft 1.2 with the following CIDs: 1334, 1335, 1336, 1367, 1965, 2114, 2270, 2288, 2289, 2661, 2664, 2719, 2805, 2862, 2874, 2879, 2880, 2881, 2979 and 2150.

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** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 2150 | 176 | 9.20.5.6 | For sensor devices, the length of payload is similar. An optimized RAW slot allocation scheme should be provided.  |  | Revised- TGah editor to make changes shown in 11-14-366r1 under the heading for CID 2150 |

**CID 2150**

**Discussion:**

The current RA frame is flexible to indicate the resource allocation when most paged STAs have different size of buffered packets and scarcely distributed STAs in the RAW group have buffered packets.

While when most of the STAs in the RAW group have buffered packets, the total size of the slot assignment signalling will increase dramatically. For example, if 64 STAs within a block have buffered downlink packets to be transmitted within the RAW, the size of slot assignment will be 256 bytes.

In a typical sensor networking scenario, the service traffic is similar to each other, so that the length of packet is of similar size. An optimized RAW slot assignment scheme especially for sensor-only access window as a new indication mode in RA frame format is introduced to reduce the overhead of slot assignment.

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| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1334 | 8.3.4.3 |  49 | 31 | "the Resource Allocation frame contains Frame Control, Duration, TA, BSSID, ..." Unlike what it is said in the text, the figure does not show duration and TA fields. | Add the missing fields in the figure, or fix the text (seems the latter is the case). | Revised- TGah editor to make changes shown in 11-14/366r1 under the heading for CIDs 1334, 1335, 1336, 1367, 2805, 2881.  |
| 1335 | 8.3.4.3 | 50 | 21 | " ... is broadcasted." to " ... is broadcasted for." | As in the comment | Revised- TGah editor to make changes shown in 11-14/366r1 under the heading for CIDs 1334, 1335, 1336, 1367, 2805, 2881.  |
| 1336 | 8.3.4.3 | 50 | 24 | Change "...1bit ..." to "... 1 bit ...". | As in the comment  | Revised- TGah editor to make changes shown in 11-14/366r1 under the heading for CIDs 1334, 1335, 1336, 1367, 2805, 2881.  |
| 1367 | 8.3.4.3 | 49 | 26 | RA frame has some inconsistencies. In the format there is no duration field but in the description it still refers to the duration field. Also frames with no duration should be classified as PV1 to be compliant with the latest draft. And the Group Indicator field is only 1 bit and cannot be as a field of the MPDU which is expressed as multiples of octet. | Move RA frame to PV1 frames and add the Group Indicator fiedl in the Frame Control field of the RA frame. | Revised- TGah editor to make changes shown in 11-14/366r1 under the heading for CIDs 1334, 1335, 1336, 1367, 2805, 2881.  |
| 1965 | 8.3.4.3 | 49 | 28 | The described RA frame format is different from frame format shown in Figure 8-56--Resource Allocation frame format. For example, in the description, it is said there are Duration and TA field, however, in the figure, there are no such fields. | Please make the description and figure 8-56 conistent. | Revised.Revision identical to the resolution for CID 1334 |
| 2114 | 8.3.4.3 | 49 | 31 | there is no Duration and TA in Figure 8-56 | delete Duration and TA field | Revised.Revision identical to the resolution for CID 1334.  |
| 2270 | 8.3.4.3 | 49 | 45 | Very strange design of the Group Indicator field in the Resource Allocation frame in Figure 8-56: the size of all the other fields are in bytes, only the size of the Group Indicator field is in bit, just 1-bit. If looking at the entire frame design, a 7-bit padding field is needed to make the frame byte aligned. | revise the design of the Resource Allocation frame to make it byte-aligned. | Revised.Revision identical to the resolution for CID 1367. |
| 2288 | 8.3.4.3 | 49 | 31 | where is Durarion field? | Clarify it | Revised.Revision identical to the resolution for CID 1334.  |
| 2289 | 8.3.4.3 | 49 | 45 | Do other 7-bits in the octet that includes Group Indicator exist? | Update the frame format accordingly | Revised.Revision identical to the resolution for CID 1367. |
| 2661 | 8.3.4.3 | 49 | 47 | RA Frame length is not multiple of 8 | make 'Group Indicator' field 1 octet instead of 1 bit | Revised.Revision identical to the resolution for CID 1367. |
| 2664 | 8.3.4.3 | 49 | 31 | Duration and TA fields have been removed from the RA frame. | Delete the Duration and TA fields from the description of the contents of the RA frame. | Revised.Revision identical to the resolution for CID 1334. |
| 2719 | 8.3.4.3 | 49 | 45 | Group Indicator is 1 bit. Why not aligned to 1 octet | Please provide a solution to align to 1 octet for Group Indicator subfield | Revised.Revision identical to the resolution for CID 1367. |
| 2805 | 8.3.4.3 | 49 | 45 | With regard to Figure 8-56, how are word length boundaries maintained when the frame has this extra 1 bit field? | Change the length of the Group Indicator sub-field to 1 octet and reserve the un-used bits. | Revised- TGah editor to make changes shown in 11-14/366r1 under the heading for CIDs 1334, 1335, 1336, 1367, 2805, 2881.  |
| 2862 | 8.3.4.3 | 49 | 31 | The TA (Transmitter Address) field is not present in the Resource Allocation frame. | Delete the TA field from sentence (Page 49 Line 31). | Revised.Revision identical to the resolution for CID 1334.  |
| 2874 | 8.3.4.3 | 50 | 10 | The size of the Resource Allocation frame is not a octet unit.After moving the Group Indicator bit into the Frame Control field, redefine the format of the Frame Control field of the RA frame. | Move the Group Indicator bit into the Frame Control field. And, redefine the format of the Frame Control field of the RA frame | Revised.Revision identical to the resolution for CID 1367 |
| 2879 | 8.3.4.3 | 49 | 31 | "Duration" and "TA" field are not shown in Figure 8-56. It should be deleted. | Modify the sentence from "The Resource Allocation frame contains Frame Control, Duration, TA, BSSID ..." to "The Resource Allocation frame contains Frame Control, BSSID ...". | Revised.Revision identical to the resolution for CID 1334.  |
| 2880 | 8.3.4.3 | 49 | 45 | The size of RA frame is not a multiple of Bytes.It should be a multiple of Bytes. | As mentioned in the Comment. | Revised.Revision identical to the resolution for CID 1367. |
| 2881 | 8.3.4.3 | 50 | 10 | Figure 8-2 is FC for non S1G STAs. It needs further clarification why RA frame uses FC shown in Figure 8-2. | As mentioned in the Comment. | Revised- TGah editor to make changes shown in 11-14/366r1 under the heading for CIDs 1334, 1335, 1336, 1367, 2805, 2881.  |
| 2979 | 8.3.4.3 | 49 | 31 | Duration and TA fields are not present in Figure 8-56 | Remove phrase "Duration, TA" | Revised.Revision identical to the resolution for CID 1334. |

CIDs: 2150

***TGah editor: Modify the sub-clause 9.20.5.6 as the following:***

**9.20.5.6 RAW Operation with Resource Allocation frame**

***Change the following paragraph (Page 208, Lines 16-32)in the sub-clause 9.20.5.6 as follows:***

An AP indicates its intention to transmit a Resource Allocation (RA) frame by setting the Bit 1 of the RAW Type Options field in the RAW control subfield of the RAW assignment subfield of the RPS element frame to 1.

The RA frame is broadcasted ~~to~~ for intended STAs indicated by the RPS element.

An AP shall schedule the Resource Allocation frame as the first frame to be transmitted at the beginning of the RAW following the channel access rules. The beginning of the RAW is further defined in the RAW start time subfield of the RAW assignment subfield of the RPS element.

AP shall defer the transmission of the RA frame till the channel is free but since the pre-allocated RAW duration information in the RPS frame may be shortened by the delay of the transmission of the RA frame, the AP and STA shall check the transmission time of the allocated slot against the end of RAW period. If the transmission time is later than the end of RAW period, the AP and STA shall discard the instruction enforced by the RAW and follow the channel access rules defined in the specification.

The AP assigns a RAW slot to either an individual STA indicated by the Partial AID subfield or a group of STAs indicated by the Group ID subfield within the Slot Assignment field of the RA frame when Slot Assignment Mode subfield in the Frame Control field of the RA frame is set to 0. The AP assigns a RAW slot to an individual STA indicated by the Slot Assignment indication field of the RA frame when Slot Assignment Mode subfield in the Frame Control field of the RA frame is set to 1.

An intended STA identified by the RPS element should wake up before the RAW start time indicated in the RAW start time subfield of the RAW assignment subfield of the RPS element to receive the RA frame. The STA shall not access the medium during its assigned RAW with the RA indication if it fails to receive the RA frame. The STA can resume to access the channel according to the channel access rule after the RAW.

An intended STA identified by the RPS element of a RAW learns its assigned time slots for both uplink and downlink service periods according to the slot assignment subfield or the slot assignment bitmap in slot assignment indication field of the RA. The STA should be awake before the start of the slot time assign to it. ~~In an assigned RAW slot, a STA shall not access the channel for transmission if the UL/ DL bit of the Slot Assignment field of the RA frame is set to 0.~~ AP shall start the downlink transmission using the EDCA procedure at the beginning of the slot assignment if the TIM bit for the STA is 1. The STA may transmit uplink data as listed below:

* when the AP explicitly signals permission for the non-AP STA to begin UL transmission using the explicit signaling provided by SF exchange or RD protocol,
* using EDCA procedure when the AP transmits a frame to the STA with more data bit equal to 0,
* using EDCA procedure at the beginning of its slot assignment if the TIM bit for this STA is 0 and this STA has not negotiated with the AP to use the UL- Sync procedure,
* after receiving a frame sequence that contains a Sync frame if the STA has negotiated with the AP to use the UL- Sync procedure.

~~If the bit is set to 1 indicating that the AP has no DL buffered data for the STA the paged or unpaged, STA allows to access the channel based on the method illustrated for RAW operation (see 9.20.5.1)~~.

CIDs 1334, 1335, 1336, 1367, 1965, 2114, 2270, 2288, 2289, 2661, 2664, 2719, 2805, 2862, 2874, 2879, 2880, 2881, 2979 and 2150

**Instruction to TGah Editor:*make the following changes to sub-clauses 8.3.4.3 in Page 59/Lines 1~9 and move the subclause at the end of 8.7.5.3:***

8.3.4.3 Resource Allocation frame format

The Resource Allocation frame is broadcasted ~~to~~ for all STAs within a RAW Group (see 8.4.2.170b) to indicate presence of downlink buffered data for paged STAs and their assigned time slots for both uplink and downlink service periods. ~~The Resource Allocation frame contains Frame Control, Duration, TA, BSSID, RAW Group, RAW Duration, Group Indicator, Slot Assignment, and FCS fields.~~ The Resource Allocation frame has two kinds of format depending on the slot assignment mode indicated in the Frame Control field. The Resource Allocation frame formats are ~~is~~ illustrated in Figure 8-56a (Resource Allocation frame format for slot assignment mode 0) and 8-56b (Resource Allocation frame format for slot assignment mode 1).

*Please modify Figure 8-56 in Page 59/ Line 13 as follows:*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FC |  RAW Group  | BSSID | RAW Duration | ~~Group Indicator~~  | Slot Assignment 1 |  | Slot Assignment N | FCS |

Octets: 2 3 6 2 3 or 4 3 or 4 4

**Figure 8-56a—Resource Allocation frame format** for slot assignment mode 0

***Please include the following figure (Page 59, Lines 21) in the sub-clause 8.3.4.3***



Figure 8-56b Resource Allocation frame format for slot assignment mode 1

***Please modify the following figure (Page 59, Lines 34) in the sub-clause 8.3.4.3***



Figure 8-58 Slot Assignment field when slot assignment mode is set to 0 and the Group Indicator field is set to 0

***Please change the Title of figure 8-57 (Page 59, Lines 32) in the sub-clause 8.3.4.3***

Figure 8-57 Slot Assignment field when slot assignment mode is set to 0 and the Group Indicator field is set to 1

***Please add the following figure (Page 59, Lines 42) in the sub-clause 8.3.4.3***

Figure 8-58a Slot Assignment Indication field when slot assignment mode is set to 1

*Please modify the following text and Figure 8-57a in Page 58/ Line 43 as follows:*

~~The Frame Control field is as defined in 8.2.4.1 (Frame Control field) and illustrated in 8-2 (Frame Control field in frames except S1G control frames when Type is not equal to 1 or Subtype is not equal to 6).~~

The Frame Control field format of the short MAC header (Figure 8-532b – Frame Control field) for the Resource Allocation frame is shown in Figure 8-56c

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Protocol Version (1) | Type | PTID / Subtype | Slot Assignment Mode | MoreFragments | Power Management | Group Indicator | Protected Frame | End of Service Period | Relayed Frame | ACK policy |

Bits: 2 3 3 1 1 1 1 1 1 1 1

**Figure 8-56c—Frame Control field format for Resource Allocation frame**

*Please modify the paragraph in Page 59/ Line 57 as follows:*

Group Indicator of length 1 bit indicates whether any subfield of MU group is included or no subfield of MU group exists in the Slot Assignment field if Slot Assignment Mode field is set to 0.

Otherwise, it is reserved.

*Please modify the following text in Page 60/ Line 1~18 as follows:*

The Slot Assignment field contains EOM Indicator, Group ID, and Slot Start Offset for MU group of STAs as shown in Figure 8-57 (Slot Assignment field when slot assignment mode is set to 0 and the Group Indicator field is set to 1) or ~~UL / DL Indicator,~~ Partial AID, and Slot Start Offset for an assigned STA as shown in Figure 8-58 (Slot Assignment field when slot assignment mode is set to 0 and the Group Indicator field is set to 0).

If Group Indicator is set to 1, the Slot Assignment field is used for either MU group of STAs or an assigned STA, otherwise the Slot Assignment field is not used for MU group of STAs. The Slot Assignment field for MU group of STAs is located first at the beginning of the Slot Assignment fields, if exists.

~~Within the Slot Assignment field, the UL /DL Indicator indicates whether the first data transmitted in the assigned RAW slot is used for UL or DL direction. This subfield is of length 1 bit and when the bit is set to 0, it indicates DL traffic and UL traffic when the bit is set to 1.~~ Since MU MIMO is used for DL traffic, the first bit, as called EOM Indicator, for the MU group block indicates whether its following subfields are used for the last MU group when the bit is set to 1 or more MU groups exist after subfields for this MU group when the bit is set to 0.

***Please add the following paragraph (Page 60, Lines 27) in the sub-clause 8.3.4.3 as follows:***

The RA frame contains Slot Assignment Indication field to indicate to each of the STA in the RAW group the number of UL/DL slot allocations within the current RAW.

The Slot Assignment Bitmap subfield indicates the number of allocation units allocated for all STAs in the RAW group in ascending order with each 4 bits corresponding to one STA. The decimal number represented by the 4 bits indicates the number of allocation units for a STA. Eg.“0000” indicates no allocation for a STA. “0001” indicates one allocation unit for a STA. The Slot Assignment Bitmap subfield is of variable length determined by the equation as below:

The length of Slot Assignment Bitmap = (RAW End AID- RAW Start AID+1) x 4 bits,

where the RAW End AID and RAW Start AID for the RAW group are defined in 8.4.2.170b (RPS element).

The pad subfield contains 0 or 4 bits of zeros to make the total number of bits in the Slot Assignment Indication field equal to an integer number of octets.