IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB 200 Comment Resolution for Clause 9.22.5 | | | | |
| Date: 2014-09-17 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Chittabrata Ghosh | Nokia | 2075 Allston Way, Suite 200, Berkeley, CA 94704 | +1-650-200-7566 | chittabrata.ghosh@nokia.com |

Abstract

This submission proposes resolution for comments in clause 9.22.5 of TGah Draft 2.1 with the following CIDs: 3317, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3329, 3330, 3652, 3655, 3656, 3780, 3781, 3782, 3783, 3785, 4014, 4023, and 4024

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 3317 | 9.21.5 | 257 | 14 | This subclause contains multiple subclauses with normative behavior and descriptions that are not very clear and sometimes in conflict with each other. Make sure that the descriptions are consistent throughout the clause. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3327 |
| 3319 | 9.21.5.1 | 257 | 23 | The S1G Beacon frame can be transmitted every TSBTT as well | "beacon interval" => "(short) beacon interval" throughout the subclause | Accepted |
| 3320 | 9.21.5.1 | 257 | 27 | Keep consistency on how capability indication is used/signaled. An S1G STA with dot11xxxx equal to true/false shall set the XYZ field in the S1G Capabilities element it transmits to 1/0. And "An AP shall not include a non-AP STA in any RAW Group from which it has received an S1G Capabilities element with the XYZ field equal to 0. Same considerations for the use of "STA" which should refer to a "non-AP STA" or even better "TIM STA" and use one of the two terminologies either "time slot" or "RAW slot". | As in comment throughout the subclause. | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3320 |
| 3321 | 9.21.5.1 | 257 | 55 | The RAW is divided into one or more "RAW slots" rather than time slots. Please use the terminology consistently throughout the subclause. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3320 |
| 3322 | 9.21.5.1 | 258 | 5 | This paragraph and the last paragraph seem to contain some redundant information. See 9.21.5.3, 9.21.5.8 etc. Make sure there is no redundancy/conflicts across these subclauses. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3320 |
| 3323 | 9.21.5.1 | 258 | 18 | This paragraph is not very clear. Also how does the AP know whether the STA supports SST? | Make clear that the Channel Indication signaling in the RPS element follows the signaling in the SST procedure. Also clarify how the AP knows whether STA supports SST. | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3320 |
| 3324 | 9.21.5.2 | 258 | 48 | The periodic RAW is described in 9.21.5.8. Remove this last sentence and the next paragraph that follows it because they are redundant (eventually move part of it to 9.21.5.8) | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3324 |
| 3325 | 9.21.5.2 | 258 | 61 | These three paragraphs are not very clear. They should clearly specify how the AP shall set the Cross Slot Boundary field and whether the non-AP STA shall limit the duration of its frame exchange within its assigned RAW slot depending on the value of the Cross Slot Boundary value. And given that the normative behavior should be clear by now the paragraph describing Figure 9-30a can have descriptive text. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3325 |
| 3326 | 9.21.5.3 | 259 | 54 | This listing is too confusing because of all the signaling, references to Figures and redundant information. Please split the content so that it is clear that the listing specifies what x (with two items one for each if condition) is, what Noffset is. Then add a paragraph (preferrably one that precedes each figure with a brief explanation of the figures) that refers to the figures. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3326 |
| 3327 | 9.21.5.4 | 261 | 42 | This sentence should be moved in 9.21.5.1 immediately after the capability indications descriptions (i.e., in P257L37). And remove the sentence starting in P258L8: A STA that is not a member of the group..." because the description is a repetition of the entence suggested to be moved in the same sublause. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3327 |
| 3329 | 9.21.5.5 | 261 | 47 | Some typos in this subclause: e.g., remove "in" in P262L22, and replace the "an" with "the" when applicable. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3329 |
| 3330 | 9.21.5.7 | 263 | 1 | This subclause needs some polishing. Please use correct terminologies for "access the channel" identify the fields with capital letters, prepend "the" when necessary, and use reference to other procedures (e.g., BDT, RD, UL sync etc. | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 3330 |
| 3652 | 9.21.5.1 | 259 | 9 | it is better to state this rule "A STA that is not a member of the group indicated by the RAW Group subfield... the AP shall respond with a control frame." after the next paragrpah which describes channel indication in RPS element | As comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CIDs 3320 and 3327 |
| 3655 | 9.21.5.3 | 259 | 63 | Delete "otherwise" | As comment | Accepted |
| 3656 | 9.21.5.4 | 261 | 17 | why are only paged STAs allowed to access Triggerring Frame Raw? Unpaged STAs who have uplink data to transmit can send NDP PS-Poll with UDI indication set to 1. | Please clarify it | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CIDs 3656 |
| 3780 | 9.21.5.2 | 258 | 63 | Clarify whether Cross Slot Boundary field is used for backoff procedure (when the backoff counter is not 0 at the end of the allocated slot and the crossing of slot boundary is allowed, can the STA continue the backoff with the current backoff counter value?). | Add the text to clarify it | Rejected  Comment: Existing text in P265L55 already specifies the condition:  “If the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is 0, a STA shall count down backoff only in its assigned slots within the RAW. If the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is 1, the STA shall continue to count down backoff after its assigned slots.” |
| 3781 | 9.21.5.5 | 262 | 42 | Change to "the STA may continue to count down backoff after its assigned slots" | As in comment | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CIDs 3781 and 3782 |
| 3782 | 9.21.5.5 | 261 | 47 | It is not clear what is used for EDCA parameters, CW[AC] etc. in a RAW slot. Is CW[AC] in a RAW slot be set to Cwmin[AC] at the beginning of the allocated slot? Are QSRC[AC] and QLRC[AC] set to 0 at the at the beginning of the allocated slot?  The meaning of "reset and disregard the second backoff function state" in P262L45 is not clear. | Add the following text: at the beginning of the allocated slot, the STA/AP sets the CW[AC] of the secondary backoff procedure to CWmin[AC], and sets QSRC[AC] and QLRC[AC] to 0. | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CIDs 3781 and 3782 |
| 3783 | 9.21.5.6 | 262 | 51 | It is not clear how to select the EDCA parameters in RAW other than generic RAW and trigger RAW. | Add the text to clarify it | Rejected  Comment: The exsiting text mentions that the EDCA mechanism is followed as in 9.22.2 (HCF contention based channel access (EDCA)). |
| 3785 | 9.21.5 | 257 | 14 | RAW is used by other features for protection etc. However, the mandatory part of RAW is more than that, e.g. medium access rules in RAW, slot allocation, resource allocation. This make other features complicate. | Mandate core part of RAW and make other part of RAW optional. | Rejected  Comment: The core part of the RAW includes the channel access rules for STAs in RAW Group and prohibition of STAs not in RAW Group who have to set NAV for the RAW Duration; this core part is already separated from the optional features. |
| 4014 | 9.21.5.4 | 261 | 7 | The sentence "When the RAW is restricted to STAs whose AID bits in the TIM element are equal to 1 (the RAW Type field is equal to 0 and the Bit 0 of the RAW Type Options field is equal to 1 or the RAW Type field is equal to 3), paged STAs only are allowed to access the medium in the RAW, ..." appear to assume Block Bitmap encoding mode. The AID mapping mentioned in this section is not applicable if a different encoding scheme e.g. Single AID or OLB or ADE is used. | Use terms applicable to all TIM encoding modes. | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CID 4014 |
| 4023 | 9.21.5 | 258 | 12 | The intent of the sentence is not clear: "Upon receipt of any frame (e.g., PS-Poll frame or trigger frame) for the RAW duration from a STA not within the group indicated by the RAW Group subfield in the RAW Assignment field of the RPS element, the AP shall respond with a control frame." | "...respond with a control frame", what control frame? Please clarify and also rephrase the sentence to make the intent clearer. | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CIDs 3320 and 3327 |
| 4024 | 9.21.5 | 258 | 32 | Referring to the following sentence: "An S1G AP may indicate the sensor-only access window in some Beacon frames by allocating the RAW or PRAW.", how is it indicated in the RPS IE? If it is just based on the RAW Group, what makes this different from other types of devices? | Please clarify how is the sensor-only access window is signaled. | Revised  The TGah Editor to modify the text as indicated in the document  doc.: IEEE 802.11-14/1290r0 under CIDs 3320 and 3327 |

**CIDs 3317, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3329, 3330, 3652, 3655, 3656, 3780, 3781, 3782, 3783, 3785, 4014, 4023, and 4024**

**Instruction to TGah Editor: Change the existing text in subclause 9.22.5 with the following text:**

**9.22.5.1 General**

**# CID 3320 and 3327**

***Please change the paragraph in Page 260 Line 39 with the following paragraph:***

An S1G STA with dot11RAWOperationSupported equal to true shall set the RAW Operation Support field in the S1G Capabilities element it transmits to 1. An S1G STA with dot11RAWOperationSupported equal to false shall set the RAW Operation Support field in the S1G Capabilities element it transmits to 0.

***Please change the paragraph in Page 260 Line 47 with the following paragraph:***

An AP shall not include ~~the~~ a non-AP STA~~s~~ in any RAW Group from which it has received an S1G Capabilities element with the RAW Operation Support field ~~in the S1G Capabilities element~~ equal to 0 ~~in any RAW Groups~~.

***Please change the paragraphs starting in Page 260 Line 51 with the following paragraphs:***

A TIM STA with dot11RAWOperationSupported equal to false that successfully receives an RPS element from the AP it is associated shall not access the WM for the RAW duration indicated in the RPS element.

A TIM STA is in the RAW group indicated by the RAW Group subfield in the RAW Assignment field of the RPS element if the AID of the STA (*n*) is greater than or equal to the lowest AID of the STA allocated in the RAW (*N*1) and the AID of the TIM STA is less than or equal to the highest AID of the TIM STA (*N*2) allocated in the RAW (i.e., *N*1 ≤ *n* ≤ *N*2), where *N*1 is constructed by concatenating the Page Index (2 bits) subfield and the RAW Start AID (11 bits) in the RAW Group subfield of the RPS element and *N*2 is constructed by concatenating the Page Index (2 bits) subfield and the RAW End AID (11 bits) in the RAW Group subfield of the RPS element.

A TIM STA that receives an RPS element in an S1G Beacon frame transmitted by the AP with which it is associated determines the RAW timing as the RAW duration specified by RAW Slot Definition subfield in the RAW Assignment field of the received RPS element and the start time of the RAW specified by the RAW Start Time subfield in the RAW Assignment field of the received RPS element.

The RAW is divided into one or more ~~time~~ RAW slots. The Slot Duration Count subfield of the RAW Slot Definition subfield in the RAW Assignment field of the RPS element defines the duration of a ~~time~~ RAW slot in the RAW.

If the TIM STA belongs to the RAW group, it is allowed to contend for medium access at the start of the assigned ~~time~~ RAW slot (see 9.22.5.3 (Slot assignment procedure in RAW)).

The AP may allocate more than one RAW by including more than one RAW Assignment field in the RPS element within a beacon interval with different RAW parameters. The AP may also assign periodic RAWs to a group of TIM STAs where the periodicity information is indicated in the RPS element (see 8.4.2.170b (RPS element)).

The AP may assign to each TIM STA or a group of TIM STAs a ~~time~~ RAW slot inside the RAW at which the STA(s) is (are) allowed to contend for medium access. After determining its channel access ~~time~~ RAW slot assigned by the AP, the TIM STA starts to access the channel not earlier than its assigned RAW slot based on the S1G variant of EDCA (9.22.2.5a (EDCA channel access in an S1G BSS(#3130))). A TIM STA that is not a member of the RAW group indicated by the RAW Group subfield in the RAW Assignment field of the RPS element or of the RAW type implicitly indicated by the RAW Type subfield for which the RAW Group subfield is not present, shall not access the WM in the indicated channels of the RPS element or in the BSS operating channel if there are no indicated channels for duration of the RAW, except for a non-AP STA that is allowed not to check the beacon (e.g., non-TIM STA). Upon receipt of any frame (e.g., PS-Poll frame or trigger frame) for the RAW duration from a TIM STA not within the RAW group indicated by the RAW Group subfield in the RAW Assignment field of the RPS element, the AP shall respond with a control frame (e.g., NDP PS-Poll ACK frame).

An AP may further indicate on which channel(s) the SST STA(s) that are granted access to the RAW are allowed to transmit for the RAW duration, through the Channel Indication subfield in the RAW Assignment field of the RPS element (see 8.4.2.170b (RPS element)). An SST STA is an S1G STA that is associated with an AP and that chooses a subset of the allowed operating channels for the SST on which to operate when SST operation is activated by the AP as indicated in the Subchannel Selective Transmission element in Beacon frame. A value of 1 in a bit position in the Channel Activity Bitmap in the Channel Indication subfield of the RPS element indicates that operation is allowed on the BSS operating channel for the RAW duration, with any allowed operating bandwidth that includes that channel, subject to the limitations described in clause 9.42f (Subchannel Selective Transmission (SST)). Access to the channel shall be performed according to the signaling of the procedure described in 9.42f (Subchannel Selective Transmission (SST)) followed by the Channel Indication signaling in RPS element, assuming the primary channel is a channel identified by a value of 1 in one of the Channel Activity bits in the Channel Indication subfield in the RAW Assignment field of the RPS element. An AP shall not include a TIM STA that is not supporting the SST Operation in the RAW Group of an RPS element that has a Channel Indication that does not include the primary BSS operating channel(#3653).

An S1G AP may indicate the sensor-only access window in some Beacon frames by allocating the ~~RAW or~~ PRAW (9.22.5.8 Periodic RAW (PRAW) operation). During the sensor-only access window, only Sensor type STAs can access the wireless medium. ~~Both Sensor type STAs and non-Sensor type STAs can access the wireless medium outside a sensor-only access window.~~ An S1G AP may determine the duration of sensor-only access window based on the number of Sensor type STAs in its network, their expected uplink data amount and data rate and any other factors that the S1G AP chooses.

**9.22.5.2 RAW structure and timing**

**# CID 3324**

***Please change the paragraphs starting in Page 261 Line 58 with the following paragraphs:***

An AP indicates the RAW allocation and slot assignment within the RAW by including the RPS element and the TIM element in an S1G Beacon frame. ~~The AP may also indicate the presence of periodic RAW (PRAW) allocation by setting the Periodic RAW Indication subfield to 1 in the RAW Control subfield of RAW Assignment field in the RPS element (see 8.4.2.170a (RPS element)).~~

~~A STA that receives the RPS element with the Periodic RAW Indication subfield equal to 1 in the RAW Control subfield of RAW Assignment field obtains information of RAW periodicity in the PRAW Periodicity subfield. The periodicity of RAW assignment for a group of STAs indicated in the RAW Group subfield of the RAW Assignment field of RPS element is valid for a fixed number of periods indicated in the PRAW Validity subfield of the Periodic Operation Parameters subfield in the RAW Assignment field of RPS element.~~

**# CID 3327**

***Please change the paragraphs starting in Page 265 Line 9 with the following paragraphs:***

~~A TIM STA with dot11RAWOperationSupported equal to false that successfully receives an RPS element from the AP it is associated with shall not access the WM for the RAW duration indicated in the RPS element.~~

**# CID 3324**

***Please change the paragraphs starting in Page 267 Line 20 with the following paragraphs:***

The periodicity of RAW assignment for a group of STAs indicated in the RAW Group subfield of the RAW Assignment field of RPS element is valid for a fixed number of periods indicated in the PRAW Validity subfield of the Periodic Operation Parameters subfield in the RAW Assignment field of RPS element. An AP may extend current PRAW assignment by indicating the PRAW assignment with the PRAW Validity subfield value extended before it expires.

**# CID 3325**

***Please change the paragraphs starting in Page 262 Line 7 with the following paragraphs:***

~~In the RPS element, the AP indicates the Cross Slot Boundary rule for each RAW.~~ An AP allows or prohibits transmission at the end of the assigned RAW slot by using the Cross Slot Boundary subfield in the RAW Slot Definition subfield within the RAW Assignment field of the RPS element (8.4.2.170b RPS element).

If the Cross Slot Boundary subfield in the RAW Slot Definition subfield within the RAW Assignment field of the RPS element is set to 1, an STA is allowed to cross its assigned RAW slot boundary to complete the ongoing frame exchange sequence ~~is allowed to exceed boundary of its allocated time slot~~.

If the Cross Slot Boundary subfield in the RAW Slot Definition subfield within the RAW Assignment field of the RPS element is set to 0, an STA shall not transmit or cause to be transmitted a frame exchange sequence that would exceed boundary of its allocated ~~time~~ RAW slot. ~~The STA that is changing from Doze to Awake state at the start of the allocated time slot is allowed to immediately start contending for the WM without waiting until a frame sequence is detected, or until a period of time equal to the ProbeDelay has transpired.~~

As shown in Figure 9-29a (Restricted Access Window (RAW)), if the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is equal to 0, an STA shall only initiate frame transmission if the remaining time to the end of the assigned RAW slot duration is greater than or equal to the transmission time and ~~complete the transmission of a frame and~~ reception of any immediate response expected from the peer MAC entity prior to the end of the allocated slot boundary. Otherwise, it shall not initiate transmission of a frame even though the remaining slot duration is nonzero.

**# CID 3326**

***Please change the paragraph starting in Page 262 Line 56 with the following paragraph:***

The STA shall determine the index of the time slot, *i*slot, in which the STA is allowed to start contending forthe medium based on the following mapping function

*i*slot = (*x* + *N*offset) *mod N*RAW

where

~~if the RAW is restricted to STAs whose AID bits in the TIM element are equal to 1 (the RAW Type field is equal to 00 and the Bit 0 of the RAW Type Options field is equal to(#4181) 1 or the RAW Type field~~

~~is equal to 11),(#3654)~~ *~~x~~* ~~is the position index of the AID of the STA when the AIDs are arranged in ascending order and each AID is assigned with a position index, which starts from 0 (see Figure 9-29c (Illustration of the RAW slot assignment procedure (RAW restricted to STAs whose AID bits are equal to 1))); if the RAW is not restricted to STAs whose AID bits in the TIM element are equal to 1 (the RAW Type field is equal to 00 and the Bit 0 of the Raw Type Options field is equal to(#4181) 0 or the RAW Type field is equal to 11),~~ *~~x~~* ~~is the AID of the STA, otherwise (see Figure 9-29b (Illustration of the RAW slot assignment procedure (RAW not restricted to STAs whose AID bits are equal to 1)));~~

*~~N~~*~~offset represents the offset value in the mapping function, which improves the fairness among the STAs in the RAW, and the STA shall use the two least significant octets of the FCS field of the S1G Beacon frame for the~~ *~~N~~*~~offset;~~

*~~mod X~~* ~~indicates the modulo~~ *~~X~~* ~~operation.~~

* (#3654) *x* is the position index of the AID of the STA or the AID of the STA;
* *N*offset represents the offset value in the mapping function, and
* *mod X* indicates the modulo *X* operation.

The value *x* is the position index of the AID of the STA if the RAW is restricted to STAs whose AID bits in the TIM element are equal to 1 (the RAW is a Generic RAW and the Bit 0 of the RAW Type Options field is equal to(#4181) 1 or the RAW is a Triggering Frame RAW) and AIDs are arranged in ascending order each AID is assigned with a position index, which starts from 0 (see Figure 9-29c (Illustration of the RAW slot assignment procedure (RAW restricted to STAs whose AID bits are equal to 1))). Otherwise, if the RAW is not restricted to STAs whose AID bits in the TIM element are equal to 1 (the RAW is a Generic RAW and the Bit 0 of the Raw Type Options field is equal to(#4181) 0), *x* is the AID of the STA (see Figure 9-29b (Illustration of the RAW slot assignment procedure (RAW not restricted to STAs whose AID bits are equal to 1))); *N*offset represents the offset value in the mapping function that improves the fairness among the STAs in the RAW, and the STA shall use the two least significant octets of the FCS field of the S1G Beacon frame for the *N*offset.

**# CID 3329**

***Please change the paragraphs starting in Page 265 Line 37 with the following paragraphs:***

For supporting the restricted channel access control based on EDCA, an STA maintains two backoff function states. First backoff function state is used ~~in~~ outside RAW and second backoff function state is used ~~in~~ inside RAW.

Each STA performing EDCA access suspends an operation of its EDCAF at the start of each RAW and stores the value of the backoff counter, CW[AC], QSRC[AC] and QLRC[AC] as the first backoff state. At the end of the RAW, the stored first backoff function state is restored and an operation of the EDCAF is resumed. If the previously stored first backoff function state is empty, the EDCAF of an STA shall invoke a backoff procedure, even if no additional transmissions are currently queued.

If ~~a~~ the STA is participating in the RAW and has a pending MPDU, the EDCAF of the STA shall invoke a new backoff procedure for accessing the WM in the RAW using the access category indicated by the RAW\_AC subfield in an EDCA Parameter Set element. The values of the backoff and CW[AC] used in the RAW is called the second backoff function state.

If the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is 0, ~~a~~ the STA shall count down backoff only in its assigned slots within the RAW. If the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is 1, the STA shall continue to count down backoff after its assigned slots.

**# CID 3330**

***Please change the paragraphs starting in Page 266 Line 17 with the following paragraphs:***

An AP ~~indicates its intention to~~ transmits a Resource Allocation (RA) frame ~~by setting~~ if ~~the~~ Bit 1 of the RAW Type Options subfield is equal to 1 in the RAW C~~c~~ontrol subfield of the RAW A~~a~~ssignment ~~sub~~field of the RPS element. ~~frame to 1~~.

The RA frame is broadcasted ~~for intended~~ to STAs indicated by the RAW Group subfield in 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 of the RA frame is later than the end of RAW period, the AP and STA shall discard the ~~instruction enforced by the~~ information indicated in the ~~RAW~~ RPS element and follow the channel access rules defined ~~in the specification~~ outside the RAW (9.22.2 HCF contention based channel access).

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 equal to 0. The AP assigns a RAW slot to an individual STA indicated by the Slot Assignment I~~i~~ndication field of the RA frame when Slot Assignment Mode subfield in the Frame Control field of the RA frame is equal 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~~ medium access according to the channel access rule after the RAW.

An intended STA identified by the RPS element of a RAW learns its assigned ~~time~~ RAW slots for both uplink and downlink service periods according to the S~~s~~lot A~~a~~ssignment subfield or the S~~s~~lot A~~a~~ssignment B~~b~~itmap subfield in S~~s~~lot A~~a~~ssignment I~~i~~ndication field of the RA frame. The STA should be awake before the start of the RAW slot time assigned to it. The AP shall start the downlink transmission using the EDCA procedure at the beginning of the RAW slot assignment if the TIM bit for the STA in the TIM element is equal to 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 BDT (9.42d Bi-directional TXOP) or RD protocol (9.28 Reverse direction 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 (9.42c.1 Sync frame transmission procedure for uplink traffic),

—after receiving a frame sequence that contains a Sync frame if the STA has negotiated with the AP to use the UL-Sync procedure.

**# CID 3656**

***Please change the paragraph starting in Page 264 Line 49 with the following paragraph:***

AP may designate a RAW for trigger frames by setting the RAW type subfield of the RPS element to 3 (Triggering Frame RAW). When the RAW type is Triggering Frame RAW, each ~~paged~~ STA in the RAW Group is allowed to send up to one triggering frame during its assigned slot as described in 9.21.5.3 (Slot assignment procedure in RAW). In the Triggering Frame RAW, a trigger frame is limited to a QoS Null (no data) contained in a non-A-MPDU frame or a (NDP) PS-Poll frame. In the Triggering Frame RAW, the STA transmits a trigger frame to the AP not earlier than the start of its assigned RAW slot. The duration of the trigger frame exchange sequence shall not exceed a slot duration calculated by the RAW Slot Definition Subfield in the RAW Assignment field of the RPS element. And, in the Triggering Frame RAW, crossing slot boundary is not allowed.

**# CIDs 3781 and 3782**

***Please change the paragraph starting in Page 265 Line 49 with the following paragraph:***

If a STA is participating in the RAW and has a pending MPDU, the EDCAF of STA shall invoke a new backoff procedure for accessing the WM in the RAW using the access category indicated by the RAW\_AC subfield in an EDCA Parameter Set element. At the beginning of the allocated slot, the STA/AP sets the CW[AC] of the secondary backoff procedure to CWmin[AC]. The values of the backoff and CW[AC] used in the RAW is called the second backoff function state.

If the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is 0, a STA shall count down backoff only in its assigned slots within the RAW. If the Cross Slot Boundary subfield in RAW Assignment field of the RPS element is 1, the STA shall continue to count down backoff after its assigned slots.

**# CID 4014**

***Please change the two paragraphs starting in Page 264 Line 32 with the following two paragraphs:***

When the RAW is not restricted to STAs ~~whose AID bits in the TIM element are equal to 1~~ with DL BU indication in the TIM element (the RAW ~~Type field is equal to 0~~ is a Generic RAW and the Bit 0 of the RAW Type Options field is equal to 0), all STAs that belong to a RAW group are allowed to access the medium in the RAW of the RAW group, an AP assigns a time slot for each STA that belongs to the RAW group (9.22.5.3 (Slot assignment procedure in RAW)). Each STA that belongs to the RAW group shall start to contend for the WM not earlier than the start of the assigned time slot. The channel access is based on EDCA.

When the RAW is restricted to STAs ~~whose AID bits in the TIM element are equal to 1~~ with DL BU indication in the TIM element (the RAW ~~Type field is equal to 0~~ is a Generic RAW and the Bit 0 of the RAW Type Options field is equal to 1 or the RAW ~~Type field is equal to 3~~ is a Triggering Frame RAW), paged STAs only are allowed to access the medium in the RAW, after receiving a TIM element, the paged STA starts to contend for the WM not earlier than the allocated time slot within the RAW defined as the function of STA position in the TIM element and the RAW group information in the RPS element (9.22.5.3 (Slot assignment procedure in RAW)), and non-paged STAs are not allowed to access the RAW.