IEEE P802.11  
Wireless LANs

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| LB 200 cluase 9.20.5.1 comment resolution | | | | |
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Abstract

This submission proposes comment resolutions of the clause 9.20.5.1 from TGah Draft 1.0.

* CIDs: 1209, 1210, 1211, 1349, 1350, 1480, 1481, 1482, 1483, 1486, 1487, 1728, 1729, 1730, 2231, 2232, 2233, 2234, 2249, 2250, 2251, 2465, 2466, 2467, 2646, 2905

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** |
| 1209 | 171 | 9.20.5.1 | "Restricting uplink channel access to a small number ofSTAs and spreading their uplink access attempts over a much longer period of time significantly improves the efficiency ofthe utilization of the medium by reducing collisions." -- this statement is not unconditionally true, but only true given certain parameters. | Replace "improves" with "might improve" | Accepted-  Agree with the comment. |
| 1210 | 172 | 9.20.5.1 | "on DCF or EDCA."  This requires some more unpacking. S1G has its own special type of EDCA. When can an S1G STA use DCF? | Replace with "the S1G variant of EDCA (9.20.2.9)". | Revised-  A S1G STA can use either the DCF or the S1G variant of EDCA.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 1210. |
| 1211 | 172 | 9.20.5.1 | "S1G STAs can access medium" - grammar. Also, we generally use the term "wireless medium" | ".. can access the wireless medium"  Ditto line 30 | Accepted-  Agree with the comment. |
| 1349 | 171 | 9.20.5.1 | The first sentence is somewhat vague and does not state the tradeoff involved in RAW cleary. It'd be clearer if this sentence points out to the tradeoff between reducing colision and increasing average delay, for large number of clients within a BSS. Similarly, the last sentence (L38) which points out to improving fainess is (actually out of place as the last sentence in this pragarpah and) should be combined with the first sentence to give a balanced statement regarding RAW. | As in the comment | Revised-  Agree in principle.  The first sentence is not unconditionally true. See the proposed change from CID 1209. |
| 1350 | 171 | 9.20.5.1 | "... whether it belongs to the group indicated in the RAW Group field, the start time of the RAW, and the duration of the RAW." is not clear what it means to belong to the start time and duration of RAW. Does it mean "... whether it belongs to the group indicated in the RAW Group field." or "... whether it belongs to the group indicated in the RAW Group field with the specified start time and duration of the RAW."? | As in the comment | Revised-  Agree in principle.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 1350 |
| 1480 | 171 | 9.20.5.1 | RAW (restricted access window) | change it to RAW (Restricted Access Window) | Accepted-  Agree with the comment. |
| 1481 | 171 | 9.20.5.1 | "A STA" should be changed to "An STA" throughout the document | as in the comment | Rejected-  Both “A STA” and “An STA” are used in our base documents (e.g., IEEE 802.11mc D2.0). |
| 1482 | 171 | 9.20.5.1 | (2bits) should be changed to (2 bits) throughout the subclause | as in the comment | Accepted-  Agree with the comment. |
| 1483 | 172 | 9.20.5.1 | it is not clear if only SST STAs can access the RAW on other channels or any STA? | clarify if it is limited to SST STAs. If not, define a rule to not include the nonSST STAs in a RAW with channel indication that does not include the primary BSS operation Channel | Revised-  The SST operation in the RAW is limited to only SST STA.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 1483. |
| 1486 | 172 | 9.20.5.1 | "access medium" should be changed to "access the medium" | as in the comment | Revised-  Agree in principle.  See the proposed change from CID 1211. |
| 1487 | 172 | 9.20.5.1 | remove the "And" from the beginning of the line: "And both the sensor S1G..." | as in the comment | Accepted-  Agree with the comment. |
| 1728 | 171 | 9.20.5.1 | "in RPS element" needs an article. | On lines 52, 56 and 59 replace "in RPS element" with "in the RPS element". Do the same throughout the draft. | Accepted-  Agree with the comment. |
| 1729 | 172 | 9.20.5.1 | There appears to be no definition of "sensor-only access window". Define that concept in the text (without the intial caps, since this is not a frame, field, element, etc.).. | Supply a definition of "sensor-only access window" and replace "Sensor-Only Access Window" with "sensor-only access window" throughout the draft. | Revised-  Definition is not needed for all terminology  But, "Sensor-Only Access Window" should be changed to “sensor-only access window".  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 1729. |
| 1730 | 172 | 9.20.5.1 | "can access medium" both is giving a permission (not stating a physical possibility) and needs an article. | Replace "can access medium" with "may access the medium" on both lines 28 and 29. On line 31 replace "can decide on the duration of Sensor-Only" with "may determine the duration of the sensor-only". | Revised-  Agree in principle.  See the proposed change from CID 1211. |
| 2231 | 171 | 9.20.5.1 | Don't think the word "signifcantly" without quantified support is suitable to a technology standard spec, such as 802.11, as how much improvement is "significant"? | Delete the word "significantly" in the sentence in line 33 page 171. | Accepted-  Agree with the comment. |
| 2232 | 171 | 9.20.5.1 | The parameter "dot11RAWOptionActivated" is not defined. | Define "dot11RAWOptionActivated" in Annex C. | Rejected-  All MIB variables will be defined in Annex C before going to the sponsor ballot. |
| 2233 | 171 | 9.20.5.1 | What does it mean by "(short) Beacon frame"? Is it "short Beacon frame", or "shoart Beacon frame and Beacon frame"?  A similar comment to line 54 page 87 on "(short) Beacon or (Short) Probe Response frame". | Throughout the entire 11ah/D1.0 draft spec, Please clarify meanings of "(short) Beacon frame" and (Short) Probe Response frame. | Rejected-  (short) Beacon frame means either Beacon frame or short Beacon frame.  Similar wording (e.g., (QoS) Null Data frames) is used in our base documents (e.g., IEEE 802.11mc D2.0).  No changes are needed. |
| 2234 | 171 | 9.20.5.1 | The parameter "dot11RAWOperationSupported" is not defined. | Define "dot11RAWOperationSupported" in Annex C. | Rejected-  All MIB variables will be defined in Annex C before going to the sponsor ballot. |
| 2249 | 172 | 9.20.5.1 | could not find how the Channel indication field is used to indicate the channels. Mutual referencing in the sepc, but none of the places gives a clear description. Is it the same as the 8-bit Channel Activity Bitmap subfield in Figure 8-401dk in the Subchannel Selective Transmission element? | please clarify. | Revised-  Yes, the Channel Indication field description is the same as Figure 8-401dk.  It is better to add this reference.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 2249. |
| 2250 | 171 | 9.20.5.1 | The RAW assignment in RPS element is transmitted to STAs in broadcast message, in unlicensed band environment, then, even with the most robust MCS, there is still no guarantee the broadcast message will be correctly delievered, e.g., collision or interference with other RATs. Then, what happens if some of the intended STAs do not receive the broadcast message? Does it mean the allocated resources to those STAs will be wasted? and those STAs will contend for the channel access as without RAW operation? | please clarify. | Revised-  Please see the discussion shown in 11-14-0232r1 under the heading for CID 2250, 2251.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 2250, 2251. |
| 2251 | 172 | 9.20.5.1 | some fundamental questions about RAW: assign time slot to STAs; and STAs can content for channel access in the assigned time slot; how about the STAs does not support RAW, can they content too? What happens if the AP receives a packet from a STA who transmitted in a slot not assigned to him? | please clarify. | Revised-  Please see the discussion shown in 11-14-0232r1 under the heading for CID 2250, 2251.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 2250, 2251. |
| 2465 | 171 | 9.20.5.1 | "Assigning restricted uplink channel access windows to different groups of STA increases fairness." -- why? Efficiency I can see, but fairness is not clear to me | Add some justification, or delete | Accepted-  Agree in principle. The basic motivation of the RAW is not related with the fairness.  So, remove that sentence. |
| 2466 | 172 | 9.20.5.1 | Surely S1G STAs are required to use EDCA, not DCF? Ditto 174.52 | Delete "DCF or" | Revised-  A S1G STA can use either the DCF or the S1G variant of EDCA.  TGah editor to make changes shown in 11-14-0232r1 under the heading for CID 2466. |
| 2467 | 172 | 9.20.5.1 | "sensor STA", "sensor S1G STA" (also at 210.34) | "Sensor type STA" (5 instances in total) | Accepted-  Agree with the comment. |
| 2646 | 171 | 9.20.5.1 | The RAW (Restricted Access Window) concept for being is flawed and backwards. It doesn't improve fairness it makes it worse. In the presence of Interference the RAW concept only makes access worse | Remove RAW from the amendment | Rejected-  The drawback of the RAW is that a delay can be increased and fairness can be worse.  But, it still has a benefit of reducing the power consumption when many stations compete the WM simultaneously. |
| 2905 | 171 | 9.20.5.1 | "the highest AID of the STA (N2)" should be "the highest AID of the RAW (N2)". | Modify "the highest AID of the STA (N2)" to "the highest AID of the RAW (N2)". | Rejected-  N2 represents the highest AID value among STAs allocated in a RAW.  Current wording is correct. |

**Discussion:**

**CID 2250, 2251**

Comment asks to clarify the RAW operation when a STA not within a group of a RAW transmits a frame for the duration of the RAW.

The RAW can not prevent to transmit a frame in its specific duration from a non-granted STA, because it is not guaranteed that a STA always receives a RAW element.

One solution on the side of AP is that an AP should provide the specific idle period after receiving a PS-Poll frame or a trigger frame. And, don’t allow to responds with the DATA frame for a RAW duration after receiving a PS-Poll frame or a trigger frame from a non-granted STA.

**Propose:**

Revised for CID 1209, 1210, 1211, 1349, 1350, 1480, 1482, 1483, 1486, 1487, 1728, 1729, 1730, 2231, 2249, 2250, 2251, 2465, 2466, 2467, per discussion and editing instructions in 11-14/0232r1.

***TGah editor: Modify the sub-clause 9.20.5.1 as the following:***

* Restricted Access Window (RAW) Operation
* General

(#122)Restricting uplink channel access to a small number of STAs and spreading their uplink access attempts over a much longer period of time ~~significantly~~ might improve~~s~~ the efficiency of the utilization of the medium by reducing collisions. When dot11RAWOptionActivated is true, an AP may allocate a medium access interval called RAW (R~~r~~estricted A~~a~~ccess W~~w~~indow) for a group of STAs within a beacon interval and broadcast this information using (short) Beacon frame.(#908) ~~(#249)Assigning restricted uplink channel access windows to different groups of STA increases fairness.~~

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

A non-AP STA with dot11RAWOperationSupported set to true shall be able to follow the RAW procedure as described in this subclause.

An AP shall not include the STAs with RAW Operation Support field in the S1G Capabilities element set to 0 in any RAW Groups.

A STA is in the RAW group indicated by the RAW Group subfield in RAW Assignment field of ~~in~~ 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 STA is less than or equal to the highest AID of the 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 STA that receives an RPS element in a (#853)(Short) 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. ~~whether it belongs to the group indicated in the RAW Group field, the start time of the RAW, and the duration of the RAW.~~

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

If the STA belongs to the group, it is allowed to contend for medium access at the start of the assigned time slot (see 9.20.5.3).

The AP may allocate more than one RAW by including more than one RAW Assignement field in the RPS element within a beacon interval with different RAW parameters.(#911)

The AP may assign to each STA or a group of STAs a time slot inside the RAW at which the STA(s) is (are) allowed to contend for medium access. After determining its channel access time slot assigned by the AP, the STA starts to access the channel not earlier than its assigned slot based on the DCF or the S1G variant of EDCA (9.20.2.9)  ~~(#594)DCF or EDCA~~. But, a STA not within the group indicated by the RAW Group subfield in the RAW Assignment field of ~~in~~ the RPS element shall not access the WM for the RAW duration, except for a 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 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.

An AP may further indicate on which channel(s) the SST STA(s) that are granted access to the RAW are allowed to transmit, through the Channel Indication subfield in the RAW Assignment field of the RPS element (see 8.4.2.170b) which has the same definition as described in the Channel Activity Bitmap subfield in the Channel Activity Schedule field of the Subchannel Selective Transmission element (8.4.2.170l). A value of 1 in a bit position in the bitmap indicates that operation is allowed on the BSS operating channel, with any allowed operating bandwidth that includes that channel, subject to the limitations described in clause 9.46 (Subchannel Selective Transmission (SST)). Access to the channel shall be performed according to the procedure described in 9.46 (Subchannel Selective Transmission (SST)) assuming the primary channel is a channel identified by a value of 1 in one of the bitmap bits in the Channel Indication subfield in the RAW Assignment field of the RPS element. An AP shall not include the any 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 operation Channel.

An AP shall not include the STAs with RAW Operation Support field in the S1G Capabilities element set to 0 in any RAW Groups.

(#834)An S1G AP may indicate the s~~S~~ensor-o~~O~~nly a~~A~~ccess w~~W~~indow in some Beacon frames by allocating the RAW or PRAW. During the s~~S~~ensor-o~~O~~nly a~~A~~ccess w~~W~~indow, only Sensor type STA ~~sensor S1G STAs~~ can access the wireless medium. ~~And b~~Both Sensor type STA ~~sensor S1G STAs~~ and non-Sensor type STA ~~non-sensor S1G STAs~~ can access the wireless medium outside s~~S~~ensor-o~~O~~nly a~~A~~ccess w~~W~~indow. An S1G AP may determine ~~can decide on~~ the duration of s~~S~~ensor-o~~O~~nly a~~A~~ccess w~~W~~indow based on the number of Sensor type STAs ~~sensor STAs~~ in its network, their expected uplink data amount and data rate and any other factors that the S1G AP chooses.