IEEE P802.11
Wireless LANs

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| LB 203 Comment Resolution for 10.2.2.20 |
| Date: 2014-08-01 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Alfred Asterjadhi | Qualcomm Inc. | 5775 Morehouse Dr, San Diego, CA 92109 | +1-858-658-5302 | aasterja@qti.qualcomm.com |

Abstract

This submission proposes resolutions for comments in clauses 10.2.2.20 of TGah Draft 2.0 with the following CIDs (TOT 9 CIDs):

* 3181, 3409, 3505, 3599, 3600, 3601, 3858, 3859, 3860

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Changed the resolution for CID 3859 from Rejected to Revised after accounting for some received feedback. In addition there have been a couple of changes in the proposed resolution cells for certain CIDs and also fixed one reference (changes are highlighted in green in this document)

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** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3181 | 327.5 | 10.2.2.20 | This statement requires the AP that goes to power save also implement RAW. But what if AP does not implement RAW? It makes more sense to have this statement as a recommendation. | Change "shall" to "should". | Revised –Agree with the commenter. Proposed resolution is inline with the suggested change. TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3181. |
| 3409 | 327.5 | 10.2.2.20 | "An AP that transmits an S1G Beacon frame with AP PM subfield equal to 1 shall include an RPS element in the S1G Beacon frame that includes an omni RAW during which all STAs are allowed to access (i.e., the RPS element contains a RAW Assignment field with RAW Type field equal to 3 and RAW Type Options subfield equal to 2). The omni RAW may be used for association of new STAs."Why "shall" the AP transmit an omni RAW in this case? Are other RAWs not recommended in PS mode of the AP when AP PM subfield is equal to 1? | Please clarify whether other types of RAWs are allowed with PS mode of the AP. | Revised –Proposed resolution is the same as for CID 3181 which changes “shall” to “should” and should address the first question of the commenter.As for the second question please note that the RAW is allocated so that STAs that are not associated with the AP can send their association request frames. The omni RAW serves precisely for this purpose as all STAs are allowed to access during this RAW. Other types of RAWs are scheduled to differentiate the traffic that is generated by associated STAs (for example SST RAW can be accessed by SST STAs, Triggering RAW can be accessed by TIM STAs to transmit PS-Poll frames and so on). TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3409. |
| 3505 | 327.1 | 10.2.2.20 | "starting at any TWT start time, and for the following" -- but what for the following? | Replace "start time, and for the following" with "start time and continuing for the folloiwing" | Revised –Agree with commenter that the current wording is somewhat confusing. Proposed change clarifies that the intervals of time in this case refer to any TWT SPs (which is the current terminology used in Subclause 9.42) that are negotiated according to TWT operation.TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3505. |
| 3599 | 326.30 | 10.2.2.20 | In 10.2.2.20 first paragraph it is specified as "S1G AP", but in further paragraphs its just "AP". | Remove restriction of an S1G AP. | Revised –Agree in principle with the commenter. The AP Power management is currently defined only for S1G STAs and this is reflected by the fact that the MIB variable dot11APPMActivated is defined for S1G STAs only. Hence, we account for the suggested change by the commenter but for better clarity we also add the following: “This Subclause describes AP power management procedure for an S1G AP.”TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3599. |
| 3600 | 327.17 | 10.2.2.20 | AP may reject association or reassociation due to MAD element, but I don't see any reject status code for this. It would be good to communicate this to the STA. | Add a status code to Table 8-53 (REVmc/D3.0) to communicate a rejected association/reassociation due to MAD element | Revised –Agree with the commenter. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3600. |
| 3601 | 327.23 | 10.2.2.20 | AP may dissociate due to MAD element, but I don't see any status code for this. It would be good to communicate this reason to the STA. | Add a status code to Table 8-53 (REVmc/D3.0) to communicate that the dissociation is due to MAD element | Revised –Agree with the commenter. Proposed resolution accounts for the suggested change. TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3601. |
| 3858 | 326.45 | 10.2.2.20 | It seems the AP indicates that it is in power save mode by setting AP PM to 1 and additionally include RPS element with Simplex RAW indication and 0 RAW Type Option indication. | Change the sentence per the comment. | Revised –Actually the AP indicates that is in power save mode using any of the two signalings, i.e., setting the AP PM bit to 1 or setting up one ore more RAWs of type AP PM RAW. The proposed resolution is to clarify this by specifying that any of the two signallings can be used by the AP and also clarifying that the RAW is an AP PM RAW inline with the description available for RPS element in 8.4.2.170a. TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3858. |
| 3859 | 326.28 | 10.2.2.20 | It is not clear how a power save STA receives the buffered frames from a power save AP. | Add the related text. | Revised –Agree in principle with the commenter. This subclause describes the procedure that an AP follows to declare that it is going to be in PS mode for certain intervals of time. The procedures that a STA follows to receive DL BUs from the AP depend on which procedure the STA has chosen to follow during its association (and eventually negotiated) with the AP. For example a TWT STA follows the procedure in 9.42 (Target wake time), a non-TIM STA follows the procedures in 9.43 (non-TIM STA operation) an SST STA follows the procedures in 9.47 (Subchannel Selective Transmission (SST)) and so on. However, an AP that goes to sleep during a (short) beacon interval for a given interval of time shall do so in a deterministic way if it has not included a RAW element with an omni RAW. This way non-AP STAs know when to be able to communicate with the AP. The proposed resolution is to specify that the AP stays awake immediately following the transmitted S1G Beacon for a period of time of (short) beacon interval minus dot11MaxAwayDuration.TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3859. |
| 3860 | 326.60 | 10.2.2.20 | It is not good to make AP power save to depend on RAW/TWT. | Add a simple functionality to make AP power save to be independent with RAW/TWT. | Revised –Agree in principle with the comment. However, note the paragraph to which this comment applies doe not imply that the AP power save is dependent on RAW or TWT. The paragraph simply clarifies that an AP intending to go in power save for the beacon interval that has signalled RAWs or negotiated TWTs need to respect the scheduled RAW/TWTs and be awake to communicate with the STAs for which these intervals of time are setup. However, there is one statement that currently requires an AP that goes to sleep to schedule an omni RAW (P327P5). And inline with proposed resolution for CID 3181, and with this comment, the suggested change is to have the scheduling of the omni RAW as recommended rather than mandatory behavior.TGah editor to make the changes shown in 11-14/1019r1 under all headings that include CID 3860. |

* **AP Power management**

***TGah Editor: Change the paragraphs below as follows (#3599):***

This subclause describes AP power management procedure for an S1G AP.

An AP with dot11APPMActivated equal to true may operate in the following Power Management modes:

* Active
* Power save

An AP in active (#3442) mode shall be in Awake state and may receive frames at any time.

An AP with dot11APPMActivated equal to true in Power Save mode may be in any of the following two power states:

* Awake
* Doze

***TGah Editor: Change the paragraph below as follows (#3858):***

The AP with dot11APPMActivated equal to true may indicate that it is operating in Power Save mode by either:

* Setting the AP PM bit in the Frame Control field of the S1G Beacon frame to 1
* Including one or more RPS elements in the S1G Beacon frame that indicate AP PM RAWs (i.e., with the RAW Assignment Type equal to Simplex RAW and RAW Type Options equal to 0)

The AP shall operate in active (#3442) mode during a beacon interval or short beacon interval if the AP PM subfield in the S1G Beacon frame transmitted at the T(S)BTT is equal to 0. Similarly, the AP shall operate in active (#3442) mode during one or more RAWs defined by an RPS element with the RAW Assignment type equal to Generic RAW, Sounding RAW, Triggering Frame RAW or Simplex RAW with RAW Type Options equal to 1 or 2.

***TGah Editor: Change the paragraph below as follows (#3505):***

An AP that transmits an S1G Beacon frame with AP PM subfield equal to 1 may be in Doze state at any time until the next T(S)BTT, except that it shall be in Awake state during any of the following intervals of time:

* Any RAW or PRAW intervals that are setup according to 9.21.5 (Restricted Access Window (RAW) Operation), except for RAWs that are defined by any RPS element with RAW Assignment Type equal to Simplex RAW and RAW Type Options equal to 0
* Any TWT SPs that are negotiated according to 9.42 (Target wake time (TWT))

***TGah Editor: Change the paragraph below as follows (#3181, 3409, 3860, 3859 Ed):***

An AP that transmits an S1G Beacon frame with AP PM subfield equal to 1 should include an RPS element in the S1G Beacon frame that includes an omni RAW during which all STAs are allowed to access (i.e., the RPS element contains a RAW Assignment field with RAW Type field equal to 2 and RAW Type Options subfield equal to 2). The omni RAW may be used for association of new STAs. The AP that does not include the RPS element with the omni RAW, shall be awake for an amount of time not less than (short) beacon interval minus dot11MaxAwayDuration immediately following the S1G Beacon frame..

An AP shall not be in Doze state for a duration of time that exceeds the value of the dot11MaxAwayDuration. The AP shall set dot11MaxAwayDuration to the lowest value obtained from the Max Away Duration field that is contained in the most recently received MAD elements from any of its associated STAs.

An AP may reject an the association or reassociation request from a STA if it considers the STA's value of the Max Away Duration field of the MAD element included in the (Re-)Association Request frame to be unacceptable. For example, an AP that schedules to be in Doze state for 100 ms can reject association of a STA that indicates in the Association Request frame a value of 30 ms in its Max Away Duration field.

An AP may disassociate an STA based on the value indicated by Max Away Duration of the latest MAD element received from that STA.

An AP may include a MAD element in the (Re-)Association Response or Probe Response frame that indicates the suggested maximum away duration during which the AP can be considered in Doze state.

An STA may include a MAD element in the Probe Request or (Re-)Association Requests frames.

Irrespective of the Power Management mode and Power States, an AP shall maintain the synchronization of the network by generating beacons as described in clause 10.1.3 (Maintaining synchronization).

A STA that is the intended receiver of a frame transmitted by an AP that has the PM Mode subfield equal to 0 shall consider the AP in active (#3442) mode.

An AP that has previously sent a frame to one or a group of STAs with PM bit equal to 0, shall send a frame with PM bit equal to 1 to the same set of STAs before changing its operation mode to Power Save mode.

A STA that is the intended receiver of a frame transmitted by an AP that has the PM Mode subfield equal to 1 shall consider the AP in Power Save mode.

***TGah Editor: Insert the following rows (ignoring the header row) into Table 8-53 (#3600, 3601):***

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| **Table 8-53 Status code** |
| **Status Code** | **Name**  | **Meaning** |
| <ANA> | REJECTED\_MAX\_AWAY\_DURATION\_UNACCEPTABLE | Association denied/disassociated because the suggested value for max away duration is unacceptable |