IEEE P802.11
Wireless LANs

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| LB 200 Comment Resolution for Clause 9.50 |
| Date: 2014-01-31 |
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Abstract

This submission proposes resolutions for comments in clause 9.50 of TGah Draft 1.0 with the following CIDs:

1269, 1359, 1389, 1934, 1935, 1936, 1937, 2965

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** |
| 1269 | 210.52 | 9.50 | "The indications described in this clause allow a STA to indicate such limitations toanother STA that intends to communicate with it, so that operations can be performed successfully"These indications do not guarantee success, only reduce failure. | Embrace your pessimistic side and reword this to a "glass half empty" statement. | Agree with the commenter.Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |
| 1359 | 210.48 | 9.50 | What if an AP does not want to deal with STAs whose dot11S1GActivityEnabled is set to true? Should AP rejects their association request? Or should there be a capability bit where AP annonces support for such STAs? | Provide a capability bit for AP to annonce its support for energy-limited devices, and clarify that such STAs should check this capability before deciding to associate with an AP. | Proposed resolution is to allow an AP that supports only non-Sensor STAs to deny association or disassociate them if it wants to. However, an AP that supports Sensor STAs must support these energy limited STAs.Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |
| 1389 | 210.48 | 9.50 | Using transmitter STA and receiver STA makes it a little bit confusing. Probably better to identify the energy limited STA with a denomination of Energy Limited (EL) STA. | As in comment. | See discussion. Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |
| 1934 | 232.48 | 9.50 | I think 9.50 should be in Clause 10 | Move to Clause 10 if appropriate | Accepted –TGah Editor to make changes proposed by the commenter. |
| 1935 | 232.52 | 9.50 | "The indications described in this clause allow a STA to indicate such limitations to another STA that intends to communicate with it, so that operations can be performed successfully." Does not read well | Replace cited text with "A STA may indicate such limitations. " | Agree with the commenter.Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |
| 1936 | 232.60 | 9.50 | "A transmitter S1G STA receiving an Activity Specification element from a receiver S1G STA shall not transmit to the receiver STA, or cause the receiver STA to transmit, a unicast PPDU that would exceed a time of Max Awake Interval following the most recent transition of the STA from Doze to Awake state as known at the transmitter." It starts off badly and then ends incomprehensible. Which STA for the Doze to Awake state, either? | Replace cited text with "A S1G STA that receives an Activity Specification element from another S1G STA shall not transmit to that STA, or cause that STA to transmit, a unicast PPDU that would exceed a time of Max Awake Interval following the most recent transition of either STA from Doze to Awake state as known by the other STA" Still not happy with this as I do not understand what the last part was trying to say | See discussion. Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |
| 1937 | 233.10 | 9.50 | Here we go again , a 'transmitter STA receiving"??? How can this be. Either a STA is transmitting or receiving. Do you mean a STA that ready to transmit, or a STA that has received? The use of 'transmitter STA' and 'reciver STA' is not correct and in places reads silly. Need to go through this entire subclause and say exactly what is meant. | Go through this clause and get rid of 'transmitter STA' and "receiver STA". A 'transmitter STA' is either a STA that is transmitting' or simply "STA" . The reciever STA in most cases is "another STA' . Anyway, please sort it out. | See discussion. Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |
| 2965 | 211.08 | 9.50 | (S)TBTT' should be 'T(S)BTT' | change '(S)TBTT' to 'T(S)BTT' | Agree with the commenter.Revised – TGah editor to make changes shown in 14/0213r0 under the heading for CIDs from 1269 to 2965. |

**Discussion:** *CIDs 1389, 1936, and 1937- the commenters are right that the terminology used throughout this subclause (receiver STA and transmitter STA) is confusing and generates certain ambiguity. Proposed resolution is to be inline with commenters’ suggestions to differentiate the two STAs: i.e., to identify the energy limited STA as an EL STA which replaces the receiver STA throughout the subclause. Similarly, the transmitter STA is referred to as S1G STA.*

* **Support for energy limited STAs**

**Instructions to TGah Editor*: Change this subclause as follows:***

An energy limited (EL) STA is an S1G STA with dot11S1GActivityEnabled set to true that is powered by a small energy supply and is limited in terms of its ability to transmit or receive in certain intervals of time. An EL STA may indicate these limitations to an S1G STA that intends to communicate with it by using the signalling described in this subclause. The procedure described below increases the likelihood that frame exchanges between these two STAs are performed successfully.

 An EL STA shall include an Activity Specification element in Probe Request and (Re) Association Request frames and may send Activity Specification frames.

An S1G AP that sets the STA Type Support in the S1G Capabilities element to 2 (i.e., supports only non-Sensor type STAs or that changes support from Sensor type STAs to non-Sensor type STAs), as described in 9.49 (Sensor Only BSS), may refuse (re) association or can disassociate an EL STA. The S1G AP that refuses (re) association or disassociates an EL STA shall set the Status code field in the (Re) Association Response or in the Disassociation frame to ENERGY\_LIMITED\_OPERATION\_NOT\_SUPPORTED.

An S1G STA receiving an Activity Specification element from an EL STA shall not transmit to the EL STA, or cause the EL STA to transmit, a unicast PPDU that would exceed a time of Max Awake Interval following the most recent transition of the EL STA from Doze to Awake state as known at the S1G STA.

The S1G STA estimates the time of the most recent transition of the EL STA from Doze to Awake state based on the latest of the following events:

* the time a PS-Poll or trigger frame sent by the EL STA is received by the S1G STA
* the start of a TWT for the EL STA, setup with the S1G STA
* the start time of a RAW slot in a RAW scheduled for the EL STA by the S1G STA
* a T(S)BTT at which the EL STA shall receive a (Short) Beacon

An S1G STA receiving an Activity Specification element from an EL STA shall not schedule a transmission of a unicast PPDU intended for the EL STA, or cause the EL STA to transmit a unicast PPDU, before a Recovery Time interval has expired since the EL STA’s last transition to Doze state, as known at the S1G STA. An EL STA may indicate the Recovery time interval by including the Recovery time interval in the Duration field of an NDP (Modified) ACK frame with Duration Indication set to 1.

The S1G STA estimates the time the EL STA transition to Doze state based on the latest of the following events:

* the reception of an acknowledgment for a transmission to the EL STA of a Buffered Unit sent in response to a PS-Poll generated by the EL STA
* the reception of an acknowledgment for the transmission to the EL STA of a frame with EOSP field set to 1
* the reception of an NDP (Modified) ACK sent by the EL STA that has a Duration Indication set to 1 and a non-zero value of the Duration field which is sent as a response to a frame generated by the STA
* the end of Adjusted Wake Time for a TWT for the EL STA setup with the S1G STA
* the end time of a RAW slot in a RAW scheduled for the EL STA by the S1G STA
* the end of a (Short) Beacon’s transmission that the EL STA is scheduled to receive
* the end of group addressed BU(s)’s transmission the EL STA is scheduled to receive following a DTIM.

When the S1G STA cannot complete frames exchanges within Max Awake Interval, a new back-off procedure is invoked after stopping the current transmission.

**Instructions to TGah Editor*: Add the following row in Table 8-42 Status codes:***

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| * **Status codes**
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| **Status code** | **Name** | **Meaning** |
| 104 | ENERGY\_LIMITED\_OPERATION\_NOT\_SUPPORTED | Re (association) refused or disassociated because energy limited operation is not supported at the AP. |
| 105–65 535 |  | Reserved |