IEEE P802.11  
Wireless LANs

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| Comment TGah D1.0 Comment Resolutions for Subclause 8.4.1.6 | | | | |
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Abstract

This document provides resolutions for CID 1081, 1082, 1083, 1084, 1085, 1380, 2123, 2400, 2402, 2404, 2728, 2777.

The changes are in the following subclause: 8.4.1.6.

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# 0 Revision Notes

R0: First draft

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1081 | 8.4.1.6 | 62 | 47 | "non-S1G BSS and Short Beacon Interval for S1G BSS" -- but ListenInterval is a property of the STA, not the BSS | BSS -> STA (twice), and insert missing articles. | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 1081. |
| 1082 | 8.4.1.6 | 62 | 48 | "is used to dictate to a STA," -- Dictation is something that happens in language lessons. Unless the AP is trying to teach the STA a language, recommend that it avoid dictation. | Express outcome in terms of non-AP STA behavior. | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 1082. |
| 1083 | 8.4.1.6 | 62 | 63 | " Bit Encoding" -- ah, a truly important concept, so important that it has to be capitalized as a hint that us lesser mortals should speak it only in suitably reverent tones. | Or if that is not the intent, lower case it.  Read the WG11 style on capitalization. Basically proper nouns (the names of frames, fields, structures, enumeration values) are capitalized and everything else is not. | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 1083. |
| 1084 | 8.4.1.6 | 63 | 14 | "The definition of the unified scaling factors" -- this is informal English. It assumes some kind of implicit relationship been "unified scaling factors" and values of the "Unified Scaling Factor" field. That may or may not be the case. | Replace with "The values of the Unified Scaling Factor field are defined in Table ..".  Review all Clause 8 and replace any similar colloquial definition of field values with a non-colloquial alternative that cites the name of the field properly. | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 1084. |
| 1085 | 8.4.1.6 | 63 | 24 | Don't show integer values as a bit string, but as integers. That avoids any possible doubt as to which bit goes where (yes, I know you have labelled the bits, but that won't stop people reading these as a bitstring, least significant on the left). | Replace binary integer representation with numberic (i.e. decimal), and remove the "(B15 B14)" | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 1085. |
| 1380 | 8.4.1.6 | 62 | 58 | There is inconsitency between the name of the field "Unified Scaling Factor and its description in the text. Multiple occurrences were detected. | Replace all occurrences of "Scaling Factor" with "Unified Scaling Factor" throughout the draft.Eventually add acronym USF. | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 1380. |
| 2123 | 8.4.1.6 | 62 | 47 | Comma in "The Listen Interval field in an Association Response frame is used to dictate to a STA, a value of ListenInterval that is different from" is very confusing | Delete the comma | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 2123. |
| 2400 | 8.4.1.6 | 62 | 48 | "is used to dictate to a STA," -- Dictation is something that happens in language lessons. Unless the AP is trying to teach the STA a language, recommend that it avoid dictation. | Express outcome in terms of non-AP STA behavior. | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 2400. |
| 2402 | 8.4.1.6 | 62 | 35 | The Listen Interval stuff also applies to reassociation (see also 6.3.8.3/5 and 9.42.5 and 9.47.2 and 10.1.4.3.3b and 4.12 and 8.4.2.170f and 8.4.2.170v and 9.47.3 and 9.47.4 and 9.47.5.2 and 10.2.2.2) | Search for "association re" and consider in each case whether a "(Re)" should be prefixed | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 2402. |
| 2404 | 8.4.1.6 | 63 | 20 | Just to avoid misunderstandings, it would be desirable to state explicitly that the scaling factors are decimal (not binary) | Add "(decimal)" after "Scaling Factor" | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 2404. |
| 2728 | 8.4.1.6 | 62 | 35 | Determinig the lifetime of frames that AP buffers for a STA may be based on the information besides Listen Interval. | Change the text in subclause 8.4.1.6 (REVmc D1.1) after P576L20 | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 2728. |
| 2777 | 8.4.1.6 | 62 | 35 | the definition of listen interval need further clarificaiton for non-TIM STA | Please clarify | Revised  Tgah editor to make changes shown in 11-14-0033r0 under the heading for CID 2777. |

***Discussion:***

**CID 1083**

Agreed with the comment to follow the WG11 style on capitalization: Basically proper nouns (the names of frames, fields, structures, enumeration values) are capitalized and everything else is not.

**CID 1380**

Agreed with the comment in principle to replace all occurrences of "Scaling Factor" with "Unified Scaling Factor" (when appropriated) throughout the draft and add acronym USF.

***Proposed changes:***

**Instruction to Editor: *Please consider the proposed change in 8.4.2.78, 8.4.2.81 and 8.4.2.170d.***

***For example, please replace “Scaling Factor” with “Unified Scaling Factor” in the subclause 8.4.2.78 (P84L32) , 8.4.2.81 (P85L4) and 8.4.2.170d (P92L51 and P94L3), replace “unified scaling factor” with “Unified Scaling Factor” in the subclause 8.4.2.78 (P84L36) and 8.4.2.81 (P85L6), replace “Unified scaling factor” with “Unified Scaling Factor” in the subclause 8.4.2.81 (P85L7) and 8.4.2.170d (P92L52, P94L1), and replace “Bit Encoding” with “bit encoding” in the subclause 8.4.2.78 (P84L35) .***

**CID 2402**

Agreed with the comment to add the case of “Reassociation Request and Response”.

**CID 2728**

For TIM segmentation, an AP may use the Listen Interval information and the Segment Count element in determining the lifetime of frames that it buffers for a STA. If TIM segmentation is implemented, AP shall buffer the downlink data for a STA with dot11NonTIMModeActivated set to false in power save mode for at least a duration T when TIM segment schedule may be changed over the beacons with a Segment Count element. Extra time is needed i.e. T> listen interval to account for the latency factor such as TIM Offset.

The following example assumes the STA’s listen interval is 4 BIs. It shows the lifetime of buffered frame T for the STA can be set to 8 BIs. Note that TD is the buffered frame delivery time after the beacon with STA’s page segment. Toff is the duration in TU to the TBTT of the first DTIM beacon carrying the Segment Count element for the STA’s page after the frame is buffered at AP for a period of LI.

* + STA’s Page Period = 8 BIs, TIM offset = 1 BI, STA’s page segment number = 1
  + DTIM period = 4 BIs, Toff =1 BI, TD =1 BI, Listen Interval = 4 BIs

For TWT STA, as the listen interval shall be larger than the Wake interval, AP may use Wake Interval Exponent in Request Type field format and Wake Interval Mantissa of TWT element to determine the lifetime of frames that buffers for TWT STAs. When dot11TWTSupport is true, an S1G AP may use the Wake Interval in determining the lifetime of frames that it buffers for an S1G TWT STA.

***Proposed changes:***

**Instruction to Editor: *Please Insert the following text in subclause 9.45 L27P195 (802.11ah D1.1):***

When dot11TIMSegmentSupported is true, an S1G AP may use the Listen Interval and Segment Count element information in determining the lifetime of frames that it buffers for an S1G TIM STA that supports TIM segmentation.

**Instruction to Editor: *Please Insert the following text in subclause9.41 L57P182 (802.11ah D1.1) :***

When dot11TWTSupport is true, an S1G AP may use the Wake Interval in determining the lifetime of frames that it buffers for an S1G TWT STA.

***Proposed changes:***

**Instruction to Editor: *Please make the following changes in clause 8.4.1.6 (802.11ah D1.1):***

**8.4.1.6 Listen Interval field**

***Change the first paragraph of sub-clause 8.4.1.6 as follows:***

The Listen Interval field is used to indicate to the AP how often a STA with dot11NonTIMModeActivated set to false in power save mode wakes to listen to Beacon management frames and it is used to indicate to an AP, the duration during which a STA with dot11NonTIMModeActivated set to true is required to transmit at least one PS-Poll or trigger frame. The value of ~~this parameter is~~ the Listen Interval parameter ~~of the MLME-ASSOCIATE.request or MLME-REASSOCIATE.request~~ used by MLME primitives is determined from the Listen Interval field as described in this subclause and is expressed in units of Beacon Interval for non-S1G BSS and Short Beacon Interval for S1G BSS. The length of the Listen Interval field is 2 octets. The Listen Interval field in an Association (Reassociation) Response frame is used ~~to dictate to a~~ by the recipient STA to set its listen interval to ~~,~~ a value of ListenInterval that is different from the value of ListenInterval in the corresponding Association(Reassociation) Request frame based on an AP's buffer management consideration.

***Insert the following paragraph and Figure 8.43a after Figure 8-43:***

When dot11S1GOptionImplemented is false, the 16 bits of the Listen Interval field are an unsigned integer

which is the ListenInterval value. When dot11S1GOptionImplemented is true, the first two MSBs of the

Listen Interval field indicates the Unified Scaling Factor and the remaining 14 bits indicate the unscaled

ListenInterval value. The value of Listen Interval is equal to the unscaled ListenInterval value multiplied by

Unified Scaling Factor. This b~~B~~it e~~E~~ncoding is illustrated in Figure 8-43a (Bit encoding).

The ~~definition~~values of the U~~u~~nified S~~s~~caling F~~f~~actor~~s~~ are defined~~shown~~ in Table 8-36a (Unified scaling factor).

**Table 8-36a -Unified scaling factor**

|  |  |
| --- | --- |
| Unified Scaling Factor  ~~(B15 B14)~~ | Scaling Factor |
| 0~~00~~ | 1 |
| 1~~01~~ | 10 |
| 2~~10~~ | 1000 |
| 3~~11~~ | 10000 |

***Instruction to Editor: Please add the acronym USF for Unified Scaling Factor and replace “Unified Scaling Factor” with “USF” when appropriated.***

**Discussion:**

**CID 2777**

Agreed with the comment.

In the current draft, the Listen Interval field is used to indicate to the AP how often a STA with dot11NonTIMModeActivated set to false (i.e. TIM STA) in power save mode wakes to listen to Beacon management frames or it is used to indicate to AP the duration during which a STA with dot11NonTIMModeActivated set to true (i.e. Non-TIM STA) is required to transmit at least one PS-Poll or trigger frame.

For Flow Type 1 TWT (Target Wake Time) Requesting STA, the Flow Type field indicates the type of interaction between the TWT requesting STA and the TWT responding STA at a TWT. A value of 0 in the Flow Type field indicates an Announced TWT in which the TWT requesting STA will send a PS-Poll or a trigger frame to signal its awake state to the TWT responding STA before a frame is sent from the TWT responding STA to the TWT requesting STA. A value of 1 in the Flow Type field indicates an Unannounced TWT in which the TWT responding STA will send a frame to the TWT requesting STA at TWT without waiting to receive a PS-Poll or trigger frame from the TWT requesting STA. Thus, Flow Type 1 TWT requesting STA may not send PS-Poll / trigger frame during TWT SPs.

In the current draft, the TWT responding NDP Paging STA may not be required to send PS-Poll/trigger frame, but it shall schedule an NDP Paging frame as the first frame for transmission at the TWTs indicated by the NDP Paging Response, if any of the following conditions is satisfied:

* There are BUs for the Requesting STA
* No NDP Paging frame was sent in the N consecutive preceding TWT(s), where N is equal to the value of the Max NDP Paging Period field in the NDP Paging Response.

Flow Type 1 allows TWT STA not to send PS-Poll/trigger frame in TWT SPs. For a duration equal to listen interval, there could be that only AP sends data frame to the TWT STA (expecting either No ACK or ACK) and it is not necessary that TWT STA shall send PS-Poll/trigger frame (e.g. no uplink frame). If ACK Policy of the transmitted frame is not No ACK, acknowledgement frame could be regarded as equivalent to PS-Poll/trigger frame. If ACK Policy of the transmitted frame is No ACK, TWT STA shall send a frame (PS-Poll/trigger frame/a frame soliciting next TWT) if no frame has been sent during listen interval. The definition of Listen Interval can be redefined as follows: The Listen Interval field is used to indicate to AP the duration during which a STA with dot11NonTIMModeActivated set to true is required to transmit at least one frame (PS-Poll frame, trigger frame, a frame sent by the TWT requesting non-AP STA (e.g. acknowledgment (response control frame) or a frame to solicit next TWT) to the TWT responding AP STA, NDP Paging frame). The basic idea is to allow the frame transmitted by Non-TIM STA regarded as the same as PS-Poll/trigger frame.

**Instruction to Editor: *Please make the following changes in subclause 8.4.1.6 (802.11ah D1.1):***

**8.4.1.6 Listen Interval field**

***Change the first paragraph of sub-clause 8.4.1.6 as follows:***

The Listen Interval field is used to indicate to the AP how often a STA with dot11NonTIMModeActivated set to false in power save mode wakes to listen to Beacon management frames and it is used to indicate to an AP, the duration during which a STA with dot11NonTIMModeActivated set to true is required to transmit at least one ~~PS-Poll or trigger frame~~ non-NDP frame that is addressed to the associated AP or NDP Paging frame. The value of ~~this parameter is~~ the Listen Interval parameter ~~of the MLME-ASSOCIATE.request or MLME-REASSOCIATE.request~~ used by MLME primitives is determined from the Listen Interval field as described in this subclause and is expressed in units of Beacon Interval for non-S1G BSS and Short Beacon Interval for S1G BSS. The length of the Listen Interval field is 2 octets. The Listen Interval field in an Association(Reassociation) Response frame is used ~~to dictate to a~~ by the recipient STA to set its listen interval to ~~,~~ a value of ListenInterval that is different from the value of ListenInterval in the corresponding Association(Reassociation) Request frame based on an AP's buffer management consideration.

**Instruction to Editor: *Please replace the text of “at least one PS-Poll or trigger frame” with “at least one non-NDP frame that is individually addressed to the associated AP or NDP paging frame” in the whole document for the same description.***

**Instruction to Editor: *Please make the following changes in subclause 10.2.2.6 (REVmc1.1).***

k) An AP may delete buffered BUs for implementation-dependent reasons, including the use of an aging function and availability of buffers. The AP may base the aging function on the Listen Interval specified by the STA in the (Re)Association Request frame or the WNM-Sleep Interval specified by the non-AP STA in the WNM-Sleep Mode Request frame. In addition, the S1G AP may base the aging function on the Listen Interval specified by the AP in the (Re)Association Response frame.