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### IEEE P802.11­ Wireless LANs

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| 11ax D2.0 MAC Comment Resolution for | | | | |
| Date: 2019-01-14 | | | | |
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Abstract

This submission proposes resolutions for comments of TGax Draft 3.0 and the proposed change is for TGax Draft 3.3

CIDs:

15900, 15773, 15635, 15774, 15775, 15046, 16559, 16560, 15726, 15784,

15785, 15448, 15449, 15787, 15418, 15125, 16619, 16620, 15419, 15788,

15126, 16621, 16622, 16561, 16873, 15725, 15451, 15452, 15789

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 TGax D3.2 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D3.0 Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

***The “vernumber” = 2, as 18/1855r\_2***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 15900 | 175.17 | 9.4.2.244.1 | This is no "Quiet Time Period field" in QTP element | Clarify it. | Revised: revise the text to clarify the confusion.  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15900 |
| 15773 | 176.3 | 9.4.2.244.2 | The key words for normative statements are "shall", "should", and "may". We should avoid introducing unnecessary variations. Here we have the variation "not recommended". ("Other transmissions are not recommended during the period.") This is the only context in the entire draft in which something is "not recommended". Is this meant to be stronger than "should not", or weaker, or the same? And why is the intended behavior even discussed here at all, since it's dealt with comprehensively in clause 27? | Delete "Other transmissions are not recommended during the period." | Accepted: |
| 15635 | 177 | 9.4.2.244.3 | poor grammar | change "The Service Specific Identifier field indicates HE STAs participated in the peer-to-peer operation is given preference to transmit frames in the period." to "The Service Specific Identifier field indicates the HE STAs participating in the peer-to-peer operation are given preference to transmit frames in the period." | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15635 |
| 15774 | 177.1 | 9.4.2.244.3 | "Other transmissions are not recommended during the period." This is already stated in 9.4.2.244.2, so what's the point of repeating it here? What is the point of stating it in either place, since the full functionality is given in clause 27? And with "shall", "should", and "may" being the standard and clear options for normative statements, why introduce the variant "not recommended"? | Delete "Other transmissions are not recommended during the period." | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15774 |
| 15775 | 178.16 | 9.4.2.244.4 | "Other transmissions are not recommended during the period." This is already stated in 9.4.2.244.2 and 9.4.2.244.3, so what's the point of repeating it here? What is the point of stating it in either place, since the full functionality is given in clause 27? And with "shall", "should", and "may" being the standard and clear options for normative statements, why introduce the variant "not recommended"? | Delete "Other transmissions are not recommended during the period." | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15775 |
| 15046 | 189.07 | 9.6.28.3 | The frame format doesn't need to get into the details of the content of the element carried in that frame. As such, delete the second sentence in the fourth paragraph of 9.6.28.3 | Replace the fourth paragraph of this section as: "The Quiet Time Period element is always present in the frame." | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15046 |
| 16559 | 374 | 61 | At the end of the Quiet Time period, the HE STA that chooses not to be silent will have an unfair advantage over the HE STA that decides to stay quiet in term of access to the WM. The rule needs to be applied uniformly over all HE STAs, whether they choose to be silent or not during the QTP. | Modify the paragraph as follows: "An AP that supports QTP shall set the QTP Support field in the AP's HE Capabilities element to 1 and shall set the QTP Capability field to 0 otherwise. All HE STAs shall continue the countdown." | Reject:  The spirit of the Quiet Time Period is to encourage a cooperative behavior among STAs in a BSS.  An STA with no urgent data to send decides to pause its countdown counter when another application announces that it will have heavy traffic. In doing so, contention of the channel is reduced during the period and as a result, will improve the utilization of the radio resource. |
| 16560 | 375 | 44 | Bullet c) implies that there are CCA rules that apply specifically to HE STA. But there are no such rules that have been defined so far. This bullet needs to be revised as suggested. | When a Quiet Time Period Setup element is received, the requester HE STA may transmit frames. The transmission of a frame by HE STA in this period shall follow the normal channel access rules | Revised:  Delete the sentence,”The transmission of a frame by HE STA in this period shall follow the CCA rules applying to HE STA.” |
| 15726 | 374.53 | 27.16.4.1 | Is Quiet Time Period mandatory or optional? It appears to be optional for STAs and optional for APs. How does it work in a BSS that has both HE QTP STAs, HE non-QTP STAs and VHT, HT and other STAs? Is there any benefit at all to the Quiet Time Period in mixed BSSs as mentioned, or unlicensed spectrum in general? | Remove QTP | Reject:  The QTP is an optional feature as stated in 27.16.4.1. The Quiet Time Period feature is to provide a mechanism to reduce contention in a period in an HE BSS when a transmission schedule of an application is known.  There are applications (i.e. NAN) that employ their own scheduling mechanism for power saving and efficient frame exchanges, for example, NAN.  The quiet time period feature provides a mechanism to coordinate the exchange of frames of different sets of applications in a more orderly fashion to reduce the possibility of collision and improve the opportunities to access the channel. |
| 15784 | 374.54 | 27.16.4.1 | There is a fundamental discrepancy between the first sentence of this subclause ("The QTP ... defines a period ... during which only HE STA which supports the peer-to-peer operation may transmit frames") and the rest of the subclause. The second and third sentences say that HE STAs that do not participate in peer-to-peer operation "should not" send frames (implying that they may), and the final sentence explicitly says that they may send frames. But the "only" in the first sentence indicates that they cannot. (If there is a difference between "supporting" and "participating in" peer-to-peer operation, it is not explained anywhere in the amendment; for this comment I'm assuming they're the same thing.) It is not fully clear whether the first sentence is normative (in which case we have contradictory normative statements) or descriptive (in which case the description is inaccurate). I.e**., if we say "only an HE STA that satisfies condition C may perform action A", does that have equivalent force to the normative statement "an HE STA that does not satisfy condition C shall not perform action A"? Either way the sentence needs to change.** | Change the first sentence of the subclause to "**The QTP (quiet time period) is an optional feature that defines a period that is intended by a Requester HE STA and its AP to be used primarily for peer-to-peer operation**. **The QTP is intended to inform other HE STAs of the period and the intended peer-to-peer operation, and to request that those other HE STAs do not transmit during the QTP unless they are participating in the peer-to-peer operation defined by the Quiet Time Period Setup element**." Delete the second and thrd sentences in this paragraph, and change the fourth sentence to "**Any HE STA may ignore the request**." | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15784 |
| 15785 | 374.55 | 27.16.4.1 | The second and third sentences here are puzzling: what does the third sentence add to the meaning of the second? If "any HE STA" should not transmit frames during the period, doesn't that mean that all HE STAs in the HE BSS (and those not in the HE BSS as well) should remain quiet? If that's the case, delete the third sentence. If the intention is that HE STAs in an OBSS don't count, then the second sentence is badly worded and adds nothing compared to the third. One or other needs to go. Better still, delete both of them: in either case the "should" is weak. The entire feature is of very questionable value, but it may be barely acceptable if understood as simply conveying information to other STAs; more information can't hurt. | Delete either the second sentence (if the request to stay quiet does not apply to OBSS HE STAs) or the third sentence (if it does), or (better still) delete both sentences. | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15784 |
| 15448 | 374.56 | 27.16.4.1 | The word "should" must be replaced by the word "shall" (or by the word "may") | As in comment. | Revised:  The sentence is deleted with resolution of 15784 |
| 15449 | 374.58 | 27.16.4.1 | The word "should" must be replaced by the word "shall" (or by the word "may") | As in comment. | Revised:  The sentence is deleted with resolution of 15784 |
| 15787 | 374.62 | 27.16.4.1 | The last two sentences are garbled ("decides to stay quiet pause", "if choose"). | Fix these errors. | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15787 |
| 15418 | 374.62 | 27.16.4.1 | "An HE STA decides to stay quiet pause its countdown counter and resume count down when a quiet period ends." should be "An HE STA that decides to stay quiet pauses its countdown counter and resumes count down when a quiet period ends." | As in comment. | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15787 |
| 15125 | 374.63 | 27.16.4.1 | Which countdown is paused? | Clarify that EDCA counters are paused | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15125 |
| 16619 | 374.63 | 27.16.4.1 | Sentence needs commas | Change to "stay quiet, pause its countdown counter, and resume" | Revised:  [TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15787 |
| 16620 | 374.64 | 27.16.4.1 | Incorrect grammar in "if choose" | Change to "if it chooses" | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15787 |
| 15419 | 374.64 | 27.16.4.1 | " An STA can continue the countdown if choose not to be Silent." should be " A STA can continue the countdown if chooses not to be silent." | As in comment. | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15787 |
| 15788 | 375.33 | 27.16.4.2 | Improper use of gerund or missing verb: "The Quiet Time Request element indicating the duration, interval, and type of operation (indicated by Service Specific Identifier)." | Change "indicating" to "indicates", if that is what is intended. | Accepted: |
| 15126 | 375.33 | 27.16.4.2 | Clarify which action frame is sent? And who carries the Control field | Update bullet a) as: "the requester HE STA sends a Quiet Time Period action frame with the Quiet Time element carrying Control field set to 0." | Revised:  Agree with the comment.  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15126 |
| 16621 | 375.34 | 27.16.4.2 | Verb is missing | Change "indicating" to "indicates" | Accepted:  As in CID 15788 |
| 16622 | 375.34 | 27.16.4.2 | Control field is not indicated | Indicate which control field is set to 0 | Revised:  Agree with the comment.  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15126 |
| 16561 | 375.35 |  | The Identifier of the Service Specific Identifier field and its corresponding operation type is not defined. | Define the Identifiers and its corresponding operation types | Revised  : The service specific Identifier is randomly selected by a peer-to-peer operation. There is no need for 11axspecification to define it.  To the Editor: add to Note 1 in 27.16.4.2 |
| 16873 | 375.48 | 27.16.4.2 | Regarding Note 1, an element can be created (quite simply), but it should use ANQP, as GAS is just a transport mechanism for un-associated frames. ANQP-elements then carry the information payloads. | Create a new ANQP-element in clause 9 and some associated behaviour text. Commenter can assist with the creation of the text. | Revised:  Delete NOTE 1.  The Note 1 simply shows an example. There are other method for a peer-to-peer application to inform AP about the identifier. The commenter is welcomed to submit a contribution to define an ANQP element and associated behavior. |
| 15725 | 375.51 | 27.16.4.2 | Is this defined in the standard, or a vendor specific GAS extension? "NOTE 1--The HE STA can use the GAS protocol to transport an element that informs an AP about the type(s) of peer to-peer operations that the HE STA supports" | If we can't better describe what the GAS is carrying suggest to delete the note | Revised:  Delete NOTE 1.  Note 1 shows one possible way to let AP knows of a peer to-peer operation. There could be other mechanisms. |
| 15451 | 375.58 | 27.16.4.3 | Conditional | Change "When" to "if" | Revised:  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15451 |
| 15452 | 375.65 | 27.16.4.3 | It says here that a "copy of the request token from the request[ing] STA" is contained in the QTP Response element transmitted by the responding STA(?). However, this is not supported by the description of the Quiet Time Period Response element in Clause 9.4.2.244.4. | As in comment. | Revised:  The text is revised to clarify the confusion.  TGax editor, please make changes as shown in document 11-18/1855r\_vernumber under CID 15452 |
| 15789 | 376.11 | 27.16.4.3 | "Only HE STA which supports the operation indicated by the Service Specific Identifier field of the Quiet Time Period element may transmit frames in the quiet time period." This introduces a major discrepancy with the discussion in 27.16.4.1, which casts quiet time period as optional to obey; see in particular the last sentence of 27.16.4.1, which says that all HE STAs may transmit during a quiet time period. It is essential to resolve the discrepancy, and the meaning in 27.16.4.1 seems to be by far the better one, as well as being the intended one. | Delete the cited sentence in 27.16.3.4. | Accepted:  As in CID 15789 |

**Discussion:**

See the table above

**Propose:**

Revised the following text per discussion and editing instructions in 11-18/0444r0.

***Instruction to the TGax Editor:***

***Instruction to the TGax Editor to revise the following clauses in draft 3.2.***

27.16.4 Quiet HE STAs in an HE BSS

27.16.4.1 General

~~The QTP (Quiet time period) is an optional feature that defines a period for peer-to-peer operation during which only HE STA which supports the peer-to-peer operation may transmit frames~~. Quiet time period (QTP) is an optional feature that defines a period that

is intended primarily for peer-to-peer operation between an STA requesting a QTP (Requester HE STA) and its peers.

The QTP mechanism informs other HE STAs of the period and the intended peer-to-peer operation, and requests that those other HE STAs do not transmit during the QTP unless they are participating in the peer-to-peer operation defined by the Quiet Time Period Setup element. ~~During the period an HE STA should not transmit frames unless it participates in peer-to-peer operation. All HE STAs in the HE BSS not participating peer-to-peer operation should stay quiet in the period.~~ Any HE STA may ignore the request and ~~All HE STAs in the HE BSS not participating peer-to-peer operation may~~ access the channel by following the CCA rule as specified in 27.2.[15784, 15785]

An AP that supports QTP shall set the QTP Support field in the AP's HE Capabilities element to 1 and shall set the QTP Capability field to 0 otherwise. An HE STA that decides ~~decidinges~~ to stay quiet ~~stops pause its countdown counter and resumes count down~~ suspends the decrementing of its backoff counters and resumes it [15125] when a quiet period ends.

NOTE -- Otherwise, an HE STA ~~can~~ that does not stay quiet does not suspend the decrementing of its backoff counters. ~~continues the countdown process if choose not to be silent~~.[15787]

27.16.4.2 Procedure at the requester HE STA

Upon the reception of an MLME-QTP.request primitive, an HE STA shall perform the following procedure to start the quiet time period operation (Figure 27-13 (Quiet time period operation)):

1. If the responder AP and the requester HE STA are QTP capable as indicated by the QTP Support field in the HE Capabilities element, the requester HE STA sends a Quiet Time Period Action frame (9.6.28.3) with the Control field of the Quiet Time Period element indicating Quiet Time Period Request ~~HE action frame with value of the control field set to 0~~. [15126]. The Quiet Time Period Request element indicates ~~ing~~[15788] the duration, interval, and type of operation (indicated by Service Specific Identifier). The requester HE STA may include multiple Quiet Time Period Request elements in one frame for multiple types of peer-to-peer operations.

b) If a Quiet Time Period Response element is received with the dialog token matching the request token with a status code set to a value of SUCCESS, the AP has confirmed the reception of the Quiet Time Period Request element, and the MLME shall issue an MLME-QTP.confirm primitive indicating the success of the procedure.

c) When a Quiet Time Period Setup element is received, the requester HE STA may transmit frames. ~~The transmission of a frame by HE STA in this period shall follow the [16560] CCA rules applying to HE STA.~~

~~NOTE 1—The HE STA can use the GAS protocol to transport an element that informs an AP about the type(s) of peer-to-peer operations that the HE STA supports.~~

NOTE ~~2~~1—The frames belong to the requested type of peer-to-peer operation indicated by the Service Specific Identifier field of the Quiet Time Period Response. The service specific identifier is randomly selected by the peer-to-peer operation.

27.16.4.3 Procedure at the responder AP

A responder AP may operate as follows (Figure 27-13 (Quiet time period operation)):

a) ~~When~~ If [15451] a Quiet Time Period Request (QTP Request) element is received from an HE STA in an ~~HE action~~ Quiet Time Period Action frame, the MLME shall issue an MLME-QTP.indication primitive.

b) Upon receipt of the MLME-QTP.response primitive, the AP may respond by sending a Quiet Time Period Response element in a~~nHE action~~ broadcast Quiet Time Period Action frame.

1) If the status code is SUCCESS, the AP accepts the request ~~the request is accepted~~. The ~~responder~~ AP shall schedule the quiet period(s) according to the accepted request. Contained in the transmitted Quiet Time Period Response element is a copy of the ~~request~~ dialog [15452] token from the requester HE STA. The QTP procedure shall be terminated if the number of quiet periods exceeds the value of the Repetition Count field specified.

2) If the status code is REJECTED, the AP indicated the request cannot be fulfilled.

3) If the status code is COUNTERED ~~ountered~~, the AP counters the request with recommended values and the current request is rejected. Upon receiving the counter-proposal ~~Countered~~, an HE STA ~~shall~~ can send a new ~~the~~ Quiet Time R~~r~~equest element to set up ~~the~~ another quiet time period.

c) When the scheduled quiet time periods arrive, the ~~responder~~ AP may transmit an ~~HE action~~ Quiet Time Period Action frame including a Quiet Time Period Setup element. ~~Only HE STA which supports the operation indicated by the Service Specific Identifier field of the Quiet Time Period Setup element may transmit frames in the quiet time period~~.[15789] The ~~responder~~ AP shall set the Quiet Period Duration field of the Quiet Time Period Setup frame to a value no larger than indicated in the Quiet Period Duration field of the Quiet Time Period Request element sent by the requester HE STA.

NOTE—The AP is not required to transmit a Quiet Time Period Setup frame when a scheduled quiet time period~~s~~ arrive~~s~~. The interference mitigation protocol is to provide an AP a tool to manage and avoid interference. How or whether the AP will transmit a Quiet Time Period Setup frame when a scheduled quiet time period~~s~~ arrives is not in the scope of this specification.

9.4.2.244.1 General

Quiet Time Period ~~Action frame~~ element formats are defined to support quiet time ~~P~~period functionality for peer-to-peer ~~(Table 9-421ab)~~ operation. The Quiet Time Period ~~This~~ element is carried in Quiet Time Period Action frame (HE action frame 9.6.28.1) ~~(see 9.7 (Aggre-gate MPDU (A-MPDU)))~~ A Control field ~~(Figure 9-589dc (Quiet Time Period element format)),~~ in the Quiet Time Period element which is the octet immediately after the HE A~~a~~ction field (Quiet Time Period Action frame~~field~~ [15900], specifies the type of actions of the Quiet Time Period action frame. The first two-bits defines the operations ~~and referred to as Quiet Time Period Subtype field~~. The remaining 6 bits are reserved.

**9.4.2.244.2 Quiet Time Period Setup**

The Service Specific Identifier field indicates a specified peer-to-peer operation during which HE STAs that have requested the participation might transmit frames during the quiet time period. ~~Other transmissions are not recommended during the period [~~15773~~]~~. ~~Value for the Service Specific Identifier field contains an identifier assigned by the peer-to-peer operation.~~

**9.4.2.244.3 Quiet Time Period Request**

The Service Specific Identifier field indicates a specified peer-to-peer operation ~~for~~ during which ~~participating~~ HE STAs that have requested the participation might transmit frames during the quiet time period. ~~Other transmissions are not recommended during the period~~ [15774]. ~~The Service Specific Identifier field indicates~~ the HE STAs participated in the peer-to-peer operation ~~is~~ are [15635] given preference to transmit frames in the period. The Service Specific Identifier field contains an identifier assigned by the peer-to-peer applications.

**9.4.2.244.4 Quiet Time Period Response**

The Service Specific Identifier field indicates a peer-to-peer operation ~~for~~ during which ~~participating~~ HE STAs that have requested the participation might transmit frames during the quiet time period. ~~Other transmissions are not recommended during the period~~[15775]. The Service Specific Identifier field contains an identifier assigned by the peer-to-peer applications.

**9.6.28.3 Quiet Time Period Action frame details**

The Quiet Time Period element is defined in ~~always present in the frame~~ 9.4.2.248. ~~The presence and contents of the Quiet Time Setup field, Quiet Time Request field, and Quiet Time Response field are dependent on the values of the Control field of Quiet Time Period element~~.[15046]