IEEE P802.11
Wireless LANs

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| Comment resolutions for non-AP STA scanning – part 2 |
| Date: 2019-08-01 |
| 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 |
| Abhishek Patil | Qualcomm Inc. |  |  |  |
| George Cherian | Qualcomm Inc. |  |  |  |

Abstract

This submission proposes resolutions for multiple comments related to TGax D4.0 with the following CIDs (2 CIDs):

* 20210, 21581

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Incorporated suggestions received during the conference call. Changes in green.
* Rev 2: Incorporated a tentative proposal to address Mark’s comment by moving the lower bound from 7ms to 5.484 ms. Changes in this color.
* Rev 3: Incorporated feedback received from Thomas and Yongho (for tech. motivation description). Changes are in this color.

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 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax 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.***

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| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20210 | GEORGE CHERIAN | 431.00 | 6GHz scannning: Consider allowing STAs to send Probe Req in PSC, after detecting Xms of IDLE time on the channel (X < 20ms. The exact value is TBD) | As in the comment. | Revised –Agree in principle. Proposed resolution is to use a default value of 7 ms, which covers the maximum possible duration of a PPDU (~5.5ms plus an extra time of 1.5 ms of idle time) and a minimum value which is ~5.5 ms. TGax editor to make the changes shown in 11-19/1388r3 under all headings that include CID 20210. |
| 21581 | Yusuke Tanaka | 432.63 | It is not technically clear why a STA can discover an AP by sending Probe Request after completing operations described in the above. Typically, transmission power of an AP is higher than that of a STA, thus it is unlikely that transmission by a STA helps discovering an AP.In addition, PSCs can not always be available as described in P432L10. A STA can never know whether PSCs are not available or an AP is not discovered. Therefore descriptions in this bullet let a STA behave as if in a PSC even when PSCs are not available. | Remove this bullet. | Revised –Agree in principle with the comment that in general it is more beneficial for the STA to listen to APs transmissions for discovering the AP, however in certain cases it might be desirable for the STA to attempt to transmit a Probe Request frame (i.e., enable active scanning). For example, because the AP might have decided to not send a FILS Discovery frame because its co-located AP is transmitting an RNR IE in a different band. There are pros and cons for this exemption, which were discussed during the specification drafting, and the conclusion is to allow this exemption for the PSC case only. Also please note that the STA always knows where the PSCs are located since their position is predeterministically mapped (refer to the beginning of this subclause) and they are subject to regulatory constraints. Please refer to the following note:“NOTE—PSCs might not all be available in a specific location due to regulatory restrictions.”Proposed resolution is to add to the note a similar statement.TGax editor to make the changes shown in 11-19/1388r3 under all headings that include CID 21581. |

**Discussion:** *The proposed resolution for these two CIDs, in Rev0, is in principle the same as the resolutions that were proposed in 11-19/0962r4, except that for CID 21581, instead of rejecting the comment, we add one more sentence in the clarificatory note as suggested by the commenter.*

* Non-AP STA scanning behavior

**TGax Editor: *Change the paragraph below as follows (#CID 21581, 20210):***

The set of 20 MHz channels in the 6 GHz band, with channel center frequency, ch\_a = Channel starting fre­quency - 55 + 80 × n (MHz) are referred to as preferred scanning channels (PSCs). Channel starting fre­quency is defined in 27.3.22.2 (Channel allocation in the 6 GHz band), and n = 1, ..., 15.

NOTE—PSCs might not all be available in a specific location due to regulatory restrictions. A STA scanning the 6 GHz band knows where these PSCs are located since their position is fixed.*(#21581)*

The non-AP STA shall not transmit more than one Probe Request frame to the broadcast destination address with the Address 3 field set to the wildcard BSSID and the SSID field not set to the wild­card SSID during each 20 TU period scanning the channel.*(#20210)* The non-AP STA shall not transmit more than three Probe Request frames to the broad­cast destination address with Address 3 field set to a non-wildcard BSSID during each 20 TU period scanning the channel.

**TGax Editor: *Change the paragraph below as follows (#CID 20210):***

If the non-AP STA is scanning a channel, then the following apply:

* If the STA has received a FILS Discovery frame indicating that an AP is operating in that channel, or if the STA has received a Reduced Neighbor Report or Neighbor Report element indicating that an AP is operating in that channel then the STA may, subject to the other rules in this clause, send a Probe Request frame to the broadcast destination address in that channel, with the SSID field set to the SSID that corresponds to that AP or with the Short SSID field of the Short SSID List element set to the short SSID that corresponds to that AP and/or with the Address 3 field set to the BSSID of that AP, starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA),*(#20210)*
* Otherwise, if the channel is a PSC and the STA has determined the medium to be idle for a continuous period of at least dot11MinPSCProbeDelay, which has a minimum value of 5.484ms and a default value of 7 ms, from the start of the scan on the channel then the STA may, subject to other rules in this subclause, send a Probe Request frame to the broadcast destination address in that channel, with the SSID field set to the SSID that corresponds to an AP or with the Short SSID field of the Short SSID List element set to the short SSID that corresponds to an AP, and/or with the Address 3 field set to the BSSID of an AP, starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA).*(#20210)*
* Otherwise, if the STA has discovered the presence of an AP in that channel through means that are out of scope of the standard and the AP might be detected by the STA, then the STA may send a Probe Request frame to the broadcast destination address in that channel, with the Address 3 field set to the BSSID of that AP starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA),
* Otherwise, if the FILS-Probe-Timer reaches dot11FILSProbeDelay and the channel is a PSC, then the STA may, subject to the other rules in this subclause, send a Probe Request to the broadcast destination address in that channel, starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA),
* Otherwise, the STA shall not send a Probe Request frame to the broadcast destination address in that channel.*(#20210)*

NOTE 1—The STA might send an individually addressed Probe Request frame to an AP for reasons other than active scan (e.g. to obtain an updated EDCA parameter set) even if it has already received a FILS Discovery, Probe Response or Beacon frame from that AP.

NOTE 2—An AP might be detected by a STA if the STA and the AP are on the same channel and in range.

If a non-AP STA sends a Probe Request frame in the 6 GHz band that includes a FILS Request Parameters element, then the non-AP STA shall set the value of PHY Support Criteria subfield in the element to either 0 or 3.

**TGax Editor: *Insert the MIB variable below in an appropriate location of Annex C.3 (#CID 20210):***

dot11MinPSCProbeDelay OBJECT-TYPE

SYNTAX Unsigned32 (5484..100000)

UNITS "microseconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by an external management entity.

Changes take effect as soon as practical in the implementation.

A STA does not send a Probe Request frame if it is scanning a preferred scanning channel in the 6 GHz band unless the channel has been continuously idle for this duration since the start of the scan on that channel."

DEFVAL { 7000 }

::= { dot11StationConfigEntry <ANA> }*(#20210)*

**TGax Editor: *Insert the row below in an appropriate location of Dot11HEStationConfigEntry (#CID 20210):***

Dot11HEStationConfigEntry ::=

SEQUENCE {

dot11HEULMUResponseSchedulingOptionImplemented TruthValue,

dot11MinPSCProbeDelay Unsigned32,*(#20210)*

**11.1.4.3 Active scanning**

**11.1.4.3.2 Active scanning procedure for a non-DMG STA**

**TGax Editor: *Change the paragraph below as follows (#CID 20210):***

***Change item b), c) and d) in the 2nd paragraph as follows:***

For each channel to be scanned:

b)If the STA is a FILS STA or is a 6 GHz HE STA*(#20210)*, set the FILSProbeTimer to 0 and starts the FILSProbeTimer. While the FILS ProbeTimer is less than dot11FILSProbeDelay the STA may skip a probe request transmission and proceed to step i) after setting the ActiveScanningTimer to 0 and starting the ActiveScanning­Timer, if one of the following conditions matches:

1)The STA receives a broadcast addressed Probe Request frame that the SME considers to be suitable to discover a candidate AP for association.

2)The STA receives one or more of Probe Response, Beacon, Measurement Pilot, or FILS Dis­covery frame that identify an AP that the SME considers a suitable candidate for association.

3)The STA successfully sent a Probe Request frame by following the UORA procedure as defined in 26.5.4 (UL OFDMA-based random access (UORA)).

NOTE—How an SME considers a probe request or AP suitable is outside the scope of this standard.

c)Perform the basic access procedure as defined in 10.3.4.2 (Basic access). While waiting for access to WM, STA may send one or more Probe Request frames by following the UORA procedure and pro­ceed to step i)

d)Send a probe request to the broadcast destination address. The probe request is sent with the SSID and BSSID from the received MLME-SCAN.request primitive. When either the SSID List or Short SSID List or both are is present in the MLME-SCAN.request primitive, send one or more Probe Request frames, each with an SSID one or more SSIDs indicated in either the SSID List or Short SSID List or both, and the BSSID from the MLME-SCAN.request primitive.