IEEE P802.11
Wireless LANs

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |
| --- |
| Default QMF policy additions |
| Date: 2019-03-01 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Matthew Fischer | Broadcom |  |  | Matthew.fischer@broadcom.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 |

Abstract

This document presents proposed draft edit instructions and accompanying discussion regarding the inclusion of default QMF policy values for various Action frames that do not currently have a default QMF policy value.

The proposed changes address CID 2718 of LB236 on TGmd D2.0.

Changes are referenced to TGmd D2.1.

**REVISION NOTES:**

**R0**:

initial

**R1**:

11.25.1.1 – Add a statement that the access category assigned to an IQMF or GQMF frame is never modified (e.g. if the QMF policy is modified between an initial and later transmission attempts of a QMF frame, the AC for the frame shall not be changed)

**END OF REVISION NOTES**

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

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

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

**CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2718 | Yunsong Yang | 11.25.1.2 | 2412.6 | Many newly defined action frames are not mentioned in Table 11-17. Therefore, by default, they will use the AC\_BE as their default QMF policy. It is probably worthwhile to double-check those action frames that aren't currently included in the table, especially those action frames that were introduced after QMF was standardized, to see if their defalt values should remain as AC\_BE or not. | Add action frames, whose default QMF policy shouldn't be AC\_BE, along with their new QMF policy values, into the table. | Revise - TGmd editor to make changes as shown in 11-19/0348r0 that are marked with CID 2718 which assign default QMF policy values to various management action frames that do not currently have such an assignment. |

**Discussion:**

The existing Default QMF policy table appears to have addressed all Action categories through 21.

But TGmd D2.0 includes categories beyond 21, as follows:

|  |  |
| --- | --- |
| **Code** | **Meaning** |
| 22 | Unprotected S1G |
| 23 | S1G |
| 24 | Flow control |
| 25 | Control Response MCS Negotiation |
| 26 | FILS |
| 27 | CDMG |
| 28 | CMMG |
| 29 | GLK |

Individual Actions within a category can be assigned to different default QMF policy AC values, so the question to be asked for each Action within each of the above-listed categories is which AC is needed for that Action. The following tables attempt to summarize the intended use of each Action within each category in order to provide some information that can be used to evaluate the proposed AC for each Action. When more detail is needed to make such a decision, the author encourages readers to consult the TGmd draft.

Note that some frames might be used for future amendment operation, e.g. some S1G TWT related frames are being reused in the TGax amendment, and for those purposes, should we assign an AC based on the future expected use? What if the S1G use is AC\_BE and the HE use needs to be AC\_VI or AC\_VO? Can the HE amendment change the AC\_BE to AC\_VI at a later date? It depends:

If the new amendment has more urgency for the use of the frame, i.e. a higher priority of AC, and the new amendment upgrades the AC in the baseline, e.g. from AC\_BE to AC\_VI in the default QMF policy for the given frame, then there would be no problem with respect to backwards compatibility and compliance, as existing users of the Action frame will still be compliant, if the QMF policy in the table is understood to be the upper bound of the AC allowed for the frame.

However, if a new amendment wants to use a lower priority for a frame that is already listed in the table, then what happens when that new amendment becomes part of the baseline?

We might need to create split entries in the table for a given category/action combination – e.g. AC\_VI when Category X, Action Y frame is transmitted by an S1G STA to an S1G STA and AC\_BE when Category X, Action Y is transmitted by an HE STA to an HE STA.

The author is soliciting opinions regarding this matter, as it might arise for the TWT Setup and TWT Response within the Unprotected S1G Category with respect to TGax.

Note that in addition to the new categories, some amendments have added new frames within existing categories, in particular, within the Public Action Category.

The following tables discuss the various frames which need an examination of default QMF policy and offer a proposed AC value for each such frame. The proposed changes that follow the discussion section provide the editing instructions to implement the proposed values indicated in the discussion section.

***Note that the following tables are part of the discussion section of the document and not part of the proposed draft edit section!***

**Unprotected S1G**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | AID Switch Request | S1G | Request by a non-AP STA to receive a new AID value and new listen interval – as described by S1G associated text, the S1G devices are expected to be low throughput, low wake-state frequency devices often of a sensor reporting nature. No urgency required. | AC\_BE |
| 1 | AID Switch Response | S1G | See AID Switch Request | AC\_BE |
| 2 | Sync Control | S1G | Used as a switch to enable or disable the transmission of a sync frame at the start of a non-AP STA SP. No urgency required. | AC\_BE |
| 3 | STA Information Announcement | S1G | Used to communicate STA AID information to STAs that are not the AP or the STA that owns the AID. Used for cases when AID changes and a third party STA needs to know the new AID value (e.g. DLS connection). Because frames might not reach their intended recipient until the new AID value is known – for DLS type links, the RA is the full 48 bit MAC address of the recipient, but the TA is the AID, so a recipient might reject a reception if it is not expecting to receive from that AID. Some urgency. | AC\_VI |
| 4 | EDCA Parameter Set | S1G | Sent by AP to non-AP STA to set the EDCA parameters for that individual STA. | AC\_BE |
| 5 | EL Operation | S1G | EL = Energy Limited – configuration type information | AC\_BE |
| 6 | TWT Setup | S1G, HE | Service Period establishment == configuration | AC\_BE |
| 7 | TWT Teardown | S1G, HE | Service Period establishment == configuration | AC\_BE |
| 8 | Sectorized Group ID List | S1G | Establishment of Sector Group membership. | AC\_BE |
| 9 | Sector ID Feedback | S1G | Used during sectorized operation sector training. | AC\_BE |
| 10 | Reserved |  | Reserved. | NA |
| 11 | TWT Information | S1G, HE | Used to communicate the TSF time of the Next TWT SP start, needed before a STA using explicit TWT can revert to DOZE. For HE, can be used to terminate a TWT SP. | AC\_VI |
| 12-255 | Reserved |  |  | NA |

**S1G**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | Reachable Address Update | S1G | Indicates change in routing information by an S1G relay. | AC\_VO |
| 1 | Relay Activation Request | S1G | Enable/disable relay functionality. | AC\_VO |
| 2 | Relay Activation Response | S1G | Enable/disable relay functionality. | AC\_VO |
| 3 | Header Compression | S1G | Negotiate header compression use. | AC\_BE |
| 4-255 | Reserved |  |  | NA |

**Flow Control**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | Flow Suspension | S1G | Sent to suspend transmissions to the transmitter of the frame. Note that S1G has transactional flow control signalling in addition to the Flow Suspension frame. | AC\_VI |
| 1 | Flow Resumption | S1G | Sent to resume transmissions to the transmitter of the frame. Note that S1G has transactional flow control signalling in addition to the Flow Resumption frame. | AC\_VI |
| 2-255 | Reserved |  |  | NA |

**Control Response MCS Negotiation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | Control Response MCS Negotation Request | S1G | Request to set a difference in MCS between eliciting MPDUs and elicited MPDUs. | AC\_BE |
| 1 | Control Response MCS Negotation Response | S1G | Response to request to set a difference in MCS between eliciting MPDUs and elicited MPDUs. | AC\_BE |
| 2-255 | Reserved |  |  | NA |

**FILS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | FILS Container frame | FILS | IP Address negotiation. | AC\_BE |
| 1-255 | Reserved |  |  | NA |

**CDMG**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | Notification Period Request | CDMG | Negotiation with a neighbour on a shared channel for a period of time to transmit control information. | AC\_BE |
| 1 | Notification Period Response | CDMG | Negotiation with a neighbour on a shared channel for a period of time to transmit control information. | AC\_BE |
| 2 | Channel Splitting Request | CDMG | Negotiation with a neighbour on a shared channel to move. | AC\_BE |
| 3 | Channel Splitting Response | CDMG | Negotiation with a neighbour on a shared channel to move. | AC\_BE |
| 4 | CDMG Allocation Request | CDMG | Negotiation with a neighbour on a shared channel to schedule non-control transmissions. | AC\_BE |
| 5 | CDMG Allocation Response | CDMG | Negotiation with a neighbour on a shared channel to schedule non-control transmissions. | AC\_BE |
| 6-255 | Reserved |  |  |  |

**CMMG**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | CMMG Compressed Beamforming | CMMG | These frames are always time priority, so the AC is actually NA. | AC\_BE |
| 1 | Operating Mode Notification | CMMG | Communicates a change in the configuration of the STA operating parameters, e.g. BW, NSS. | AC\_VO |
| 2-255 | Reserved |  |  |  |

**GLK**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 0 | GLK Groupcast Mode Change Notification | GLK | Modify the parameters of operation of GLK. | AC\_BE |
| 1-255 | Reserved |  |  |  |

**Public**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Action field** | **Meaning** | **STA Type** | **Discussion** | **Proposed AC** |
| 34 | FILS Discovery | FILS | Assigned to same AC as measurement pilot. | AC\_BE |
| 35 | DCS Measurement Request | CDMG | Initiation of a measurement operation. | AC\_BE |
| 36 | DCS Measurement Report | CDMG | Report for a measurement operation | AC\_BE |
| 37 | DCS Request | CDMG | Request to move to a different channel. | AC\_BE |
| 38 | DCS Response | CDMG | Response to request to move to a different channel. | AC\_BE |
| 39 | Extended Notification Period Request | CDMG | Negotiation with a neighbour on a shared channel for a period of time to transmit control information. | AC\_BE |
| 40 | Extended Notification Period Response | CDMG | Negotiation with a neighbour on a shared channel for a period of time to transmit control information. | AC\_BE |
| 41 | Extended Channel Splitting Request | CDMG | Negotiation with a neighbour on a shared channel to move. | AC\_BE |
| 42 | Extended Channel Splitting Response | CDMG | Negotiation with a neighbour on a shared channel to move. | AC\_BE |
| 43 | Group Addressed GAS Request | Interworking | Request for service information. | AC\_BE |
| 44 | Group Addressed GAS Response | Interworking | Response to request for service information. | AC\_BE |
| 45 | On-channel Tunnel Request | FST | Request for tunnel. Recommend same as existing robust version of the frame. | AC\_VO |

**Proposed Changes to TGmd D2.1:**

**9.6.7.1 Public Action frames**

***TGmd editor: within TGmd D2.1, in Table 9-362 – Public Action field values, change the Public Action value in the last row (i.e. the row for Reserved) from 45-255 to 46-255.***

**9.6.7.42 Extended Notification Period Response frame format**

***TGmd editor: within TGmd D2.1, in 9.6.7.42 Extended Notification Period Response frame format, change the text as shown:***

The Dynamic Bandwidth Control element is defined in 9.4.2.220 (Dynamic Bandwidth Control element).

**11.25 Quality-of-service management frame (QMF)**

**11.25.1 General**

**11.25.1.1 Overview**

***TGmd editor: within TGmd D2.1, in 11.25.1.1 Overview, insert the following text at the end of the subclause:***

A QMF STA shall not modify the access category of an IQMF or GQMF frame after an initial transmission of the frame has been performed, regardless of any subsequent modification to the QMF policy under which the STA is operating.

**11.25.1.2 Default QMF policy**

The default QMF policy is as defined in Table 11-17 (Default QMF policy(#59)). It defines the access category of each Management frame based on management subtype value, category value, and action value. QMFs not included in this table shall be assigned an access category AC\_BE.

***TGmd editor: within TGmd D2.1, in Table 11-17 – Default QMF policy, insert the following new rows, noting that the header row is shown for convenience:***

**Table 11-17 – Default QMF policy**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description** | **Management Frame Subtype value from Table 9-1 (Valid type and subtype combinations)** | **Category value from Table 9-53 (Category values)** | **Action field** | **QMF access category** |
| Public – FILS | 1101 | 4 | 34 | AC\_BE **(#2718)** |
| Public – CDMG | 1101 | 4 | 35-42 | AC\_BE **(#2718)** |
| Public – Interworking | 1101 | 4 | 43, 44 | AC\_BE **(#2718)** |
| Public - FST | 1101 | 4 | 45 | AC\_VO **(#2718)** |
| Unprotected S1G | 1101 | 22 | 0, 1, 2, 4-9 | AC\_BE **(#2718)** |
| Unprotected S1G | 1101 | 22 | 3, 11 | AC\_VI **(#2718)** |
| S1G | 1101 | 23 | 0, 1, 2 | AC\_VO **(#2718)** |
| S1G | 1101 | 23 | 3 | AC\_BE **(#2718)** |
| Flow Control | 1101 | 24 | 0, 1 | AC\_VI **(#2718)** |
| Control Response MCS Negotation | 1101 | 25 | 0, 1 | AC\_BE **(#2718)** |
| FILS | 1101 | 26 | 0 | AC\_BE **(#2718)** |
| CDMG | 1101 | 27 | 0-5 | AC\_BE **(#2718)** |
| CMMG | 1101 | 28 | 0 | AC\_BE **(#2718)** |
| CMMG | 1101 | 28 | 1 | AC\_VO **(#2718)** |
| GLK | 1101 | 29 | 0 | AC\_BE **(#2718)** |

**End of proposed changes.**