IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DMG Small Fixes | | | | |
| Date: 10 November 2015 | | | | |
| Author(s): | | | | |
| Name | Company | Address | Phone | Email |
| Payam Torab | Broadcom Corporation |  |  | [ptorab@broadcom.com](mailto:ptorab@broadcom.com) |
| Solomon Trainin | Intel Corporation |  |  | [solomon.trainin@intel.com](mailto:solomon.trainin@intel.com) |
| Carlos Cordeiro | Intel Corporation |  |  | [carlos.cordeiro@intel.com](mailto:carlos.cordeiro@intel.com) |

Abstract

Proposed resolutions to CID 5987 and 5988, relative to Draft P802.11REVmc\_D4.3.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 5987 | 9.3.2.12 | 1262.01 | 1 | 9.3.2.12 | DMG groupcast frames may be physically transmitted in multiple directions and therefore can be received multiple times by a DMG STA. A duplicate detection mechanism needs to be defined for DMG groupcast | Text will be provided, along the lines of defining a receive cache per group address. |
| 5988 | 8.3.1.14 | 608.61 | 61 | 8.3.1.14 | Clarify usage of DMG CTS-to-self before transmitting groupcast frames. A DMG STA (e.g., an AP) should be able to signal one or more intended recipients that sit in the same spatial direction (or are served by the same transmit beam) of a following transmission. While the TA field in the DMG CTS-to-self in this case may refer to a group of STAs (unlikely, but possible), transmission of the frame is always directional. | Text will be provided, along the lines of clarifying RA and TA settings for DMG CTS-to-self before sending a groupcast frame. |

**Revision History**

R0: Initial revision

R1: Excluded RC9 (DMG Group Addressed) from the RC1 umbrella rule

R2: Editorial changes; created a rule in Table 9-4.

R3: Brought the baseline revision up to Draft P802.11REVmc\_D4.3.

**8.3.1.14 DMG CTS frame format**

...

When the DMG CTS frame is a response to an RTS frame, the value of the RA field of the DMG CTS frame is set to the address from the TA field of the RTS frame. When the DMG CTS frame is the first frame in a frame exchange, the RA field is set to the MAC address of the transmitter.

For DMG CTS frames other than DMG CTS-to-self frames, the Duration field is set to the value of the Duration field of the immediately previous RTS frame, minus the time, in microseconds, required to transmit the DMG CTS frame and its SIFS interval. For DMG CTS-to-self frames, the Duration field is set to the remaining duration of the TXOP or SP. If the calculated duration includes a fractional microsecond, that value is rounded up to the next higher integer.

For DMG CTS frames other than DMG CTS-to-self frames, the TA field is the MAC address of the STA transmitting the DMG CTS frame. For DMG CTS-to-self frames, the TA field is set to the individual (group) address of the recipient(s) of the frame that the DMG STA intends to transmit after the DMG CTS-to-self frame.

**9.3.2.4 Setting and resetting the NAV**

...

A STA that receives at least one valid frame in a PSDU can update its NAV with the information from any valid Duration field in the PSDU. When the received frame's RA is equal to the STA's own MAC address, the STA shall not update its NAV. Further, when the received frame is a DMG CTS frame and its TA is equal to the STA’s own MAC address, the STA shall not update its NAV. For all other received frames the STA shall update its NAV when the received Duration is greater than the STA's current NAV value...

**9.3.2.12.3 Receiver Requirements**

... When a Data, Management or Extension frame is received in which the Retry subfield of the Frame Control field is equal to 1, the appropriate cache is searched for a matching frame. In DMG, when a group addressed frame is received the appropriate cache is searched for a matching frame. If the search is successful, the frame is considered to be a duplicate. Duplicate frames are discarded.

...

*[Editor: Please add a new row to Table 9-4 (that would be RC9 as of Draft4.3 – or a higher index if necessary)].*

**Table 9-4—Receiver Caches**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Receiver cache identifier** | **Cache name** | **Applies to** | **Status** | **Multiplicity /**  **Cache size** | **Receiver**  **requirements** |
| RC1 | Not QoS Data | A STA receiving frames that  are not QoS Data, excluding if supported:  RC4  RC5  RC6  RC9 | Mandatory | Indexed by: <Address 2, sequence number, fragment number>.  At least the most recent cache entry per <Address 2>. | RR1  RR2  RR5 |
| ... |  |  |  |  |  |
| RC9 | DMG Group Addressed | A DMG STA receiving a group addressed frame | Mandatory | Indexed by: <Address 1, Address 2, sequence number, fragment number>  The most recent cache entry per <Address 1, Address 2, sequence-number>. | RR6 |
| ...  RR4: For the purposes of duplicate detection, QoS (+)Null frames shall be ignored.  RR5: The STA shall discard the frame if the Retry subfield of the Frame Control field is 1 and it matches an entry in the cache.  RR6: The STA shall discard the frame. | | | | | |