IEEE P802.11
Wireless LANs

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| ACK policy for QoS Null |
| Date: 2011-07-18 |
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Abstract

This document provides resolution for the comments listed below

Comments are from: 11-11-0907-0x-00ac-lb178-comments-tgac-d1-0.xlsx

Comments refer to: Draft P802.11ac\_D1.0.pdf

**Comments**

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| 3403 | 21.39 | 8.2.4.5.4 | According to Ack policy in Table 8-6, QoS Null frames shall set to Normal Ack or Implicit Block Ack Request policy. However, ack collisions will occur when QoS Null frames are carried in MU PPDU.  | Allow No Ack or Block Ack policies for QoS Null frames carried in MU PPDU. | DISAGREE | MAC |
| 3418 | 21.39 | 8.2.4.5.4 | According to Ack policy in Table 8-6, QoS Null frames shall set to Normal Ack or Implicit Block Ack Request policy. However, ack collisions will occur when QoS Null frames are carried in MU PPDU.  | Allow No Ack or Block Ack policies for QoS Null frames carried in MU PPDU. | DISAGREE | MAC |

**Discussion**

The commenter correctly points out that the only ACk policy for QoS null frames id Normal ACK; It is also correct that if QoS Null is sent to more than one STA in the MU-PPDU, there will be colliding ACKs

It is to be noted that QoS Null is not allowed in a A-MPDU; that is because A-MPDUs cannot carry frames with normal ACK policy

A QoS Null can be included in a VHT Single MPDU with EOF bit set to 1, indicating that Normal ACK is expected

A reason why the QoS null can only have normal ACK is that it does not carry a valid sequence number: receiver is supposed to ignore the sequence number; this is because sequence number is in general associated with the presence of an MSDU or in MMPDUs, but QoS Null is not an MMPDU and carries no MSDU;

Allowing a BA policy would require to define a valid sequence number, which is a departure from the current specs; alternatively, the response BA should be generated in a way that does not account for the sequence number, which is also a departure from current specs.

BA policy should not be allowed for QoS Null frames, as it will imply subtle changes to existing specs and can be avoided by using the methods described in the following

In a MU-MIMO PPDU, a QoS Null may be sent in a VHT Single MPDU with EOF bit set to 1 to one of the STAs; that would generate an ACK as a response; ACK may be wrapped in a HT Control field if necessary for carrying e.g. link adaptation information; this is already allowed by specs

QoS Null shall not be sent to any of the remaining STAs, to avoid collision;

Comment does not specify the reason for introducing the change;

One possible reasons is to allow short frames to be sent to multiple STAs in a single MU-PPDU

Note that if that is the case, any other (short) frame not requiring ACK may be sent to the remaining recipient STAs of the MU-PPDU; QoS Null is not the only choice;

For instance, one option is to send a short data frame with no-ACK policy; another option is to send an ACK frame; note that ACK can even be wrapped in a HT Control wrapper in case it need be used for e.g link adaptation; another option is to send a CTS frame, with appropriate Duration (0); note that CTS can even be wrapped in a HT Control wrapper in case it need be used for e.g link adaptation