IEEE P802.11
Wireless LANs

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| Proposal of SAR clarification  |
| Date: 2020-05-03 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Solomon Trainin | Qualcomm |  |  | strainin@qti.qualcomm.com |
| Alecsander Eitan  | Qualcomm |  |  | eitana@qti.qualcomm.com |
| Assaf Kasher | Qualcomm |  |  | akasher@qti.qualcomm.com |
| Chen, Cheng  | Intel |  |  | cheng.chen@intel.com |
| Payam Torab  | Facebook |  |  | torab@ieee.org |

Abstract

Proposal of SAR clarification

Discussion:

Two issues are identified in the SAR definition.

1. The A-MSDU is not addressed in the SAR definition. It should be clarified that the segmentation and reassembly function works with the MSDU or A-MSDU depending on the A-MSDU aggregation function as shown in the MAC Data Service Architecture definition illustrated in Figures 5-1 and 5-2. The existent text uses the wording of "MSDU or A-MSDU" to reflect the fact that the MSDU and A-MSDU are treated equally. See for example 10.25.6 (HT-immediate block ack extensions). Two types of changes of the existent SAR text are required in that relation.
* Make it clear that the SAR function gets MSDU from the MAC SAP when no aggregation is provided and gets the A-MSDU if the aggregation is provided. The same about the release of the units.
* Replace the MSDU with “MSDU or A-MSDU” in all cases when the SAR function processes the units.
1. There are three places in the text that refers to the capacity of the single MPDU buffer by using the MSDU size without the SAR agreement. It happens in 9.4.2.278 SAR Configuration element, 10.25.2 Setup and modification of the block ack parameters, and in 10.69.2 Segmentation operation: “maximum supported MSDU size, without SAR agreement, for a DMG PPDU as indicated in Table 9-25" The MPDU buffer shall be able to contain the entire MPDU so the definition is misleading.

Propose to replace with a clear reference to the MPDU size in this definition and keep the definion in one place.

In the same places is declared that the MPDU size may be limited using the ADDTS exchange "... or to the last value agreed between the peers via an ADDTS Request and Response frame exchange for this TID”. There is no clear reference to how to change the maximal MPDU size using the ADDTS handshake. The TSPEC conveyed by the ADDTS exchange contains the maximum MSDU size that indirectly can limit the MPDU size.

Propose to clarify the use of the TSPEC for that purpose.

Two more changes of the 802.11ay D5.0 text are added to the r1 of the document:

Name of the field is changed to the SAR Capability Information field to comply with the name in the subclause 9.4.2.127.8 (SAR Capability Information field)

The EDMG is changed to DMG because the SAR Capability Information field is part of the DMG Capabilities element, see Figure 9-549 (DMG Capabilities element format)

***TGay editor implement the changes as presented below***

**9.2.4.4.1a Sequence Control field structure when SAR is used**

***In the sub-clause replace all appearances of MSDU by “MSDU or A-MSDU” exclude “Start of MSDU”, “End of MSDU”, “MSDU\_Modulo”, and “MSDU Sequence Number”.***

**9.4.2.127.8 SAR Capability Information field**

**Table 9-254a – Subfield definition of the SAR Capability Information field**

|  |  |  |
| --- | --- | --- |
| **Subfield**  | **Definition**  | **Encoding**  |
| Maximum Segmented MSDU Exponent  | Indicates the maximum MSDU or A-MSDU size supported when segmentation and reassembly is enabled.  | This subfield is an integer in the range 0 to 9. The maximum segmented MSDU or A-MSDU size that is defined by this subfield is equal to: 2 (13 + Maximum Segmented MSDU Exponent) – 1 octets  |

**9.4.2.278 SAR Configuration element**

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The MSDU Buffer Size field indicates the number of buffers available for this particular TID. Each buffer is capable of holding the number of octets equal to the maximum supported MSDU or A-MSDU size as indicated in the SAR Capability Information field of the STA’s DMG Capabilities element.

The MPDU Buffer Size field indicates the number of buffers available for this particular TID. Each buffer is capable of holding a number of octets equal to the maximum MPDU size, as indicated in Table 9-25 for a DMG PPDU or to the last value of the of Maximum MSDU Size field of the TSPEC element agreed between the peers via an ADDTS Request and Response frame exchange for this TID, plus any security encapsulation overhead, plus MAC header and FCS.

**10.69.1 General**

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A DMG STA that supports segmentation and reassembly may segment large MSDUs received at the MAC SAP or A-MSDU received at the A-MSDU aggregation function into MSDU segments or A-MSDU segments respectively that are transmitted into MPDUs (see 10.69.2). These MSDU or A-MSDU segments are reassembled at the recipient STA to recreate the original MSDU or A-MSDU (see 10.69.3). MSDU or A-MSDU segments shall be carried in individually addressed MPDUs.

The segmentation and reassembly mechanism allows a STA to receive at the MAC SAP an MSDU with a size that is optimal for an upper layer or aggregate MSDUs into A-MSDU that is not limited to the maximum transmission unit. The MSDU is delivered to the MAC SAP and the A-MSDU is delivered to the A-MSDU De-aggregation of the recipient STA through MSDU or A-MSDU segments carried within MPDUs transmitted over the wireless link using the HT-Immediate BlockAck mechanism (see 10.25.6). The recipient STA is responsible to reassemble the segmented MSDUs or A-MSDU into their original size MSDU or A-MSDU and forward it to the MAC SAP or to the A-MSDU De-aggregation respectively. This mechanism allows sending a large MSDU or A-MSDU over the wireless link without the need for any upper layer fragmentation or segmentation processing. The maximum MSDU or A-MSDU size is negotiated between communicating peers during SAR establishment.

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A STA that supports segmentation and reassembly shall be capable of reception of MPDUs carrying segments of different MSDUs or A-MSDU plus any security encapsulation overhead, MAC header and FCS and to reassemble it back to the original MSDU or A-MSDU size.

***In the sub-clauses, 10.69.2 Segmentation operation and 10.69.3 Reassembly operation replace all appearances of MSDU by “MSDU or A-MSDU” exclude “Start of MSDU”, “End of MSDU”, “MSDU Sequence Number”***

**10.69.2 Segmentation operation**

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An MPDU that has the End of MSDU subfield equal to 0 and the Start of MSDU subfield equal to 1 shall have a size given by the maximum MPDU size as defined in 9.4.2.278 SAR Configuration element.

**10.25.2 Setup and modification of the block ack parameters**

P230L4

In addition, the MPDU Buffer Size subfield shall not exceed the value of 2(MPDU Modulo-2) and shall be equal or larger than the value of the resulting maximum segmented MSDU size as indicated by the Maximum Segmented MSDU Exponent subfield in the recipient’s DMG Capabilities element divided by the maximum MPDU size, as defined in 9.4.2.278 SAR Configuration element.

The originator may set the MSDU Buffer Size subfield to a value greater than

2MSDU Modulo – 2 if the MPDU Modulo subfield is set to a value greater than 9; in this case, the recipient may receive multiple MSDUs or A-MSDUs with identical SNs that are not detected.

**10.25.6.6.1 General**

P237L26

Any MSDU or A-MSDU that has been passed up to the next MAC process shall be deleted from the receive reordering buffer.

P237L7

Buffered MPDUs belonging to MSDUs or A-MSDUs that have been received, but not yet passed up to the next MAC process.

**10.25.6.6.2 Operation for each received Data frame**

**10.25.6.6.3 Operation for each received BlockAckReq**

***In the sub-clauses replace all appearances of MSDU by “MSDU or A-MSDU” exclude “Start of MSDU”, “End of MSDU”, and “MSDU\_SN”. Pay note to not replace if the combination of "MSDU or A-MSDU" already exists***

**10.25.6.7.1 General**

**10.25.6.8 Maintaining block ack state at the originator**

***In the sub-clauses replace all appearances of MSDU by “MSDU or A-MSDU” exclude “Start of MSDU”, “End of MSDU”, “MSDU\_SN”, MSDU\_SSN, MSDU lifetime, MSDU Modulo, and MSDU Buffer Size. Pay note to not replace if the combination of "MSDU or A-MSDU" already exists***