IEEE P802.11
Wireless LANs

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| Comment Resolution subclause 5.3 |
| Date: 2021-05-10 |
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Abstract

This submission resolve the following comments for subclause 5.3 of 802.11bd D1.0:

* 1055, 1056, 1057, 1106, 1143, 1145, 1207, 1208, 1209, 1210,
* 1211, 1370, 1389, 1488, 1489, 1491, 1552, 1553, 1741, 1742,
* 1755, 1756, 1840, 1274

Revisions:

 R0: initial version

 R1: changes per the comments received:

 For each parameter a value related to up to MAC layer to decide is added.

 1553 is rejected

 R2: add several values for MAC to decide

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** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 1055 | 20 | 44 | "legacy" is not defined. change to "non-NGV". Two instances. the one below but also in 5.3.2, | as in comment | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1055 |
| 1056 | 20 | 48 | "permitted aggregation" is not clear. Add text clarifying the possible options? | as in comment | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1056 |
| 1057 | 20 | 49 | "number of repetitions" is vague. Please either expand the name or add text to clarify the intent, for example number of repetitions of the non-NGV frames | as in comment | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1057 |
| 1106 | 20 | 62 | Not clear what " The primary channel is not used for channel switch." means. | When the channel width indicates 20 MHz, the primary channel parameter indicates the OCB primary channel. The primary channel parameter is not used to initiate channel switching?. Please clarify if this is what is meant. | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1106 |
| 1143 | 20 | 59 | Add description of the each element in radio environment request vector | As in the comment | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1143  |
| 1145 | 21 | 19 | Add description of each element in radio environment status vector | As in the comment | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1145  |
| 1207 | 20 | 58 | To promote a consistent implementation of the standard, I suggest more information be provided about the various elements of the radio environment request and status vectors specified in 5.3.1 and 5.3.2. Specific information would include a set of valid element values, range of values, and description. | After the list of radio environment request vector elements, create a table that explains what values are valid for each element and provides a description of each element. The table could be similar to the tables routinely provided for primitive parameters.Similarly, after the list of radio environment status vector elements in 5.3.2, create a table with valid values and descriptions | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1207 |
| 1208 | 20 | 52 | It is important that when a MSDU is discarded due to its expiry time being reached, the contention state of the EDCAF associated with that MSDU not be modified, even if the MSDU is at the head-of-line of the associated queue. We should add a note to that effect so that implementers will treat expiry in a consistent way | Add a note in this sub-clause: "Note: when an MSDU reaches its expiry time and is discarded, the CW state variable of the EDCAF associated with that MSDU is unchanged." | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1208 |
| 1209 | 20 | 65 | There is a note about an NGV STA always operating in one primary channel at any given time. Since the concept of a primary channel is specific to 20 MHz transmissions, the note should be qualified. I understand that the purpose of the note is to clarify that the inclusion of a primary channel element in the request vector does not imply that a STA using 20 MHz channels will switch primary channels packet by packet | Change the NOTE to: "NOTE - An NGV STA transmitting in 20 MHz channels maintains a single primary channel at any given time". | Accepted |
| 1210 | 21 | 3 | There is an inconsistency in the logic about when the fallback parameter is present, and there is also some confusing language. I assume "This parameter optionally presents when" should actually be "This parameter is optionally present when". That should be changed (editorial). The condition is stated to be "when dot11NGVActivated is TRUE". That condition should be broadended to "when dot11NGVActivated is TRUE and when channel width is greater than 10 MHz", because fallback is meaningless and should be omitted if channel width is 10 MHz. | change the final sentence of the paragraph to "This parameter is optionally present when dot11NGVActivated is TRUE and when channel width is greater than 10 MHz, and is absent otherwise." | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1210 |
| 1211 | 21 | 18 | The radio environment status vector cannot report transmit power level. Based on discussion in TGbd transmit power level should be replaced by received signal strength | replace "transmit power level" with "receive signal strength indicator" or "RSSI" | RevisedTGbd editor to make changes in 11-21/0779r2 under CID 1211 |
| 1370 | 20 | 59 | The radio environment vectors are underspecified. If this is a control over how MSDUs are transmitted (as implied by the inclusion in the MA-UNITDATA.request), then how is frame reception controlled? What is the expectation of the radio in between MA-UNITDATA.requests on different channels? What is the expectation when an MA-UNITDATA.request is issued while there is still a prior request pending in an outbound tx queue? Also, of the 11 items in the request vector only 3 of them are specifically described in normative behavior text (in clause 31, for example), and none of the status vector items are described at all. A few more are implied (such as frequency band and channel width, might be assumed to be part of specifying the channel along with the primary channel parameter). The rest are completely unspecified and left to the reader to assume their purpose/behavior from the name. They should all have clear normative text (and such text would help with the questions I asked). | Add text with normative descriptions of all the elements in these vectors, and add (probably in clause 31) normative behavior requirements for the MAC to receive/deliver the elements. | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1370 |
| 1389 | 20 | 63 | It is not clear what "The primary channel is not used for channel switch." means. There is no other reference to channel switch in this subclause | Delete the cited text | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1389 |
| 1488 | 20 | 48 | A new set of parameters is included here but for at least some of the parameters, there is no language in the draft indicating how the parameter is to be used. For others, there might be a mention of the parameter, but the language is often vague. There also seems to be no indication of what values the parameters can take. | provide text to describe the allowed values of each of the parameters - usually, a table is provided for such parameters - and provide text that describes how each of the parameters of the radio environment request vector are to be used in either or both of the MAC and PHY subclauses, as appropriate, while referencing specific values of each parameter | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1488 |
| 1489 | 21 | 6 | A new set of parameters is included here but for at least some of the parameters, there is no language in the draft indicating how the parameter is to be used. For others, there might be a mention of the parameter, but the language is often vague. There also seems to be no indication of what values the parameters can take. | provide text to describe the allowed values of each of the parameters - usually, a table is provided for such parameters - and provide text that describes how each of the parameters of the radio environment request vector are to be used in either or both of the MAC and PHY subclauses, as appropriate, while referencing specific values of each parameter | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1489 |
| 1491 | 21 | 18 | How does the receiving NGV STA know the transmit power of the frame? Is is communicated somehow in the header? | Verify that the transmit power can be communicated in this data structure and add text somewhere in the specification of how its used. | RevisedDiscussion: it should be RSSI.TGbd editor to make changes in 11-21/779r2 under CID 1491 |
| 1552 | 20 | 44 | What is the legacy PPDU format? Is it NON\_NGV\_10? | If yes, change it to NON\_NGV\_10. If not, please clarify. There are more "legacy" format mentioned throughout this document. | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1522 |
| 1553 | 20 | 39 | Should N\_TX be included in the Radio Environment Request Vector? | Add it if needed. | RejectedDiscussion: N\_TX is used in MAC/PHY interface where PHY can normalize the waveform and add the corresponding CSD values. |
| 1741 | 20 | 63 | "The primary channel is not used for channel switch." What does this mean? Does it mean the primary channel cannot be changed? Does it mean the primary channel does not announce channel switching? (Then, which channel does it?) | Clarify. | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1741 |
| 1742 | 20 | 65 | "NOTE-- An NGV STA always operates in one primary channel at any given time." What does this mean? Other than multi-link in 11be, I think there is no case a STA can use multiple primary channels. Does it mean that multi-link cannot be applied to NGV STAs? Or does it mean anything else? | Clarify. | RevisedSee the change proposed by CID 1209 |
| 1755 | 20 |  | Each elements in the radio environment request vector needs to be described. And the allowed values for each elements need to be specified. | As in comment. | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1755 |
| 1756 | 21 |  | Each elements in the radio environment status vector needs to be described. And the allowed values for each elements need to be specified. | As in comment. | RevisedTGbd editor to make changes in 11-21/779r2 under CID 1756 |
| 1840 | 20 | 32 | Radio environment vectors appears to be a notion in the control plane. Why specify them as a part of the user plane? | Move this subclause to Clause 4, if it is a concept big enough, or to Clause 31. | RejectedDiscussion: each MSDU has its own radio environment vectors based on the following factors: the recipient capabilities, whether the MSDU is unicast or broadcast MSDU etc. |
| 1274 |  |  | Comment from TGbd ARC meeting:Channel control (frequency band, primary channel, and maybe channel width) should probably in a separate control interface. | Define the SME behavior and control interface. | RejectedDiscussion: The channel information could be different for different MSDUs, e.g. bandwidth. The integration of channel information and MSDU avoid the synchronization of dynamic channel change and the MSDU transmissions in the related channels. |

**5.3 Radio Environment Vectors**

The radio environment vectors allow higher layer entities to provide control information to and receive status information from the MAC sublayer entity appropriate for communication within a rapidly changing radio environment.

***TGbd editor: Change subclause 5.3.1 as follows:***

**5.3.1 Radio Environment Request Vector**

The radio environment request vector contains the following parameters pertaining to the transmission of the MPDU associated with the MSDU associated with the request containing the vector:

– PPDU format,

– data rate/MCS,

– number of spatial streams,

– permitted aggregation,

– number of repetitions,

– expiry time ,

– frequency band,

– primary channel

– channel width

– fallback enabled

– transmit power level.

(#1143, 1207, 1755) The PPDU format parameter indicates the format of the PPDU as defined in Table 5-x1 (PPDU format definition) that is used to transmit the MSDU.

Table 5-x1----PPDU format definition

|  |  |
| --- | --- |
| PPDU format value | description |
| 0 | Non-NGV PPDU (#1055, 1522) |
| 1 | NGV PPDU |
| 2 | PPDU format decided by MAC layer |

The data rate/MCS parameter indicates the data rate of the PPDU carrying the MSDU if the PPDU format has value 0 or the MCS carrying the MSDU if the PPDU format has value 1. The data rate can be one of 0 (decided by MAC layer), 3, 4.5, 6, 9, 12, 18, 24, and 27 Mb/s. The MCS is defined in 32.3.15 (Parameters for NGV-MCSs) with an exception that the value 15 means the actual MCS is decide by MAC layer.

The number of spatial streams parameter with value 1 or 2 indicates the number of spatial streams being used to transmit the PPDU carrying the MSDU. The number of spatial streams parameter with value 0 means that the number of spatial streams is decided by the MAC layer

The permitted aggregation parameter indicates whether the A-MPDU aggregation can be applied to the MSDU. The value 0 means the aggregation is not applied, the value 1 means the aggregation can be applied, while the value 2 means it is up to MAC layer to decide whether the aggregation can be applied. (#1056)

The number of repetitions parameter indicates the maximal number of repetitions that can be used to transmit the MSDU in broadcast MPDU of non-NGV PPDU in 10MHz width where the value 15 means it is up to MAC layer to decide whether the repeatation is applied to the MSDU. This parameter is reserved when the MSDU is not in broadcast MPDU in 10 MHz width. (#1057)

The expiry time parameter indicates the time in milliseconds until the MSDU is discarded if still not transmitted where the value 0 means it is up to MAC layer to decide the expiry time of the MSDU.

NOTE----When an MSDU reaches its expiry time and is discarded, the CW state variable of the EDCAF associated with that MSDU is unchanged. (#1208)

The frequency band parameter indicates the band where the MSDU is transmitted where the value 0 means the MAC layer will select the frequency band.

The primary channel indicates the primary 10MHz channel where the MSDU is transmitted where the value 0 means the MAC layer will select the primary channel.

The channel width parameter indicates either 10MHz or 20MHz width used to transmit the MSDU as defined in Table 5-x2 (channel width definition). When the channel width indicates 20 MHz, the primary channel parameter indicates the OCB primary channel.

 (#1106, 1389, 1741)NOTE— An NGV STA always operates in one primary channel at any given time.

Table 5-x2----channel width definition

|  |  |
| --- | --- |
| Channel width value | description |
| 0 | 10MHz |
| 1 | 20MHz |
| 2 | The channel width is decided by the MAC layer |

The fallback enabled parameter indicates whether the transmission of 10 MHz PPDU in the OCB primary channel is allowed in an NGV STA while the NGV STA performs channel access to transmit 20 MHz NGV PPDU. The value 0 means the fallback to 10MHz can be applied to the MSDU, the value 1 means the fallback to 10MHz can’t be applied to the MSDU, while the value 3 means it is up to MAC layer to decide whether the fallback is applied to the MSDU. This parameter optionally presents when dot11NGVActivated is TRUE and when channel width parameter is 20 MHz, and absent otherwise. (#1210)

The transmit power level parameter indicates the combined transmit power at the transmit antenna connector of all the antennas used to transmit the MSDU in units of dBm / 10 MHz. The transmit power is described with a resolution of 1 dB, with values in the range 0 to 60 representing –20 dBm / 10 MHz to 40 dBm / 10 MHz, respectively. Values from 60 to 126 are reserved. The value 127 means that it is up to MAC laye to decide the transmit power of the MSDU.

***TGbd editor: Change subclause 5.3.2 as follows:***

**5.3.2 Radio Environment Status Vector**

The radio environment status vector contains the following parameters pertaining to the reception of the MPDU that contained the MSDU associated with the indication containing the vector:

– PPDU format (legacy/NGV),

– data rate/MCS,

– aggregation,

– frequency band,

– primary channel

– channel width,

– RSSI (#1211, 1491).

(#1145, 1207, 1756) The PPDU format parameter indicates the format of the received PPDU that carries the MSDU as defined in Table 5-x1 (PPDU format definition).

The data rate/MCS parameter indicates the data rate of the received PPDU carrying the MSDU if the PPDU format has value 0 or the MCS carrying the MSDU if the PPDU format has value 1. The date rate can be one of 3, 4.5, 6, 9, 12, 18, 24, and 27 Mb/s. The MCS is defined in 32.3.15 (Parameters for NGV-MCSs).

The aggregation parameter indicates whether the A-MPDU aggregation is applied to the received MSDU. The value 0 means the aggregation is not applied, while the value 1 means the aggregation is applied.

The frequency band parameter indicates the band where the MSDU is received.

The primary channel indicates the primary 10MHz channel where the MSDU is received.

The channel width parameter indicates either 10MHz or 20MHz width of the PPDU carrying the received MSDU as defined in Table 5-x2 (channel width definition). When the channel width indicates 20 MHz, the primary channel parameter indicates the OCB primary channel.

The RSSI parameter indicates the receive signal power, measured at the STA's antenna connector and averaged over the antennas, for the NGV portion of the received NGV PPDU and is defined in Table 5-x3 (RSSI).

Table 5-x3 RSSI

|  |  |
| --- | --- |
| RSSI | **Description** |
| 0 to 90 | The RSSI, in units of dBm, is -110 + *Fval*, where *Fval* is the subfield value |
| 91 to 127 | Reserved |

**31. Next Generation V2X (NGV) MAC specification**

TGbd editor: add the following subclause in Clause 31: (#1370, 1488, 1489)

**31.x NGV MAC data service**

A NGV STA shall follow the rules in 10.2.7 (MAC data service) and the additional rules as defined in 31.x (NGV MAC data service).

When transmitting a MPDU that encapsulate a MSDU, a NGV STA shall use the PPDU format indicated by the PPDU format parameter of the radio environment request vector related to the MSDU.

When a parameter in radio environmrnt request vector represents “selection within MAC sublayer”, a NGV STA shall select the related parameter value by itself. Otherwise the following rules shall be applied.

When transmitting a MPDU that encapsulate a MSDU, a NGV STA shall use the date rate/MCS indicated by the data rate/MCS parameter of the radio environment request vector reated to the MSDU in the initiate transmission of the MPDU. In the retransmission of the MPDU, the data rate/MCS shall be no more than date rate/MCS indicated by the data rate/MCS parameter of the radio environment request vector related to the MSDU.

When transmitting a MPDU that encapsulates a MSDU, a NGV STA shall use the number of spatial streams indicated by the number of spatial streams parameter of the radio environment request vector related to the MSDU in the initiate transmission of the MPDU. In the retransmission of the MPDU, the number of spatial streams shall be no more than number of spatial streams indicated by the number of spatial streams parameter of the radio environment request vector reated to the MSDU.

A NGV STA shall transmit a frame that encapsulates a MSDU in an A-MPDU if the permitted aggregation parameter of the radio environment request vector related to the MSDU is equal to 1. Otherwise the NGV STA shall not aggregate the frame in an A-MPDU.

A NGV STA shall set the lifetime of a MSDU to the value of expiry time parameter of the radio environment request vector related to the MSDU.

A NGV STA shall transmit a MPDU of a MSDU in the channel defined by the frequency band parameter, primary channel parameter and channel width parameter of the radio environment request vector related to the MSDU with the following exception:

If the channel width indicates 20MHz width and the fallback enabled parameter indicates 1, the channel can be 10MHz channel.

A NGV STA shall transmit a MPDU of a MSDU with the Tx power indicated by transmit power level parameter of the radio environment request vector related to the MSDU.

When reporting a received MSDU to the uplayer, a NGV STA shall report the radio environment status vector as defined in 5.3.2 (Radio Environment Status Vector) of the received MSDU.