IEEE P802.11
Wireless LANs

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| CR for 35.2.1.3 part -2 |
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Abstract

This submission addresses the following CIDs (changes are relative to 11be draft 1.4):

4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317.

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4186 | 244 | 14 | 35.2.1.3.2 | Which field of the MU RTS TXS Trigger frame carries the allocated time? Since the time allocation is for the non-AP STA and the frame is a broadcast frame I am guessing that the time allocation is somewhere in the User Info field? This needs to be specified. | As in comment.  | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 4811 | 105 | 1 | 9.3.1.22.5 | Define the signaling for the Allocation Duration. | As in comment. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 5121 | 105 | 1 | 9.3.1.22.5 | Define the Allocation Duration subfield. | As in comment | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 5388 | 105 | 1 | 9.3.1.22.5 | Is the Allocation Duration subfiled the exact name in Trigger frame because there is no field in Trigger frame? Is it RU allocation field? Or UL Length field? Or New field? If it's new field, update the Trigger frame format with the field and the related description. Otherwise, correct the name. | Add the Allocation Duration Subfield in Trigger frame or correct the name of subfield exactly. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 5902 | 105 | 1 | 9.3.1.22.5 | "Allocation Duration subfield" definition is not found | define this field | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 6001 | 105 | 1 | 9.3.1.22.5 | The unit of allocated time is missing. | Fix the issue. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 6699 | 105 | 1 | 9.3.1.22.5 | Where is the Allocation Duration subfield located and what is the MU-RTS TXS Trigger frame? Is it the same as MU-RTS Trigger frame or a different variant? | If MU-RTS TXS Trigger frame is a new variant TF, it should be listed as such. Also provide details of the Allocation Duration subfield. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 6973 | 105 | 1 | 9.3.1.22.5 | I see no explanation of the Allocation Duration subfield. Is it a new subfield in the MU-RTS? | Clarify it. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 7327 | 244 | 27 | 35.2.1.3.1 | How is signalled the allocated time in the MU-RTS TXS ? | Indicate that the allocated time is signalled in the UL Length subfield of the Common Info field of the MU RTS TXS frame. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 7556 | 105 | 1 | 9.3.1.22.5 | "An Allocation Duration subfield in the MU-RTS TXS Trigger frame indicates the time duration allocated to the non-AP STA within the TXOP obtained by the AP." Where is this Allocation Duration subfield carried (and how is it set)? This is the only place when searching for "Allocation Duration", and not even defined in 802.11ax. Maybe the Trigger Dependent User Info field is present for MU-RTS TXS Trigger frame and have this subfield in it? Need to add info on this. | As in comment. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 7557 |  |  | 35.2.1.3 | How to signal the time allocated to a non-HT STA during Triggered TXOP sharing procedure is not clear. It needs clarification. | As in comment. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 7665 | 244 | 14 | 35.3.1.3.2 | It is not clear how to indicate time allocated in MU-RTS TXS Trigger frame. Is it based on the UL Length? Also, in figure 35-1 and 2, it seems protocol assumes using CTS-to-self to gain TXOP, but this part is missing in the text. Please clarify. | See comment. | **Revised**We propose the precise signaling for that field. The CTS-to-self usage is just an example of a frame that the AP may transmit prior to sending the TXS frame and hence no normative textg is needed. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 7698 | 105 | 1 | 9.3.1.22.5 | The Allocation Duration subfield needs to be defined. | define the subfield | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 8078 | 105 | 1 | 9.3.1.22.5 | where is the Allocation Duration subfield is located in MU-RTS TXS Trigger frame? This is the only description having Allocation Duration subfield. Add the figure or more explantion on where to locate. | as in comment | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |
| 8317 | 104 | 1 | 9.3.1.22.5 | How long is the Allocation Duration subfield? and where is thie subfield ?Please define it. | as in comment. | **Revised**We propose the precise signaling for that field. **TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-22-39-00-00be-CR-for-35.2.1.3-remaining-part2.docx. |

**Discussion:**

Essentially there are two options: User Info or Common Info. In order to make a choice between the two, we consider the following:

* The range of the time allocation field needs to be sufficient to cover the max range of a typical TXOP (~8ms) which is higher than max PPDU length (~5ms).
* The UL Length field is currently reserved for MU-RTS. For other TF variants it signals the exact PPDU length and the PPDU duration is derived indirectly from the length information. Hence, this field cannot be used as it is with current interpretation to signal time allocation for TXS.
* **Extensibility issue 1:** In future, the group may consider a generalized scheme where a single TF sent from AP sequentially allocates time to multiple STAs for P2P. For example, TF sent at time t may schedule STA-1 for the interval (t,t+T1), STA-2 for (t+T1, t+T1+T2), STA-3 for (t+T1+T2, t+T1+T2+t3),… This can be used, for example, for scheduling isochronous P2P traffic with latency bound of few 100us where the additional overhead of a new TF plus SIFS for every allocation becomes significant. If such a scheme is adopted, then the signaling defined for that protocol would also cover our current single user allocation scheme as a special case. Hence, its cleaner to avoid duplication of signaling and rather try to make our current signaling seamlessly extensible for the future protocol.
* **Extensibility issue 2:** In future, the group may consider schemes wherein a single MU-RTS TXS variant sent from AP allocates time to multiple STAs for P2P in different RUs (see 11-21-1938, 11-19-1117). In such cases, similar to C-OFDMA, it may be important to align the PPDUs transmitted on the different RUs. As such the signaling for PPDU lengths need to be common to all addressed STAs. If we use the UL Length field to signal TXOP allocation for our current modes of TXS, then reusing the same field to signal PPDU length in a different mode may be harder for implementations. It is probably cleaner to keep the usage of UL Length to signal PPDU length as it is today and not mix it with TXOP allocation.

We summarize the comparison between two options below:

|  |  |  |
| --- | --- | --- |
|  | Option 1 (User Info) | Option 2 (Common Info::UL Length) |
| Overhead | Common Info + 1 User Info | Common Info + 1 User Info |
| Does it require change to existing frame format ? | Yes, some reserved bits (say, 9) need to be used.  | Yes, the interpretation (i.e., granularity, range ) of the bits located in UL Length needs to change.  |
| Does it satisfy Extensibility issue 1 ? | Yes, by assigning 9 bits to signal time allocation and leaving the door open for remaining reserved bits to signal time offset in future. Moreover, even an EHT STA may be scheduled along with EHT+ STAs in this protocol without need to understand the bits for time offset.  | No.  |
| Does it satisfy Extensibility Issue 2 ? | Yes | No.  |

Based on the above comparison, either Option 1 or Option 2 works for our current scheme as they have **same overhead and both require changes to frame format**. But in order to make the signaling future compatible, its preferable to use Option 1(User Info).

Which option do you support to signal the time allocation field ?

**Option 1:** User Info with 9 bits in granularity of 16us (~ 8ms) ?

**Option 2:** Common Info with granularity of 16us

**Abstain/No preference:**

***[Option 1 starts]***

9.3.1.22 Trigger frame format

9.3.1.22.1 General

***TGbe editor: Modify Figure 9-88 in P117L41 of 11be draft 1.4 as follows:***

 **B0 B3 B4 B15 B16 B17 B18 B19 B20 B21 B22 B23 B25**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Trigger Type | UL Length | More TF | CS Required | UL BW | GI And HE-LTF Type/Triggered TXOP Sharing Mode | MU-MIMO HE-LTF Mode | Number of HE-LTF Symbols And Midamble Periodicity |

Bits: 4 12 1 1 2 2 1 3

 **B26 B27 B28 B33 B34 B35 B36 B37 B52 B53 B54 B62**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| UL STBC | LDPCExtraSymbolSegment | AP TxPower | Pre-FECPaddingFactor | PEDisambiguity | UL SpatialReuse | Doppler | ULHE-SIG-A2Reserved |

Bits: 1 1 6 2 1 16 1 9

 **B63**

|  |  |
| --- | --- |
| Reserved | Trigger Dependent Common Info |

 Bits: 1 variable

Figure 9-88—HE variant Common Info field format (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

***TGbe editor: Revise the text in P120L42 of 11be draft 1.4 as follows:***

The Triggered TXOP Sharing Mode subfield in an HE or EHT variant Common Info field indicates the
triggered TXOP sharing mode as shown in Table 9-53e (TXOP Sharing Mode subfield encoding).

9.3.1.22.1.2.1 HE variant User Info field

***TGbe editor: Revise the following text under 9.3.1.22.1.2.1 in draft 1.4 as follows:***

The HE variant User Info field is defined in Figure 9-90 (HE variant User Info field format) for all Trigger
frame variants except the NFRP Trigger frame and the MU-RTS TXS Trigger frame, which is defined in 9.3.1.22.9 (NFRP Trigger frame format) and 9.3.1.22.5 (MU-RTS Trigger frame format) respectively (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

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9.3.1.22.1.2.2 EHT variant User Info field

The EHT variant User Info field is defined in Figure 9-92a (EHT variant User Info field format) for all Trigger frame variants except the NFRP Trigger frame(#8074) and the MU-RTS TXS Trigger frame (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

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9.3.1.22.5 MU-RTS Trigger frame format

***TGbe editor: Delete the following paragraph starting in P142L48 of 11be draft 1.4:***

***TGbe editor: Revise the following paragraphs starting in P142L54 of 11be draft 1.4 as follows:***

The HE variant User Info field for MU-RTS TXS Trigger frame is defined in Figure 9-64xx (HE variant User Info field format in the MU-RTS TXS Trigger frame). The User Info field for MU-RTS TXS Trigger frame with EHT variant Common Info is defined in Figure 9-64xy (EHT variant User Info field format in the MU-RTS TXS Trigger frame) (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317) .

B0 B11 B12 B19 B20 B28 B29 B39

|  |  |  |  |
| --- | --- | --- | --- |
| AID12 | RU Allocation | Allocation Duration | Reserved |

Bits: 12 8 9 11

 **Figure 9-64xx—HE variant User Info field format in the MU-RTS TXS Trigger frame** (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

B0 B11 B12 B19 B20 B28 B38 B39

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AID12 | RU Allocation | Allocation Duration | Reserved | PS160 |

Bits: 12 8 9 11

 **Figure 9-64xy—EHT variant User Info field format in the MU-RTS TXS Trigger frame** (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

The UL HE-MCS, UL FEC Coding Type, UL DCM, SS Allocation/RA-RU Information and UL Target
Receive Power fields in the HE variant User Info field are reserved.

The UL EHT-MCS, UL FEC Coding Type, SS Allocation/RA-RU Information and UL Target Receive
Power fields in the EHT variant User Info field are reserved.

The Allocation Duration subfield in the User Info field of the MU-RTS TXS Trigger frame indicates the time duration allocated to the non-AP STA within the TXOP obtained by the AP, in units of 16 µs.

(#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

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**35.2.1.3 Triggered TXOP sharing procedure**

**35.2.1.3.2 AP behavior**

***TGbe editor: Insert the following text in P342L30 of 11be draft 1.4 as follows***

The allocation time to the associated non-AP EHT STA is specified in the Allocation Duration subfield in the MU RTS TXS Trigger frame(#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317) .

***[Option 1 ends]***

***[Option 2 starts]***

9.3.1.22 Trigger frame format

9.3.1.22.1 General

***TGbe editor: Modify Figure 9-88 in P117L41 of 11be draft 1.4 as follows:***

 **B0 B3 B4 B15 B16 B17 B18 B19 B20 B21 B22 B23 B25**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Trigger Type | UL Length/Allocation Duration | More TF | CS Required | UL BW | GI And HE-LTF Type/Triggered TXOP Sharing Mode | MU-MIMO HE-LTF Mode | Number of HE-LTF Symbols And Midamble Periodicity |

Bits: 4 12 1 1 2 2 1 3

 **B26 B27 B28 B33 B34 B35 B36 B37 B52 B53 B54 B62**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| UL STBC | LDPCExtraSymbolSegment | AP TxPower | Pre-FECPaddingFactor | PEDisambiguity | UL SpatialReuse | Doppler | ULHE-SIG-A2Reserved |

Bits: 1 1 6 2 1 16 1 9

 **B63**

|  |  |
| --- | --- |
| Reserved | Trigger Dependent Common Info |

 Bits: 1 variable

Figure 9-88—HE variant Common Info field format (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

***TGbe editor: Modify Figure 9-88a as follows:***

 **B0 B3 B4 B15 B16 B17 B18 B19 B20 B21 B22 B23 B25**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Trigger Type | UL Length/Allocation Duration | More TF | CS Required | UL BW | GI And HE/EHT-LTF Type/Triggered TXOPSharing Mode | Reserved | Number Of HE/EHT-LTFSymbols |

Bits: 4 12 1 1 2 2 1 3

 **B26 B27 B28 B33 B34 B35 B36 B37 B52 B53 B54**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Reserved | LDPCExtraSymbolSegment | AP TxPower | Pre-FECPaddingFactor | PEDisambiguity | UL SpatialReuse | Reserved | HE/EHTP160 |

Bits: 1 1 6 2 1 16 1 1

 **B55 B56 B62 B63**

|  |  |  |  |
| --- | --- | --- | --- |
| Special User Info Field flag | EHT Reserved | Reserved | Trigger Dependent Common Info |

Bits: 1 7 1 variable

**Figure 9-88a—EHT variant Common Info field format** (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

***TGbe editor: Revise the text in P119L38 of 11be draft 1.4 as follows:***

The UL Length subfield is present in an HE variant Common Info field and in an EHT variant Common Info field of a Trigger frame that solicits a TB PPDU. It indicates the value of the L-SIG LENGTH field of the
solicited ~~HE~~ TB PPDU (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

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***TGbe editor: Add the following paragraph in P119L47 as follows:***

The Allocation Duration subfield is present in an HE or EHT variant Common Info field of an MU-RTS TXS Trigger frame and is defined in 9.3.1.22.5 (MU-RTS Trigger frame format) (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317)

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***TGbe editor: Revise the text in P120L42 of 11be draft 1.4 as follows:***

The Triggered TXOP Sharing Mode subfield in an HE or EHT variant Common Info field indicates the
triggered TXOP sharing mode as shown in Table 9-53e (TXOP Sharing Mode subfield encoding) (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317) .

***TGbe editor: Revise the text in P142L7 of 11be draft 1.4 as follows:***

The ~~UL Length~~, (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317) ~~GI And HE-LTF Type~~, MU-MIMO HE-LTF Mode, Number Of HE-LTF Symbols And
Midamble Periodicity, UL STBC, LDPC Extra Symbol Segment, AP Tx Power, Pre-FEC Padding Factor,
PE Disambiguity, UL Spatial Reuse, and Doppler and UL HE-SIG-A2 Reserved subfields in the Common
Info field are reserved.

***TGbe editor: Revise the text in P142L47 of 11be draft 1.4 as follows***

An Allocation Duration subfield in the MU-RTS TXS Trigger frame indicates the time duration allocated to
the non-AP STA within the TXOP obtained by the AP in units of 16us. Otherwise, the Allocation Duration subfield is reserved (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317).

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**35.2.1.3 Triggered TXOP sharing procedure**

**35.2.1.3.2 AP behavior**

***TGbe editor: Insert the following text in P342L30 of 11be draft 1.4 as follows***

The allocation time to the associated non-AP EHT STA is specified in the Allocation Duration subfield in the MU RTS TXS Trigger frame (#4186, 4811, 5121, 5388, 5902, 6001, 6699, 6973, 7327, 7556, 7557, 7665, 7698, 8078, 8317) .

***[Option 2 ends]***