IEEE P802.11  
Wireless LANs

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| Draft Text for Channel Allocation for SP | | | | |
| Date: 2017-3-17 | | | | |
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|  |  |  |  |  |

Abstract

This document proposes specification text for signalling related to SP allocation for 11ay.

30.3.7 Control trailer

***Change the third paragraph as follows:***

The format of the control trailer depends on the value of the TXVECTOR parameter CT\_TYPE. Table 28 defines the control trailer format when the CT\_TYPE parameter is equal to CTS\_DTS. Table 29 defines the control trailer format when the CT\_TYPE parameter is equal to GRANT\_RTS\_CTS2self. Table 30 defines the control trailer format when the CT\_TYPE parameter is equal to SPR.

***Change Table 28-30 as follows. (Move all the CTCS fields to the end of the control trailer for Table 28 – 30)***

**Table 28 —Control trailer definition when CT\_TYPE is CTS\_DTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Number of bits** | **Start bit** | **Description** |
| Channel  Aggregation | 1 | 0 | See Table 15 |
| BW | 8 | 1 | See Table 15 |
| Primary Channel  Number | 3 | 9 | See Table 15 |
| SISO/MIMO | 1 | 12 | Set to 0 to indicate that the following transmission from this STA is performed in SISO. Set to 1 to indicate that the following transmission from this STA is performed in MIMO. |
| SU/MU MIMO | 1 | 13 | Set to 0 to indicate SU-MIMO, and set to 1 to indicate MU-MIMO. Reserved when SISO/MIMO is set to 0. |
|  |  |  |  |
| Reserved | 113 | 14 | Set to 0 by the transmitter and ignored by the receiver. |
| CTCS | 16 | 127 | Contains the CRC-16 computed over the content of the control trailer.  This field is computed as defined in section 20.3.7 |

**Table 29 —Control trailer definition when CT\_TYPE is GRANT\_RTS\_CTS2self**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Number of bits** | **Start bit** | **Description** |
| Channel  Aggregation | 1 | 0 | See Table 15 |
| BW | 8 | 1 | See Table 15 |
| Primary Channel  Number | 3 | 9 | See Table 15 |
| SISO/MIMO | 1 | 12 | Set to 0 to indicate that the following transmission from this STA is  performed in SISO. Set to 1 to indicate that the following transmission from this STA is performed in MIMO. |
| SU/MU MIMO | 1 | 13 | Set to 0 to indicate SU-MIMO, and set to 1 to indicate MU-MIMO.  Reserved when SISO/MIMO is set to 0. |
| Number of SS | 3 | 14 | The value of this field plus one indicates the number of SSs transmitted  to the EDMG STA that is the recipient of the control trailer. Reserved if  SISO/MIMO is set to 0. |
| TX Sector ID for  SS1 | 6 | 17 | This field indicates the sector that the transmitter of this control trailer  uses for SS1. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS1 | 2 | 23 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS1. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS1 | 2 | 25 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS1. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS2 | 6 | 27 | This field indicates the sector that the transmitter of this control trailer  uses for SS2. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS2 | 2 | 33 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS2. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS2 | 2 | 35 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS2. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS3 | 6 | 37 | This field indicates the sector that the transmitter of this control trailer  uses for SS3. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS3 | 2 | 43 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS3. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS3 | 2 | 45 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS3. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS4 | 6 | 47 | This field indicates the sector that the transmitter of this control trailer  uses for SS4. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS4 | 2 | 53 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS4. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS4 | 2 | 55 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS4. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS5 | 6 | 57 | This field indicates the sector that the transmitter of this control trailer  uses for SS5. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS5 | 2 | 63 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS5. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS5 | 2 | 65 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS5. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS6 | 6 | 67 | This field indicates the sector that the recipient of this control trailer uses  for SS6. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS6 | 2 | 73 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS6. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS6 | 2 | 75 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS6. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS7 | 6 | 77 | This field indicates the sector that the transmitter of this control trailer  uses for SS7. Reserved if SISO/MIMO is set to 0. |
| TX DMG antenna  ID for SS7 | 2 | 83 | This field indicates the DMG antenna that the transmitter of this control  trailer uses for SS7. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS7 | 2 | 85 | This field indicates the DMG antenna that the recipient of this control  trailer uses for SS7. Reserved if SISO/MIMO is set to 0. |
| TX Sector ID for  SS8 | 6 | 87 | This field indicates the sector that the recipient of this control trailer uses  for SS8. Reserved if SISO/MIMO is set to 0. |

|  |  |  |  |
| --- | --- | --- | --- |
| TX DMG antenna  ID for SS8 | 2 | 93 | This field indicates the DMG antenna that the transmitter of this control trailer uses for SS8. Reserved if SISO/MIMO is set to 0. |
| RX DMG antenna  ID for SS8 | 2 | 95 | This field indicates the DMG antenna that the recipient of this control trailer uses for SS8. Reserved if SISO/MIMO is set to 0. |
|  |  |  |  |
| Reserved | 30 | 97 | Set to 0 by the transmitter and ignored by the receiver. |
| CTCS | 16 | 127 | Contains the CRC-16 computed over the content of the control trailer.  This field is computed as defined in section 20.3.7 |

**Table 30 —Control trailer definition when CT\_TYPE is SPR**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field** | **Number of bits** | **Start bit** | **Description** |
| Channel  Aggregation | 1 | 0 | See Table 15 |
| BW | 8 | 1 | If the IsChannelNumber field is set to 1, the BW field indicates the requested channel number for the allocation using the bitmap format of the BW field defined in Table 15.  If the IsChannelNumber field is set to 0, the BW field indicates a channel width. In this case, the channel width can be allocated on any channel number. |
| Primary Channel  Number | 3 | 9 | See Table 15 |
| IsChannelNumber | 1 | 12 | Indicates whether the STA requests a designed channel or not. |
|  |  |  |  |
| Reserved | 114 | 13 | Set to 0 by the transmitter and ignored by the receiver. |
| CTCS | 16 | 127 | Contains the CRC-16 computed over the content of the control trailer. This field is computed as defined in section 20.3.7 |

11.4 TS operation

11.4.13 DMG allocation formats

11.4.13.2 Isochronous allocations

In order to request the setup of an isochronous allocation, a DMG STA shall set the Allocation Format field in the DMG TSPEC element to 1.

***Insert the following paragraphs after the first paragraph***

An EDMG STA may request an SP allocation(s) by using the BW, Channel Aggregation and IsChannelNumber subfields in the DMG TSPEC element. Upon reception of a DMG ADDTS Request frame that is admitted, an EDMG AP or EDMG PCP sets the values of BW and Channel Aggregation subfields in the DMG TSPEC element of the DMG ADDTS Response frame sent in response to the ADDTS Request frame as follows:

* If the IsChannelNumber subfield in the received ADDTS Request frame is equal to 0, the AP or PCP may allocate a channel with channel width less than or equal to the value of the BW subfield.
* If the IsChannelNumber subfield in the received ADDTS Request frame is equal to 1, the AP or PCP should allocate the channel as indicated by the BW subfield.

Following the successful admittance of a DMG TSPEC with an isochronous allocation, the AP or PCP should allocate time in the beacon interval to meet the periodicity and minimum allocation requirements specified in the DMG TSPEC element.

Referring to fields in the DMG TSPEC element, the AP or PCP should check that over each Allocation Period the sum of the time allocations is at least the Minimum Allocation. In addition, the AP or PCP should check that each individual allocation has a minimum duration of at least Minimum SP Duration. See 9.4.2.134 (DMG TSPEC element), 10.36.6 (Channel access in scheduled DTI), and 10.36.6.4 (Pseudo-static allocations).

With an isochronous DMG TSPEC, the allocation period defines the period over which the channel time allocation repeats. The scheduler should check that at least the minimum allocation is made within each allocation period. The allocation may be composed of multiple SPs. The scheduler also checks that each SP making up the allocation is no shorter than the minimum SP duration. The scheduler is free to position the SPs that make up the allocation anywhere in the allocation period. The scheduler may allocate up to the maximum allocation each allocation period if resources permit.

11.4.13.3 Asynchronous allocations

***Insert the following paragraphs after the first paragraph***

A DMG STA uses the SPR frame to request channel time for asynchronous traffic.

An EDMG STA may request an SP allocation(s) by using the BW, Channel Aggregation and IsChannelNumber subfields in the SPR frame. Upon reception of a SPR frame, an EDMG AP or EDMG PCP sets the values of BW and Channel Aggregation subfields in the control trailer of the Grant frame sent in response to the SPR frame as follows:

* If the IsChannelNumber subfield in the received SPR frame is equal to 0, the AP or PCP may allocate a channel with channel width less than or equal to the value of the BW subfield.
* If the IsChannelNumber subfield in the received SPR frame is equal to 1, the AP or PCP should allocate the channel as indicated by the BW subfield.

For each TID, source DMG STA, and destination DMG STA tuple, the AP or PCP can maintain the amount of outstanding channel time that needs to be allocated. Each time it receives an SPR frame, the amount of outstanding channel time is set to the value received in the SPR frame from the source DMG STA for the identified TID and destination DMG STA. The amount of outstanding channel time is decreased by the amount allocated when channel time is scheduled for that TID, source DMG STA, and destination DMG STA tuple.

A DMG STA may also use a DMG TSPEC to reserve resources for asynchronous traffic. In this case, the STA shall set the Allocation Format field in the DMG TSPEC element to 0. The AP or PCP should admit an asynchronous DMG TSPEC only if it is able to meet the minimum allocation requirements specified in the DMG TSPEC element.

With an asynchronous DMG TSPEC, a DMG STA registers the minimum allocation it expects within the allocation period while an SP request is in effect that is greater than the minimum allocation specified. In addition, the STA expects that each allocation is at least of duration specified by the Minimum Duration field of the DMG TSPEC, provided the outstanding SP request is at least that long. In admitting a DMG TSPEC, the AP or PCP should check that there are sufficient resources available to meet the TSPEC requirements.

**References:**

1. 17/0433r1- Channel Allocation for SP
2. Draft P802.11ay\_D0.2