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Re:	IEEE P802.16-REVd/D5		
Abstract	This contribution introduces corrections to the definitions of the AAS-IE in the OFDMA PHY		
Purpose	Adopt into P802.16d/D5 corrigenda		
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Corrections for AAS IE in OFDMA PHY

Dave Pechner, Todd Chauvin

1 Problems with the current AAS IE definition

There are discrepancies and contradictions between the definition of an AAS zone as defined by the AAS IE's and the AAS-DLFP. For correct AAS operation, these two messages must have common definitions. The discrepancies between the AAS-DLFP and AAS IE's are summarized below:

1. The AAS-DLFP defines the "Uplink_Preamble_Config" field which defines the number of preamble symbols used in the UL AAS zone. This field is missing from the AAS_UL_IE.

2. The AAS-DLFP defines the "Downlink_Preamble_Config" field which defines the number of preamble symbols used in the DL AAS zone. This field is missing from the AAS_DL_IE.

In addition, several fields are missing from the AAS IE's to completely define the AAS zone:

3. The symbol offset for the start of the UL AAS zone is missing from the AAS_UL_IE.

4. The symbol offset for the start of the DL AAS zone is missing from the AAS_DL_IE.

5. The UL_PermBase for the AAS zone is missing from the AAS_UL_IE.

6. The DL_PermBase for the AAS zone is missing from the AAS_DL_IE.

Finally, a few clarifications and corrections:

7. The definition of the AAS zone is incorrectly stated to last until the end of the frame. The behavior of any subsequent AAS IE or zone switch IE is undefined.

8. The downlink AAS IEs defined in tables 276 and 291 include entries that specify the first and last bins in the AMC AAS zone. These are redundant since the AAS DL and UL zones are a time partition of the frame and occupy all available subchannels.

2 Outline of proposed solution

The following changes are proposed. Specific text changes are presented in the next section.

1) Update the AAS_DL_IE definition to resolve the discrepancies with the AAS-DLFP and to completely define the DL AAS Zone
   - Add a 6 bit field for the DL_PermBase field
   - Add an 8 bit OFDMA symbol filed to define the starting location of the DL AAS Zone
   - Add a two bit field to define the number of OFDMA symbols to be used for the DL preamble

2) Update the AAS_UL_IE definition to resolve the discrepancies with the AAS-DLFP and to completely define the UL AAS Zone
   - Add a 7 bit field for the UL_PermBase field
   - Add an 8 bit OFDMA symbol filed to define the starting location of the UL AAS Zone
   - Add a two bit field to define the number of OFDMA symbols to be used for the UL preamble

3) Clarify that there can be multiple AAS zones per frame. Clarify that an AAS zone is terminated by a subsequent AAS IE or zone switch IE.

4) Remove the 'first bin index' and 'last bin index' entries in the AAS DL and UL IEs.

3 Proposed Text Changes

Section 8.4.5.3.3:

[Replace section 8.4.5.3.3 with the following:]

Within a frame, the switch from non-AAS to AAS-enabled traffic is marked by using the extended DIUC = 15 with the AAS_DL_IE() to indicate that the subsequent allocations shall be for AAS traffic. ~~, until the start of the first UL-MAP allocation using TDD, and until the end of the frame using FDD, shall be for AAS traffic.~~ The AAS_DL_IE defines a DL AAS Zone that spans continuous OFDMA symbols until terminated by a Zone Switch IE, another AAS_DL_IE or the end of the DL frame. Multiple AAS zones can exist within the same frame. When used, the CID in the DL-MAP_IE() shall be set to the broadcast CID. All DL bursts in the AAS portion of the frame may be preceded by ~~a~~ an AAS preamble based on the ~~indication~~ "Downlink_preamble_config" field in the AAS_DL_IE(). The preamble is defined in 8.4.4.6.3.1. ~~The preamble is defined in 8.4.6.1.1, and shall be selected to have the same segment number as the DL frame preamble, and the cell ID shall equal to *(DL-Preamble IDcell + 16) mod 32*. The preamble shall exist only on those sub-channels used by the DL burst.~~

[Modify table 276 as follows:]

Syntax	Size	Notes
AAS_DL_IE() {		
Extended DIUC	4 bits	AAS = 0x02
Length	4 bits	Length = 0x03
Permutation	2 bits	0b00 = PUSC permutation 0b01 = FUSC permutation 0b10 = Optional FUSC permutation 0b11 = AMC permutation
DL_PermBase	6 bits	
OFDMA Symbol Offset	8 bits	
Preamble indication	2 bits	~~0b00 = No preamble~~ ~~0b01 = Preamble used~~ ~~0b10 – 0b11 = Reserved~~ 0b00 - 0 symbols 0b01 - 1 symbols 0b10 - 2 symbols 0b11 - 3 symbols
Padding	6 bits	Set to Zero
~~**First bin index** 6 bits When Permutation=0b10, this indicates the~~	~~Index of the first band allocated to this AMC~~	~~Segment~~
~~**Last bin index** 6 bits When Permutation=0b10, this indicates the~~	~~Index of the last band allocated to this AMC~~	~~Segment~~
~~}~~		

Permutation

Defines the permutation used within the DL AAS Zone

DL_PermBase

Permutation Base for specified DL AAS Zone

OFDMA Symbol offset

The offset of the OFDMA symbol in which the AAS Zone starts, measured in OFDMA symbols from beginning of the current downlink frame.

Preamble Indication

Defines the number of DL AAS preambles to be used before each DL burst in the AAS Zone.

Section 8.4.5.4.6:

[Replace section 8.4.5.4.6 with the following:]

Within a frame, the switch from non-AAS to AAS-enabled traffic is marked by using the extended UIUC = 15 with the AAS_UL_IE() to indicate that the subsequent allocation ~~until the end of the frame~~ shall be for AAS traffic. The AAS_UL_IE defines a UL AAS Zone that spans continuous OFDMA symbols until terminated by a Zone Switch IE, another AAS_UL_IE or the end of the UL frame. Multiple UL AAS Zones can exist within the same frame. When used, the CID in the UL-MAP_IE() shall be set to the broadcast CID. All UL bursts in the AAS portion of the frame may be preceded by ~~a~~ an AAS preamble based on the ~~indication~~ "Uplink_preamble_config" field in the AAS_UL_IE().The preamble is defined in section 8.4.4.6.3.2.

[Modify table 291 as follows:]

Syntax	Size	Notes
AAS_UL_IE() {		
Extended UIUC	4 bits	AAS = 0x03
Length	4 bits	Length = 0x04
Permutation	2 bits	0b00 = PUSC permutation 0b01 = FUSC permutation 0b10 = AMC permutation 0b11 = Reserved
UL_PermBase	7 bits	
OFDMA Symbol Offset	8 bits	
AAS zone length	8 bits	Number of OFDMA symbols in AAS zone
Preamble indication	2 bits	~~0b00 = No preamble~~ ~~0b01 = Preamble used~~ ~~0b10 – 0b11 = Reserved~~ 0b00 - 0 symbols 0b01 - 1 symbols 0b10 - 2 symbols 0b11 - 3 symbols
Padding	5 bits	Set to Zero
~~**First bin index** 6 bits When Permutation=0b10, this indicates the~~	~~Index of the first band allocated to this AMC~~	~~Segment~~
~~**Last bin index** 6 bits When Permutation=0b10, this indicates the~~	~~Index of the last band allocated to this AMC~~	~~Segment~~
~~}~~		

Permutation

Defines the permutation used within the UL AAS Zone

UL_PermBase

Permutation Base for specified UL AAS Zone

OFDMA Symbol offset

The symbol offset of the UL AAS Zone. This is referenced to the 'Allocation Start Time' field in the UL-MAP.

AAS Zone Length

The duration of the UL AAS Zone, specified in number of OFDMA symbols.

Preamble Indication

Defines the number of UL AAS preambles to be used before each UL burst in the AAS Zone.