Project	IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>
Title	Corrections for AAS IE in OFDMA PHY
Date Submitted	2004-11-1
Source(s)	Tal Kaitz, Ran Yaniv — Alvarion — tal.kaitz@alvarion.com, ran.yaniv@alvarion.com
	Dave Pechner, Doug Dahlby, Adam Kerr, Todd Chauvin — ArrayComm Inc. — dpechner@arraycomm.com, dahlby@arraycomm.com, adam@arraycomm.com, chauvin@arraycomm.com
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
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.
Patent Policy and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

Corrections for AAS IE in OFDMA PHY

Dave Pechner, Todd Chauvin

1   Problems with the current AAS IE definition

1) The definition of a DL AAS Zone by the AAS_DL_IE is incomplete. The DL AAS Zone must be completely defined by the AAS_DL_IE. Missing information include:
      - OFDMA Symbol Offset
      - AAS Zone Duration
      - Preamble Type (frequency or time shifted)
      - Preamble Configuration (number of symbols)
      - Default preamble shift index
      - AAS Diversity-Map Scan indicator
      - AMC tile configuration

2) The definition of an UL AAS Zone by the AAS_UL_IE is incomplete. The UL AAS Zone must be completely defined by the AAS_UL_IE. Missing information include:
      - OFDMA Symbol Offset
      - AAS Zone Duration
      - Preamble Type (frequency or time shifted)
      - Preamble Configuration (number of symbols)
      - Default preamble shift index
      - AMC tile configuration

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 completely define the DL AAS Zone

2) Update the AAS_UL_IE definition to completely define the UL AAS Zone

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 Zone duration is specified as a number of consecutive symbols. 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	
DL AAS Zone Duration	8 bits	Specified in OFDMA symbols
Preamble Indication	1 bit	0 = Frequency shifted preamble 1 = Time shifted preamble
~~Preamble indication~~ Preamble Configuration	2 bits	~~0b00 = No preamble~~ ~~0b01 = Preamble used~~ ~~0b10 – 0b11 = Reserved~~ 0b00 - 0 symbols 0b01 - 1 symbols 0b10 - 2 symbols 0b11 - 3 symbols
AAS Diversity-Map Scan Indication	2 bits	0b00 – Diversity Map Scan present 0b01 – Diversity Map Scan not included 0b10 – Reserved 0b11 - Reserved
If (AMC Permutation) {		
AMC Configuration	2 bits	0b00 = 6x1 tiles 0b01 = 3x2 tiles 0b10 = 2x3 tiles 0b11 – 1x6 tiles
}		
Else {		

Reserved	2 bits	Set to Zero
}		
Padding	1 bit	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.

AAS Zone Duration
>   The duration of the specified AAS Zone, measured in OFDMA symbols.

Preamble Indication
>   Defines the type of preamble used in the DL AAS Zone.

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

AAS Diversity-Map Scan
>   Indicates if the AAS Diversity-Map Scan Zone is present in the downlink AAS Zone.

AMC Configuration
>   Defines the tile structure of the AMC permutation in the DL AAS Zone. This field is only used if the AAS Zone utilizes the AMC permutation.

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 UL AS Zone duration is specified as a number of consecutive symbols. 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 = 0x02
Length	4 bits	Length = 0x03
Permutation	2 bits	0b00 = PUSC permutation 0b01 = FUSC permutation 0b10 = AMC permutation 0b11 = Reserved
UL_PermBase	7 bits	
OFDMA Symbol Offset	8 bits	
DL AAS Zone Duration	8 bits	Specified in OFDMA symbols
Preamble Indication	1 bit	0 = Frequency shifted preamble 1 = Time shifted preamble
~~Preamble indication~~ Preamble Configuration	2 bits	~~0b00 = No preamble~~ ~~0b01 = Preamble used~~ ~~0b10 – 0b11 = Reserved~~ 0b00 - 0 symbols 0b01 - 1 symbols 0b10 - 2 symbols 0b11 - 3 symbols
If (AMC Permutation) {		
AMC Configuration	2 bits	0b00 = 6x1 tiles 0b01 = 3x2 tiles 0b10 = 2x3 tiles 0b11 – 1x6 tiles
}		
Else {		
Reserved	2 bits	Set to Zero
}		
Padding	2 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

OFDMA Symbol offset
        The symbol offset of the UL AAS Zone. This is referenced to the start of the DL frame plus the
        value TTG.

UL_PermBase
        Permutation Base for specified UL AAS Zone

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

Preamble Indication
        Defines the type of preamble used in the UL AAS Zone.

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

Preamble Shift Index

Default value of K in equations 100 and 101. This should match the beam index value in the DLFP message

AMC Configuration

Defines the tile structure of the AMC permutation in the UL AAS Zone. This field is only used if the AAS Zone utilizes the AMC permutation.