

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
Title	New ARQ ACK type for 802.16a	
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Re:	IEEE 802.16 Working Group Letter Ballot #4 (P802.16a/D1-2001)	
Abstract	This document defines an additional ACK type. The new ACK type called “Cumulative with Selective ACK entry” combines cumulative acknowledgement with selective acknowledgment. This is very useful in real world ARQ implementations.	
Purpose	Incorporate the changes proposed in this document into P802.16a/D1-2001	
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1 Introduction

Currently P802.16a/D1-2001 defines two ARQ ACK types: 00 = Selective ACK entry and 01 = Cumulative ACK entry. While both of these entries are useful, another common scenario is when both selective and cumulative acknowledgements need to be conveyed in a single message. This document proposes such an ACK message entry that can be used along with the other two defined in the draft. The rest of this document presents the specific changes required to include the additional ACK type in P802.16a/D1-2001.

2 Specific Changes to P802.16a/D1-2001

Replace section 6.2.4.2 and Table 166 on page 47 with the following:

6.2.4.2 ARQ Feedback Information Element Format

Table 166 shows the basic ARQ acknowledgment information element used by the receiver to signal positive or negative and/or cumulative acknowledgments. This information element may be piggybacked with another PDU or transported as a payload in a standalone PDU.

Table 166: ARQ Feedback Information Element

Syntax	Size	Notes
ARQ_feedback_IE () {	Variable	
CID	16 bits	The ID of the connection being referenced
LAST	1 bit	0 = More ARQ feedback IE in the list 1 = Last ARQ feedback IE in the list
ACK Type	2 bits	00 = Selective ACK entry 01 = Cumulative ACK entry 10 = Cumulative with Selective ACK entry 11 = Reserved
BSN	11 bits	Block sequence number for the acknowledged ARQ block
Number of 16 bits ACK Maps	2 bits	00 = 1 (i.e., 16 bits) 01 = 2 (i.e., 32 bits) 10 = 3 (i.e., 48 bits) 11 = 4 (i.e., 64 bits)
If (ACK Type != 01) for (i=0; i< (Number of 16 bits ACK Maps +1); ++i) {		

<p>ACK MAP</p>	<p>16 bits</p>	<p>Each bit set to one indicates the corresponding ARQ block has been received without errors. The bit corresponding to the BSN value in the IE, is the most significant bit of the first 16-bit map entry. The bits for succeeding block numbers are assigned left-to-right (msb to lsb) within the map entry.</p> <p>If the ACK Type is 10, then the most significant bit of the first 16-bit map entry must be set to one and the IE should be interpreted as a cumulative ACK for the BSN value in the IE. The rest of the bitmap shall be interpreted similar to ACK Type 00.</p>
<p>}</p>		
<p>}</p>		