Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Multicast Group Membership Query message for Multicast and Broadcast Service in IEEE 802.16e**
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Source(s)	Yongjoo Tcha, Kyoo-Tae Ryoo, Seong-Choon Lee KT 17 Woomyeon-dong, Seocho-gu, Seoul, Korea, 137-792 Voice: +82-2-526-6155 Fax: +82-2-526-5200 mailto: yjtcha@kt.co.kr
Re:	IEEE P802.16e/D3 Letter Ballot
Abstract	This document contains a suggestion of new Multicast Group Membership Query message for Multicast and Broadcast Service in IEEE 802.16e.
Purpose	The document is contributed to support certain comment on IEEE P802.16e/D3 Letter Ballot.
Notice	
Release	
Patent Policy and Procedures	

Multicast Group Membership Query message for Multicast and Broadcast Service in IEEE 802.16e

Yongjoo Tcha, Kyoo-Tae Ryoo, Seong-Choon Lee
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1. Problem Statements

In Multicast and Broadcast service (MBS), data is transmitted to multiple recipients. Transmitting the same data to multiple recipients allows network resources to be used efficiently. The MBS uses a group address to transmit the data for all recipients instead of the recipients' host addresses.

The recipient that wants to receive MBS has to join a group in advance. Internet Group Management Protocol (IGMP) for IPv4 and Multicast Listener Discovery (MLD) protocol for IPv6 are used for joining a multicast group. Multicast router broadcasts Membership query message to directly attached hosts in its subnet.

As there is no message type for broadcasting membership query in IEEE802.16e/D3, BS has to send this message to each active MSSs.

2. Proposal

A Group Membership Query message is defined in MAC management message. A BS shall broadcast the Group Membership Query message to all MSSs in the cell and a MSS that wants to join a multicast group sends a report message to the multicast router.

3. Proposed Text Changes

[Add new section after the section 6.3.2.3.60:]

6.3.2.3.61 Group Membership Query (GRP-MEM-QRY) message
A GRP-MEM-QRY message may be transmitted by a BS to query multicast reception state of MSSs that want to join a multicast group.
A BS shall generate GRP-MEM-QRY message in the format shown in Table xx.
An MSS shall generate a Membership report message in response to the GRP-MEM-QRY message. The membership report message shall be carried in the Payload of MAC PDU and use Transport CIDs.
The format of membership report message shall be described in IETF RFC 3376. So, the membership report message doesn't need to be defined in this document.

Table xx GRP-MEM-QRY Message Format

Syntax	Size	Notes
GRP-MEM-QRY_Message_Format() {		

Type	1 bits	0 = IGMP 1 = MLD
Max Resp Code	8 bits	The Max Resp Code field specifies the maximum time allowed before sending a responding report. The actual time allowed, called the Max Resp Time, is represented in units of 1/10 second.
Group address	32 bits	0, when general query
Number of Sources (N)	16 bits	Number of source addresses
For (i=0; i<N; i++) {		
Source Address	32 bits	
}		
}		

[Insert a row in Table 14 at the subsection 6.3.2.3]

Table 14 – MAC Management messages

Type	Message name	Message description	Connection
61	GRP-MEM-QRY	Group Membership Query message	broadcast

Reference

[1] IEEE P802.16e/D3, 31 May 2004 “Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems,”
[2] B. Cain, et. al., “Internet Group Management Protocol, Version 3,” rfc3376.
[3] R. Vida, et. al., “ Multicast Listener Discovery Version 2 (MLDv2) for IPv6,” rfc3810.