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Re:	IEEE P802.16e/D3 Letter Ballot	
Abstract	This document contains new assignment scheme of transport CIDs for multicast service.	
Purpose	The document is contributed to support certain comment on IEEE P802.16e/D3 Letter Ballot.	
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Multicast CID assignment for Multicast and Broadcast Service in IEEE 802.16e

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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.

We need some group CIDs to transmit the MBS data to all recipients efficiently. But there is no discrimination between unicast and multicast transport CIDs in current standard, and MSSs do not know whether the connection is a unicast connection or a multicast connection.

As the CID is not classified into unicast and multicast CIDs, a MSS moving into a new cell which wants to continue the MBS must send a multicast group join request message in Layer 3 (e.g. IGMP membership report message).

If MSSs request to join a multicast group with upper layer message regardless of the existence of the same multicast group member in the new cell, seamless service may not be possible because of additional time needed to join group member and acquire a new CID.

In summary, the multicast channel should be classified in Layer 2 to decrease the time delay and support the seamless multicast service during handover.

2. Proposal

To support seamless MBS during handover, CIDs need to be classified into unicast and multicast CIDs. MBS channels should have one to one relationship with multicast CIDs.

When the MSS moves into a new cell which has the same CID, it can be served MBS without any delay. Moreover, as the same subchannels are assigned to the CID in the network, SNR can be increased near the cell edge.

3. Proposed Text Changes

6.3.13 Establishment of multicast connections

The BS may establish a downlink multicast service by creating a connection with each MSS to be associated with the service. ~~Any available traffic CID value may be used for the service (i.e. there are no dedicated CIDs for multicast transport connections)~~ Some traffic CID values may be assigned for the service (i.e. there are some dedicated CIDs for multicast transport connections). To ensure proper multicast operation, the CID used for the service is the same for all BSs and for all MSSs on the same channel that participate in the connection. ~~The MSSs need not be aware that the connection is a multicast connection.~~ The data transmitted on the connection with the given CID shall be received and processed by the MAC of each involved MSS. Thus each multicast SDU is

transmitted only once per BS channel. Since a multicast connection is associated with a service flow, it is associated with the QoS and traffic parameters for that service flow.

ARQ is not applicable to multicast connections.

If a downlink multicast connection is to be encrypted, each SS participating in the connection shall have an additional security association (SA), allowing that connection to be encrypted using keys that are independent of those used for other encrypted transmissions between the MSSs and the BS.

[Insert this Table in the section 6.3.13]

Table MBS CID Mapping example

Content Name	Multicast IP address	BS ID	CID for MBS
Station #1	224.34.56.78	0x0...001	0x1001
		0x0...002	0x1001
		0x0...003	0x1001
Station #2	225.34.56.78	0x0...001	0x1002
		0x0...002	0x1002
		0x0...003	0x1002
Station #3	230.11.128.54	0x0...001	0x1003
		0x0...002	0x1003
		0x0...003	0x1003

[Insert a row in Table 343 at the section 10.4]

Table 343 - CIDs

CID	Value	Description
Initial ranging	0x0000	Used by SS and BS during initial ranging process.
Basic CID	0x0001 – m	The same value is assigned to both the DL and UL connection.
Primary management	m+1 – 2m	The same value is assigned to both the DL and UL connection.
Transport CIDs and secondary Mgt CIDs	2m+1 – 0xFE9F	For the secondary management connection, the same value is assigned to both the DL and UL connection.
Multicast CIDs	0xFEA0 – 0xFEFE	For the downlink multicast service, the same value is assigned to all MSSs on the same channel that participate in the connection.
AAS initial ranging CID	0xFEFF	A BS supporting AAS shall use this CID when allocating a Initial Ranging period for AAS devices
Multicast polling CIDs	0xFF00 – 0xFFFD	An SS may be included in one or more multicast polling groups for the purposes of obtaining bandwidth via polling. These connections have no associated service flow.

Padding CID	0xFFFE	Used for transmission of padding information by SS and BS.
Broadcast CID	0xFFFF	Used for broadcast information that is transmitted on a downlink to all SS.