Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
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Re:	Response to Recirculation Ballot #14c Announcement
Abstract	**The delivery of MBS contents using tunnel**
Purpose	Review and Adopt the suggested changes into P802.16e/D4-2004
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1 Introduction

The multimedia broadcast service(MBS) can be provided with the concept of MBS zones. MBS content may be transmitted to all or some selected MBS zones of the network. This concept can be found in the earlier proposal IEEE C802.16e-04/201[1].
When a MBS zone is configured, MBS server or contents are assigned to the specified area. The desired MBS contents can not be delivered to the MSS outside of the MBS zone or attached to the BS which does not have the MBS capability. When a MSS moves outside of the MBS zone, the service can no longer be provided.
We propose the unicast tunneling from a base station(BS) in MBS zone to the MSS which is outside of the MBS Zone and thus can not receive the desired MBS contents but does not want to lose the current service. The base station inside the MBS zone is called the MBS agent BS. When the agent BS is requests the tunnel registration, it creates the tunnel and forwards the MBS contents to the MSS.
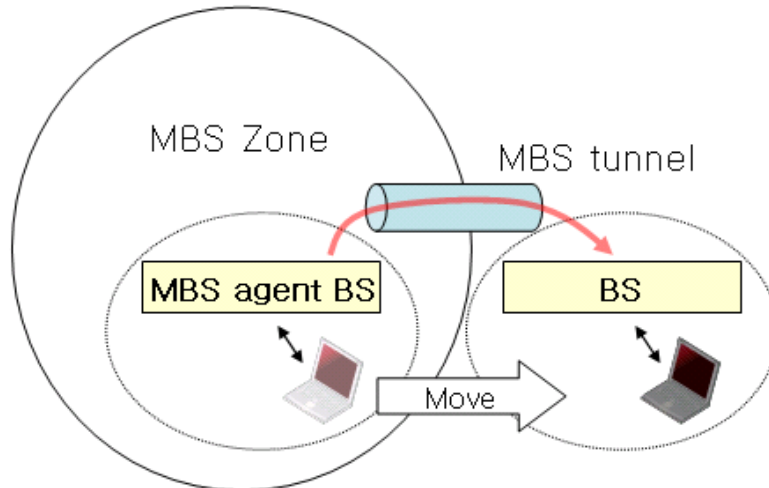

Figure1. MBS tunneling

When the MSS moves under a new BS and the initialization is finished, the MSS sends DSA-REQ message with the specific MBS content's multicast IP address, port number and agent BS ID. Then the BS sends the tunnel request to the agent BS in the MBS zone. The MSS should still have the information of the agent BS in the MBS zone. And the BS should have the capability of IP in IP encapsulation[2] for the purpose of forwarding the MBS packet to the MSS. Since MBS packets are deliver to the MSS with this tunnel, the MSS can continue the MBS service even if it is located outside the MBS zone. The MBS tunnel lifetime should be maintained. Hence, we propose new parameter format and backbone messages.

2 Reference

[1] Yong Chang, et al., "Enhanced Broadcast/Multicast Capabilities," IEEE C802.16e-04/201r1, July 2004.
[2] IETF RFC 2003, "IP Encapsulation within IP," C.Perkins, October 1996.

3 Text Change

[Insert the following after 11.13.19]

11.13.20 MBS Agent BS-ID
The value of this parameter identifies the MBS agent BS which MSS wants to establish a tunnel with.

Type	Length	Value	Scope
[145/146].18	6	MAC Address	DSA-REQ

[Modify the table D1 as follows]

Service	Possible methods for providing service	Comments
Provide a BS with the identity of its neighbors	(1) Get info from ASA server (2) Configuration(network	Options(1) and (2) are really the same, the only difference is where the configuration

	management)	is done
Provide a BS with the identity of the ASA server	(1) ASA server publishes its presence (2) Configuration (network management)	Message format and transport protocol need to be specified for interoperability
Advertise the information of a certain MSS has registered with a BS	(1) BS notifies ASA server (2) BS notifies neighbor BS	Message format and transport protocol need to be specified for interoperability
Provide a BS information about a certain MSS	(1) ASA server provides information (2) Serving BS provides information(or network management if Serving BS cannot be found)	Message format and transport protocol need to be specified for interoperability
Information exchange during HO	(1) ASA server is in the middle (2) BS to BS direct exchange	Message format and transport protocol need to be specified for interoperability
Providing a BS with information about its neighbors	(1)ASA server is in the middle (2)BS to BS direct exchange	Message format and transport protocol need to be specified for interoperability
Creating tunnel for the MBS delivery	BS to BS direct exchange	Message format and transport protocol need to be specified for interoperability

[Insert the following after C.2.7]

C.2.8 Tunnel Registration Request
This message is sent from the new BS to the agent BS in the MBS zone. The agent BS upon receiving this message creates a tunnel to the new BS and forwards the MBS content.
Table C9 – Tunnel-REG-request Message

Field	Size	Notes
Global Header	152-bit	
For(j=0; k<Num Records; j++){		
MSS unique identifier	48-bit	48-bit unique identifier used by MSS(as provided by the MSS or by the *I-am-host-of* message)
MSS IP Address	32-bit	The IP address of MSS which is the tunnel endpoint
MBS contents IP Address	32-bit	The IP address of MBS contents which MSS want to be forwarded
MBS contents port	16-bit	The port of MBS contents which MSS want to be forwarded
Lifetime	16-bit	The second of lifetime which this tunnel is maintained
}		
Security field	TBD	A means to authenticate this message
CRC field	32-bit	IEEE CRC-32

C.2.9 Tunnel Registration Response
Table C10 – Tunnel-REG-response Message

Field	Size	Notes
Global Header	152-bit	
For(j=0; k<Num Records; j++){		
MSS unique identifier	48-bit	48-bit unique identifier used by MSS(as provided by the MSS or by the *I-am-host-of* message)
ACK/NACK	8-bit	Acknowledgement or Negative acknowledgement - 1 is Acknowledgement which means the tunnel is setup successfully - 2 is Negative acknowledgement which means the tunnel can not be setup
}		
Security field	TBD	A means to authenticate this message
CRC field	32-bit	IEEE CRC-32