

Project	IEEE 802.16 Broadband Wireless Access Working Group < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >
Title	Multicast when using Tunnel CID
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Re:	IEEE 802.16j-06/034: "Call for Technical Proposals regarding IEEE Project P802.16j"
Abstract	This contribution describes how to perform multicasting in tunneling connection
Purpose	Propose method of multicasting in tunneling connection
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## Multicast when using Tunnel CID

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### 31. Introduction

4 To utilize the radio resources for MR network, the concept of “tunnel” is introduced to reduce the MAC  
5 overhead and process in the relay link [1]. There are two modes for tunnel connections. In Tunnel Burst  
6 mode, only station at egress of tunnel would read the encapsulated MPDU and other stations along tunnel  
7 would directly forward MPDU after decoding the MAP\_IE with destination T-CID. Alternatively, in Tunnel  
8 Packet mode, every station along tunnel would receive the encapsulated MPDU and read the relay MAC  
9 header to see whether a T-CID is placed or not. If a destination T-CID is appeared, intermediated stations  
10 would forward the MPDU without reading payload and only station at egress of tunnel would read the  
11 contents of payload.

12

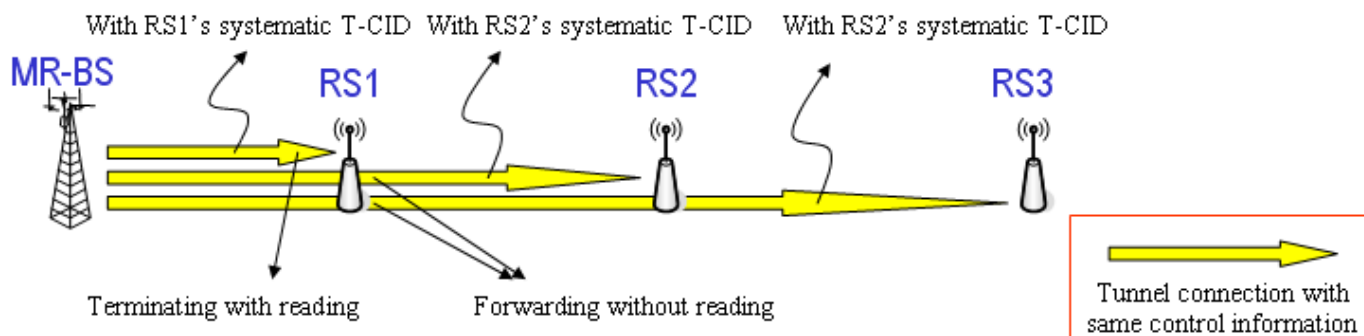
13 In MR network, MR-BS always needs to control and manage several RSs at the same time. Compared to  
14 unicasting identical control message for every RS, the usage of multicasting control message by MR-BS to  
15 RSs is more suitable and efficient. In this contribution, we propose to perform multicasting along tunnel by  
16 Tunnel Packet mode. With this scheme, it can achieve multicasting along tunnel connection with less  
17 processing and resources.

18

### 192 Proposal

20 To support multicasting control message along tunnel, every station along this tunnel shall be  
21 responsible to forward the encapsulated MPDU to next-hop station and read the associated payload (control  
22 message) until the egress of tunneling. When systematic T-CID allocation is used, due to the systematic  
23 structure, it is unable to be assigned a common systematic multicast CID for the multicast group. Instead,  
24 establishing multiple unicast connections with different systematic T-CIDs is employed. Figure 1 shows this  
25 case and it can be observed that a lot of resources are wasted. Alternatively, when explicit path management  
26 is used (non-systematic T-CID allocation), a common multicast CID can be assigned for the members of  
27 multicast group; however, multicast routing tables shall be maintained for the members of multicast group  
28 and conduct them forward the multicast packets. Figure 2 shows this case and it can be founded that it needs  
29 a lot of overhead.

30

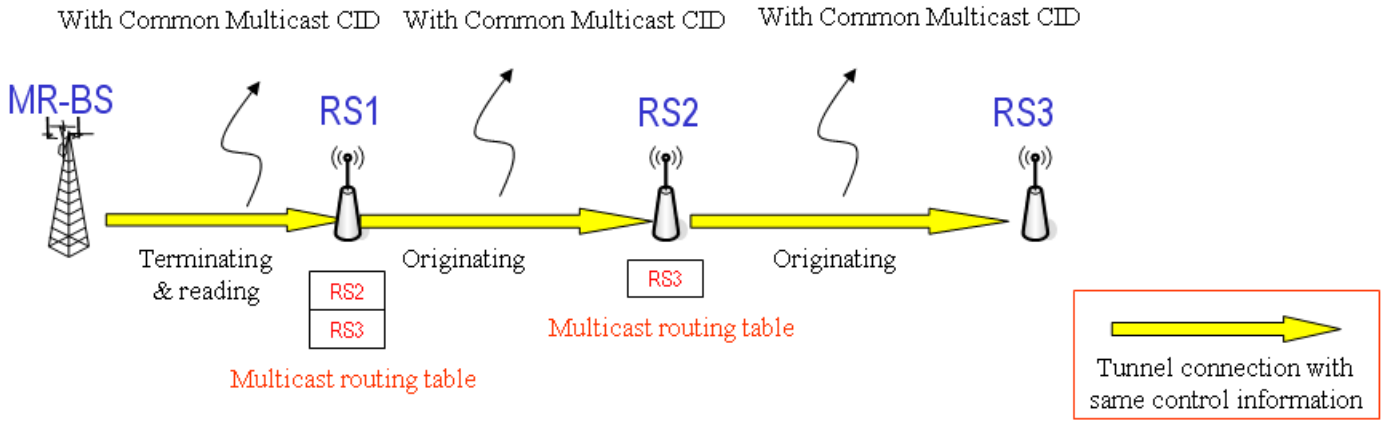


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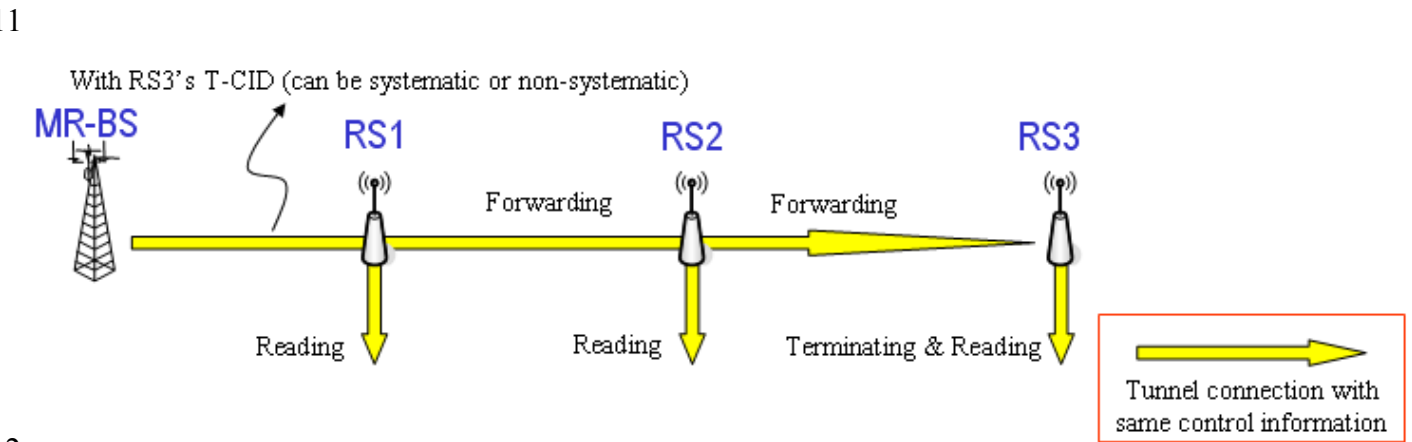
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1 Figure 1, an example of multicasting when systematic CID is used



2  
3 Figure 2, an example of multicasting when non-systematic CID is used

4  
5 To avoid these problems, a refinement of Tunnel Packet mode is proposed. We will endow the relay  
6 MAC header with an additional functionality: One bit called Owner-ship type in relay MAC header will be  
7 used to indicate whether intermediated station needs to read the contents of payload after its forwarding.  
8 With this refinement, one tunnel connection with last-hop station's T-CID (can be systematic or non-  
9 systematic) and enabled "Owner-ship type" bit in the header can realize the multicasting along this tunnel at  
10 once time. An example of the proposed scheme is shown in Figure 3.



12  
13 Figure 3, Perform multicasting by proposed scheme

14  
15 This scheme provides the following benefits:

- 16 ➤ More efficient transmission – the radio resources regarding with multicasting can be achieved
- 17 within one tunnel connection.
- 18 ➤ Less signaling overhead– with this scheme, it doesn't need additional signaling to maintain the
- 19 multicasting routing table in intermediated RSs.

20  
213 **Proposed Text Change**

1-----Start of the Text-----

2

3 *[Add following text into session 6.3.3.8.1]*

46.3.3.8.1 Transmission using tunnels

5For multicasting control message along a tunnel, the MR-BS can arrange a tunnel connection by Tunnel  
6Packet mode. In this relay MAC header, the T-CID of last-hop station would be placed and the “Owner-  
7ship” bit would be set to “1” to let intermediated stations along this tunnel can forward and read the  
8associated control message.

9

10-----End of the Text-----

11

12

13**References**

14[1] IEEE 802.16j-06/026r3, “P802.16j Baseline Document”.

15[2] IEEE C802.16j-06/241r5, “Connection Management and Relay Path Configuration”.

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