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Re:	Call for Technical Proposals regarding IEEE Project P802.16j (IEEE 802.16j-06/027)
Abstract	IE that needs to be added to enable improved network entry support for relay stations.
Purpose	Adoption of the proposed text into P802.16j
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Routing Announcements for Network Entry Support

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1   Introduction

This contribution proposes a method of transmitting routing related parameters in order to facilitate the network entry of Relay Stations (RSs) in a multihop relay (MR) network.

In order to facilitate the incorporation of this proposal in to IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026 are listed in Section 3.

2   General Description

In a multihop IEEE 802.16 network that employs relay stations (RS) for the purpose of coverage extension or capacity improvement, it is important for the RSs entering the network, to consider the routing characteristics of the access station and the path from the access station to its MR-BS, before associating with the access station.

2.1   Elements of Routing Announcements

There are several parameters that are of interest and should be considered.

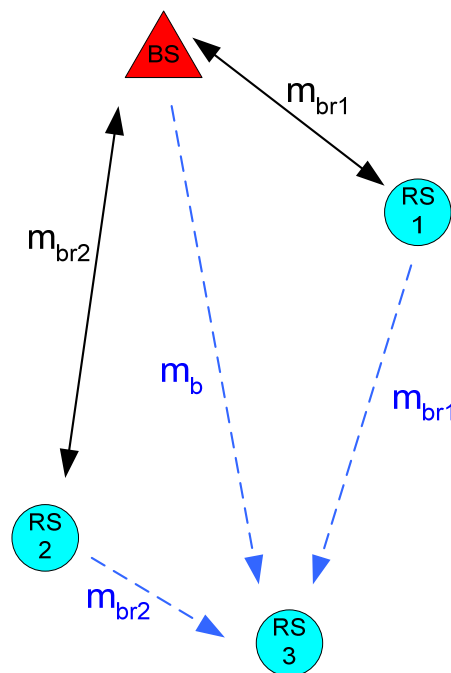#### 2.1.1   Path Metric to the MR-BS

Figure 1 – Path metric announcement

Consider the exemplary network shown in Figure 1. BS is a MR-BS. RS1 and RS2 are already in the network and are associated to BS as per the topology shown. The end-to-end (ETE) path metric between RS1 and BS is m_{br1} and between RS2 and BS is m_{br2}.

When RS3 enters the MR network, it should be made aware of the ETE path metric from each access station to BS, so that RS3 may include this information in its network entry decisions. Each MR-BS and RS should transmit this information on the downlink using the mechanism described in Section 2.2. The MR-BS should also transmit a metric value (m_b, in this example).

2.1.2 Number of Hops to the BS

Each RS should transmit on the downlink, its number of hops to the MR-BS that they are associated to. The mechanism used to transmit this information is described in Section 2.2.

2.1.3 BSID

Each RS should transmit on the downlink, the BSID of the MR-BS it is associated to. The mechanism used to transmit this information is described in Section 2.2.

2.1.4 Next Hop towards the BS

Each RS should transmit on the downlink, the node ID of the device that is their next hop towards the MR-BS. The mechanism used to transmit this information is described in Section 2.2.

2.2 Data Encapsulation

The above information should be encapsulated in to a structure (Routing_Advertisement_IE), and may be carried in the DL-MAP transmitted by the MR-BS and the RSs, as an extended IE.

3 Proposed Text Changes

[Insert text in sub clause 6.3.9.16]

[Insert a new sub clause 6.3.9.16.1]

6.3.9.16.1 Network Entry Procedure for RS

This section describes the network entry procedure for relay stations entering an MR network.

[Insert a new sub clause 6.3.9.16.1.1]

6.3.9.16.1.1 Routing Announcements for network Entry Support

The MR-BS and the RS shall transmit the Routing_Advertisement_IE in the form of a DL-MAP extended IE in the DL-MAP message transmitted in the MMR-BS-to-MS and RS-to-MS control zones. [These zones are defined in C80216j-06_155].

The MR-BS and the RS shall also transmit the Routing_Advertisement_IE in the MAP message transmitted in the MMR-BS-to-RS and RS-to-RS control zones. [These zones are defined in C80216j-06_155].

Routing_Advertisement_IE is defined in section 8.4.5.3.28.

The RS entering the MR network shall decode the Routing_Advertisement_IE and use its contents to select the access station to enter the MR network through it. The RS shall then proceed to complete the rest of the network entry procedure with the selected access station.

[Change section 8.4.5.3.2.1]

[Insert new row in Table 277a]

Extended DIUC (hexadecimal)	Usage
0A	**Routing_Advertisement _IE**

[Insert a new sub clause 8.4.5.3.28]

8.4.5.3.28 Routing Advertisement IE

[Insert the following text in section 8.4.5.3.28]

In the DL-MAP the MR-BS and the RS may transmit DIUC = 15 with the Routing_Advertisement _IE() to facilitate RS network entering.

Syntax	Size	Notes
Routing_Advertisement_IE(){	-	-
Extended DIUC	4 bits	RANN = 0x0A
Length	4 bits	Length = 0x02 or 0x0F
ETE Metric	16 bits	The metric of the path from the access station to its MR-BS
BSID	48 bits	The BSID of the MR-BS to which the access station is associated
Next Hop Node ID	48 bits	The ID of the node next hop towards the MR-BS.
Number of Hops	8 bits	Number of hops from the access station to its MR-BS
}	-	-

The "Length" field of the Routing_Advertisement_IE() could take either of the two values, 0x02 and 0x0F. This enables MR-BSs to transmit a shorter version of the Routing_Advertisement_IE().