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| Re: | IEEE 802.16j-07/007r2: "Call for Technical Comments and Contributions regarding IEEE Project 802.16j" |
| Abstract | This contribution proposes relay path management during network entry |
| Purpose | Text proposal for 802.16j Baseline Document |
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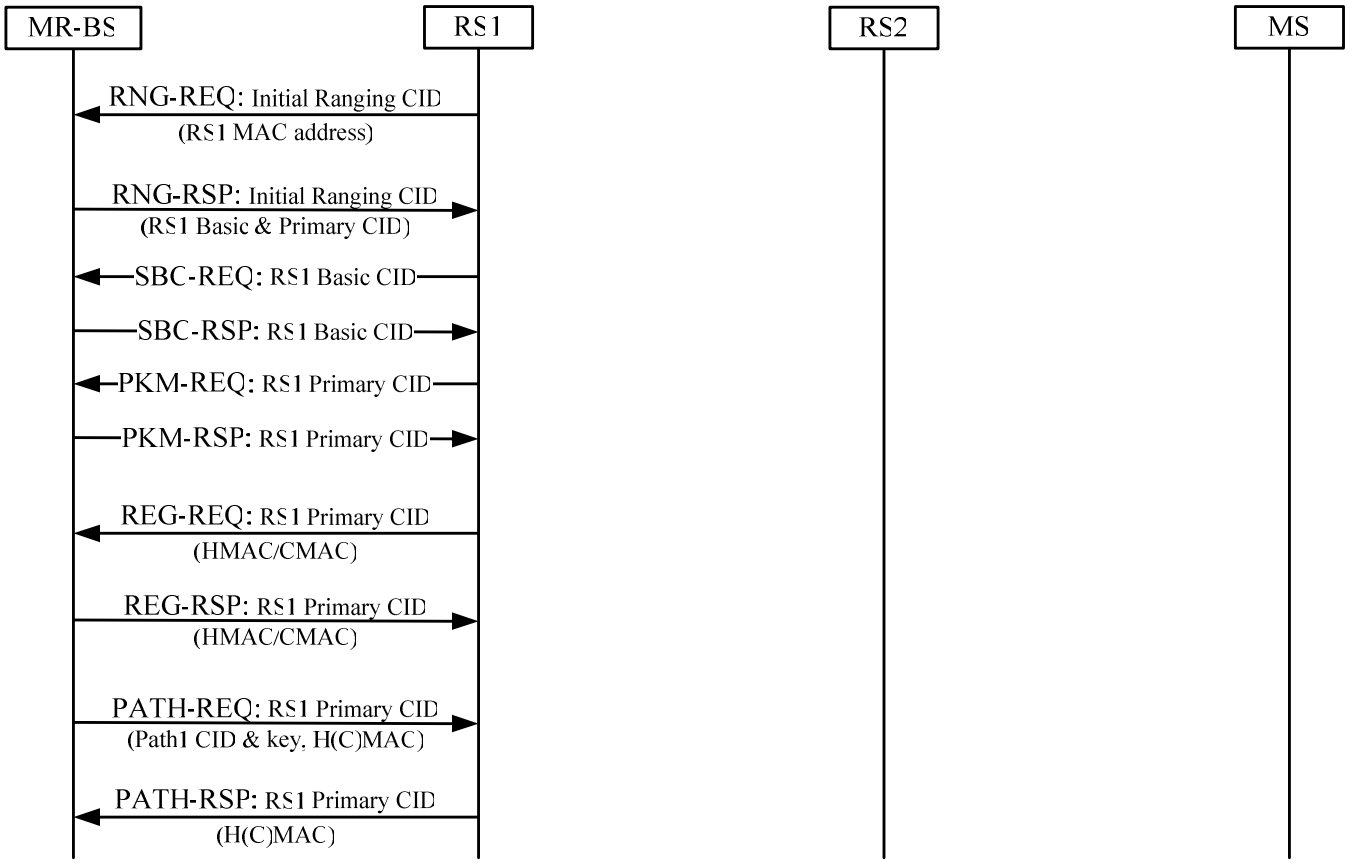
# Relay Path Management during Network Entry

# Introduction

This contribution describes relay path management during network entry. Three examples are given to illustrate the proposed relay path management scheme which enhances the IEEE contribtions C80216j-07/031r1, C80216j-07/032, and C80216j-07/134. In order to facilitate the incorporation of this proposal into IEEE 802.16j standard, specific changes to the baseline working document IEEE 802.16j-06/026r2 are listed below.

Example 1: RS1 entering the MR-BS network directly



Example 2: RS2 entering the MR-BS network via RS1

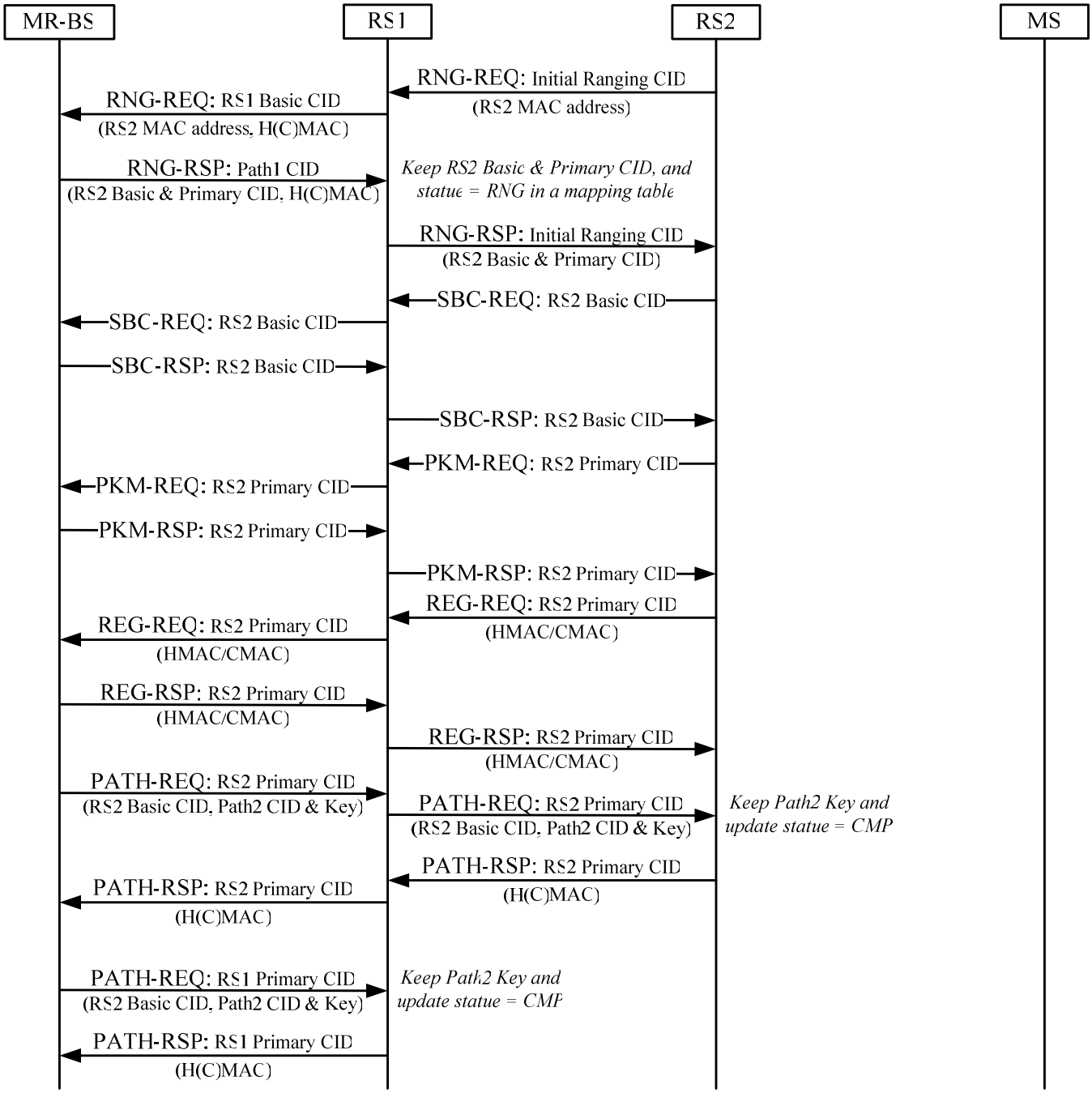



Table 3-a Mapping table in RS1 after receiving RNG-RSP

| CID in message header | Basic CID of Terminal | Station for forwarding | status |
|---|---|---|---|
| RS2 Basic CID | RS2 Basic CID | RS2 Basic CID | RNG |
| RS2 Primary CID | RS2 Basic CID | RS2 Basic CID | RNG |

Table 3-b Mapping table in RS1 after receiving PATH-REQ

| CID in message header | Basic CID of Terminal | Station for forwarding | status |
|---|---|---|---|
| RS2 Basic CID | RS2 Basic CID | RS2 Basic CID | CMP |
| RS2 Primary CID | RS2 Basic CID | RS2 Basic CID | CMP |

Example 3: MS entering the MR-BS network via RS1 and RS2

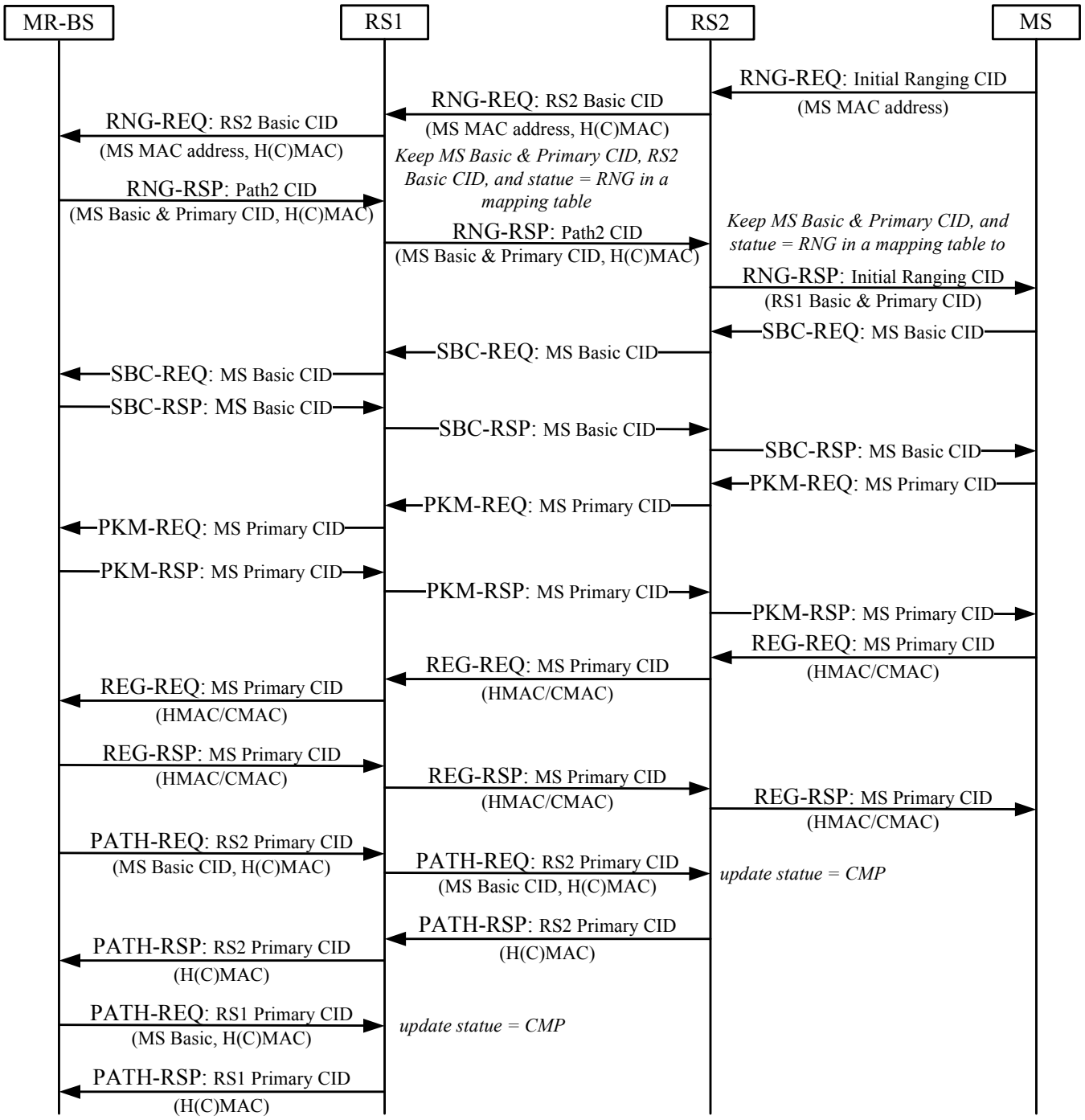



Table 5-a Mapping table in RS1 after receiving RNG-RSP

| CID in message header | Basic CID of Terminal | Station for forwarding | status |
|---|---|---|---|
| RS2 Basic CID | RS2 Basic CID | RS2 Basic CID | CMP |
| RS2 Primary CID | RS2 Basic CID | RS2 Basic CID | CMP |
| MS Basic CID | MS Basic CID | RS2 Basic CID | RNG |
| MS Primary CID | MS Basic CID | RS2 Basic CID | RNG |

Table 5-b Mapping table in RS1 after receiving PATH-REQ

| CID in message header | Basic CID of Terminal | Station for forwarding | status |
|---|---|---|---|
| RS2 Basic CID | RS2 Basic CID | RS2 Basic CID | CMP |
| RS2 Primary CID | RS2 Basic CID | RS2 Basic CID | CMP |
| MS Basic CID | MS Basic CID | RS2 Basic CID | CMP |
| MS Primary CID | MS Basic CID | RS2 Basic CID | CMP |

Table 6-a Mapping table in RS2 after receiving RNG-RSP

| CID in message header | Basic CID of Terminal | Station for forwarding | status |
|---|---|---|---|
| MS Basic CID | MS Basic CID | MS Basic CID | RNG |
| MS Primary CID | MS Basic CID | MS Basic CID | RNG |

Table 6-b Mapping table in RS2 after receiving PATH-REQ

| CID in message header | Basic CID of Terminal | Station for forwarding | status |
|---|---|---|---|
| MS Basic CID | MS Basic CID | MS Basic CID | CMP |
| MS Primary CID | MS Basic CID | MS Basic CID | CMP |

# Text Proposal

*[Add new sections 6.3.25.1]*

6.3.25.1 Relay path management during network entry

Path CID is defined as a multicast CID of a path ID. Relay path management during network entry can be conducted as defined below.

- After processing the RNG-REQ with $RS_i$ basic CID originated from MS or $RS_j$, the MR-BS replies a RNG-RSP with path CID of the path ID, associated with $RS_j$, to $RS_i$ and protects the message with HMAC/CMAC tuple using the Security Zone Key (SZK) associated with the path ID.
- When an RS receives RNG-RSP message with the path CID, it first verifies the message using the HMAC/CMAC tuple with SZK. If the message is valid, it should bind with basic CID and primary CID containing in the message with the path ID and start a timer Txx. If the RS is the endpoint of the path, it should remove the HMAC/CMAC tuple, replace path CID with initial ranging CID, and forward to the MS or RS originating RNG-REQ.
- After a RS successfully register, the MR-BS should send PATH-REQ with path CID and SZK to all RSs along the path for binding basic CID with path ID via a hop-by-hop operation.
- After receiving PATH-REQ, the RS shall respond with PATH-RSP and stop Txx.
- If Txx expires before receiving PATH-REQ, the RS shall remove the path ID and associated basic CID and primary CID.