

RS Network Entry

IEEE 802.16 Presentation Submission Template (Rev. 8.3)

Document Number:

IEEE S802.16j-06/208

Date Submitted: 2006-11-07

Source:

Kanchei (Ken) Loa, Yung-Ting Lee, Yi-Hsueh Tsai,
Heng-Iang Hsu, Chih-Chiang Hsieh , Shiann-Tsong Sheu

Voice: 886-2-2739-9616

Institute for Information Industry
8F., No. 218, Sec. 2, Dunhua S. Rd.,
Taipei City, Taiwan.

Fax: 886-2-2378-2328

E-mail: loa@nmi.iii.org.tw

Venue:

IEEE 802.16 Session #46, Dallas, US

Base Document:

IEEE C802.16j-06/208 http://dot16.org/CSUpload//upload/Relay_db/C80216j-06_208.pdf

Purpose:

Propose the text regarding RS network entry

Notice:

This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release:

The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.

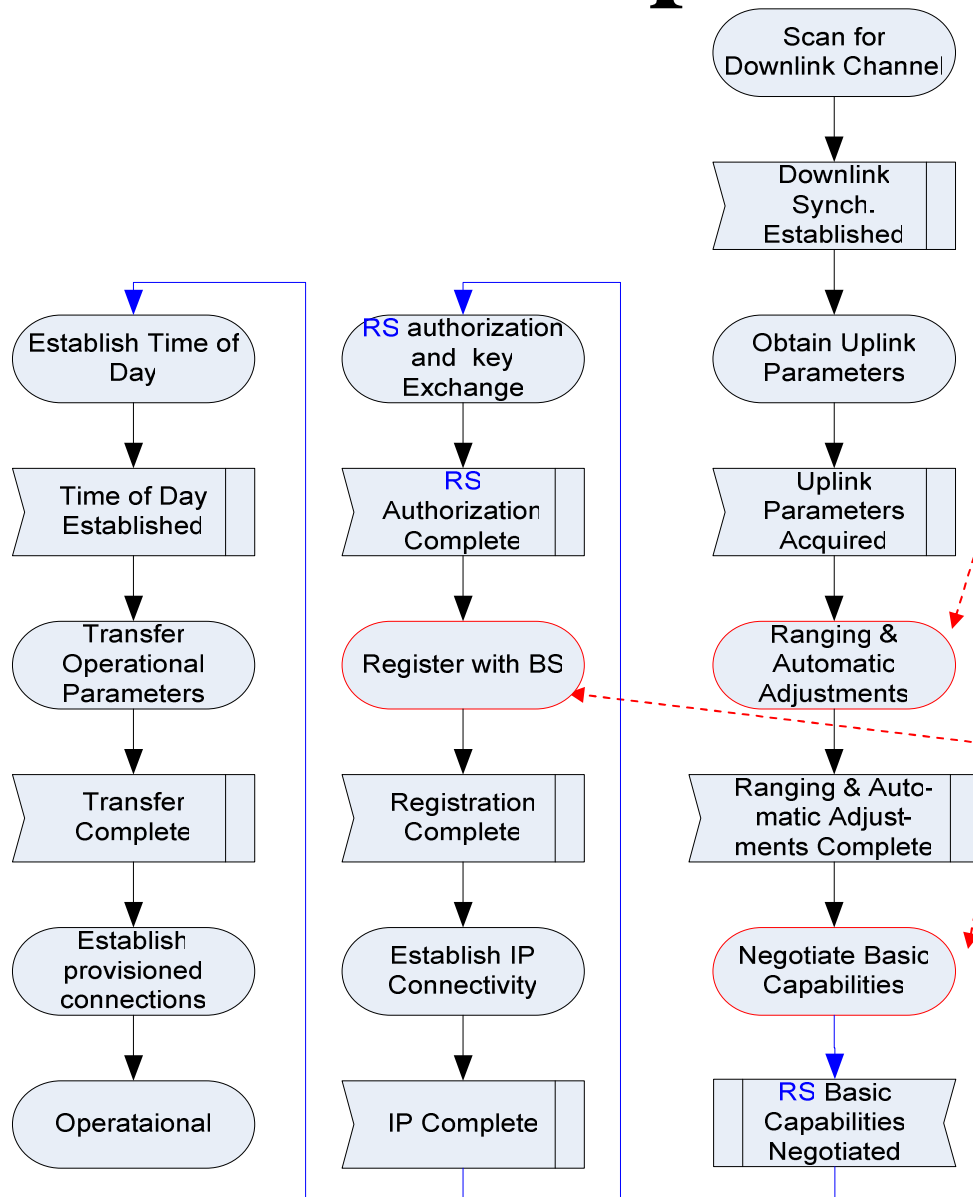
IEEE 802.16 Patent Policy:

The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <<http://ieee802.org/16/ipr/patents/policy.html>>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <<mailto:chair@wirelessman.org>> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <<http://ieee802.org/16/ipr/patents/notices>>.

Design Objectives

- Shall support RS to join Multihop Relay network
- Should support RS to enter and register the Multihop Relay network via various RS mode
- Should be centralized controlled by the MR-BS
- The modifications to legacy Network Entry procedure should be minimized
- The mode of RS and associated parameters should be assigned during the Network Entry procedure
- The new network topology after joining an RS should be determined during the Network Entry procedure

Proposed Remedy



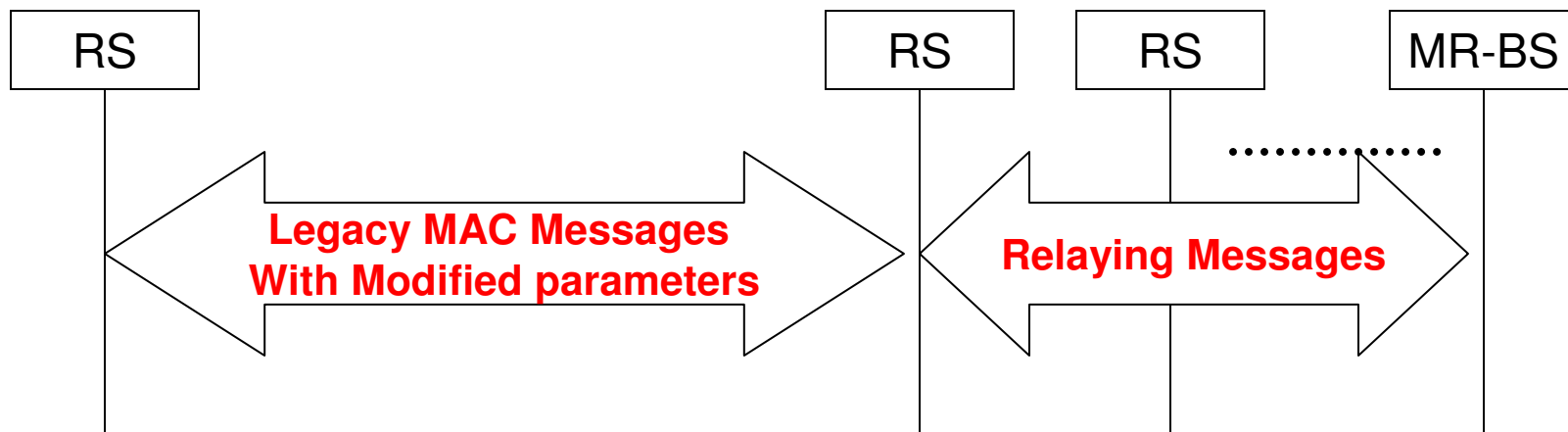
1. The phases of “Ranging & Automatic Adjustment” and “Negotiate Basic Capabilities” should be modified for various RS modes

– After RS completed the procedures of the two phases, the new network topology could be determined

2. The mode of RS and associated parameters could be assigned in the phase of “registration”

Proposed Remedy

- The 16d/e MAC request & response messages should be used with modifications on parameters required for RS
- Relaying messages are defined to transport the information in the relay path required for completing the Network Entry procedures.



Proposed Relaying Messages

Same as C80216j-06_207

<u>Message name</u>	<u>Message description</u>	<u>Connection</u>
<u>RLY_CFG-MAP</u>	<u>MR-BS configure associated RS for RS broadcasting</u>	<u>Broadcast/Multicast /Basic</u>
<u>RLY_Transship-CIRC</u>	<u>RS transport RS/MS CDMA initial ranging code to associated MR-BS</u>	<u>Basic</u>
<u>RLY_Transship-DATA</u>	<u>RS transport RS/MS data to associated MR-BS</u>	<u>Primary</u>
<u>RLY_CIRC-IND</u>	<u>MR-BS notify candidate RS to accept the new coming RS/MS CDMA initial ranging code</u>	<u>Basic</u>
<u>RLY_IR-IND</u>	<u>MR-BS notify candidate RS to accept the new coming RS/MS</u>	<u>Basic</u>

Key Points & Benefits

- The procedures of RS entering a Multihop Relay network are centrally controlled by the MR-BS
- Use legacy 16e network entry procedures and associated messages (with modified parameters for RS) for RS entering a Multihop Relay network
- Define five relaying messages in the relay path for completing RS joining a Multihop Relay network
 - Reuse same messages defined in C80216j-06_207(MS network entry with RS)
- After RS completed the procedures of initial ranging and capacity negotiation, the new network topology could be determined

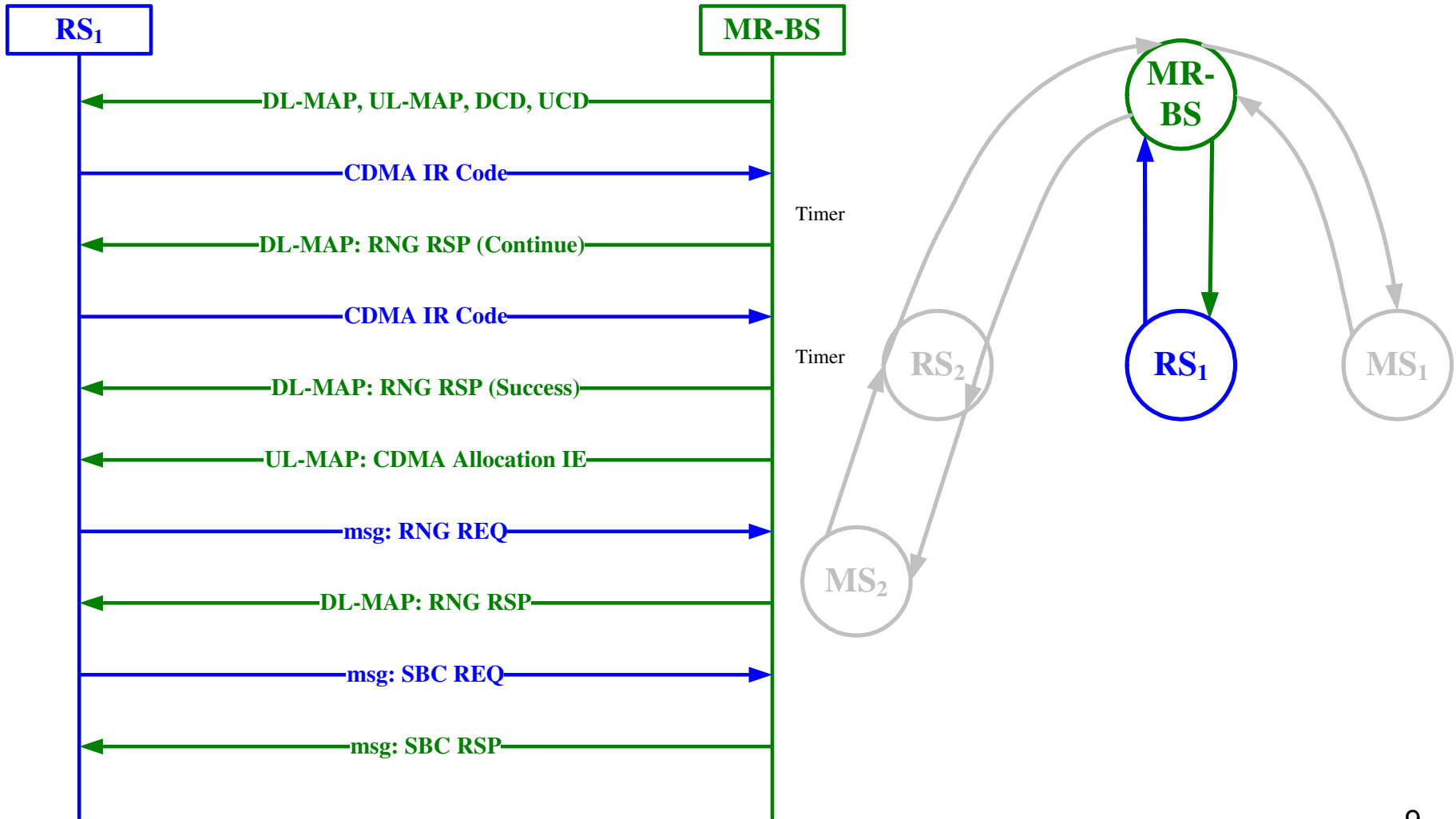
Backup

Initial Network Topology Establishment after Joining an RS

- It could be determined in “Ranging & Automatic Adjustment” and “Negotiate Basic Capabilities”
- If RS uses same CDMA initial ranging code set as MS
 - MR-BS cannot identify if a new node is MS or RS until the phase of “Negotiate basic capabilities” (SBC)
 - Because MR-BS controls the network topology, MR-BS should admit in SBC phase if the new RS can join the network and determine which RS the new RS should attach to
- If RS uses distinct CDMA initial ranging code sets
 - MR-BS could determine the identity of the new node to be MS or RS in the phase of “Perform ranging” (IR)
 - MR-BS could apply different policies for initial network topology establishment in IR phase. For example, the serving MR-BS can configure an RS to be the endpoint of a relay link. When the RS receives a CDMA initial ranging code from a new RS, the RS could ignore the code right away.

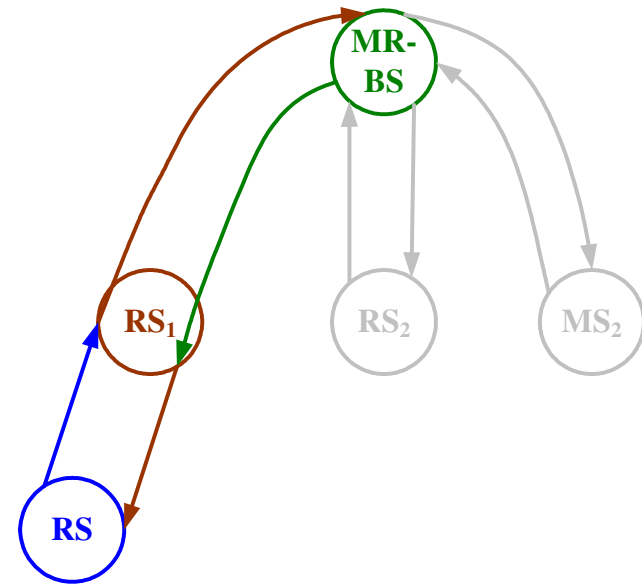
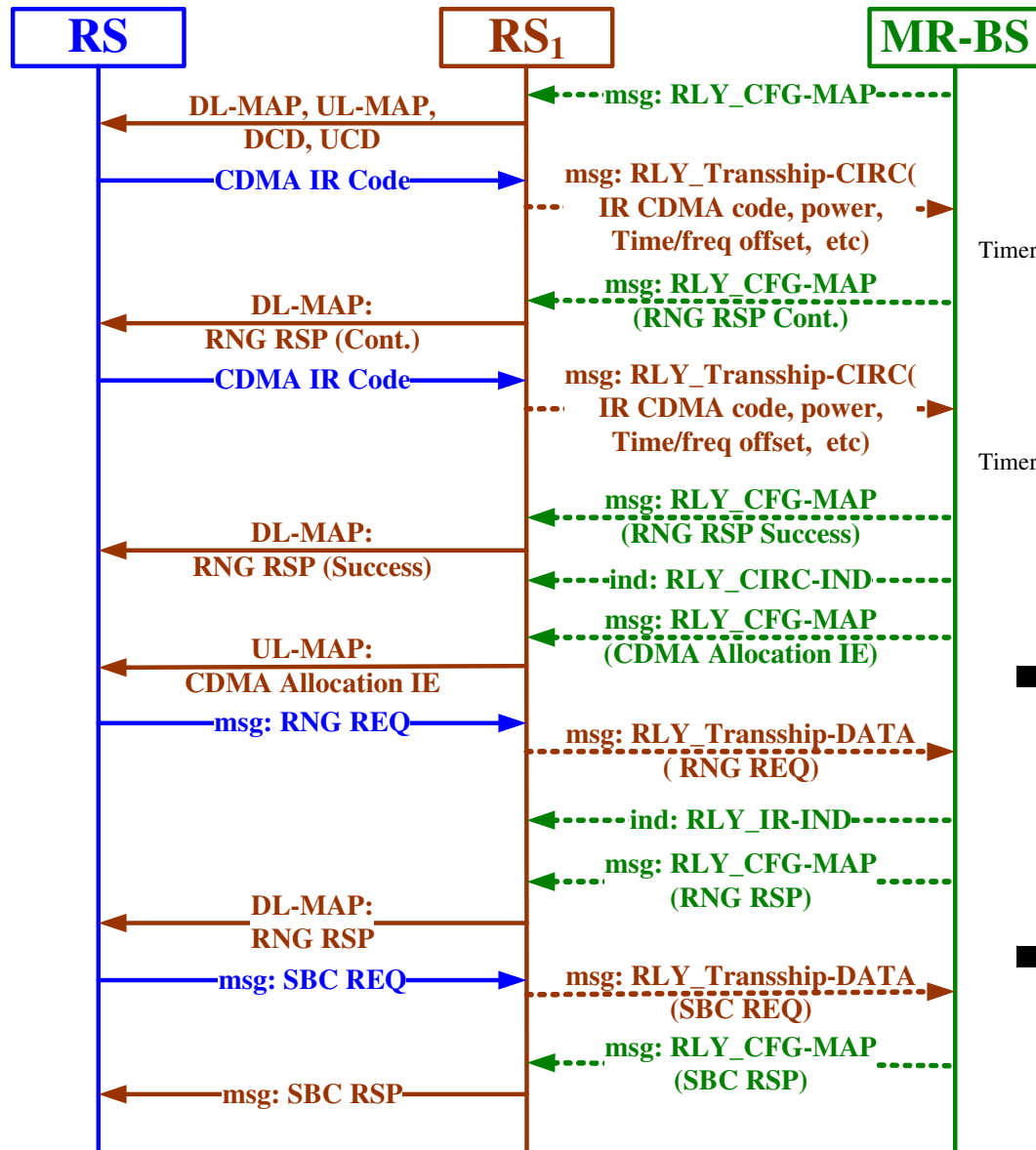
RS joining Multihop Relay Network Example 1

Legacy 16e procedure is applied



RS joining Multihop Relay Network via RS

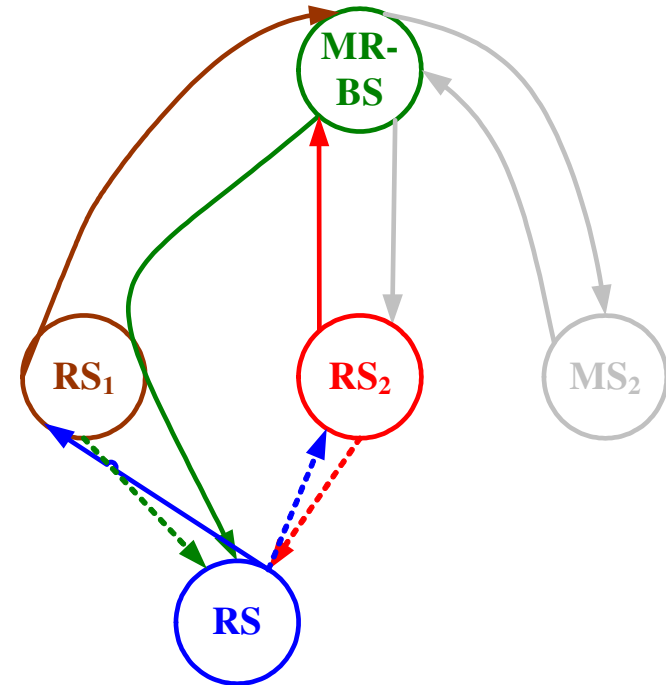
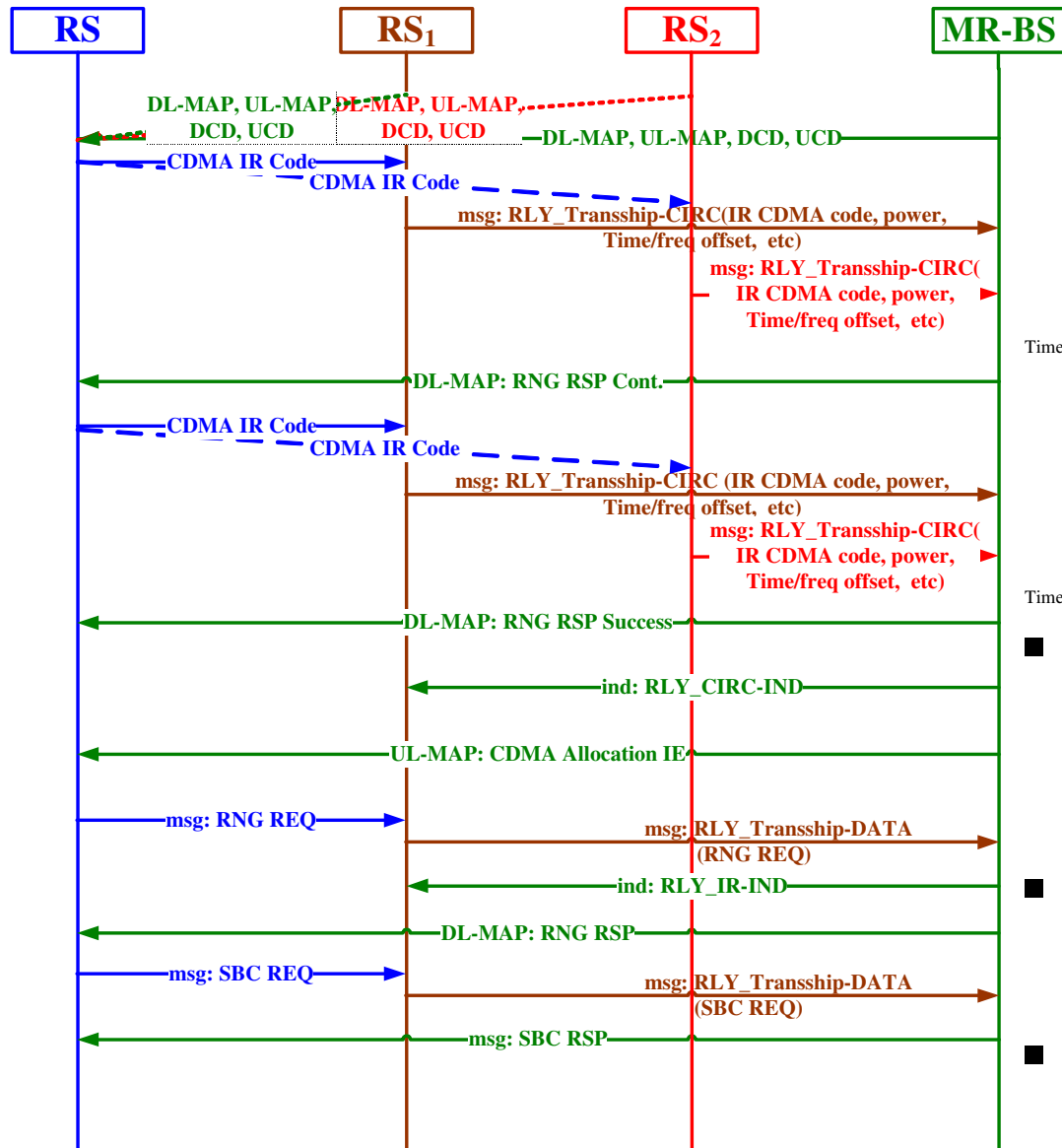
Example 2



- Only RS1 can decode messages from the new RS and vice versa
- MR-BS assigns the new RS to join the network via RS1

RS joining Multihop Relay Network via RS

Example 3



- Both RS1 and RS2 can decode messages from the MS and vice versa
- The new RS can also decode messages from MR-BS
- MR-BS assigns the new RS to join the network via RS1