Project	IEEE 802.16 Broadband Wireless Access Working Group **<http://ieee802.org/16>**
Title	In-band Semi-transparent Relay Frame Structure
Date Submitted	2007-04-19
Source(s)	Kanchei (Ken) Loa, Yi-Hsueh Tsai, Yung-Ting Lee, Heng-Iang Hsu Shiann-Tsong Sheu, Frank C.D. Tsai, Youn-Tai Lee, Chih-Chiang Hsieh, Hua-Chiang Yin, Institute for Information Industry 8F., No. 218, Sec. 2, Dunhua S. Rd., Taipei City, Taiwan. [add co-authors here] Voice: +886-2-2739-9616 loa@iii.org.tw
Re:	IEEE 802.16j-07/013: “Call for Technical Comments Regarding IEEE Project 802.16j”
Abstract	This contribution proposes in-band semi-transparent relay frame structure
Purpose	Text proposal for 802.16j Baseline Document
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.
Patent Policy and Procedures	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>.

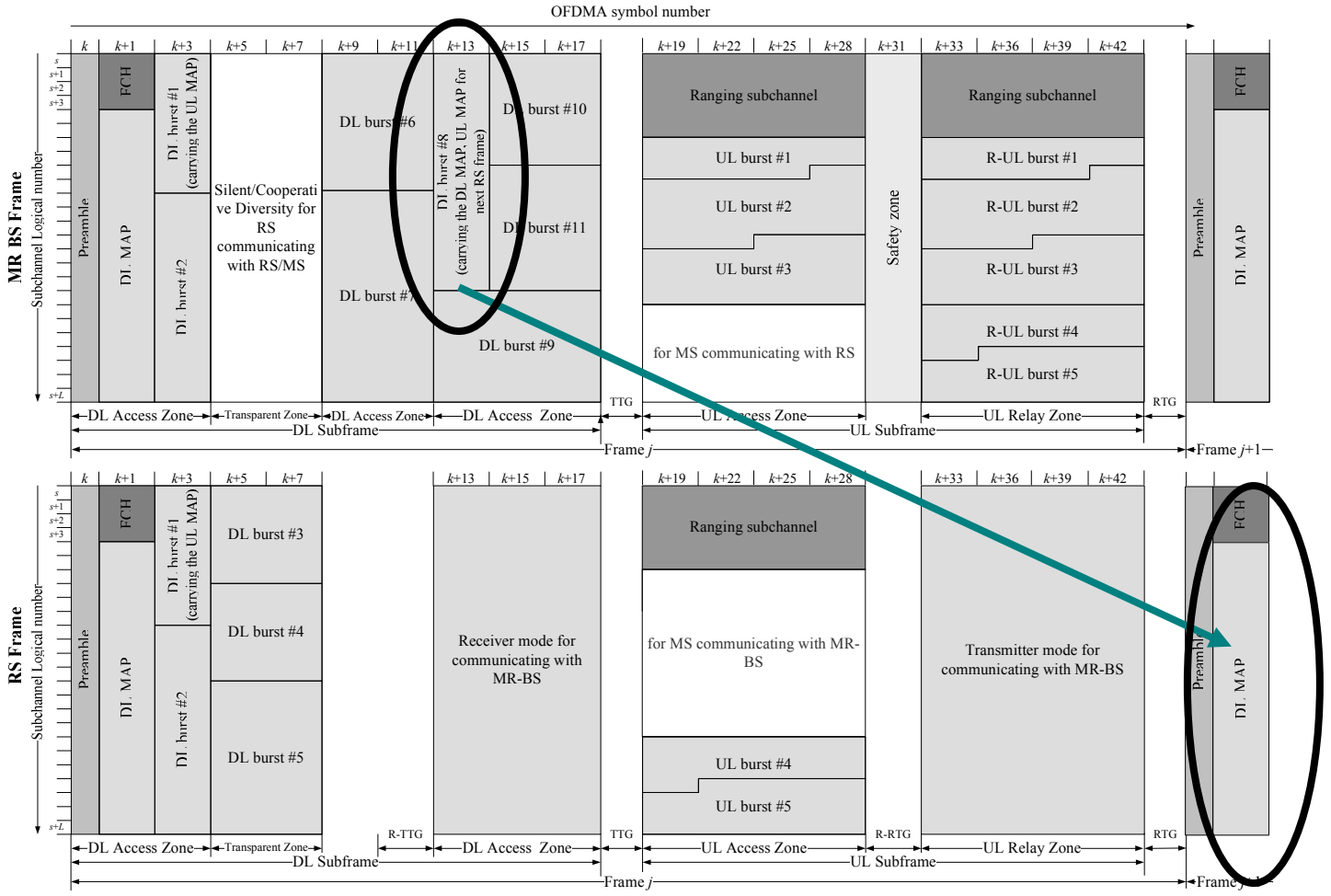
In-band Semi-transparent Relay Frame Structure

Introduction

In IEEE 80216j-06/026r3 section 6.3.9.16.1.1 RS grouping, it states that "*when the virtual RS group include an MR-BS, all the RSs in the virtual group shall either* ***transmit the same preamble as the MR-BS****, FCH and MAP or they all do not transmit any preamble. When an MR-BS is not included in the virtual group, one of the RSs in the virtual group is a non-transparent RS and all the others shall either transmit the preamble, FCH and MAP of the said non-transparent RS or they all do not transmit preamble, FCH and MAP. The radio resources may be shared by these RSs for data burst transmission. The existence of the group is totally transparent to its MS(s).*"

Even though each RS transmitting same preamble in a virtual RS group utilizes non-transparent frame structure and follow the procedures of non-transparent RS to obtain FCH, DL-MAP, UL-MAP DCD and UCD (for transmit in the next frame) from BS. But, for other operations such as MS network entry and MS CDMA ranging, the RS transmitting same preamble must follow the same procedures of transparent RS. Therefore, this contribution defines a new category of RS called "Semi-transparent RS" for RS transmitting same preamble in a virtual RS group. The name "semi-transparent" reflects the fact that a RS transmitting same preamble in a virtual RS group shares the same segment/channel with other RS/BS within the same group as the transparent RS does, but utilizes non-transparent RS frame structure.

Figure 1 Example of configuration for an in-band semi-transparent relay frame structure



This contribution proposes an in-band semi-transparent RS to amend the section 8.4.4.7 in IEEE 80216j-06/026r3.

Proposed text changes

[Change the text in section 3 "Definitions" as indicated:]

3.90 DL Access_Zone: A portion of the DL sub-frame in the MR-BS/RS frame used for MR-BS/RS to MS, or transparent RS, or semi-transparent RS transmission.

3.102 Non-transparent RS: A non-transparent RS transmits different DL frame-start preamble, FCH, DL-MAP/ULMAP and DCD/UCD from its neighbor access stations.

[Insert the text in section 3 "Definitions" as indicated:]

3.103 Semi-transparent RS: A semi- transparent RS transmits corresponding DL frame-start preamble, FCH, DL-MAP/UL-MAP, and DCD/UCD of the assigned virtual group.

8.4.4.7 Frame structure of MR-BS and RS

[Insert the following new subclause 8.4.4.7.5 as indicated:]

8.4.4.7.5 Frame structure for semi-transparent mode

A semi-transparent RS shall utilize non-transparent frame structure. The semi-transparent RS shall transmit corresponding DL frame-start preamble, FCH, DL-MAP/UL-MAP, and DCD/UCD of the assigned virtual group at the beginning of the frame.