Frame Structures for Multihop Relay System

IEEE 802.16 Presentation Submission Template (Rev. 8.3)

Document Number:

IEEE S802.16j-06/231r1

Date Submitted:

2006-11-14

Source:

Dale Branlund, Michael Webb
BRN Phoenix Inc.
2500 Augustine Drive
Santa Clara, CA USA 95054

Voice: +1-408-572-9703
Fax: +1-408-351-4911
E-mail: dbranlund@brnphoenix.com

Venue:

802.16 Session 46 (Dallas, TX)

Base Document:

C80216j-06_231.pdf

Purpose:

This document provides a Technical Proposal for airlink frame structures for consideration by the 802.16j Task Group.

Requirements

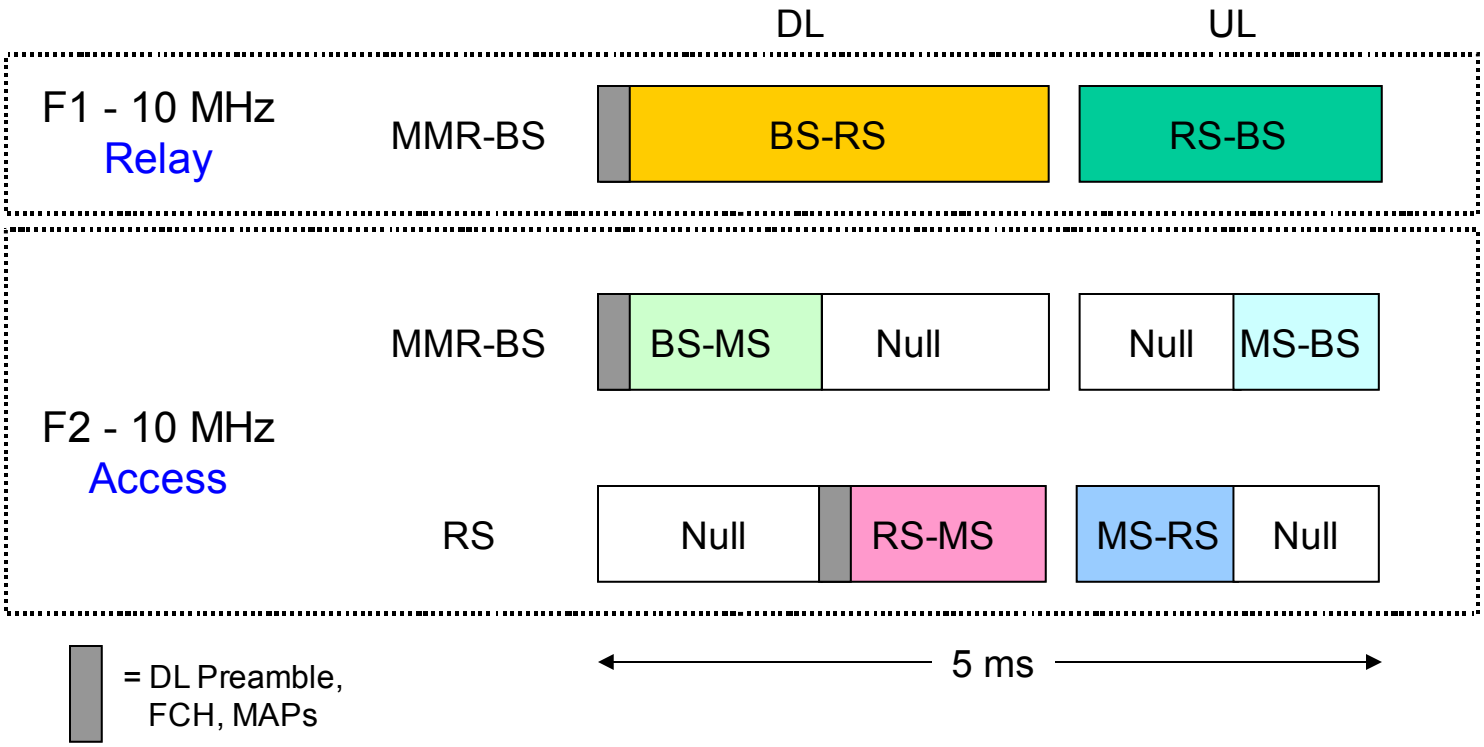
- Frame structure needs to support different service provider deployment scenarios and business objectives:
  - Subscriber density
  - Service offerings, terminal types
  - Amount of spectrum available
  - QoS objectives
  - Siting constraints
- Several alternative frame structure & channel configurations are needed
- Objective to maximize reuse of 802.16e structures

Four General Cases

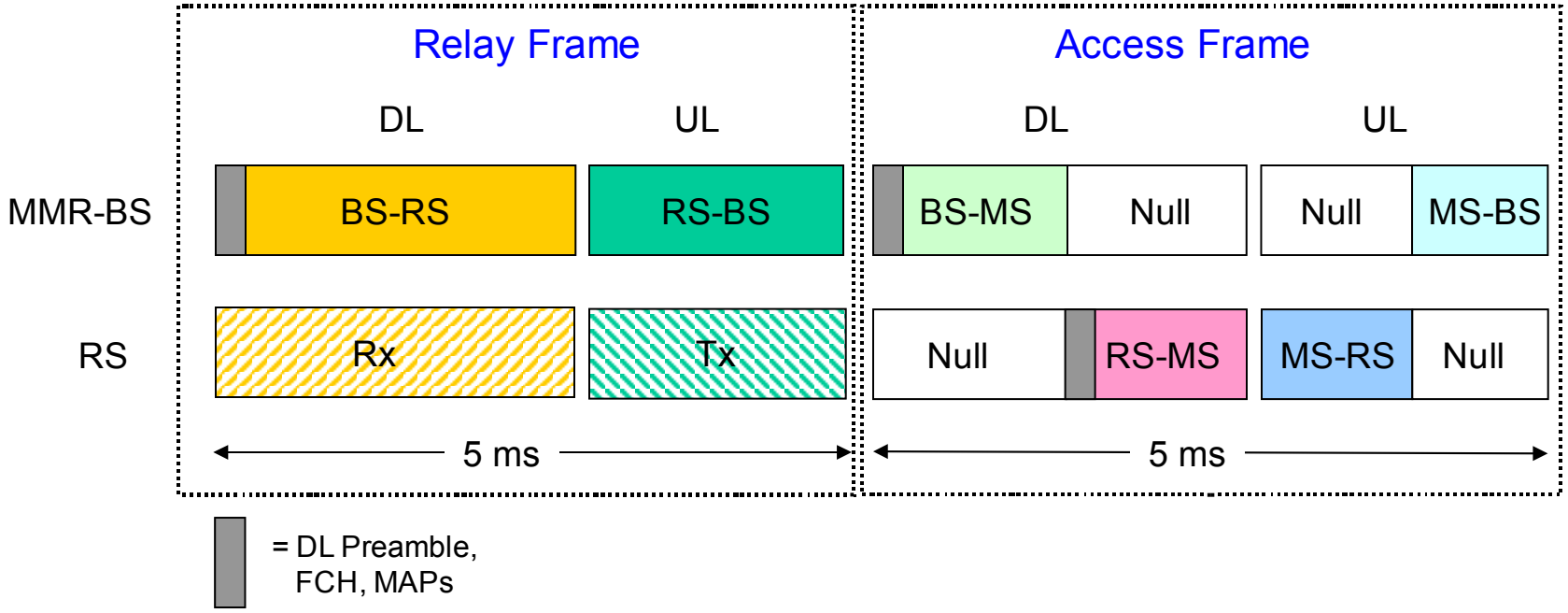
1. Separate channel for Relay links
2. Alternate Relay and Access frames in time
3. Relay and Access combined in one frame
4. Hybrid alternating/combined

- Tradeoffs:
  - Capacity (dedicated for Relay) and throughput efficiency
  - Spectrum utilization
  - Latency
  - Complexity/cost of RS
  - Link performance
  - Support of multi-hop relay

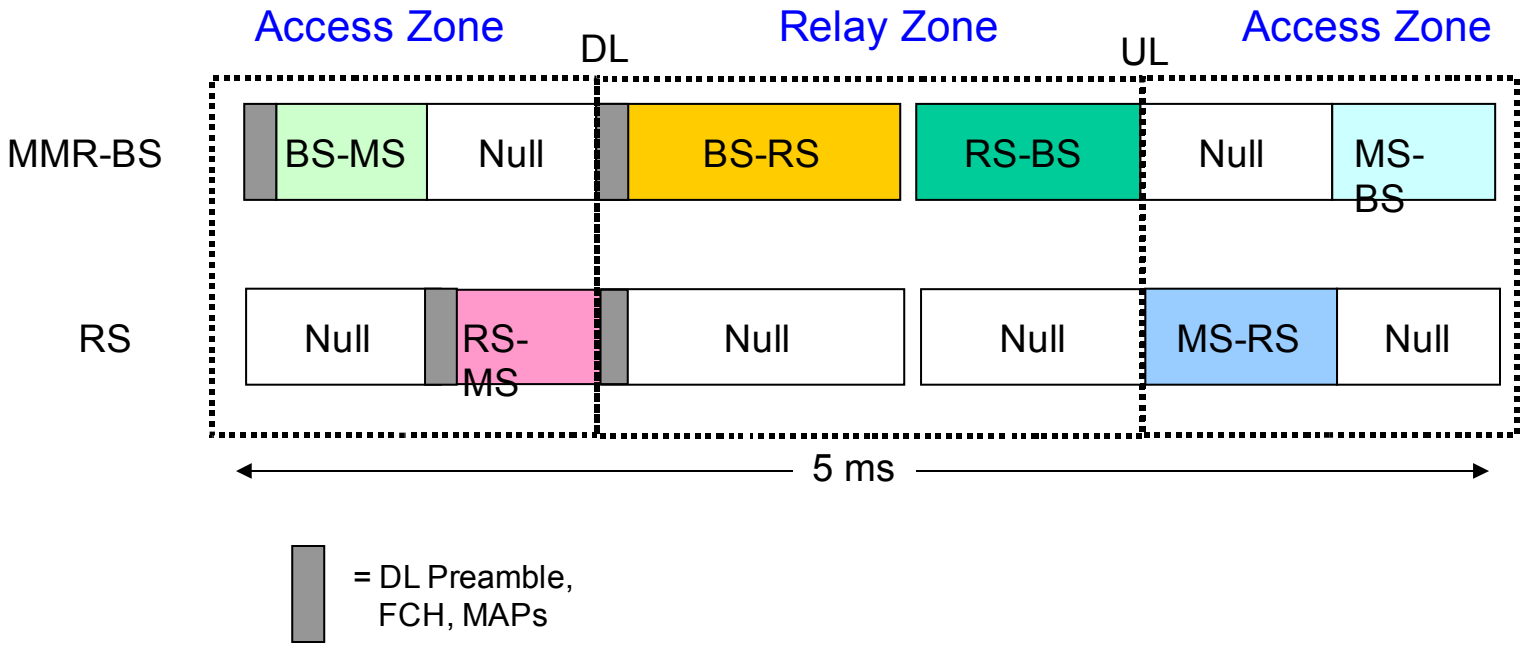
1. Separate Access & Relay Channels



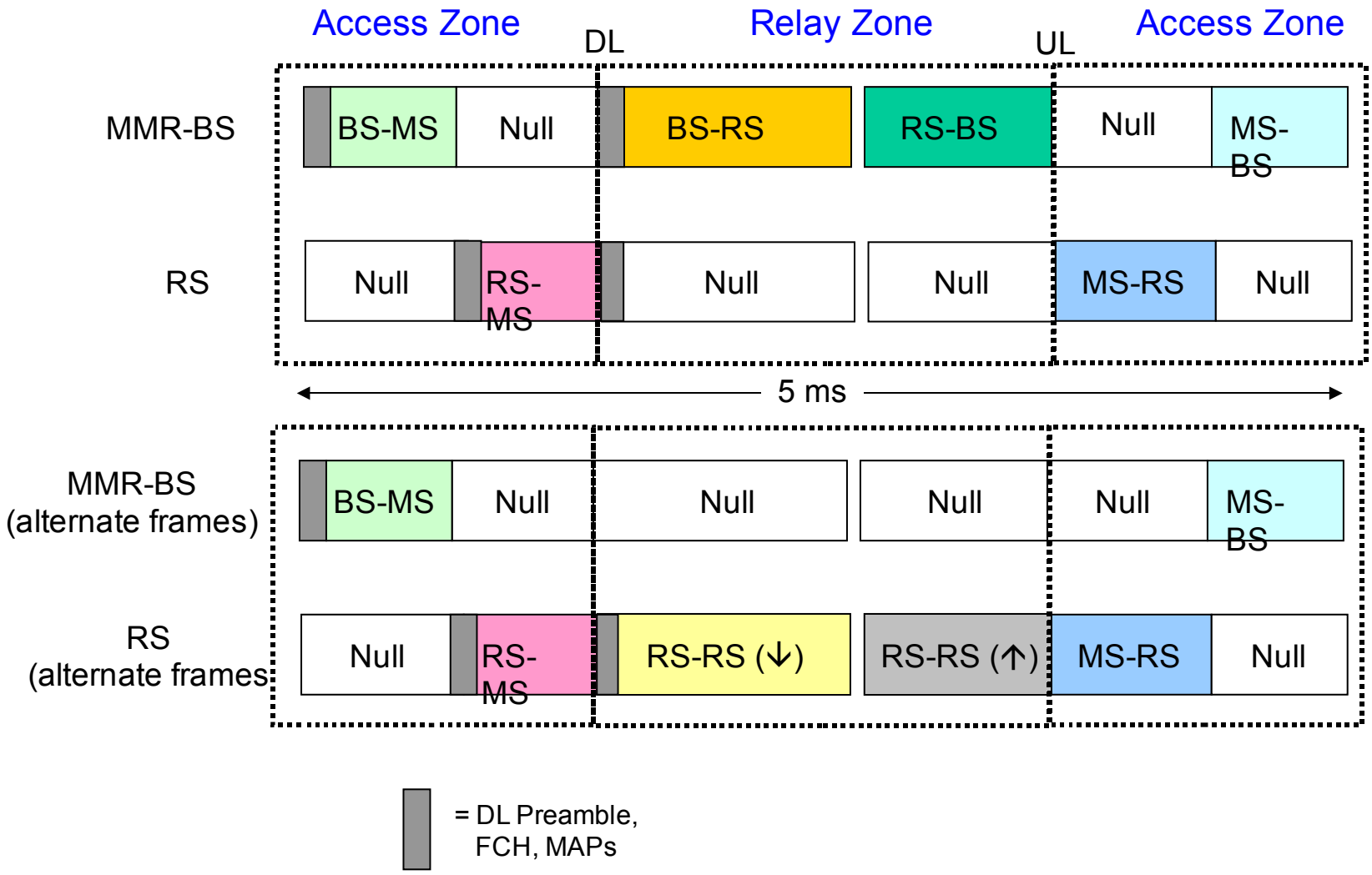
2. Alternating Access & Relay



3. Combined Frame



4. Hybrid Alternating/Combined



Key Points

- Need to support use of separate channel for Relay links
- Placement of Access at end of UL, beginning of DL is preferred to minimize uplink training latency (improve uplink performance)
- Support of “null zones” in which BS/RS/MS do not transmit or receive