Discussion on R-zone/R-MAP and Frame Structure for MMR

Document Number:
IEEE C802.16j-06/077

Date Submitted:
2006-07-03

Source:
Hang Zhang, Wen Tong, Peiying Zhu, Mohan Fong
Gamini Senarnath, David Steer, Derek Yu, Wang G-Q
Jose Costa
Nortel, 3500 Carling Avenue
Ottawa, On K2H 8E9 Canada

Dean Kitchener, Mark Naden
Nortel
London Road
Harlow, Essex, CM17 9NA

Venue:
IEEE 802.16 Session #44, San Diego, USA

Base Document: C80216j-06_041:”Harmonized definitions and terminology for Mobile Multihop Relay”

Purpose:
To introduce the terminologies of R-Frame, R-zone and R-MAP

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>.
Introduction and Background

• Based on IEEE802.16j PAR, the new node RS is introduced and new function/capability is added for MMR-BS without modification of MS, in order to retain the backward compatibility,

• We define the following:
  – Frame structure that enables the relay $\rightarrow$ MMR-frame,
  – Relay zone $\rightarrow$ R-zone
  – Relay zone MAP $\rightarrow$ R-MAP
MMR Frame Structure Example (3 hops)

- Single carrier and single radio RS case

![Diagram of MMR Frame Structure Example (3 hops)](image-url)

Legend:
- **Red**: 16e Preamble
- **Orange**: R_zone (R-DL)
- **Blue**: 16e FCH
- **Pink**: R_zone (R-UL)
- **Yellow**: 16e MAPs
- **Gray**: R-MAP
- **Light Blue**: could be used for DL and UL MS access excluding transmission for BS ↔ RS and RS ↔ RS,
- **White**: demodulated 16e preamble and MAP
- **Purple**: UL Ranging
R-zone and R-MAP Example (3 hops)

- Each R-zone is associated with a R-MAP, R-zone can be dynamically allocated and de-allocated by MMR-BS

![Diagram showing R-zone and R-MAP example](image-url)
Summary

- MMR-Frame is introduced to support the mapping of R-zone which maintain the backward compatibility based on PAR
- 16e MAP_IE is reused to support the links
  - MMR-BS $\leftrightarrow$ MS
  - RS $\leftrightarrow$ MS
  - No impact on MS
- R-zone is introduced to support dedicated links for
  - MMR-BS $\leftrightarrow$ RS
  - RS $\leftrightarrow$ RS
  - Serving MMR-BS and Serving RS are required to
    - transmit 802.16e preamble
    - transmit 802.16e FCH and MAP
- R-MAP is introduced for RS related resource assignment
Text Proposal

• **MMR-Frame**
  “The frame support the links between MMR-BS and RS and between RSs”

• **R-Zone**
  “The OFDMA resource dedicated to the links between MMR-BS and RS and between RSs communications”

• **R-MAP**
  “The MAP dedicated to the R-zone resource allocation”