Relay-Station Preamble Segment Assignment/Re-Assignment

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Source:
Peter Wang, Adrian Boariu,
Shashikant Maheshwari, Yousuf Saifullah
Voice: +1 214-912-4613
Nokia
Fax: peter.wang@nokia.com
6000 Connection Drive, Irving, TX
E-mail: peter.wang@nokia.com

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Purpose:
Propose the text regarding relay-station preamble segment assignment for multi-hop relay

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Introduction

• In the frame structure, the first OFDMA symbol of the DL transmission is preamble

• Three types of preamble carrier-sets (Segment 0, 1, and 2)

• In the DL PUSC mode, any segment used in the preamble shall be allocated at least one group of subchannels in the DL First Zone that contains FCH and DL-MAP

• The First Zone PUSC subchannels used do not have the DL permutation
Interference Possibility

- RS can be turned on at anytime/anywhere and with mobility

- If the RS overlaps in coverage with its neighboring RSs/BSs and the same segment values are used

- Than MS/SS could not decode the Cell-ID and the control messages (such as FCH and DL-MAP signals)
Initial RS Neighboring Detection

RS_0 preamble transmission

{Segment_0, IDCell_0}

RS_0 data transmission

RS_1 preamble transmission

{Segment_1, IDCell_1}

RS_1 data transmission

RS_1 can detect RS_0 preamble

RS neighbor detection and RS segment assignment, where the pathloss exponent is 3.
The RS_p relay could be acting as a cooperative-diversity relay for RS_0 and RS_1.
Message Signaling for RS Preamble Segment Assignment

MR-BS

REG-REQ (Indicate RS capability support)

RS-NBR-MEAS-REQ (Measure RSSI and preamble index)

The RS scans its neighboring RS/BS preambles

RS-NBR-MEAS-RPT (Report RSSI and preamble index)

(1) Analyze RS report (2) Make decision to allow or deny the RS

RS_CONF-REQ (Assign preamble index values or deny the RS activity)

RS_CONF-RSP (Result)

(1) RS configured itself (2) If preamble is assigned then start TX preamble & MAP

Potential RS
Mobile RS Neighboring Detection

- Embedding RS signature signal into the frame structure with periodic scanning of RS signature signal (the repetition time could be similar to the handover measurement report)

- Using the MS neighboring RSS measurement reports and its serving cell C/I report from the handover process to detect the neighboring interference
Message Signaling for RS Preamble Re-Assignment

(1) Analyze RS report or MS report
(2) Make decision to prepare the RS preamble index re-assignment

Trigger handover to MS attached to the RS

MOB_BSHO_REQ (BS/RS ID list, action time etc.)

MOB_HO_IND (response the BSHO)

RS_CONF_REQ (RS preamble index re-assignment)

RS_CONF_RSP (RS preamble index resultt)

RNG_REQ

RNG_RSP
Summary

- Initial RS neighborhood detection and its preamble segment assignment
- Mobile RS neighborhood detection and its preamble segment re-assignment