Relaying methods proposal for 802.16j

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Purpose:

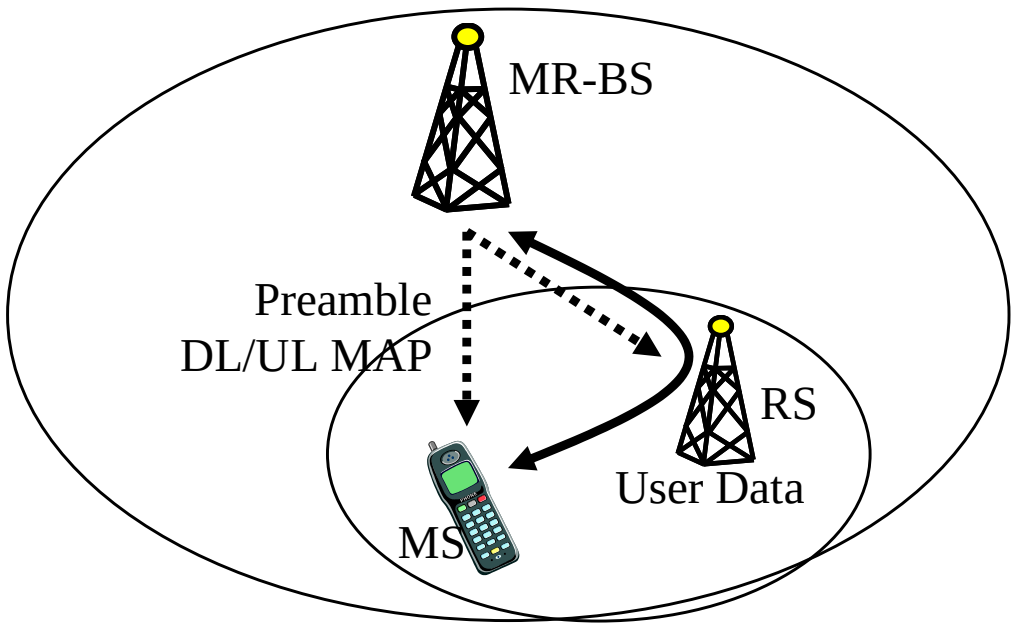
For discussion and approval of inclusion of the proposed text into the P802.16j baseline document.

Introduction

- This contribution proposes basic architecture of relaying systems.
- Two types of Relay Station are proposed.
  - Transparent RS
  - Non-transparent RS
- Both types of RS do not perform MS management (e.g. authentication, registration, etc) and connection management (e.g. CID allocation, classification, etc.) which are done at the MR-BS.
- Related sections in the standard :
  - 6.1.1 Relaying Extension

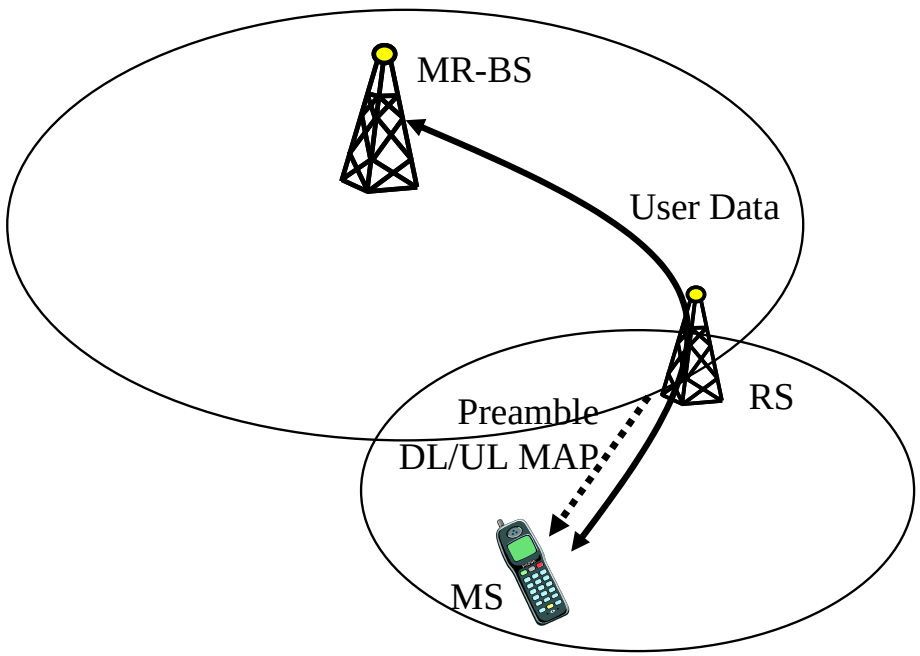
Transparent RS

- The transparent RS does not transmit preamble, FCH and MAPs. MS receives those signal and messages from MR-BS, but data traffic is transferred via intermediate RS.
- The transparent RS can enhance system capacity and improve per-user throughput, especially in an urban area.



Non-transparent RS

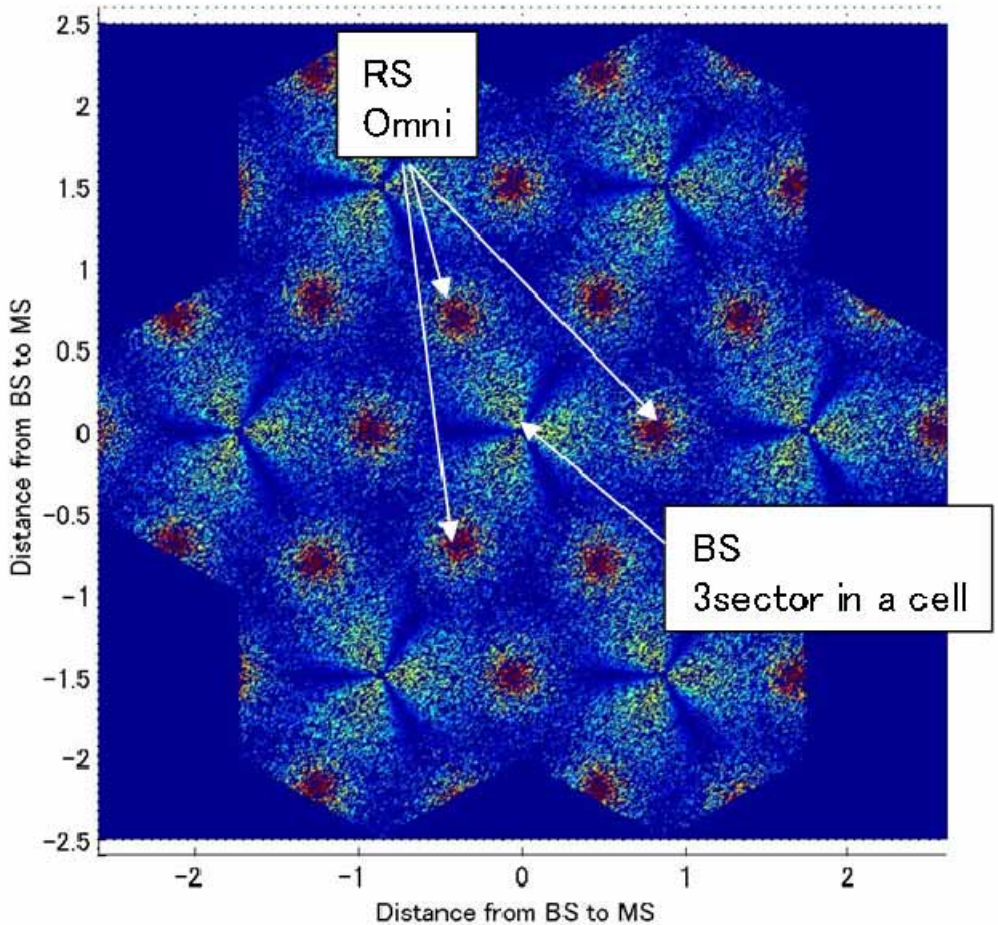
- The non-transparent RS transmits preamble, FCH and MAPs. MS receives those signal and messages from RS. This types of RS has two options, centralized scheduling and distributed scheduling. In the former one, MAPs of RS controlling access link are created by MMR-BS and forwarded to RS. In the latter, MAPs are created by RS itself.
- This type of RS can expand service coverage, especially in a rural area.



Summary

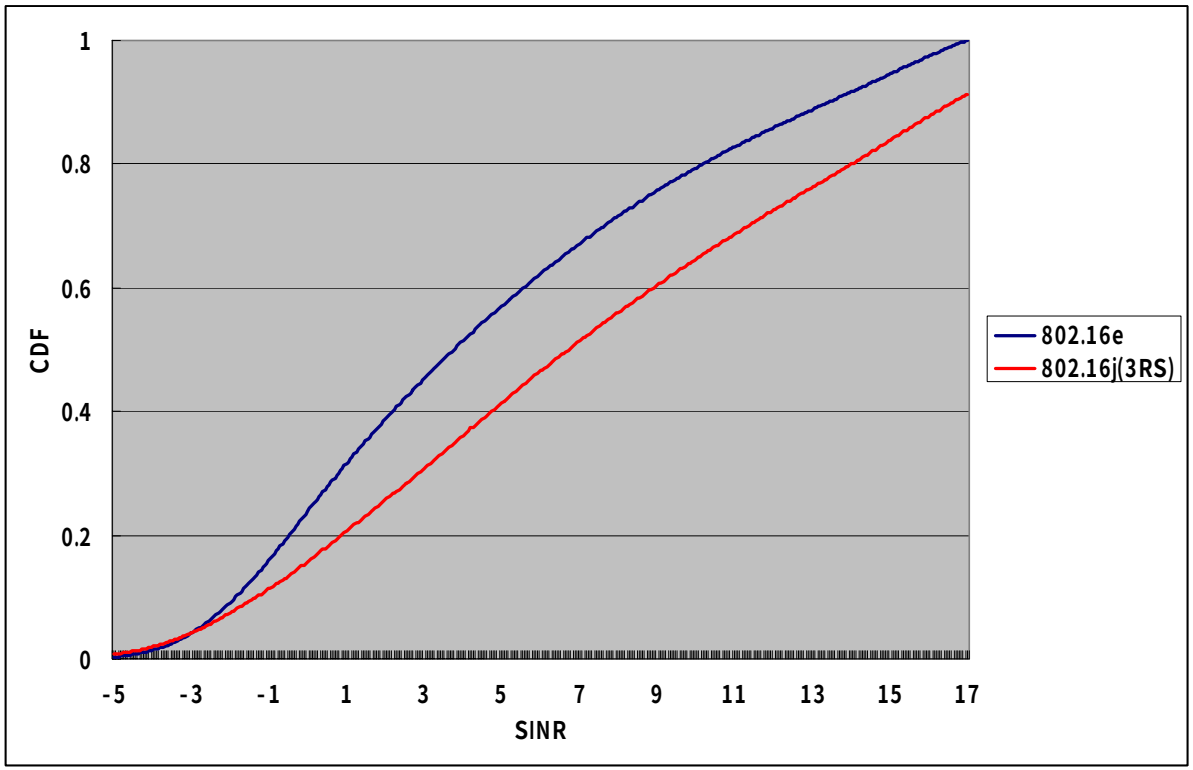
- Proposes two types of Relay Station
  - Transparent RS
  - Non-Transparent RS
- Proposes MS and Connection management function at the MR-BS in order to simplify RS function.

Appendix: Simulation Results (1/3)



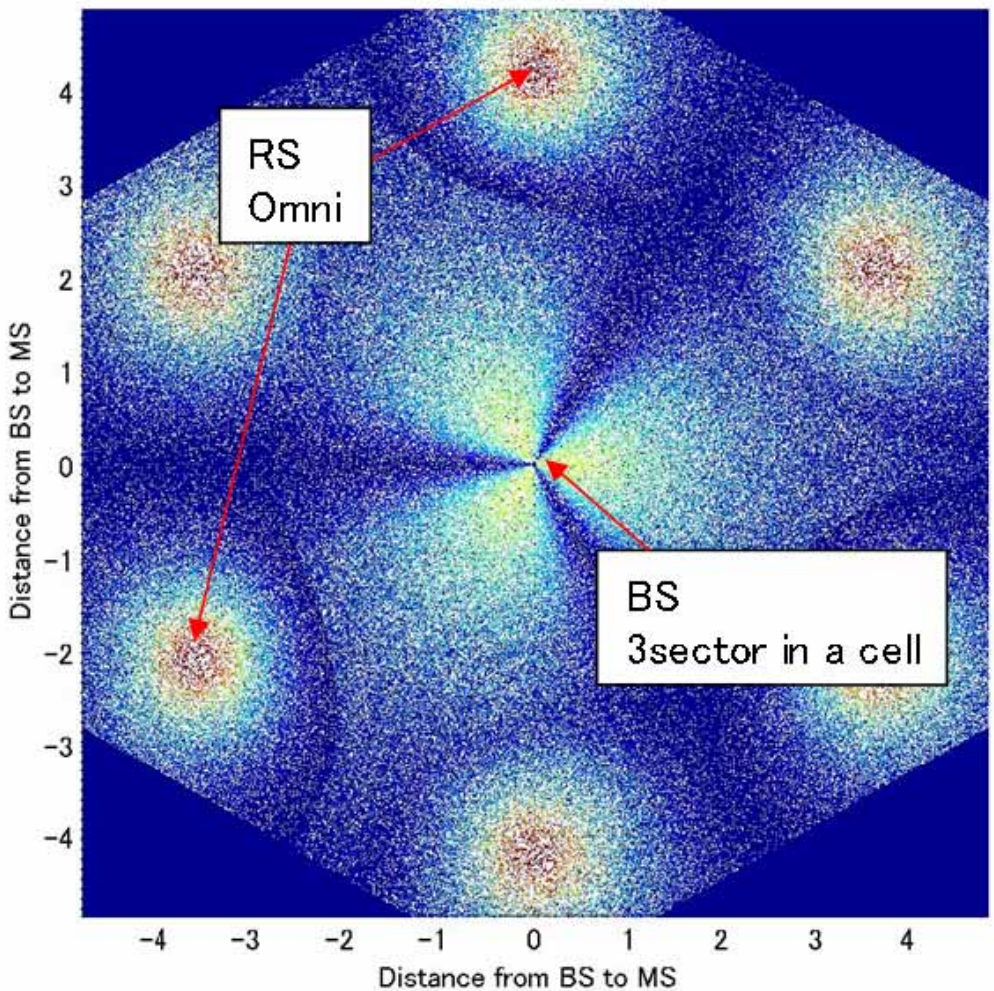
DL SINR distribution with transparent RS

Appendix: Simulation Results (2/3)



DL SINR CDF (transparent RS)

Appendix: Simulation Results (3/3)



DL SINR distribution with non-transparent RS

Appendix: Simulation Parameters

Parameter	Value
Carrier frequency	2.5 [GHz]
Bandwidth	10 [MHz], 1024-FFT
Number of sectors	3
BS Antenna pattern	70 deg (-3 dB) with 20 dB front-to-back ratio
BS transmission power	43 [dBm]
RS transmission power	33 [dBm]
Number of RS antennas	1 (omni antenna)
Antenna gain (BS/RS/MS)	10 / 10 / 0 [dBi]
MS noise figure	9 [dB]
Path loss model	-
BS-RS	LOS
BS-MS, RS-MS	NLOS ($128+37.6*\log_{10}(R[km])$)
Shadowing std. division	8 [dB]