

# Decision method of relayed MS in MMR-enabled networking

## IEEE 802.16 Presentation Submission Template (Rev. 8.3)

Document Number:

IEEE: C802\_16mmr-05\_038.pdf

Date Submitted:

2005-11-11

Source:

Aeran Youn, Duhyun Mun, Kiseon Ryu, Beomjoon Kim

**LG Electronic Inc.**

533 Hogye-1dong, Dongan-gu, Anyang, 431-749, Korea

Voice: +82-31-450-7188

Fax: +82-31-450-7912

E-mail: aryoun@lge.com

Venue:

IEEE 802.16 Session #40, Vancouver, Canada

Base Document:

None

Purpose:

Information

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>>.

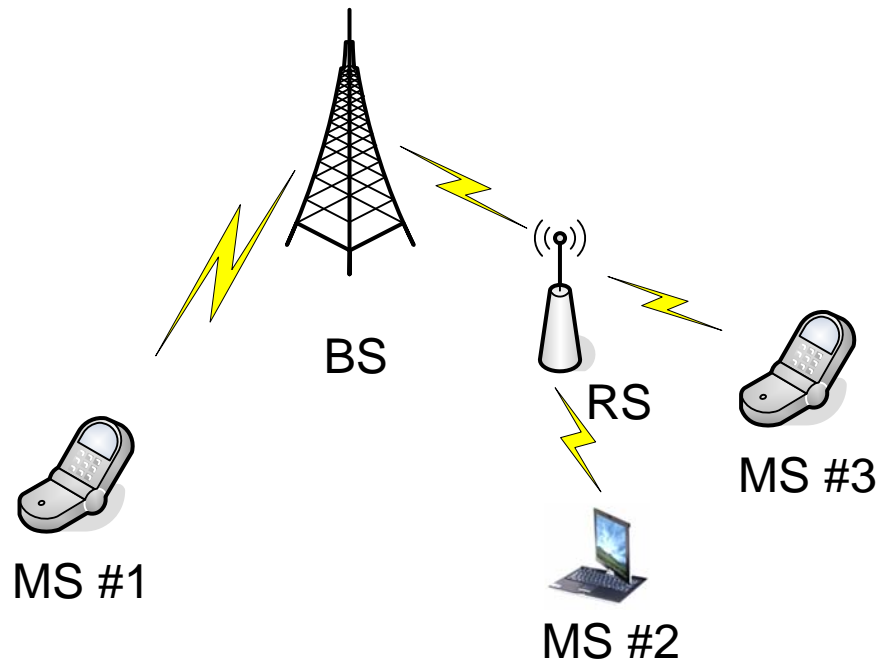
# Decision method of relayed MS in MMR-enabled networking

---

Aeran Youn, Duhyun Mun, Kiseon Ryu, and Beomjoon Kim  
LG Electronic Inc.  
November, 2005

# Current discussed RS

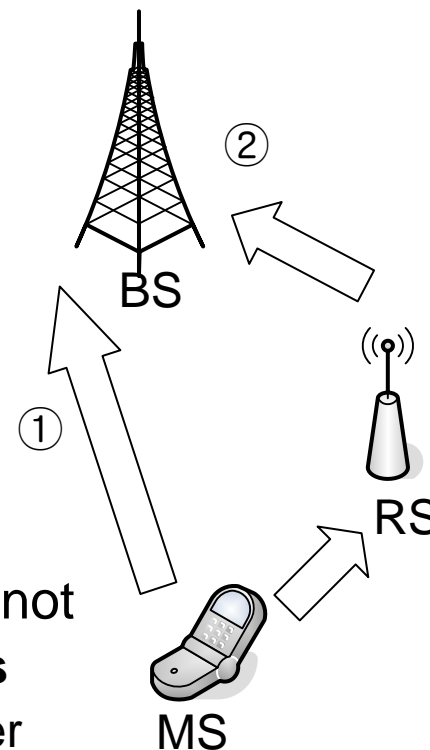
- ❑ There is no indication to determine relayed MS
  - Which MS communicates directly with BS or indirectly with BS via RS



# Proposed scheme

## ❑ To determine relayed MS

- All relaying transmissions are indicated by the BS
- The conditions of determination relayed MS
  - ▶ For enhanced throughput
  - ▶ and extended cell coverage by using RS
  - ▶ When UL signal quality of the MS is changed
- BS uses UL signal qualities of the MS
  - ▶ **Directly: Between BS and MS**
  - ▶ **Indirectly: Between BS and MS via RS**
    - RS detects UL signal quality of the MS
    - and after reports it to the BS
- Determines whether the MS will be relayed or not
  - ▶ **BS compares UL signal qualities of two paths**
    - Selected value of the two path values is better than the other and a certain value



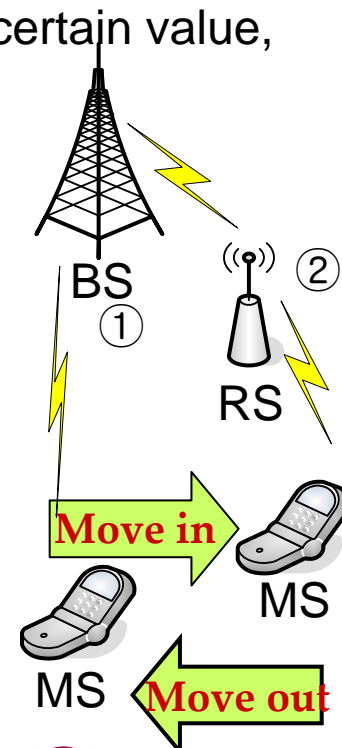
# Reporting method

- ❑ The reporting method of MS UL signal quality
  - Consider backward compatibility with 802.16 TGe PMP mode
    - ▶ **CQICH (Channel Quality Information Channel)**
    - ▶ **MAC management message**

# For example

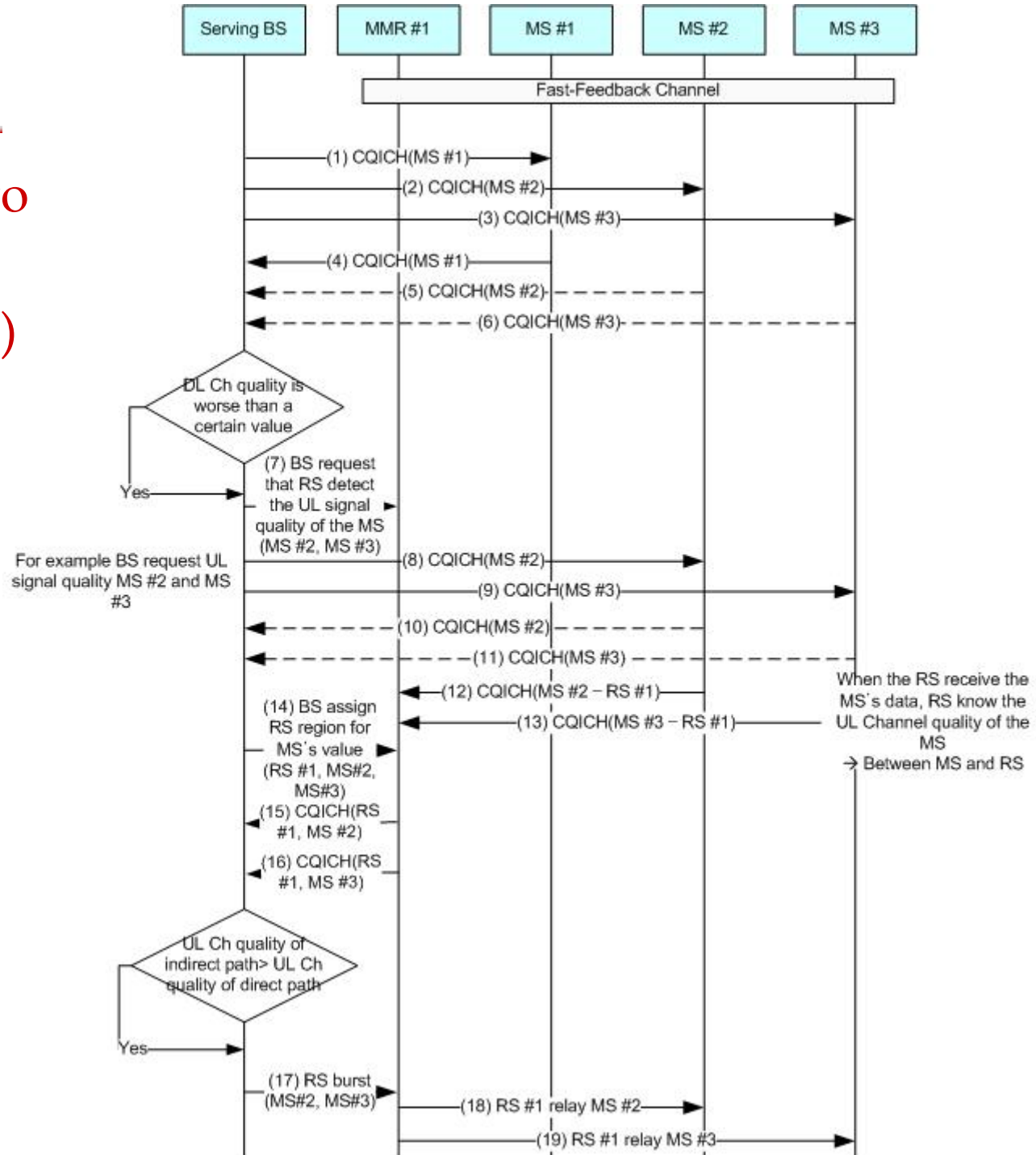
## □ When BS tries to connect relaying transmission(1/2)

- MS is located in BS coverage
- MS communicates directly with the BS,
  - ▶ **BS receives UL signal quality of MS, directly**
  - ▶ **When the MS moves in RS service region,**
    - The values go from bad to worse and worse than a certain value, gradually.
  - ▶ **When BS wants to change modulation to provide higher throughput to the MS,**
- BS receives UL signal quality of the MS via RS
  - ▶ **RS detects UL signal quality of the MS and reports it to the BS**
  - ▶ **BS compares UL signal qualities of two paths**
    - If indirect path UL signal quality is better than direct path UL signal quality of MS, BS tries to connect relaying transmission to the MS
- MS communicates with BS via RS, indirectly.



When BS tries to connect relaying transmission(2/2)

- CQICH method



## ❑ When BS tries to disconnect relaying transmission

- MS is located out of BS coverage
- MS communicates indirectly with BS via RS
  - ▶ **BS receives UL signal quality of MS, indirectly**
  - ▶ **When the MS moves out RS service region,**
    - The values go from bad to worse, gradually and worse than a certain value
  - ▶ **When BS wants to disconnect relaying transmission to the MS**
- BS requests UL signal quality to the MS, directly
  - ▶ **BS compares UL signal qualities of two paths**
    - If direct path UL signal quality is better than indirect path UL signal quality of the MS and a certain value,
  - ▶ **BS tries to disconnect relaying transmission to the MS**
- MS communicates with BS, directly.



## ❑ To determine relayed MS

- The conditions of determination relayed MS
  - ▶ **For enhanced throughput**
  - ▶ **and extended cell coverage by using RS**
  - ▶ **When UL signal quality of MS is changed**
- BS uses UL signal qualities of MS
  - ▶ **Directly**
  - ▶ **Indirectly**
- BS compares UL signal quality of two paths
- BS decides whether the MS will be relayed or not
- The reporting method for UL signal quality of MS
  - ▶ **CQICH**
  - ▶ **MAC management message**