| | | |
|---|---|---|
| Project | IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**> | |
| Title | Enhancement of BS Initiated Handoff Algorithm for 802.16e | |
| Date Submitted | [2003-11-07] | |
| Source(s) | Changhoi Koo<br>Jung Je Son<br><br>Samsung Electronics<br>Suwon, Kyeongki-do<br>Korea | Voice: [+82-31-279-5091]<br>Fax: [+82-31-279-5130]<br>chkoo@samsung.com<br>jungje.son@samsung.com |
| Re: | Response for Call for Comments of IEEE802.16e-03/07r4<br>Call for Comments of IEEE802.16e-03/07r4 is announced at 80216e-03_23. | |
| Abstract | Contains the enhanced element about BS initiated Handoff of 802.16e | |
| Purpose | Discussion and adaptation in a proper position for enhancement of 802.16e handoff algorithm | |
| 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. | |
| Patent Policy and Procedures | 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>. | |

# Enhancement of BS Initiated Handoff Algorithm for 802.16e

Changhoi Koo and Jung Je Son

SAMSUNG Electronics

## Introduction

IEEE802.16e-03-07/r4 defines both MSS Initiated Handoff procedures with MOB_MSSHO-REQ message and BS Initiated Handoff procedures with MOB_BSHO-REQ message. The main characteristic of handoff scheme is to negotiate QoS service capability and service level between serving BS and neighbor BS to continue current services between MSS and serving BS over the air.

Since this service negotiation result is attained from serving BS not MSS, it can help efficient processing of handoff in case of BS initiated through adding some information to request message by BS. When serving BS informs recommended neighbor BS according to its QoS capabilities negotiation results, MSS can determine and skip without scanning some neighbor BSs that cannot support proper QoS service level requested by the MSS. At this case, MSS can get better performance such as reduced time of scanning its neighbor BS and more chance to receive data from serving BS during handoff. And at last it result in reduced total handoff time from initialization to completion. Since the service capabilities negotiation result is already used in other messages in terms of service level prediction and for MSS, the only requested information about its neighbor BS is whether it can support QoS service as same level as current BS support, we can easily modify MOB_BSHO-REQ message and satisfy expected result with adding one parameter. In addition, current BS initiated handoff algorithm is not efficient since it just use an additive message used in MS initiated handoff message flow. And also after receiving MOB_MSSHO_RSP from MSS, BS should process negotiation among neighbor BSs for QoS service support.

In our proposal, we efficiently modify the BS initiated handoff procedures with only changing the position of the QoS negotiation process and modifying MOB_BSHO-REQ and MOB_MSSHO-RSP message.

## Proposed Remedy (Text changes)

Include “Service Level Prediction” in MOB_BSHO-RSP Message depicted in page 22 as following :

Table 84g-MOB_BSHO-REQ Message Format

| Syntax | Size | Notes |
|---|---|---|
| MOB_BSHO-REQ_Message_Format(){ | | |
| Management Message Type = 51 | 8 bits | |
| N_Recommended | 8 bits | |
| For(j=0;j<N_NEIGHBORS; j++){ | | |
| Neighbor BS-ID | 48 bits | |
| Service Level Prediction | 8 bits | |
| } | | |
| } | | |

Correct in page 25, line 12, as followings :

An MSS shall transmit an MOB_MSSHO-RSP Message upon reception of MOB_~~MSS~~BSHO-REQ message.

Add Following Paragraph after page 25 line 38 :

When MSS receives a MOB_BSHO-REQ message from serving BS, it may decide target BS according to the result of SINR scanning for each neighbor BS appropriately recommended from MOB_BSHO-REQ message with service level prediction. And MSS can notify the target BS using MOB_MSSHO-RSP message with "N_Recommended = 1". And at this case, BS may skip sending MOB_BSHO-RSP message.

Add BS SINR on MOB_MSSHO-RSP Message depicted in Table 84j of page 25 as following:

Table 84j-MOB_MSSHO-RSP Message Format

| Syntax | Size | Notes |
|---|---|---|
| MOB_MSSHO-RSP_Message_Format(){ | | |
| Management Message Type = 54 | 8 bits | |
| N_Recommended | 8 bits | |
| Estimated HO time | 8 bits | |
| For(j=0;j<N_Neighbors;j++){ | | |
| Neighbor BS-ID | 48 bits | |
| BS S/(N+1) | 8 bits | |
| } | | |
| } | | |

In page 60, replace Figure D.9 with:

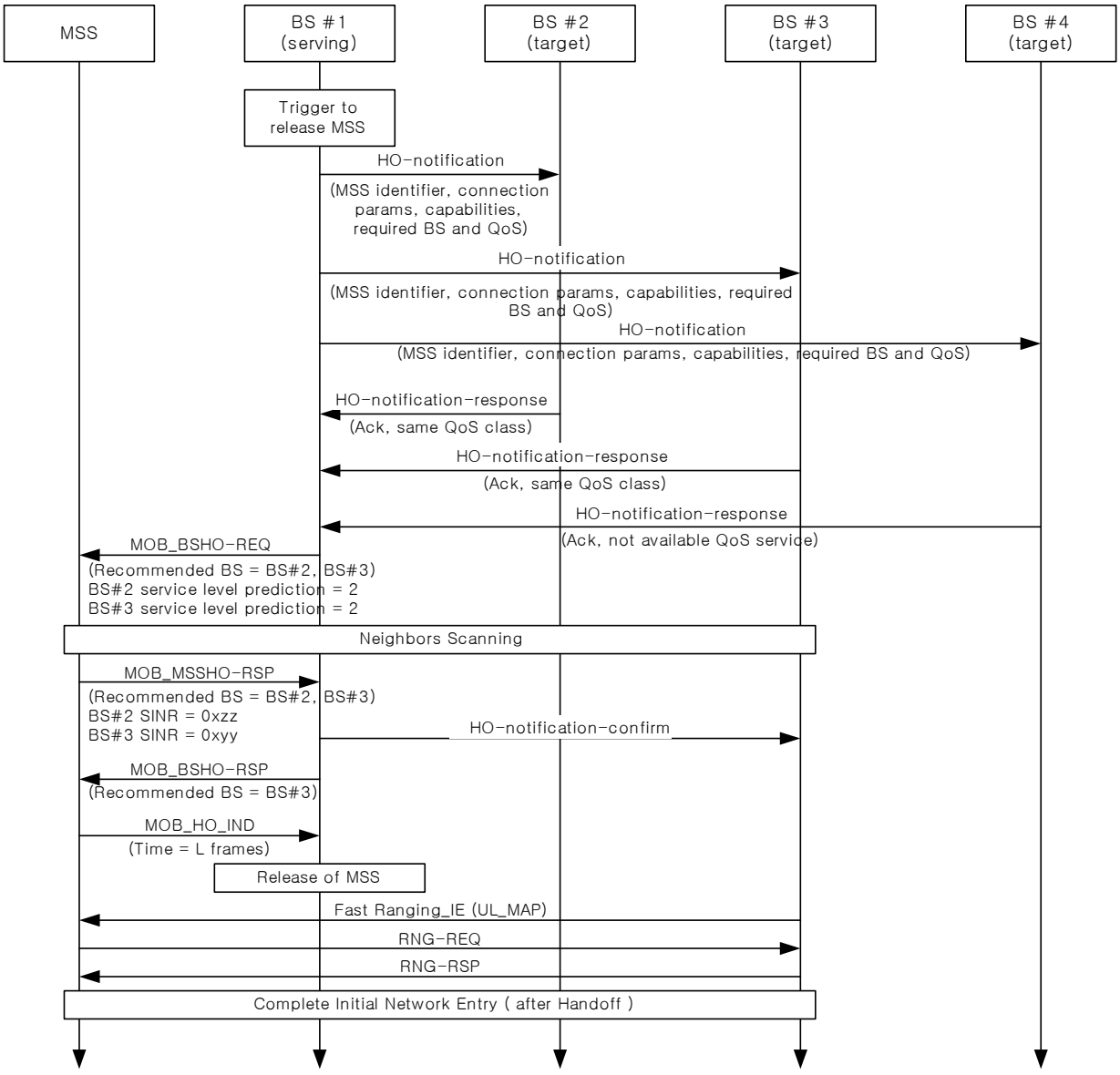


Figure D.9 – HO process by BSS request

In page 60, Add following Figure after Figure D.9 at section D.1 with:

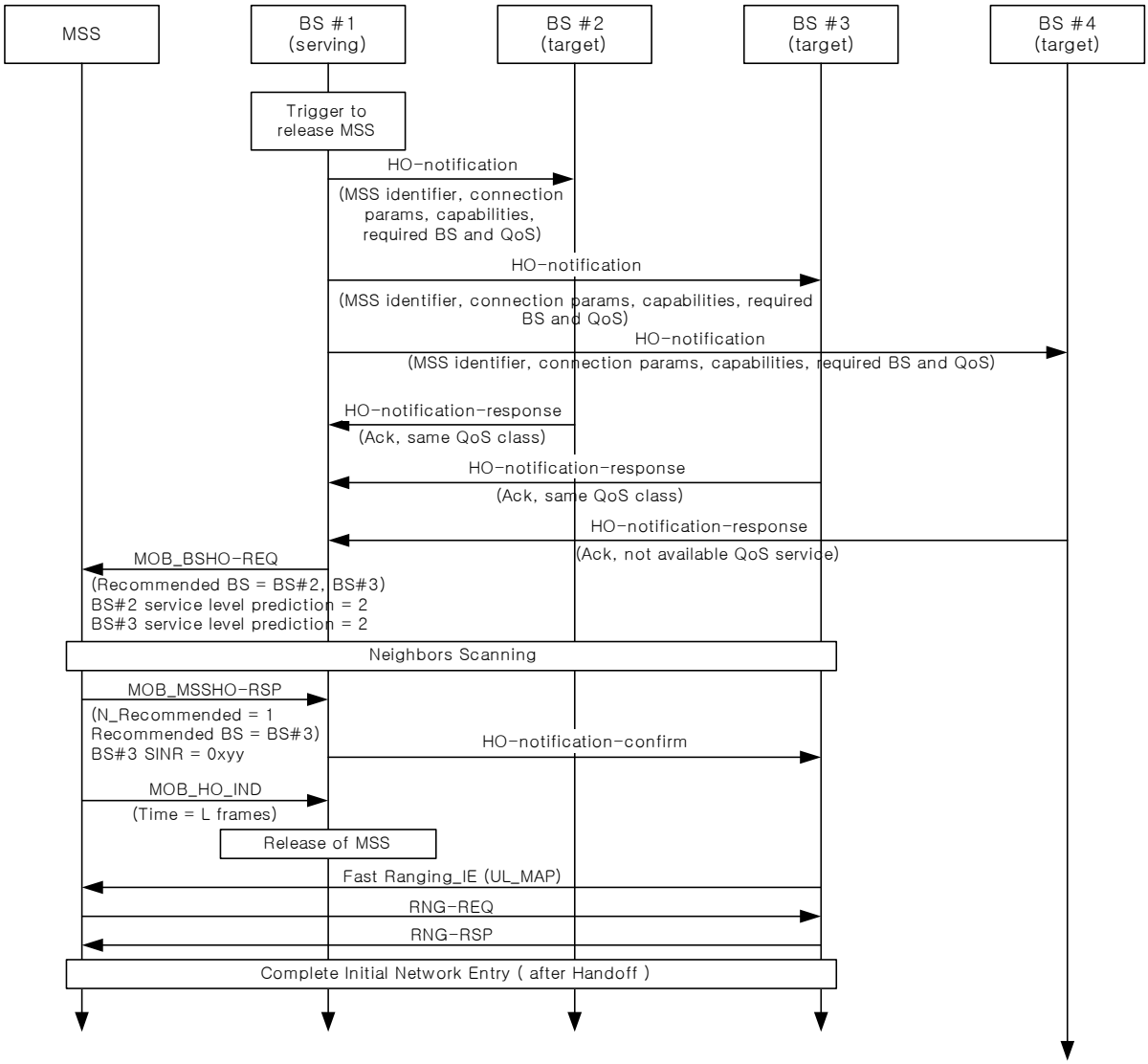


Figure D.10—HO process by BSS request and MSS decision of target BS