Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	Relay Station Handover Procedure
Date Submitted	2007-03-11
Source(s)	Hang Zhang, Mo-Han Fong, Peiying Zhu, Wen Tong, David Steer, Gamini Senarath, Derek Yu, Mark Naden, G.Q. Wang Nortel 3500 Carling Avenue Ottawa, Ontario K2H 8E9 Voice: +1 613 7631315 [mailto:WenTong@nortel.com] [mailto:pyzhu@nortel.com]
Re:	A response to a Call for Technical Proposal, http://www.ieee802.org/16/relay/docs/80216j-07_007r2.pdf
Abstract	This contribution proposes RS handover procedure which is required when an RS migrates from the air-interface provided by one access station to the air-interface provided by another access station due to radio environment change or topology change, etc.
Purpose	To incorporate the proposed text into the P802.16j Baseline Document (IEEE 802.16j-06/026r2)
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>.

Relay Station Handover Procedure

Hang Zhang, Mo-Han Fong, Peiying Zhu, Wen Tong, David Steer, Gamini Senarath, Derek Yu, Mark Naden, G.Q. Wang

Nortel

1. Introduction

During normal operation, a RS may perform handover (change its access station) due to radio environment change or topology change, and etc.

In contribution C802.16j-07/097r3, RS initial network entry is addressed. In this contribution RS handover procedure is proposed.

2. RS HO procedure

The following Figure shows the RS HO procedure.

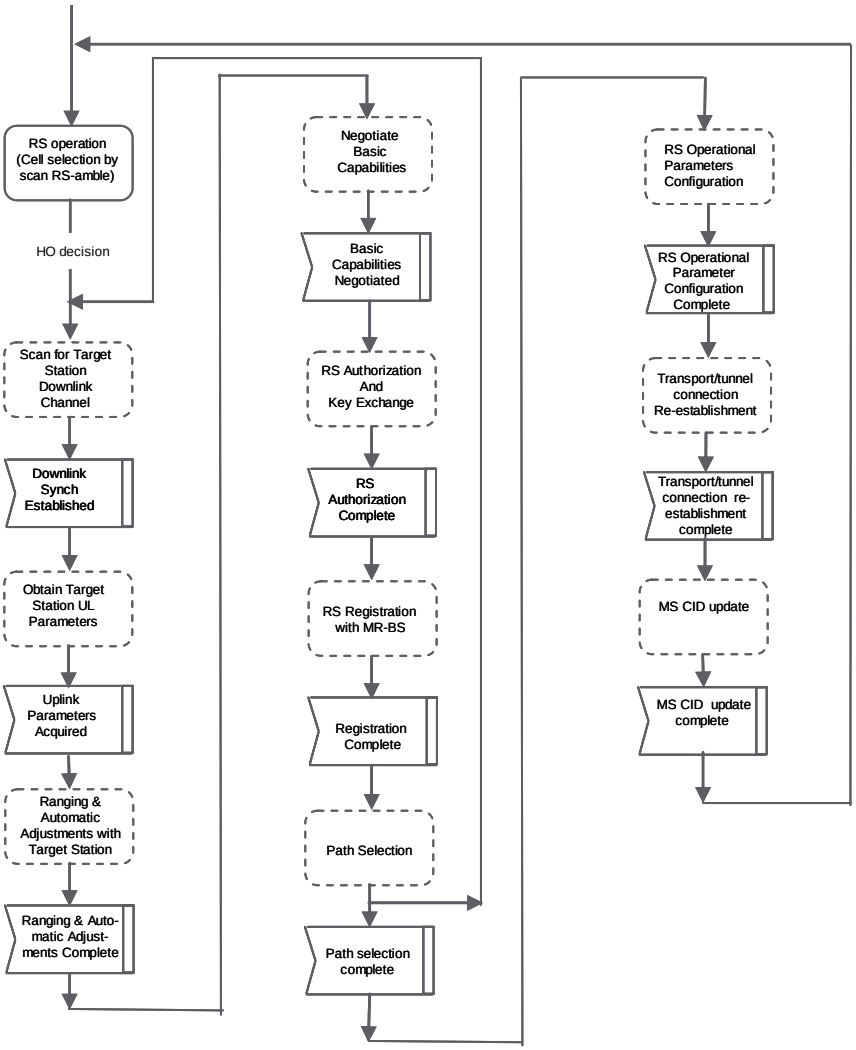

Figure 1. RS HO process

RS HO procedure reuses MS HO procedure with following addition operation steps:

- path selection
- RS operational parameter configuration
- Transport/tunnel connection re-establishment
- MS CID update – This stage is used to support the connection re-establishment between the child MSs and the target MR-BS if the MS handover procedure as described in 6.3.22.5 is not invoked between the MS and the Target MR-BS, i.e. there is full service and operational state transfer or sharing between Serving MR-BS and Target MR-BS. Otherwise, this stage shall be omitted and the MS handover procedure as described in 6.3.22.5 shall be invoked. MS CID update process is only needed when MS CID based data forwarding scheme is used and when a CID of a child MS collides with the CID of another MS served by the target MR-BS. In this case, this stage is used for the target MR-BS to inform the RS, which is performing the handover, regarding the new CIDs of its child MSs, in order for the RS o swap the new CIDs of its child MSs to the old CIDs before forwarding the MAC PDUs to the child

MSs. For non-MS CID based data forwarding schemes, this step shall be omitted since the data forwarding from the MR-BS to the access RS is based on established routes, e.g. tunnel, destination RS basic CID, source routing. Thus, there is no issue of MSs CID collision.

3 Proposed text change

3.1 Text change for RS HO description

[Replace section 6.3.22.4 with the following]]

6.3.22.4. RS handover

This section defines the RS HO process in which an RS migrates from the air-interface provided by one access station to the air-interface provided by another access station. The RS HO process is depicted in Figure xxx.

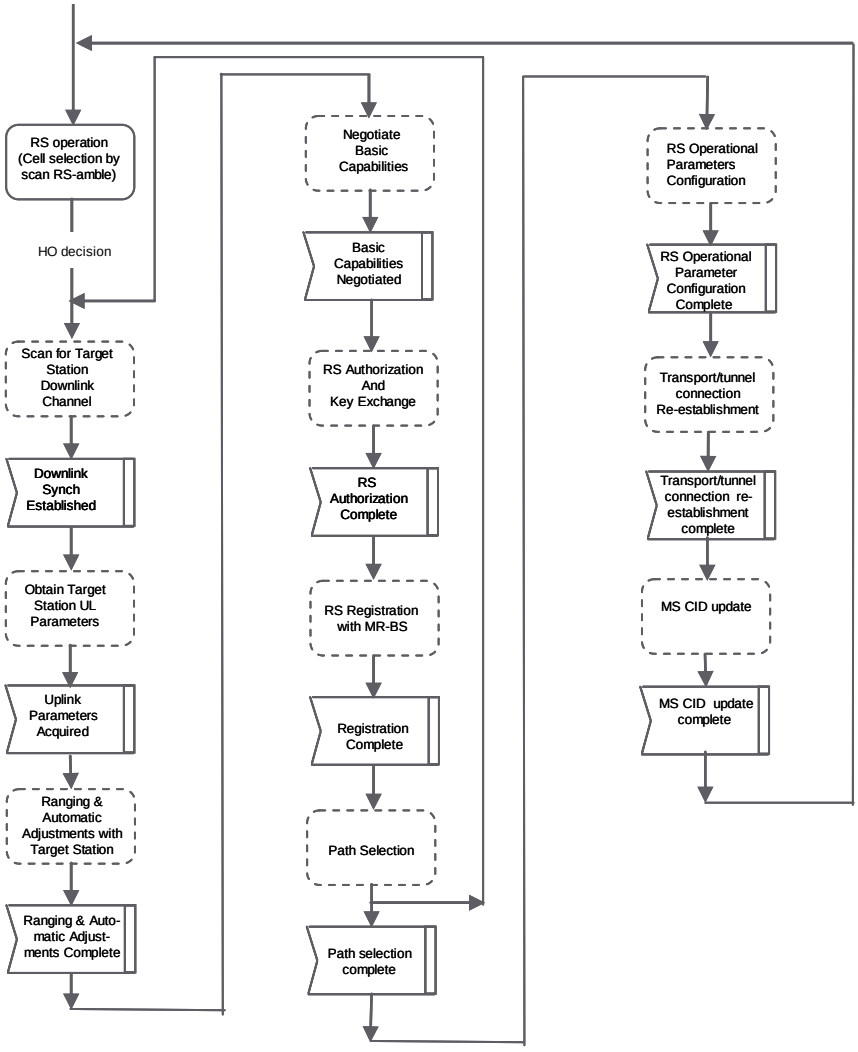

Figure XXX. RS HO process

The RS HO process consists of stages of MS HO process and the following additional stages

- Path selection – This stage enable the target MR-BS to indicate a path re-reselection. The target MR-BS may decide to skip this step if the bit #0 in RS HO optimization TLV of MOB_BS-REQ/RSP is set
- RS operational parameter configuration – This stage enables the target MR-BS to reconfigure RS operational parameters. The target MR-BS may decide to skip this step if the bit #1 in RS HO optimization TLV of MOB_BS-REQ/RSP is set
- Transport/tunnel connection re-establishment – this stage enables the target MR-BS to re-establish transport/tunnel connections for an RS. The target MR-BS may decide to skip this step if the bit #2 in RS HO optimization TLV of MOB_BS-REQ/RSP is set
- MS CID update – This stage is used to support the connection re-establishment between the child MSs and the target MR-BS if the MS handover procedure as described in 6.3.22.5 is not invoked between the MS and the Target MR-BS, i.e. there is full service and operational state transfer or sharing between Serving MR-BS and Target MR-BS. Otherwise, this stage shall be omitted and the MS handover procedure as described in 6.3.22.5 shall be invoked. MS CID update process is only needed when MS CID based data forwarding scheme is used and when a CID of a child MS collides with the CID of another MS served by the target MR-BS. In this case, this stage is used for the target MR-BS to inform the RS, which is performing the handover, regarding the new CIDs of its child MSs, in order for the RS o swap the new CIDs of its child MSs to the old CIDs before forwarding the MAC PDUs to the child MSs. For non-MS CID based data forwarding schemes, this step shall be omitted since the data forwarding from the MR-BS to the access RS is based on established routes, e.g. tunnel, destination RS basic CID, source routing.

3.2 Text change for RS HO Optimization TLV in RNG-RSP message

Insert the following to the end of 6.3.2.3.6:

The following TLV parameter shall be included in the RNG-RSP message when the RS is attempting to perform network re-entry or handover and the target MR-BS wishes to identify re-entry process management messages that may be omitted during the current HO attempt:

RS HO Optimization (see 11.6)

Identifies re-entry process management messages that may be omitted during the current HO attempt due to the availability of RS service and operational context information obtained by means that are beyond the scope of this standard, and the RS service and operational status post-HO completion. The RS shall not enter Normal Operation with Target MR-BS until completing receiving all network re-entry, MAC management message responses as indicated in RS HO Process Optimization.

[Change Table 367 as indicated:]

Name	Type	Length	Value
RS HO optimization	TBA	1	Bit #0: set to 1 to indicate path selection is omitted Bit #1: set to 1 to indicate RS operational parameter configuration is omitted Bit# 2: set to 1 to indicate RS connection/tunnel re-establishment is omitted Bit #3: set to 1 to indicate MS service flow re-establishment sub-stage is omitted Bit #4-7: *reserved*