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Re:	This contribution is response to call for technical proposal (IEEE 802.16j-06/027).	
Abstract	This document proposes an addition of RSID into REG-REQ message in order to support path selection for handover through RS.	
Purpose	Discuss and adapt proposed text and message format.	
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Path selection for handover through RS

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1. General

This document presents the needed amendments in order to support path selection for handover through RS.

2. Background

Conventional 16e handover (HO) process is below, as shown in figure 1.

- (1) Each BS exchanges some information, such as neighbor BS list and radio resource, etc., via backbone network.
- (2) Serving BS (BS1) broadcasts MOB_NBR-ADV message in order to inform neighbor BS information to MS. Moreover, MS may get the neighbor BS information using scanning process by itself.
- (3) When MS initiates HO process, MS transmits MOB_MSHO-REQ message with neighbor BS information that MS has.
- (4) BS1 asks whether MS's existing service flow (SF) can be supported to the target BS (BS2) via backbone network. *This process is out of 16e standard.
- (5) BS2 replies the result of (4). *This process is out of 16e standard.
- (6) BS1 replies MOB_BSHO-RSP message containing information of recommended BS which can support the MS's existing SF for the HO to MS.
- (7) MS notifies MOB_HO-IND message containing BSID of target BS to BS1.

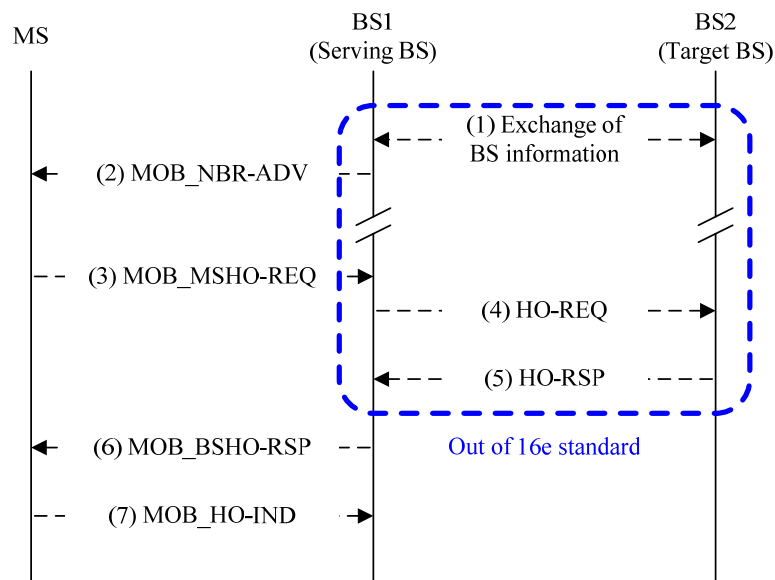


Figure 1 Conventional 16e HO sequence

In conventional 16e case, the radio resource is managed by each BS individually, as shown above. However, in MMR case, if a MS initiates HO process through RS, the serving BS needs to decide a suitable path which can support MS's existing SF in consideration of radio resource of relay link.

3. Proposed method

We propose that BS has a routing table of relay link based on tree network topology. As shown in figure 2 and 3, RS informs its RSID which is the same as BSID format using REG-REQ message when RS make a registration to the network. The RSID which is related with CID of RS and network topology needs to be added to the routing table. The routing table is used for selection of suitable destination node, and the path which can not provide QoS by HO is excepted.

3.1 Intra-cell HO

- Centralized scheduling [Figure 2 (a)]
 - (1) When RS makes a registration process, it notifies its RSID to BS in order to create/revise routing table based on tree network topology. In centralized scheduling case, BS manages the radio resource of all subordinate links by itself, as shown below.
 - ✓ Access link (BS-MS)
 - ✓ Relay link (BS-RS)
 - ✓ Subordinate RS's access link (RS-MS)
 - (2) MS transmits MOB_MSHO-REQ message with neighbor BS information that MS has.
 - (3) BS can decide whether MS's existing SF can be supported in consideration of radio resource of relay link (BS-RS) and subordinate RS's access link (RS-MS). If the new path through RS can not support the SF, BS shall not contain the RS information in MOB_BSHO-RSP message as a recommended path.
 - (4) MS notifies MOB_HO-IND message to the serving BS.

- Distributed scheduling [Figure 2 (b)]
 - (1) When RS makes a registration process, it notifies its RSID to BS in order to create/revise routing table based on tree network topology. In distributed scheduling case, BS may manage only the radio resource of relay link (BS-RS) and RS may manage only the radio resource of access link (RS-MS).
 - (2) MS transmits MOB_MSHO-REQ message with neighbor BS information that MS has.
 - (3) After BS decides whether MS's existing SF can be supported in consideration of radio resource of relay link (BS-RS), BS transmits "HO-REQ" message which may be the same message format as (4) in figure 1.
 - (4) Moreover, after RS decides the same judgment for its access link (RS-MS), RS replies "HO-RSP" message which may be the same message format as (5) in figure 1.
 - (5) If the new path through RS can not support the SF, BS shall not contain the RS information in MOB_BSHO-RSP message as a recommended path.
 - (6) MS notifies MOB_HO-IND message to the serving BS.

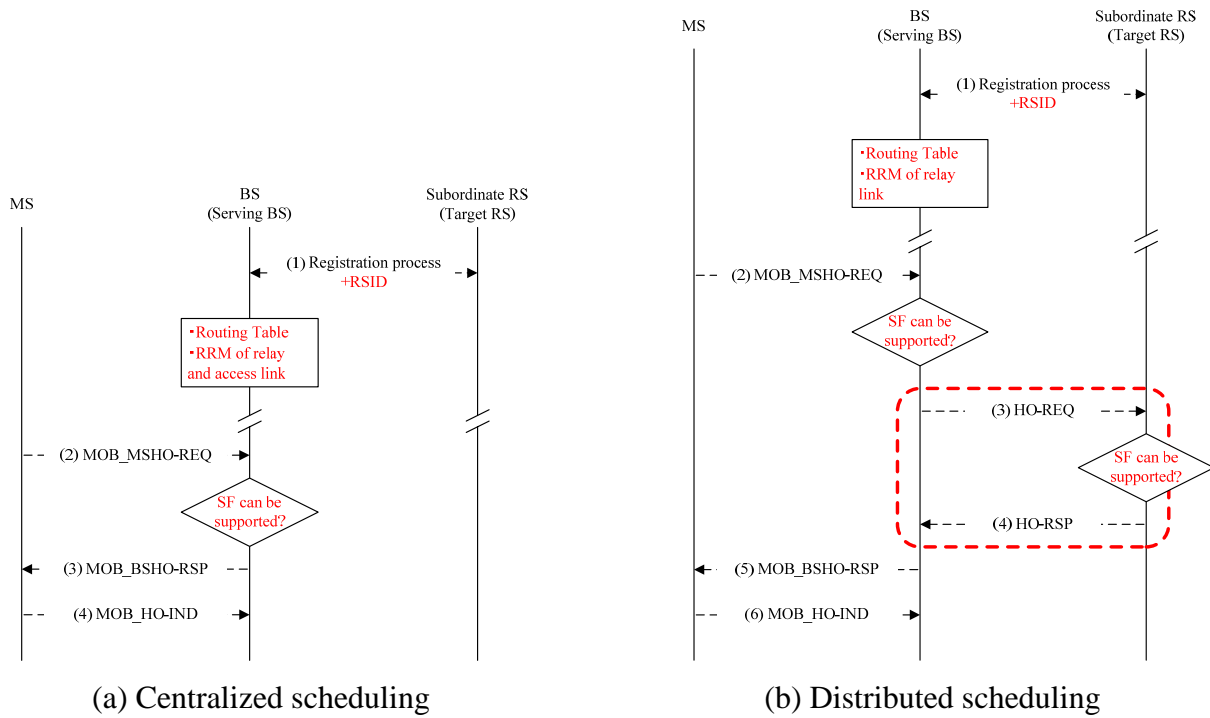


Figure 2 Intra-cell HO procedure

3.2 Inter-cell HO

- Centralized scheduling

As shown in figure 3(a), this procedure is the same as intra-cell HO sequence (Centralized scheduling) except BS-BS communication.

- Distributed scheduling

As shown in figure 3(b), this procedure is the same as intra-cell HO sequence (Distributed scheduling) except BS-BS communication.

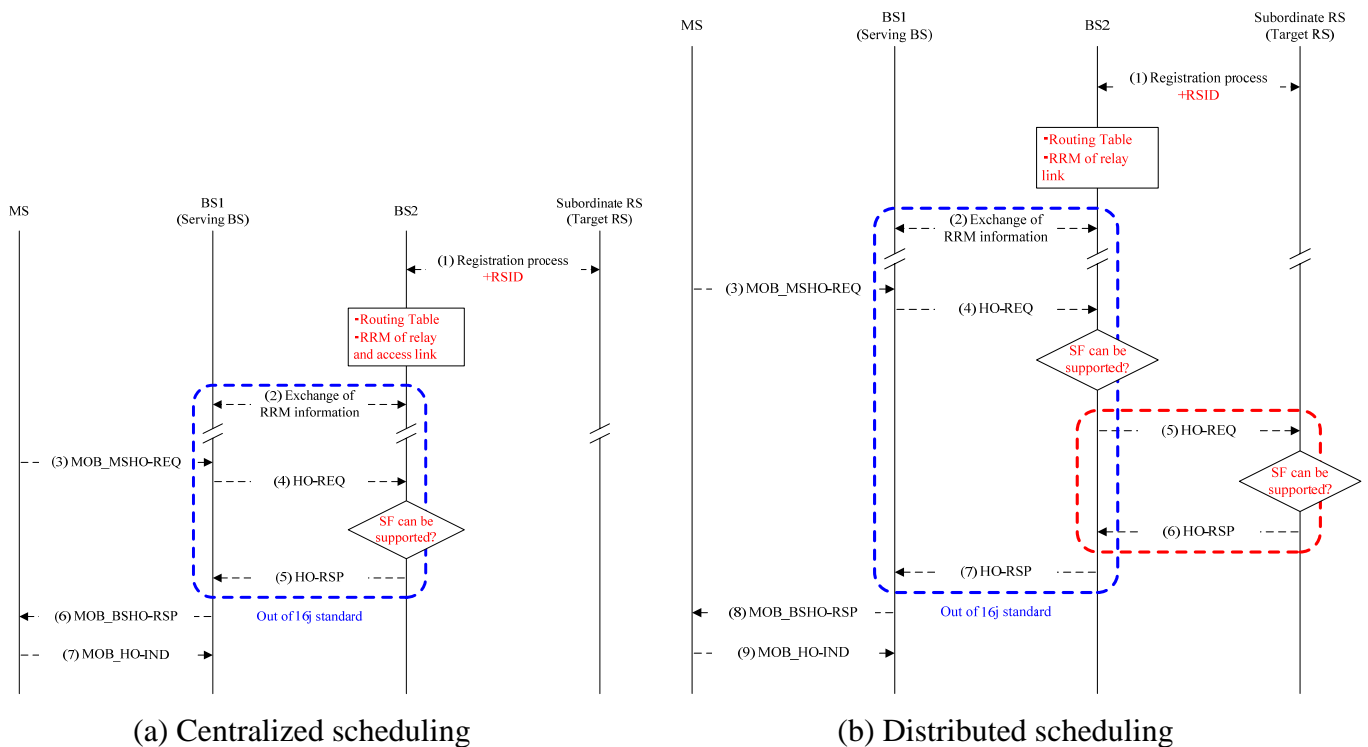


Figure 3 Inter-cell HO procedure

4. Text to be inserted into standard

6.3.2.3.7 *Registration request (REG-REQ) message*

Insert the following text at the end of the 6.3.2.3.7:

In MMR, when RS make a registration to the network, the REG-REQ shall contain the following TLVs:

Relay Station ID (11.7.27)

11.7 *REG-REQ/RSP management message encodings*

Insert the following text at the end of the 11.7:

11.7.27 Relay Station ID (RSID)

This field specifies the Relay Station ID which RS informs to BS, used in MMR. The RSID is reuse of Base Station ID.

Type	Length	Value	Scope
<u>45</u>	<u>6</u>	<u>RSID which is the same format as BSID</u>	<u>REG-REQ</u>