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Title	MS Handover with Relay	
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Source(s)	<p>Yousuf Saifullah, Shashikant Maheshwari, Haihong Zheng Nokia 6000 Connection Drive, Irving, TX</p> <p>Aik Chindapol, Jimmy Chui, Hui Zeng Siemens Corporate Research 755 College Road East, Princeton, NJ, USA</p>	<p>Voice: 972 894 5000 Fax: Yousuf.saifullah@nokia.com, shashikant.maheshwari@nokia.com, haihong.1.zheng@nokia.com</p> <p>Voice: +1 609 734 3364 Fax: +1 609 734 6565 Email: aik.chindapol@siemens.com</p>
Re:	This is a response to the call for proposals 80216j-06_034.pdf	
Abstract	This contribution describes MS handover procedure in presence of relays.	
Purpose	Add proposed spec changes in P802.16j Baseline Document (IEEE 802.16j-06/026r1)	
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MS Handover with Relay

Yousuf Saifullah, Shashikant Maheshwari, and Haihong Zheng
Nokia

When MS is connected to MR-BS through one or more RS, then we need to determine about the handover states anchor point or location in the network. There are two options either keep the states on the RS or the MR-BS.

This contribution proposes that the handover states in the network for an MS connected through an RS should stay anchored in the BS. This provides the following advantages:

- Less complexity for RS,
- No change from the 16e mobility model, where BS holds the mobility state.
- Less handovers in the system, as the BS is a higher entity in the air interface hierarchy.

If the handover states are moved to RS, then the following are the disadvantages:

- RS still needs to send handover signaling to the MR-BS, as the user plane needs to be changed from the MR-BS. So in most of the cases there is no saving in signaling. There is saving only in one case, when target RS is one hop away from the serving RS.
- This would require supporting another set of signaling from MR-BS, which not only complicates RS but also changes the MR-BS interface from 16e.
- RS to RS signaling and connections need to be defined and maintained, making RS more complex.
- During handover preparation, the SLP needs to be retrieved from MR-BS in case of centralized scheduling, as target RS doesn't have control on its resource allocation
- Security keys need to be distributed to the RS, so it can perform message authentication.

The target station could be a BS or RS. If it is RS, then MS does ranging with the RS and MR-BS during network re-entry procedure. The ranging procedure for relays is described in [1].

Table 1: Different serving and target station scenarios for an MS handover

Serving \ Target	BS	FRS	MRS
BS	1	2	2
FRS	1	2	2
MRS	1	2	2

1 = 16e mobility procedure

2 = 16e mobility procedure + Ranging with RS and MMR-BS

Spec Changes

Insert new sub-clause after section 6.3.22.3

6.3.22.4 MS Handover in Relay Network

An MS, connected through a fixed RS, shall follow the same procedures as described for an MS handoff in section 6.3.22.2 without RS. The fixed RS relays all the signaling transparently between MS and MR-BS.