Project	IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>
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Re:	IEEE 802.16j-07/007r2 : “Call for Technical Comments and Contributions regarding IEEE Project 802.16j”
Abstract	This contribution proposes the handover procedure for MS handover in non-transparent RS and transparent RS coexisting multi-hop relay network for IEEE 802.16 j.
Purpose	Text proposal provided as an input for 802.16j Baseline Document
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MS Handover in Transparent RS and Non-transparent RS Coexisting Multi-hop Relay Network

1 Introduction

In this proposal, we proposal the handover cases in transparent RS and non-transparent RS coexisting multi-hop relay network as a response to the call for technical contributions regarding IEEE Project 802.16j. We assume in this contribution that transparent RS stand for the RS which transmit the same preamble/FCH/MAP as its superior anchor station (RS or MR-BS) in the same MR cell. Non-transparent RS transmits its own preamble/FCH/MAP and thus could act as an anchor station to its subordinate transparent RS. Also non-transparent RS worked as a BS to the MS.

2 Problem statement

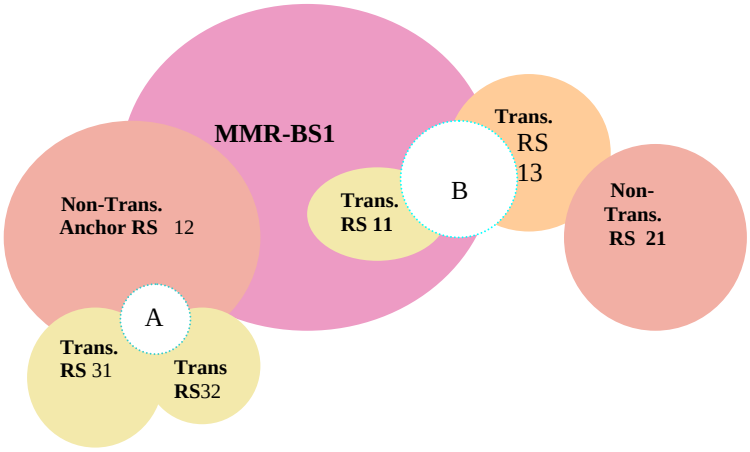

Fig.1 An example topology for coexistence of non-transparent RS and transparent RS in one MR cell

We propose the above Fig.1 topology example with both transparent and non-transparent RS to coexist in the MR network. Since by coexistence, we could exploit the advantages both of non-transparent RS and transparent RS. Mounted in the middle or the end of the hops, non-transparent RS could reduce the multi hop delay while transparent RS could lessen the handover frequency and hence there will be less interference. Besides we could make a flexible network topology according to different system and custom requirements.

Having this topology as an example for a centralized MR network, handover procedures involving transparent RS and non-transparent RS will happen, the following procedure as in the baseline document is suggested to be as a remedy.

2.1 Intra MR-BS handover and inter MR-BS handover among access stations with different preamble/FCH/MAP in transparent RS and non-transparent RS coexisting multi-hop relay network

If the current access station and the target access station for MS have different preamble/FCH/MAP, an MS connected through an RS or MR-BS shall follow the same procedures as described for an MS handover in section 6.3.22.2. The RS shall relay HO related management messages between MS and MR-BS. After that, the topology for related MR cell should be updated and new candidate station set needs to be established in the target anchor station for the MS if transparent RS is one of the access stations before or after handover.

2.2 Intra MR-BS handover among access stations with same preamble/FCH/MAP in transparent RS and non-transparent RS coexisting multi-hop relay network

In the case the current access station and the target access station for MS has the same preamble/FCH/MAP, MS is not aware of the HO, for instance in Fig.1, handover among area A and handover among area B. Therefore, RS and MR-BS shall control the handover process transparently to MS. If there are no direct path from MR-BS/anchor RS to the multi-hop MS, the handover procedure with transparent RS in a centralized multi-hop relay network in [2] shall be employed. If the transparent RSs are subordinates RSs to an anchor station RS like in Fig.1 area A, we could regard this anchor station RS 12 as a MR-BS to control the intra RS handover procedure the same way as in the MR-BS controlled intra RS handover. After that, the topology for related MR cell should be updated.

3 Text Proposals

[*Insert the following subclause as section 6.3.22.5.xx*]

6.3.22.5.xx Intra MR-BS handover and inter MR-BS handover among access stations with different preamble/FCH/MAP in transparent RS and non-transparent RS coexisting multi-hop relay network

If the current access station and the target access station for MS have different preamble/FCH/MAP, an MS connected through an RS or MR-BS shall follow the same procedures as described for an MS handover in section 6.3.22.2. The RS shall relay HO related management messages between MS and MR-BS. After that, the topology for related MR cell should be updated and new candidate station set needs to be established in the target anchor station for the MS if transparent RS is one of the access station before or after handover.

6.3.22.5.xx Intra MR-BS handover among access stations with same preamble/FCH/MAP in transparent RS and non-transparent RS coexisting multi-hop relay network

In the case the current access station and the target access station for MS have the same preamble/FCH/MAP, MS is not aware of the HO. Therefore, RS and MR-BS shall control the handover process transparently to MS. If there are no direct path from MR-BS/anchor RS to the MS, the intra MR-BS handover with transparent RS in a centralized multi-hop relay network procedure in [2] shall be employed. If the transparent RSs are subordinates RSs to an anchor station RS, we could regard this anchor station RS as a MR-BS to control the intra RS handover procedure the same way as in the MR-BS controlled intra RS handover.
After that, the topology for related MR cell should be updated.

4 References

[1] Baseline document for Draft Standard for Local and Metropolitan Area Networks, IEEE 802.16j-06/026r2.
[2] “Handover with transparent RS in centralized multi-hop relay network” IEEE 802.16j-07/246,
[3] “Harmonized definitions and terminology for 802.16j Mobile Multihop Relay,” IEEE 802.16j-06/014r1 http://www.ieee802.org/16/relay/index.html, October 2006.