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Title	**Path selection and reselection for RSs in IEEE 802.16j Multi-hop Relay Network**
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Re:	IEEE 802.16j-06/034: “Call for Technical Proposals regarding IEEE Project P802.16j”
Abstract	This contribution describes path selection and reselection for RSs in IEEE 802.16j
Purpose	Propose the path reselection procedures for RSs in IEEE 802.16j specification
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Path Selection and Reselection for RSs in IEEE 802.16j Multi-hop Relay Network

1. Introduction

In the IEEE 802.16j #46 meeting, quite a few contributions proposed methods on path selection and/or reselection for RSs in the MR network [1-8]. The usage of path selection is when an RS first comes to attach to the MR network [1-4], and the usage of path reselection is when the network or an operating RS wants to perform path optimization so as to improve the path and/or network performance [5-6]. Generally speaking, the proposed methods can be divided into two categories: RS-assisted network-controlled [2,4,7,8] and network-assisted RS-controlled [1,3]. In the former, the RS makes measurements of the MR-BS and/or other RSs and reports them to the network (MR-BS) which in turn makes the selection decision. In the latter, the network broadcasts information regarding relay paths, and the RS makes the selection decision by itself after evaluating the information.

For the network-assisted RS-controlled scheme, in order to support path selection that may occur at anytime, periodic broadcast of path information is needed [1, 3]. In view of the fact that the instances of path selection for RSs may not occur too frequently, the periodic broadcast of path information can be very inefficient. This contribution focuses only on the RS-assisted network-controlled scheme.

Several RS-assisted network-controlled path selection methods were proposed in the IEEE 802.16j #46 meeting [2,4,7,8], where path selection is done during the network entry of RS. Nevertheless, path reselection is also needed for an operating RS for the purpose of better path and/or network performance. This contribution proposes to specify path reselection for RSs as a separate procedure from the path selection which is performed during the network entry.

2 Proposed text

----------Start text proposal----------

6.3.25 Relay path management and routing

[Insert the following sub-clauses and texts into this section]

6.3.25.1 Path selection for RSs

[This subsection may refer to 6.3.9.16 Support for network entry and initialization in relay mode]

6.3.25.2 Path reselection for RSs

A method of path reselection for RS is required for relay path management in addition to path selection which is performed during the network entry for a new coming RS. Path selection is used for an operating RS in order to obtain a better path and/or network performance.

The procedure of path reselection for RS consists of three steps: (1) MR-BS and/or RSs measurements and reporting. (2) Decision of path selection and notification (3) RS network re-entry. The procedure can be initiated by the MR-BS or the RS.

6.3.25.2.1 MR-BS and/or RSs measurements and reporting

TBD

[This subsection may refer to 6.3.26 Relay station neighborhood discovery or 6.3.27 Interference measurement for MR] (For example, the RS sounding mechanism proposed in [9] or the reporting scheme in [5])

6.3.25.2.2 Decision of path selection and notification

After the MR-BS collects the measurement reports from the RS, it makes the decision on the path selection according to some algorithms. The decision shall be notified to the RS. (For example, the RLY_TPY-IND message in [2] or Tree optimization (TREE_TPY_OPT-IND) message in [5]).

6.3.25.2.3 RS network re-entry

The network re-entry shall be performed by the RS if it is indicated (For example, the RLY_TPY-IND message in [2] or Tree optimization (TREE_TPY_OPT-IND) message in [5]). The RS can skip some of network re-entry processes such as RS basic capability REG/RSP, RS registration REQ/RSP and address acquisition by checking the RS network re-entry optimization parameter in order to accelerate the RS network re-entry.

----------End of text proposal----------

References

[1] IEEE C802.16j-06/158, “Routing Announcements for Network Entry Support”.

[2] IEEE C802.16j-06/167, “RS Network Entry, Topology Establishment and Initialization for IEEE 802.16j”.

[3] IEEE C802.16j-06/278, “Path selection for RS initial network entry”.

[4] IEEE C802.16j-06/286, “MS / RS network entry and initialization”.

[5] IEEE C802.16j-06/296r1, “Link Adaptive Multi-hop Path Management for IEEE 802.16j”.

[6] IEEE C802.16j-06/287r1, “Neighborhood Discovery and Topology Learning”.

[7] IEEE C802.16j-06/124r4, “MS Network Entry for transparent Relay Station”.

[8] IEEE C802.16j-06/133r4, “MS network entry for non-transparent Relay Station”.

[9] IEEE C802.16j-06/149r1, “Resource reuse and interference management mechanism”.