Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Changes to Relay Related Sections in SDD**
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Re:	Call for Comments and Contributions on Project 802.16m – SDD – as announced in IEEE 802.16m-08/024
Abstract	When communications occur via a relay station, they do not go between a BS and an MS. In 16j, communications were defined between the MS and an MR-BS, which is distinct from a BS. It is important to maintain the distinction in 16m in order to keep the requirements for multihop relay distinct from requirements on BSs.
Purpose	Discuss and adopt
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Changes to Relay Related Sections in SDD

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Background

When communications occur via a relay station, they do not go between a BS and an MS. In 16j, communications were defined between the MS and an MR-BS, which is distinct from a BS. It is important to maintain the distinction in 16m in order to keep the requirements for multihop relay distinct from requirements on BSs. However, 16j took the wrong approach in specifying the MR-BS as an entity that serves both relay stations and MS (thereby feeding the confusion that the MR-BS is a BS).

We suggest calling the entity that serves as the endpoint of communications over relay stations the Multihop Relay Control Station (MRCS) to clearly distinguish it and its requirements and behavior from the BS.

There should be no explicit or implied requirement on an MRCS to also be a BS. This means that the MRCS serves relay stations only. An MS can be served only by an RS or directly by a BS. (In that sense, the RS is much closer to being a BS than the MRCS).

A physical entity that serves both MSs and RSs incorporates the functionality of a BS and an MRCS (the 16j MR-BS, in comparison, is a combined MRCS and BS). Although such devices may be implemented, the standard should keep a logical separation between the MRCS and the BS. This separation will help keeping the standard simple, clean and well structured.

The standard should not preclude the deployment of entities that serve as MRCS only, and should allow for profiles to be specified for such devices. For instance, it is conceivable to deploy a relay network consisting of MRCSs and RSs only, which may be overlaid on a network of BSs. The two networks may be sharing the same backhaul network and ASN-GWs, etc.

Flexible and alternate solutions for collocated co-existence of BSs and MRCSs should be provided, not assuming that the MRCS is transmitting from the same antennas as the BS (as in 16j, where the MR-BS transmits frames with an access zone and a relay zone). Frequency separation, spatial separation and time separation should be considered. For instance, for time separation, the solution could be to allow for gaps in the frames transmitted by the BS to allow for the MRCS to transmit. (In comparison to 16j, the 16m frame does not have a "Relay Zone", but may provide a gap allowing the MRCS to transmit.

2 Proposed Changes

On page 7, line 17, change text as:

The Relay Stations (RSs) may be deployed to provide improved coverage and/or capacity (**Error! Reference source not found.**). ~~When RSs are present, communications between the BS and the MS can occur directly or via relay.~~

On page 8, figure 2, replace the two instances of 16m BS that are linked to 16j and 16m RS, by a 802.16m

MRCS.

On page 8, lines 3-12,modify as:

A 16m ~~BS~~ Multihop Relay Control Station (MRCS) that is capable of supporting a 16j RS, shall communicate with the 16j RS in the "legacy zone". The 16m ~~BS~~ MRCS is not required to provide 16j protocol support in the "16m zone". [The design of 16m relay protocols should be based on the design of 16j wherever possible, although 16m relay protocols used in the "16m zone" may be different from 16j protocols used in the "legacy zone".]

Error! Reference source not found. and **Error! Reference source not found.**, show the 16m relay related interfaces that are to be supported and those which are not required to be supported in the 802.16 specification. Only the interfaces involving RSs (16m and legacy RS) are shown.

~~The 16j BS, shown in Figure 3 is referred to as an MR-BS in the 16j draft amendment.~~ **Error! Reference source not found.** and **Error! Reference source not found.** also indicate the specific 802.16 protocol that is to be used for supporting the particular connection. In **Error! Reference source not found.**, it is assumed that the 16m MS supports 16m and 16e air interface per SRD requirements. The standard shall support physical collocation of the 16m BS and MRCS.

On page 9, Figure 3, replace the 16m BS by 16m MRCS and the 16j BS by 16j MR-BS. In the "Key" box, modify as follows:

Connections that are to be specified~~supported~~

On page 10, Table 1,change as follows:

Connection #	Connected Entities	Protocol used	Supported (Y/N)
1	16m ~~BS~~ MRCS -16m RS	16m	Y
2	16m ~~BS~~ MRCS - 16j RS	16j	Y
3	16m RS – 16j BS	N/A	N
4	16j BS - 16j RS	16j	Y
5	16m RS - 16m MS	16m	Y
6	16m RS - 16e MS	16e	Y
7	16m MS – 16j RS	16e	Y
8	16j RS - 16e MS	16e	Y
9	16m RS – 16j RS	N/A	N
10	16m MRCS - 16m MS	N/A	N
11	16m MRCS - 16e MS	N/A	N

On page 32, line 7, delete the contents of this section, since it assumes that the 16m BS communicates with an RS, which is not the case.