

Relay features in 16m

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Venue:

TGm call for comments on IEEE 802.16m-08/040. Specific topic : “TGm SDD: Relay”

Base Contribution:

N/A

Purpose:

To be discussed and adopted by TGm for the 802.16m SDD

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Philosophy of 16m relay

- Maximize the use of already defined features in 16j
- Minimize options as much as possible

Addressing for RS

- Utilize 16m's addressing scheme.
 - MAC address
 - 48-bit unique address
 - It is used as BSID.
 - Station ID
 - Uniquely assigned ID within the domain of BS
 - Use specifically reserved Station ID for broadcast/ranging
 - Flow ID
 - For basic/primary/secondary connection of RS itself

Issues on Scheduling

- Distributed scheduling
 - Reuse distributed scheduling mode of 16j
- Centralized scheduling
 - Assuming blind detection,
 - RS decodes MAP IEs using all Station IDs of its subordinate stations to find resource allocation information.
 - It's burden for a RS.
 - Alternatively, BS shall provide resource allocation information as well as MAP/Data.
 - It needs additional overhead.
 - Overhead caused due to centralized scheduling is prohibitive.
 - Feedback for MIMO data on access link (e.g., CQI, CSI, PMI)

Issues on Forwarding

- The following should be taken for consideration when designing forwarding scheme for 16m relay
 - CID based forwarding cannot be directly applied.
 - Blind detection puts a constraint on the number of decoding iterations that RS should perform.

Scheduling support for HARQ/ARQ

- 16j has so many options on HARQ or ARQ.
 - Some mechanism causes large processing overhead and delay.
- In 16m relay,
 - Methods to have less overhead and less delay should be taken.
 - Hop-by-hop HARQ can be considered.
 - BS-MS HARQ scheme in non-relay can be utilized.
 - Two-link ARQ mode can be considered.
 - With assumption that access link is vulnerable but relay link is more robust
 - ARQ operation is divided into for relay link between BS and access RS and for access link between access RS and MS.

Issue on Security

- 16j has two modes of security.
 - Centralized and distributed security
- 16m relay can consider MS awareness factor to define security mechanism.

Proposed SDD Text

[Insert the followings at subclause 15:]

15.1 Addressing

Addressing mechanism in subclause 10.1 can be utilized for 16m RS with a restriction that “Flow Identifiers” for management connections only are assigned within a RS.

15.2 Scheduling and forwarding

16m RS can operate in distributed scheduling.

15.3 ARQ support

ARQ operation can be divided into for relay link between BS and access RS and for access link between access RS and MS. ARQ operation between access RS and MS follows 16m ARQ mechanism.

15.4 HARQ support

Hop-by-hop HARQ can be considered. 16m HARQ mechanism over between BS and MS can be utilized for each hop.

15.5 Security support

Security mechanism (centralized security or distributed security) for 16m relay is FFS. MS awareness can be a factor to define security mechanism for 16m RS. ⁸