Clarification on Relay Frame Structure Option 2

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Re: IEEE 802.16m-08/033 – Call for Contributions and Comments on Project 802.16m System Description Document (SDD), on the topic of "SDD Session 56 Cleanup, Call for PHY details"

Purpose: Adopt the proposal into the IEEE 802.16m System Description Document

Introduction

- During the relay adhoc meeting in Session #56, a number of issues were raised regarding relay frame structure option 2:
  1. How would you do distributed scheduling
  2. Control signaling
  3. How would you do Power control
  4. Need to investigate Interference DL to UL
  5. Latency
  6. Subchannelization scheme (DL/UL compatible)
  7. Synchronization
- This contribution provides clarification on these issues.

Issue #1: How would you do distributed scheduling

- Super-ordinate station always perform the scheduling for DL and UL and send corresponding control signaling to the sub-ordinate station

Issue #2: Control signaling

- See explanation on previous slide

Issue #3: How would you do Power control

- The station in bi-directional receive mode should control the received power from the different transmitters (i.e. super-ordinate station and sub-ordinate station) to combat near-far problem and ensure acceptable dynamic range of received power.
- For the case of BS receive zone, BS controls the power of the different transmitters (i.e. sub-ordinate RSs) through UL power control procedure.

Issue #4: Need to investigate Interference DL to UL

- Scenario 1: RS in bi-directional transmit zone where RS transmit to both BS and sub-ordinate RS. Interference from RS to the regular UL transmission from MS in the same BS
  - UL transmission from MS is in the UL access zone, separately from the bi-directional transmit zone.

- Scenario 2: RS in bi-directional transmit zone where RS transmit to both BS and sub-ordinate RS. Interference from RS to the regular UL transmission from MS in a neighbor BS in the case where the neighbor BS doesn't have bi-directional tx zone
  - This is the same as regular inter-cell interference. The RS is power controlled by its serving BS which is its strongest BS so the interference power generated to the neighbor BS should be much lower. Option 1 has the same inter-cell interference situation in the 16m UL Relay Zone.

Issue #5: Latency

- Option 2 can do hop-to-hop relay within a frame, but not option 1

Issue #6: Subchannelization scheme (DL/UL compatible)

- DL and UL uses the same 18x6 PRU and pilot structure for traffic.
- As in the current sub-carrier mapping scheme in the SDD text (IEEE 802.16m-08/003r4), a frequency partition can be defined for the bidirectional tx/rx where the permutation is the same for the tx and rx.

Issue #7: Synchronization

- The sub-ordinate station always synchronizes with the super-ordinate station through preamble of R-amble.
- Within a cell, the propagation delay on different relay links, access links should be within the CP.