Consideration of MMR Basic Networking Topology Constraints

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Purpose:
To present a proposal of 6 MMR configuration modes

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Introduction

• The scope of Multi-hop Mobile Relay (MMR) contains the following nodes which are already existing in the 802.16 TGe PMP mode
  – Base Station (BS)
  – Mobile Station (MS)

• The scope of MMR creates the following new nodes which are not existing in the 802.16 TGe PMP mode
  – Fixed Relay Station (F-RS)
  – Mobile Relay Station (M-RS)

• In this contribution, we discuss the constraints and limitations of the network topology of the MMR with backward compatibility of 802.16 TGe PMP mode

• The practical consideration of extension MMR with minimized complexity in networking and implementation complexity for the new nodes, especially
  – The mobile device complexity
  – The handover complexity required to support mobility
  – The radio performance benefit by enable the MMR
  – To minimize the overall latency of the MMR
The Six MMR Configurations (1)

- **Mode-0**: The BS can associate with several MSs
  - Basic PMP one hop
  - Direct link when the radio condition is good
- **Mode-1**: The BS can associate with several FRSs
  - Basic two-hop relay from BS to FRS
- **Mode-2**: The FRS can associate with several MSs
  - Basic two-hop relay from FRS to MS
- **Mode-3**: The FRS can associate with at most one FRS *(optional)*
  - Enable multi-hop for the FRS
  - Peer-to-peer mode for FRS
- **Mode-4**: The BS can associate with several MRS
  - Enable two-hop from BS to MRS
- **Mode-5**: The MRS can associate with at *most one* MS
  - Enable multi-hop from MRS to MS
  - Peer-to-peer mode for MS
- **Mode-6**: The MRS can associate with at *most one* MRS *(optional)*
  - Enable multi-hop from MRS to MRS
  - Peer-to-peer mode for MRS
The Six MMR Configurations (2)
Discussion and Summary

• The proposed MMR networking topology is based on
  – Use BS for PMP mode
  – Use FRS for sub PMP mode
  – Use MRS for peer-to-peer mode
    • To simplify the MS and MRS complexity
    • To simplify the handover

• Enable the multi-hop and mesh networking
  – Mode-1/2/4/5 enable multi-hop
  – Mode- 3/4/ enable mesh