Consideration of MMR Basic Networking Topology Constraints

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Purpose:
To present a proposal of 6 MMR configuration modes

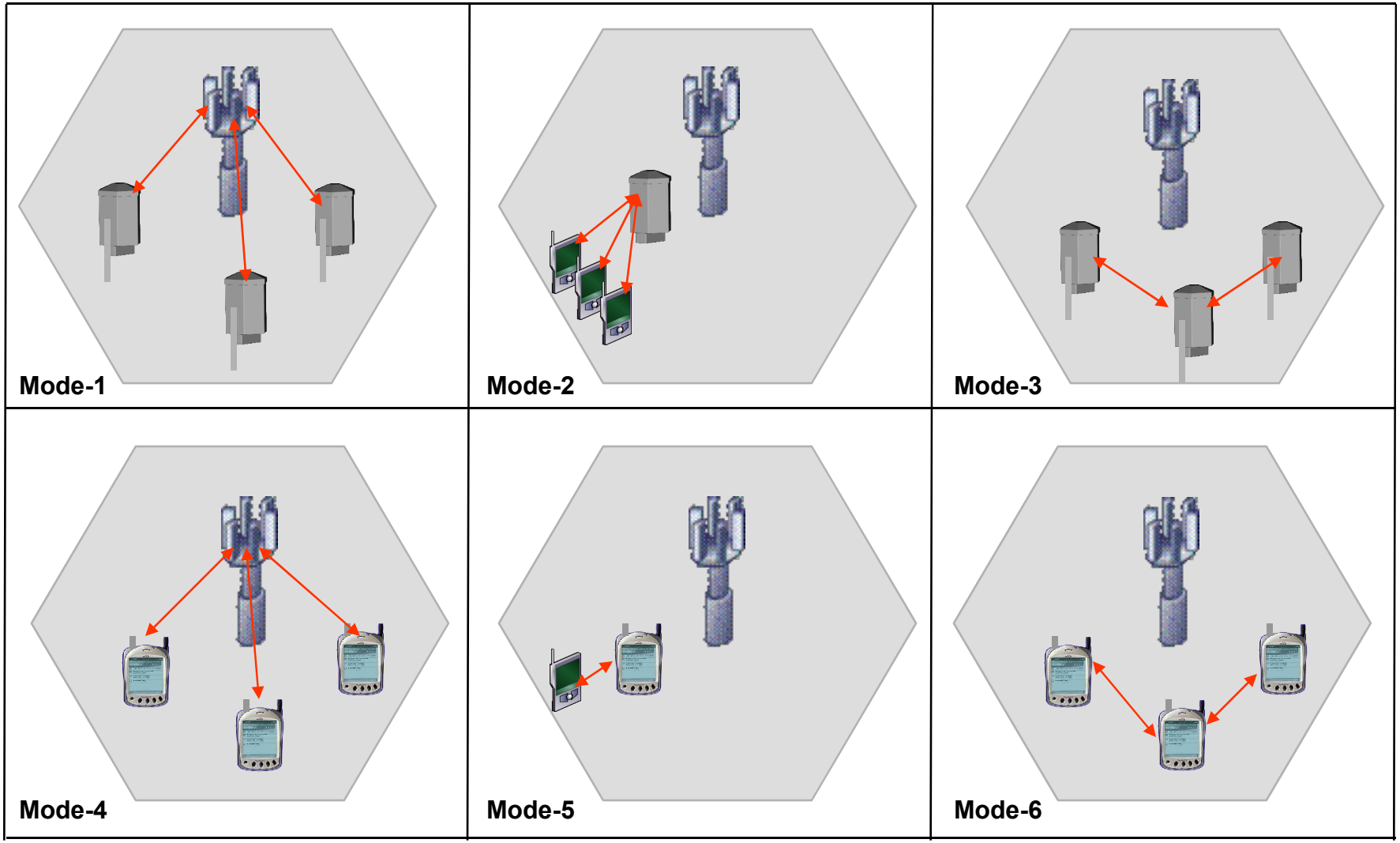
Introduction

- 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