Consideration of MMR Basic Networking Topology Constraints
(update)

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Purpose:
To further clarify the 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
  - Ancillary Infrastructure Relay Station (AI-RS)
    - Service provider deployed and optimized with networking capability
  - Client Relay Station (C-RS)
    - User device with relay capability
- 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 Link 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 *at least one* AI-RS
  - Basic two-hop relay from BS to AI-RS
- **Mode-2**: The AI-RS can associate with several MSs
  - Basic two-hop relay from AI-RS to MSS
- **Mode-3**: The AI-RS can associate *at least one* AI-RS (*optional*)
  - Enable multi-hop for the AI-RS
- **Mode-4**: The BS can associate with several C-RS
  - Enable two-hop from BS to C-RS
- **Mode-5**: The C-RS can associate with *at most one* MS
  - Enable multi-hop from C-RS to MS
- **Mode-6**: The C-RS can associate with *at most one* C-RS (*optional*)
  - Enable multi-hop from C-RS to C-RS
The Six MMR Link Configurations (2)
Ancillary Infrastructure Backhaul Relay (Fixed Case)

Fixed links

Multi-Hop Relay with mesh
Ancillary Infrastructure Access Relay (Fixed Case)

Mobile links

Multi-Hop Relay with partial mesh

2-Hop Relay

Fixed links

Multi-Hop Relay with mesh
Ancillary Infrastructure Access Relay (Mobility Case)
Client Access Relay (Nomadic Case)

Fixed/Nomadic links

Fixed/Nomadic links
MMR Basic Networking Topology Constraints

Ancillary Infrastructure Relay

Client Relay
Discussion and Summary

• The proposed MMR networking topology is based on
  – Use BS for PMP mode
  – Use AI-RS for sub PMP mode
  – Use C-RS for point-to-point relay mode
    • To simplify the MS and C-RS complexity
    • To simplify the handover

• Enable the multi-hop and mesh networking
  – Mode-2/3/6 enable multi-hops
  – Mode-1/3 enable mesh