

Consideration of MMR Basic Networking Topology Constraints (update)

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Purpose:

To further clarify the MMR configuration modes

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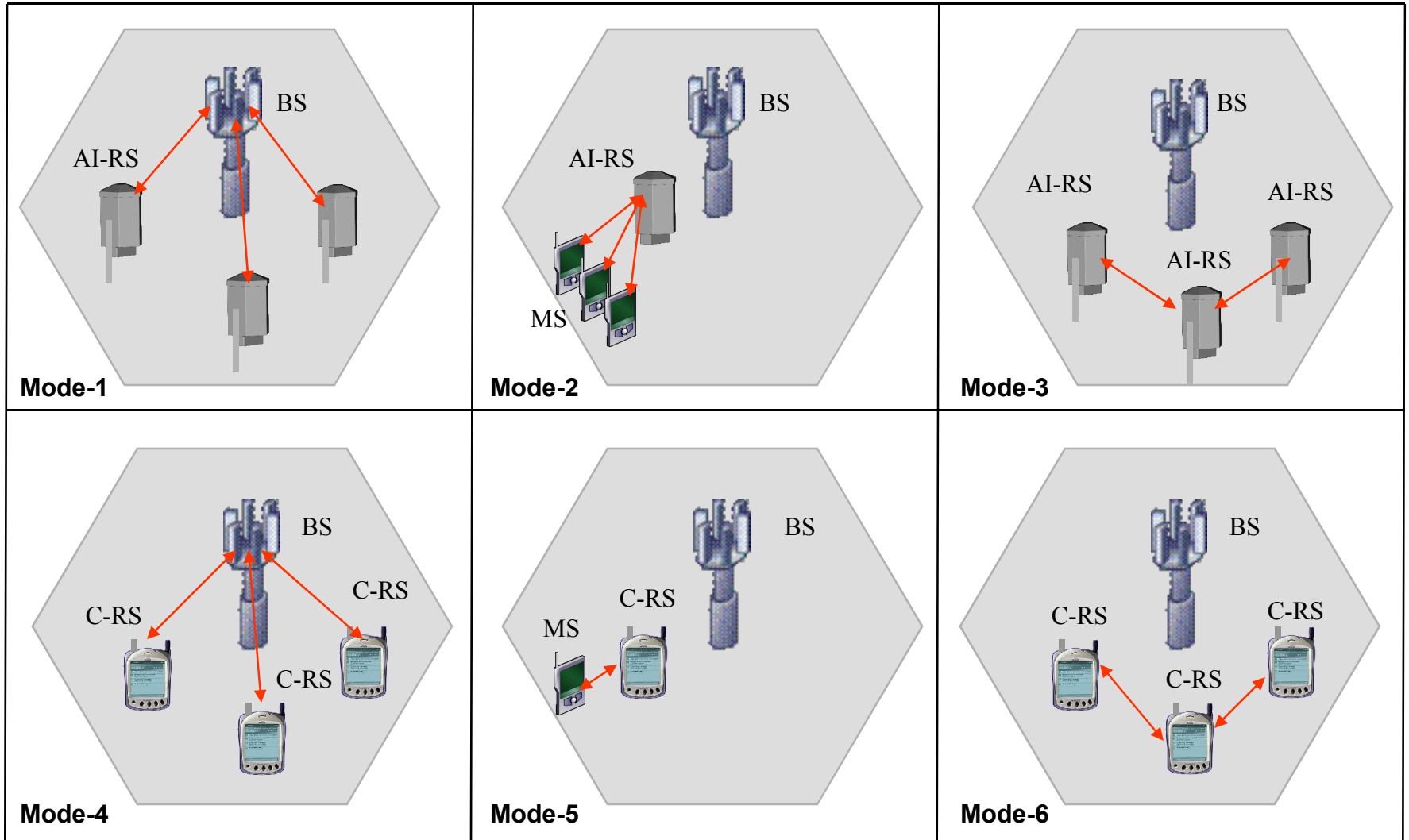
Introduction

- 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

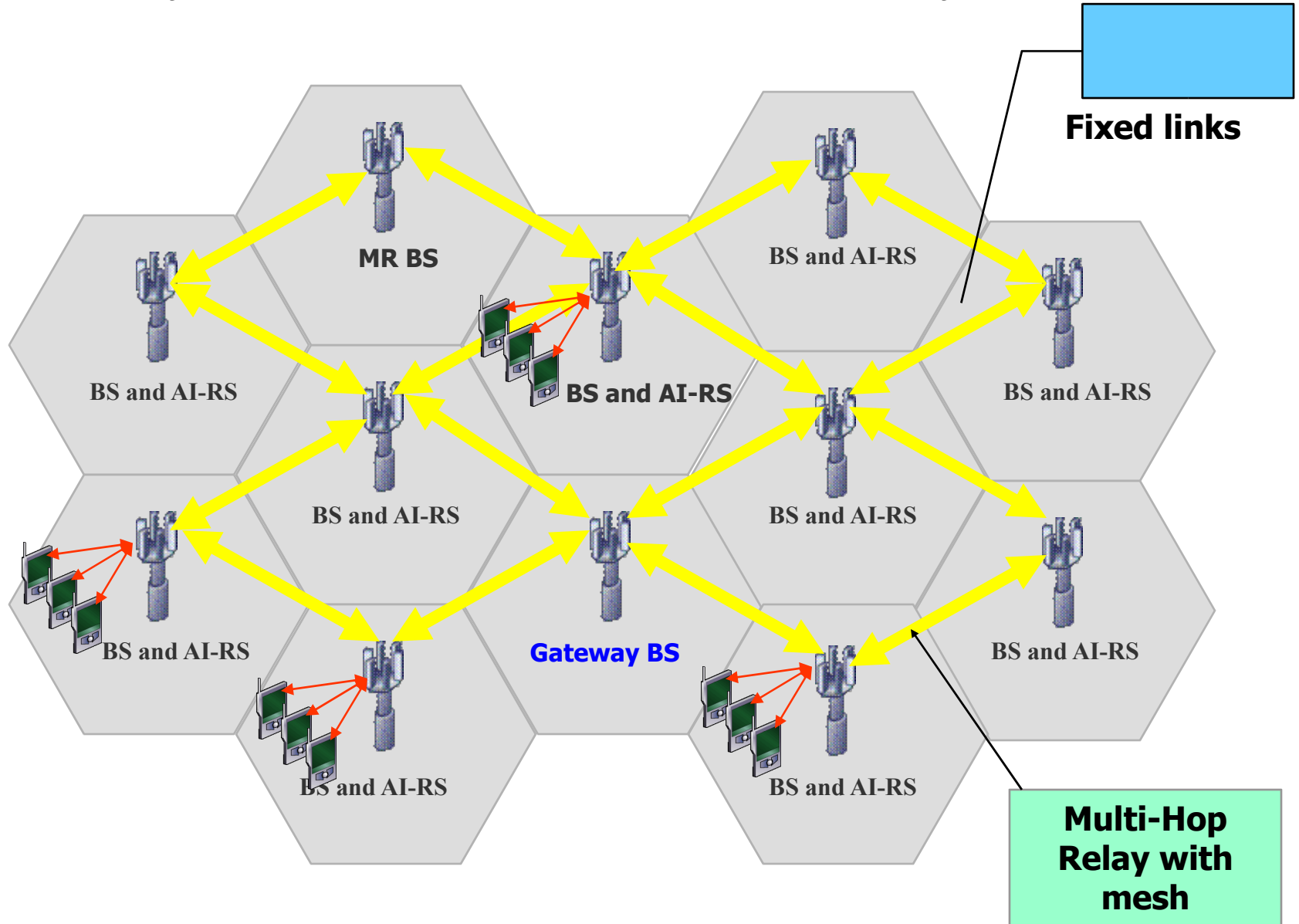
The Six MMR Link Configurations (1)

- 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)



Ancillary Infrastructure Access Relay (Fixed Case)

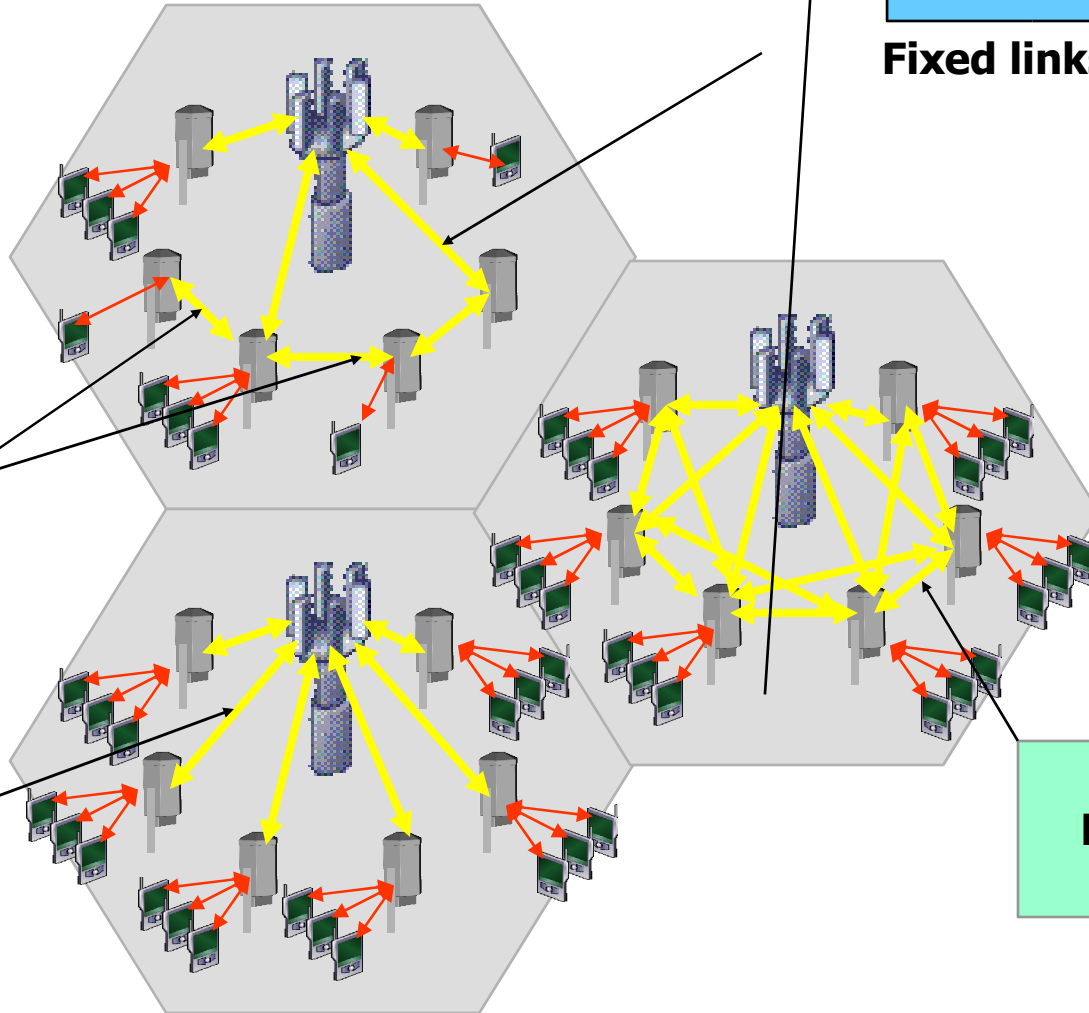
Mobile links

Fixed links

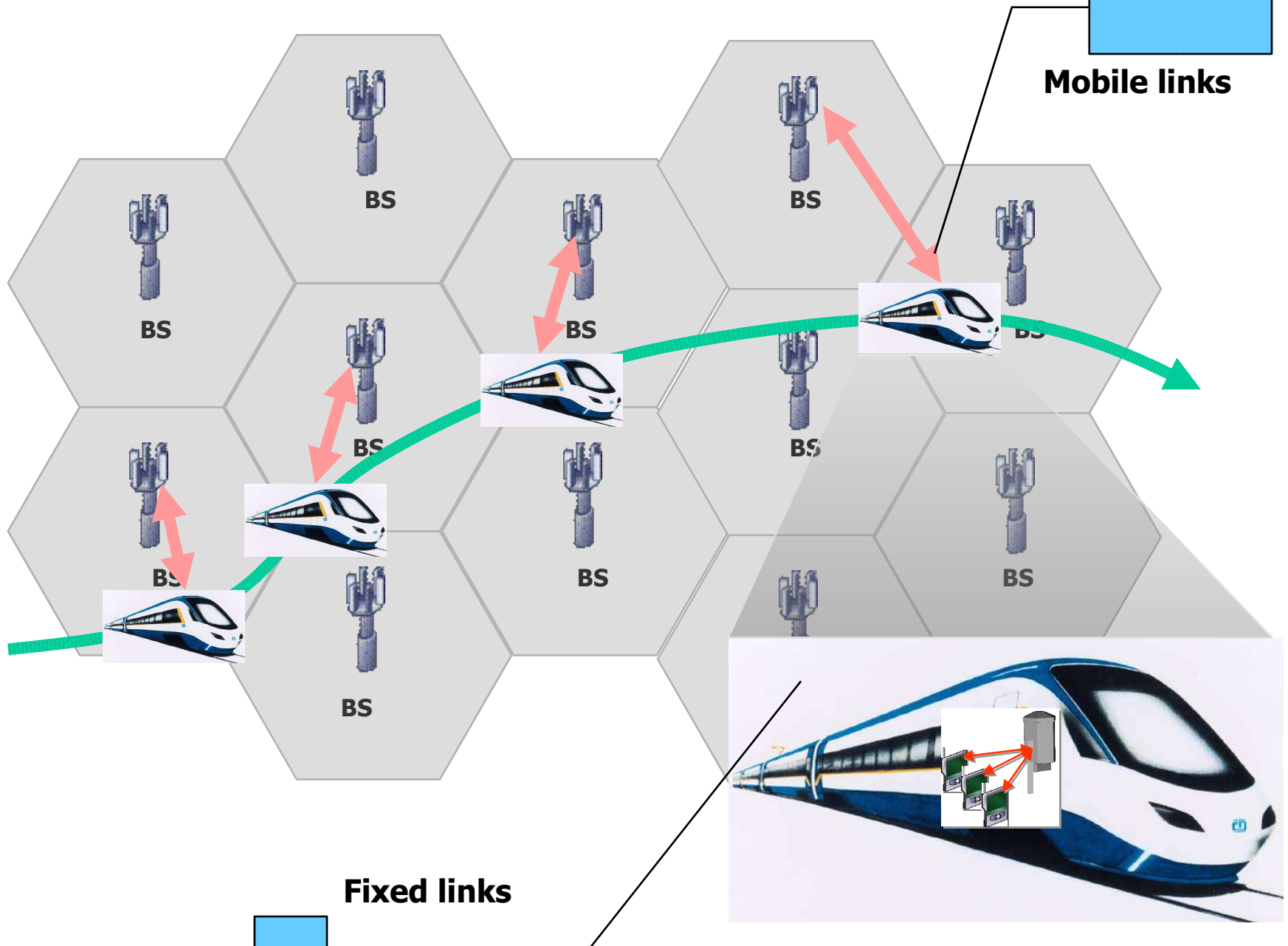
Multi-Hop Relay with partial mesh

2-Hop Relay

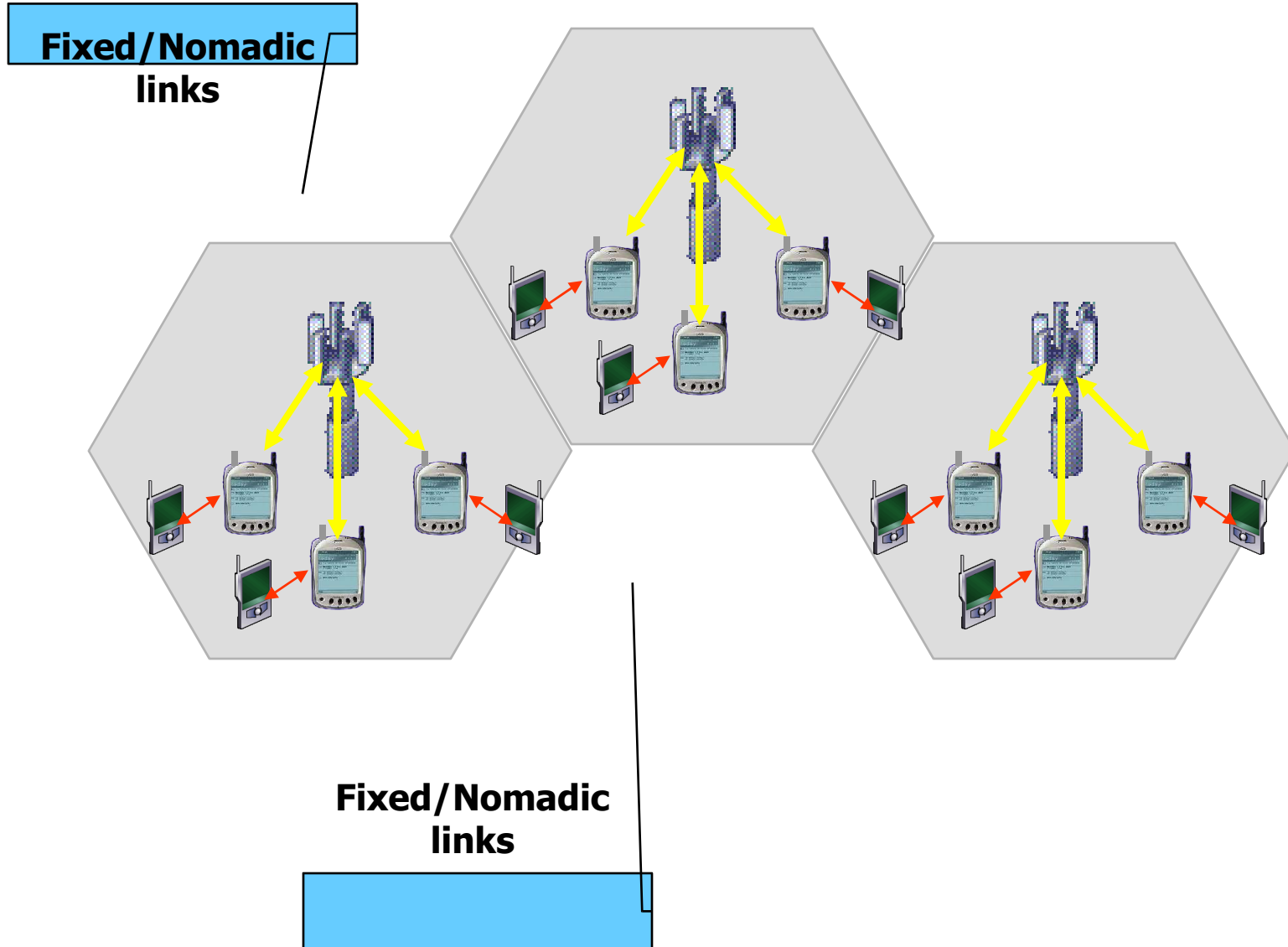
Multi-Hop Relay with mesh



Ancillary Infrastructure Access Relay (Mobility Case)



Client Access Relay (Nomadic Case)



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