

# Handover scenarios for 802.16 MMR

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# Handover Scenarios for 802.16 MMR

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# Goal

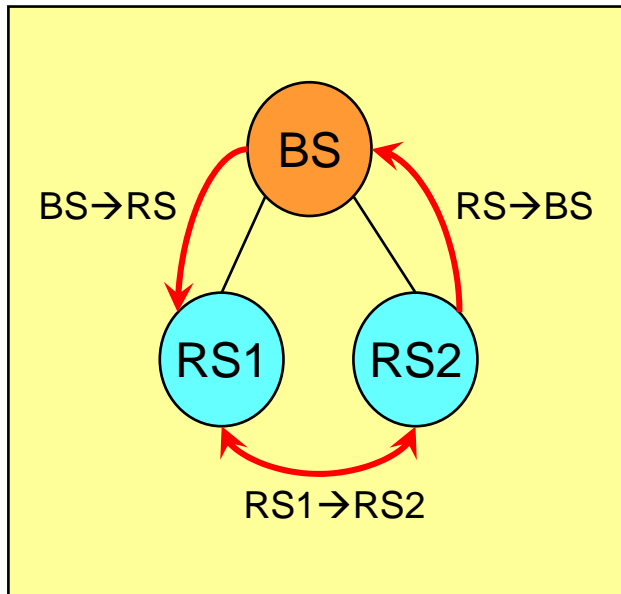
- Purpose of MMR (Ref. IEEE 802.16-05/051)
  - (User) throughput enhancement
  - Coverage extension
- In this contribution, we address the handover issues by classifying the scenarios based on who triggers a handover event.
  - Five scenarios are classified
    - Triggered by SS: 4 scenarios (Ref. IEEE C802.16mmr-05/028)
    - Triggered by Mobile-RS :1 scenario
  - The design issues associated with these scenarios are enumerated and considered.

# Assumptions

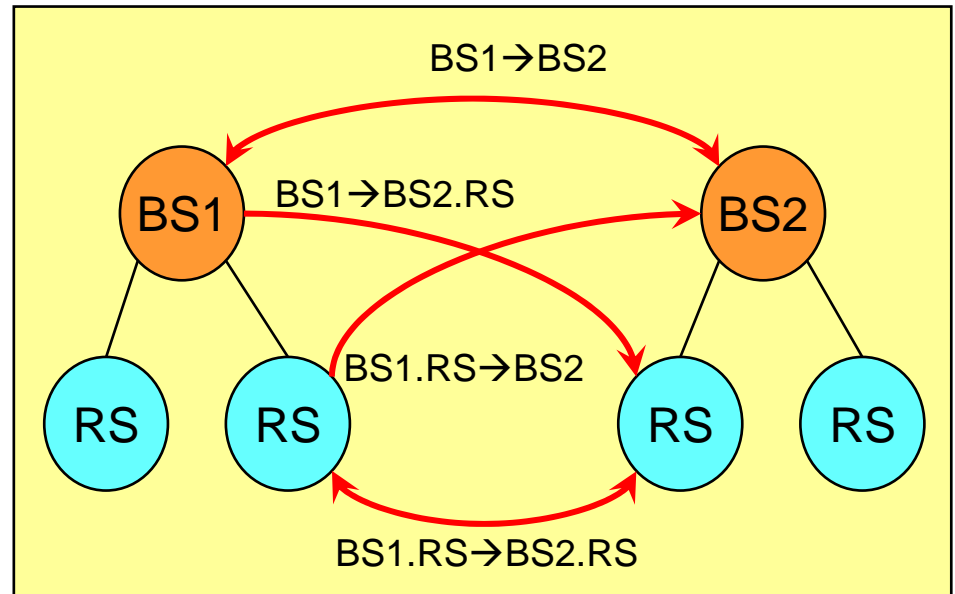
- To simplify the RS functionality, BS manages radio resources for all RSs and SSs.
  - RS does not directly connect to backhaul.
- The legacy SS (PMP mode) can work in MMR systems without identifying RS.
  - Legacy SS can not identify RS.

# Triggered by SS

- SS needs handover due to its migration.
- Ref. IEEE C802.16mmr-05/028, it could be divided into several handover scenarios.



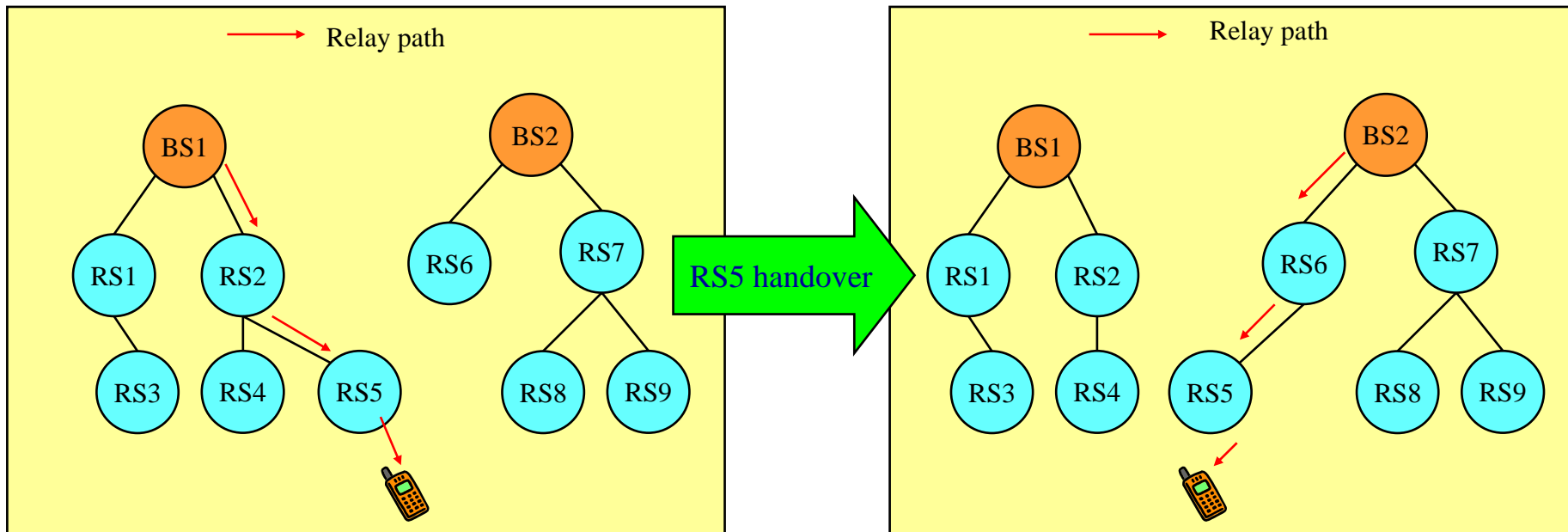
Intra-BS handover











Inter-BS handover

# Triggered by Mobile-RS

- RS needs handover due to its migration.
- RS should be involved in the handover process of relayed RSs/SSs.



# Handover Scenarios

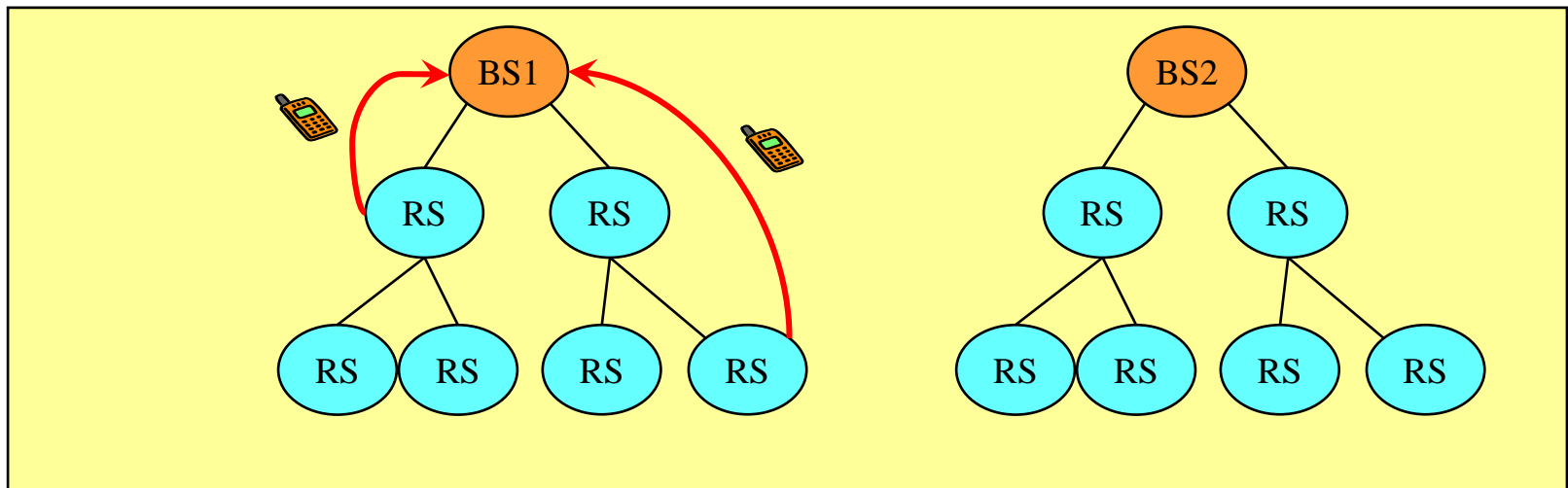
- Triggered by SS
  - Intra-BS handover
    - RS → BS  BS as handover target ①
    - RS1 → RS2  RS as handover target ②
    - BS → RS 
  - Inter-BS handover
    - BS1 → BS2  BS as handover target ③
    - BS1.RS → BS2 
    - BS1 → BS2.RS  RS as handover target ④
    - BS1.RS → BS2.RS 
- Triggered by Mobile-RS  ⑤

# Scenario 1

(Intra-BS, RS→BS)

- Handover initiation
  - Handover target is serving BS.
  - Legacy SS can identify and measure BS.

→ No modification is required in handover procedure.



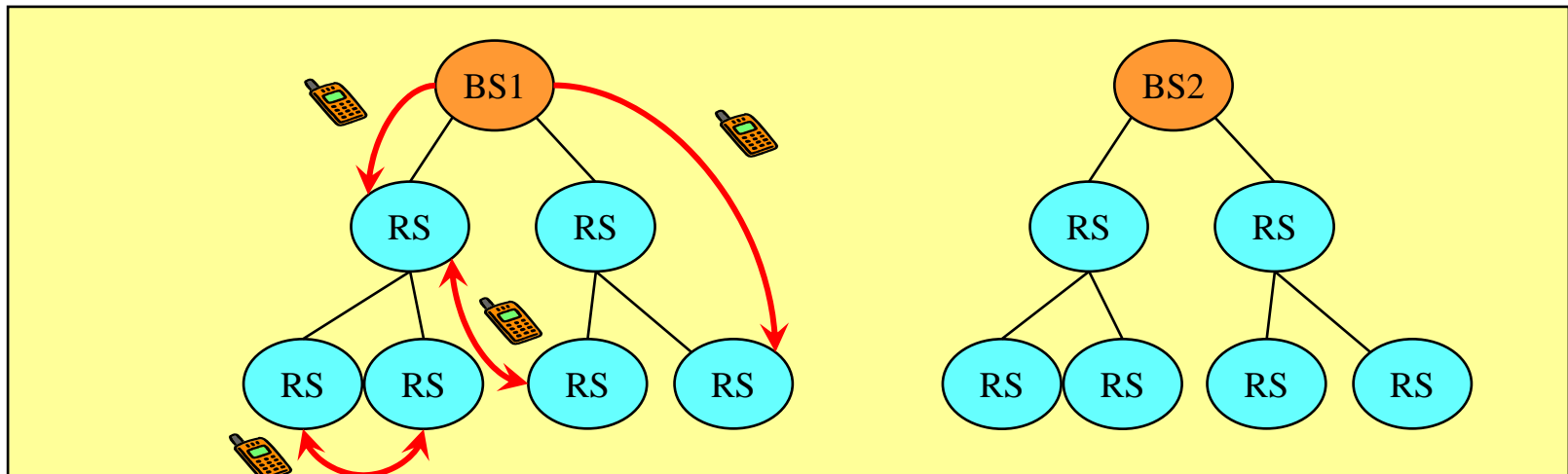


# Scenario 2

(Intra-BS, BS→RS or RS→RS)

- Handover initiation
  - Handover target is serving BS's RS .
  - Legacy SS can not identify RS→how to find the RS ?

→Need modification in handover procedure to get RS's information.

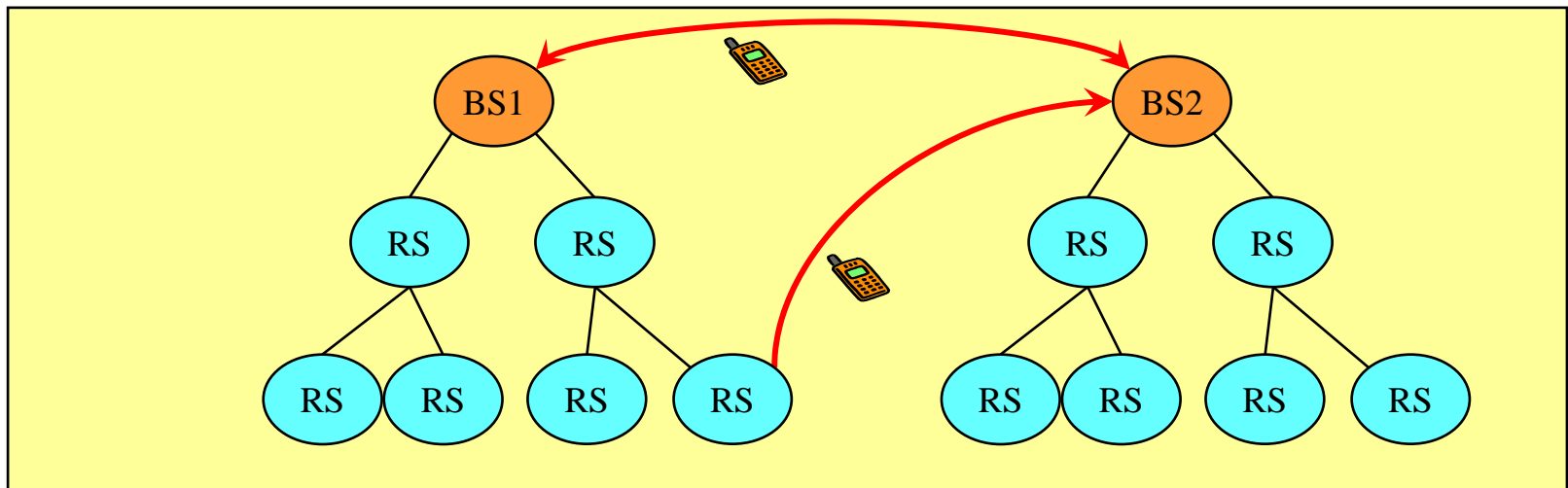


# Scenario 3

(Inter-BS,  $BS \rightarrow BS$  or  $BS1.RS \rightarrow BS2$ )

- Handover initiation
  - Handover target is neighbor BS.
  - Legacy SS can identify and measure neighbor BS.

→ No modification is required in handover procedure.

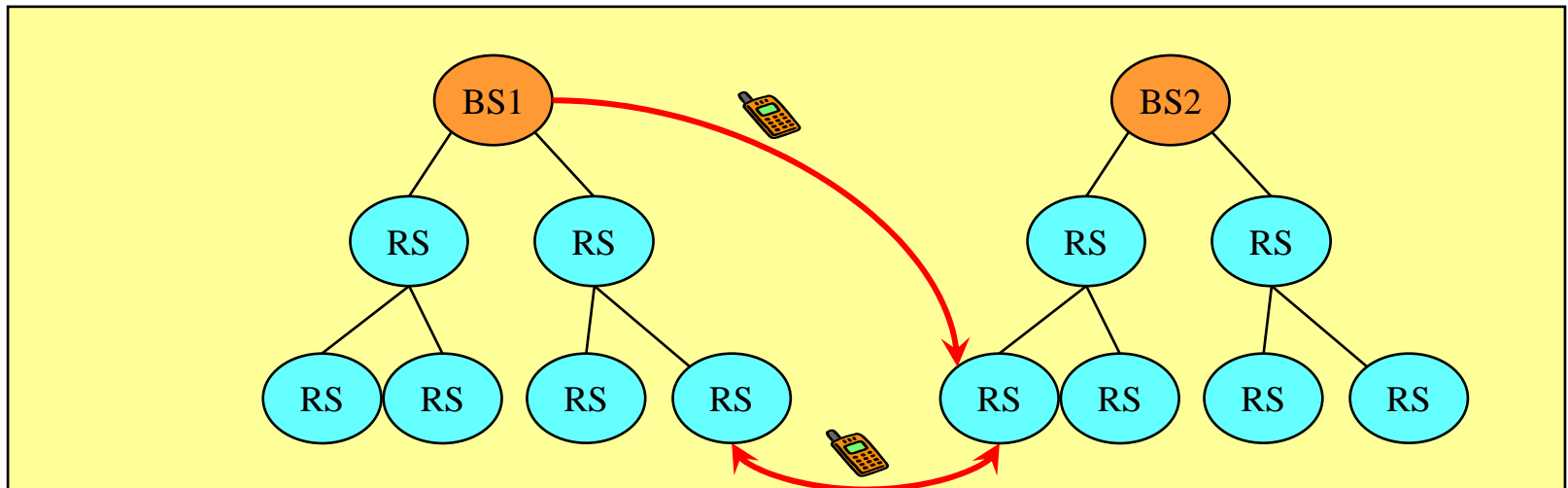


# Scenario 4

(Inter-BS, BS1→BS2.RS, BS1.RS→BS2.RS)

- Handover initiation
  - Handover target is neighbor BS's RS.
  - Legacy SS can not identify RS → how to find the RS ?

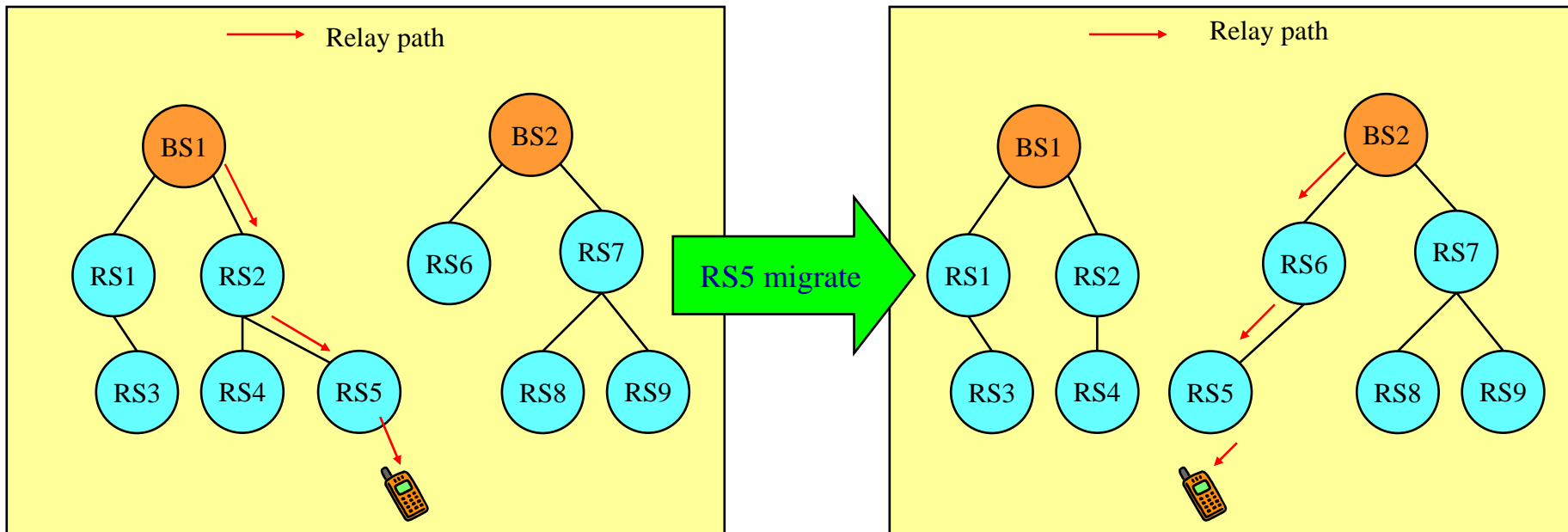
→ Need modification in handover procedure to get RS's information.



# Scenario 5

## (Mobile-RS)

- Handover initiation
    - RS needs to find the prior RS/BS .
    - RS should help maintain the relay path between BS and SS.
- ➔ Need new handover procedures for mobile-RS.



# Summary

- When SS perform handover process and the handover target is RS, handover procedure should be modified to let SS access target RS.
- When mobile-RS perform handover, a new handover procedure is needed.

		Handover target	Need modification
Triggered by SS	Scenario 1 RS→BS	Serving BS	No
	Scenario 2 BS→RS or RS →RS	Serving BS.RS	Yes
	Scenario 3 BS→BS or BS1.RS→BS2	Neighbor BS	No
	Scenario 4 BS1→BS2.RS or BS1.RS→BS2.RS	Neighbor BS.RS	Yes
Triggered by Mobile-RS	Scenario 5	RS/BS	New handover procedure

# References

- IEEE 802.16-05/051  
Ad-hoc Meeting Report: Mobile Multi-hop Relay Networking in IEEE 802.16 (2005-07-21)
- IEEE C802.16mmr-05/028  
Open problems in Mobile Multi-hop Relay System (Kyungjoo Suh, etc; 2005-11-11)
- IEEE C802.16mmr-05/003  
Mobility Management for Multi-Hop Relay (Yu-Ching Hsu; 2005-09-11)