# Handover scenarios for 802.16 MMR

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# Handover Scenarios for 802.16 MMR

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# Goal

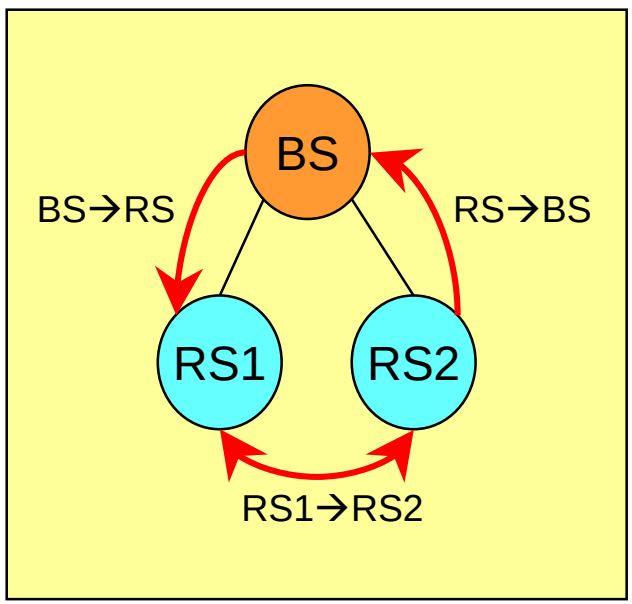
- Purpose of  MMR (Ref. IEEE C802.16-05/013)
  - (User) throughput enhancement
  - Coverage extension
- In this contribution, we address the handover issues by classifying the scenarios based on who triggers a handover event.
  - Five scenarios are classified
    - Triggered by SS: 4 scenarios
    - Triggered by Mobile-RS :1 scenario
  - The design issues associated with these scenarios are enumerated and considered.

# Assumptions

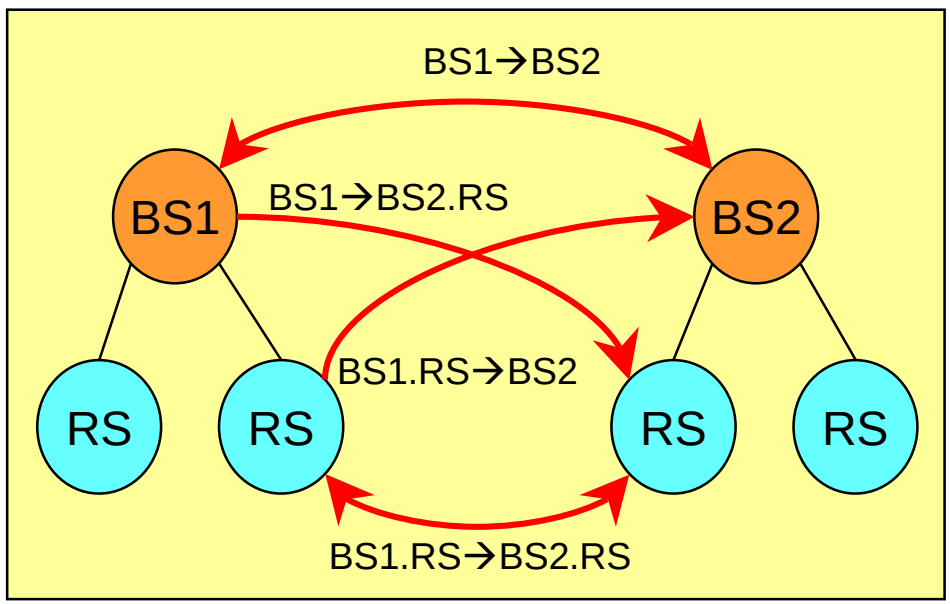
- To simplify the functionalities of RS, BS manages radio resources for RSs and SSs.
  - RS does not directly connect to backhaul.
- The legacy SS  (PMP mode) can work in MMR systems without identifying RS.
  - Legacy SS can not identify RS.

# Triggered by SS

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



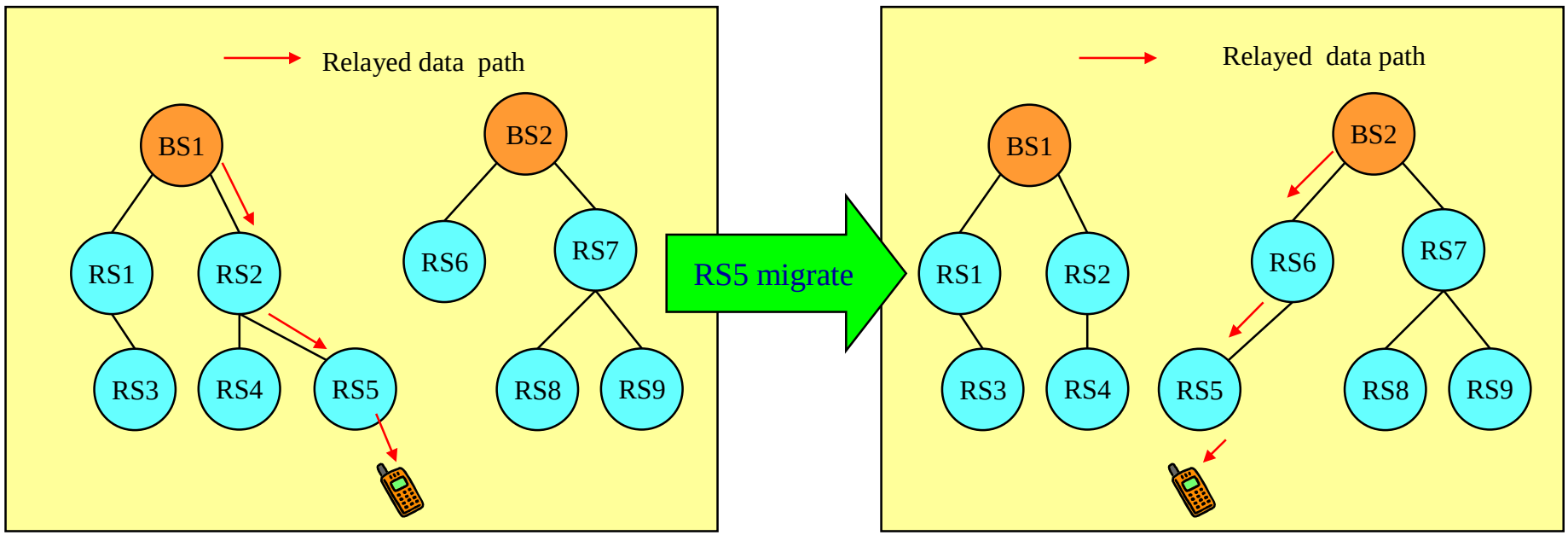

Intra-BS handover




Inter-BS handover

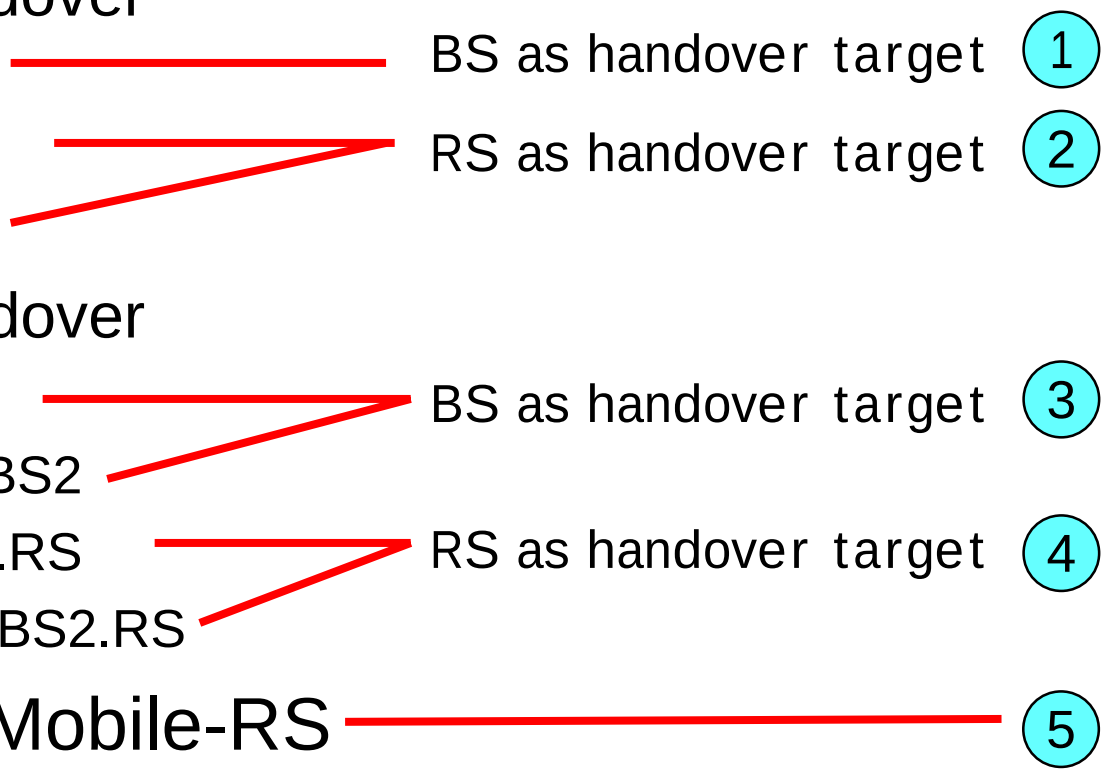
# Triggered by Mobile-RS

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



# Handover Scenarios

- Triggered by SS (Ref. IEEE C802.16mmr-05/028)
  - Intra-BS handover
    - RS → BS
    - RS1 → RS2
    - BS → RS
  - Inter-BS handover
    - BS1→ BS2
    - BS1.RS → BS2
    - BS1 → BS2.RS
    - BS1.RS → BS2.RS
- Triggered by Mobile-RS

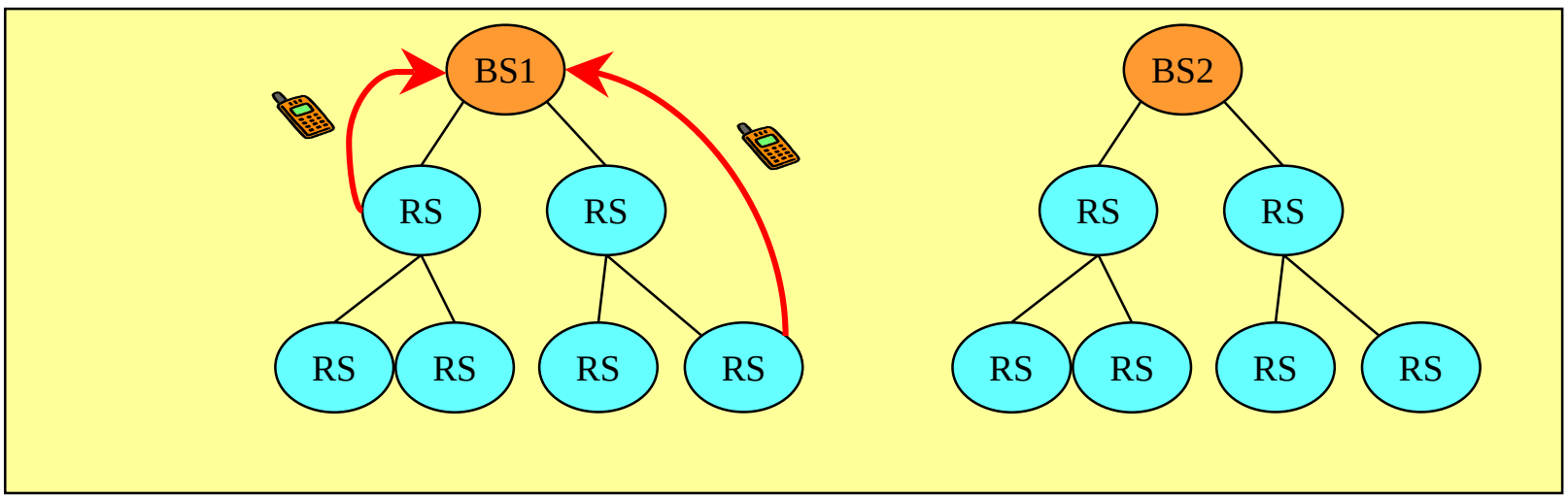


# Scenario 1

(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.

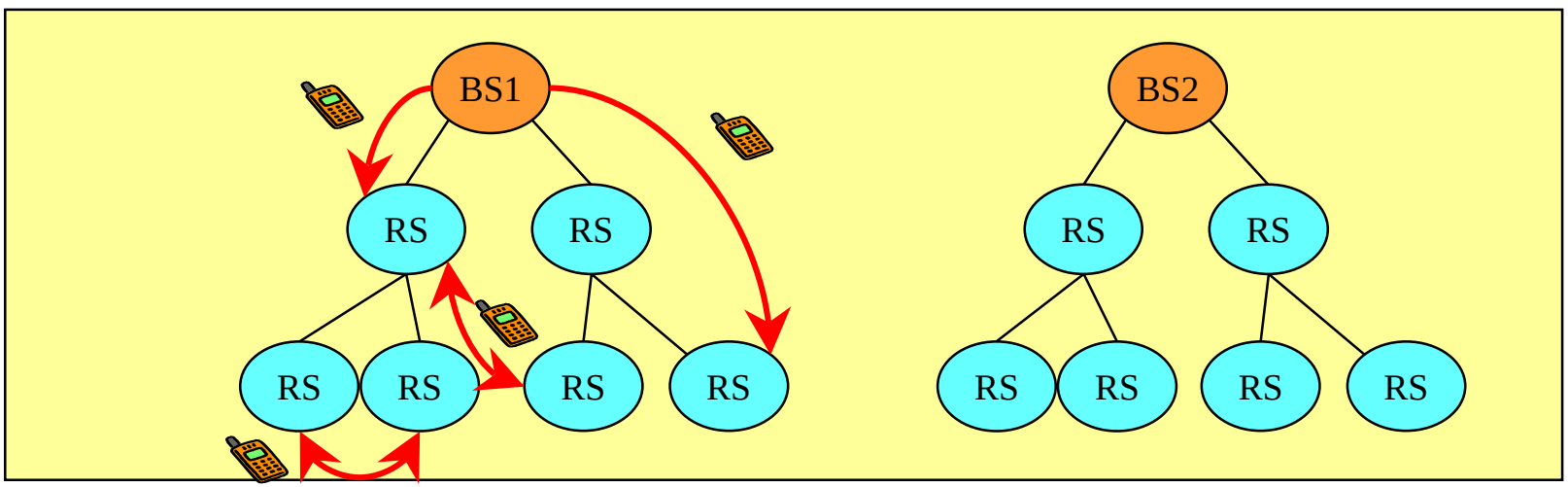


# Scenario 2

(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.

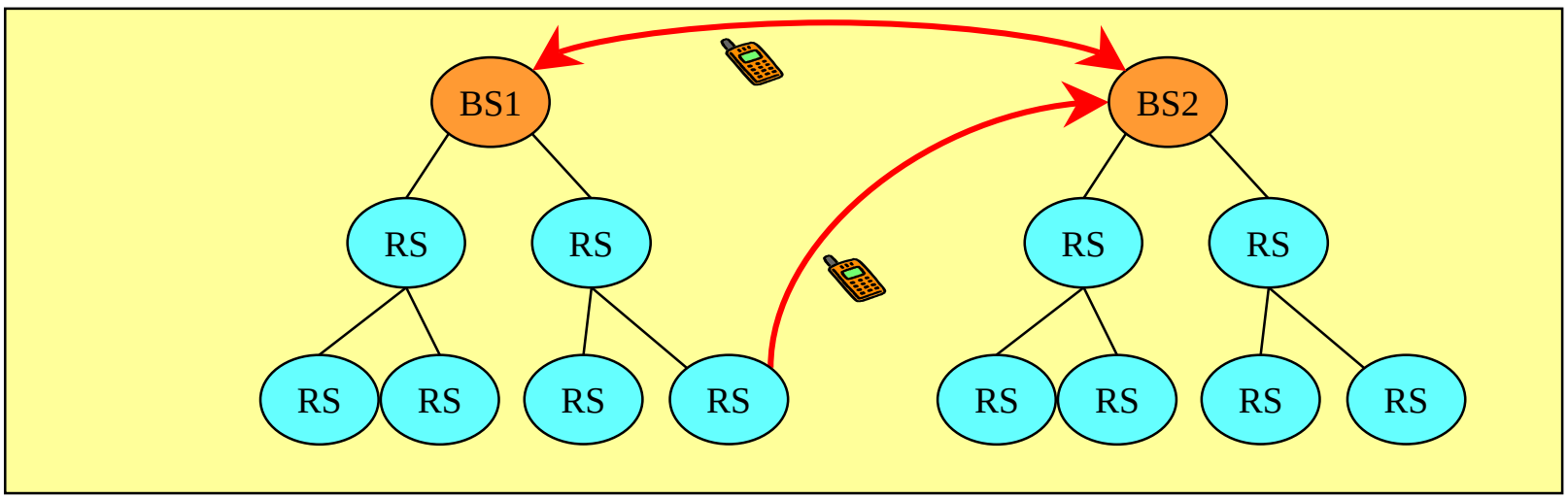


# Scenario 3

(Inter-BS, BS→BS or BS1.RS→BS2)

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

➔No modification is required in handover procedure.

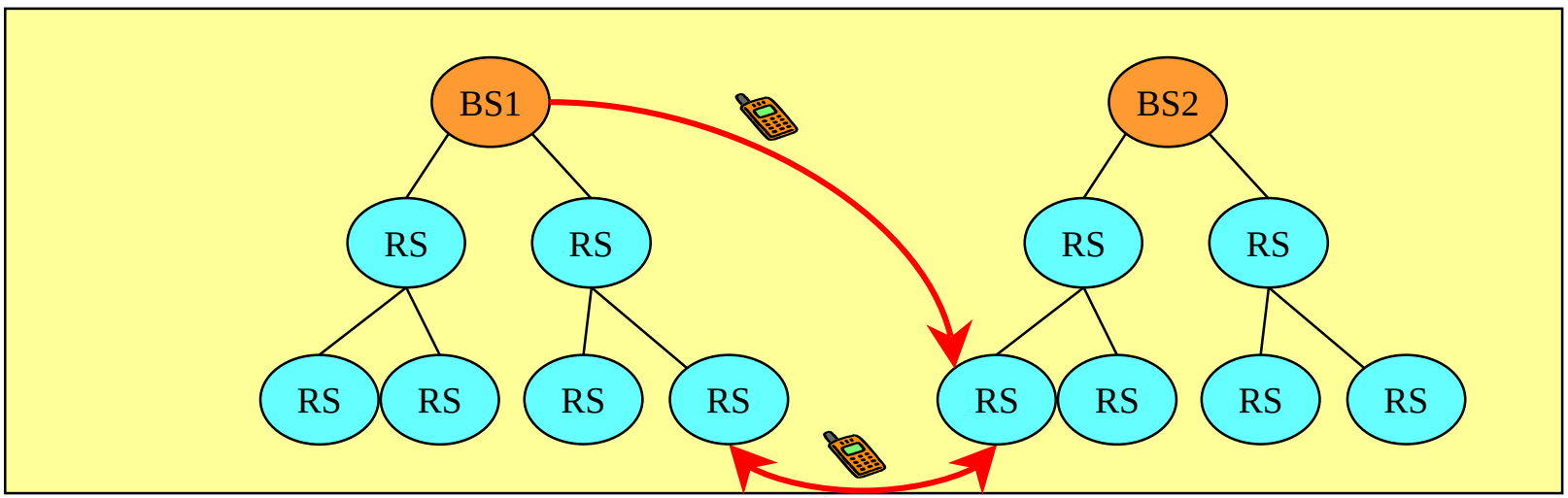


# Scenario 4

(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 ?

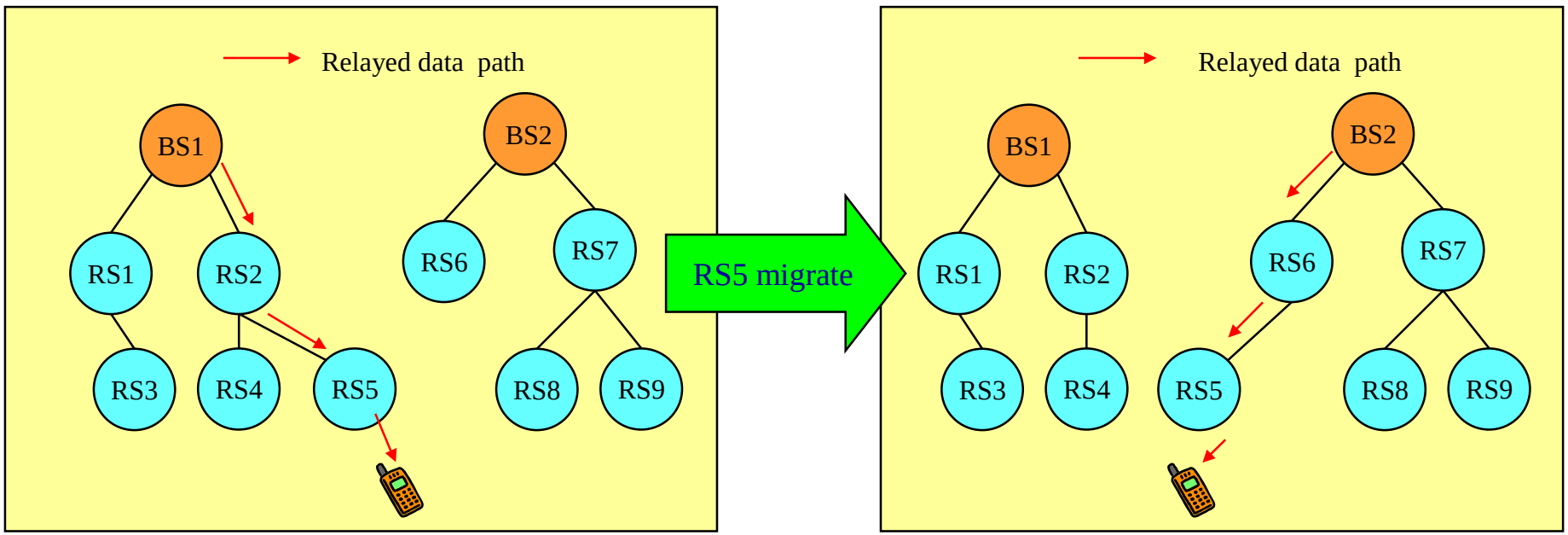
➔Need modification in handover procedure to get RS's information.



# Scenario 5
## (Mobile-RS)

- Handover initiation
  - Mobile-RS needs to find the prior RS/BS (handover target).
  - Mobile-RS should help maintain the relayed data 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<br>RS→BS | Serving BS | No |
| | Scenario 2<br>BS→RS or RS →RS | Serving BS.RS | Yes |
| | Scenario 3<br>BS→BS or BS1.RS→BS2 | Neighbor BS | No |
| | Scenario 4<br>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 C802.16-05/013

  Mobile Multi-hop Relay Networking in IEEE 802.16 (2005-07-13)
- 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)