[Mobility Management for Mobile Multi-hop Relay Networks]

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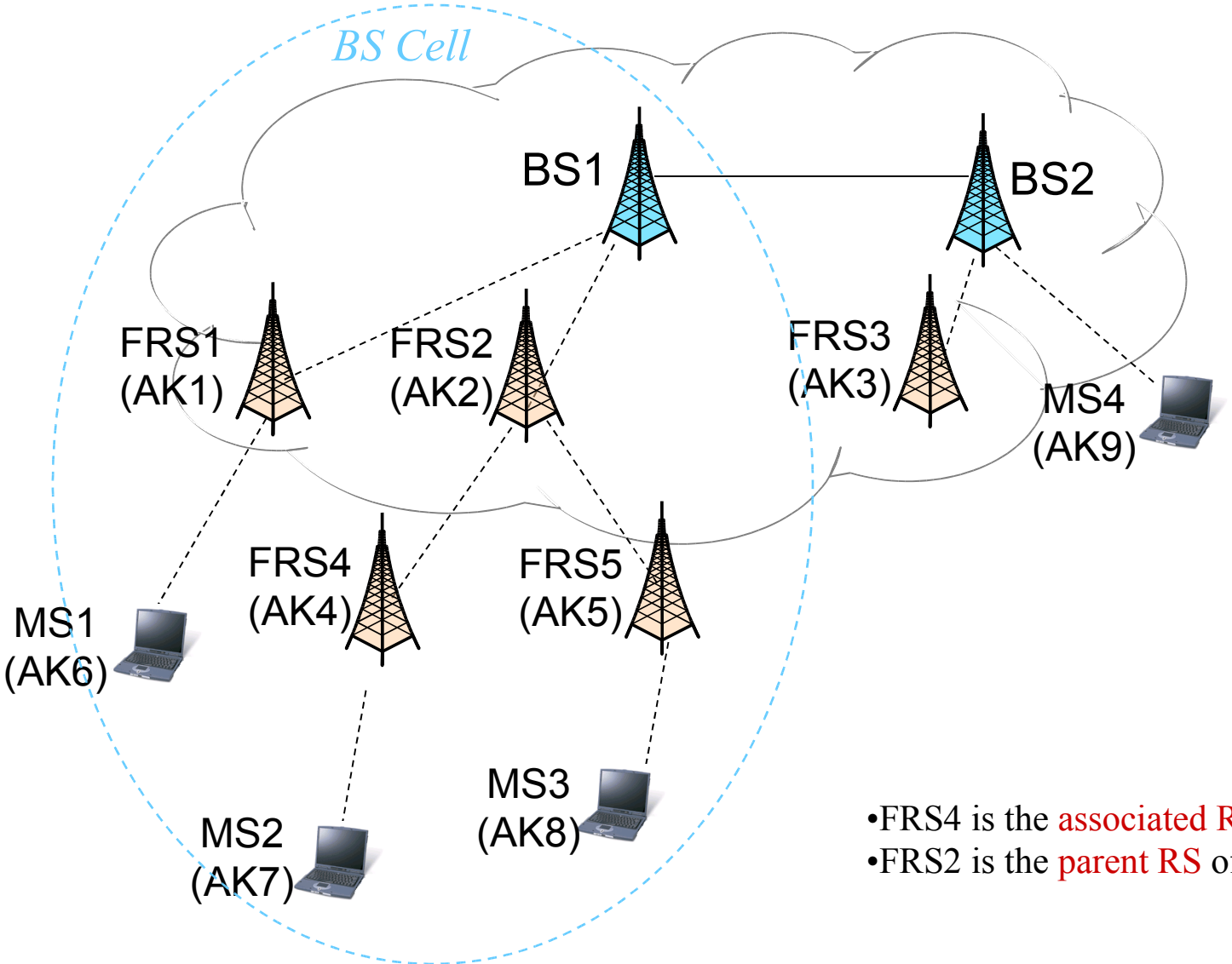
None.

Purpose:

This is a response to IEEE 802.16mmr-05/001(call for contributions: IEEE 802.16's Study Group on Mobile Multi-hop Relay) to present a recommendation on the mobility management mechanism.

Network Architecture



- FRS4 is the associated RS of MS2
- FRS2 is the parent RS of FRS4

Assumptions

- BS knows location of FRSs and the infrastructure topology
- For MS, FRS acts as BS
- For BS, FRS acts as MS
- Within a *BS Cell*, all CIDs are assigned and managed by BS
  - The CIDs include basic CID, primary CID, secondary CID, and transport CID
- FRS does not assign CIDs to MS

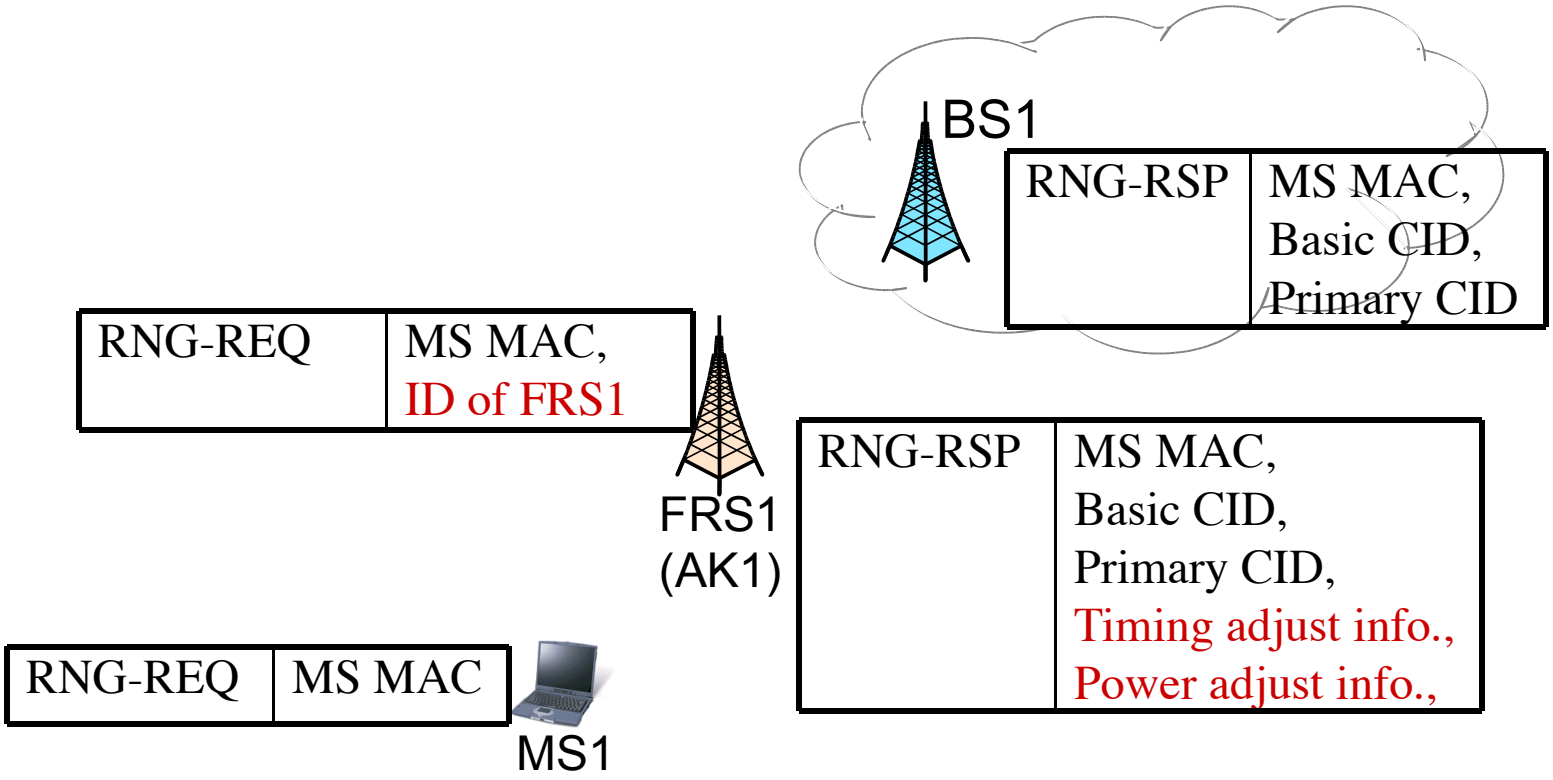
Information Requirement for Mobility Management

Info. of MS / Nodes	MAC Address of MS	CIDs assigned to MS	Associated RS	IP address
BS	●	●	●	●
Parent RS	●	●	○	○
Associated RS	●	●	○	○

Principles of the Concept for Mobility Management

- BS has to record the associated RS of an MSS
  - A newly defined TLV in RNG-REQ needs to be appended to carry the information of the associated RS when it relays the message toward the BS
- The RSs along the branch from BS to MSS have to record the MAC address and the CIDs of MSSs, so that they can relay MSS' messages
- Intra-BS HO, the CIDs of the MSS have not to be updated
  - The RSs along the old branch have to delete the CIDs of the MSS
  - The RSs along the new branch have to obtain and record the MAC address and CIDs of the MSS
- Inter-BS HO, the CIDs of the MSS have to be updated
  - The RSs along the branch in old BS cell have to delete the CIDs of the MSS
  - The RSs along the branch in new BS cell have to obtain and record the MAC address and new CIDs
- RS does not involve the security procedures
  - AK, TEK are still assigned and managed by BS within a BS cell

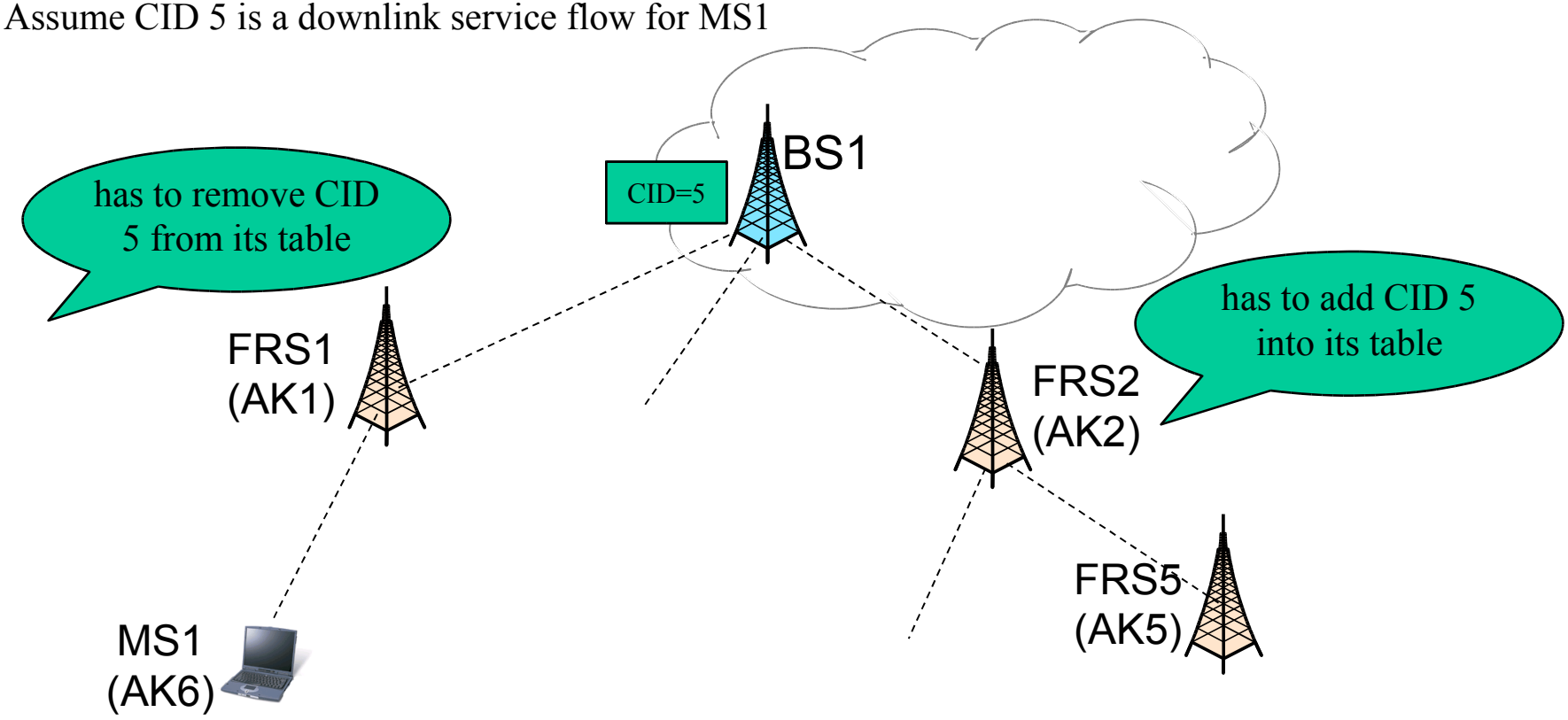
Example for Ranging Process



- Conclusion 1: a new TLV should be defined in RNG-REQ to carry the ID of associated FRS
- Conclusion 2: BS1 assigns Basic CID and Primary CID to MS in RNG-RSP
- Conclusion 3: FRS1 sends Timing and Power adjust information to MS1

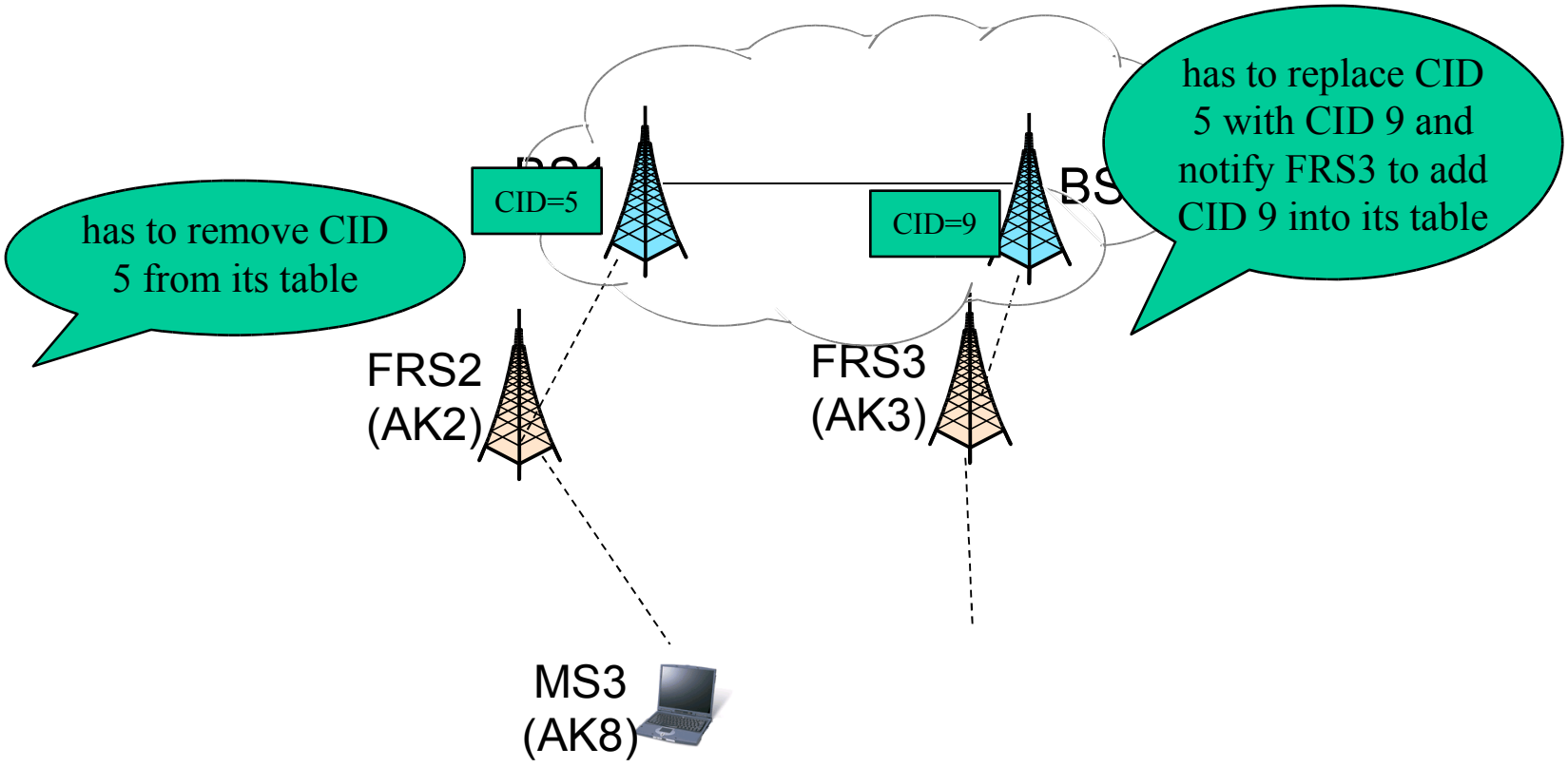
Example for Intra-BS Handoff

Assume CID 5 is a downlink service flow for MS1



- Conclusion 1: The value of CID has not to be changed when intra-BS HO occurs
- Conclusion 2: a new MAC management message should be defined to trigger FRS 1 to remove CID 5 from its table (temporarily named RLY_DEL)
- Conclusion 3: a new MAC management message should be defined to trigger FRS 2 to add CID 5 into its table (temporarily named RLY_ADD)

Example for Inter-BS Handoff



- Conclusion 1: The value of CID has to be changed when inter-BS HO occurs
- Conclusion 2: RLY_DEL could be reused to trigger FRS 2 to remove CID 5 from its table
- Conclusion 3: RLY_ADD could be reused to trigger FRS 3 to add CID 9 into its table

Other Issues and Conclusions

- ✓ A new TLV should be defined to be in RNG-REQ message
- ✓ A new message, RLY_DEL, should be defined to remove leaving CIDs in FRS
- ✓ A new message, RLY_ADD, should be defined to add coming CIDs in FRS
- ? Should FRS send MOB_NBR-ADV to notify MS of the neighboring RS and BS?