Relay Handover

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IEEE C80216j-06_190.doc

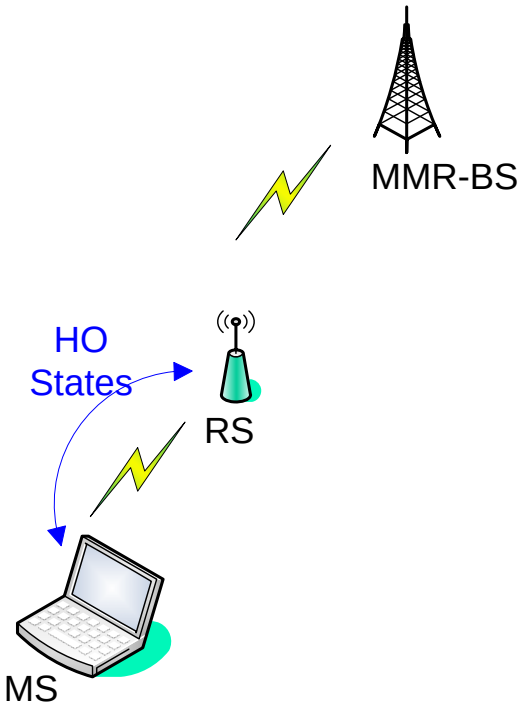
Purpose:

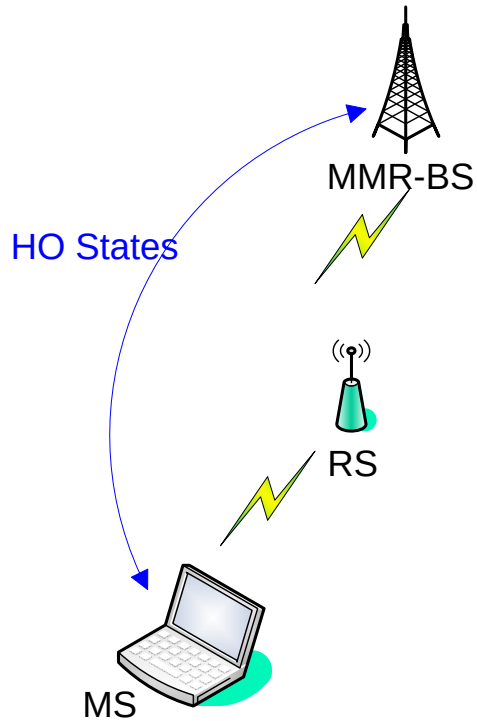
This contribution proposes relay handover procedure.

Introduction

- This contribution proposes Hard Handover procedures for the relay network
- Two aspects are covered
  - MS Handover in Relay Network
  - Mobile RS Handover

MS Handover in Relay Network



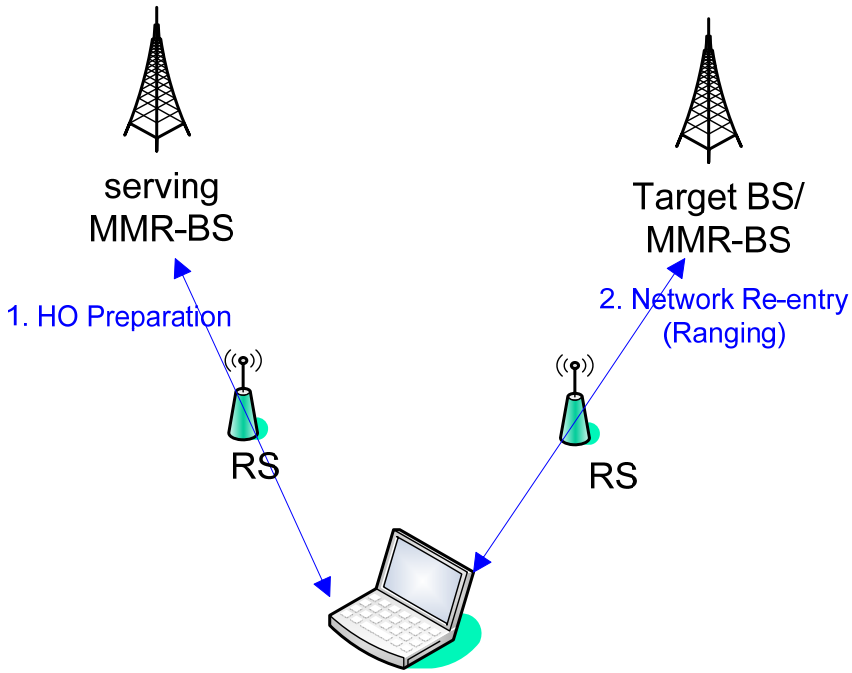


- Introduces two levels of mobility mgmt (MS<>RS, and RS<>MMR-BR)
- Makes RS and system more complex
- HO are more often, as RS changes more frequently than the BS.

- Less complex and cheaper RS
- No change from the 16e mobility model, where BS holds the mobility state.
- Less handovers in the system, as the BS is a higher entity in the air interface hierarchy.

Keep HO states in MMR-BS, unchanged from 802.16e-2005

Ranging with target RS



- MS performs handover as in 16e by exchanging same Mobility signaling with serving and target BS/MMR-BS.
- MS need to do Ranging with the RS. Refer to Ranging in 802.16j (MMR) System, IEEE C80216j-06_193.doc.

Summary of different MS Handover Scenarios

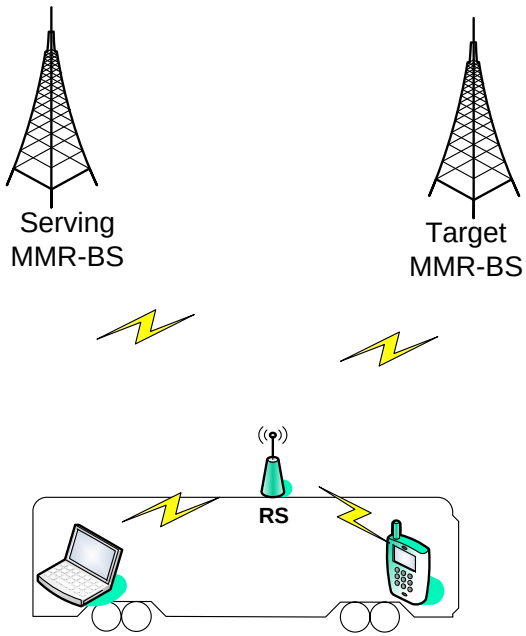
1 = 16e mobility procedure

2 = 16e mobility procedure + Ranging with RS & MMR-BS

Serving \ Target	BS	FRS	MRS
BS	1	2	2
FRS	1	2	2
MRS	1	2	2

Mobile RS Handover

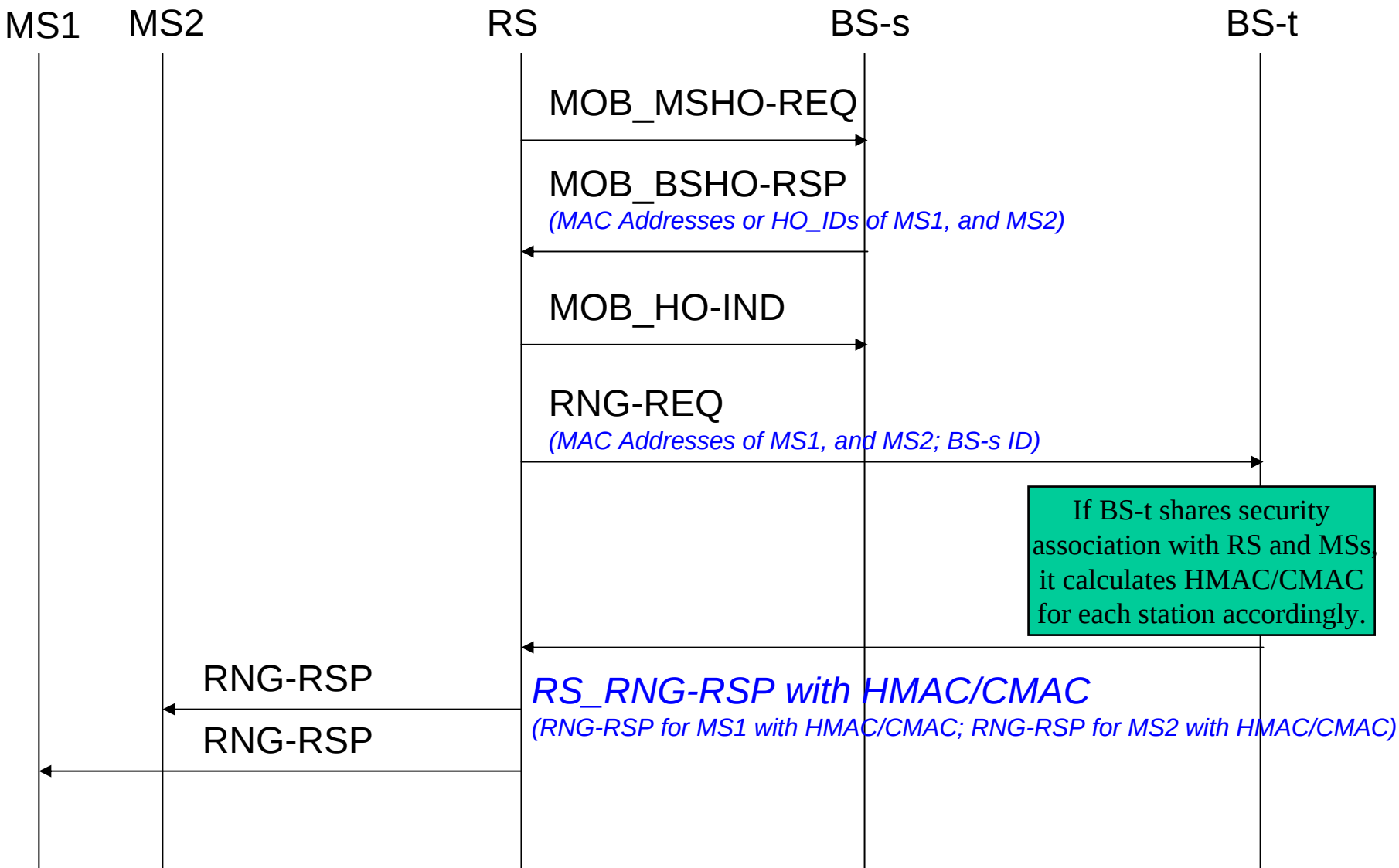
- This contribution proposes Hard Handover procedure for mobile RS
- Mobile RS introduces another leg of mobility between RS and MMR-BS links



Mobile RS Handover

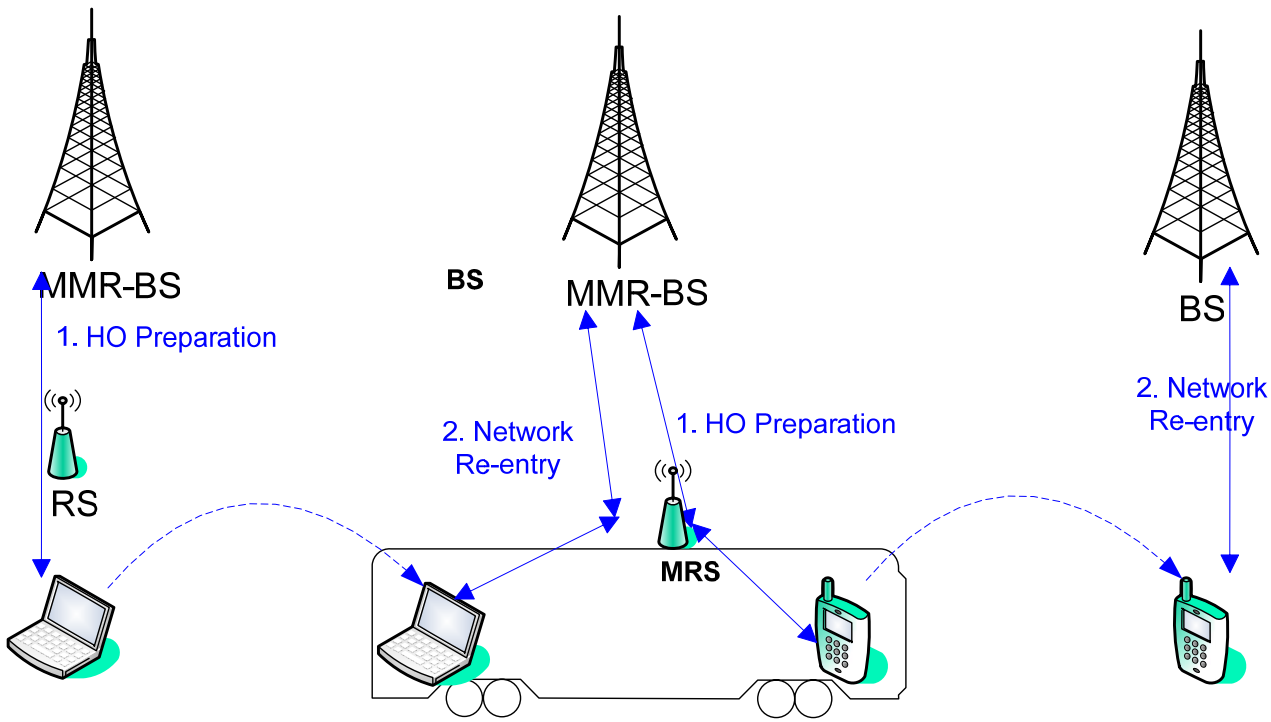
- When a mobile RS moves, it moves all the attached MS using existing Mobility messages from 16e.
- It gets a list of MAC addresses or HO_ID identifying all the attached MS during HO preparation.
- The target BS allocates CIDs using the MAC Address or HO_ID list
- If the target MMR-BS shares security association (SA) with the MSs and RS, the following occurs:
  - calculates HMAC/CMAC for each station
  - Encodes RNG-RSP for each MS with full MAC header
  - Encapsulates the above RNG-RSPs in RS_RNG-RSP and sends it to RS
  - RS verifies own HMAC/CMAC, decapsulates individual RNG-RSP and forwards them to MS
  - MSs verifies their own HMAC-CMAC and accepts CID

Mobile RS Handover Procedure



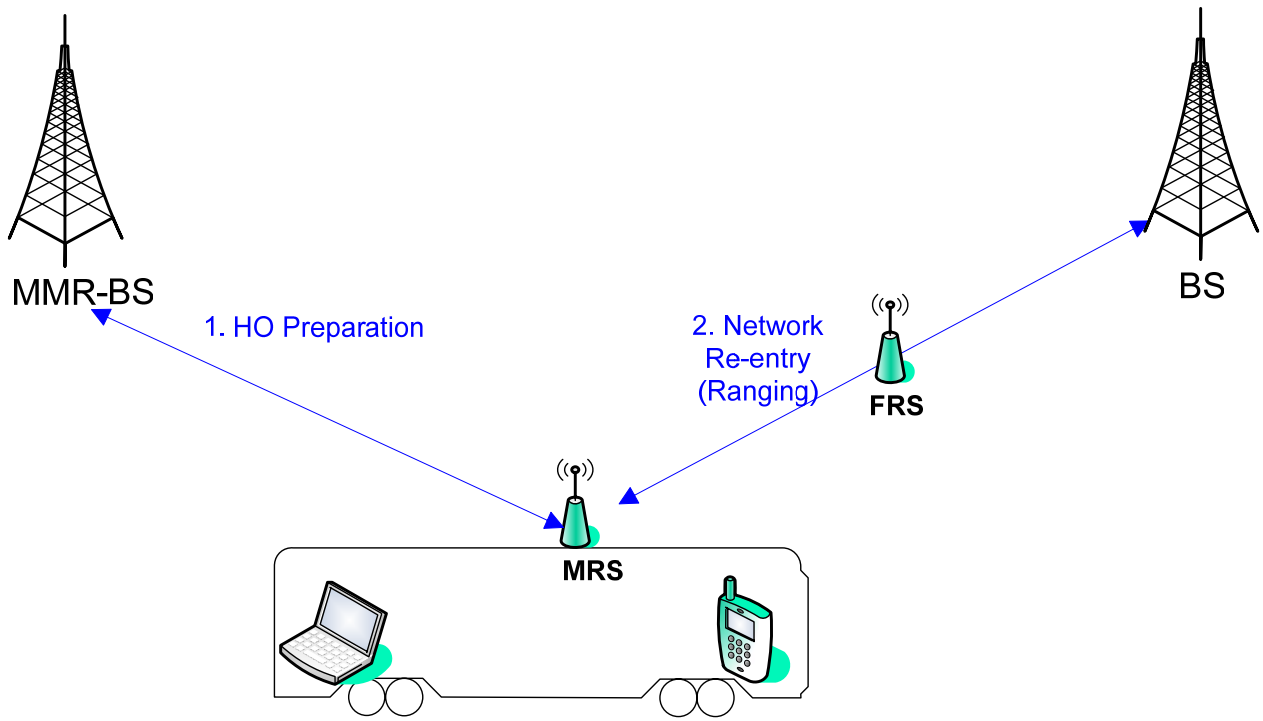
MS handover in/out of Mobile RS

- Handover state stays anchored in the BS as in 16e
- RS transparently relays the MAC Mobility messages



Mobile RS HO to Fixed RS

- Ranging procedure is same as slide-4
- FRS transparently relays the MAC Mobility messages



Conclusion

- Contribution provides text for
  - MS Handover in Relay
  - mobile RS handover
- MS Handover in Relay
  - Not different from 16e; adopt ranging from IEEE C80216j-06_193.doc
- Mobile RS Handover
  - It is faster, as only one station (RS) is involved instead of multiple MS. Easier and faster to schedule one station for the fast ranging.
  - It is bandwidth efficient. There is only one set of signaling message over the RS-BS link for all the MS attached through the RS.
  - It introduces minor changes to the existing mobility related messages from 802.16e-2005.
    - Existing messages are used with the addition of few TLVs
    - One new message is needed between MMR-BS and MRS
  - The proposal does not change any MS behavior
- More details and proposed spec changes are in C80216j-06_190.ppt