

Abbreviated SMART Relay Alliance Proposal Presentation

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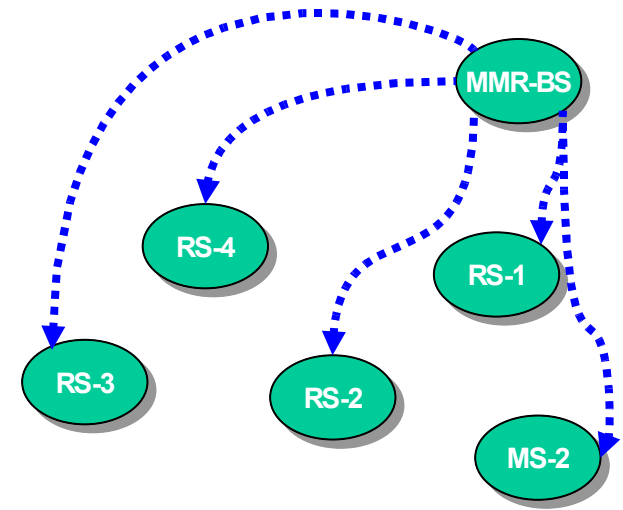
Objectives

- SMART Relay Alliance proposes RS specifications for 802.16j
- This group should take into account both
 - **Low-complexity Relay** stations for low cost solutions
 - **SMART Relay** stations for enhanced applications
- SMART Relay Alliance proposal is about this latter category

Topology management (Summary)

- **Tree topology construction at the BS**

- Which algorithm?
 - Selection of the shortest path to the BS based on link states
- Which metrics to weight vertices (dynamic/static)
 - At least Link states
- Tree topology is transmitted to all nodes using CSCF messages



Tree topology transmission

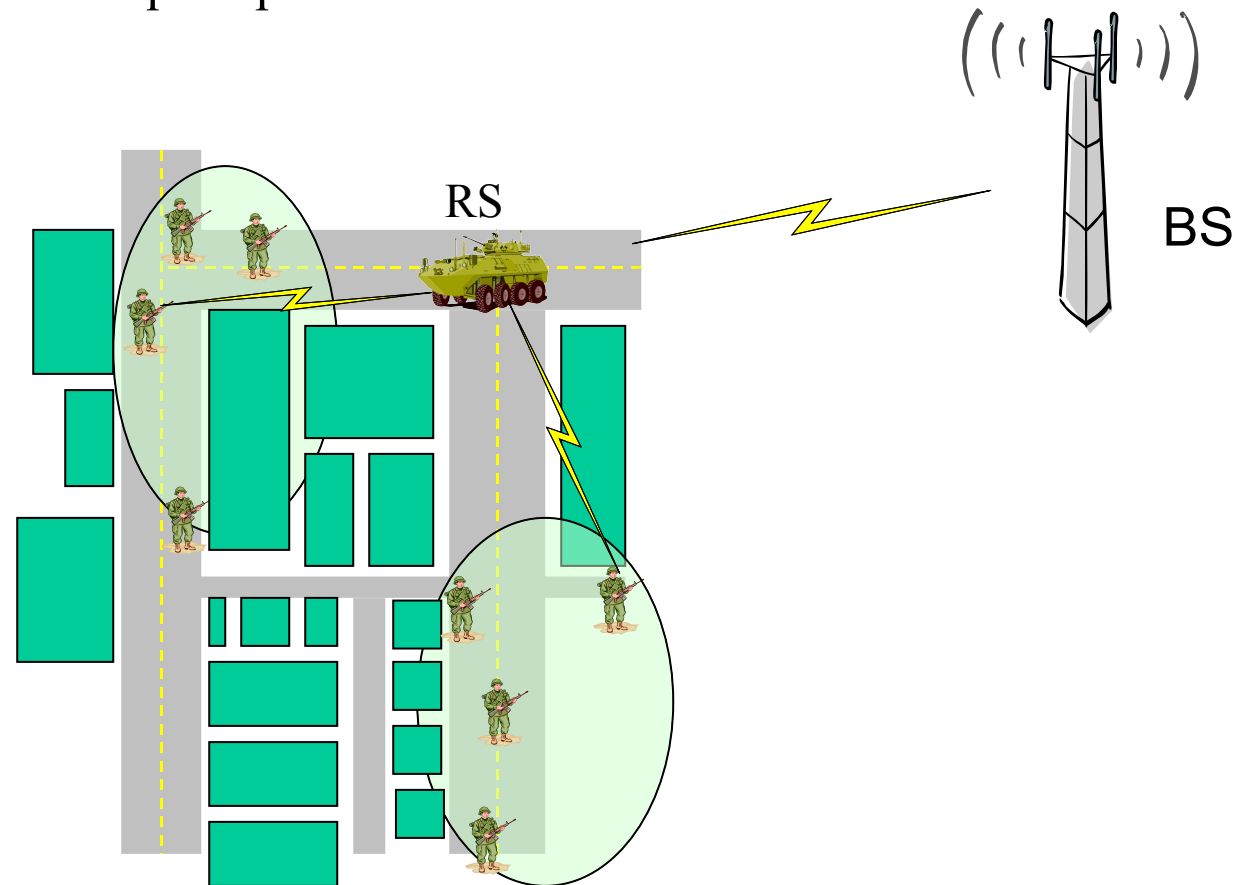
- **All nodes perform these three steps periodically to handle network dynamicity**

Routing (Summary)

- Use Hybrid protocol to take advantage of both Proactive and Reactive protocol
 - Proactive protocol to build a routing local table in all nodes
 - To set up dynamically new topology/routes based on the reactive one
- By default end-to-end delay is minimized (Proactive protocol)
- If other QoS Metrics are to consider, Reactive procedure is used
- The recommendation is to use Technique 3.

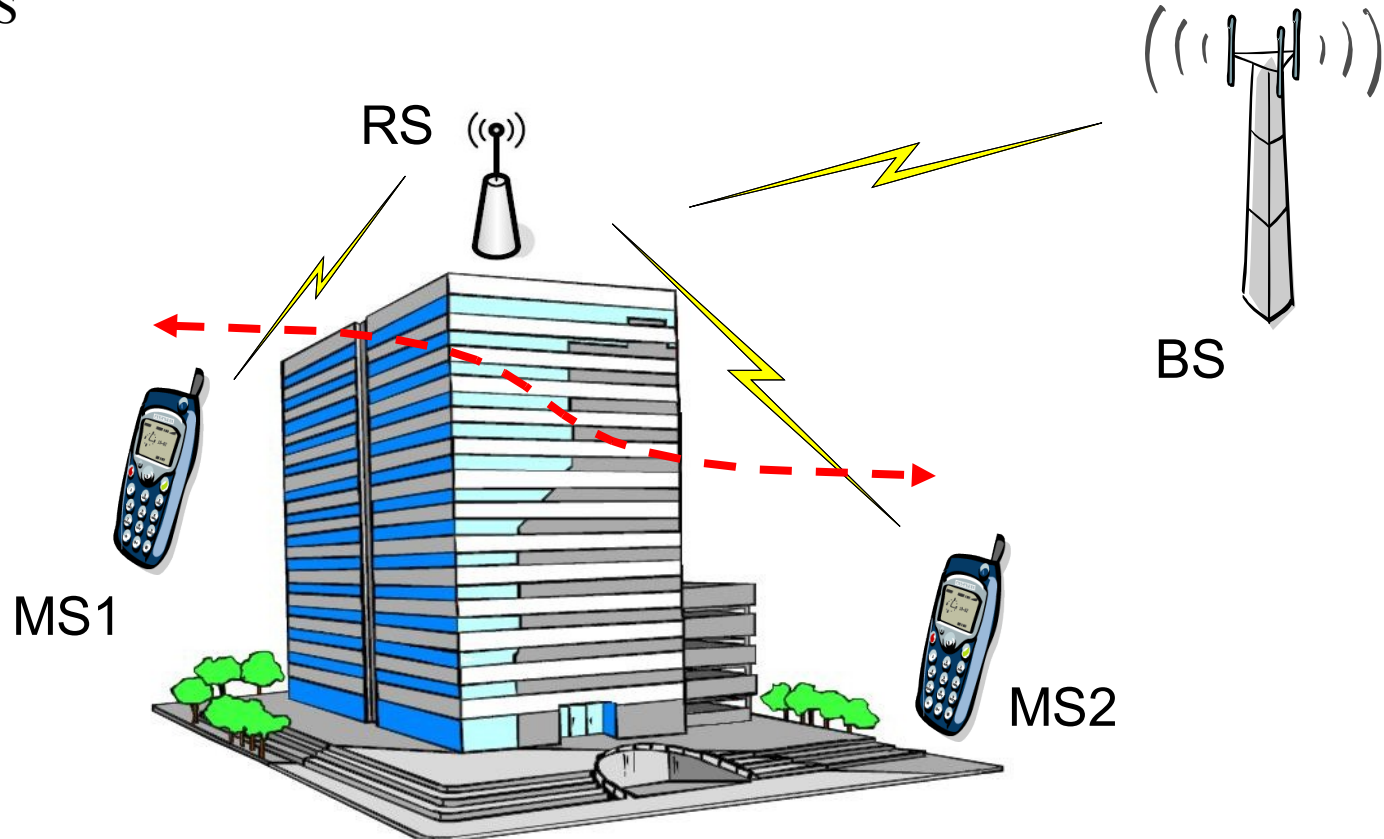
Cross Communications scenarios (1/4)

- **Example 1 : Military communication**
 - Mobile user (e.g. soldier) communicates with another mobile user within the same squad/platoon



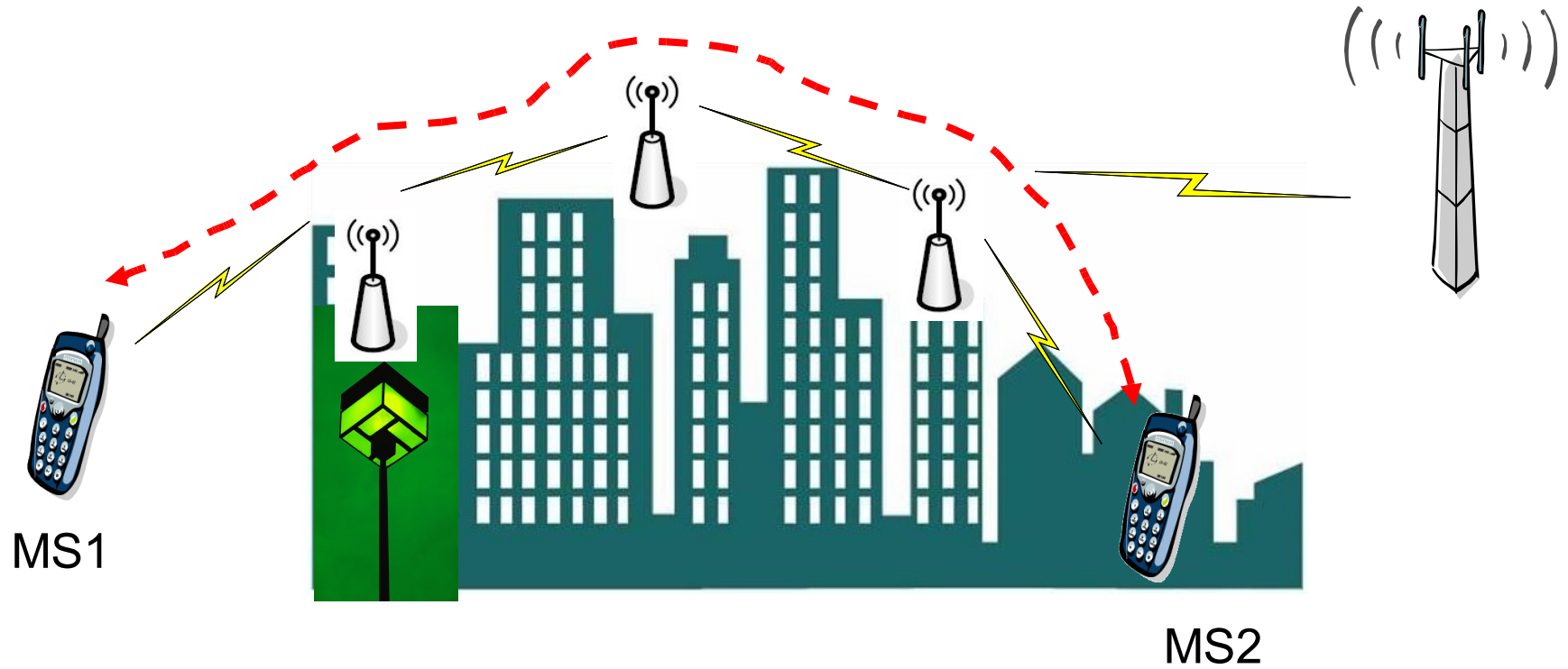
CC scenarios (2/4)

- **Example 2 : Communication in an office**
 - Two MSs are located in the same building (same RS cell)
 - RF efficiency improved since data doesn't need to be transferred to the BS



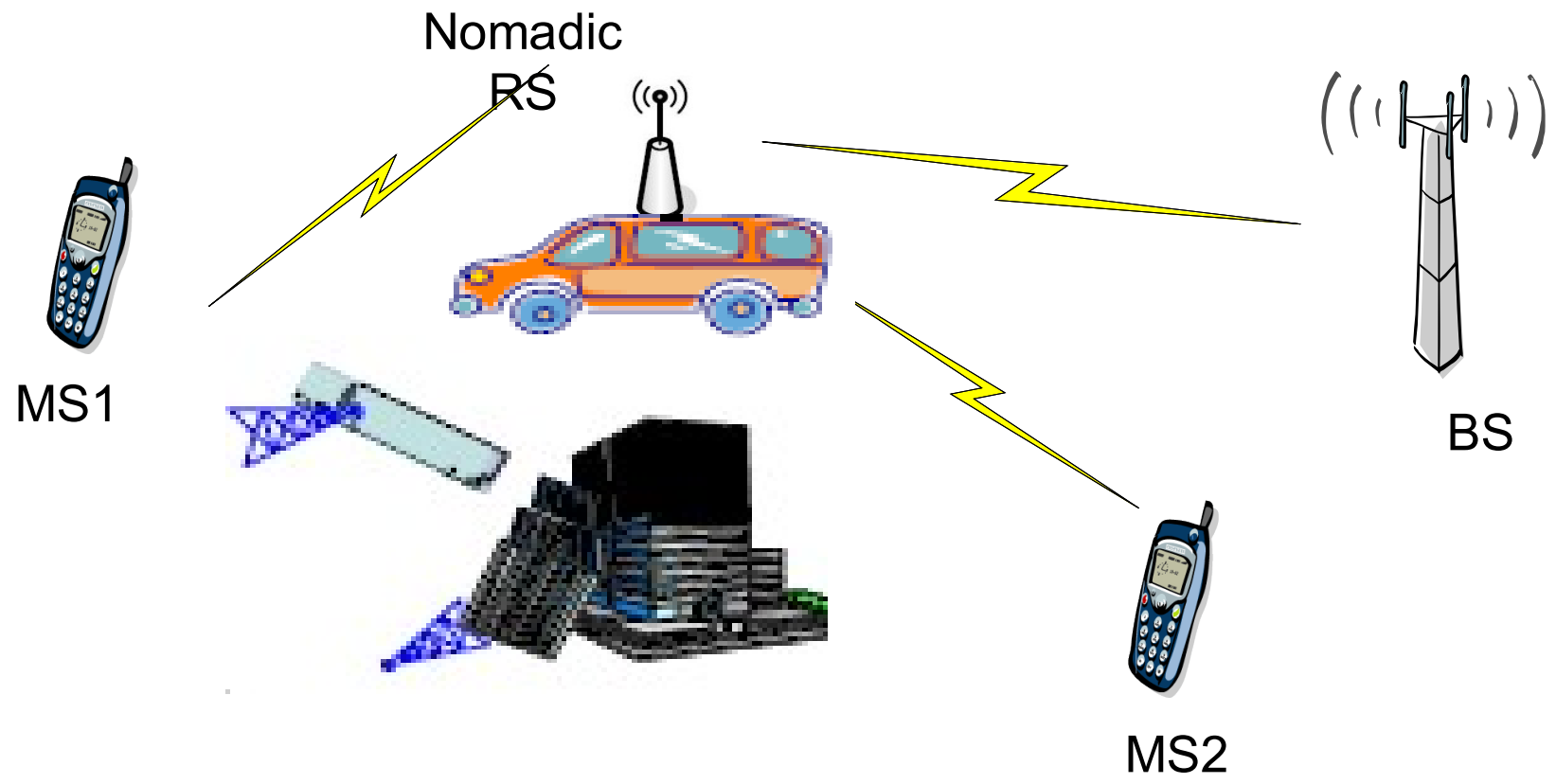
CC scenarios (3/4)

- **Example 3** : Communications among different RS cells
 - Two MSs are located in the same MMR cell but different RS cells



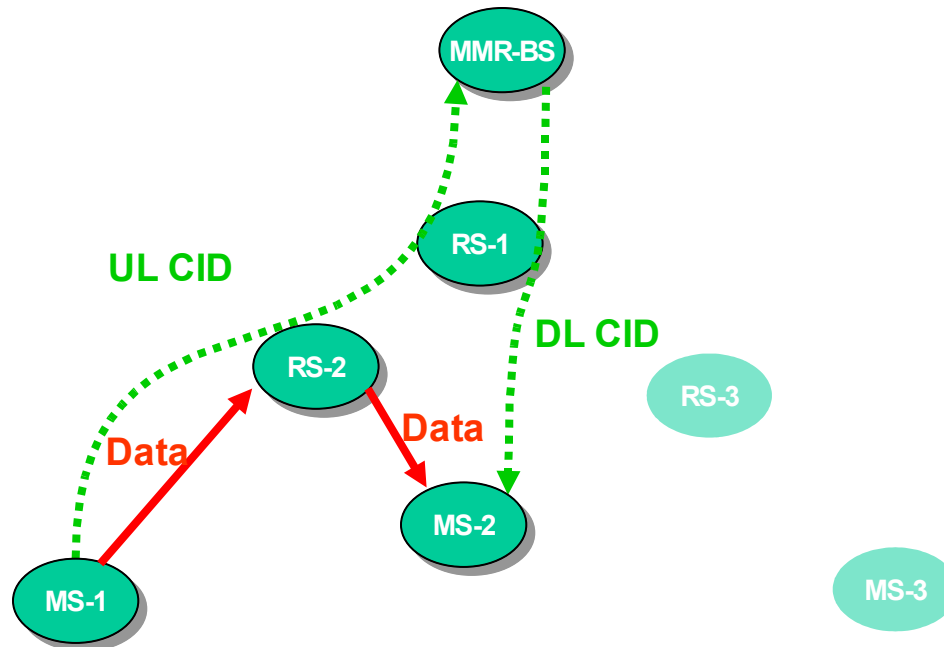
CC scenarios (4/4)

- **Example 4** : Emergency/Recovery situation



CC procedure (Summary)

- CC doesn't require any modification to the MS
 - It requires connections between MS and BS
 - 2 CID are used for 1 Cross-Communication
- The topology is still a **tree** (not a mesh)



Security with CC

Security in 802.16-2005 is based on a client/server architecture, where the BS is the server and the MS/RS are its clients.

Just as connections, security associations are established between the MMR-BS and the MS/RS.

The key management protocol provides the secure distribution of keying data from the MMR-BS to the MS/RS.

In order to support CC, the RS is required to decrypt and encrypt MS-RS-MS data plane traffic when the MMR-BS is bypassed.

The MMR-BS should provide the CC-enabled RS with the security parameters it needs to handle encryption of the data traffic it redirects.

Summary

- RS specifications should be divided into 2 parts
 - **Low-complexity Relay** stations for low cost solutions
 - **SMART Relay** stations for enhanced applications
- **SMART Relay** stations should handle
 - Routing protocol
 - Topology management
 - Power Saving
 - Security
- **SMART Relay** stations can manage Cross Communications
 - If allowed by the infrastructure owner and the country regulation
 - It should be an optional communication mode
- **SMART Relay** proposal should be considered in two categories
 - Relay Concepts
 - Routing (CC, Security, etc)