

A Grouping Scheme of Relay Station for IEEE 802.16j

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Purpose:

Introduce the concept of RS grouping and propose the required text revision

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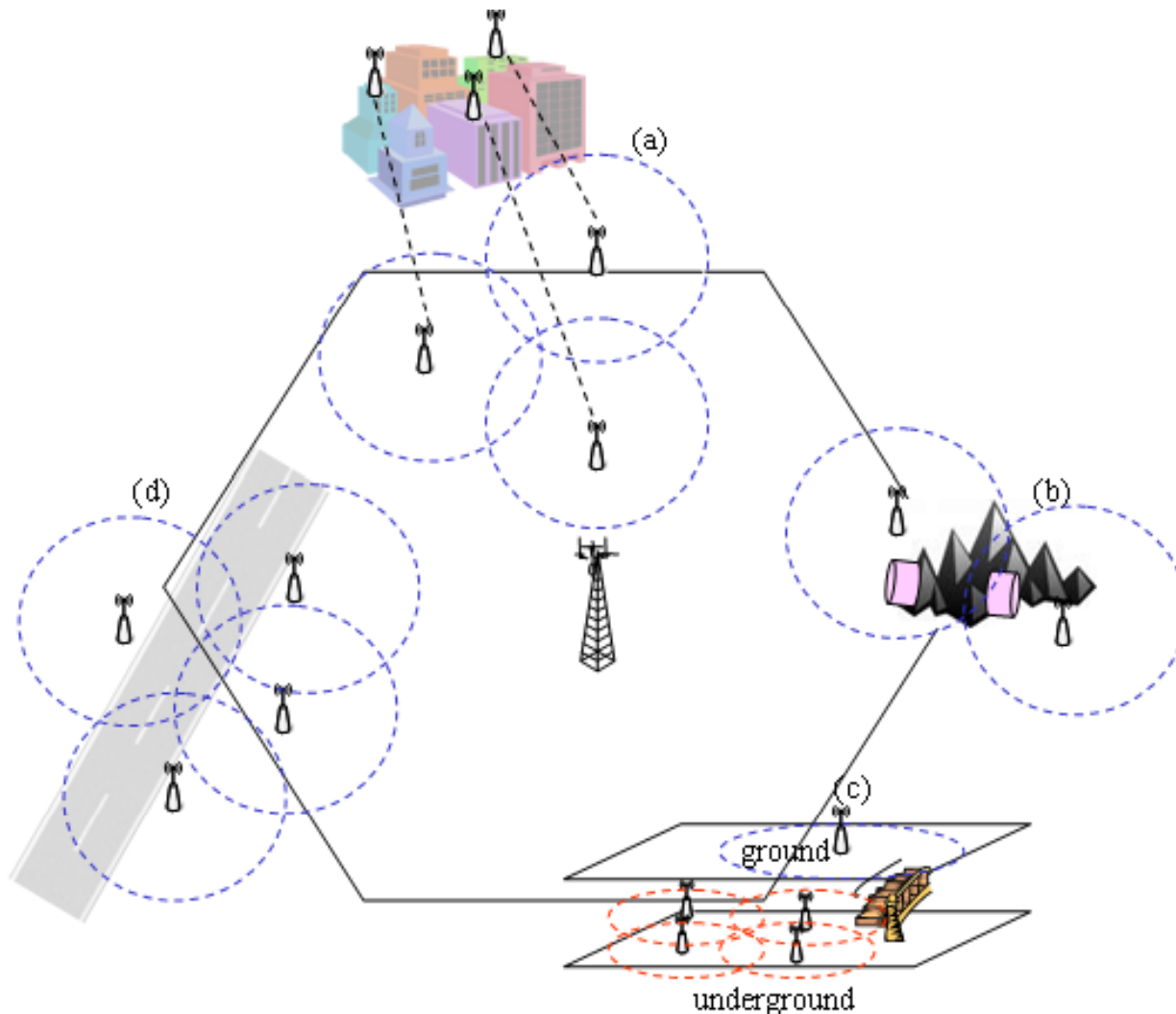
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Introduction



RSs may be deployed close to each other so as to serve a specific area, for example:

- (a) Large urban area
- (b) In a tunnel
- (c) In an underground
- (d) Along a high way

Problem Definition

- Frequent Handovers

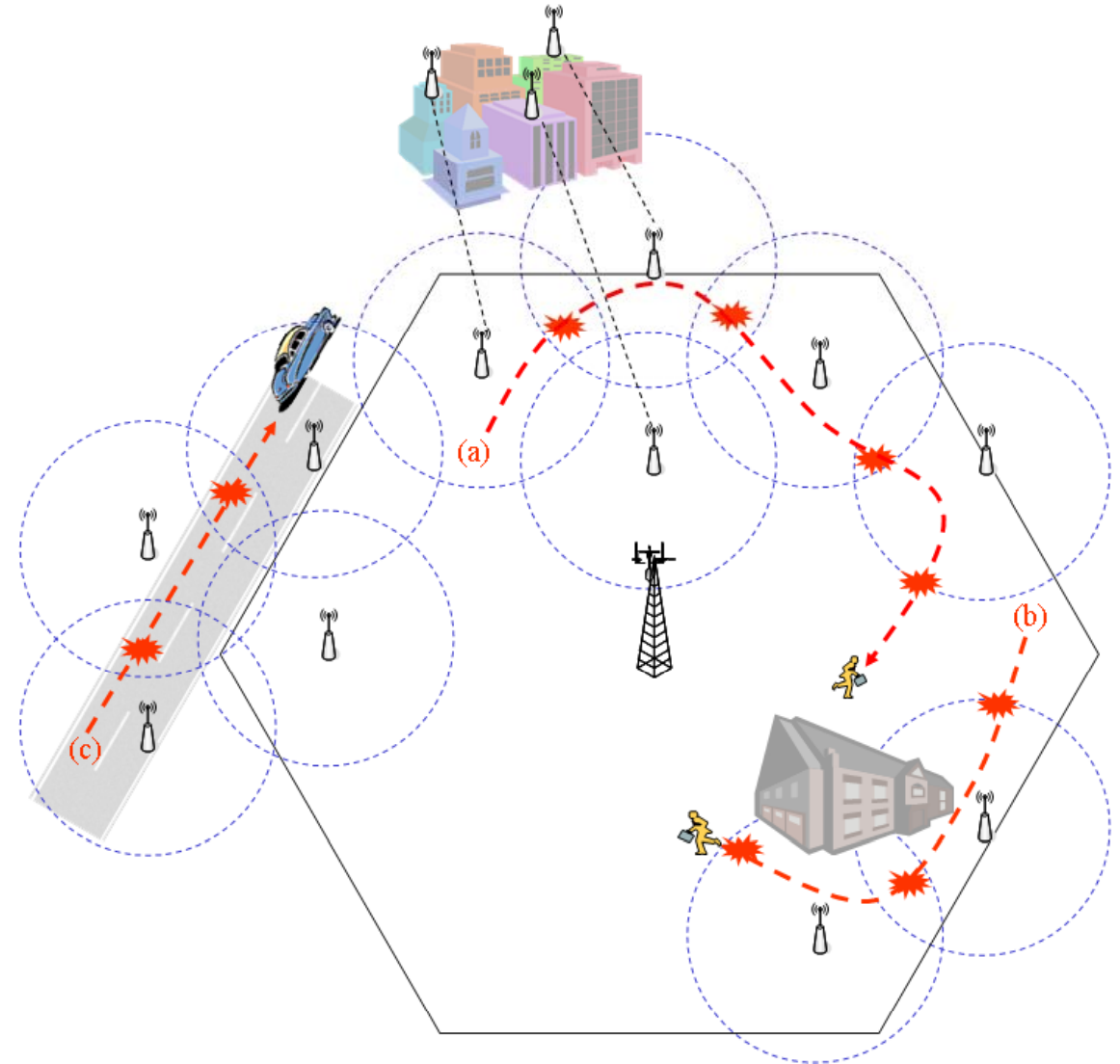
- Frequent handovers may be happened for the MS in this case

- For example:

- Path a : 4 handovers

- Path b : 3 handovers

- Path c : 2 handovers

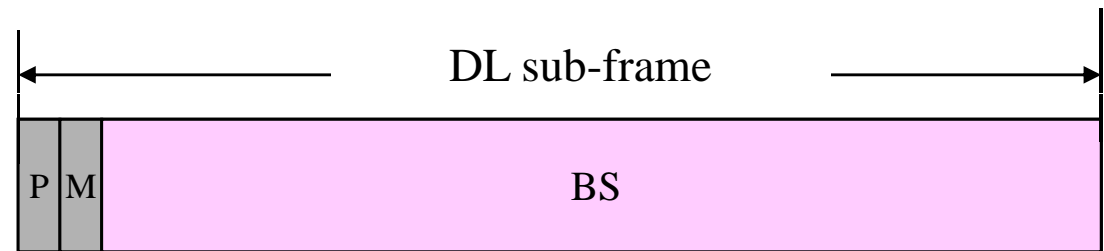


Problem Definition

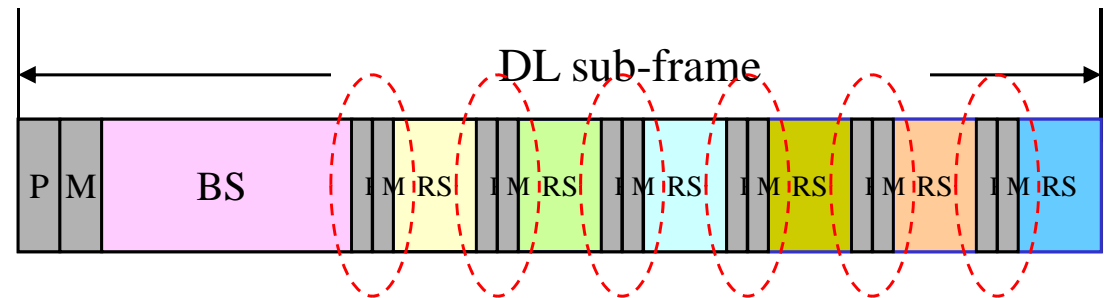
- More overhead by more relay regions

- RS transmission may be time division manner, and each relay zone may require its control signals. ex. preamble, FCH, and MAP

- More capacity consumption by more relay regions



One BS case

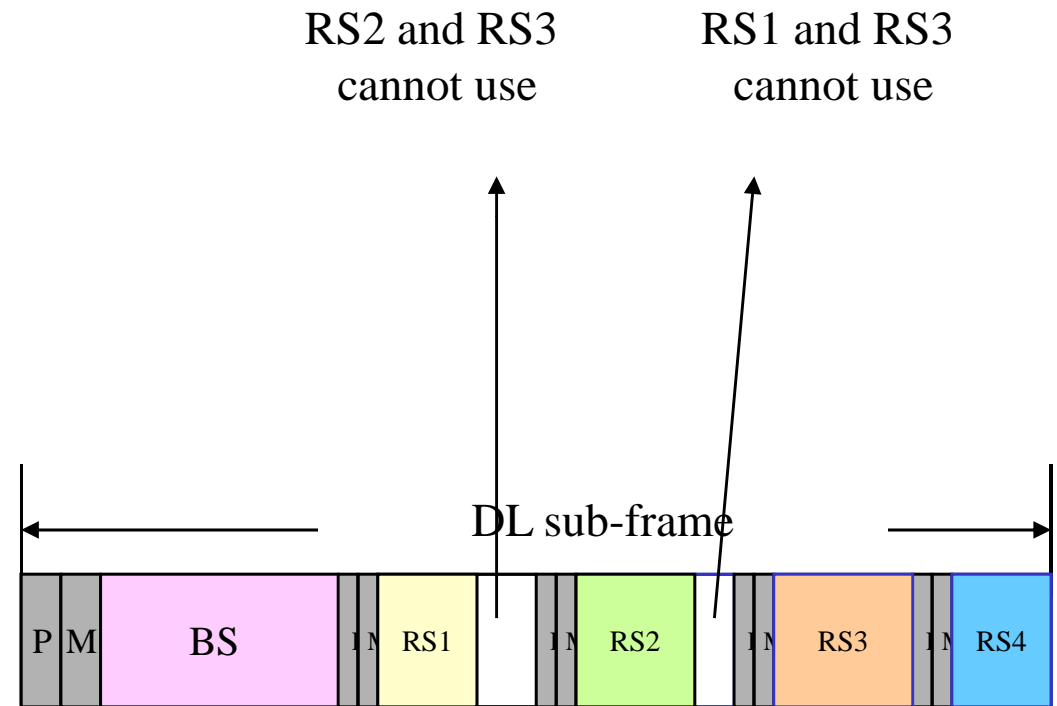


One BS with 6 RSs case

Problem Definition

- **Lower trucking efficiency if resources are pre-allocated to each relay region**

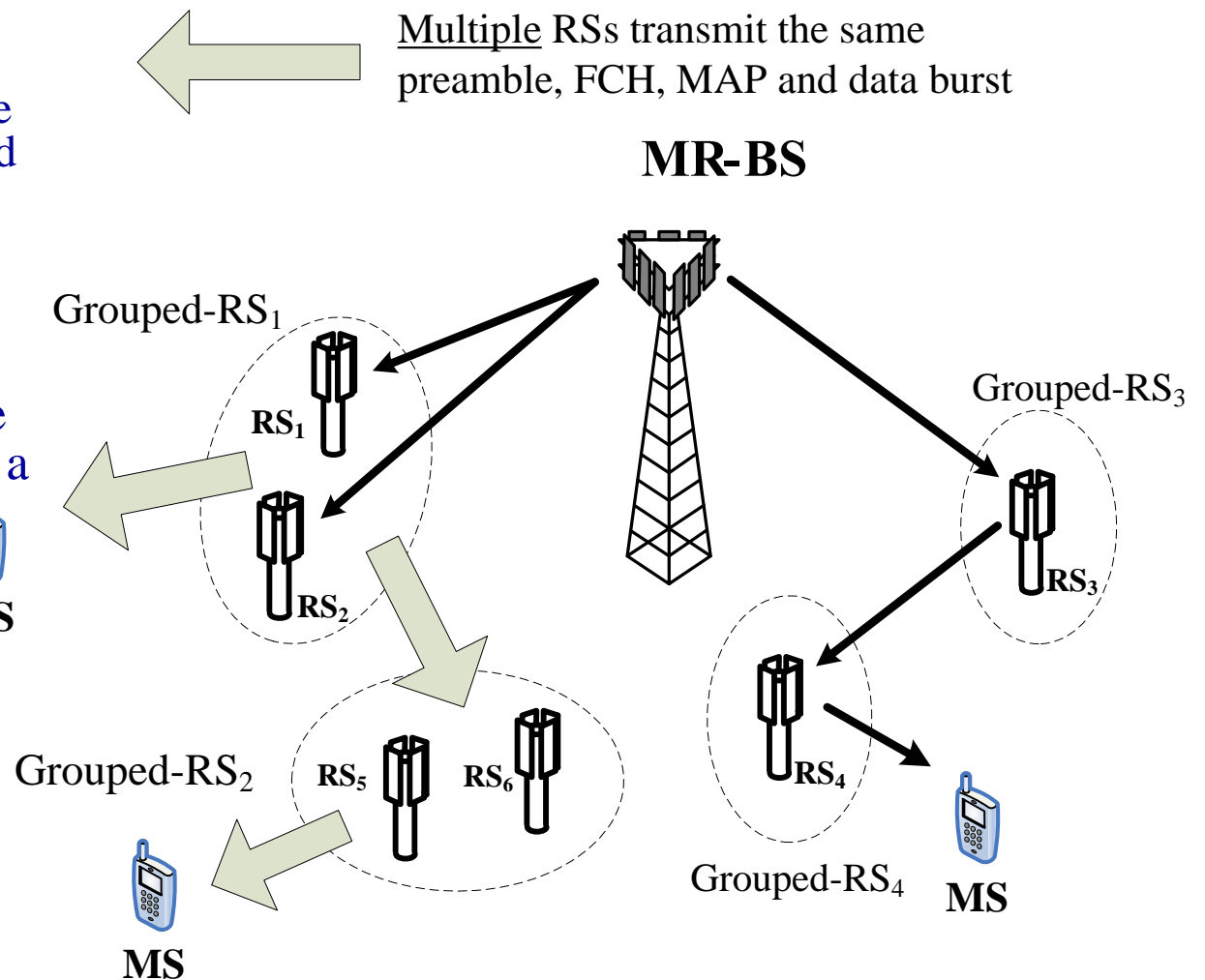
- May happen when non-transparent RS is deployed
- The resource may not be fully utilized



One BS with 4 RSs case

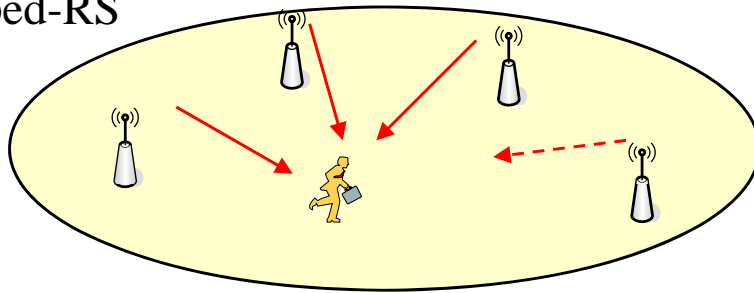
Concept of RS Grouping

- **Grouped-RS**
 - A set of RSs which transmit the same preamble, FCH, MAP and data burst
 - Each group may include more than one RS
- The neighbor RSs which are close to each other could be grouped as a grouped-RS
 - Reduce handover frequency between RSs
 - Boost up the received signal strength
- **Advantage**
 - Lower handover frequency
 - Control overhead reduction
 - Radio resource sharing

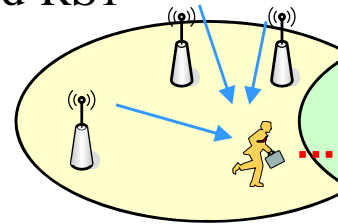


Mobility Managements for RS Grouping

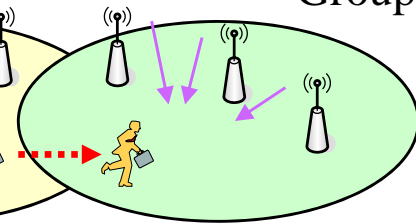
Grouped-RS



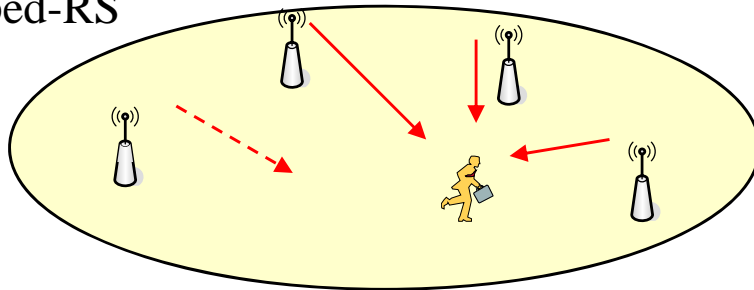
Grouped-RS1



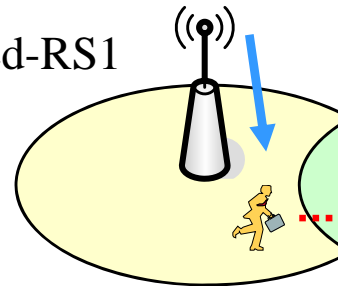
Grouped-RS2



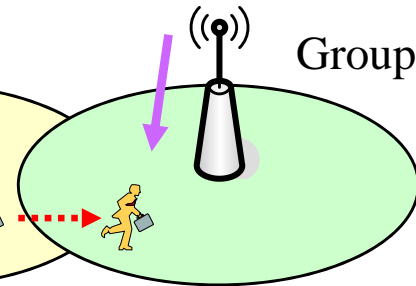
Grouped-RS



Grouped-RS1



Grouped-RS2



Intra-Group
"No Handover"

Inter-Group
"Handover between Grouped RS"

Summary

- Enable the **RS grouping** concept can achieve lower handover frequency, lower control overhead and higher resource utilization efficiency.
- A **measurement mechanism** is required to estimate how close the relay stations are
- This contribution has been harmonized with C802.16j-07/144r1