A RS Clustering Scheme for IEEE 802.16j

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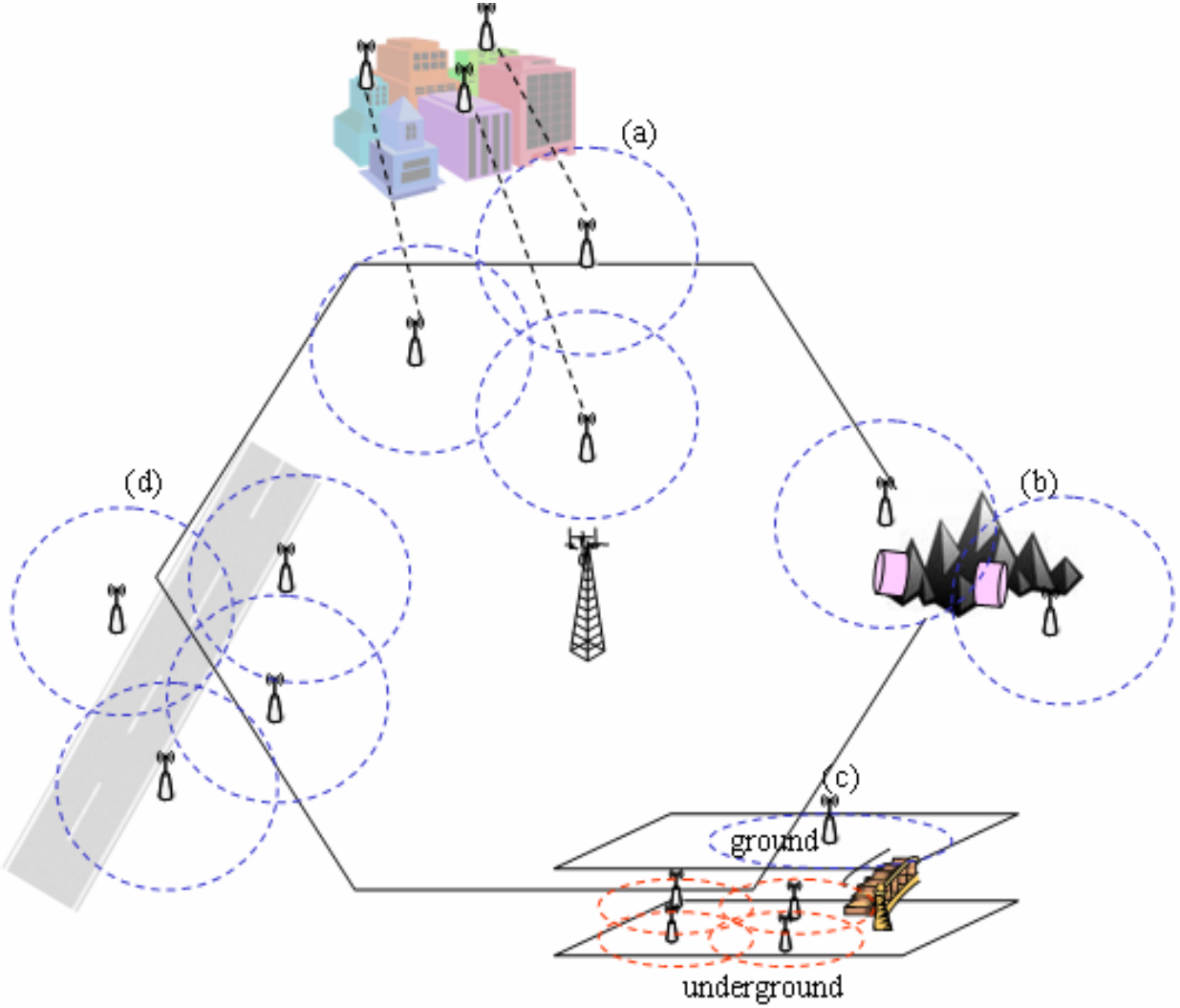
C802.16j-06/168

Purpose:

Introduce the concept inside of C802.16j-06/168

Introduction



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

(a) Large urban area

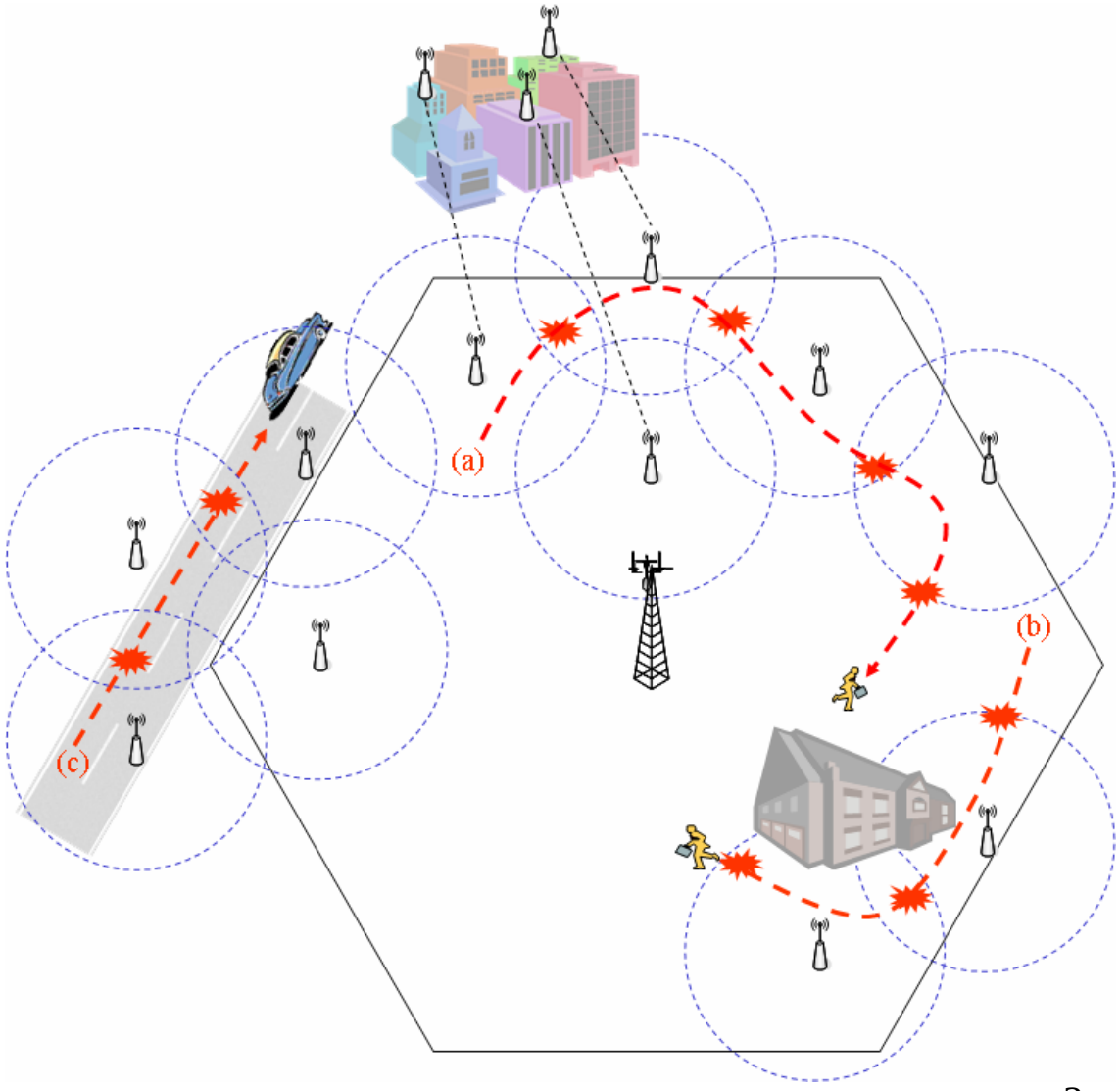
(b) In a tunnel

(c) In an underground

(d) Along a high way

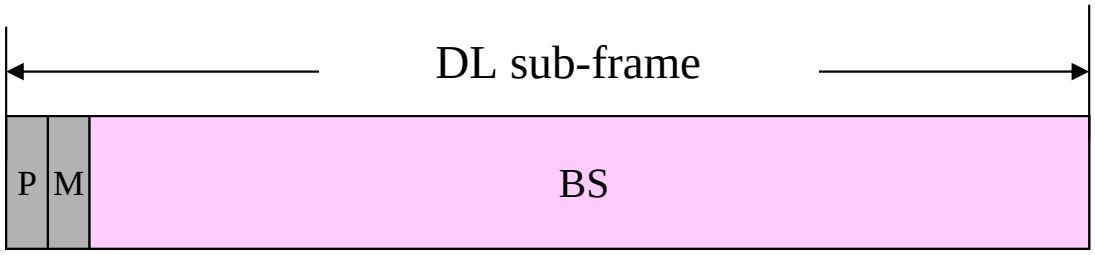
Problem Definition

- **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

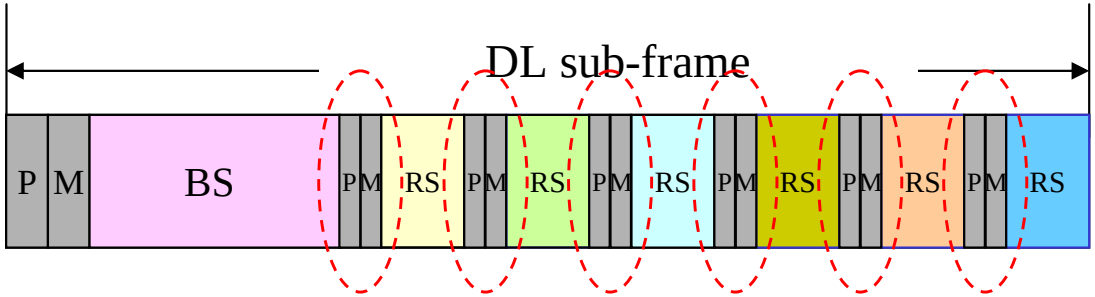


Problem Definition

- **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



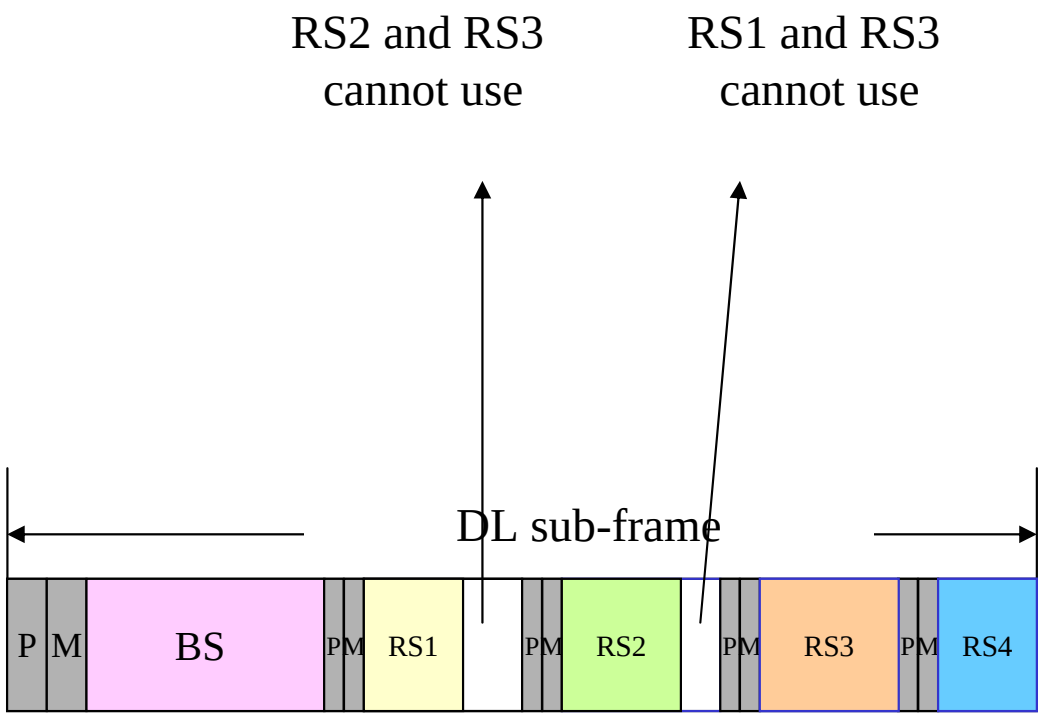
One BS case



One BS with 6 RSs case

Problem Definition

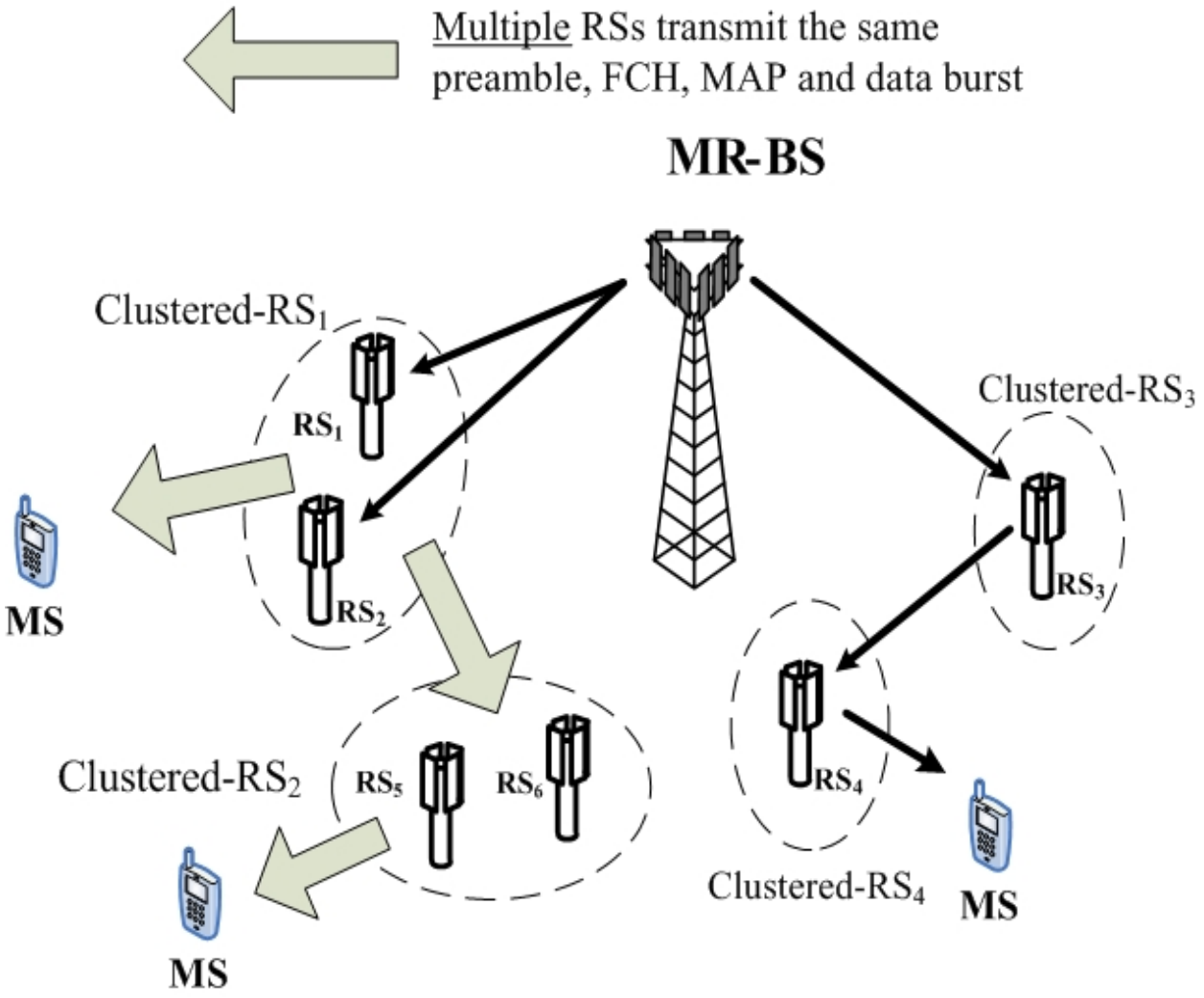
- **Lower trucking efficiency if resources are pre-allocated to each relay region**
  - May happen when decentralized resource allocation is considered
  - The resource may not be fully utilized



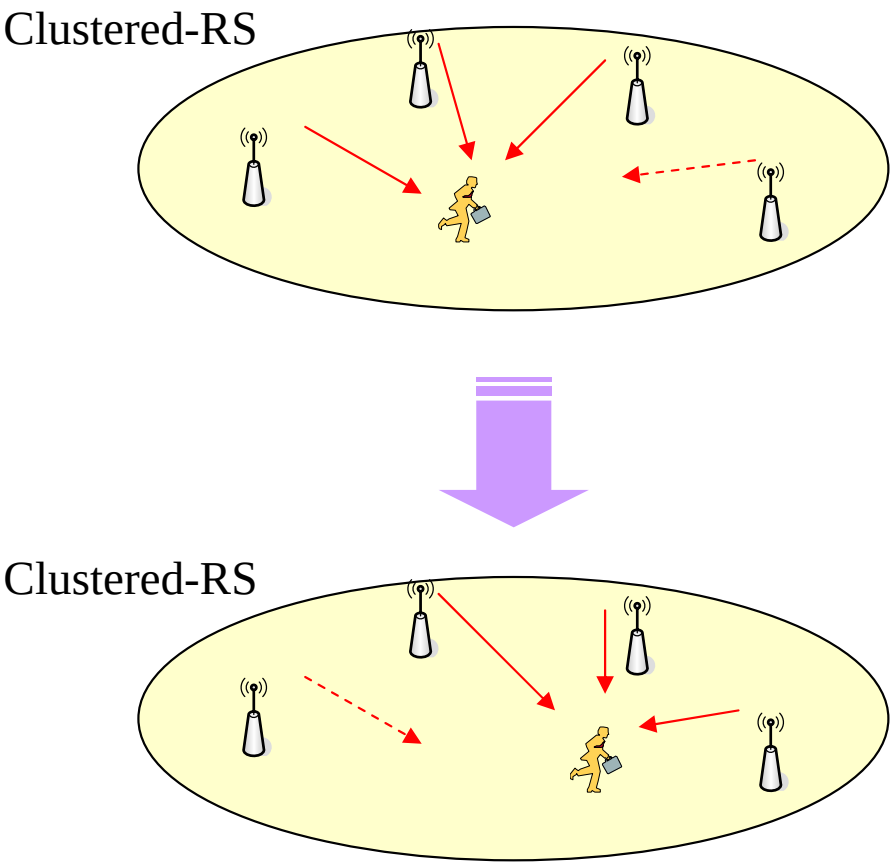
One BS with 4 RSs case

Concept of RS Clustering

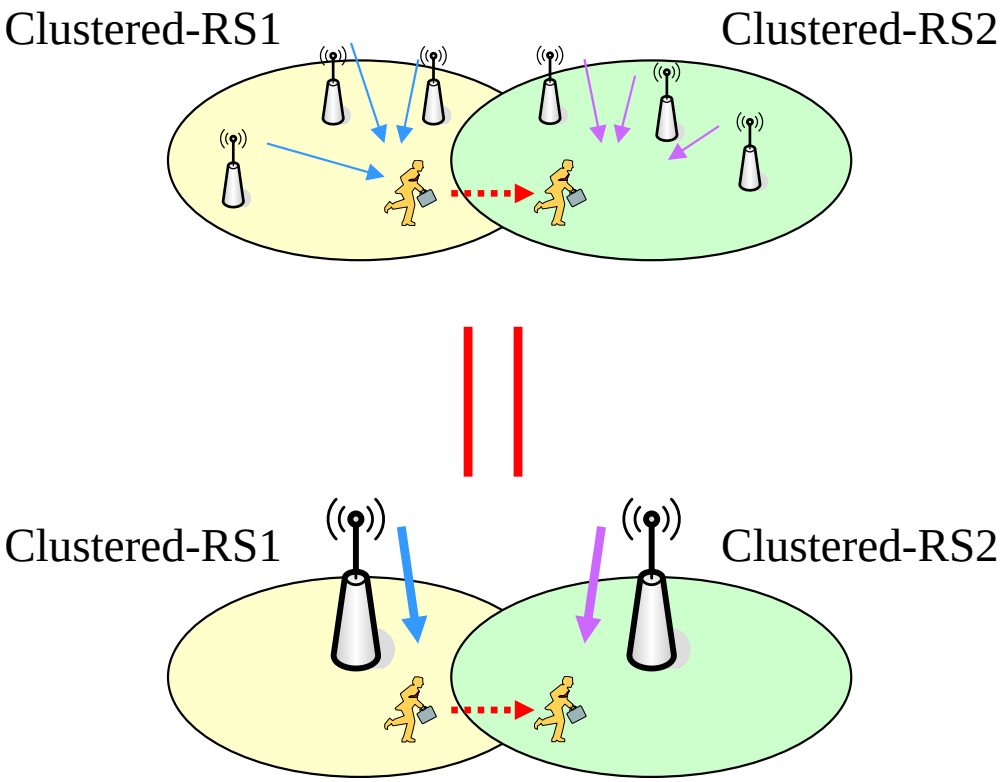
- Clustered-RS
  - A set of RSs which transmit the same preamble, FCH, MAP and data burst
  - The set may include single RS
- Adjacent RSs could be clustered together as a clustered-RS
  - Reduce handover frequency between RSs
- Advantage
  - Lower handover frequency
  - Control overhead reduction
  - Radio resource sharing



Mobility Managements for RS Clustering



Intra-Cluster
"No Handover"



Inter-Cluster
"Handover between Clustered RS"

Summary

- Enable the **RS clustering** 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
  - Addressed in text proposal