Mobile Station (MS) Classifications for Efficient Resource Utilization

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Purpose:

The document is provided as input for the IEEE 802.16j baseline document.

Introduction

- Radio resource management is very essential for wireless networks, especially for relay-based multi-hop networks.
- This contribution proposes a method about MS classifications for achieving efficient resource utilization and spatial diversity in IEEE 802.16j networks.

Assumptions

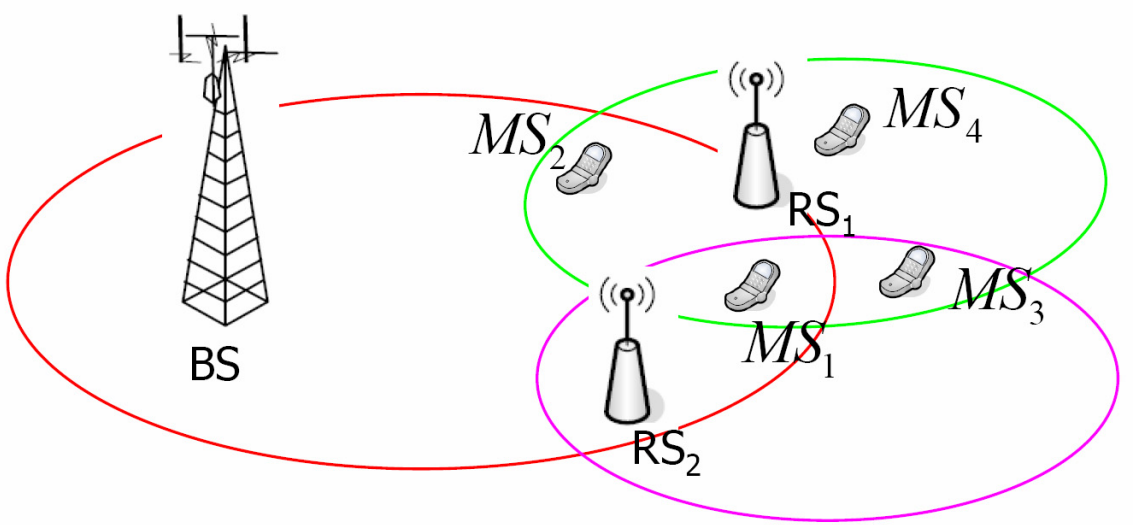
- BS has the channel quality information from RS to MS
  - Generally, BS has such kind of information, e.g. for handover purpose. This information can be directly utilized for MS classification.
  - This kind of information can also be obtained from ranging/network entry, like the method proposed by ETRI [1].

MS Classification

- One RS serves lots of MSs.
  - Some MSs can receive strong signals from the anchor RS, like MS near the RS or in coverage hole.
  - Some MSs can receive multiple comparable signals from multiple sources, like MSs in the overlapping area
- MSs shall be classified into different categories to
  - Efficiently utilize the radio resource
  - Achieve spatial diversity

MS Classification (cont.)

- Example



MSs served by RS_1 are classified into four categories

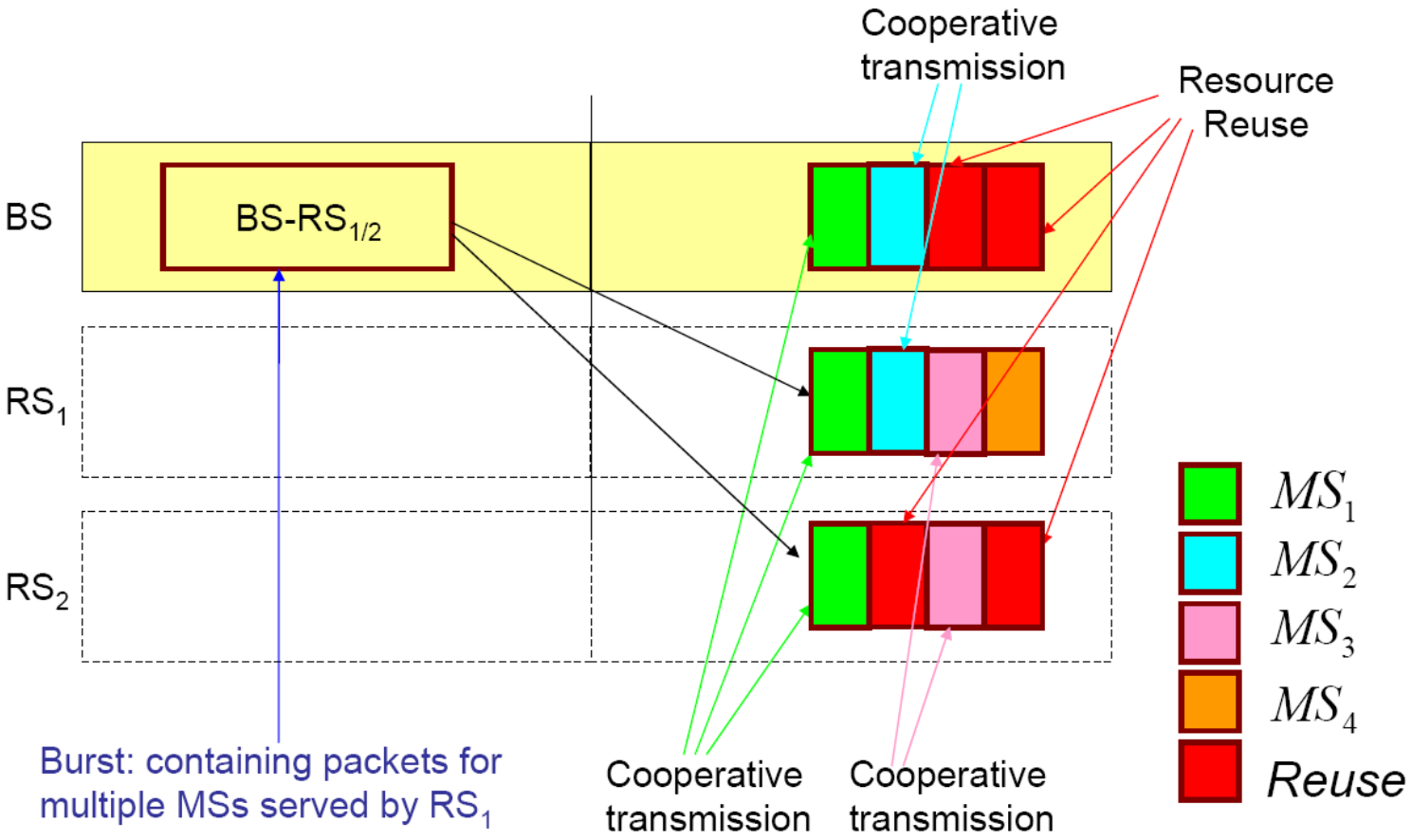
MS_1: in the overlapping area of BS, RS_1 and RS_2

MS_2: in the overlapping area of BS and RS_1

MS_3: in the overlapping area of RS_1 and RS_2

MS_4: only in RS1 service area

MS Classification Used for Resource Allocation



Both resource reuse and spatial diversity are achieved!

Summary

- MS classification is very useful for
  - Efficient resource utilization
  - Spatial diversity
- New MAC messages need to be added to
  - Inform RS of the MS classification information
  - Coordinate RS for resource reuse

References

- [1] IEEE C80216j-06_181, MS channel detection of RS in relay system, ETRI.
- [2] IEEE C80216j-07_124, Cooperative Relaying in Downlink for IEEE 802.16j, Siemens, Samsung Thales, ETRI, DoCoMo Beijing Labs, DoCoMo USA Labs, Nokia.