

Mobile Station (MS) Classifications for Efficient Resource Utilization

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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

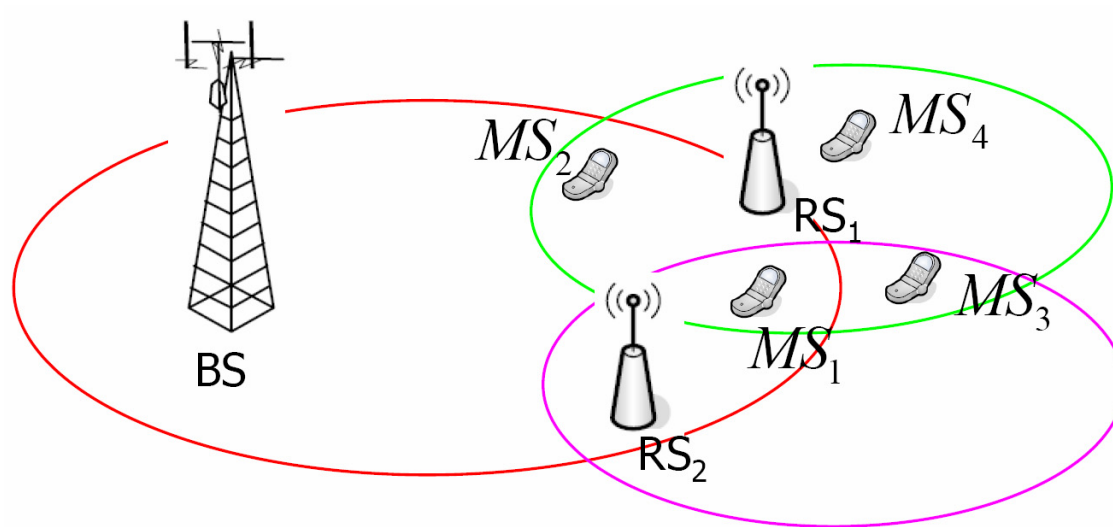
- BS has the channel quality information from RS to MS
 - Generally, BS has such kind of information, e.g. for handover purpose. This information can be directly utilized for MS classification.
 - This kind of information can also be obtained from ranging/network entry, like the method proposed by ETRI [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 RS₁ are classified into four categories

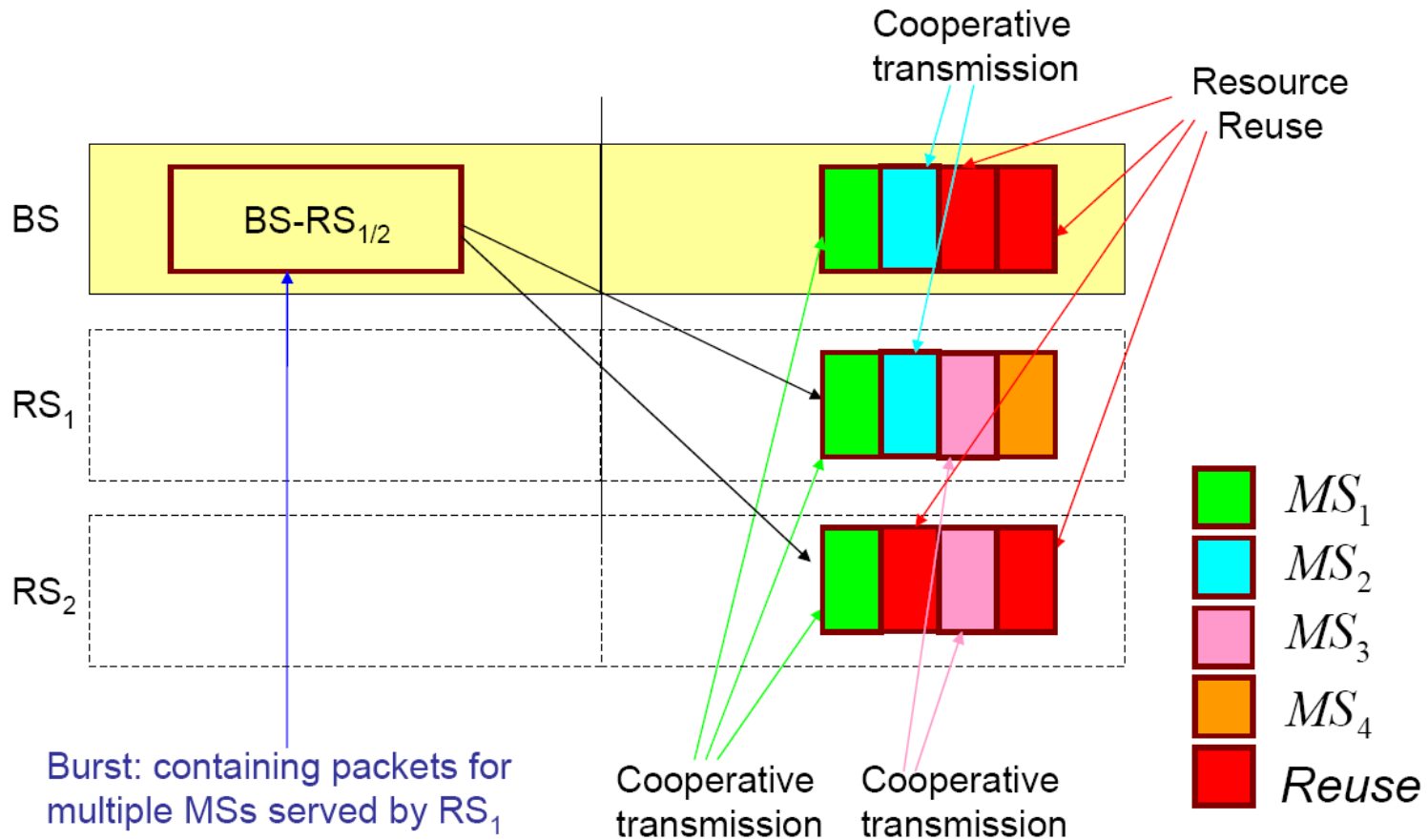
MS₁: in the overlapping area of BS, RS₁ and RS₂

MS₂: in the overlapping area of BS and RS₁

MS₃: in the overlapping area of RS₁ and RS₂

MS₄: 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.