Virtual BS and MMR-Cell Decomposition

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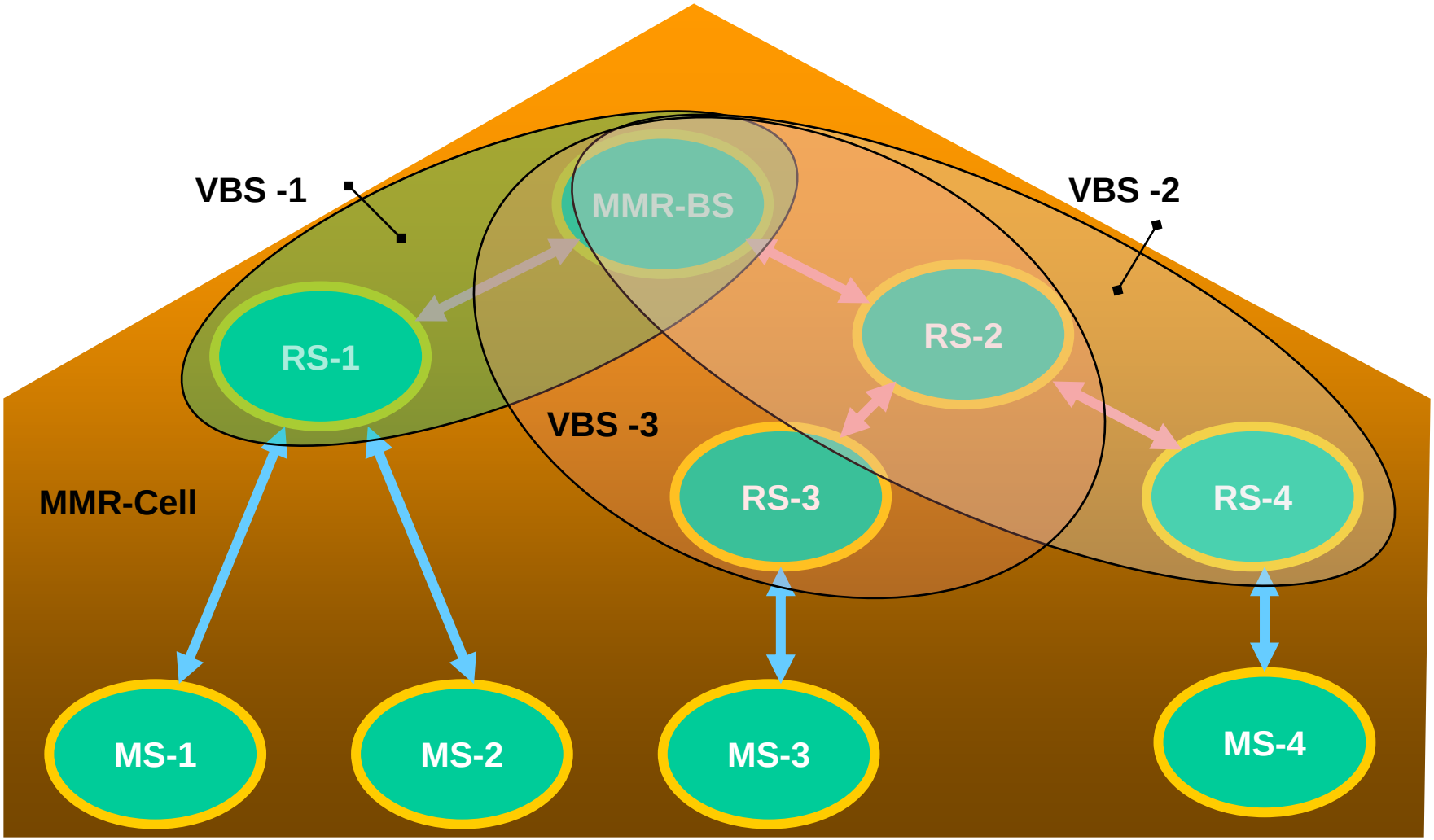
Purpose:
To introduce the terminologies of V-BS

Introduction

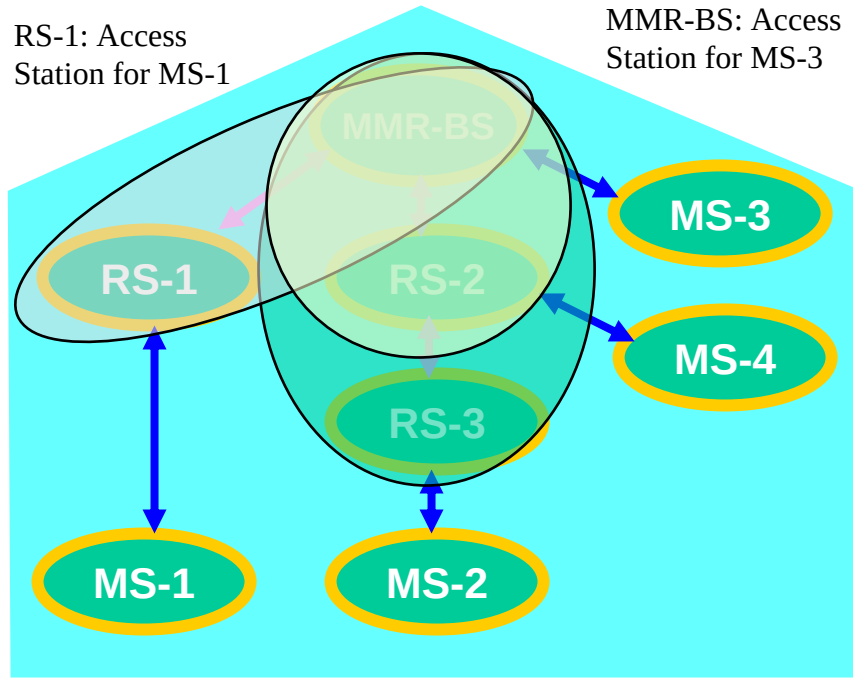
- The 802.16j PAR requires that control functions may be centralized at the base station or distributed among the relay stations with central *coordination* from the base station and the functionality of MS shall not be modified
- From the MS point-of-view, the MMR-BS and associated RS can be treated as an entirety as a virtual BS
- The mapping VBS can simplify the MS operation, in particular
  - Mobility management
  - Connectivity
  - Security
  - QoS

Definition of MMR-Cell and Virtual BS (VBS)



The Construction of VBS

- VBS is a MMR diversity set with build-in relay path topology semantic
- VBS is a logical decomposition of MMR cell
- VBS Creation
  - BS is a VBS
  - If an RS is associated with a VBS, {VBS}+{RS} is a VBS
- VBS Naming
  - Each RS belongs to a VBS
  - After finishing initial ranging and network entry the RS is assigned a 48-bit ID (i.e., BS-ID in 802.16) as VBS-ID



Four VBS :

VBS1 = {BS}
VBS2 = {BS, RS1}
VBS3 = {BS, RS2}
VBS4 = {BS, VBS3}
= {BS, RS2, RS3}

Impacts of VBS

- **Organized relay topology**
  - MMR-cell auto discovery
  - Relay path selection and maintenance
- **RS dual-mode operation**
  - VBS-ID for RS relay operation
  - MS-ID for RS mobility operation
- **E2E connectivity management**
  - CID assigned to VBS for tunnel purpose
  - Cooperative relay
- **Same network entry**
  - Retain the same entry procedure for RS and MS
- **Seamless Handover**
  - Same HO anchoring architecture
  - Intra-MMR-cell and Inter-MMR-cell handover

Text Proposal

- VBS

  "VBS consists of a serving MMR-BS and a subset of RSs along the selected relay path between MMR-BS and the designated access RS. VBS provides relay functions including data forwarding, mobility management, connectivity, security and QOS, with central coordination from MMR-BS."

- Access Station

  "The station at the point of direct access into the network for a given MS. An access station can be a BS, RS, or MMR-BS."