

Virtual BS and MMR-Cell Decomposition

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Purpose:

[To introduce the terminologies of V-BS](#)

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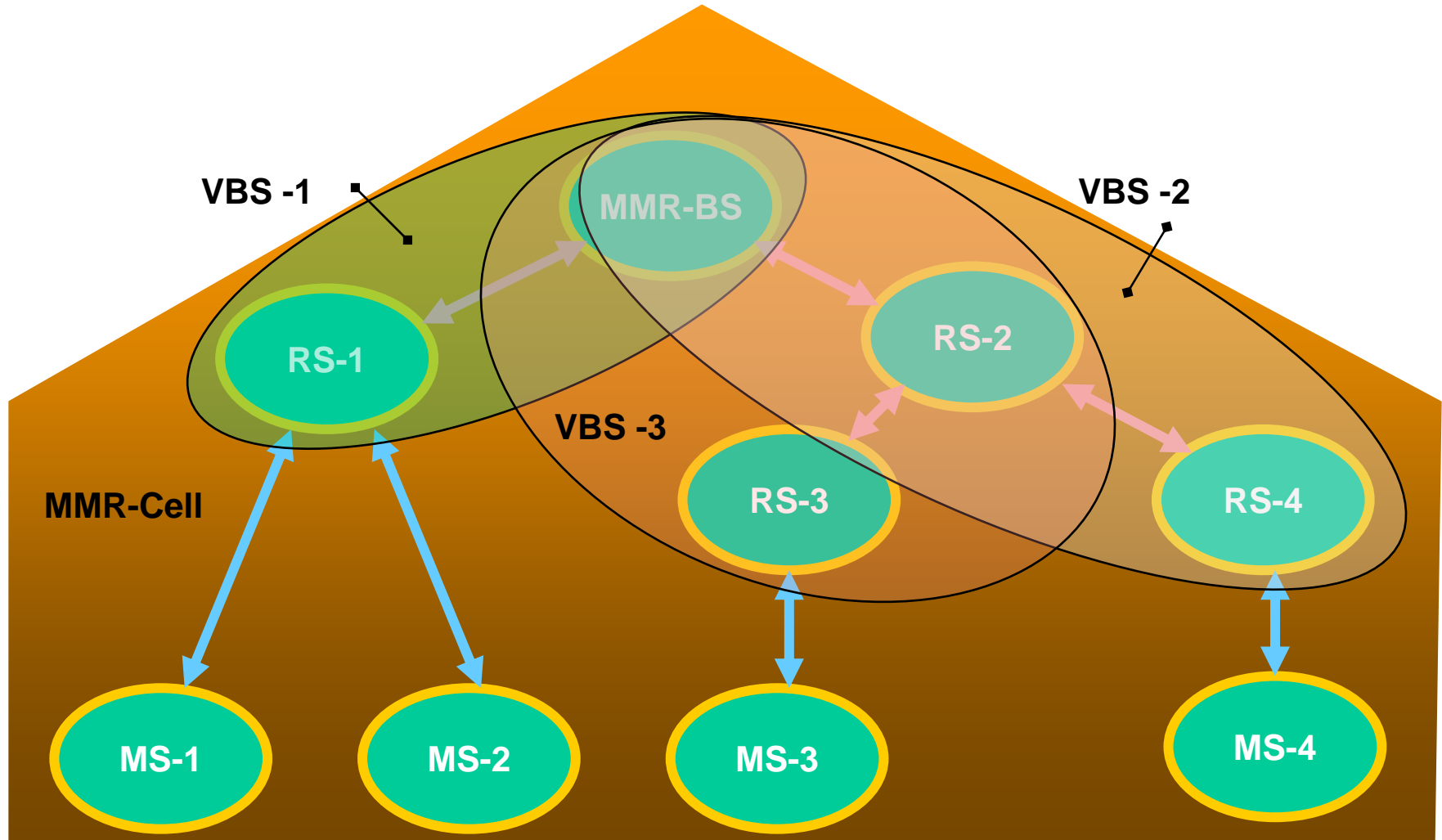
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Introduction

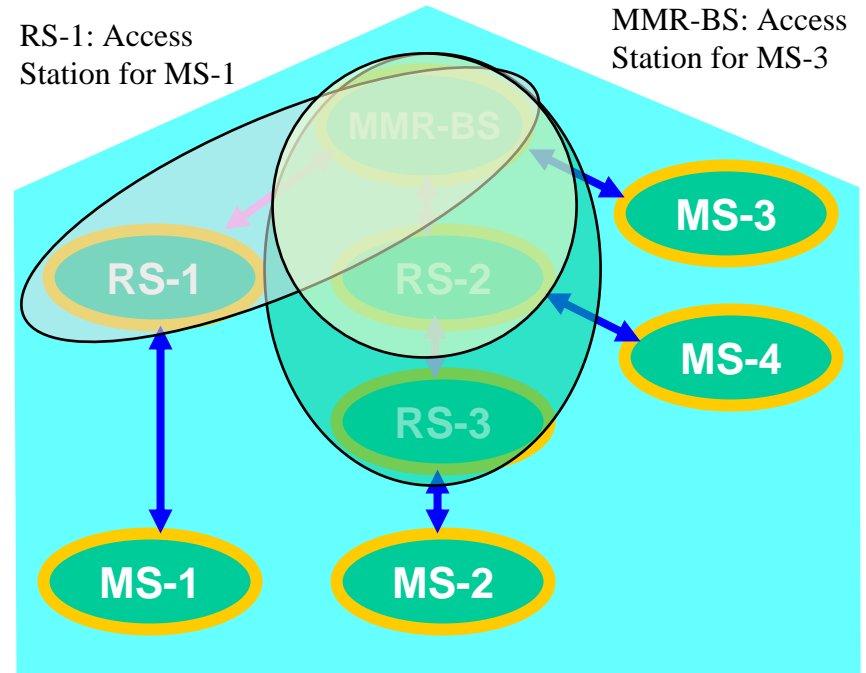
- The 802.16j PAR requires that control functions may be centralized at the base station or distributed among the relay stations with central coordination from the base station and the functionality of MS shall not be modified
- From the MS point-of-view, the MMR-BS and associated RS can be treated as 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, $\{\text{VBS}\} + \{\text{RS}\}$ 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 :

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

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.”