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Re:	A response to a Call for Technical Proposal, http://www.ieee802.org/16/relay/docs/80216j-07_013.pdf
Abstract	We provide editorial changes on 6.3.9.16.3.1 and clarifications on RS grouping concept regarding the network entry, topology configuration and data forwarding.
Purpose	To incorporate the proposed text into the P802.16j Baseline Document (IEEE 802.16j-06/026r3)
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Some Clarifications on Virtual RS Group Concept

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1 Introduction

Some characteristics of the Virtual RS-group is currently summarized in the baseline document. In this contribution, we clarify several issues related to creation/capability/configuration of virtual RS group. We also provide minor editorial text change for 6.3.9.16.3.1 in the baseline document.

2 RS group clarifications

2.1 Network entry procedures:

MS Network entry: The procedures in 6.3.9.16.1 or 6.3.9.16.2 can be followed. Each RS group member can monitor the CDMA ranging codes from subordinate nodes. If the group parent is not a member of the RS group, then RS group members follow the procedures in 6.3.9.16.1. If the group parent is a member of the RS group, then the RS group members other than the parent follow the procedure in 6.3.9.16.1, and the group parent (if not MR-BS) follows the procedures in 6.3.9.16.2.

2.2 Data forwarding by an RS group

In an RS group, not all the RSs have to forward data it receives to the terminals. For example, only a subset of RSs may be involved in macro-diversity for a given MS. In another case, one member RS may better forward traffic for only some specific subordinate terminal, while another member RS for another terminal. This can reduce the unnecessary interference and resource usage at both RSs. In that case, only specified RSs should forward data bound to the subordinate terminal. In order to enable those operations the RS should be aware of the list of CIDs that needs to be forwarded. To that end, a multicast message (RS_Member_List_Update) is proposed to be sent from MR-BS or the parent of the RS group to the RS group members whenever a change in the connection list occurs.

The measurement methods for such decisions are already described in the standard, e.g., R-amble monitoring schemes.

2.3 R-amble transmission

Although current baseline specifies the R-amble transmission from the RSs, when a transparent RS is required to transmit the R-amble there is no mechanism to inform its R-amble index. In order to perform RS group configurations, it may be necessary to facilitate R-amble measurement. Since an RS group consists of a number of RS members employing the same preamble index, there is a need for an additional field in the RS configuration message to configure the R-amble parameter. To that end, it is proposed to include the R-amble configuration parameter in the message in 6.3.3.3.67. The R-amble index assignment method for RS group members may be implementation specific. For example, the offset method may be employed to generate additional R-amble sequences, or existing R-amble sequences may be employed with an appropriate mapping from one preamble index to more than one R-amble indices.

6 Text Changes

++++Start text ++++++++++++++

[Modify 6.3.9.16.3.1 as follows]

[Replace the first sentence of the third item in Subclause 6.3.9.16.3.1 as indicated below]

• When the virtual RS group includes an MR-BS, the RSs in the virtual group shall either transmit the same preamble, FCH and MAP as the MR-BS~~, FCH and MAP~~ or they shall not transmit any preamble/FCH/MAP.

[Delete the fourth item in 6.3.9.16.3.1 as indicated below]

~~• Different RS groups shall transmit different preambles.~~

[Insert the following text at the end of the Subclause 6.3.9.16.3.1 as indicated below]

• Data forwarding within RS group: For DL, the members of an RS group may be configured to forward traffic data for only specific subordinate terminal nodes. This may be done on a per-terminal or per-transport connection basis. In this way, by specifying scheduling times, two RSs belonging to the same RS group may transmit to two different MSs/SSs at the same time. In addition, transmissions may be scheduled such that multiple RSs in the RS group may transmit to the same MS to exploit macro-diversity. This scheduling may be achieved under a centralized scheduling scheme by keeping an MS list or CID list associated with each RS. Each RS would look for the data bound to its subordinated stations or data coming from the subordinate stations in the uplink and forward in the assigned times indicated in the MAP. The list may be updated by the RS_Member_List_Update message defined in 6.3.23.XX.

For the UL, diversity combining of the information received by the members of RS group can be performed, or the UL signaling can be designed such that several member RSs may receive data from multiple MS at the same time. This scheduling may be achieved under a centralized scheduling scheme by keeping an

MS list or CID list associated with each RS and forwarding those messages in a specified resource unit (time and frequency). When the MS is same and the resources are the same, it is equivalent to macro-diversity. When the resources are same but the MSs are different, it is equivalent to parallel transmission occurring at different locations..

Each time a handover occurs or a new terminal joins an RS group, the RSs CID/terminal list is updated to keep track of the connections/terminals which are associated with a particular member RS.

[Insert Subclause 6.3.9.16.3.1.1]

6.3.9.16.3.1.1 MS Network Entry Procedures

Each RS group member shall monitor the CDMA ranging codes from subordinate nodes. If the group parent is not a member of the RS group, then RS group members shall follow the procedures in 6.3.9.16.1. If the group parent is a member of the RS group, then the RS group members other than the parent shall follow the procedure in 6.3.9.16.1, and the parent (if not MR-BS) shall follow the procedures in 6.3.9.16.2.

[Insert Subclause 6.3.9.16.3.1.2]

6.3.9.16.3.1.2 RS Network Entry Procedures

If the RS is in MS mode of operation, it shall start network entry with the MS network entry procedures in 6.3.9.16.3.1.1. During network entry or during normal operation, the MR-BS may configure the RS using RS_Configuration_REQ/RSP messages.

[Insert the Subclause RS_Member_Con_Update message format in 6.3.2.3.XX? as follows:]

6.3.2.3.xx RS_Member_List_Update message format

The virtual RS group parent may transmit RS_Member_List_Update message as a multicast message to update the virtual group members with the details of the traffic burst they shall forward. This message is transmitted whenever there is a change in the connection list of the RS group members due to their movement or movement of their subordinate nodes.

Syntax	Size	Notes
RS_Member_List_Update {		
Management message type = XX	8 bits	
Configured_para_type	4 bits	b0 = 1: data forwarding on a per CID basis b0 = 0: data forwarding on a per terminal basis b1 – b3: reserved
If (b0 of Configured_para_type == 1) {		
Number_RS	8 bits	Number of RS group members involved with the CID list update

for (i=0;i<Number_RS;i++) {		
RS Basic CID	16 bits	Basic CID of the RS group member
N_CID	8 bits	If b0 of Configured_para_type=1, number of CIDs whose data is to be forwarded by the RS group member If b0 of Configured_para_type=0, number of terminals (the first hop MSs or RSs from the group member) involved with the list update
for (j=0;j<N_CID;j++) {		
CID	16 bits	If b0 of Configured_para_type = 1, transport CIDs involved with the list update If b0 of Configured_para_type = 0, the basic CIDs involved in the list update
Add_Remove	1 bit	b0 = 1: Add CID/terminal to the forwarding list b0 = 0: Remove CID/terminal from the forwarding the list
}		
}		
}		
}		

Configured_para_type

The LSB bit indicates whether selective forwarding is enabled on a per CID basis, or on a per terminal basis.

Number_RS

This field indicates the number of RS group members for which there is an update of the connection list.for selective forwarding

N_CID

If b0 of Configured_para_type equals 1, this field indicates the total number connections that need to be added to and/or removed from the CID list of the indicated group member. If b0 of Configured_para_type=0, this field indicates the total number subordinate terminal nodes that need to be added to and/or removed from the CID list of the indicated group member.

CID

If b0 of Configured_para_type equals 1, this field indicates the transport CID to be added to and/or removed from the CID list of the indicated group member. If b0 of Configured_para_type=0, this field indicates the basic CID of the subordinate terminal nodes to be added to and/or removed from the CID list of the indicated group member.

Add_Remove

This field indicates whether the CID of the burst will be added to or removed from the current CID list of the RS group member

[Modify RS_Config_RSP message in 6.3.2.3.67 as indicated]

Syntax	Size	Notes
RS_Config-REQ format {		
Management message type = 68	8 bits	

Configured_para_type	8 bits	b0 = 1: preamble configuration is included;
		b1 = 1: remove multicast RSID to disassociate from the RS group;
		b2 = 1: Unicast RSID is included;
		b3 = 1: Multicast RSID is included;
		b4 = 0; Do not transmit preamble; 1: transmit the assigned preamble.
		b5 = 1: R-amble configuration is included
		b~~5~~6 – b7: reserved

If (b0 of Configured_para_type == 1) {		
reserved	1 bits	Shall be zero
Preamble_index	7 bits	Preamble index
}		
If (b2 of Configured_para_type == 1) {		
Unicast RSID	8 bits	Unicast RSID
}		
If (b3 of Configured_para_type == 1) {		
Multicast RSID	8 bits	Multicast RSID as the RS Group ID
}		
If (b5 of Configured_para_type == 1) {		
R-amble_index	8 bits	R-amble index
}		
}		

[Insert the following text at the end of Subclause 6.3.2.3.67]

R-amble_index

This field is used to indicate the R-amble index for transparent RSs.