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Re:	A response to a Call for Technical Proposal, http://wirelessman.org/relay/docs/80216j-076_0XX.pdf
Abstract	The baseline document 802.16j-026r3.pdf has a poor messaging format for relay configuratio We suggest to combine the similar messages into a unique message for proper message forma
Purpose	To update the proposed text proposal.
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Relay Configuration Message Consolidation for the Baseline Document

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1 Introduction

The current baseline document has the following RS configuration messages:

- 6.3.2.3.77 : Relay Frame Configuration Message transmitted from MR-BS and RS to subordinate RSs (sent during network entry).

- First Table in Section 6.3.2.3.66 (Page 26): RS configuration Request message transmitted from RS to MR-BS for preamble/ RS group related configuration change request (sent at any time including network entry).

- Second Table in Section 6.3.2.3.66 (Page 27): RS configuration Request message from MR-BS to RS to configure the R-amble transmission/measurement pattern (Sent during network entry as a unicast message , at any time as a broadcast configuration change message, at any time to have specific measurement as a multicast/broadcast/multiple unicast messages)

- 6.3.2.3.67: MR-BS configuration response message transmitted from MR-BS to RS to configure the preamble index and RS grouping parameters (a unicast message during network entry).

-6.3.2.3.69: RS preamble configuration request message transmitted from MR-BS to RS to assign upto three preambles to an intended RS (a unicast message during network entry).

-6.3.2.3.70: RS preamble configuration response message transmitted by RS to MR-BS to acknowledge whether the specific configuration in 69 is successful or not (during network entry in response to 69)

Clearly, there are similarities among a number of these messages. This happened in the meeting #48 when multiple contributions are approved without having a proper message structure in the baseline document.

In what follows we suggest to combine the similar messages and have only three different messages (instead of six messages mentioned above in the baseline). To that end, we may need broadcast or multicast messaging to configure a system-wide system parameter, or a unicast message to configure parameters related to individual nodes. Some broadcast parameters may need to be adopted by a unicast message to enable individual configuration for new nodes or nodes that requires a different set of configuration parameters.

2 Remedies

For this purpose, we can classify the messages into several classes based on: (a) the RS operation mode~~al stage~~ the message is used; (b) unicast/multicast/broadcast aspect and (c) the sender/receiver basis as follows:

~~(1) Message from RS to BS requesting/responding configuration information~~
~~- Capability of the RS/ preferred RS type (These are not included in the baseline document yet. So this document does not address this category. To be deleted in that case)~~

(1~~2~~) Unicast message from MR-BS to RS in the access mode to provide configuration information. Some information as per the current messages are given below,

- Preamble index/indices, individual RSID - 6.3.2.3.67, and 6.3.2.3.69 and 6.3.2.3.70
- If belong to an RS group, group ID - 6.3.2.3.67
- R-amble configuration - (Second table in part of 6.3.2.3.66)
- frame configuration 6.3.2.3.77

(23) Broadcast messages from MR-BS to RS to configure RSs (to be sent to all the RSs time to time after the network entry process)
- frame configuration - 6.3.2.3.77
- R-amble configuration - (Second Table in part of 6.3.2.3.66)

(34) Messages from MR-BS to a set of RSs to carry out a specific task (different RSs may do different) when necessary (or at given times)

- pre-planned R-amble TX/RX operation for monitoring - (Second table in part of 6.3.2.3.66)

(45) Message from RS to BS requesting its configuration change (i.e. RS group ID)
- RS group assignment change request (First table in - part of 6.3.2.3.66);

To enable these messaging requirementsis, we suggest having three message structures as indicated below.

A. RS_Config_REQ: Unicast message from MR-BS to RS during MS mode of operation (network entry) or RS mode of operation to provide configuration information. T; this may be an unsolicited message or a response to group assignment request from the RS.
Information examples:
- Preamble index/indices, individual RSID - 6.3.2.3.67 and 6.3.2.3.69
- If RS belongs to an RS group, group ID - 6.3.2.3.67

B. RS_Config_RCMSP: Message from RS to BS requesting its configuration change (i.e. RS group ID) or responding to the preamble configuration imposed during MS or RS mode by RS_Config_REQ.
Information examples:
- RS group assignment change request - part ofFirst table in 6.3.2.3.66,
- Fail/Success results for preamble allocation as a response to RS_Config_REQ (-6.3.2.3.70)

C. RS_Configuration_Description (RS_CD): Unicast during MS mode or Broadcast/Multicast message during normal operation from MR-BS to RS to configure RSs
Information: - frame configuration message (-6.3.2.3.77)
- R-amble configuration - (Table 2part of 6.3.2.3.66)

For (A), we combine 6.3.2.3.67, 6.3.2.3.69 and harmonize the naming to RS_Config_REQ.

For (B), we combine 6.3.2.3.66 and 6.3.2.3.70 and harmonize naming to RS_Config_RCMSP.

For (C), we rename the message of 6.3.2.3.77 to "RS configuration-description (RS-CD) message" and move the R-amble related configuration message in 6.3.2.3.66 to this message. One can insert new messages to RS-CD message for configuring additional parameters as it becomes necessary in later stages of 802.16j standardization. This message is included into the C80216j-07_217r2. If that contribution is accepted this section is to be removed.

3 Proposed text changes:

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

3.1 Change 6.3.2.3.66 (RS-Config_REQ message) as follows:

6.3.2.3.66 RSMR-BS Configuration Request Recommendationsponse Message

This message may be transmitted by an RS to request some physical layer operation parameters. An RS may use this message to report information to facilitate the determination of an MR-BS on configuration of RS operation parameters. An RS may transmit this message (i) in response to an RS_Config_REQ message with RS_enable_config field set to 1, or (ii) unsolicited to request removal from an RS group, (iii) or unsolicited to request preamble configuration.

Syntax	Size	Notes
RS_Config-RCMSPEQ format {		
Management message type = 67	8 bits	
Configuration_para_type	8 bits	b0 = 1: preamble configuration is included; b1 = 1: request to be removed from RS group; b2 = 1: response to the RS_Config_REQ from MR-BS b32 – b7: reserved
If (b0 of Configured_para_type == 1) {		
reserved	1 bits	Shall be zerro
Preamble_index	7 bits	Preamble index
}		
If (b2 of Configured_para_type == 1) {		
Result	1 bit	0 = Fail 1 = Succes
Reserved	7 bits	
TLV Encoded Information	Variable	TLV specific
}		
}		

Configuration_para_type

The first bit is used as preamble index indicator to indicate the preamble_index field is present in this message. The second bit is used as indicator to indicate the intent to be removed from the current RS group. The third bit indicates whether a RS response to the preamble configuration message from RS_config_REQ is required or not.

Preamble_index

This field is used to indicate the preamble index.

Result

Result indicates the RS preamble configuration request message; a bit of 0 indicates the message fail and a bit of 1 indicates the message success.

The RS_Config-RCMSP shall contain the following TLVs:

HMAC/CMAC Tuple (see 11.1.2)

The HMAC/CMAC Tuple shall be the last attribute in the message.

3.2 Change subclause as 6.3.2.3.67 (RS-Config_RSP message) as follows:

6.3.2.3.67 MR-BS Configuration Request ~~Response~~ Message

This message may be transmitted by an MR-BS for the purpose of RS configuration. An MR-BS may use this message to set operation parameters for an RS. MR-BS may transmit this message to request RS configuration, or as a response to an RS_Config-RCM~~SPEQ~~ message.~~or as an unsolicited message~~. This may be sent either during MS mode of operation or RS mode of operation.

Syntax	Size	Notes
RS_Config-REQ~~SP~~ 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.
		b~~B~~5 – b7: reserved

If (b0 of Configured_para_type == 1) {		
RS_response_required~~reserved~~	1 bit~~s~~	~~Shall be zero~~ 0: No RS response is required. 1: RS response required
~~Preamble_index~~N_Preamble	~~7 bits~~ 2 bits	~~Preamble index~~ N_Preamble=0 specifies NULL preamble (e.g., Transparent RS) N_Preamble=1 assigns one preamble to the RS N_Preamble=2 assigns two preambles on different segments to the RS N_Preamble=3 assigns three preambles on different segments to the RS
Reserved	5~~6~~ bits	Reserved
For (i=0, i<N_Preamble; i++){		
Preamble_index	8 bits	Assign a preamble index value to the potential RS
}		
TLV Encoded Information	Variable	TLV specific
}		
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
}		
}		

Configuration_para_type

The first bit is used as preamble index indicator to indicate the preamble_index field is present in this message. The second bit is used as the indicator to instruct the RS to remove its multicast RSID so that it is disassociate from the current RS group. The third bit is used as the Unicast RSID indicator to indicate the Unicast RSID field is present in this message. The fourth bit is used as the Multicast RSID indicator to indicate the Multicast RSID field is present in this message.

Preamble_index

This field is used to indicate the preamble index

RS_response_required

This field is used to enable RS to accept/deny the preamble assignment.

Unicast RSID

This field is used to indicate the Unicast RSID

Multicast RSID

This field is used to indicate the Multicast RSID for RS group operations

N-Preamble

N_Preamble is the number of preamble index assigned to the potential RS. For example, N-Preamble=0 means the potential RS does not transmit preamble acting as a Transparent RS. If N-Preamble=1 means the potential RS transmit one preamble index (i.e., the RS transmit one segment value and one IDCell) acting as a Non-Transparent RS. If N-Preamble=2 means the potential RS transmit two preamble index (i.e., the RS transmit two different segment values and IDCells) acting as a Non-Transparent RS.

The RS_Config-RCM~~SP~~ shall contain the following TLVs:

HMAC/CMAC Tuple (see 11.1.2)

The HMAC/CMAC Tuple shall be the last attribute in the message.

3.3 Change Subclause 6.3.2.3.77 (Relay Frame configuration message) as follows:

{ Notes to Editor: This message is to be submitted as a separate contribution C802.16j-07-217 which is already in the frame structure adhoc set up at meeting #48. If that is taken up separately this message is to be removed from here}

6.3.2.3.77 ~~Relay Frame configuration Message~~ Relay Configuration Description (RS_CD) message.

The MR-BS or RS shall transmit the Relay Configuration Description (RS-CD) message for subordinate RSs to:

(a) configure the multi-hop relay frame structure

(b) send the R-amble transmission/reception instructions to a set of RSs for preplanned neighborhood monitoring scheme

(c) send the R-amble transmission configuration parameters for synchronization and autonomous neighborhood monitoring operation

~~- Sends the R-amble transmission/reception instructions to a set of RSs for preplanned neighborhood monitoring scheme~~

~~This message shall be transmitted on the basic CID or broadcast CID.~~ This message can be sent either during access mode (initial entry) as a unicast message or any time during the normal operation as a multicast or broadcast message using the basic CID or broadcast CID.

If the b0 of Configuration_para_type is 1 the message includes frame configuration parameters as in (a), which is described in Section 8.4.4.7.

If the b1 of Configuration_para_type is 1 the message includes R-amble transmission monitoring configuration parameters as in (b) and (c) which is described below for the two cases.

Insert the text from Page 26, Line 37 until Page 27, line28, and modify as indicated below:

~~The MR-BS can send a RS_Config-REQ message to instruct the RSs to transmit or receive the R-amble in relay zone. This message can be sent by either unicast, multicast or broadcast CID of the RSs. An 8 LSB bits of the frame number index will indicate the starting point of the subsequent R-amble transmission/reception opportunities. In order to instruct the stations in different MR-cell to transmit/receive the R-ambles at the same time, a coordinator in backhaul network is needed to ensure the Start Frame Number in the message sent by different MR-BSs will align to the same time.~~

When the Prefix is set as "00", the configuration message as per above (b) is sent, i.e. tthe RS shall follow the pattern instructed by MR-BS to transmit/receive the R-amble in relay zone. The pattern is composed by the amble index, and the RS shall transmit/receive the R-amble according to the field where its amble index is. Start Frame Number is the 8 LSB bits of frame number index used to indicate the starting point of subsequent R-amble transmission/reception opportunities. In order to coordinate the R-amble transmission/reception in different MR-cell, a coordinator in backhaul network is needed to ensure the Start Frame Number parameters sent in different MR-cell will align to the same time. The transmission opportunities are identified by Monitoring Duration and Interleaving Interval for each iteration. An example is given in Figure x, where the Duration = 2, Interleaving Interval = 3 and the Iteration = 2. When the Iteration is more than one, the pattern for each iteration will be carried in this message. After the last iteration, the RSs shall report the measurement results by RS_NBR-MEAS-REP message defined in 6.3.2.3.63.

Move Lines 24-28 on Page 27 to the following paragraph as indicated below:

If the Prefix is set "01", the configuration message as per above (c) is sent, i.e., the RS will autonomously transmit/receive the R-amble ~~in relay zone~~ without periodic instruction from MR-BS by defining R-amble repetition patterns and monitoring patterns. The deactivation or activation of the functionalities of individual RSs can be done by sending (unicast) this message during initial entry of an RS. In the case of conflict, broadcast message parameters shall supersede the unicast message parameters except for the case of the parameter M which shall be set only by the unicast message. –The detail design of the associated parameters is stated in 8.4.6.1.1.46.3.x.x. ~~The RS is instructed to report its measurement results if the Prefix is set as "10"~~ - When the RS is instructed to transmit/receive the R-amble transmission autonomously, the MR-BS shall send the measurements using standard measurement reporting mechanisms already defined in this document. Alternatively, MR-BS can instruct the RS to report its measurement results by this message with the prefix set as "10".

~~This message is transmitted (unicast or broadcast) by a MMR-BS for the purpose of RS configuration. A MMR-BS can use this message to set operation parameters for a RS. This also can be used to choose the R-amble repetition pattern and to activate or deactivate these monitoring/synchronization processes for a specified period.~~

~~The deactivation or activation of the functionalities of individual RSs can be done by sending (unicast) this message during initial entry of an RS. In the case of conflict, broadcast message parameters shall supersede the unicast message parameters except for the case of the parameter M which shall be set only by the unicast message.~~

Syntax	Size	Notes
Relay_Configuration_Description() {		
Management message type = xx	8bits	
Configuration_para_type	8 bits	b0 = 1, Frame Structure-Configuration message is included. b1 = 1, R-amble transmission monitoring parameters are included.

		b2 to b7 are reserved
If (b0 of Configuration_para_type == 1) {		
Type of frame	1 bits	0: single frame approach 1: multiframe approach
Frame Number	4 bits	Frame number to take effect
DL indicator	1 bit	1: indicates DL subframe configuration are included
UL indicator	1 bit	1: indicates UL subframe configuration is included
Reserved	1 bit	
If(Type of frame ==0){		
If (DL indicator ==1){		
Number of relay zones	8 bits	
for (i=0; i< Number of Relay zones; i++) {		
Transceiver mode	2 bits	00: Tx mode, 01:Rx mode, 11:Idle mode
OFDMA Symbol Offset	*8 bits*	
Frame_Config_Duration	6 bits	
}		
}		
If (UL indicator ==1){		
Number of relay zones	8 bits	
for (i=0; i< Number of Relay zones; i++) {		
Transceiver mode	2 bits	
OFDMA Symbol Offset	8 bits	
Frame_Config_Duration	6 bits	
}		
}		
}		
If(Type of frame ==1){		
If (DL indicator ==1){		
Number of frame	8 bits	
for (i=0; i< Number of frame; i++) {		
Transceiver mode	2 bits	00: Tx mode, 01:Rx mode, 11:Idle mode
OFDMA Symbol Offset	8 bits	
Reserved	6 bits	

}		
}		
If (UL indicator ==1){		
Number of frame	8 bits	
for (i=0; i< Number of frame; i++) {		
Transceiver mode	2 bits	00: Tx mode, 01:Rx mode, 11:Idle mode
OFDMA Symbol Offset	8 bits	
Reserved	6 bits	
}		
}		
}		
}		
If (b1 of Configuration_para_type == 1) {		
{		
Start Frame Number	8 bits	8 LSB bits of the frame number
Monitoring_Duration	8 bits	Units are frames
Prefix	2 bits	00: The R-amble transmission and reception is instructed by MR-BS. 01: The R-amble transmission and measurement shall be performed autonomously. 10: The RSs shall report its neighbor measurement results. 11: *reserved*
If (Prefix == 00){		
Interleaving Interval	8 bits	Units are frames
Iteration Number	8 bits	Units are frames
N_stations	8 bits	Number of stations received this message
For (j=0, j< Iteration, j++){		
N_Transmitter	8 bits	Number of stations to transmit the R-amble
For (i=0, i< N_Transmitter , i++){		
Amble Index	8 bits	The RS with the amble index in this list shall transmit the R-amble
}		
For (j=0, j< N_stations - N_Transmitter , j++){		
Amble Index	8 bits	The RS with the amble index in this list shall receive the R-amble
}		
}		
}		
If (Prefix == 01){		

Config_type	3 bits	Bit [0] = 1: R-amble for synchronization is present. Bit [0] = 0: R-amble for synchronization is not transmitted. Bit [1] = 1: R-amble for random monitoring is present; Bit [1] = 0: any current monitoring operation is to be stopped by all RSs. Bit [2] = 1: any RS which does not support subordinate RSs should transmit the R-amble for advertisement purpose Bit [2] = 0: any RS which does not support subordinate RSs should not transmit the R-amble.
If (Config_type[0] = = 1){		
Synchronization cycle	8 bits	N, Units are frame (see subsection 8.4.6.1.1.3.1)
Synchronization frame offset	4 bits	Ks, Units are frame (see subsection 8.4.6.1.1.3.1)
}		
If (Config_type[1] = = 1){		
Neighbor monitoring cycle	4 bits	M, Units are frame (see subsection 8.4.6.1.1.3.2)
Neighbor monitoring frame offset	4 bits	Kmn, Units are frame (see subsection 8.4.6.1.1.3.1)
Neighbor monitoring frame repetition	8 bits	L, Units are frame (see subsection 8.4.6.1.1.3.1)
}		
}		
Report Request	1 bit	0: RSSI 1: CINR
}		

Type of frame:

This field indicates whether a single frame approach or multi frame approach is being used.

Frame number:

This is the frame number for the frame configuration to take effect. The system applies the frame configuration in the message starting from the frame number.

DL indicator:

-1 indicates that the message include DL subframe configuration.

UL indicator:

1 indicates that the message include UL subframe configuration.

Transceiver mode:

-Transceiver mode in the relay zone is one of either Tx mode, Rx mode, or Idle mode. When the transceiver mode is idle mode, it does not transmit nor receive.

OFDMA symbol Offset :

The relay zone starts at the OFDMA symbol Offset.

Duration:

-The relay zone ends after the duration starting from the OFDMA symbol offset. The unit of duration is OFDMA symbol.

Number of frame :

This field indicates the number of frames in a multi-frame.

Start Frame Number

The RS shall start transmitting/receiving the R-amble from this designated frame number

Monitoring_Duration

Duration (in units of frames) of the measurement/monitoring/transmission process. If the Monitoring_Duration value is set to 0x00 and prefix is 0b01 monitoring is to be continued until further notice

Interleaving Interval

The period (in units of frames) which is interleaved between the consecutive R-amble transmission/reception opportunity

Iteration

The requested number of iterating intervals

N_Transmitter

Number of stations instructed to transmit R-amble, the station may be RS or MR-BS.

N_Receiver_RS

Number of RSs instructed to receive R-amble

Amble index

R-amble means preamble, midamble or postamble transmitted in relay zone. It will be determined by R-amble location in downlink relay zone.

Synchronization Cycle Length, N

This field is used to indicate the synchronization R-amble period if present

Synchronization Frame Offset, Ks

The offset of the second R-amble in the synchronization cycle

Neighbor Monitoring Frame Repetition Rate, L

This field is used to indicate the neighbor monitoring R-amble period if present

Neighbor Monitoring Frame Offset, Kmn

The offset of the R-amble in the neighbor monitoring cycle

Neighbor Monitoring Cycle Length, M

This defines the number of neighbor monitoring R-amble frames in an R-amble monitoring cycle

3.4 Remove Subcaluses 6.3.2.3.69 and 6.3.2.3.70.

[Note to editor: Subclause 6.3.2.3.69 has beenis merged to 6.3.2.3.67, and Subclause 6.3.2.3.70 has beenis merged to 6.3.2.3.66].

3.5 Change Subclause 6.3.2.3 (MAC management messages) as follows:

[Note to Editor: There are proposals to take this section out of this contribution and submit a new contribution, which is TBD. The message numbernumbering in the left column of the following table is to be incorporated as per the editor's discretion. The Section numbers of the Sections 6.3.2.3.XXin the baseline document C802.16j-078-026r3 should be changed according to the message numberrs in this table]

6.3.2.3 MAC Management Messages

67	RS-CDC	Cooperative diversity configuration for RS message	Basic { Notes to Editor: Currently this is in the Section 6.3.2.3.62 of C802.16j-078-026r3 which needs to be changed to 6.3.2.3.67}
X1	MR-NBR-INFO	MR-NBR-INFO mESSAGE	Basic
X2	MR_Code_REP	MR Code Report message	Basic
X3	RS_Config_REQ	RS configuration request message	Basic
X4	RS_Config_RCM	RS Configuration recommendation message	Basic
X5	RS_CD	Relay Configuration Description (RS_CD) message	Basic
X6x	CID_ALLOC-IND	CID allocation message	Basic
(X6+1) 68-255		*Reserved*	

++++End text++++++