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Source(s)	Adrian Boariu, Shashikant Maheshwari, Haihong Zheng, Yousuf Saifullah, Peter Wang Nokia Siemens Networks E-mail: <a href="mailto:adrian.boariu@nsn.com">adrian.boariu@nsn.com</a>
Re:	This is in response for call for comments P802.16j/D1
Abstract	Some clarifications for RS_CD message
Purpose	Review and adopt
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## On RS\_CD message

Adrian Boariu, et al.

NSN

### Introduction

The RS\_CD message provides configuration parameters for an RS. The current message does not include certain parameters like EIRP, BSID, etc., so we have re-written this message.

### Specification changes

[Replace the section 6.3.2.3.73 as following]

This message is sent using the primary CID to an RS for initial network entry or reconfiguration procedure, in order to inform the (re)configuration parameters that the RS shall apply. Upon receiving the message, the RS responds using MR\_Generic-ACK (6.3.2.3.86) only if it evaluates that the configuration can be applied on time.

*NOTE: The following messages are affected by this new format: REG-REQ/RSP, SBC-REQ/RSP, RS\_Config-REQ*

**Table 183n—RS configuration description (RS-CD) message format**

Syntax	Size	Notes
RS-CD_Message_Format(){		
Management Message Type = 79	8 bits	
Transaction ID	16 bits	
Frame Number Action	8 bits	The LSB 8 bits of the access station FN when the configuration shall be applied.
CPAT (Configuration Parameter and Action Type) bitmap	16 bits	b0=1, Preamble index included b1=1, R-amble index included b2=1, RS EIRP included b3=1, RS Frame Offset included b4=1, BSID included b5=1, Operator ID included b6=1, Used Subchannel included b7=1, DL subframe structure configuration included b8=1, UL subframe structure configuration included b9=1, R-amble transmission/monitoring parameters included b9-b15: reserved
If (b0 of CPAT == 1) {	-	-
Preamble index	8 bits	The preamble index assigned. This is for non-transparent RS.
}	-	-
If (b1 of CPAT == 1) {	-	-
R-amble index	8 bits	The R-amble index assigned.
}	-	-
If (b2 of CPAT == 1) {	-	-
RS EIRP	8 bits	The EIRP value to be used by the RS on DL.
}	-	-
If (b3 of CPAT == 1) {	-	-
RS Frame Offset	8 bits	LSB 8 bits, unsigned integer frame offset value between FN used by the RS's superordinate station and FN that should be used by the RS.
}	-	-

If (b4 of CPAT == 1) {	-	-
BSID	48 bits	BSID assigned to RS.
}	-	-
If (b5 of CPAT == 1) {	-	-
Operator ID	48 bits	Operator ID assigned to RS. If not present, the RS should use that of its access station.
}	-	-
If (b6 of CPAT == 1) {	-	-
Used Subchannel bitmap	6 bits	bit #0, Subchannel group 0 bit #1, Subchannel group 1 bit #2, Subchannel group 2 bit #3, Subchannel group 3 bit #4, Subchannel group 4 bit #5, Subchannel group 5
<i>Reserved</i>	2 bits	shall be set to zero
}	-	-
if(b7 of CPAT == 1) {	-	-
Number of frames	8 bits	This value shall be the same value as that used when UL configuration is present.
for(i=0; i<Number of frames; i++){	-	-
Number of zones	3 bits	First zone is always access zone for DL
<i>reserved</i>	5 bits	Shall be zero
for(j = 0; j<Number of zones; j++){	-	-
Transceiver mode	2 bits	00: Tx mode 01: Rx mode 11: Idle mode
OFDMA Symbol Offset	7 bits	
Frame_Config_Duration	6 bits	
Zone Configuration indicator	1 bit	1: Zone Configuration included
if (Zone Configuration indicator ==1) {	-	-
Zone Configuration IE_Format()	<i>Variable</i>	see Table 183o
}	-	-
}	-	-
}	-	-
}	-	-
if(b8 of CPAT ==1){	-	-
Number of frames	8 bits	This value shall be the same value as that used when DL configuration is present.
for(i =0; i<Number of frames; i++){	-	-
Number of zones	3 bits	
<i>reserved</i>	5 bits	Shall be zero
for(j = 0; j<Number of zones; j++){	-	-
Transceiver mode	2 bits	00: Tx mode 01: Rx mode 11: Idle mode
OFDMA Symbol Offset	7 bits	
Frame_Config_Duration	6 bits	
Zone Configuration indicator	1 bit	1: Zone Configuration included
if (Zone Configuration indicator ==1) {	-	-
Zone Configuration IE_Format()	<i>Variable</i>	see Table 183o
}	-	-
}	-	-
}	-	-
}	-	-
If(b9 of CPAT == 1){	-	-
Start Frame Number	8 bits	8 LSB bits of the frame number at MR-BS
Monitoring_Duration	8 bits	Units are frame

Prefix	2 bits	00: The R-amble transmission and measurement 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
Report Request	1 bit	0:RSSI 1:CINR
Reserved	1 bit	Shall be zero
if(Prefix == 00) {	-	-
Interleaving Interval	8 bits	Units are frame
Iteration Number	8 bits	Units are frame
N_stations	6 bits	Number of stations received this message
For(i=0; i<Iteration; i++){	-	-
N_Transmitter	6 bits	Number of stations to transmit the R-amble
for(j=0;j<N_Transmitter;j++){	-	-
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
<i>Reserved</i>	1 bit	Shall be zero
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)
<i>Reserved</i>	4 bits	Shall be zero
}	-	-
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	Km, 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)
}	-	-
}	-	-
}	-	-
Encoded TLV	<i>variable</i>	
}	-	-

**Frame Number Action**

This is the frame number for configuration to take effect. The RS applies the configuration starting from this frame number of the access station and given in this parameter.

**RS Frame Offset**

RS frame offset indicates the offset value between frame number used by the RS's superordinate station and frame number that should be used by the RS for whom this message is addressed. When the RS broadcast frame number in its frame, RS shall keep the offset relative to the frame number used by the superordinate station as indicated by this value. The value represents LSB 8 bits, unsigned integer for the frame offset.

**RS EIRP**

The MR-BS shall indicate to the RS the EIRP the RS can utilize on the access DL preamble and advertised in any DCD message transmitted by the RS on the access link. The EIRP parameter is reported in dBm and quantized in 1dB steps ranging from [TBD]dBm (encoded 0x00) to [TBD]dBm (encoded 0xFF). Values outside this range shall be assigned the closest extreme.

**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 counted after the preamble of the corresponding frame.

**Frame Configuration Duration**

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

**Number of frames**

This field indicates the number of frames in a multi-frame. The value zero is not valid. If the value is one, this indicates single-frame structure.

**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**

The index of the R-amble (see 8.4.6.1.1.3)

**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, Km**

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

The RS-CD message may include the following TLVs:

**UL allocation start time**

This TLV indicates the effective start time of the uplink allocation defined by the R-MAP on R-link. If the effective start time is defined as 0, the uplink allocation defined by the R-MAP is effective in the current frame; if the value of this TLV is set to N, the uplink allocation defined by the R-MAP in frame  $i$  is effective in frame  $i + N$ .

When the Prefix is set as "00", the RS shall follow the pattern instructed by MR-BS to transmit/receive the R-amble. 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.

If the Prefix is set "01", the RS will autonomously transmit/receive the R-amble 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 8.4.6.1.1.4. When the RS is instructed to transmit/receive the R-amble transmission autonomously, the RS 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".

### RS paging group (see 11.23.2)

### Preamble indexes reserved for moving relay station (see. 11.23.1)

### Preamble reselection thresholds (see. 11.24)

### HMAC/CMAC Tuple (see 11.1.2)

Table 183o Zone Configuration IE

Zone Configuration IE_Format() {	-	-
Zone Configuration bitmap	8 bits	b0=1, permutation based included b1=1, range of subchannels included b2=1, STC mode b3=1, Cooperative diversity mode b4=1, AMC mode b5=1, Safety/PAR reduction mode b6-b7: reserved
if (b0 of Zone Configuration bitmap ==1) {		
Permutation based	6 bits	DL_PermBase to be used in this zone
Reserved	2 bits	
}	-	-
if (b1 of Zone Configuration bitmap ==1) {	-	-
Min Subchannel index	8 bits	The index of subchannel from which the allocation starts.
Max Subchannel index	8 bits	The index of subchannel at which the allocation ends.
}	-	-
if (b2 of Zone Configuration bitmap ==1) {	-	-
STC mode	TBD	
}	-	-
if (b3 of Zone Configuration bitmap ==1) {	-	-
Cooperative diversity mode	TBD	
}	-	-
if (b4 of Zone Configuration bitmap ==1) {	-	-
AMC mode	TBD	
}	-	-
if (b5 of Zone Configuration bitmap ==1) {	-	-
Safety/PAR reduction mode	TBD	
}	-	-
}	-	-

### More changes need to be done...

[Change the section 6.3.2.3 as following]

Change the line 42 the "Connection" column for RS\_CD from "Basic" to "Primary"

[Replace the section 6.3.2.3.73 as following]

Delete the section 11.7.27 RS frame offset.

Delete on p. 22 lines 11 and 22 the "RS frame offset (11.7.27)". Also delete the lines 27 and 28 with the sentence that refers to this TLV.