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Clarify and Decrease the RNG_REQ message overhead in IEEE 802.16e

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1. Introduction

In the current IEEE P802.16e/D5a, the RNG_REQ message includes Serving BS ID and Target BS ID items. However, we think it is not necessary to include Target BS ID and Preamble Index in the RNG_REQ message, because when it is attempting to range the Target BS, the MSS have acquired the synchronization with the Target BS, and acquired the DCD/UCD and DL/UL_MAP message, so the MSS have acquired the Target BS ID and Preamble Index information.

In addition, MSS MAC Address shall be included in the RNG-REQ message when the MSS is attempting to join the network. However, when the MSS is performing handover and attempting to range the Target BS, MSS MAC Address may not be included in the RNG_REQ message, because the MSS have acquired the HO_ID assigned by Target BS before performing handover.

In this contribution, we clarify the information elements in the RNG_REQ message.

2. Proposed Text Changes

Modify the text in section 6.3.2.3.5 beginning with the sentence shown as indicated.] Page 28 Line23 in IEEE P802.16e/D5a.

All other parameters are coded as TLV tuples as defined in 11.5.

The following parameters shall be included in the RNG-REQ message when the MSS is attempting to join the network:

Requested Downlink Burst Profile
MSS MAC Address

But when the MSS is performing handover and is attempting to range the Targer BS, MSS MAC Address may not be included in the RNG_REQ message. Because the MSS may acquire the HO_ID assigned by Target BS when the MSS has been completed association. So when the HO_ID has been included in the RNG_REQ message, the MSS MAC Address will not be included in the RNG_REQ message.

The following parameters shall be included in the RNG-REQ message when the MSS is attempting to perform re-entry, association or handover:

Serving BSID

The BSID of the BS to which the MSS is currently connected (has completed the registration cycle and is in Normal Operation). The serving BSID shall not be included if the interval timer is timed-out (serving BSID AGINGTIMER, see Table 264a). Inclusion of serving BSID in the RNG-REQ message signals to the sarget BS that the MSS is currently connected to the network through the serving BS and is performing association or is in the process of handover network re-entry.

~~Target BS ID~~
~~Preamble Index~~

The following TLV parameter shall be included in the RNG-REQ message when the MSS is attempting to perform re-entry or handover:

HO Indication

Presence of item in message in combination with serving BS ID BSID indicates the MSS is currently attempting to HO; or in combination with Paging Controller ID the MSS is attempting Network Re-entry from Idle Mode to the BS.

Location Update Request

Presence of item in message indicates MSS action of Idle Mode Location Update Process.

Paging Controller ID

This The Paging Controller ID is a logical network identifier for the serving BS or other network entity retaining MSS service and operational information and/or administering paging activity for the MSS while in Idle Mode.

The following TLV parameter may be included in RNG_REQ message when a MSS is performing initial ranging to the selected target BS:

HO_ID

Optional ID assigned for use in initial ranging to the target BS during HO once the BS is selected as the target BS.

The following TLV parameter shall be included in the RNG-REQ message when the MSS is attempting to perform Location Update due to power down:

Power Down Indicator

Indicates the MSS is currently attempting to perform Location Update due to power down.

The following parameter may be included in RNG_REQ message when the MSS is attempting to perform handover and needs to inform target BS of its preference to continue in Sleep Mode after handover to target BS.

Power_Saving_Class_Parameters

Compound TLV to specify Power Saving Class operation.

[Insert at the end of section 6.3.2.3.5]

The following parameter may be included in the RNG-REQ message when the MSS is attempting to perform network re-entry or handover and the MSS has a valid HMAC Tuple necessary to expedite security authentication.

HMAC Tuple (see 11.1.2)

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