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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, 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~~

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 target 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:

**MSS MAC Address**

MSS MAC Address shall be included in RNG-REQ during the initial network entry. During the HO process, MSS MAC Address shall be included in RNG-REQ when the HO-ID is not available from 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.