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Title	Service Primitives for Location Update	
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Re:	Call for Comment on P802.16g Baseline Document	
Abstract	This contribution proposes service primitives for location update.	
Purpose	The document should be considered during the resolution of comments on the baseline document.	
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Service Primitives for Location Update

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Problem Statement

In this contribution, we propose service primitives for Location Update which are exchanged through Control Service Access Point (C-SAP) of Management Plane specified in IEEE 802.16g baseline document. Location Update of an MSS is performed by Mobility Management service of an NCMS. An MSS in idle mode performs Location Update in order to inform an NCMS of its current location information, i.e., paging group, and this information is used to page cells within paging group of the called MSS when there is pending DL traffic toward the MSS.

Location Update is performed if any of Location Update conditions is met and there are currently four Location Update conditions defined: Zone Update, Timer Update, Power Down Update, and MAC Hash Skip Threshold Update. In Zone Update, the MSS shall perform Location Update process when the MSS detects a change in paging group by comparing the paging group identifier, PG_ID, stored in the MSS with that of transmitted by the preferred BS in the DCD message or MOB_PAG-ADV broadcasting message. In Timer Update, MSS shall periodically perform Location Update process prior to the expiration of the idle mode timer. In Power Down Update, the MSS shall attempt to complete a Location Update once as part of its orderly power down procedure. In MAC Hash Skip Threshold update, the MSS shall perform Location Update process when the MSS MAC hash skip counter exceeds MAC hash skip threshold.

All the above Location Updates are realized by Ranging request/response (RNG-REQ/RSP) message between an MSS and a BS, and Location Update request and Location Update response service primitives are defined between a BS and an NCMS to perform Location Update, as shown in Fig. 1.

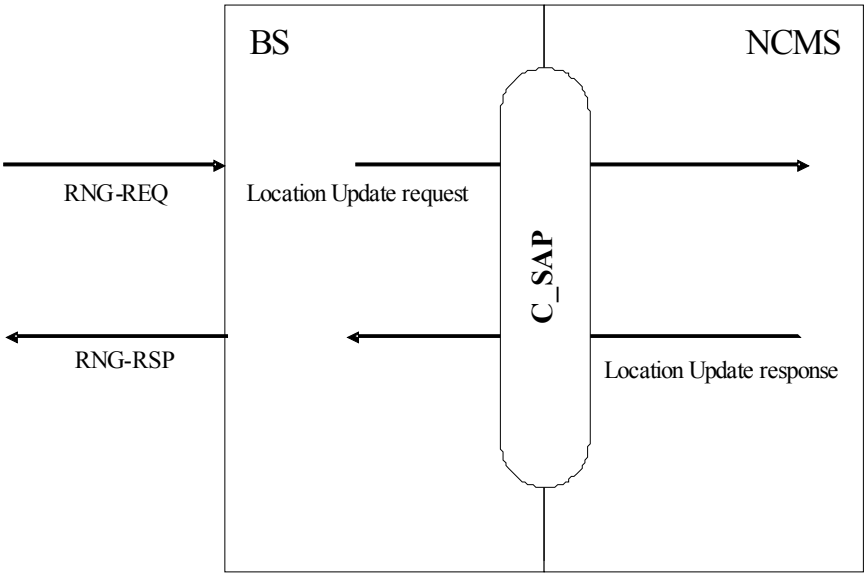

Fig. 1 - Location Update Primitives

Summary of the Proposed Remedy

In this contribution, we define two primitives for supporting Location Update between a BS and an NCMS, which are described briefly in the following table.

Primitive	Direction	Primitive Contents
Location Update request	BS -> NCMS	MSS MAC Address, BS ID, Paging Controller ID, Paging Group ID, MAC Hash Skip Threshold, Power Down Indicator
Location Update response	NCMS -> BS	MSS MAC Address, Location Update Result, Paging Information, Paging Controller ID, MAC Hash Skip Threshold, Power Down Response

Proposed Text Changes

[Modify section 14.5.9.3 as follow]

14.5.9.3 Location Management

14.5.9.3.1 Location Update Procedure

Location management of an MSS is performed by mobility management service of an NCMS. An MSS in idle mode performs Location Update in order to inform an NCMS of its current location information, i.e., paging group, and this information is used to page cells within paging group of the called MSS when there is pending DL traffic toward the MSS.

Location Update is performed if any of Location Update conditions is met and there are currently four Location Update conditions defined: Zone Update, Timer Update, Power Down Update, and MAC Hash Skip Threshold Update. In Zone Update, the MSS shall perform Location Update process when the MSS detects a change in paging group by comparing the paging group identifier, PG_ID, stored in the MSS with that of transmitted by the preferred BS in the DCD message or MOB_PAG-ADV broadcasting message. In Timer Update, MSS shall periodically perform Location Update process prior to the expiration of the idle mode timer. In Power Down Update, the MSS shall attempt to complete a Location Update once as part of its orderly power down procedure. In MAC Hash Skip Threshold update, the MSS shall perform Location Update process when the MSS MAC hash skip counter exceeds MAC hash skip threshold.

All the above Location Updates are realized by Ranging request/response (RNG-REQ/RSP) message between an MSS and a BS, and Location Update request and Location Update response service primitives are defined between a BS and an NCMS to perform Location Update.

Figure 2 shows service primitives for Location Update between a BS and an NCMS.

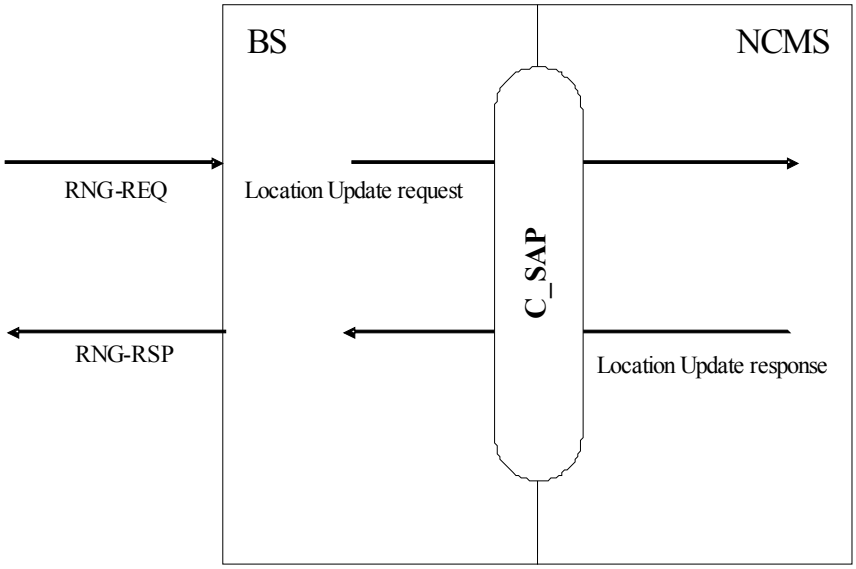

Fig. 2 - Location Update Primitives

14.5.9.3.2 Service Primitives for Location Update

14.5.9.3.2.1 Location Update request

14.5.9.3.2.1.1 Function

This primitive is issued by a BS to inform a management entity of Mobility Management Services in an NCMS that an MSS requests to initiate Location Update.

14.5.9.3.2.1.2 Semantics of the service primitive

The parameters of the primitives are as follows:

Location Update request
(
MSS MAC Address
BS ID
Paging Controller ID
Paging Group ID
MAC Hash Skip Threshold
Power Down Indicator
)

MSS MAC Address
48-bit MAC address which will identify MSS
BS ID
Identifier of serving BS
Paging Controller ID
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.

Paging Group ID
One or more logical affiliation groupings of BS
MAC Hash Skip Threshold
Maximum number of successive MOB_PAG-ADV messages that may be sent from a BS without individual notification for an MSS, including MAC address hash of an MSS for which Action Code is 00, 'No Action Required'.
Power Down Indicator
Indicates the MSS is currently attempting to perform Location Update due to power down.

14.5.9.3.2.1.3 When generated

This primitive is generated when the BS receives RNG-REQ message with either Ranging Purpose Indication with bit #1 set to 1, MAC Hash Skip Threshold, or Power Down Indicator.

14.5.9.3.2.1.4 Effect of receipt

This primitive shall be generated on BS side and a management entity of Mobility Management Services shall respond to this primitive by sending Location Update response.

14.5.9.3.2.2 Location Update response

14.5.9.3.2.2.1 Function

This primitive is issued by the NCMS to respond to Location Update request from the BS

14.5.9.3.2.2.2 Semantics of the service primitive

The parameters of the primitives are as follows:

Location Update response
(
MSS MAC Address
Location Update Result
Paging Information
Paging Controller ID
MAC Hash Skip Threshold
Power Down Response
)

MSS MAC Address
48-bit MAC address which will identify MSS
Location Update Result
Response to Location Update Request:
0x00=Failure of Idle Mode Location Update. The MSS shall perform Network Re-entry from Idle Mode
0x01=Success of Idle Mode Location Update
0x10, 0x11: Reserved
Paging Information
New Paging Information assigned to MSS. Paging Information shall only be included if Location Update Response=0x01 and if Paging Information has changed. The Paging Information TLV defines the Paging Group ID, PAGING_CYCLE and PAGING OFFSET parameters to be used by the MSS in IDLE mode. PAGING_CYCLE is the cycle in which

the paging message is transmitted within the paging group. PAGING OFFSET determines the frame within the cycle in which the paging message is transmitted and it must be smaller than PAGING CYCLE value. Paging Group ID specifies the paging group the MSS is assigned to.

Paging Controller ID

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. Paging Controller ID shall only be included if Location Update Response=0x01 and if Paging Controller ID has changed.

MAC Hash Skip Threshold

Maximum number of successive MOB_PAG-ADV messages that may be sent from a BS without individual notification for an MSS, including MAC address hash of an MSS for which Action Code for the MSS is 00,'No Action Required'. If BS does not include this TLV item in the RNG-RSP message, any BS may omit MAC Address Hash of the MSS with Action Code 00,'No Action Required' from any MOB_PAG-ADV message.

Power Down Response

Indicates the MSS's Power Down Location Update result.
0x00= Failure of Power Down Information Update.
0x01= Success of Power Down Information Update.

14.5.9.3.2.2.3 When generated

This primitive is generated at an NCMS in order to request a BS to issue a RNG-RSP message.

14.5.9.3.2.2.4 Effect of receipt

A BS receiving Location Update response shall transmit RNG-RSP message with the appropriate parameters settings.

References

[1] IEEE 802.16e/D9
[2] IEEE 802.16g-04/03r3, "Baseline Document – P802.16g Management Plane Procedures and Services"
[3] IEEE Std 802-16-2004