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Title	Service Primitive for Paging Management
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Re:	Call for Comment on P802.16g Baseline Document
Abstract	This contribution proposes service primitive for paging group action
Purpose	The document should be considered during the resolution of comments on the baseline document.
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Service Primitive for Location Update Management

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Problem Statement

1) When the MS perform Location Update by RNG_REQ, the new Paging Group ID should be assigned by NCMS(Paging Controller) via Location Update Response message after receiving the Location Update Request message from BS.
2) In order to assure secure location update, the Location Update procedure should use 3-handshake mechanism, so this contribution propose to add a new primitives-Location Update Confirm message to NCMS.
3) The flag of the completion of Location Update should be occurred after SBS send RNG_RSP message to the MS.
4) The SBS should tell NCMS the result of Location Update.

Summary of the Proposed Remedy

In this contribution, we define a primitive for supporting Paging Group Management between a BS and an NCMS, which is described briefly in the following table.

Primitive	Direction	Primitive Contents
Location Update Request	BS -> NCMS	MS MAC Address BS ID Paging Controller ID
Location Update Respons e	NCMS -> BS	MS MAC Address Paging Controller ID Paging Information
Location Update Confirm	BS -> NCMS	MS MAC Address BS ID Paging Controller ID Location Update Result MAC Hash Skip Threshold Power Down Response

Proposed Text Changes

[Modify section 14.5.9.3.2 as follow]

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 MS 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
(
MS MAC Address
BS ID
Paging Controller ID
~~Paging Group ID~~
~~MAC Hash Skip Threshold~~
~~Power Down Indicator~~
)

MS MAC Address
48-bit MAC address which will identify MS

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 MS service and operational information and/or administering paging activity for the MS 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 MS, including MAC address hash of an MS for which Action Code is 00, 'No Action Required'.~~
~~**Power Down Indicator**~~
~~Indicates the MS 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 Paging Controller ID and 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
(
MS MAC Address
~~Location Update Result~~
Paging Information
Paging Controller ID
~~MAC Hash Skip Threshold~~
~~Power Down Response~~
)
MS MAC Address
48-bit MAC address which will identify MS

~~**Location Update Result**~~
~~Response to Location Update Request:~~
~~0b00=Failure of Idle Mode Location Update. The MS shall perform Network Re-entry from Idle Mode~~
~~0b01=Success of Idle Mode Location Update~~
~~0b10, 0b11: Reserved~~

Paging Information
New Paging Information assigned to MS. 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 MS 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 MS is assigned to.

Paging Controller ID
Paging Controller ID is a logical network identifier for the serving BS or other network entity retaining MS service and operational information and/or administering paging activity for the MS 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 MS, including MAC address hash of an MS for which Action Code for the MS is 00,'No Action Required'. If BS does not include this TLV item in the RNGRSP message, any BS may omit MAC Address Hash of the MS with Action Code 00,'No Action Required' from any MOB_PAG-ADV message.~~

~~**Power Down Response**~~
~~Indicates the MS'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.

14.5.9.3.2.2 Location Update Confirm

14.5.9.3.2.2.1 Function
This primitive is issued by the BS to confirm Location Update result to the NCMS.

14.5.9.3.2.2.2 Semantics of the service primitive

The parameters of the primitives are as follows:

Location Update confirm
(
MS MAC Address
BS ID
Paging Controller ID
Location Update Result
Power Down Response
)

MS MAC Address

48-bit MAC address which will identify MS

Location Update Result
Response to Location Update Request:
0b00=Failure of Idle Mode Location Update. The MS shall perform Network Re-entry from Idle Mode
0b01=Success of Idle Mode Location Update
0b10, 0b11: Reserved

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

Power Down Response
Indicates the MS'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 BS after a BS transmit RNG_RSP message.

14.5.9.3.2.2.4 Effect of receipt
NCMS receives Location Update Confirm from BS and finally updates MS location.

References

[1] IEEE 802.16e/D10
[2] IEEE 802.16g-04/008, “Baseline Document – P802.16g Management Plane Procedures and Services”
[3] IEEE Std 802-16-2004