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Re:	Contribution on comments to IEEE 802.16g/D8
Abstract	Re-definition of Idle mode service primitives in section 14.2.4.2
Purpose	Adoption
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Amendment to Idle Mode Service Primitives

Jeehyeon Na, Jaesun Cha, Jungmo Moon and Sangho Lee

ETRI

1. Motivation

This contribution is to clarify the subscriber mode related function of an NCMS on an MS side and refine idle mode service primitives and figures in order to include service primitives between an MS and an NCMS on the MS side. It consists of two parts; changing of subscriber mode management and idle mode service primitives.

1) Motivation of changing of subscriber mode

Subscriber mode management is described as informative in section 14.2.4 and it is managed at an MS, a BS and an NCMS. Figure 479 which shows subscriber mode transition diagram at an NCMS is not clear whether for an NCMS on a BS and an MS side or not.

Therefore, we clarify figure 479 and the related texts in order to be used both NCMS at an MS and a BS side.

2) Motivation of changing of idle mode service primitives

In the current draft, there are defined four procedures for idle mode service primitives; idle mode initiation at an MS or an NCMS on a BS side, Paging Announce and Network re-entry. However, the service primitives between an MS and an NCMS on the MS are only defined in idle mode initiation at NCMS on the BS side.

Therefore, we propose to change figure 480, 482, 483 to the figures which are included the service primitives between an 802.16 entity (MS) and an NCMS on the MS side and modify the related service primitives parameters in this contribution. And we also correct some editorial texts.

2. Proposed Text Changes

[Modify the text from line 62 of page 66 as follows]

Figure 479 shows Subscriber Mode transition diagram at the NCMS with service primitives related with the Subscriber Mode transition. Subscriber Mode transition from Normal Operation to Idle Mode is performed by exchanging C-PG-REQ and C-PG-RSP between ~~a BS~~ an 802.16 entity and the NCMS after successful DREG-REQ message from the MS with De-Registration_Request_Code=0x01 or DREG-CMD message from the BS with Action Code = 0x05, where C-PG-REQ and C-PG-RSP are defined in 14.2.4.2.1 and 14.2.4.2.2, respectively. Subscriber Mode transition from Idle Mode to Normal Operation is initiated after exchanging ~~C-PG-IND, C-PG-RSP;~~ C-PG-IND, C-PG-RSP; and C-PG-ACK between an 802.16 entity ~~BS~~ and the NCMS, where ~~C-PG-IND, C-PG-RSP,~~ C-PG-IND, C-PG-RSP, and C-PG-ACK are defined in ~~14.2.4.2.4,~~ 14.2.4.2.2, and 14.2.4.2.3, respectively.

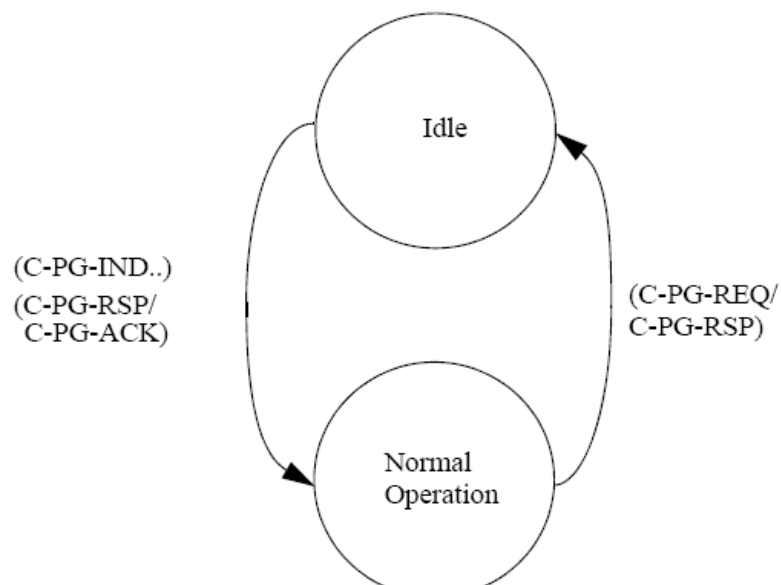


Figure 479—Subscriber mode transition diagram at NCMS

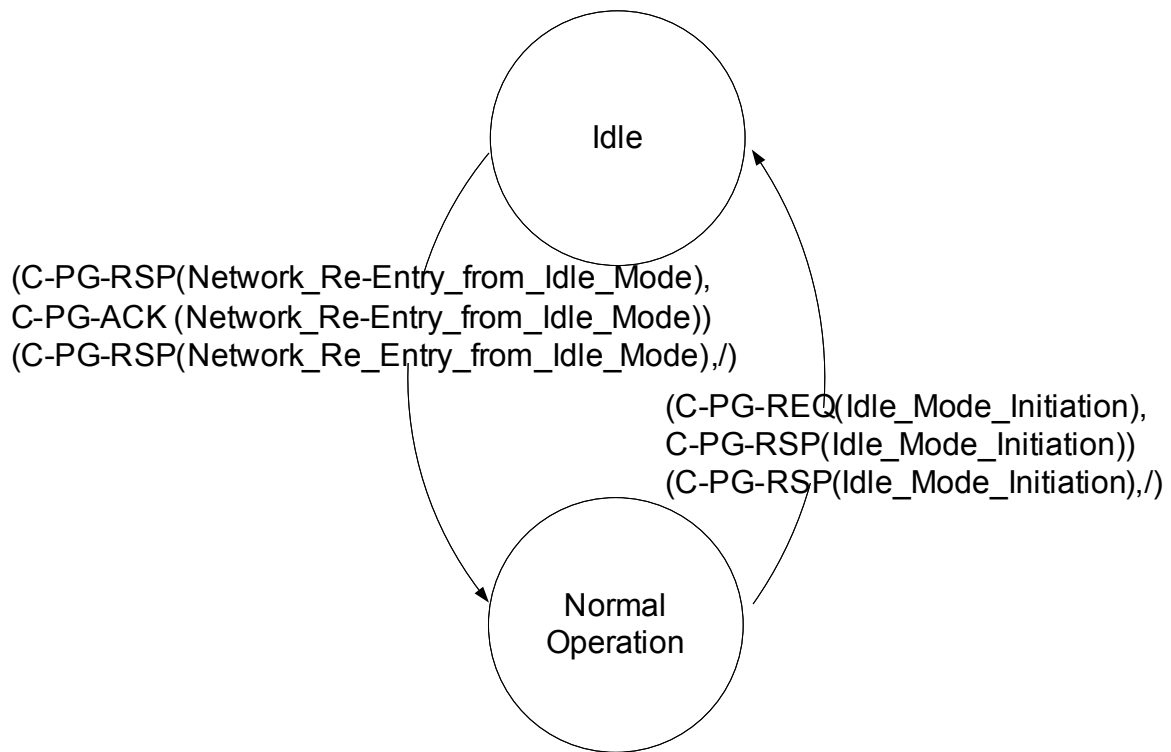


Figure 479—Subscriber mode transition diagram at NCMS [\(on BS or MS side\)](#)

[Change the figure 480 and its title to as follows]

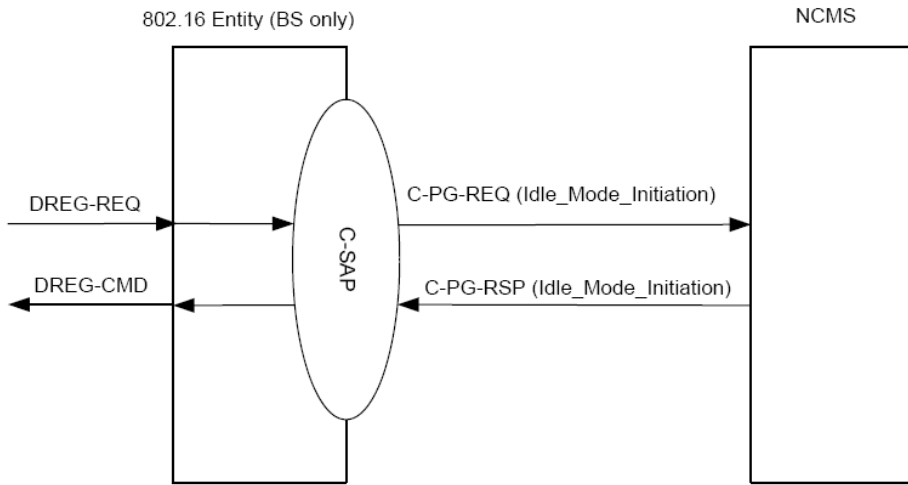


Figure 480—Idle mode initiation (MS initiated)

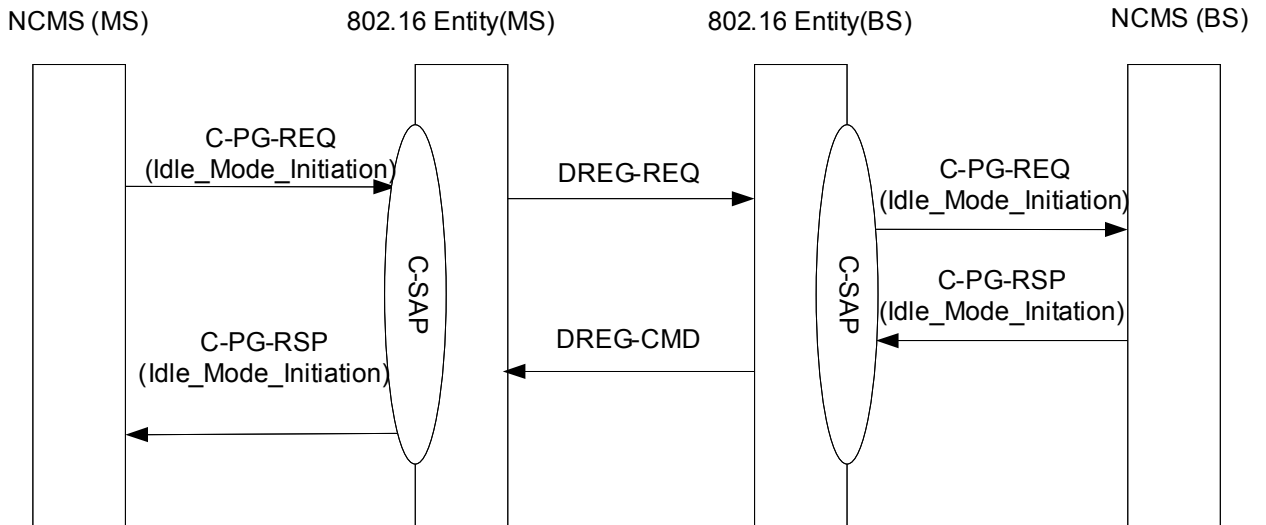


Figure 480 – Idle mode initiation (NCMS on the MS side)

[Change the figure 482 to the following figure Section 14.2.4.2]

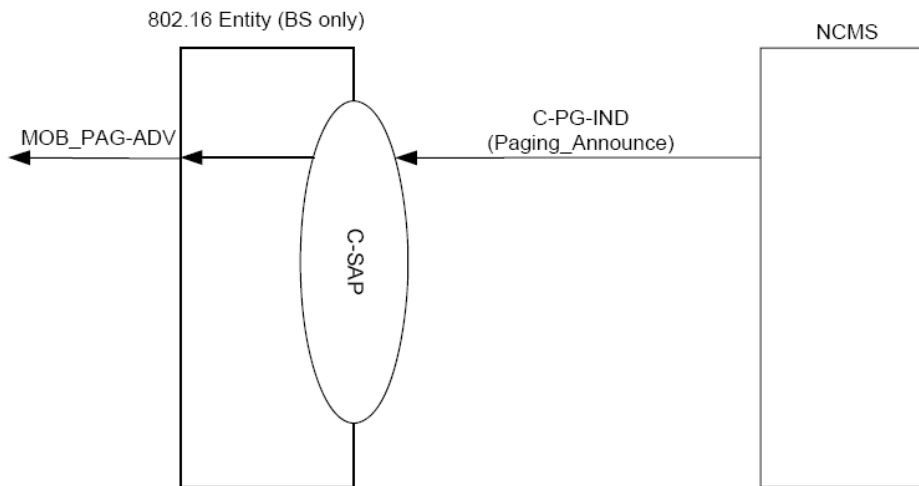


Figure 482—Paging Announcement

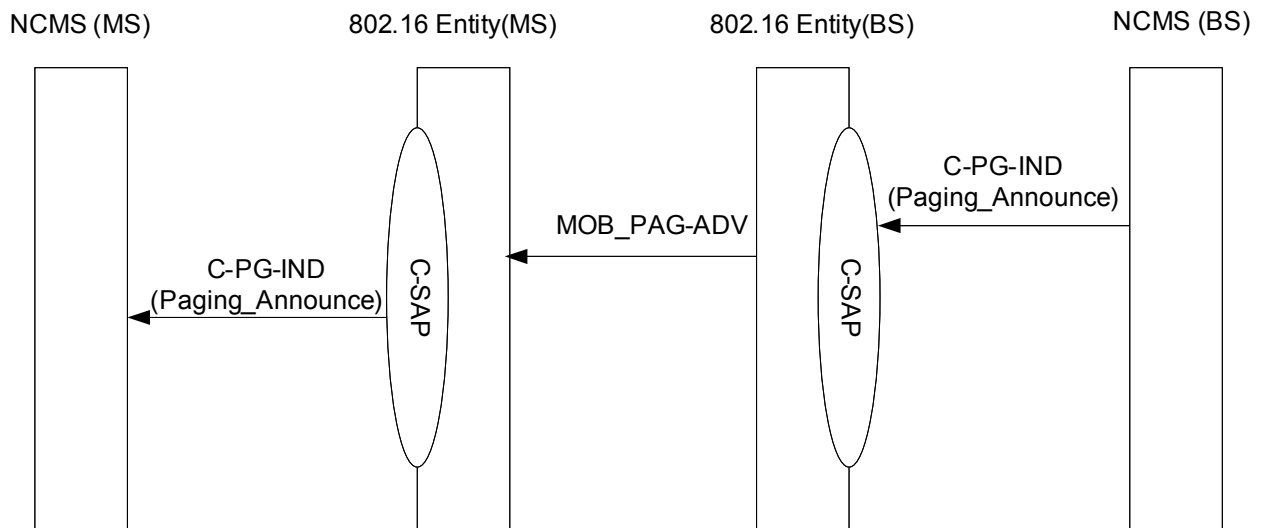


Figure 482- Paging Announcement

[Change the figure 483 to the following figure in 14.2.4.2]

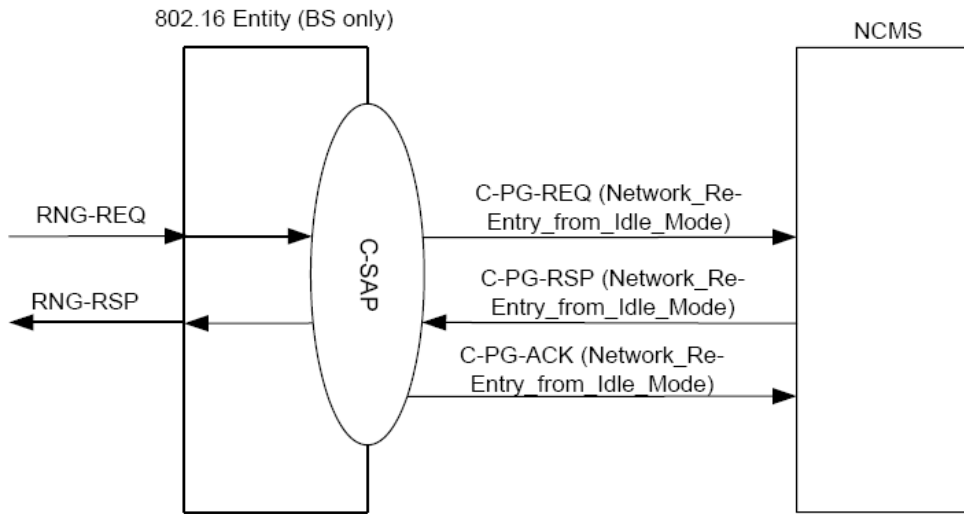


Figure 483—Network re-entry from Idle mode primitives

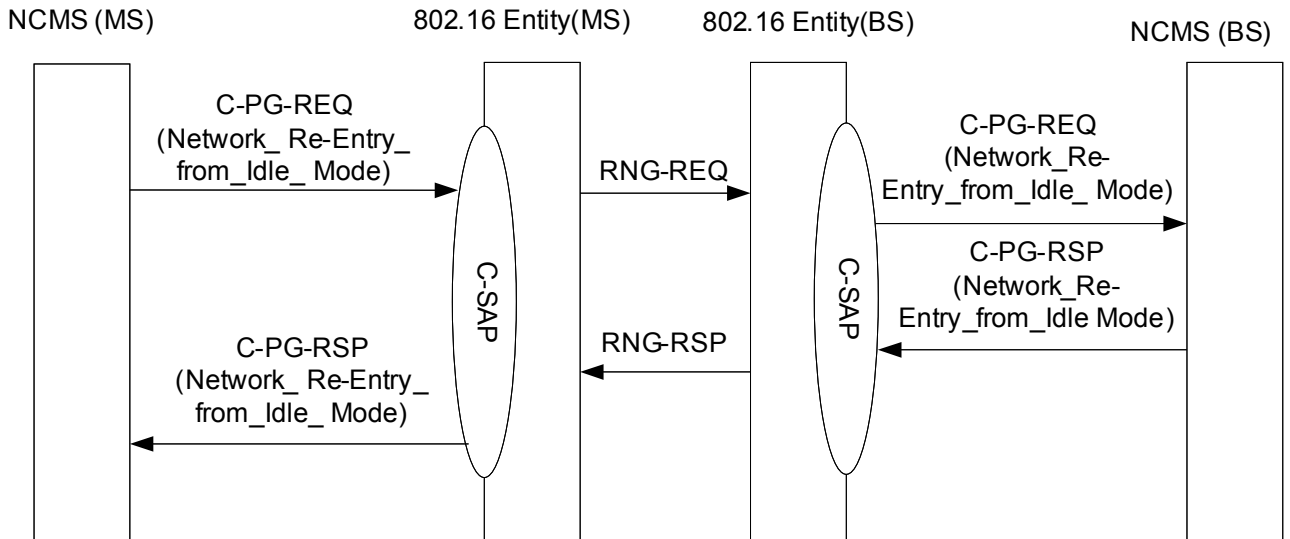


Figure 483- Network re-entry from Idle mode primitives

[Modify Subclause 14.2.4.2.1 as follows]

14.2.4.2.1 C-PG-REQ

This primitive is used by an 802.16 entity or [an NCMS](#) to trigger an idle mode service procedure. The Operation_Type included in this primitive defines the type of idle mode service procedure to be performed. The possible Operation_Types for this primitive are listed in Table below.

Operation Type	Action_Type	Description
Action	Idle Mode Initiation Idle Mode Initiation	Idle Mode Initiation Request
Action	Network Re-Entry from Idle Mode Network Re-Entry from Idle Mode	Network Re-Entry from Idle Mode Request

[*Modify Subclause 14.2.4.2.1.1 as follows*]

14.2.4.2.1.1 C-PG-REQ (Action_Type = Idle_Mode_Initiation)**Function:**

This primitive is issued by [an NCMS \(MS or BS\)](#) ~~a BS~~ to [initiate idle mode](#) ~~inform the Paging and Idle Mode Services entity in the NCMS that an MS requests to initiate Idle Mode. This primitive can also be issued by the NCMS to force MS into an Idle mode by instructing the BS to initiate a DREG-CMD to the MS with Action Code=0x05.~~

Semantics of the service primitive:

The parameters of the primitive are as follows:

C-PG-REQ

(
 Operation_Type: Action,
 Action_Type: Idle_Mode_Initiation,
 Destination: NCMS, BS, MS,
 Attribute_List:
 MS MAC Address,
 Paging_Information,
 Paging_Controller_ID,
 Security_Information,
 Idle_Mode_Retain_Information,
 MAC_Hash_Skip_Threshold,
 Service_Flow_parameters,
 Service_and_operational_information
)

MS MAC Address

48-bit MAC Address which identifies MS during Idle Mode

Paging_Information

Paging Group ID, Paging Cycle, Paging Offset

Paging_Controller_ID

A logical network identifier for the serving BS or other network entity retaining MS service and operational information and/or administrating paging activity for the MS while in Idle Mode. The Paging Controller ID shall be set to the BSID when a BS is **acting as the Paging Controller**.

Security_Information

AK Context, security association info, authenticator ID, etc.

Idle_Mode_Retain_Information

MS request for Paging Controller retention of MS service and operational information to expedite future Network Re-entry from Idle Mode. (see 6.3.2.3.42.)

MAC Hash Skip Threshold

Maximum number of successive MOB_PAG-ADV messages that may be sent from a BS individual notification for an MS, including MS MAC Address Hash of an MS for which Action Code is 0b00, 'No Action Required'.

Service Flow parameters

Parameters for the existing Service Flow without actually activating it to carry traffic at MS Idle Mode Initiation, e.g. Paging Preference.

Service and operational information

MS service and operational information associated with MAC state machines, CS classifier information, etc.

When generated:

This primitive is generated ~~by an NCMS when the NCMS decides on Idle mode initiation or by an 802.16 entity when a BS~~ the 802.16 entity receives MAC messages for initiation of idle mode a(DREG-REQ or DREG-CMDmessage with Deregistration_Request_Code=0x01, "request for MS De-Registration from serving BS and initiation of MS Idle Mode").

Effect of receipt:

~~This primitive shall be generated on the BS side and the Paging and Idle Mode Services entity shall respond to this primitive by sending C-PG-RSP(Idle_Mode_Initiation)-~~
The NCMS responds to this primitive with C-PG-RSP(Idle_Mode_Initiation) and performs idle mode initiation procedure.

14.2.4.2.1.2 C-PG-REQ (Action_Type = ~~Network re-entry from idle mode~~ Network Re-Entry from Idle Mode)

Function:

This primitive is issued by an NCMS on a MS ~~a BS~~ to inform ~~the Paging and Idle Mode Services entity of Paging Services~~ an 802.16 entity that the specified MS is attempting to re-enter network ~~in response to paging.~~

Semantics of the service primitive:

The parameters of the primitive are as follows:

C-PG-REQ

(
 Operation_Type: Action,
 Action_Type: Network_Re-Entry_from_Idle_Mode,
 Destination: MS, NCMS,
 Attribute_List:
 MS MAC Address,
 Paging Information,
 Paging Controller ID,
 BSID
)

MS MAC Address

48-bit MAC Address which identifies MS during Idle Mode

Paging Information

Paging Group ID, Paging Cycle, and Paging Offset parameters followed used by MS in Idle Mode.

Paging Controller ID

A logical network identifier for the serving BS or other network entity retaining MS service and operational information and/or administrating paging activity for the MS while in Idle Mode. The Paging Controller ID shall be set to the BSID when a BS is acting as the Paging Controller.

BSID

A network identifier of the BS at which the MS is attempting to re-enter network

When generated:

This primitive is generated by a BS when an NCMS on MS wants to network re-entry. This primitive is also generated by an 802.16 entity(BS) when it receives a RNG-REQ message including Ranging Purpose Indication with setting bit #0 to 1 in combination with Paging Controller ID.

Effect of receipt:

C-PG-REQ(Network Re-Entry from Idle Mode) notifies the Paging and Idle Mode Services entity that the specified MS is attempting to re-enter network through the specified BS in order to receive DL traffic. The management entity also checks the MS service and operational information for the MS, and transmits C-PG-RSP(Network Re-Entry from Idle Mode) in response to this primitive.
If an 802.16 entity(MS) receives C-PG-REQ(Network Re-Entry from Idle Mode), it generates with RNG-REQ to a BS. If an NCMS on BS receives C-PG-REQ(Network Re-Entry from Idle Mode), it responds to the request with C-PG-RSP (Network Re-Entry from Idle Mode) primitive.

[*Modify Subclause 14.2.4.2.2 as follows*]

14.2.4.2.2 C-PG-RSP

This primitive is used by an 802.16 entity or NCMS to respond to an idle mode service request. The Operation_Type included in this primitive defines the type of idle mode service procedure to be performed. The possible Operation_Types for this primitive are listed in Table below:

Operation Type	Action Type	Description
Action	- Idle Mode Initiation <u>Idle Mode Initiation</u>	Idle Mode Initiation Request
Action	- Network Re-entry from Idle Mode <u>Network Re-Entry from Idle Mode</u>	Network Re-Entry from Idle Mode Request

14.2.4.2.2.1 C-PG-RSP (Action_Type = Idle_Mode_Initiation)**Function:**

This primitive is issued by the Paging and Idle Mode Services entity in the NCMS in response to the C-PG-REQ(Idle_Mode_Initiation) primitive.

Semantics of the service primitive:

The parameters of the primitive are as follows:

C-PG-RSP

(

Operation_Type: Action,
 Action_Type: Idle_Mode_Initiation,
 Destination: NCMS, BS, MS,
 Attribute_List:
 Action code,
 MS MAC Address,
 Paging Information,
 Paging Controller ID,
 Idle Mode Retain Information,
 MAC Hash Skip Threshold,
 REQ-duration

)

Action code

Indicates the value of Action code to be included in DREQ-CMD message. (see Table 55.)

MS MAC Address

48-bit MAC Address which identifies MS during Idle Mode

Paging Information

Paging Group ID, Paging Cycle, and Paging Offset parameters followed by MS in Idle Mode.

Paging Controller ID

A logical network identifier for the serving BS or other network entity retaining MS service and operational information and/or administrating paging activity for the MS while in Idle Mode. The Paging Controller ID shall be set to the BSID when a BS is acting as the Paging Controller.

Idle Mode Retain Information

MS request for Paging Controller retention of MS service and operational information to expedite future Network Re-entry from Idle Mode. (see 6.3.2.3.42.)

MAC Hash Skip Threshold

Maximum number of successive MOB_PAG-ADV messages that may be sent from a BS individual notification for an MS, including MS MAC Address Hash of an MS for which Action Code is 0b00, 'No Action Required'.

REQ-duration

Waiting value for the DREG-REQ message re-transmission (measured in frames).

When generated:

This primitive is generated by an NCMS(MS) to request a BS-802.16 entity(MS) to issue a DREG-CMD-REQ message. This primitive is also generated by an NCMS(BS) to request a 802.16 entity(BS) to issue a DREG-CMD message.

Effect of receipt:

If an 802.16 entity(-BS) receives -receiving C-PG-RSP(Idle_Mode_Initiation), it shall transmit DREG-CMD message with setting each field in accordance with the information elements in this primitive. If an 802.16 entity(MS) receives C-PG-RSP(Idle_Mode_Initiation), it should send DREG-REQ to BS.

14.2.4.2.2.2 C-PG-RSP (Action_Type = Network re-entry from Idle mode Network Re-Entry from Idle Mode)**Function:**

This primitive is issued by the Paging and Idle Mode Services entity to confirm the MS Network Re-entry from Idle Mode and provide the BS, at which the MS is attempting to re-enter the network, with service and operational information.

Semantics of the service primitive:

The parameters of the primitive are as follows:

C-PG-RSP

(
 Operation_Type: Action,
 Action_Type: Network_Re-Entry_from_Idle_Mode,
 Destination: BS, NCMS,
 Attribute_List:
 MS MAC Address,
 Security Information,
 Service and operational information,
)

MS MAC Address

48-bit MAC Address which identifies MS during Idle Mode

Security Information

AK Context, Security Association Info, Authenticator ID, etc.

Service and operational information

MS service and operational information associated with MAC state machines, CS classifier information, etc.

When generated:

This primitive is generated ~~by when an NCMS(BS) receives C-PG-REQ(Network_Re-Entry_from_Idle_Mode)~~ or when an 802.16 entity(MS) receives a ~~RNG-REQ-RSP~~ message including Ranging Purpose Indication with setting bit #0 to 1 in combination with Paging Controller ID.

Effect of receipt:

~~If an 802.16 entity(BS) receiving receives~~ C-PG-RSP(Network_Re-Entry_from_Idle_Mode), ~~it~~ transmits RNG-RSP message ~~including HO-Process-Optimization which is based on the service and operational information in this primitive. And then (The~~ 802.16 entity(BS) acknowledges the receipt of this message by transmitting the C-PG-ACK(Network_Re-Entry_from_Idle_Mode) message to the NCMS(BS). ~~If an NCMS(MS) receives C-PG-RSP(Network_Re-Entry_from_Idle_Mode), it completes network re-entry procedures.~~