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Separation of Ranging Procedure based on Ranging Type

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1. Motivation

RNG-REQ/RSP messages are used to perform network re-entry from Idle Mode and location update process in Idle Mode. Although there are separate Idle Mode management primitives that are triggered by RNG-REQ/RSP message, C-NEM-REQ/RSP (ranging) primitives also deal with network re-entry from Idle Mode and location update.

Regardless of ranging types, we can use one unified primitive to deal with RNG-REQ/RSP message in all cases. But, when RNG-REQ/RSP messages are used for network re-entry from Idle Mode or location update, 3-way primitive handshake is used between 802.16 entity and NCMS. When RNG-REQ/RSP message are used for network entry or network re-entry during HO, 2-way primitive handshake is used. Thus, it's better to separate idle more-related ranging type from C-NEM-REQ/RSP (ranging)

In this contribution, we remove any Idle-mode-related parameters from C-NEM-REQ/RSP (ranging). In addition, we also remove CDMA code and Management CIDs from C-NEM-REQ/RSP (ranging) because CDMA code is not delivered to NCMS and Management CIDs are managed by MAC layer.

2. Proposed Text Changes

[***Modify subclause 14.2.7.1.1 as follows***]

14.2.7.1.1 C-NEM-REQ (Action type = Ranging)

14.2.7.1.1.1 MS side

Function:
This primitive requests ranging. Upper layer management entities shall request ranging by sending this primitive to the MAC layer through NCMS.

Semantics:

C-NEM-REQ
(
Operation_type: Set
Action_type: Ranging
Destination: MS
Attribute_List:
Ranging Type
)

Table 453 – Ranging Request attributes (MS Side)

Name	Type	Valid Range	Description
Ranging Type	Enumeration	Initial, Handoff, ~~Location update,~~	This identifies the ranging type

		Periodic	

When generated:
This primitive is generated by the upper layer management entities to initiate ranging procedure for initial network entry, network re-entry after handover~~,~~ and periodic ranging~~, network re-entry from Idle mode, and location update of Idle Mode mobile terminals~~.

Effect of receipt:
MAC layer shall generate RNG-REQ MAC management message including corresponding TLVs depending on the Ranging type and RNG-REQ message shall be sent to the BS over air interface.

14.2.7.1.1.2 BS side

Function:
This primitive notifies the upper layer management entity in BS that the mobile terminal requests ranging with RNG-REQ.

Semantics:

C-NEM-REQ
(
Operation_type: Set
Action_type: Ranging
Destination: MS
Attribute_List:
MS Address,
~~CDMA code,~~
MAC Version,
Required Downlink Burst Profile,
Serving BSID,
HO Indication~~,~~
~~Location Update Request,~~
~~Paging Controller ID~~
)

Table 454 – Ranging Request attributes (BS Side)

Name	Type	Valid Range	Description
MS Address	MAC Address	Any valid individual MAC Address	MAC Address of MS
~~CDMA code~~			
MAC Version	Enumeration	IEEE Std 802_16-2001 IEEE Std 802_16-2004, IEEE Std 802.16e, IEEE Std 802.16g-2007	MAC version supported by MS
Required Downlink Burst Profile			DIUC value of Downlink Burst Profile
Serving BS Id			Serving BSID during ranging
HO Indication			This parameter indicates the MS is currently attempting to HO~~ or Network Re-entry from Idle Mode to the BS~~.
~~Location Update Request~~	~~—~~		~~This parameter indicates MS action of Idle Mode Location Update Process~~

~~Paging Controller ID~~			~~This 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.~~

When generated:
This primitive is generated by MAC layer when MAC layer receives RNG-REQ message over the air interface.

Effect of receipt:
Upon receipt ranging indication, C-NEM-RSP is generated

[***Modify subclause 14.2.7.2.1 as follows***]

14.2.7.2.1 C-NEM-RSP (Action type = Ranging)

14.2.7.2.1.1 BS side

Function:
This primitive returns the result of ranging request.

Semantics:

C-NEM-RSP
(
Operation_type: Set
Action_type: Ranging
Destination: BS
Attribute_List:
MS Address,
~~Result Code,~~
~~Management CIDs,~~
Resource Retain Flag,
HO Process Optimization~~,~~
~~Location Update Response,~~
~~Paging information,~~
~~Paging Controller ID,~~
~~Next Periodic Ranging~~
)

Table 457 – Ranging Response Attributes (BS Side)

Name	Type	Valid Range	Description
MS Address	MAC Address	Any valid individual MAC Address	MAC Address of MS that requests ranging
Result Code	Enumeration		
~~Management CID~~	~~Enumeration~~	~~Basic CID~~ ~~Primary Management CID~~	~~Management CID of MS if ranging succeeded~~
Resource Retain Flag			MT information retained
HO Process Optimzation			Network re-entry process optimization after

			handover
~~Location Update Response~~	~~Enumeration~~	~~Success Failure~~	~~Location update result in idle mode~~
~~Paging Information~~			~~Changed paging information if location update succeeded~~
~~Paging Controller ID~~			~~Idle mode management entity (Paging controller ID)~~
~~Next Periodic Ranging~~			~~Frame offset of next ranging during~~

When generated:
This primitive is generated when decided to notify the ranging result after receiving ranging request.

Effect of receipt:
MAC layer sends RNG-RSP message

14.2.7.2.1.2 MS side

Function:
This primitive notifies the result of ranging to upper layer entity.

Semantics:

C-NEM-RSP
(
Operation_type: Set
Action_type: Ranging
Destination: NCMS
Attribute_List:
MS Address,
Result Code,
Management CIDs,
Resource Retain Flag,
HO Process Optimization,
Location Update Response,
Paging information,
Paging Controller ID,
Next Periodic Ranging
)

Table 458 – Ranging Response Attributes (MS Side)

Name	Type	Valid Range	Description
MS Address	MAC Address	Any valid individual MAC Address	MAC Address of MS that requests ranging
Result Code	Enumeration		
~~Management CID~~	~~Enumeration~~	~~Basic CID Primary Management CID~~	~~Management CID of MS if ranging succeeded~~
Resource Retain Flag			MT information retained
HO Process Optimzation			Network re-entry process optimization after handover
~~Location Update~~	~~Enumeration~~	~~Success~~	~~Location update result in~~

~~Response~~		~~Failure~~	~~idle mode~~
~~Paging Information~~			~~Changed paging information if location update succeeded~~
~~Paging Controller ID~~			~~Idle mode management entity (Paging controller ID)~~
~~Next Periodic Ranging~~			~~Frame offset of next ranging during~~

Effect of receipt:
The upper layer entity receives the result of ranging.

When generated:
This primitive is generated when MAC layer receives RNG-RSP message.