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Source(s)	Eunkyung Kim, Sungcheol Chang, Won-Ik Kim, Seokki Kim, Sungkyung Kim, Miyoung Yun, Hyun Lee, Chulsik Yoon, Kwangjae Lim ETRI Voice: +82-42-860-5415 E-mail: ekkim@etri.re.kr scchang@etri.re.kr
Re:	"IEEE 802.16-12-0142," in response to Letter Ballot #38 on P802.16.1a/D1
Abstract	AAI-RNG-REQ/RSP message on GRIDMAN Draft Standard
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN
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Clarification on AAI-RNG-REQ/RSP message over IEEE 802.16.1a

Eunkyung Kim, Sungcheol Chang, Won-Ik Kim, Seokki Kim, Sungkyung Kim, Miyoung Yun, Hyun Lee, Chulsik Yoon, Kwangjae Lim
ETRI

1. Introduction

This document provides clarification on the AAI-RNG-REQ/RSP message and ASN.1 coding thereof.

2. References

[1] IEEE 802.16-12-0132-00, GRIDMAN System Requirement Document including SARM annex, January 2012.
[2] IEEE P802.16n™/D1, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, February 2012.
[3] IEEE P802.16.1a™/D1, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, February 2012.
[4] EEE P802.16Rev3/D4, IEEE Draft Standard for Local and metropolitan area networks; Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems," February 2012.
[5] IEEE P802.16.1™/D4, IEEE Draft for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, February 2012.

3. Proposed Text on the IEEE 802.16.1a Amendment Draft Standard

[----------Start of Text Proposal----------]

[*Remedy1: Change 6.2.3.1 AAI-RNG-REQ in page 9 on P802.16.1a/D1 as follows:*]

6.2.3.1 AAI-RNG-REQ

Change Table 27 in section 6.2.3.1 as indicated:

Table 27 - AAI-RNG-REQ message field description

Field	Size (bits)	Value/Description	Condition
Ranging Purpose Indication	4	0b0000 = Initial network entry 0b0001 = HO reentry 0b0010 = Network reentry from idle mode 0b0011 = Idle mode location update 0b0100 = DCR mode extension 0b0101 = Emergency call setup (e.g., E911) 0b0110 = Location update for updating service flow management encodings of E-MBS flows 0b0111 = Location update for transition to DCR mode from idle mode 0b1000 = Reentry from DCR mode, coverage loss or detection of different ABS restart count. 0b1001 = Network reentry from a Legacy BS 0b1010 = Zone switch to MZONE from LZONE 0b1011 = Location update due to power down. 0b1100 = Interference mitigation request to a CSG Femto ABS when experiencing interference from the CSG Femto ABS 0b1101 = NS/EP call setup ~~0b1110 -0b1111 = reserved~~ 0b1110 = Ranging purpose for HR-Network 0b1111 = reserved	-
If (Ranging Purpose Indication == 0b0000) {		// Initial network entry	
If (S-SFH Network Configuration bit == 0b0 and AMSID privacy is enabled) {			
AMSID*	48	The AMSID hash value. Refer to 16.2.5.3.1	

Table 27 - AAI-RNG-REQ message field description

Field	Size (bits)	Value/Description	Condition
} else if (S-SFH Network Configuration bit == 0b1 or AMSID privacy is disabled){			
AMS MAC address	48	AMS's real MAC address	
}			
MAC version	8	See 11.1.3	
Initial Offset for uplink power control (OffsetInitial)	5	The bit size represents power level ranging from –15 dB (0x00) to 16dB (0x1F) with 1dB step The value is determined by AMS after successful initial ranging process	
~~Coverage loss indicator~~	~~1~~	~~0b0: Initial network entry~~ ~~0b1: Initial network entry by coverage loss~~	
~~If (Coverage loss indicator == 0b1) {~~			
Serving BSID	48	The BSID of the HR-MS's previous Serving HR-BS before incurring a coverage loss	Shall be present if the initial network entry after coverage loss in HR-Networks
~~}~~			
…	…	…	…
}else if (Ranging Purpose Indication == 0b1101) {		//NS/EP call setup	
AMS MAC address	48	AMS's real MAC address	
MAC version	8	see 11.1.3	
Initial Offset for uplink power control (OffsetInitial)	5	The bit size represents power level ranging from -15dB (0x00) to 16dB(0x1F) with 1dB step. The value is determined by AMS after successful initial ranging process.	
}else if (Ranging Purpose Indication == 0b1110) {		// Ranging purpose for HR-Network	

Table 27 - AAI-RNG-REQ message field description

Field	Size (bits)	Value/Description	Condition
Extended Ranging Purpose Indication	4	0b0000 = HR multicast service location update 0b0001 = Network reentry for FBIS operation 0b0010 = Network reentry from idle mode for extension of TDC. 0b0011-0b1111 = reserved	
If(Extended Ranging Purpose Indication == 0b0000) {			
action code	3	bit0: multicast service flow update bit1: location update due to multicast zone change bit2: multicast security key update	
if (action code bit0 is set) {			
If (STID is not pre assigned) {			
Serving BSID	48	The BSID of the AMS's previous S-ABS before incurring a coverage loss, or the BSID of the S-ABS to which the AMS is currently connected (has completed the registration cycle and is in Connected State).	
Previous STID	12	The STID which the AMS uses in the previous S-ABS.	
} else {			
STID	12	The Station ID pre-assigned by the T-ABS	
}			
If (CMAC indicator == 0b1){			
AK_COUNT	16	The AMS's current value of the AK_COUNT, which is used to update the security keys in the T-ABS.	Shall be presented if the AMS has a CMAC Tuple necessary to expedite security authentication
}			

Table 27 - AAI-RNG-REQ message field description

Field	Size (bits)	Value/Description	Condition
}			
if (action code bit1 is set) {			
if (S-SFH Network Configuration bit == 0b1){			
AMS MAC Address	48	AMS's real MAC address	
} else {			
Deregistration Identifier (DID)	18	The ID that the AMS is assigned for idle mode and currently maintains.	
}			
Paging Controller ID	48	The Paging Controller ID that the AMS currently maintains in idle mode	
PGID	16	The identification of the paging group to which the AMS previously belonged.	
Paging Cycle	4	PAGING_CYCLE applied to the AMS	
Paging Offset	12	PAGING_OFFSET applied to the AMS	
If (CMAC indicator == 0b1){			
AK_COUNT	16	The AMS's current value of the AK_COUNT, which is used to update the security keys in the T-ABS.	Shall be presented if the AMS has a CMAC Tuple necessary to expedite security authentication
}			
}			
} else if (Extended Ranging Purpose Indication == 0b0001) {		// Network reentry for FBIS operation	
If (STID is not pre assigned) {			

Table 27 - AAI-RNG-REQ message field description

Field	Size (bits)	Value/Description	Condition
Serving BSID	48	The BSID of the AMS's previous S-ABS before incurring a coverage loss, or the BSID of the S-ABS to which the AMS is currently connected (has completed the registration cycle and is in Connected State).	
Previous STID	12	The STID which the AMS uses in the previous S-ABS.	
} else {			
STID	12	The Station ID pre-assigned by the T-ABS	
}			
If (CMAC indicator == 0b1){			
AK_COUNT	16	The AMS's current value of the AK_COUNT, which is used to update the security keys in the T-ABS.	Shall be presented if the AMS has a CMAC Tuple necessary to expedite security authentication
}			
Primary Serving ABS flag	1	0b0 : the AMS shall set its primary serving ABS as S-ABS (Degraded HR-BS) after network reentry 0b1 : the AMS shall set its primary serving ABS as T-ABS (Target HR-BS) after network reentry	
~~Switched Access Mode~~	~~1~~	~~0 : Switched Access with fixed Switched Access Windows~~ ~~1 : Switched Access with variable Switched Access Windows~~	
~~If(Switched Access Mode==0) {~~ if(switch access mode is switch access with fixed Switched Access Windows) {			
Switched Access Window Size	8	The size of fixed Switched Access Window in unit of frame	Shall be present if Switched Access Mode is fixed Switch Access Window

Table 27 - AAI-RNG-REQ message field description

Field	Size (bits)	Value/Description	Condition
~~} else if (Switched Access Mode == 1) {~~ }else if(switch access mode is switch access with variable Switched Access Windows) {			
Maximum Switched Access Window Size	8	Maximum size of Switched Access Window in unit of frame	Shall be present if Switched Access Mode is variable Switch Access Window
}			
Switched Access Start Time	8	The 8 least significant bits of the absolute frame number at the T-ABS where the AMS starts to perform the Switched Access operation.	
} //end of Extended Ranging Purpose Indication			
} //end of Ranging Purpose Indication			
…	…	…	…

[*Remedy2: Replace 6.2.3.2 AAI-RNG-RSP in page 12 on P802.16.1a/D1 by following text*]

6.2.3.2 AAI-RNG-RSP

Change Table 28 in section 6.2.3.2 as indicated:

Table 28 - AAI-RNG-RSP message field description

Field	Size (bits)	Value/Description	Condition
Ranging Abort	1	Set to 1 when an ABS rejects the AMS.	Present when an ABS rejects an AMS.
If (Ranging Abort == 1) {			

Table 28 - AAI-RNG-RSP message field description

Field	Size (bits)	Value/Description	Condition
Ranging Abort Timer	16	Timer defined by an ABS to prohibit the AMS from attempting network entry at this ABS, for a specific time duration. Value: 0 (Do not try ranging again at the ABS.) Value: 1–65534, in units of seconds Value: 65535 (When the received CSGID(s) from the AMS does not match any of the CSGID(s) of the Femto ABS. This value indicates the Ranging Abort Timer is not to be used, and the AMS can range any time.)	
}else{			
…	…	…	…
Location Update Response	4	0x0= Success of Location Update 0x1= Failure of Location Update 0x2 = *Reserved* 0x3 = Success of location update and DL traffic pending 0x4 = Allow AMS's DCR mode initiation request or DCR mode extension request 0x5 = Reject AMS's DCR mode initiation request or DCR mode extension request 0x6~0xF: *Reserved*	Shall be included when this message is sent in response to an AAI-RNG-REQ message used to perform location update or DCR mode initiation from Idle Mode or DCR mode extension.
If (Location Update Response == 0x0) {			
…	…	…	…
}//end of for (N-E-MBS-Zone-IDs)			
<u>New Multicast Group Zone ID</u>	<u>12</u>	<u>Indicates a Multicast Group Zone ID to update in target HR-BS.</u>	<u>Shall be included in HR-Network in response to the AAI-RNG-REQ message where ranging purpose indication is set to 0b1110 and Extended Ranging Purpose Indication is set to 0b0000 and action code bit0 is set to 1.</u>

Table 28 - AAI-RNG-RSP message field description

Field	Size (bits)	Value/Description	Condition
New Multicast Indication cycle	8	Start of multicast indication cycle. The first superframe is the multicast available interval and rest superframes are the multicast unavailable interval. 8 LSB of superframe number	Shall be present if needed to update in HR-Network
For(j=1;j<=M;j++){		Number of Multicast Group ID and FID (M) to update in the TABS[1..16]. Mapping of current Multicast Group ID and FID and new Multicast Group ID and FID to be updated. Based on the value of Num of Multicast Group ID and FID to be updated.	Present if it needs to be updated.
Current Multicast Group ID	12		
Current FID	4		
New Multicast Group ID	12		
New FID	4		
}			
for (k=1;k<=N;k++){		Number of security key of multicast (N) to update [1..16]	Present if it needs to update MTEK in HR-Network.
Multicast Group ID	12	Multicast Group ID to update METK	
FID	4	FID to update MTEK	
COUNTER_MTEK	16	COUNTER_MTEK used for deriving current MTEK	
MEKS	2	Encryption key sequence number for current MTEK	
}			
SMS	*variable*	Short Message content up to the size of 140 bytes.	May be included when SMS contents is sent in idle mode.
}//end of If (Location Update Response == 0x0)			

Table 28 - AAI-RNG-RSP message field description

Field	Size (bits)	Value/Description	Condition
Reentry Process Optimization	5	Reentry process optimization bitmap indicates which MAC control message transactions may be omitted during an attempted reentry (i.e., reentry during HO (including zone switching), and reentry from idle mode) A value of 1 in the bitmap indicates that the corresponding MAC control message transaction may be omitted, while a 0 indicates that the corresponding MAC control message transaction shall be completed. The AMS shall only commence Connected State with the T-ABS after completing all the required MAC control message transactions. Bit 0: Omit AAI-SBC-REQ and AAI-SBC-RSP MAC control messages during reentry processing Bit 1: Omit PKM Authentication phase Bit 2: Omit AAI-REG-REQ and AAI-REG-RSP message during reentry processing. Bit 3: Omit higher layer protocol triggering for IP address refresh during reentry processing Bit 4: For the case of reentry during HO including zone switching, a 1 indicates to the AMS that the T-ABS has received the full service and operational states for static and dynamic context (including ARQ window parameters and state machines). For the case of reentry from Idle mode, a 1 indicates to the AMS that the T-ABS has received the static context of the AMS. The static context includes SFIDs and related description (QoS descriptors and CS classifier information) for all service flows that the AMS has currently established as well as any SAs with their related keying information.	
…	…	…	…

Table 28 - AAI-RNG-RSP message field description

Field	Size (bits)	Value/Description	Condition
If (it is under network reentry for HO){			
New Multicast Group Zone ID	12	Indicates a Multicast Group Zone ID to update in target HR-BS.	Shall be included in HR-Network in response to the AAI-RNG-REQ message where ranging purpose indication is set to 0b1110 and Extended Ranging Purpose Indication is set to 0b0000 and action code bit0 is set to 1.
New Multicast Indication cycle	8	Start of multicast indication cycle. The first superframe is the multicast available interval and rest superframes are the multicast unavailable interval. 8 LSB of superframe number	Shall be present if needed to update in HR-Network
For (i = 0; i< M; i++) {		Number of Multicast Group ID and FID (M) to update in the T-ABS[1..16]. Mapping of current Multicast Group ID and FID and new Multicast Group ID and FID to be updated. Based on the value of Num of Multicast Group ID and FID to be updated.	Present if it needs to be updated.
Current Multicast Group ID	12		
Current FID	4		
New Multicast Group ID	12		
New FID	4		
}			
for (k=1;k<=N;k++){		Number of Security key of multicast (N) to update [1..16]	Present if it needs to update MTEK in HR-Network.
Multicast Group ID	12	Multicast Group ID to update METK	
FID	4	FID to update MTEK	

Table 28 - AAI-RNG-RSP message field description

Field	Size (bits)	Value/Description	Condition
COUNTER_MTEK	16	COUNTER_MTEK used for deriving current MTEK	
MEKS	2	Encryption key sequence number for current MTEK	
}			
}//end of If (it is under network reentry for HO)			
For (*i* = 0; *i*<N_SFIDs; *i*++) {		N_SFIDs is Number of SFIDs supported in MZone when an AMS performs Zone Switching from LZone to MZone. Its maximal number is 24.	Present if CID to FID mapping is done through the AAI-RNG-RSP message during Zone Switching operation. If this field is not present, all FIDs for the transport connection should be reestablished through the AAI-DSA exchanges after completion of network reentry in MZone.
SFID	32	FID in MZone should be assigned as defined in 6.2.6.4.1.3.1 per each DL/UL connections	
}			
} //End of else (Ranging Abort==1)			

[*Remedy3: Add the following text in Annex in page 212 on P802.16.1a/D1*]

Annex A

...

A.2 MAC control message definitions (normative)

Change Annex A.2 as indicated:

```
WirelessMAN-Advanced-Air-Interface DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN

-- MAC Control Messages

MAC-Control-Message ::=       SEQUENCE {
        message MAC-Control-Msg-Type,
...

}

MAC-Control-Msg-Type ::=      CHOICE {
        -- System information
        aaiSCD                          AAI-SCD,
        aaiSIIAdv                       AAI-SII-ADV,
        aaiULPCNi                       AAI-ULPC-NI,
        -- Network entry / re-entry
        aaiRngReq                       AAI-RNG-REQ,
        aaiRngRsp                       AAI-RNG-RSP,
        aaiRngAck                       AAI-RNG-ACK,
        aaiRngCfm                       AAI-RNG-CFM,
        aaiSbcReq                       AAI-SBC-REQ,
        aaiSbcRsp                       AAI-SBC-RSP,
        aaiRegReq                       AAI-REG-REQ,
        aaiRegRsp                       AAI-REG-RSP,
        -- Network exit
        aaiDregReq                      AAI-DREG-REQ,
        aaiDregRsp                      AAI-DREG-RSP,
        -- Connection management
        aaiDsaReq                       AAI-DSA-REQ,
        aaiDsaRsp                       AAI-DSA-RSP,
        aaiDsaAck                       AAI-DSA-ACK,
        aaiDscReq                       AAI-DSC-REQ,
        aaiDscRsp                       AAI-DSC-RSP,
        aaiDscAck                       AAI-DSC-ACK,
        aaiDsdReq                       AAI-DSD-REQ,
        aaiDsdRsp                       AAI-DSD-RSP,
        aaiGrpCfg                       AAI-GRP-CFG,
        -- Security
        aaiPkmReq                       AAI-PKM-REQ,
        aaiPkmRsp                       AAI-PKM-RSP,
        -- ARQ
        aaiArqFbk                       AAI-ARQ-FBK,
        aaiArqDsc                       AAI-ARQ-DSC,
        aaiArqRst                       AAI-ARQ-RST,
        -- Sleep mode
        aaiSlpReq                       AAI-SLP-REQ,
        aaiSlpRsp                       AAI-SLP-RSP,
        aaiTrfInd                       AAI-TRF-IND,
        aaiTrfIndReq                    AAI-TRF-IND-REQ,
        aaiTrfIndRsp                    AAI-TRF-IND-RSP,
        -- Handover
        aaiHoInd                        AAI-HO-IND,
        aaiHoReq                        AAI-HO-REQ,
        aaiHoCmd                        AAI-HO-CMD,
        aaiNbrAdv                       AAI-NBR-ADV,
        aaiScnReq                       AAI-SCN-REQ,
        aaiScnRsp                       AAI-SCN-RSP,
        aaiScnRep                       AAI-SCN-REP,
        -- Idle mode
        aaiPagAdv                       AAI-PAG-ADV,
```

```
        aaiPgidInfo                     AAI-PGID-INFO,
        -- Multicarrier
        aaiMcAdv                        AAI-MC-ADV,
        aaiMcReq                        AAI-MC-REQ,
        aaiMcRsp                        AAI-MC-RSP,
        aaiCmCmd                        AAI-CM-CMD,
        aaiCmInd                        AAI-CM-IND,
        aaiGlobalConfig                 AAI-GLOBAL-CFG,
        -- Power Control
        aaiUlPowerAdj                   AAI-UL-POWER-ADJ,
        aaiUlPsrConfig                  AAI-UL-PSR-CFG,
        -- Collocated Coexistence
        aaiClcReq                       AAI-CLC-REQ,
        aaiClcRsp                       AAI-CLC-RSP,
        -- MIMO
        aaiSbsMimoFbk                   AAI-SBS-MIMO-FBK,
        aaiMbsMimoFbk                   AAI-MBS-MIMO-FBK,
        aaiMbsMimoReq                   AAI-MBS-MIMO-REQ,
        aaiMbsMimoRsp                   AAI-MBS-MIMO-RSP,
        aaiMbsMimoSbp                   AAI-MBS-MIMO-SBP,
        aaiMbsSoundingCal               AAI-MBS-SOUNDING-CAL,
        aaiDlIm                         AAI-DL-IM,
        -- FFR
        aaiFfrCmd                       AAI-FFR-CMD,
        aaiFfrRep                       AAI-FFR-REP,
        -- SON
        aaiSonAdv                       AAI-SON-ADV,
        -- Relay
        aaiARSCfgCmd                    AAI-ARS-CFG-CMD,
        -- EMBS
        aaiEmbsCfg                      AAI-EMBS-CFG,
        aaiEmbsRep                      AAI-EMBS-REP,
        aaiEmbsRsp                      AAI-EMBS-RSP,
        -- LBS
        aaiLbsAdv                       AAI-LBS-ADV,
        aaiLbsInd                       AAI-LBS-IND,
        -- Misc
        aaiL2Xfer                       AAI-L2-XFER,
        aaiMsgAck                       AAI-MSG-ACK,
        aaiResCmd                       AAI-RES-CMD,
        ...
}

-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
-- Common type definitions
-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-

PhyCarrierIndex ::=             INTEGER (0..62)

.........


-- Common type definitions for HR-Network
MulticastGroupZoneID::=         BIT STRING (SIZE (12))
MulticastIndicationCycle::=     BIT STRING (SIZE (8))
HRMultimodeIndication::=        ENUMERATED {
        normalBRorRS,
        hrMSActingAsBRorRS,
        hrBsActingAsBRorRS
}
```

```
-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
-- Some boundary values
-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
maxReceivedCodes              INTEGER ::= 32         -- N_Received_Codes(6 bits)
-- Equal to the size of RngAckBitmap
maxRngOpps                    INTEGER ::= 4
maxRngAckFrames               INTEGER ::= 8          -- N_Frame_Identifiers(3 bits)
maxPreassignedCarriers        INTEGER ::= 8          -- N_Preassigned_Carriers
maxPhyCarrierIndices          INTEGER ::= 64         -- N-PHY-Carrier-Indices
maxNeighborABSs               INTEGER ::= 64         -- N-NBR-ABSs
maxNeighborR1BSs              INTEGER ::= 64         -- N-NBR-R1BSs
maxCarriers                   INTEGER ::= 64         -- N-Carrier-Info

-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
-- System Configuration Descriptor Messages
-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-



..................



-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
-- Network entry / re-entry messages
-- *-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
-- single type definition for ranging messages
MACAddress ::=                BIT STRING (SIZE (48))
MACVersion ::=                INTEGER (0..255)
CRID ::=                      BIT STRING (SIZE (72))
DID ::=                       BIT STRING (SIZE (12))
CSGID ::=                     BIT STRING (SIZE (1..24))
SMS ::=                       OCTET STRING (SIZE (1..140))
SFID ::=                      BIT STRING (SIZE (32))
MapMaskSeed ::=               BIT STRING (SIZE (15))
IPv4Address ::=               OCTET STRING (SIZE (4))
IPPortNumber ::=              INTEGER (0..65535)
OperatorID ::=                BIT STRING (SIZE (24))
CapabilityIndex ::=           INTEGER (0..31)
DeviceClass ::=               INTEGER (0..31)
FeatureSupport ::=            ENUMERATED {
                                      notSupported,
                                      supported
                              }

IPv6HomeNetworkPrefix ::=     BIT STRING (SIZE (64))

-- single type definition for ranging messages for HR-Network
SwitchAccessWindowsSize ::=   BIT STRING (SIZE (8))
MAXSwitchAccessWindowsSize ::= BIT STRING (SIZE (8))
SwitchAccessStartTime::=      BIT STRING (SIZE (8))

-- complex type definition for ranging messages
FidInfo ::=                   SEQUENCE {
       flowIdentifier                 FID,
       fidChangeCount                 FidChangeCount,
       dlULIndicator                  ENUMERATED {
                                             dl,
                                             ul
                                      }

}
```

```
..................


EMBSZoneInfoItem ::=          SEQUENCE {
        embsZoneID                      EMBSZoneID,
        newEMBSZoneID                   EMBSZoneID                                      OPTIONAL,
        physicalCarrierIndex            PhyCarrierIndex                                 OPTIONAL,
        bitmapAndServiceFlowInfo        BitmapAndSfInfo
}

SuccessOfLocationUpdate ::=   SEQUENCE {
        paginggroupidupdate             BIT STRING (SIZE (32))                          OPTIONAL,
        pagingoffsetupdate              BIT STRING (SIZE (24))                          OPTIONAL,
        newPagingCycle                  PgCycle                                         OPTIONAL,
        newPagingGroupID                PGID                                            OPTIONAL,
        newPagingOffset                 PgOffset                                        OPTIONAL,
        deregistrationID                DID                                             OPTIONAL,
        newPagingControllerID           PCID                                            OPTIONAL,
        embsZoneInfo                    SEQUENCE (SIZE (1..8)) OF EMBSZoneInfoItem      OPTIONAL,
        newMulticastGroupZoneId         MulticastGroupZoneID                            OPTIONAL,
        newMulticastIndicationCycle     MulticastIndicationCycle                        OPTIONAL,
        multicastInfo                   SEQUENCE (SIZE (1..16)) OF SEQUENCE {
                currentMulticastGroupID         MulticastGroupID,
                currentFID                      FID,
                newMulticastGroupID             MulticastGroupID,
                newFID                          FID
        } OPTIONAL,
        multicastKeyUpdate              SEQUENCE (SIZE (1..16)) OF SEQUENCE {
                currentMulticastGroupId         MulticastGroupID,
                currentFId                      FID,
                counterMtek                     CounterTEK,
                meks                            EKS
        } OPTIONAL,
        smsMessage                      SMS
OPTIONAL
}

RngRspForHoReentryInfo ::=    SEQUENCE {
        newMulticastGroupZoneId         MulticastGroupZoneID                            OPTIONAL,
        newMulticastIndicationCycle     MulticastIndicationCycle                        OPTIONAL,
        multicastInfo                   SEQUENCE (SIZE (1..15)) OF SEQUENCE {
                currentMulticastGroupID         MulticastGroupID,
                currentFID                      FID,
                newMulticastGroupID             MulticastGroupID,
                newFID                          FID
        } OPTIONAL,
        multicastKeyUpdate              SEQUENCE (SIZE (1..16)) OF SEQUENCE {
                currentMulticastGroupId         MulticastGroupID,
                currentFId                      FID,
                counterMtek                     CounterTEK,
                meks                            EKS
        } OPTIONAL
}

LocationUpdateResponse ::=    SEQUENCE {
        locationUpdateRsp               LocationUpdateRsp                               OPTIONAL,
        locationUpdateResult            CHOICE {
                -- locationUpdateResponse = 0x0
                successOfLocationUpdate         SuccessOfLocationUpdate,
                others                          NULL
        }

}
```

```
InitialNetworkEntry ::=       SEQUENCE {
        amsidOrMacAddress             CHOICE {
                -- be selected for advanced network mode and AMSID privacy is
                -- enabled
                amsidStarHashValue            MACAddress,
                -- be selected for other cases
                macAddress                    MACAddress
        },
        macVersion                    MACVersion,
        -- The bit size represents power level ranging from -15dB (0x00) to
        -- 26dB (0x1F)
        -- The value is determined by AMS after successful initial ranging
        -- process.
        initialOffsetUlpc             INTEGER (0..31),
        -- in the case of initial network after coverage loss of previous BS
        servingBsid                   BSID                                    OPTIONAL,
        ...
}

HandoverReentry ::= SEQUENCE {
        stidOrMacAddress CHOICE {
                -- be selected if STID is not pre assigned
                stidInfo SEQUENCE {
                        servingBsid BSID,
                        previousSTID STID
                },
                -- be selected if STID is pre assigned
                addressInfo CHOICE {
                -- be selected for R1 network mode
                        macAddress MACAddress,
                -- be selected for non R1 network mode
                        currentSTID STID
                }
        },
        akCount AKCount OPTIONAL,
        fidList SEQUENCE (SIZE (1..24)) OF FidInfo OPTIONAL,
        ...

}



..................




RedirectionInfo ::=                   SEQUENCE {
        absidForNeighborABS                   BSID,
        preambleForNeighborABS                PreambleIndex,
        centerFreqForNeighborABS              CenterFreq
}

RNGPurposeForHRNetwork ::=            SEQUENCE {
        extendedRngPurposeInd                 CHOICE {
                hrMulticastServiceLocationUpdate          HrMulticastServiceLocationUpdate,
                networkReentryForFBISOperation            NetworkReentryForFBISOperation,
                networkReentryFromIdleModeForExtenOfTDC   BOOLEAN,
                ...
        }
}

HrMulticastServiceLocationUpdate ::=  SEQUENCE {
```

```
        actionCode                                      BIT STRING {
                multicastServiceFlowUpdate                      (0),
                locationUpdateDueToMulticastZoneChange          (1),
                multicastSecurityKeyUpdate                      (2)
                } (SIZE(3)),
        locationUpdateMulticastFlows                    LocationUpdate
}

NetworkReentryForFBISOperation ::=          SEQUENCE {
        isStidPreAssigned                               CHOICE {
                -- be selected if STID is not pre assigned
                stidInfo                                        SEQUENCE {
                        servingBsid                                     BSID,
                        previousSTID                                    STID
                        },
                -- be selected if STID is pre assigned
                currentSTID                                     STID
        },
        akCount                                         AKCount                         OPTIONAL,
        -- Primary serving ABS flag
        -- set to 0 when the AMS sets its primary serving ABS as S-ABS (Degraded HR-BS)
        -- after network reentry
        -- set to 1 when the AMS sets its primary serving ABS as T-ABS (Target HR-BS)
        -- after network reentry
        primaryServingAbsFlag                           BOOLEAN,
        switchedAccessWindowSize                        CHOICE {
                -- be selected if switch access mode is fixed switched access windows
                switchedAccessWindowSize                        SwitchAccessWindowsSize,
                -- be selected if switch access mode is variable switched access windows
                maximumSwitchedAccessWindowSize                 MAXSwitchAccessWindowsSize
                },
        switchedAccessStartTime                         SwitchAccessStartTime
}

-- +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
-- Ranging Request
-- +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
AAI-RNG-REQ ::=                         SEQUENCE {
        -- Indicate whether this message is protected by CM
        cmacIndicator                           CMACI,
        rangingPurposeDiffMessage               CHOICE {
                initialNetworkEntry                     InitialNetworkEntry,
                handoverReentry                         HandoverReentry,
                networkReentryFromIdleMode              NetworkReentryFromIdleMode,
                idleModeLocationUpdate                  LocationUpdate,
                dcrModeExtension                        DCRModeExtension,
                emergencyCallSetup                      EmergencyCallSetup, -- e.g., E911
                -- Location update for updating service flow management encoding
                -- of E-MBS flows
                locationUpdateEmbsFlows                 LocationUpdate,
                -- Location update for transition to DCR mode from idle mode
                locationUpdateToDcrMode                 LocationUpdate,
                -- Reentry from DCR mode, coverage loss or detection of
                -- different ABS restart count
                reentryFromDcr                          ReentryFromDCR,
                -- Network reentry from a R1 BS
                networkReentryFromR1                    NetworkReentryFromR1,
                -- Zone switch to MZONE from LZONE
                zoneSwitch                              ZoneSwitch,
                locationUpdatePowerDown                 LocationUpdate,
                -- experiencing "femto interference"
                femtoInterference                       FemtoInterference,
                -- NS/EP Call Setup
                nsEpCallSetup                           NsEpCallSetup,
                rngPurposeForHRNetwork                  RNGPurposeForHRNetwork,
```

```
                ...
                },
        -- CSG information
        csgInformation                 SEQUENCE (SIZE (1..15)) OF CsgInfoItem OPTIONAL,
        ...
}

-- +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
-- Ranging Response Message
-- +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-

..................

END
```

[------------------------------------End of Text Proposal--]