

Project	IEEE 802.16 Broadband Wireless Access Working Group < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >	
Title	ASN.1 coding for AAI-SBC-REQ/RSP messages in IEEE 802.16.1a	
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Re:	In response to Sponsor Ballot on P802.16.1a	
Abstract	ASN.1 coding for SBC-REQ/RSP in GRIDMAN Draft Standard	
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN	
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# ASN.1 coding for AAI-SBC-REQ/RSP messages in IEEE 802.16.1a

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## 1. Introduction

This document provides ASN.1 encoding for AAI-SBC-REQ/RSP messages in P802.16.1a.

## 2. References

- [1] IEEE 802.16-12-0132-00, GRIDMAN System Requirement Document including SARM annex, January 2012.
- [2] IEEE P802.16n<sup>TM</sup>/D5, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
- [3] IEEE P802.16.1a<sup>TM</sup>/D5, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
- [4] IEEE P802.16<sup>TM</sup>-2012, IEEE Standard for Air Interface for Broadband Wireless Access Systems," August 2012.
- [5] IEEE P802.16.1<sup>TM</sup>-2012, IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, September 2012.

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

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

**[Remedy: replace text in line#27 - line#30, page 241, P802.16.1a/D5 by following:]**

```

44 -- +-----+
45 -- Ranging Response Message
46 -- +-----+
47 AAI-RNG-RSP ::= SEQUENCE {
48     -- set to 1 when an ABS rejects the AMS
49     rangingAbortFlag          BOOLEAN,
50     timerOrSTID               CHOICE {
51         -- Timer defined by an ABS to prohibit the AMS from attempting
52         -- network entry at this ABS, for a specific time duration
53         -- Value 65535 (When the received CSGID(s) from the AMS
54         -- does not match any of the CSGID(s) of the Femto ABS.
55         -- This value indicates the Ranging Abort Timer is not
56         -- to be used, and the AMS can range any time.)
57         -- Value 0 (do not try ranging again at the ABS)
58         -- Value 1-65534, in units of seconds
59     rangingAbortTimer          INTEGER (0..65535),
60     availableRangingResp      RangingResponse
61     },
62     ...
63 }
64
65
```

```

1 RangingResponse ::= SEQUENCE {
2   tempStidOrSTID CHOICE {
3     temporarySTID STID,
4     stid STID
5   } OPTIONAL,
6   mapMaskSeed MapMaskSeed,
7   amsidOrMacAddress CHOICE {
8     -- selected for advanced network mode and AMSID privacy is enabled
9     amsidStarHashValue MACAddress,
10    -- selected for other cases
11    macAddress MACAddress
12  },
13  crid CRID OPTIONAL,
14  -- response based on ranging purpose sent in AAI-RNG-REQ
15  rangingPurpose CHOICE {
16    emergencyCallSetup SEQUENCE {
17      emergencyServiceFID FID (2..15)
18    },
19    nsEpCallSetup SEQUENCE {
20      nsEPServiceFID FID (2..15)
21    },
22    locationUpdatePowerDown LocationUpdateResponse,
23    locationUpdateEmbsFlows LocationUpdateResponse,
24    idleModeLocationUpdate LocationUpdateResponse,
25    locationUpdateToDcrMode LocationUpdateResponse,
26    dcrModeExtension LocationUpdateResponse
27  },
28  -- bitmap for Reentry Process Optimization
29  reentryProcessOptimization ReentryProOptimization OPTIONAL,
30  activationDeadline INTEGER (0..63) OPTIONAL,
31  -- 1: perform neighbor station measurement report
32  nbrBsMeasurementRptIndicator BOOLEAN OPTIONAL,
33  resourceRetainTime INTEGER (0..255) OPTIONAL,
34  flowUpdating SEQUENCE (SIZE (1..24)) OF SEQUENCE {
35    sfid SFID,
36    updateOrDelete ENUMERATED {
37      update,
38      delete
39    },
40    dlULIndicator ENUMERATED {
41      dl,
42      ul
43    },
44    updatedQoSInfo QoSParameter OPTIONAL,
45    rohc FeatureSupport OPTIONAL,
46    phs INTEGER {
47      packetPhs (1)
48    } (0..1) OPTIONAL
49  } OPTIONAL,
50  unsolicitedBsGrantIndicator BOOLEAN OPTIONAL,
51  clcResponse CLCResponse OPTIONAL,
52  csgIdList SEQUENCE (SIZE (1..64, ...)) OF CSGID OPTIONAL,
53  nbrAbsRedirectInfoList SEQUENCE (SIZE (1..8)) OF RedirectionInfo OPTIONAL,
54  rangingRequestBit BOOLEAN OPTIONAL,
55  invalidFIDList SEQUENCE (SIZE (1..24)) OF SEQUENCE {
56    fid FID,
57    dlULIndicator ENUMERATED {
58      dl,
59      ul
60    }
61  } OPTIONAL,
62  saidUpdateBitMap BIT STRING (SIZE (16)) OPTIONAL,
63  rngRspForHandoverReentry RngRspForHoReentryInfo OPTIONAL,
64  mzoneSfidList SEQUENCE (SIZE (1..24)) OF SFID OPTIONAL,
65  ...

```

```

1  }
2
3
4
5
6
7  -- ++++++-----
8  -- Ranging Acknowledge
9  -- ++++++-----
10 AAI-RNG-ACK ::= SEQUENCE {
11     unicastIndication CHOICE {
12         broadcastRngAck BroadcastRngAck,
13         unicastRngAck RangingStatus
14     },
15     ...
16 }
17
18 -- ++++++-----
19 -- Ranging Confirmation
20 -- ++++++-----
21 AAI-RNG-CFM ::= SEQUENCE {
22     amsStid STID,
23     ...
24 }
25
26 -- ++++++-----
27 -- Basic Capability Request
28 -- ++++++-----
29 AAI-SBC-REQ ::= SEQUENCE {
30     amsNspRequest CHOICE {
31         serviceInfoQuery BIT STRING {
32             reqNspIdList (0),
33             reqVerboseNameList (1)
34         } (SIZE (2)),
35         sbcRequest SEQUENCE {
36             capabilityIndex CapabilityIndex,
37             deviceClass DeviceClass,
38             clcRequest CLCRequest OPTIONAL,
39             dlLongTTI FeatureSupport OPTIONAL,
40             ulSounding BIT STRING {
41                 fdm (0),
42                 cdm (1)
43             } (SIZE (2)) OPTIONAL,
44             oLRegion BIT STRING {
45                 type0 (0),
46                 type1 (1),
47                 type2 (2)
48             } (SIZE (3)) OPTIONAL,
49             dlFfrResourceMetric FeatureSupport OPTIONAL,
50             dlMaxNumOfSuMimoStreams INTEGER (1..8) OPTIONAL,
51             dlMaxNumOfMuMimoStreams INTEGER (1..2) OPTIONAL,
52             ulMaxNumOfSuMimoStreams INTEGER (1..4) OPTIONAL,
53             ulMaxNumOfMuMimoStreams INTEGER (1..4) OPTIONAL,
54             dlMIMOModes BIT STRING {
55                 -- 1: supported, 0: not supported
56                 mode0 (0),
57                 mode1 (1),
58                 mode2 (2),
59                 mode3 (3),
60                 mode4 (4),
61                 mode5 (5)
62             } (SIZE (6)) OPTIONAL,
63             ulMIMOModes BIT STRING {
64                 -- 1: supported, 0: not supported
65                 mode0 (0),

```

```

1           mode1           (1),
2           mode2           (2),
3           mode3           (3),
4           mode4           (4)
5           } (SIZE (5))    OPTIONAL,
6   dlFeedback             BIT STRING { -- 1: supported
7                           differentialMode (0),
8                           mimoFeedbackMode0 (1),
9                           mimoFeedbackMode1 (2),
10                          mimoFeedbackMode2 (3),
11                          mimoFeedbackMode3 (4),
12                          mimoFeedbackMode4 (5),
13                          mimoFeedbackMode5 (6),
14                          mimoFeedbackMode6 (7),
15                          mimoFeedbackMode7 (8),
16                          longTermReporting (9),
17                          shortTermReporting (10)
18                          } (SIZE (11))    OPTIONAL,
19   subBandAAMAP           FeatureSupport    OPTIONAL,
20   dlPilotPatternMUmimo   BIT STRING {
21                           dl4Stream        (0),
22                           dl8Stream        (1)
23                          } (SIZE (2))    OPTIONAL,
24   ulPilotPatternMUmimo   BIT STRING {
25                           ul2Stream        (0),
26                           ul4Stream        (1),
27                           ul8Stream        (2)
28                          } (SIZE (3))    OPTIONAL,
29   numberOfTxAntennas     ENUMERATED {
30                           oneAntenna,
31                           twoAntenna,
32                           fourAntenna
33                          }              OPTIONAL,
34   modulationSchemes      BIT STRING {
35                           dl64QAM         (0),
36                           ul64QAM         (1)
37                          } (SIZE (2))    OPTIONAL,
38   ulHARQBufferingCap     INTEGER (1..128)    OPTIONAL,
39   dlHARQBufferingCap     INTEGER (1..128)    OPTIONAL,
40   amsDlProcessingCap     INTEGER (1..128)    OPTIONAL,
41   amsUlProcessingCap     INTEGER (1..128)    OPTIONAL,
42   fftSizes               BIT STRING {
43                           fft2048         (0),
44                           fft1024         (1),
45                           fft512          (2)
46                          } (SIZE (3))    OPTIONAL,
47   authorizationPolicy    ENUMERATED {
48                           noAuthorization,
49                           eapBasedAuthorization
50                          }              OPTIONAL,
51   interRatOperationMode  InterRatOpMode    OPTIONAL,
52   interRatTypesSupport   BIT STRING {
53                           ieee802-11     (0),
54                           geran           (1),
55                           utran           (2),
56                           e-utran        (3),
57                           cdma2000       (4)
58                          } (SIZE (5))    OPTIONAL,
59   mihCapabilitySupported FeatureSupport    OPTIONAL,
60   maxTxPower             SEQUENCE {
61                           maxTxPowerForQPSK    INTEGER (0..255),
62                           maxTxPowerFor16QAM    INTEGER (0..255),
63                           maxTxPowerFor64QAM    INTEGER (0..255)
64                          },
65   aRSnetworkentry        SEQUENCE {

```

```

1          relaymode                BOOLEAN                OPTIONAL,
2          aRSTTG                    INTEGER (0..49)        OPTIONAL,
3          --present if relaymode == 0
4          aRSRTG                    INTEGER (0..49)        OPTIONAL
5          --present if relaymode == 0
6      } OPTIONAL,
7      visitedNSPID                  NSPID                  OPTIONAL,
8      -- HR Network Capabilities
9      multimodeCapabilitySupported BIT STRING {
10                                     ttr                  (0),
11                                     str                  (1),
12                                     bsSupport           (2)
13                                     } (SIZE(3))          OPTIONAL,
14      fbisCapabilitySupported        FeatureSupport    OPTIONAL,
15      localForwardCapability        ENUMERATED {
16                                     noSupport,
17                                     rsDetectAndPerform,
18                                     rsNoDetectButPerform
19                                     }                    OPTIONAL,
20      talkAroundDCForwardingSupported FeatureSupport    OPTIONAL,
21      tdcForwardCapability          SEQUENCE (SIZE (1..8)) OF SEQUENCE {
22          directZoneType            ENUMERATED {
23              cdmz,
24              cdmz-e,
25              csmz
26          }
27      }
28      directModeSlotNumProhibitingResourceAlloc ENUMERATED {
29          slot1,
30          slot2
31      }
32  } OPTIONAL,
33  ...
34  } --sbcRequest sequence
35  }, -- amsNspRequest choice
36  ...
37  }
38
39  NspInformation ::= SEQUENCE {
40      -- Shall present if AAI-SII-ADV Message Pointer is not included.
41      -- Optional if AAI-SII-ADV Message Pointer is included.
42      nspIdentifier SEQUENCE (SIZE (1..16)) OF NSPID OPTIONAL,
43      -- if SIQ bit 1 is set. The order of Verbose NSP Names presented shall be in
44      -- the same order as the NSP IDs presented in the NSP List.
45      verboseNspNameList SEQUENCE (SIZE (1..16)) OF VerboseName OPTIONAL,
46      aaiSiiAdvPointer INTEGER (0..16383) OPTIONAL
47  }
48
49
50  -- +-----+
51  -- Basic Capability Response
52  -- +-----+
53  AAI-SBC-RSP ::= SEQUENCE {
54      sbcRspInfo CHOICE {
55          nspInformation NspInformation,
56          noSiq SEQUENCE {
57              capabilityIndex CapabilityIndex,
58              deviceClass DeviceClass,
59              clcResponse CLCResponse OPTIONAL,
60              dlLongTTI FeatureSupport OPTIONAL,
61              ulSounding BIT STRING {
62                  fdm (0),
63                  cdm (1)
64              } (SIZE (2)) OPTIONAL,
65

```

```

1          oLRegion                               BIT STRING {
2              type0                               (0),
3              type1                               (1),
4              type2                               (2)
5          } (SIZE (3))                            OPTIONAL,
6          dlFfrResourceMetric                     FeatureSupport    OPTIONAL,
7          dlMaxNumOfSuMimoStreams                 INTEGER (1..8)    OPTIONAL,
8          dlMaxNumOfMuMimoStreams                 INTEGER (1..2)    OPTIONAL,
9          ulMaxNumOfSuMimoStreams                 INTEGER (1..4)    OPTIONAL,
10         ulMaxNumOfMuMimoStreams                 INTEGER (1..4)    OPTIONAL,
11         dlMIMOModes                             BIT STRING {
12             -- 1: supported, 0: not supported
13             mode0                               (0),
14             mode1                               (1),
15             mode2                               (2),
16             mode3                               (3),
17             mode4                               (4),
18             mode5                               (5)
19         } (SIZE (6))                            OPTIONAL,
20         ulMIMOModes                             BIT STRING {
21             -- 1: supported, 0: not supported
22             mode0                               (0),
23             mode1                               (1),
24             mode2                               (2),
25             mode3                               (3),
26             mode4                               (4)
27         } (SIZE (5))                            OPTIONAL,
28         dlFeedback                               BIT STRING { -- 1: supported
29             differentialMode                    (0),
30             mimoFeedbackMode0                  (1),
31             mimoFeedbackMode1                  (2),
32             mimoFeedbackMode2                  (3),
33             mimoFeedbackMode3                  (4),
34             mimoFeedbackMode4                  (5),
35             mimoFeedbackMode5                  (6),
36             mimoFeedbackMode6                  (7),
37             mimoFeedbackMode7                  (8),
38             longTermReporting                  (9),
39             shortTermReporting                 (10)
40         } (SIZE (11))                            OPTIONAL,
41         subBandAAMAP                             FeatureSupport    OPTIONAL,
42         dlPilotPatternMUmimo                     BIT STRING {
43             dl4Stream                           (0),
44             dl8Stream                           (1)
45         } (SIZE (2))                            OPTIONAL,
46         ulPilotPatternMUmimo                     BIT STRING {
47             ul2Stream                           (0),
48             ul4Stream                           (1),
49             ul8Stream                           (2)
50         } (SIZE (3))                            OPTIONAL,
51         numberOfTxAntennas                       ENUMERATED {
52             oneAntenna,
53             twoAntenna,
54             fourAntenna
55         }                                       OPTIONAL,
56         modulationSchemes                       BIT STRING {
57             dl64QAM                             (0),
58             ul64QAM                             (1)
59         } (SIZE (2))                            OPTIONAL,
60         ulHARQBufferingCap                       INTEGER (1..128) OPTIONAL,
61         dlHARQBufferingCap                       INTEGER (1..128) OPTIONAL,
62         amsDlProcessingCap                       INTEGER (1..128) OPTIONAL,
63         amsUlProcessingCap                       INTEGER (1..128) OPTIONAL,
64         fftSizes                                 BIT STRING {
65             fft2048                             (0),

```

```

1          fft1024          (1),
2          fft512          (2)
3      } (SIZE (3))          OPTIONAL,
4  authorizationPolicy    ENUMERATED {
5      noAuthorization,
6      eapBasedAuthorization
7  }          OPTIONAL,
8  interRatOperationMode  InterRatOpMode          OPTIONAL,
9  interRatTypesSupport   BIT STRING {
10     ieee802-11          (0),
11     geran                (1),
12     utran                (2),
13     e-utran             (3),
14     cdma2000            (4)
15 } (SIZE (5))          OPTIONAL,
16 mihCapabilitySupported  FeatureSupport          OPTIONAL,
17 visitedNspRealmName    VisitedNSPRealm          OPTIONAL,
18 -- HR Network Capabilities
19 localForwardCapability    ENUMERATED {
20     noSupport,
21     rsDetectAndPerform,
22     rsNoDetectButPerform
23 }          OPTIONAL,
24 talkAroundDCForwardingSupported    FeatureSupport          OPTIONAL,
25 tdcForwardCapability          SEQUENCE (SIZE (1..8)) OF SEQUENCE {
26     directZoneType          ENUMERATED {
27         cdmz,
28         cdmz-e,
29         csdmz
30     }
31     directModeSlotNumProhibitingResourceAlloc    ENUMERATED {
32         slot1,
33         slot2
34     }
35 }          OPTIONAL,
36 } OPTIONAL,
37 }
38 }
39 },
40 ...
41 }
42
43
44
45 -- +-----+
46 -- Registration Request
47 -- +-----+
48
49
50
51
52
53
54 [-----End of Text Proposal-----]
55
56
57
58
59
60
61
62
63
64
65

```