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RADIUS Accounting Server MIB for IPv6

Status of This Memo

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Abstract

This memo defines a set of extensions that instrument RADIUS accounting server functions. These extensions represent a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. Using these extensions, IP-based management stations can manage RADIUS accounting servers.

This memo obsoletes RFC 2621 by deprecating the MIB table containing IPv4-only address formats and defining a new table to add support for version-neutral IP address formats. The remaining MIB objects from RFC 2621 are carried forward into this document. This memo also adds UNITS and REFERENCE clauses to selected objects.

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1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. The objects defined within this memo relate to the Remote Authentication Dial-In User Service (RADIUS) Accounting Server as defined in RFC 2866 [RFC2866].

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

This document uses terminology from RFC 2865 [RFC2865] and RFC 2866 [RFC2866].

This document uses the word "malformed" with respect to RADIUS packets, particularly in the context of counters of "malformed packets". While RFC 2866 does not provide an explicit definition of "malformed", malformed generally means that the implementation has determined the packet does not match the format defined in RFC 2866. Those implementations are used in deployments today, and thus set the de facto definition of "malformed".

3. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

4. Scope of Changes

This document obsoletes RFC 2621 [RFC2621], RADIUS Accounting Server MIB, by deprecating the radiusAccClientTable table and adding a new table, radiusAccClientExtTable, containing radiusAccClientInetAddressType and radiusAccClientInetAddress. The purpose of these added MIB objects is to support version-neutral IP addressing formats. The existing table containing

radiusAccClientAddress is deprecated. The remaining MIB objects from RFC 2621 are carried forward into this document. This memo also adds UNITS and REFERENCE clauses to selected objects.

RFC 4001 [RFC4001], which defines the SMI Textual Conventions for version-neutral IP addresses, contains the following recommendation.

'In particular, when revising a MIB module that contains IPv4 specific tables, it is suggested to define new tables using the textual conventions defined in this memo [RFC4001] that support all versions of IP. The status of the new tables SHOULD be "current", whereas the status of the old IP version specific tables SHOULD be changed to "deprecated". The other approach, of having multiple similar tables for different IP versions, is strongly discouraged.'

5. Structure of the MIB Module

The RADIUS accounting protocol, described in RFC 2866 [RFC2866], distinguishes between the client function and the server function. In RADIUS accounting, clients send Accounting-Requests, and servers reply with Accounting-Responses. Typically, Network Access Server (NAS) devices implement the client function, and thus would be expected to implement the RADIUS accounting client MIB, while RADIUS accounting servers implement the server function, and thus would be expected to implement the RADIUS accounting server MIB.

However, it is possible for a RADIUS accounting entity to perform both client and server functions. For example, a RADIUS proxy may act as a server to one or more RADIUS accounting clients, while simultaneously acting as an accounting client to one or more accounting servers. In such situations, it is expected that RADIUS entities combining client and server functionality will support both the client and server MIBs. The server MIB is defined in this document, and the client MIB is defined in [RFC4670].

This MIB module contains thirteen scalars as well as a single table, the RADIUS Accounting Client Table, which contains one row for each RADIUS accounting client with which the server shares a secret. Each entry in the RADIUS Accounting Client Table includes twelve columns presenting a view of the activity of the RADIUS accounting server.

This MIB imports from [RFC2578], [RFC2580], [RFC3411], and [RFC4001].

6. Deprecated Objects

The deprecated table in this MIB is carried forward from RFC 2621 [RFC2621]. There are two conditions under which it MAY be desirable for managed entities to continue to support the deprecated table:

1. The managed entity only supports IPv4 address formats.

2. The managed entity supports both IPv4 and IPv6 address formats, and the deprecated table is supported for backwards compatibility with older management stations. This option SHOULD only be used when the IP addresses in the new table are in IPv4 format and can accurately be represented in both the new table and the deprecated table.

Managed entities SHOULD NOT instantiate row entries in the deprecated table, containing IPv4-only address objects, when the RADIUS accounting client address represented in such a table row is not an IPv4 address. Managed entities SHOULD NOT return inaccurate values of IP address or SNMP object access errors for IPv4-only address objects in otherwise populated tables. When row entries exist in both the deprecated IPv4-only table and the new IP-version-neutral table that describe the same RADIUS accounting client, the row indexes SHOULD be the same for the corresponding rows in each table, to facilitate correlation of these related rows by management applications.

7. Definitions

```
RADIUS-ACC-SERVER-MIB DEFINITIONS ::= BEGIN

IMPORTS
       MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,
       Counter32, Integer32,
       IpAddress, TimeTicks, mib-2      FROM SNMPv2-SMI
       SnmpAdminString                  FROM SNMP-FRAMEWORK-MIB
       InetAddressType, InetAddress     FROM INET-ADDRESS-MIB
       MODULE-COMPLIANCE, OBJECT-GROUP  FROM SNMPv2-CONF;

radiusAccServMIB MODULE-IDENTITY
       LAST-UPDATED "200608210000Z"  -- 21 August 2006
       ORGANIZATION "IETF RADIUS Extensions Working Group."
       CONTACT-INFO
              " Bernard Aboba
                Microsoft
                One Microsoft Way
                Redmond, WA  98052
                US
```

```
                  Phone: +1 425 936 6605
                  EMail: bernarda@microsoft.com"
          DESCRIPTION
                "The MIB module for entities implementing the server
                 side of the Remote Authentication Dial-In User
                 Service (RADIUS) accounting protocol.  Copyright (C)
                 The Internet Society (2006).  This version of this
                 MIB module is part of RFC 4671; see the RFC itself
                 for full legal notices."
          REVISION "200608210000Z"  -- 21 August 2006
          DESCRIPTION
                "Revised version as published in RFC 4671.  This
                 version obsoletes that of RFC 2621 by deprecating
                 the MIB table containing IPv4-only address formats
                 and defining a new table to add support for version-
                 neutral IP address formats.  The remaining MIB objects
                 from RFC 2621 are carried forward into this version."
          REVISION "199906110000Z"    -- 11 Jun 1999
          DESCRIPTION "Initial version as published in RFC 2621."
          ::= { radiusAccounting 1 }

   radiusMIB  OBJECT-IDENTITY
          STATUS  current
          DESCRIPTION
                "The OID assigned to RADIUS MIB work by the IANA."
          ::= { mib-2 67 }

   radiusAccounting  OBJECT IDENTIFIER ::= {radiusMIB 2}

   radiusAccServMIBObjects  OBJECT IDENTIFIER
         ::= { radiusAccServMIB 1 }

   radiusAccServ  OBJECT IDENTIFIER
         ::= { radiusAccServMIBObjects 1 }

   radiusAccServIdent OBJECT-TYPE
          SYNTAX      SnmpAdminString
          MAX-ACCESS  read-only
          STATUS      current
          DESCRIPTION
                "The implementation identification string for the
                 RADIUS accounting server software in use on the
                 system, for example, 'FNS-2.1'."
          ::= {radiusAccServ 1}

   radiusAccServUpTime OBJECT-TYPE
          SYNTAX      TimeTicks
          MAX-ACCESS  read-only
```

```
          STATUS      current
          DESCRIPTION
                "If the server has a persistent state (e.g., a
                 process), this value will be the time elapsed (in
                 hundredths of a second) since the server process was
                 started.  For software without persistent state, this
                 value will be zero."
          ::= {radiusAccServ 2}

   radiusAccServResetTime OBJECT-TYPE
          SYNTAX      TimeTicks
          MAX-ACCESS  read-only
          STATUS      current
          DESCRIPTION
                "If the server has a persistent state (e.g., a process)
                 and supports a 'reset' operation (e.g., can be told to
                 re-read configuration files), this value will be the
                 time elapsed (in hundredths of a second) since the
                 server was 'reset.'  For software that does not
                 have persistence or does not support a 'reset'
                 operation, this value will be zero."
          ::= {radiusAccServ 3}

   radiusAccServConfigReset OBJECT-TYPE
          SYNTAX INTEGER { other(1),
                           reset(2),
                           initializing(3),
                           running(4)}
          MAX-ACCESS  read-write
          STATUS      current
          DESCRIPTION
                 "Status/action object to reinitialize any persistent
                  server state.  When set to reset(2), any persistent
                  server state (such as a process) is reinitialized as
                  if the server had just been started.  This value will
                  never be returned by a read operation.  When read,
                  one of the following values will be returned:
                      other(1) - server in some unknown state;
                      initializing(3) - server (re)initializing;
                      running(4) - server currently running."
          ::= {radiusAccServ 4}

   radiusAccServTotalRequests OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
```

```
                "The number of packets received on the
                 accounting port."
        REFERENCE "RFC 2866 section 4.1"
        ::= { radiusAccServ 5 }

   radiusAccServTotalInvalidRequests OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The number of RADIUS Accounting-Request packets
                 received from unknown addresses."
        REFERENCE "RFC 2866 sections 2, 4.1"
        ::= { radiusAccServ 6 }

   radiusAccServTotalDupRequests OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The number of duplicate RADIUS Accounting-Request
                 packets received."
        REFERENCE "RFC 2866 section 4.1"
        ::= { radiusAccServ 7 }

   radiusAccServTotalResponses OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The number of RADIUS Accounting-Response packets
                 sent."
        REFERENCE "RFC 2866 section 4.2"
        ::= { radiusAccServ 8 }

   radiusAccServTotalMalformedRequests OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The number of malformed RADIUS Accounting-Request
                 packets received.  Bad authenticators or unknown
                 types are not included as malformed Access-Requests."
        REFERENCE "RFC 2866 section 3"
```

```
          ::= { radiusAccServ 9 }

   radiusAccServTotalBadAuthenticators OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of RADIUS Accounting-Request packets
                that contained an invalid authenticator."
         REFERENCE "RFC 2866 section 3"
         ::= { radiusAccServ 10 }

   radiusAccServTotalPacketsDropped OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of incoming packets silently discarded
                for a reason other than malformed, bad authenticators,
                or unknown types."
         REFERENCE "RFC 2866 section 3"
         ::= { radiusAccServ 11 }

   radiusAccServTotalNoRecords OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                "The number of RADIUS Accounting-Request packets
                 that were received and responded to but not
                 recorded."
          ::= { radiusAccServ 12 }

   radiusAccServTotalUnknownTypes OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of RADIUS packets of unknown type that
                were received."
         REFERENCE "RFC 2866 section 4"
         ::= { radiusAccServ 13 }

   radiusAccClientTable OBJECT-TYPE
```

```
        SYNTAX     SEQUENCE OF RadiusAccClientEntry
        MAX-ACCESS not-accessible
        STATUS     deprecated
        DESCRIPTION
              "The (conceptual) table listing the RADIUS accounting
               clients with which the server shares a secret."
        ::= { radiusAccServ 14 }

   radiusAccClientEntry OBJECT-TYPE
        SYNTAX     RadiusAccClientEntry
        MAX-ACCESS not-accessible
        STATUS     deprecated
        DESCRIPTION
              "An entry (conceptual row) representing a RADIUS
               accounting client with which the server shares a
               secret."
        INDEX      { radiusAccClientIndex }
        ::= { radiusAccClientTable 1 }

   RadiusAccClientEntry ::= SEQUENCE {
        radiusAccClientIndex                       Integer32,
        radiusAccClientAddress                     IpAddress,
        radiusAccClientID                    SnmpAdminString,
        radiusAccServPacketsDropped                Counter32,
        radiusAccServRequests                      Counter32,
        radiusAccServDupRequests                   Counter32,
        radiusAccServResponses                     Counter32,
        radiusAccServBadAuthenticators             Counter32,
        radiusAccServMalformedRequests             Counter32,
        radiusAccServNoRecords                     Counter32,
        radiusAccServUnknownTypes                  Counter32
   }

   radiusAccClientIndex OBJECT-TYPE
        SYNTAX     Integer32 (1..2147483647)
        MAX-ACCESS not-accessible
        STATUS     deprecated
        DESCRIPTION
              "A number uniquely identifying each RADIUS accounting
               client with which this server communicates."
        ::= { radiusAccClientEntry 1 }

   radiusAccClientAddress OBJECT-TYPE
        SYNTAX     IpAddress
        MAX-ACCESS read-only
        STATUS     deprecated
        DESCRIPTION
              "The NAS-IP-Address of the RADIUS accounting client
```

```
                referred to in this table entry."
        ::= { radiusAccClientEntry 2 }

   radiusAccClientID OBJECT-TYPE
          SYNTAX     SnmpAdminString
          MAX-ACCESS read-only
          STATUS     deprecated
          DESCRIPTION
                "The NAS-Identifier of the RADIUS accounting client
                 referred to in this table entry.  This is not
                 necessarily the same as sysName in MIB II."
          REFERENCE "RFC 2865 section 5.32"
          ::= { radiusAccClientEntry 3 }

   -- Server Counters
   --
   -- Requests - DupRequests - BadAuthenticators - MalformedRequests -
   -- UnknownTypes -  PacketsDropped - Responses = Pending
   --
   -- Requests - DupRequests - BadAuthenticators - MalformedRequests -
   -- UnknownTypes - PacketsDropped - NoRecords = entries logged

   radiusAccServPacketsDropped OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
              "The number of incoming packets received
               from this client and silently discarded
               for a reason other than malformed, bad
               authenticators, or unknown types."
        REFERENCE "RFC 2866 section 3"
        ::= { radiusAccClientEntry  4 }

   radiusAccServRequests OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS deprecated
          DESCRIPTION
                "The number of packets received from this
                 client on the accounting port."
          REFERENCE "RFC 2866 section 4.1"
          ::= { radiusAccClientEntry  5 }

   radiusAccServDupRequests OBJECT-TYPE
          SYNTAX Counter32
```

```
            UNITS "packets"
            MAX-ACCESS read-only
            STATUS deprecated
            DESCRIPTION
                  "The number of duplicate RADIUS Accounting-Request
                   packets received from this client."
            REFERENCE "RFC 2866 section 4.1"
            ::= { radiusAccClientEntry 6 }

      radiusAccServResponses OBJECT-TYPE
            SYNTAX Counter32
            UNITS "packets"
            MAX-ACCESS read-only
            STATUS deprecated
            DESCRIPTION
                  "The number of RADIUS Accounting-Response packets
                   sent to this client."
            REFERENCE "RFC 2866 section 4.2"
            ::= { radiusAccClientEntry  7 }

      radiusAccServBadAuthenticators OBJECT-TYPE
            SYNTAX Counter32
            UNITS "packets"
            MAX-ACCESS read-only
            STATUS deprecated
            DESCRIPTION
                  "The number of RADIUS Accounting-Request packets
                   that contained invalid authenticators received
                   from this client."
            REFERENCE "RFC 2866 section 3"
            ::= { radiusAccClientEntry  8 }

      radiusAccServMalformedRequests OBJECT-TYPE
            SYNTAX Counter32
            UNITS "packets"
            MAX-ACCESS read-only
            STATUS deprecated
            DESCRIPTION
                  "The number of malformed RADIUS Accounting-Request
                   packets that were received from this client.
                   Bad authenticators and unknown types
                   are not included as malformed Accounting-Requests."
            REFERENCE "RFC 2866 section 3"
            ::= { radiusAccClientEntry  9 }

      radiusAccServNoRecords OBJECT-TYPE
            SYNTAX Counter32
            UNITS "packets"
```

```
            MAX-ACCESS read-only
            STATUS deprecated
            DESCRIPTION
                  "The number of RADIUS Accounting-Request packets
                   that were received and responded to but not
                   recorded."
            ::= { radiusAccClientEntry  10 }

      radiusAccServUnknownTypes OBJECT-TYPE
            SYNTAX Counter32
            UNITS "packets"
            MAX-ACCESS read-only
            STATUS deprecated
            DESCRIPTION
                  "The number of RADIUS packets of unknown type that
                   were received from this client."
            REFERENCE "RFC 2866 section 4"
            ::= { radiusAccClientEntry  11 }


      -- New MIB objects added in this revision

      radiusAccClientExtTable OBJECT-TYPE
            SYNTAX     SEQUENCE OF RadiusAccClientExtEntry
            MAX-ACCESS not-accessible
            STATUS     current
            DESCRIPTION
                  "The (conceptual) table listing the RADIUS accounting
                   clients with which the server shares a secret."
            ::= { radiusAccServ 15 }

      radiusAccClientExtEntry OBJECT-TYPE
            SYNTAX     RadiusAccClientExtEntry
            MAX-ACCESS not-accessible
            STATUS     current
            DESCRIPTION
                  "An entry (conceptual row) representing a RADIUS
                   accounting client with which the server shares a
                   secret."
            INDEX      { radiusAccClientExtIndex }
            ::= { radiusAccClientExtTable 1 }

      RadiusAccClientExtEntry ::= SEQUENCE {
            radiusAccClientExtIndex               Integer32,
            radiusAccClientInetAddressType        InetAddressType,
            radiusAccClientInetAddress            InetAddress,
            radiusAccClientExtID                  SnmpAdminString,
            radiusAccServExtPacketsDropped        Counter32,
```

```
        radiusAccServExtRequests              Counter32,
        radiusAccServExtDupRequests           Counter32,
        radiusAccServExtResponses             Counter32,
        radiusAccServExtBadAuthenticators     Counter32,
        radiusAccServExtMalformedRequests     Counter32,
        radiusAccServExtNoRecords             Counter32,
        radiusAccServExtUnknownTypes          Counter32,
        radiusAccServerCounterDiscontinuity   TimeTicks
    }

    radiusAccClientExtIndex OBJECT-TYPE
           SYNTAX     Integer32 (1..2147483647)
           MAX-ACCESS not-accessible
           STATUS     current
           DESCRIPTION
                 "A number uniquely identifying each RADIUS accounting
                  client with which this server communicates."
           ::= { radiusAccClientExtEntry 1 }

           radiusAccClientInetAddressType OBJECT-TYPE
             SYNTAX     InetAddressType
             MAX-ACCESS read-only
             STATUS     current
             DESCRIPTION
                   "The type of address format used for the
                    radiusAccClientInetAddress object."
             ::= { radiusAccClientExtEntry 2 }

       radiusAccClientInetAddress OBJECT-TYPE
             SYNTAX     InetAddress
             MAX-ACCESS read-only
             STATUS     current
             DESCRIPTION
                   "The IP address of the RADIUS accounting
                    client referred to in this table entry, using
                    the IPv6 address format."
             ::= { radiusAccClientExtEntry 3 }

    radiusAccClientExtID OBJECT-TYPE
           SYNTAX     SnmpAdminString
           MAX-ACCESS read-only
           STATUS     current
           DESCRIPTION
                 "The NAS-Identifier of the RADIUS accounting client
                  referred to in this table entry.  This is not
                  necessarily the same as sysName in MIB II."
           REFERENCE "RFC 2865 section 5.32"
           ::= { radiusAccClientExtEntry 4 }
```

```
   -- Server Counters
   --
   -- Requests - DupRequests - BadAuthenticators - MalformedRequests -
   -- UnknownTypes -  PacketsDropped - Responses = Pending
   --
   -- Requests - DupRequests - BadAuthenticators - MalformedRequests -
   -- UnknownTypes - PacketsDropped - NoRecords = entries logged

   radiusAccServExtPacketsDropped OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
              "The number of incoming packets received from this
               client and silently discarded for a reason other
               than malformed, bad authenticators, or unknown types.
               This counter may experience a discontinuity when the
               RADIUS Accounting Server module within the managed
               entity is reinitialized, as indicated by the current
               value of radiusAccServerCounterDiscontinuity."
        REFERENCE "RFC 2866 section 3"
        ::= { radiusAccClientExtEntry  5 }

   radiusAccServExtRequests OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                "The number of packets received from this
                 client on the accounting port.  This counter
                 may experience a discontinuity when the
                 RADIUS Accounting Server module within the
                 managed entity is reinitialized, as indicated by
                 the current value of
                 radiusAccServerCounterDiscontinuity."
          REFERENCE "RFC 2866 section 4.1"
          ::= { radiusAccClientExtEntry  6 }

   radiusAccServExtDupRequests OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                "The number of duplicate RADIUS Accounting-Request
                 packets received from this client.  This counter
```

```
                may experience a discontinuity when the RADIUS
                Accounting Server module within the managed
                entity is reinitialized, as indicated by the
                current value of
                radiusAccServerCounterDiscontinuity."
        REFERENCE "RFC 2866 section 4.1"
        ::= { radiusAccClientExtEntry 7 }

   radiusAccServExtResponses OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of RADIUS Accounting-Response packets
               sent to this client.  This counter may experience
               a discontinuity when the RADIUS Accounting Server
               module within the managed entity is reinitialized,
               as indicated by the current value of
               radiusAccServerCounterDiscontinuity."
        REFERENCE "RFC 2866 section 4.2"
        ::= { radiusAccClientExtEntry  8 }

   radiusAccServExtBadAuthenticators OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of RADIUS Accounting-Request packets
               that contained invalid authenticators received
               from this client.  This counter may experience a
               discontinuity when the RADIUS Accounting Server
               module within the managed entity is reinitialized,
               as indicated by the current value of
               radiusAccServerCounterDiscontinuity."
        REFERENCE "RFC 2866 section 3"
        ::= { radiusAccClientExtEntry  9 }

   radiusAccServExtMalformedRequests OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of malformed RADIUS Accounting-Request
               packets that were received from this client.
               Bad authenticators and unknown types are not
```

```
                included as malformed Accounting-Requests.  This
                counter may experience a discontinuity when the
                RADIUS Accounting Server module within the managed
                entity is reinitialized, as indicated by the current
                value of radiusAccServerCounterDiscontinuity."
        REFERENCE "RFC 2866 section 3"
        ::= { radiusAccClientExtEntry  10 }

   radiusAccServExtNoRecords OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of RADIUS Accounting-Request packets
               that were received and responded to but not
               recorded.  This counter may experience a
               discontinuity when the RADIUS Accounting Server
               module within the managed entity is reinitialized,
               as indicated by the current value of
               radiusAccServerCounterDiscontinuity."
        ::= { radiusAccClientExtEntry  11 }

   radiusAccServExtUnknownTypes OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of RADIUS packets of unknown type that
               were received from this client.  This counter may
               experience a discontinuity when the RADIUS Accounting
               Server module within the managed entity is
               reinitialized, as indicated by the current value of
               radiusAccServerCounterDiscontinuity."
        REFERENCE "RFC 2866 section 4"
        ::= { radiusAccClientExtEntry  12 }

   radiusAccServerCounterDiscontinuity OBJECT-TYPE
          SYNTAX TimeTicks
          UNITS "centiseconds"
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                "The number of centiseconds since the last
                 discontinuity in the RADIUS Accounting Server
                 counters.  A discontinuity may be the result of
                 a reinitialization of the RADIUS Accounting Server
```

```
                module within the managed entity."
          ::= { radiusAccClientExtEntry 13 }


   -- conformance information

   radiusAccServMIBConformance  OBJECT IDENTIFIER
          ::= { radiusAccServMIB 2 }

   radiusAccServMIBCompliances  OBJECT IDENTIFIER
          ::= { radiusAccServMIBConformance 1 }

   radiusAccServMIBGroups  OBJECT IDENTIFIER
          ::= { radiusAccServMIBConformance 2 }


   -- compliance statements

   radiusAccServMIBCompliance MODULE-COMPLIANCE
          STATUS  deprecated
          DESCRIPTION
               "The compliance statement for accounting servers
               implementing the RADIUS Accounting Server MIB.
               Implementation of this module is for IPv4-only
               entities, or for backwards compatibility use with
               entities that support both IPv4 and IPv6."
          MODULE  -- this module
          MANDATORY-GROUPS { radiusAccServMIBGroup }

          OBJECT        radiusAccServConfigReset
          WRITE-SYNTAX  INTEGER { reset(2) }
          DESCRIPTION  "The only SETable value is 'reset' (2)."

          ::= { radiusAccServMIBCompliances 1 }

   radiusAccServExtMIBCompliance MODULE-COMPLIANCE
          STATUS  current
          DESCRIPTION
               "The compliance statement for accounting
               servers implementing the RADIUS Accounting
               Server IPv6 Extensions MIB.  Implementation of
               this module is for entities that support IPv6,
               or support IPv4 and IPv6."
          MODULE  -- this module
          MANDATORY-GROUPS { radiusAccServExtMIBGroup }

          OBJECT        radiusAccServConfigReset
          WRITE-SYNTAX  INTEGER { reset(2) }
```

```
          DESCRIPTION  "The only SETable value is 'reset' (2)."

          OBJECT radiusAccClientInetAddressType
           SYNTAX InetAddressType { ipv4(1), ipv6(2) }
           DESCRIPTION
                 "An implementation is only required to support
                  IPv4 and globally unique IPv6 addresses."

           OBJECT radiusAccClientInetAddress
           SYNTAX InetAddress ( SIZE (4|16) )
           DESCRIPTION
                 "An implementation is only required to support
                  IPv4 and globally unique IPv6 addresses."

          ::= { radiusAccServMIBCompliances 2 }


   -- units of conformance

   radiusAccServMIBGroup OBJECT-GROUP
         OBJECTS {radiusAccServIdent,
                  radiusAccServUpTime,
                  radiusAccServResetTime,
                  radiusAccServConfigReset,
                  radiusAccServTotalRequests,
                  radiusAccServTotalInvalidRequests,
                  radiusAccServTotalDupRequests,
                  radiusAccServTotalResponses,
                  radiusAccServTotalMalformedRequests,
                  radiusAccServTotalBadAuthenticators,
                  radiusAccServTotalPacketsDropped,
                  radiusAccServTotalNoRecords,
                  radiusAccServTotalUnknownTypes,
                  radiusAccClientAddress,
                  radiusAccClientID,
                  radiusAccServPacketsDropped,
                  radiusAccServRequests,
                  radiusAccServDupRequests,
                  radiusAccServResponses,
                  radiusAccServBadAuthenticators,
                  radiusAccServMalformedRequests,
                  radiusAccServNoRecords,
                  radiusAccServUnknownTypes
                 }
         STATUS  deprecated
         DESCRIPTION
               "The collection of objects providing management of
                a RADIUS Accounting Server."
```

```
        ::= { radiusAccServMIBGroups 1 }

   radiusAccServExtMIBGroup OBJECT-GROUP
         OBJECTS {radiusAccServIdent,
                  radiusAccServUpTime,
                  radiusAccServResetTime,
                  radiusAccServConfigReset,
                  radiusAccServTotalRequests,
                  radiusAccServTotalInvalidRequests,
                  radiusAccServTotalDupRequests,
                  radiusAccServTotalResponses,
                  radiusAccServTotalMalformedRequests,
                  radiusAccServTotalBadAuthenticators,
                  radiusAccServTotalPacketsDropped,
                  radiusAccServTotalNoRecords,
                  radiusAccServTotalUnknownTypes,
                  radiusAccClientInetAddressType,
                  radiusAccClientInetAddress,
                  radiusAccClientExtID,
                  radiusAccServExtPacketsDropped,
                  radiusAccServExtRequests,
                  radiusAccServExtDupRequests,
                  radiusAccServExtResponses,
                  radiusAccServExtBadAuthenticators,
                  radiusAccServExtMalformedRequests,
                  radiusAccServExtNoRecords,
                  radiusAccServExtUnknownTypes,
                  radiusAccServerCounterDiscontinuity
                 }
         STATUS  current
         DESCRIPTION
               "The collection of objects providing management of
                a RADIUS Accounting Server."
         ::= { radiusAccServMIBGroups 2 }

   END
```

8. Security Considerations

There are management objects (radiusAccServConfigReset) defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are:

radiusAccServConfigReset
This object can be used to reinitialize the persistent state of any server. When set to reset(2), any persistent server state (such as a process) is reinitialized as if the server had just been started. Depending on the server implementation details, this action may or may not interrupt the processing of pending request in the server. Abuse of this object may lead to a Denial of Service attack on the server.

There are a number of managed objects in this MIB that may contain sensitive information. These are:

radiusAccClientIPAddress
This can be used to determine the address of the RADIUS accounting client with which the server is communicating. This information could be useful in mounting an attack on the accounting client.

radiusAccClientInetAddress
This can be used to determine the address of the RADIUS accounting client with which the server is communicating. This information could be useful in mounting an attack on the accounting client.

It is thus important to control even GET access to these objects and possibly to even encrypt the values of these object when sending them over the network via SNMP. Not all versions of SNMP provide features for such a secure environment.

SNMP versions prior to SNMPv3 do not provide a secure environment. Even if the network itself is secure (for example by using IPsec), there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

9. References

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Appendix A. Acknowledgements

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