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                RADIUS Accounting Server MIB for IPv6

Status of This Memo

   This memo provides information for the Internet community. It does
   not specify an Internet standard of any kind. Distribution of this
   memo is unlimited.

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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.

Table of Contents

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

Nelson   Informational   [Page 3]

   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

9.1. Normative References

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Appendix A.   Acknowledgements

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