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RADIUS Accounting Client 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 client 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 clients.

This memo obsoletes RFC 2620 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 2620 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 Client 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 2620 [RFC2620], RADIUS Accounting Client MIB, by deprecating the radiusAccServerTable table and adding a new table, radiusAccServerExtTable, containing radiusAccServerInetAddressType, radiusAccServerInetAddress, and radiusAccClientServerInetPortNumber. The purpose of these added MIB objects is to support version-neutral IP addressing formats. The

existing table containing radiusAuthServerAddress and radiusAuthClientServerPortNumber is deprecated. The remaining MIB objects from RFC 2620 are carried forward into this document.

RFC 4001 [RFC4001], which defines the SMI Textual Conventions for IPv6 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 client MIB is defined in this document, and the server MIB is defined in [RFC4671].

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

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

6. Deprecated Objects

The deprecated table in this MIB is carried forward from RFC 2620 [RFC2620]. 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 server 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 server, 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-CLIENT-MIB DEFINITIONS ::= BEGIN

IMPORTS
       MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,
       Counter32, Integer32, Gauge32,
       IpAddress, TimeTicks, mib-2      FROM SNMPv2-SMI
       SnmpAdminString                  FROM SNMP-FRAMEWORK-MIB
       InetAddressType, InetAddress,
       InetPortNumber                   FROM INET-ADDRESS-MIB
       MODULE-COMPLIANCE, OBJECT-GROUP  FROM SNMPv2-CONF;


radiusAccClientMIB 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 client
               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 4670; see the RFC itself for
               full legal notices."
        REVISION "200608210000Z"  -- 21 August 2006
        DESCRIPTION
              "Revised version as published in RFC 4670.
               This version obsoletes that of RFC 2620 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 2620 are carried forward into this
               version."
        REVISION "199906110000Z"  -- 11 Jun 1999
        DESCRIPTION "Initial version as published in RFC 2620."
        ::= { radiusAccounting 2 }

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

   radiusAccounting  OBJECT IDENTIFIER ::= {radiusMIB 2}

   radiusAccClientMIBObjects     OBJECT IDENTIFIER
        ::= { radiusAccClientMIB 1 }

   radiusAccClient  OBJECT IDENTIFIER
        ::= { radiusAccClientMIBObjects 1 }

   radiusAccClientInvalidServerAddresses OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of RADIUS Accounting-Response packets
               received from unknown addresses."
        ::= { radiusAccClient 1 }
```

```
   radiusAccClientIdentifier OBJECT-TYPE
         SYNTAX SnmpAdminString
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The NAS-Identifier of the RADIUS accounting client.
                This is not necessarily the same as sysName in MIB
                II."
         REFERENCE "RFC 2865 section 5.32"
         ::= { radiusAccClient 2 }

   radiusAccServerTable OBJECT-TYPE
         SYNTAX SEQUENCE OF RadiusAccServerEntry
         MAX-ACCESS not-accessible
         STATUS     deprecated
         DESCRIPTION
               "The (conceptual) table listing the RADIUS accounting
                servers with which the client shares a secret."
         ::= { radiusAccClient 3 }

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

   RadiusAccServerEntry ::= SEQUENCE {
         radiusAccServerIndex                    Integer32,
         radiusAccServerAddress                  IpAddress,
         radiusAccClientServerPortNumber         Integer32,
         radiusAccClientRoundTripTime            TimeTicks,
         radiusAccClientRequests                 Counter32,
         radiusAccClientRetransmissions          Counter32,
         radiusAccClientResponses                Counter32,
         radiusAccClientMalformedResponses       Counter32,
         radiusAccClientBadAuthenticators        Counter32,
         radiusAccClientPendingRequests            Gauge32,
         radiusAccClientTimeouts                 Counter32,
         radiusAccClientUnknownTypes             Counter32,
         radiusAccClientPacketsDropped           Counter32
   }
```

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

   radiusAccServerAddress OBJECT-TYPE
         SYNTAX     IpAddress
         MAX-ACCESS read-only
         STATUS     deprecated
         DESCRIPTION
               "The IP address of the RADIUS accounting server
                referred to in this table entry."
         ::= { radiusAccServerEntry 2 }

   radiusAccClientServerPortNumber  OBJECT-TYPE
         SYNTAX Integer32 (0..65535)
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
               "The UDP port the client is using to send requests to
                this server."
         REFERENCE "RFC 2866 section 3"
         ::= { radiusAccServerEntry 3 }

   radiusAccClientRoundTripTime  OBJECT-TYPE
         SYNTAX TimeTicks
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
                "The time interval between the most recent
                Accounting-Response and the Accounting-Request that
                matched it from this RADIUS accounting server."
         REFERENCE "RFC 2866 section 2"
         ::= { radiusAccServerEntry 4 }

   -- Request/Response statistics
   --
   -- Requests = Responses + PendingRequests + ClientTimeouts
   --
   -- Responses - MalformedResponses - BadAuthenticators -
   -- UnknownTypes - PacketsDropped = Successfully received
```

```
   radiusAccClientRequests OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
               "The number of RADIUS Accounting-Request packets
                sent.  This does not include retransmissions."
         REFERENCE "RFC 2866 section 4.1"
         ::= { radiusAccServerEntry 5 }

   radiusAccClientRetransmissions OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
               "The number of RADIUS Accounting-Request packets
                retransmitted to this RADIUS accounting server.
                Retransmissions include retries where the
                Identifier and Acct-Delay have been updated, as
                well as those in which they remain the same."
         REFERENCE "RFC 2866 section 2"
         ::= { radiusAccServerEntry 6 }

   radiusAccClientResponses OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
               "The number of RADIUS packets received on the
                accounting port from this server."
         REFERENCE "RFC 2866 section 4.2"
         ::= { radiusAccServerEntry 7 }

   radiusAccClientMalformedResponses OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
                "The number of malformed RADIUS Accounting-Response
                 packets received from this server.  Malformed packets
                include packets with an invalid length.  Bad
                authenticators and unknown types are not included as
                malformed accounting responses."
         REFERENCE "RFC 2866 section 3"
```

```
          ::= { radiusAccServerEntry 8 }

   radiusAccClientBadAuthenticators OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS deprecated
          DESCRIPTION
                "The number of RADIUS Accounting-Response
                 packets that contained invalid authenticators
                 received from this server."
          REFERENCE "RFC 2866 section 3"
          ::= { radiusAccServerEntry 9 }

   radiusAccClientPendingRequests OBJECT-TYPE
          SYNTAX Gauge32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS deprecated
          DESCRIPTION
                "The number of RADIUS Accounting-Request packets
                 sent to this server that have not yet timed out or
                 received a response.  This variable is incremented
                 when an Accounting-Request is sent and decremented
                 due to receipt of an Accounting-Response, a timeout,
                 or a retransmission."
          REFERENCE "RFC 2866 section 2"
          ::= { radiusAccServerEntry 10 }

   radiusAccClientTimeouts OBJECT-TYPE
         SYNTAX Counter32
         UNITS "timeouts"
         MAX-ACCESS read-only
         STATUS deprecated
         DESCRIPTION
              "The number of accounting timeouts to this server.
               After a timeout, the client may retry to the same
               server, send to a different server, or give up.
               A retry to the same server is counted as a
               retransmit as well as a timeout.  A send to a different
               server is counted as an Accounting-Request as well as
               a timeout."
          REFERENCE "RFC 2866 section 2"
          ::= { radiusAccServerEntry  11 }

   radiusAccClientUnknownTypes 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 server on the accounting port."
          REFERENCE "RFC 2866 section 4"
          ::= { radiusAccServerEntry  12 }

      radiusAccClientPacketsDropped OBJECT-TYPE
          SYNTAX Counter32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS deprecated
          DESCRIPTION
                "The number of RADIUS packets that were received from
                 this server on the accounting port and dropped for some
                 other reason."
          ::= { radiusAccServerEntry  13 }


      -- New MIB objects added in this revision

      radiusAccServerExtTable OBJECT-TYPE
          SYNTAX SEQUENCE OF RadiusAccServerExtEntry
          MAX-ACCESS not-accessible
          STATUS     current
          DESCRIPTION
                "The (conceptual) table listing the RADIUS accounting
                 servers with which the client shares a secret."
          ::= { radiusAccClient 4 }

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

      RadiusAccServerExtEntry ::= SEQUENCE {
          radiusAccServerExtIndex                  Integer32,
          radiusAccServerInetAddressType           InetAddressType,
          radiusAccServerInetAddress               InetAddress,
          radiusAccClientServerInetPortNumber      InetPortNumber,
          radiusAccClientExtRoundTripTime          TimeTicks,
```

```
        radiusAccClientExtRequests                Counter32,
        radiusAccClientExtRetransmissions         Counter32,
        radiusAccClientExtResponses               Counter32,
        radiusAccClientExtMalformedResponses      Counter32,
        radiusAccClientExtBadAuthenticators       Counter32,
        radiusAccClientExtPendingRequests         Gauge32,
        radiusAccClientExtTimeouts                Counter32,
        radiusAccClientExtUnknownTypes            Counter32,
        radiusAccClientExtPacketsDropped          Counter32,
        radiusAccClientCounterDiscontinuity       TimeTicks
    }

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


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


       radiusAccServerInetAddress OBJECT-TYPE
            SYNTAX     InetAddress
            MAX-ACCESS read-only
            STATUS     current
            DESCRIPTION
                  "The IP address of the RADIUS accounting
                   server referred to in this table entry, using
                   the version-neutral IP address format."
            ::= { radiusAccServerExtEntry 3 }

       radiusAccClientServerInetPortNumber  OBJECT-TYPE
            SYNTAX InetPortNumber ( 1..65535 )
            MAX-ACCESS read-only
            STATUS current
            DESCRIPTION
```

```
                "The UDP port the client is using to send requests
                 to this accounting server.  The value zero (0) is
                 invalid."
            REFERENCE "RFC 2866 section 3"
            ::= { radiusAccServerExtEntry 4 }


   radiusAccClientExtRoundTripTime  OBJECT-TYPE
         SYNTAX TimeTicks
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
                "The time interval between the most recent
                Accounting-Response and the Accounting-Request that
                matched it from this RADIUS accounting server."
         REFERENCE "RFC 2866 section 2"
         ::= { radiusAccServerExtEntry 5 }

   -- Request/Response statistics
   --
   -- Requests = Responses + PendingRequests + ClientTimeouts
   --
   -- Responses - MalformedResponses - BadAuthenticators -
   -- UnknownTypes - PacketsDropped = Successfully received

   radiusAccClientExtRequests OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of RADIUS Accounting-Request packets
                sent.  This does not include retransmissions.
                This counter may experience a discontinuity when the
                RADIUS Accounting Client module within the managed
                entity is reinitialized, as indicated by the current
                value of radiusAccClientCounterDiscontinuity."
         REFERENCE "RFC 2866 section 4.1"
         ::= { radiusAccServerExtEntry 6 }

   radiusAccClientExtRetransmissions OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of RADIUS Accounting-Request packets
                retransmitted to this RADIUS accounting server.
```

```
                Retransmissions include retries where the
                Identifier and Acct-Delay have been updated, as
                well as those in which they remain the same.
                This counter may experience a discontinuity when the
                RADIUS Accounting Client module within the managed
                entity is reinitialized, as indicated by the current
                value of radiusAccClientCounterDiscontinuity."
        REFERENCE "RFC 2866 section 2"
        ::= { radiusAccServerExtEntry 7 }

    radiusAccClientExtResponses OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of RADIUS packets received on the
               accounting port from this server.  This counter
               may experience a discontinuity when the RADIUS
               Accounting Client module within the managed entity is
               reinitialized, as indicated by the current value of
               radiusAccClientCounterDiscontinuity."
        REFERENCE "RFC 2866 section 4.2"
        ::= { radiusAccServerExtEntry 8 }

    radiusAccClientExtMalformedResponses OBJECT-TYPE
        SYNTAX Counter32
        UNITS "packets"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "The number of malformed RADIUS Accounting-Response
               packets received from this server.  Malformed packets
               include packets with an invalid length.  Bad
               authenticators and unknown types are not included as
               malformed accounting responses.  This counter may
               experience a discontinuity when the RADIUS Accounting
               Client module within the managed entity is
               reinitialized, as indicated by the current
               value of radiusAccClientCounterDiscontinuity."
        REFERENCE "RFC 2866 section 3"
        ::= { radiusAccServerExtEntry 9 }

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

```
          DESCRIPTION
                "The number of RADIUS Accounting-Response
                 packets that contained invalid authenticators
                 received from this server.  This counter may
                 experience a discontinuity when the RADIUS
                 Accounting Client module within the managed
                 entity is reinitialized, as indicated by the
                 current value of
                 radiusAccClientCounterDiscontinuity."
          REFERENCE "RFC 2866 section 3"
          ::= { radiusAccServerExtEntry 10 }

   radiusAccClientExtPendingRequests OBJECT-TYPE
          SYNTAX Gauge32
          UNITS "packets"
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
                "The number of RADIUS Accounting-Request packets
                 sent to this server that have not yet timed out or
                 received a response.  This variable is incremented
                 when an Accounting-Request is sent and decremented
                 due to receipt of an Accounting-Response, a timeout,
                 or a retransmission.  This counter may experience a
                 discontinuity when the RADIUS Accounting Client module
                 within the managed entity is reinitialized, as
                 indicated by the current value of
                 radiusAccClientCounterDiscontinuity."
          REFERENCE "RFC 2866 section 2"
          ::= { radiusAccServerExtEntry 11 }

   radiusAccClientExtTimeouts OBJECT-TYPE
        SYNTAX Counter32
        UNITS "timeouts"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
             "The number of accounting timeouts to this server.
              After a timeout, the client may retry to the same
              server, send to a different server, or give up.
              A retry to the same server is counted as a
              retransmit as well as a timeout.  A send to a different
              server is counted as an Accounting-Request as well as
              a timeout.  This counter may experience a discontinuity
              when the RADIUS Accounting Client module within the
              managed entity is reinitialized, as indicated by the
              current value of radiusAccClientCounterDiscontinuity."
          REFERENCE "RFC 2866 section 2"
```

```
        ::= { radiusAccServerExtEntry  12 }

   radiusAccClientExtUnknownTypes 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 server on the accounting port.
                This counter may experience a discontinuity when the
                RADIUS Accounting Client module within the managed
                entity is reinitialized, as indicated by the current
                value of radiusAccClientCounterDiscontinuity."
         REFERENCE "RFC 2866 section 4"
         ::= { radiusAccServerExtEntry  13 }

   radiusAccClientExtPacketsDropped OBJECT-TYPE
         SYNTAX Counter32
         UNITS "packets"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The number of RADIUS packets that were received from
                this server on the accounting port and dropped for some
                other reason.  This counter may experience a
                discontinuity when the RADIUS Accounting Client module
                within the managed entity is reinitialized, as indicated
                by the current value of
                radiusAccClientCounterDiscontinuity."
         ::= { radiusAccServerExtEntry  14 }

   radiusAccClientCounterDiscontinuity 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 Client
                   counters.  A discontinuity may be the result of a
                   reinitialization of the RADIUS Accounting Client
                   module within the managed entity."
            ::= { radiusAccServerExtEntry 15 }
```

```
   -- conformance information

   radiusAccClientMIBConformance  OBJECT IDENTIFIER
         ::= { radiusAccClientMIB 2 }

   radiusAccClientMIBCompliances  OBJECT IDENTIFIER
         ::= { radiusAccClientMIBConformance 1 }

   radiusAccClientMIBGroups  OBJECT IDENTIFIER
         ::= { radiusAccClientMIBConformance 2 }


   -- units of conformance

   radiusAccClientMIBCompliance MODULE-COMPLIANCE
        STATUS  deprecated
        DESCRIPTION
              "The compliance statement for accounting clients
               implementing the RADIUS Accounting Client 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 { radiusAccClientMIBGroup }

        ::= { radiusAccClientMIBCompliances 1 }


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

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

        OBJECT radiusAccServerInetAddress
        SYNTAX InetAddress ( SIZE (4|16) )
        DESCRIPTION
```

```
              "An implementation is only required to support
               IPv4 and globally unique IPv6 addresses."

         ::= { radiusAccClientMIBCompliances 2 }


   -- units of conformance

   radiusAccClientMIBGroup OBJECT-GROUP
        OBJECTS { radiusAccClientIdentifier,
                  radiusAccClientInvalidServerAddresses,
                  radiusAccServerAddress,
                  radiusAccClientServerPortNumber,
                  radiusAccClientRoundTripTime,
                  radiusAccClientRequests,
                  radiusAccClientRetransmissions,
                  radiusAccClientResponses,
                  radiusAccClientMalformedResponses,
                  radiusAccClientBadAuthenticators,
                  radiusAccClientPendingRequests,
                  radiusAccClientTimeouts,
                  radiusAccClientUnknownTypes,
                  radiusAccClientPacketsDropped
              }
        STATUS  deprecated
        DESCRIPTION
              "The basic collection of objects providing management of
               RADIUS Accounting Clients."
        ::= { radiusAccClientMIBGroups 1 }


   radiusAccClientExtMIBGroup OBJECT-GROUP
        OBJECTS { radiusAccClientIdentifier,
                  radiusAccClientInvalidServerAddresses,
                  radiusAccServerInetAddressType,
                  radiusAccServerInetAddress,
                  radiusAccClientServerInetPortNumber,
                  radiusAccClientExtRoundTripTime,
                  radiusAccClientExtRequests,
                  radiusAccClientExtRetransmissions,
                  radiusAccClientExtResponses,
                  radiusAccClientExtMalformedResponses,
                  radiusAccClientExtBadAuthenticators,
                  radiusAccClientExtPendingRequests,
                  radiusAccClientExtTimeouts,
                  radiusAccClientExtUnknownTypes,
                  radiusAccClientExtPacketsDropped,
                  radiusAccClientCounterDiscontinuity
```

```
        }
    STATUS  current
    DESCRIPTION
          "The basic collection of objects providing management of
           RADIUS Accounting Clients."
    ::= { radiusAccClientMIBGroups 2 }


END
```

8. Security Considerations

There are no management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. So, if this MIB is implemented correctly, then there is no risk that an intruder can alter or create any management objects of this MIB via direct SNMP SET operations.

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

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

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

radiusAcctClientServerPortNumber
: This can be used to determine the port number on which the RADIUS accounting client is sending. This information could be useful in impersonating the client in order to send data to the accounting server.

radiusAcctClientServerInetPortNumber
: This can be used to determine the port number on which the RADIUS accounting client is sending. This information could be useful in impersonating the client in order to send data to the accounting server.

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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