RADIUS Dynamic Authorization Server MIB

Status of This Memo

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Abstract

   This memo defines a portion of the Management Information Base (MIB)
   for use with network management protocols in the Internet community.
   In particular, it describes the Remote Authentication Dial-In User
   Service (RADIUS) (RFC 2865) Dynamic Authorization Server (DAS)
   functions that support the dynamic authorization extensions as
   defined in RFC 3576.

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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.
   It is becoming increasingly important to support Dynamic
   Authorization extensions on the network access server (NAS) devices
   to handle the Disconnect and Change-of-Authorization (CoA) messages
   as described in [RFC3576]. As a result, the effective management of
   RADIUS Dynamic Authorization entities is of considerable importance.
   This RADIUS Dynamic Authorization Server (DAS) MIB complements the
   managed objects used for managing RADIUS authentication and
   accounting clients as described in [RFC4668] and [RFC4670],
   respectively.

1.1. Requirements Notation

   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 [RFC2119].

1.2. Terminology

   Dynamic Authorization Server (DAS)

   The component that resides on the NAS that processes the Disconnect
   and Change-of-Authorization (CoA) Request packets [RFC3576] sent by
   the Dynamic Authorization Client.

   Dynamic Authorization Client (DAC)

   The component that sends Disconnect and CoA-Request packets to the
   Dynamic Authorization Server. Although this component often resides
   on the RADIUS server, it is also possible for it to be located on a
   separate host, such as a Rating Engine.

   Dynamic Authorization Server Port

   The UDP port on which the Dynamic Authorization Server listens for
   the Disconnect and CoA requests sent by the Dynamic Authorization
   Client.

2. 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
   [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].

3. Overview

"Dynamic Authorization Extensions to RADIUS" [RFC3576] defines the
operation of Disconnect-Request, Disconnect-ACK, Disconnect-NAK,
CoA-Request, CoA-ACK, and CoA-NAK packets. Typically, NAS devices
implement the DAS function, and thus would be expected to implement
the RADIUS Dynamic Authorization Server MIB, whereas DACs implement
the client function and thus would be expected to implement the
RADIUS Dynamic Authorization Client MIB.

However, it is possible for a RADIUS Dynamic Authorization entity to
perform both client and server functions. For example, a RADIUS
proxy may act as a DAS to one or more DACs while simultaneously
acting as a DAC to one or more DASs. In such situations, it is
expected that RADIUS entities combining client and server
functionality will support both the client and server MIBs.

This memo describes the MIB for Dynamic Authorization Servers and
relates to the following documents as follows:

[RFC4668] describes the MIB for a RADIUS Auth Client MIB.

[RFC4669] describes the MIB for a RADIUS Auth Server MIB.

[RFC4670] describes the MIB for a RADIUS Acct Client MIB.

[RFC4671] describes the MIB for a RADIUS Acct Server MIB.

[RFC4672] describes the MIB for a RADIUS Dynamic Auth Client.

A NAS typically implements the MIBs for a RADIUS Authentication
Client, a RADIUS accounting client, and a RADIUS Dynamic
Authorization Server. However, any one MIB can be implemented
without implementing any of the other MIBs; i.e., the MIBs have no
dependencies on each other. A typical case would be for a device to
implement the MIBs RADIUS authentication server, RADIUS accounting
server, and RADIUS Dynamic Authorization Client. A RADIUS proxy
might implement any, all, or a subset of the MIBs listed above and
the MIB as defined in this document.

```
                +---------------+                       +---------------+
   User 1----|               | Disconnect-Request   |               |
            |     Dynamic      |     CoA-Request      |    Dynamic    |
   User 2----| Authorization |<---------------------| Authorization |
            |     Server      |--------------------->|    Client     |
   User 3----|      (DAS)      |     Disconnect-Ack   |     (DAC)     |
            |                 |     Disconnect-NAK   |               |
                +---------------+  CoA-Ack/CoA-NAK    +---------------+
```
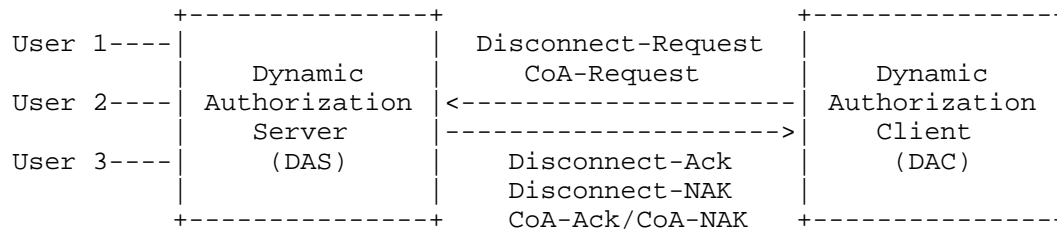
Figure 1. Mapping of clients and servers

This MIB module for the Dynamic Authorization Server contains the
following:

1. Three scalar objects.

2. One Dynamic Authorization Client Table. This table contains one
    row for each DAC with which the DAS shares a secret.

4. RADIUS Dynamic Authorization Server MIB Definitions

RADIUS-DYNAUTH-SERVER-MIB DEFINITIONS ::= BEGIN

IMPORTS
        MODULE-IDENTITY, OBJECT-TYPE,
        Counter32, Integer32, mib-2,
        TimeTicks   FROM SNMPv2-SMI   -- [RFC2578]
        SnmpAdminString   FROM SNMP-FRAMEWORK-MIB   -- [RFC3411]
        InetAddressType,
        InetAddress   FROM INET-ADDRESS-MIB   -- [RFC4001]
        MODULE-COMPLIANCE,
        OBJECT-GROUP   FROM SNMPv2-CONF;   -- [RFC2580]

radiusDynAuthServerMIB MODULE-IDENTITY
        LAST-UPDATED "200608290000Z" -- 29 August 2006
        ORGANIZATION "IETF RADEXT Working Group"
        CONTACT-INFO
                " Stefaan De Cnodder
                  Alcatel
                  Francis Wellesplein 1
                  B-2018 Antwerp
                  Belgium

                  Phone: +32 3 240 85 15
                  EMail: stefaan.de_cnodder@alcatel.be

                  Nagi Reddy Jonnala
                  Cisco Systems, Inc.
                  Divyasree Chambers, B Wing,
                  O'Shaugnessy Road,
                  Bangalore-560027, India.

                  Phone: +91 94487 60828
                  EMail: njonnala@cisco.com

                  Murtaza Chiba
                  Cisco Systems, Inc.
                  170 West Tasman Dr.
                  San Jose CA, 95134

                  Phone: +1 408 525 7198
                  EMail: mchiba@cisco.com "
        DESCRIPTION
            "The MIB module for entities implementing the server
             side of the Dynamic Authorization Extensions to the
             Remote Authentication Dial-In User Service (RADIUS)
             protocol. Copyright (C) The Internet Society (2006).

           Initial version as published in RFC 4673; for full
           legal notices see the RFC itself."

        REVISION "200608290000Z" -- 29 August 2006
        DESCRIPTION "Initial version as published in RFC 4673."
       ::= { mib-2 146 }

radiusDynAuthServerMIBObjects OBJECT IDENTIFIER ::=
                                    { radiusDynAuthServerMIB 1 }

radiusDynAuthServerScalars   OBJECT IDENTIFIER ::=
                                   { radiusDynAuthServerMIBObjects 1 }

radiusDynAuthServerDisconInvalidClientAddresses OBJECT-TYPE
      SYNTAX Counter32
      MAX-ACCESS read-only
      STATUS current
      DESCRIPTION
           "The number of Disconnect-Request packets received from
            unknown addresses. This counter may experience a
            discontinuity when the DAS module (re)starts, as
            indicated by the value of
            radiusDynAuthServerCounterDiscontinuity."
      ::= { radiusDynAuthServerScalars 1 }

radiusDynAuthServerCoAInvalidClientAddresses OBJECT-TYPE
      SYNTAX Counter32
      MAX-ACCESS read-only
      STATUS current
      DESCRIPTION
           "The number of CoA-Request packets received from unknown
            addresses. This counter may experience a discontinuity
            when the DAS module (re)starts, as indicated by the
            value of radiusDynAuthServerCounterDiscontinuity."
      ::= { radiusDynAuthServerScalars 2 }

radiusDynAuthServerIdentifier OBJECT-TYPE
      SYNTAX SnmpAdminString
      MAX-ACCESS read-only
      STATUS current
      DESCRIPTION
           "The NAS-Identifier of the RADIUS Dynamic Authorization
            Server. This is not necessarily the same as sysName in
            MIB II."
      REFERENCE
           "RFC 2865, Section 5.32, NAS-Identifier."
      ::= { radiusDynAuthServerScalars 3 }

radiusDynAuthClientTable OBJECT-TYPE
      SYNTAX SEQUENCE OF RadiusDynAuthClientEntry
      MAX-ACCESS not-accessible
      STATUS   current
      DESCRIPTION
            "The (conceptual) table listing the RADIUS Dynamic
             Authorization Clients with which the server shares a
             secret."
      ::= { radiusDynAuthServerMIBObjects 2 }

radiusDynAuthClientEntry OBJECT-TYPE
      SYNTAX   RadiusDynAuthClientEntry
      MAX-ACCESS not-accessible
      STATUS   current
      DESCRIPTION
            "An entry (conceptual row) representing one Dynamic
             Authorization Client with which the server shares a
             secret."
      INDEX   { radiusDynAuthClientIndex }
      ::= { radiusDynAuthClientTable 1 }

RadiusDynAuthClientEntry ::= SEQUENCE {
      radiusDynAuthClientIndex   Integer32,
      radiusDynAuthClientAddressType   InetAddressType,
      radiusDynAuthClientAddress   InetAddress,
      radiusDynAuthServDisconRequests   Counter32,
      radiusDynAuthServDisconAuthOnlyRequests   Counter32,
      radiusDynAuthServDupDisconRequests   Counter32,
      radiusDynAuthServDisconAcks   Counter32,
      radiusDynAuthServDisconNaks   Counter32,
      radiusDynAuthServDisconNakAuthOnlyRequests Counter32,
      radiusDynAuthServDisconNakSessNoContext   Counter32,
      radiusDynAuthServDisconUserSessRemoved   Counter32,
      radiusDynAuthServMalformedDisconRequests   Counter32,
      radiusDynAuthServDisconBadAuthenticators   Counter32,
      radiusDynAuthServDisconPacketsDropped   Counter32,
      radiusDynAuthServCoARequests   Counter32,
      radiusDynAuthServCoAAuthOnlyRequests   Counter32,
      radiusDynAuthServDupCoARequests   Counter32,
      radiusDynAuthServCoAAcks   Counter32,
      radiusDynAuthServCoANaks   Counter32,
      radiusDynAuthServCoANakAuthOnlyRequests   Counter32,
      radiusDynAuthServCoANakSessNoContext   Counter32,
      radiusDynAuthServCoAUserSessChanged   Counter32,
      radiusDynAuthServMalformedCoARequests   Counter32,
      radiusDynAuthServCoABadAuthenticators   Counter32,
      radiusDynAuthServCoAPacketsDropped   Counter32,
      radiusDynAuthServUnknownTypes   Counter32,

```
        radiusDynAuthServerCounterDiscontinuity       TimeTicks
}


radiusDynAuthClientIndex OBJECT-TYPE
        SYNTAX      Integer32 (1..2147483647)
        MAX-ACCESS not-accessible
        STATUS      current
        DESCRIPTION
              "A number uniquely identifying each RADIUS Dynamic
               Authorization Client with which this Dynamic
               Authorization Server communicates.  This number is
               allocated by the agent implementing this MIB module
               and is unique in this context."
        ::= { radiusDynAuthClientEntry 1 }

radiusDynAuthClientAddressType OBJECT-TYPE
        SYNTAX      InetAddressType
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
              "The type of IP address of the RADIUS Dynamic
               Authorization Client referred to in this table entry."
        ::= { radiusDynAuthClientEntry 2 }

radiusDynAuthClientAddress OBJECT-TYPE
        SYNTAX      InetAddress
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
              "The IP address value of the RADIUS Dynamic
               Authorization Client referred to in this table entry,
               using the version neutral IP address format.  The type
               of this address is determined by the value of
               the radiusDynAuthClientAddressType object."
        ::= { radiusDynAuthClientEntry 3 }

radiusDynAuthServDisconRequests OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "requests"
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
              "The number of RADIUS Disconnect-Requests received
               from this Dynamic Authorization Client.  This also
               includes the RADIUS Disconnect-Requests that have a
               Service-Type attribute with value 'Authorize Only'.
               This counter may experience a discontinuity when the
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                DAS module (re)starts as indicated by the value of
                radiusDynAuthServerCounterDiscontinuity."
         REFERENCE
                "RFC 3576, Section 2.1, Disconnect Messages (DM)."
         ::= { radiusDynAuthClientEntry 4 }

radiusDynAuthServDisconAuthOnlyRequests OBJECT-TYPE
         SYNTAX      Counter32
         UNITS       "requests"
         MAX-ACCESS read-only
         STATUS      current
         DESCRIPTION
                "The number of RADIUS Disconnect-Requests that include
                a Service-Type attribute with value 'Authorize Only'
                received from this Dynamic Authorization Client.  This
                counter may experience a discontinuity when the DAS
                module (re)starts, as indicated by the value of
                radiusDynAuthServerCounterDiscontinuity."
         REFERENCE
                "RFC 3576, Section 2.1, Disconnect Messages (DM)."
         ::= { radiusDynAuthClientEntry 5 }

radiusDynAuthServDupDisconRequests OBJECT-TYPE
         SYNTAX      Counter32
         UNITS       "requests"
         MAX-ACCESS read-only
         STATUS      current
         DESCRIPTION
                "The number of duplicate RADIUS Disconnect-Request
                packets received from this Dynamic Authorization
                Client.  This counter may experience a discontinuity
                when the DAS module (re)starts, as indicated by the
                value of radiusDynAuthServerCounterDiscontinuity."
         REFERENCE
                "RFC 3576, Section 2.1, Disconnect Messages (DM)."
         ::= { radiusDynAuthClientEntry 6 }

radiusDynAuthServDisconAcks  OBJECT-TYPE
         SYNTAX      Counter32
         UNITS       "replies"
         MAX-ACCESS read-only
         STATUS      current
         DESCRIPTION
                "The number of RADIUS Disconnect-ACK packets sent to
                this Dynamic Authorization Client.  This counter may
                experience a discontinuity when the DAS module
                (re)starts, as indicated by the value of
                radiusDynAuthServerCounterDiscontinuity."
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        REFERENCE
              "RFC 3576, Section 2.1, Disconnect Messages (DM)."
        ::= { radiusDynAuthClientEntry 7 }

radiusDynAuthServDisconNaks OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "replies"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
              "The number of RADIUS Disconnect-NAK packets
               sent to this Dynamic Authorization Client.  This
               includes the RADIUS Disconnect-NAK packets sent
               with a Service-Type attribute with value 'Authorize
               Only' and the RADIUS Disconnect-NAK packets sent
               because no session context was found.  This counter
               may experience a discontinuity when the DAS module
               (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.1, Disconnect Messages (DM)."
        ::= { radiusDynAuthClientEntry 8 }

radiusDynAuthServDisconNakAuthOnlyRequests OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "replies"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
              "The number of RADIUS Disconnect-NAK packets that
               include a Service-Type attribute with value
               'Authorize Only' sent to this Dynamic Authorization
               Client.  This counter may experience a discontinuity
               when the DAS module (re)starts, as indicated by the
               value of radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.1, Disconnect Messages (DM)."
        ::= { radiusDynAuthClientEntry 9 }

radiusDynAuthServDisconNakSessNoContext OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "replies"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
              "The number of RADIUS Disconnect-NAK packets
               sent to this Dynamic Authorization Client
               because no session context was found.  This counter may
```

                   experience a discontinuity when the DAS module
                   (re)starts, as indicated by the value of
                   radiusDynAuthServerCounterDiscontinuity."
          REFERENCE
                   "RFC 3576, Section 2.1, Disconnect Messages (DM)."
          ::= { radiusDynAuthClientEntry 10 }

radiusDynAuthServDisconUserSessRemoved OBJECT-TYPE
          SYNTAX   Counter32
          UNITS   "sessions"
          MAX-ACCESS read-only
          STATUS   current
          DESCRIPTION
                   "The number of user sessions removed for the
                   Disconnect-Requests received from this
                   Dynamic Authorization Client. Depending on site-
                   specific policies, a single Disconnect request
                   can remove multiple user sessions. In cases where
                   this Dynamic Authorization Server has no
                   knowledge of the number of user sessions that
                   are affected by a single request, each such
                   Disconnect-Request will count as a single
                   affected user session only. This counter may experience
                   a discontinuity when the DAS module (re)starts, as
                   indicated by the value of
                   radiusDynAuthServerCounterDiscontinuity."
          REFERENCE
                   "RFC 3576, Section 2.1, Disconnect Messages (DM)."
          ::= { radiusDynAuthClientEntry 11 }

radiusDynAuthServMalformedDisconRequests OBJECT-TYPE
          SYNTAX   Counter32
          UNITS   "requests"
          MAX-ACCESS read-only
          STATUS   current
          DESCRIPTION
                   "The number of malformed RADIUS Disconnect-Request
                   packets received from this Dynamic Authorization
                   Client. Bad authenticators and unknown types are not
                   included as malformed Disconnect-Requests. This counter
                   may experience a discontinuity when the DAS module
                   (re)starts, as indicated by the value of
                   radiusDynAuthServerCounterDiscontinuity."
          REFERENCE
                   "RFC 3576, Section 2.1, Disconnect Messages (DM), and
                    Section 2.3, Packet Format."
          ::= { radiusDynAuthClientEntry 12 }

radiusDynAuthServDisconBadAuthenticators OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "requests"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of RADIUS Disconnect-Request packets
               that contained an invalid Authenticator field
               received from this Dynamic Authorization Client. This
               counter may experience a discontinuity when the DAS
               module (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.1, Disconnect Messages (DM), and
               Section 2.3, Packet Format."
        ::= { radiusDynAuthClientEntry 13 }

radiusDynAuthServDisconPacketsDropped OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "requests"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of incoming Disconnect-Requests
               from this Dynamic Authorization Client silently
               discarded by the server application for some reason
               other than malformed, bad authenticators, or unknown
               types. This counter may experience a discontinuity
               when the DAS module (re)starts, as indicated by the
               value of radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.1, Disconnect Messages (DM), and
               Section 2.3, Packet Format."
        ::= { radiusDynAuthClientEntry 14 }

radiusDynAuthServCoARequests OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "requests"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of RADIUS CoA-requests received from this
               Dynamic Authorization Client. This also includes
               the CoA requests that have a Service-Type attribute
               with value 'Authorize Only'. This counter may
               experience a discontinuity when the DAS module
               (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."

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        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthClientEntry 15 }


radiusDynAuthServCoAAuthOnlyRequests OBJECT-TYPE
        SYNTAX       Counter32
        UNITS        "requests"
        MAX-ACCESS read-only
        STATUS       current
        DESCRIPTION
              "The number of RADIUS CoA-requests that include a
               Service-Type attribute with value 'Authorize Only'
               received from this Dynamic Authorization Client.  This
               counter may experience a discontinuity when the DAS
               module (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthClientEntry 16 }


radiusDynAuthServDupCoARequests OBJECT-TYPE
        SYNTAX       Counter32
        UNITS        "requests"
        MAX-ACCESS read-only
        STATUS       current
        DESCRIPTION
              "The number of duplicate RADIUS CoA-Request packets
               received from this Dynamic Authorization Client.  This
               counter may experience a discontinuity when the DAS
               module (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthClientEntry 17 }

radiusDynAuthServCoAAcks  OBJECT-TYPE
        SYNTAX       Counter32
        UNITS        "replies"
        MAX-ACCESS read-only
        STATUS       current
        DESCRIPTION
              "The number of RADIUS CoA-ACK packets sent to this
               Dynamic Authorization Client.  This counter may
               experience a discontinuity when the DAS module
```

                    (re)starts, as indicated by the value of
                    radiusDynAuthServerCounterDiscontinuity."
            REFERENCE
                  "RFC 3576, Section 2.2, Change-of-Authorization
                   Messages (CoA)."
            ::= { radiusDynAuthClientEntry 18 }

radiusDynAuthServCoANaks OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "replies"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of RADIUS CoA-NAK packets sent to
               this Dynamic Authorization Client. This includes
               the RADIUS CoA-NAK packets sent with a Service-Type
               attribute with value 'Authorize Only' and the RADIUS
               CoA-NAK packets sent because no session context was
               found. This counter may experience a discontinuity
               when the DAS module (re)starts, as indicated by the
               value of radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthClientEntry 19 }

radiusDynAuthServCoANakAuthOnlyRequests OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "replies"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of RADIUS CoA-NAK packets that include a
               Service-Type attribute with value 'Authorize Only'
               sent to this Dynamic Authorization Client. This counter
               may experience a discontinuity when the DAS module
               (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthClientEntry 20 }

radiusDynAuthServCoANakSessNoContext OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "replies"
        MAX-ACCESS read-only
        STATUS   current

          DESCRIPTION
                "The number of RADIUS CoA-NAK packets sent to this
                 Dynamic Authorization Client because no session context
                 was found. This counter may experience a discontinuity
                 when the DAS module (re)starts, as indicated by the
                 value of radiusDynAuthServerCounterDiscontinuity."
          REFERENCE
                "RFC 3576, Section 2.2, Change-of-Authorization
                 Messages (CoA)."
          ::= { radiusDynAuthClientEntry 21 }

radiusDynAuthServCoAUserSessChanged OBJECT-TYPE
          SYNTAX   Counter32
          UNITS   "sessions"
          MAX-ACCESS read-only
          STATUS   current
          DESCRIPTION
                "The number of user sessions authorization
                 changed for the CoA-Requests received from this
                 Dynamic Authorization Client. Depending on site-
                 specific policies, a single CoA request can change
                 multiple user sessions' authorization. In cases where
                 this Dynamic Authorization Server has no knowledge of
                 the number of user sessions that are affected by a
                 single request, each such CoA-Request will
                 count as a single affected user session only. This
                 counter may experience a discontinuity when the DAS
                 module (re)starts, as indicated by the value of
                 radiusDynAuthServerCounterDiscontinuity."
          REFERENCE
                "RFC 3576, Section 2.2, Change-of-Authorization
                 Messages (CoA)."
          ::= { radiusDynAuthClientEntry 22 }

radiusDynAuthServMalformedCoARequests OBJECT-TYPE
          SYNTAX   Counter32
          UNITS   "requests"
          MAX-ACCESS read-only
          STATUS   current
          DESCRIPTION
                "The number of malformed RADIUS CoA-Request packets
                 received from this Dynamic Authorization Client. Bad
                 authenticators and unknown types are not included as
                 malformed CoA-Requests. This counter may experience a
                 discontinuity when the DAS module (re)starts, as
                 indicated by the value of
                 radiusDynAuthServerCounterDiscontinuity."
          REFERENCE

                "RFC 3576, Section 2.2, Change-of-Authorization
                 Messages (CoA), and Section 2.3, Packet Format."
          ::= { radiusDynAuthClientEntry 23 }

radiusDynAuthServCoABadAuthenticators OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "requests"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of RADIUS CoA-Request packets that
               contained an invalid Authenticator field received
               from this Dynamic Authorization Client. This counter
               may experience a discontinuity when the DAS module
               (re)starts, as indicated by the value of
                 radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA), and Section 2.3, Packet Format."
        ::= { radiusDynAuthClientEntry 24 }

radiusDynAuthServCoAPacketsDropped OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "requests"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of incoming CoA packets from this
               Dynamic Authorization Client silently discarded
               by the server application for some reason other than
               malformed, bad authenticators, or unknown types. This
               counter may experience a discontinuity when the DAS
               module (re)starts, as indicated by the value of
               radiusDynAuthServerCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA), and Section 2.3, Packet Format."
        ::= { radiusDynAuthClientEntry 25 }

radiusDynAuthServUnknownTypes OBJECT-TYPE
        SYNTAX   Counter32
        UNITS   "requests"
        MAX-ACCESS read-only
        STATUS   current
        DESCRIPTION
              "The number of incoming packets of unknown types that
               were received on the Dynamic Authorization port. This
               counter may experience a discontinuity when the DAS

```
             module (re)starts, as indicated by the value of
             radiusDynAuthServerCounterDiscontinuity."
         REFERENCE
               "RFC 3576, Section 2.3, Packet Format."
         ::= { radiusDynAuthClientEntry 26 }


radiusDynAuthServerCounterDiscontinuity OBJECT-TYPE
         SYNTAX TimeTicks
         UNITS  "hundredths of a second"
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
               "The time (in hundredths of a second) since the
                last counter discontinuity.  A discontinuity may
                be the result of a reinitialization of the DAS
                module within the managed entity."
         ::= { radiusDynAuthClientEntry 27 }


-- conformance information

radiusDynAuthServerMIBConformance
         OBJECT IDENTIFIER ::= { radiusDynAuthServerMIB 2 }
radiusDynAuthServerMIBCompliances
         OBJECT IDENTIFIER ::= { radiusDynAuthServerMIBConformance 1 }
radiusDynAuthServerMIBGroups
         OBJECT IDENTIFIER ::= { radiusDynAuthServerMIBConformance 2 }

-- compliance statements

radiusAuthServerMIBCompliance MODULE-COMPLIANCE
         STATUS   current
         DESCRIPTION
               "The compliance statement for entities implementing
                the RADIUS Dynamic Authorization Server.  Implementation
                of this module is for entities that support IPv4 and/or
                IPv6."
         MODULE  -- this module
         MANDATORY-GROUPS { radiusDynAuthServerMIBGroup }

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

         OBJECT              radiusDynAuthClientAddress
         SYNTAX              InetAddress (SIZE(4|16))
```

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

          GROUP   radiusDynAuthServerAuthOnlyGroup
          DESCRIPTION
                "Only required for Dynamic Authorization Clients that
                 are supporting Service-Type attributes with value
                 'Authorize-Only'."

          GROUP   radiusDynAuthServerNoSessGroup
          DESCRIPTION
                "This group is not required if the Dynamic
                 Authorization Server cannot easily determine whether
                 a session exists (e.g., in case of a RADIUS
                 proxy)."

          ::= { radiusDynAuthServerMIBCompliances 1 }

-- units of conformance

radiusDynAuthServerMIBGroup OBJECT-GROUP
        OBJECTS { radiusDynAuthServerDisconInvalidClientAddresses,
                  radiusDynAuthServerCoAInvalidClientAddresses,
                  radiusDynAuthServerIdentifier,
                  radiusDynAuthClientAddressType,
                  radiusDynAuthClientAddress,
                  radiusDynAuthServDisconRequests,
                  radiusDynAuthServDupDisconRequests,
                  radiusDynAuthServDisconAcks,
                  radiusDynAuthServDisconNaks,
                  radiusDynAuthServDisconUserSessRemoved,
                  radiusDynAuthServMalformedDisconRequests,
                  radiusDynAuthServDisconBadAuthenticators,
                  radiusDynAuthServDisconPacketsDropped,
                  radiusDynAuthServCoARequests,
                  radiusDynAuthServDupCoARequests,
                  radiusDynAuthServCoAAcks,
                  radiusDynAuthServCoANaks,
                  radiusDynAuthServCoAUserSessChanged,
                  radiusDynAuthServMalformedCoARequests,
                  radiusDynAuthServCoABadAuthenticators,
                  radiusDynAuthServCoAPacketsDropped,
                  radiusDynAuthServUnknownTypes,
                  radiusDynAuthServerCounterDiscontinuity
                }
        STATUS current

```
        DESCRIPTION
              "The collection of objects providing management of
               a RADIUS Dynamic Authorization Server."
        ::= { radiusDynAuthServerMIBGroups 1 }

radiusDynAuthServerAuthOnlyGroup OBJECT-GROUP
        OBJECTS { radiusDynAuthServDisconAuthOnlyRequests,
                  radiusDynAuthServDisconNakAuthOnlyRequests,
                  radiusDynAuthServCoAAuthOnlyRequests,
                  radiusDynAuthServCoANakAuthOnlyRequests
                }
        STATUS   current
        DESCRIPTION
              "The collection of objects supporting the RADIUS
               messages including Service-Type attribute with
               value 'Authorize Only'."
        ::= { radiusDynAuthServerMIBGroups 2 }

radiusDynAuthServerNoSessGroup OBJECT-GROUP
        OBJECTS { radiusDynAuthServDisconNakSessNoContext,
                  radiusDynAuthServCoANakSessNoContext
                }
        STATUS   current
        DESCRIPTION
              "The collection of objects supporting the RADIUS
               messages that are referring to non-existing sessions."
        ::= { radiusDynAuthServerMIBGroups 3 }


END
```

5. Security Considerations

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

   Some of the readable objects in this MIB module (i.e., objects with a
   MAX-ACCESS other than not-accessible) may be considered sensitive or
   vulnerable in some network environments. It is thus important to
   control even GET and/or NOTIFY access to these objects and possibly
   to even encrypt the values of these objects when sending them over
   the network via SNMP. These are the tables and objects and their
   sensitivity/vulnerability:

   radiusDynAuthClientAddress and radiusDynAuthClientAddressType

      These can be used to determine the address of the DAC with which
      the DAS is communicating. This information could be useful in
      mounting an attack on the DAC.

   radiusDynAuthServerIdentifier

      This can be used to determine the Identifier of the DAS. This
      information could be useful in impersonating the DAS.

   SNMP versions prior to SNMPv3 did not include adequate security.
   Even if the network itself is secure (for example by using IPsec),
   even then, 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 module.

   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.

6. IANA Considerations

    The IANA has assigned OID number 146 under mib-2.

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Authors' Addresses

   Stefaan De Cnodder
   Alcatel
   Francis Wellesplein 1
   B-2018 Antwerp
   Belgium

   Phone: +32 3 240 85 15
   EMail: stefaan.de_cnodder@alcatel.be

   Nagi Reddy Jonnala
   Cisco Systems, Inc.
   Divyasree Chambers, B Wing, O'Shaugnessy Road
   Bangalore-560027, India

   Phone: +91 94487 60828
   EMail: njonnala@cisco.com

   Murtaza Chiba
   Cisco Systems, Inc.
   170 West Tasman Dr.
   San Jose CA, 95134

   Phone: +1 408 525 7198
   EMail: mchiba@cisco.com

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