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                RADIUS Dynamic Authorization Client MIB

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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) (RFC2865) Dynamic Authorization Client (DAC)
   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.
   In particular, it describes the Remote Authentication Dial-In User
   Service (RADIUS) [RFC2865] Dynamic Authorization Client (DAC)
   functions that support the dynamic authorization extensions as
   defined in RFC 3576.

   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 Client MIB complements the managed
   objects used for managing RADIUS authentication and accounting
   servers, as described in [RFC4669] and [RFC4671], 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 this component 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. [RFC4673] defines the
   Dynamic Authorization Server MIB and the relationship with other MIB
   modules. This MIB module for the Dynamic Authorization Client
   contains the following:

   1. Two scalar objects

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

4. RADIUS Dynamic Authorization Client MIB Definitions

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

   IMPORTS
           MODULE-IDENTITY, OBJECT-TYPE,
           Counter32, Gauge32, Integer32,
           mib-2, TimeTicks   FROM SNMPv2-SMI   -- [RFC2578]
           SnmpAdminString   FROM SNMP-FRAMEWORK-MIB -- [RFC3411]
           InetAddressType, InetAddress,
           InetPortNumber   FROM INET-ADDRESS-MIB   -- [RFC4001]
           MODULE-COMPLIANCE,
           OBJECT-GROUP   FROM SNMPv2-CONF;   -- [RFC2580]

   radiusDynAuthClientMIB MODULE-IDENTITY
           LAST-UPDATED "200608290000Z" -- 29 August 2006
           ORGANIZATION "IETF RADEXT Working Group"
           CONTACT-INFO
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            DESCRIPTION
                "The MIB module for entities implementing the client
                 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 4672;
                 for full legal notices see the RFC itself."

            REVISION "200609290000Z" -- 29 August 2006
            DESCRIPTION "Initial version as published in RFC 4672"
            ::= { mib-2 145 }

    radiusDynAuthClientMIBObjects OBJECT IDENTIFIER ::=
                                        { radiusDynAuthClientMIB 1 }

    radiusDynAuthClientScalars   OBJECT IDENTIFIER ::=
                                     { radiusDynAuthClientMIBObjects 1 }

    radiusDynAuthClientDisconInvalidServerAddresses OBJECT-TYPE
            SYNTAX Counter32
            MAX-ACCESS read-only
            STATUS current
            DESCRIPTION
                  "The number of Disconnect-Ack and Disconnect-NAK packets

              received from unknown addresses. This counter may
              experience a discontinuity when the DAC module
              (re)starts, as indicated by the value of
              radiusDynAuthClientCounterDiscontinuity."
         ::= { radiusDynAuthClientScalars 1 }

    radiusDynAuthClientCoAInvalidServerAddresses OBJECT-TYPE
          SYNTAX Counter32
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
              "The number of CoA-Ack and CoA-NAK packets received from
               unknown addresses. Disconnect-NAK packets received
               from unknown addresses. This counter may experience a
               discontinuity when the DAC module (re)starts, as
               indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
         ::= { radiusDynAuthClientScalars 2 }

    radiusDynAuthServerTable OBJECT-TYPE
          SYNTAX SEQUENCE OF RadiusDynAuthServerEntry
          MAX-ACCESS not-accessible
          STATUS   current
          DESCRIPTION
              "The (conceptual) table listing the RADIUS Dynamic
               Authorization Servers with which the client shares a
               secret."
         ::= { radiusDynAuthClientMIBObjects 2 }

    radiusDynAuthServerEntry OBJECT-TYPE
          SYNTAX   RadiusDynAuthServerEntry
          MAX-ACCESS not-accessible
          STATUS   current
          DESCRIPTION
              "An entry (conceptual row) representing one Dynamic
               Authorization Server with which the client shares a
               secret."
          INDEX   { radiusDynAuthServerIndex }
         ::= { radiusDynAuthServerTable 1 }

    RadiusDynAuthServerEntry ::= SEQUENCE {
          radiusDynAuthServerIndex   Integer32,
          radiusDynAuthServerAddressType   InetAddressType,
          radiusDynAuthServerAddress   InetAddress,
          radiusDynAuthServerClientPortNumber   InetPortNumber,
          radiusDynAuthServerID   SnmpAdminString,
          radiusDynAuthClientRoundTripTime   TimeTicks,
          radiusDynAuthClientDisconRequests   Counter32,

```
        radiusDynAuthClientDisconAuthOnlyRequests   Counter32,
        radiusDynAuthClientDisconRetransmissions    Counter32,
        radiusDynAuthClientDisconAcks               Counter32,
        radiusDynAuthClientDisconNaks               Counter32,
        radiusDynAuthClientDisconNakAuthOnlyRequest Counter32,
        radiusDynAuthClientDisconNakSessNoContext   Counter32,
        radiusDynAuthClientMalformedDisconResponses Counter32,
        radiusDynAuthClientDisconBadAuthenticators  Counter32,
        radiusDynAuthClientDisconPendingRequests    Gauge32,
        radiusDynAuthClientDisconTimeouts           Counter32,
        radiusDynAuthClientDisconPacketsDropped     Counter32,
        radiusDynAuthClientCoARequests              Counter32,
        radiusDynAuthClientCoAAuthOnlyRequest       Counter32,
        radiusDynAuthClientCoARetransmissions       Counter32,
        radiusDynAuthClientCoAAcks                  Counter32,
        radiusDynAuthClientCoANaks                  Counter32,
        radiusDynAuthClientCoANakAuthOnlyRequest    Counter32,
        radiusDynAuthClientCoANakSessNoContext      Counter32,
        radiusDynAuthClientMalformedCoAResponses    Counter32,
        radiusDynAuthClientCoABadAuthenticators     Counter32,
        radiusDynAuthClientCoAPendingRequests       Gauge32,
        radiusDynAuthClientCoATimeouts              Counter32,
        radiusDynAuthClientCoAPacketsDropped        Counter32,
        radiusDynAuthClientUnknownTypes             Counter32,
        radiusDynAuthClientCounterDiscontinuity     TimeTicks
    }


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

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

```
radiusDynAuthServerAddress OBJECT-TYPE
      SYNTAX      InetAddress
      MAX-ACCESS read-only
      STATUS      current
      DESCRIPTION
            "The IP address value of the RADIUS Dynamic
             Authorization Server 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
             radiusDynAuthServerAddressType object."
      ::= { radiusDynAuthServerEntry 3 }

radiusDynAuthServerClientPortNumber OBJECT-TYPE
      SYNTAX      InetPortNumber (1..65535)
      MAX-ACCESS read-only
      STATUS      current
      DESCRIPTION
            "The UDP destination port that the RADIUS Dynamic
             Authorization Client is using to send requests to this
             server.  The value zero is invalid."
      ::= { radiusDynAuthServerEntry 4 }


radiusDynAuthServerID OBJECT-TYPE
      SYNTAX      SnmpAdminString
      MAX-ACCESS read-only
      STATUS      current
      DESCRIPTION
            "The NAS-Identifier of the RADIUS Dynamic Authorization
             Server referred to in this table entry.  This is not
             necessarily the same as sysName in MIB II."
      REFERENCE
            "RFC 2865, Section 5.32, NAS-Identifier."
      ::= { radiusDynAuthServerEntry 5 }

radiusDynAuthClientRoundTripTime OBJECT-TYPE
      SYNTAX      TimeTicks
      UNITS       "hundredths of a second"
      MAX-ACCESS read-only
      STATUS      current
      DESCRIPTION
            "The time interval (in hundredths of a second) between
             the most recent Disconnect or CoA request and the
             receipt of the corresponding Disconnect or CoA reply.
             A value of zero is returned if no reply has been
             received yet from this server."
      ::= { radiusDynAuthServerEntry 6 }
```

```
radiusDynAuthClientDisconRequests OBJECT-TYPE
       SYNTAX      Counter32
       UNITS       "requests"
       MAX-ACCESS read-only
       STATUS      current
       DESCRIPTION
             "The number of RADIUS Disconnect-Requests sent
              to this Dynamic Authorization Server.  This also
              includes the RADIUS Disconnect-Requests that have a
              Service-Type attribute with value 'Authorize Only'.
              Disconnect-NAK packets received from unknown addresses.
              This counter may experience a discontinuity when the
              DAC module (re)starts, as indicated by the value of
              radiusDynAuthClientCounterDiscontinuity."
       REFERENCE
             "RFC 3576, Section 2.1, Disconnect Messages (DM)."
       ::= { radiusDynAuthServerEntry 7 }

radiusDynAuthClientDisconAuthOnlyRequests 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'
              sent to this Dynamic Authorization Server.
              Disconnect-NAK packets received from unknown addresses.
              This counter may experience a discontinuity when the
              DAC module (re)starts, as indicated by the value of
              radiusDynAuthClientCounterDiscontinuity."
       REFERENCE
             "RFC 3576, Section 2.1, Disconnect Messages (DM)."
       ::= { radiusDynAuthServerEntry 8 }

radiusDynAuthClientDisconRetransmissions OBJECT-TYPE
       SYNTAX      Counter32
       UNITS       "retransmissions"
       MAX-ACCESS read-only
       STATUS      current
       DESCRIPTION
             "The number of RADIUS Disconnect-request packets
              retransmitted to this RADIUS Dynamic Authorization
              Server.  Disconnect-NAK packets received from unknown
              addresses.  This counter may experience a discontinuity
              when the DAC module (re)starts, as indicated by the
              value of radiusDynAuthClientCounterDiscontinuity."
       REFERENCE
```

```
                    "RFC 3576, Section 2.1, Disconnect Messages (DM)."
             ::= { radiusDynAuthServerEntry 9 }

     radiusDynAuthClientDisconAcks  OBJECT-TYPE
             SYNTAX      Counter32
             UNITS       "replies"
             MAX-ACCESS read-only
             STATUS      current
             DESCRIPTION
                    "The number of RADIUS Disconnect-ACK packets
                     received from this Dynamic Authorization Server.  This
                     counter may experience a discontinuity when the DAC
                     module (re)starts, as indicated by the value of
                     radiusDynAuthClientCounterDiscontinuity."
             REFERENCE
                    "RFC 3576, Section 2.1, Disconnect Messages (DM)."
             ::= { radiusDynAuthServerEntry 10 }

     radiusDynAuthClientDisconNaks OBJECT-TYPE
             SYNTAX      Counter32
             UNITS       "replies"
             MAX-ACCESS read-only
             STATUS      current
             DESCRIPTION
                    "The number of RADIUS Disconnect-NAK packets
                     received from this Dynamic Authorization Server.
                     This includes the RADIUS Disconnect-NAK packets
                     received with a Service-Type attribute with value
                     'Authorize Only' and the RADIUS Disconnect-NAK
                     packets received if no session context was found.  This
                     counter may experience a discontinuity when the DAC
                     module (re)starts, as indicated by the value of
                     radiusDynAuthClientCounterDiscontinuity."
             REFERENCE
                    "RFC 3576, Section 2.1, Disconnect Messages (DM)."
             ::= { radiusDynAuthServerEntry 11 }

     radiusDynAuthClientDisconNakAuthOnlyRequest 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' received from this Dynamic
                     Authorization Server.  This counter may experience a
                     discontinuity when the DAC module (re)starts, as
```

                     indicated by the value of
                     radiusDynAuthClientCounterDiscontinuity."
             REFERENCE
                   "RFC 3576, Section 2.1, Disconnect Messages (DM)."
             ::= { radiusDynAuthServerEntry 12 }

    radiusDynAuthClientDisconNakSessNoContext OBJECT-TYPE
           SYNTAX   Counter32
           UNITS   "replies"
           MAX-ACCESS read-only
           STATUS   current
           DESCRIPTION
                   "The number of RADIUS Disconnect-NAK packets
                    received from this Dynamic Authorization Server
                    because no session context was found; i.e., it
                    includes an Error-Cause attribute with value 503
                    ('Session Context Not Found'). This counter may
                    experience a discontinuity when the DAC module
                    (re)starts, as indicated by the value of
                    radiusDynAuthClientCounterDiscontinuity."
           REFERENCE
                   "RFC 3576, Section 2.1, Disconnect Messages (DM)."
           ::= { radiusDynAuthServerEntry 13 }

    radiusDynAuthClientMalformedDisconResponses OBJECT-TYPE
           SYNTAX   Counter32
           UNITS   "replies"
           MAX-ACCESS read-only
           STATUS   current
           DESCRIPTION
                   "The number of malformed RADIUS Disconnect-Ack and
                    Disconnect-NAK packets received from this Dynamic
                    Authorization Server. Bad authenticators and unknown
                    types are not included as malformed Disconnect-Ack and
                    Disconnect-NAK packets. This counter may experience a
                    discontinuity when the DAC module (re)starts, as
                    indicated by the value of
                    radiusDynAuthClientCounterDiscontinuity."
           REFERENCE
                   "RFC 3576, Section 2.1, Disconnect Messages (DM), and
                    Section 2.3, Packet Format."
           ::= { radiusDynAuthServerEntry 14 }

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

          DESCRIPTION
                "The number of RADIUS Disconnect-Ack and Disconnect-NAK
                 packets that contained invalid Authenticator field
                 received from this Dynamic Authorization Server. This
                 counter may experience a discontinuity when the DAC
                 module (re)starts, as indicated by the value of
                 radiusDynAuthClientCounterDiscontinuity."
          REFERENCE
                "RFC 3576, Section 2.1, Disconnect Messages (DM), and
                 Section 2.3, Packet Format."
          ::= { radiusDynAuthServerEntry 15 }

   radiusDynAuthClientDisconPendingRequests OBJECT-TYPE
          SYNTAX   Gauge32
          UNITS   "requests"
          MAX-ACCESS read-only
          STATUS   current
          DESCRIPTION
                "The number of RADIUS Disconnect-request packets
                 destined for this server that have not yet timed out
                 or received a response. This variable is incremented
                 when an Disconnect-Request is sent and decremented
                 due to receipt of a Disconnect-Ack, a Disconnect-NAK,
                 a timeout, or a retransmission."
          REFERENCE
                "RFC 3576, Section 2.1, Disconnect Messages (DM)."
          ::= { radiusDynAuthServerEntry 16 }

   radiusDynAuthClientDisconTimeouts OBJECT-TYPE
          SYNTAX   Counter32
          UNITS   "timeouts"
          MAX-ACCESS read-only
          STATUS   current
          DESCRIPTION
                "The number of Disconnect request timeouts to this
                 server. After a timeout, the client may retry to the
                 same server or give up. A retry to the same server is
                 counted as a retransmit and as a timeout. A send
                 to a different server is counted as a
                 Disconnect-Request and as a timeout. This counter
                 may experience a discontinuity when the DAC module
                 (re)starts, as indicated by the value of
                 radiusDynAuthClientCounterDiscontinuity."
          REFERENCE
                "RFC 3576, Section 2.1, Disconnect Messages (DM)."
          ::= { radiusDynAuthServerEntry 17 }

   radiusDynAuthClientDisconPacketsDropped OBJECT-TYPE

```
        SYNTAX      Counter32
        UNITS       "replies"
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
              "The number of incoming Disconnect-Ack and
               Disconnect-NAK packets from this Dynamic Authorization
               Server silently discarded by the client application for
               some reason other than malformed, bad authenticators,
               or unknown types.  This counter may experience a
               discontinuity when the DAC module (re)starts, as
               indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.1, Disconnect Messages (DM), and
               Section 2.3, Packet Format."
        ::= { radiusDynAuthServerEntry 18 }

    radiusDynAuthClientCoARequests OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "requests"
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
              "The number of RADIUS CoA-Requests sent to this
               Dynamic Authorization Server.  This also includes
               CoA requests that have a Service-Type attribute
               with value 'Authorize Only'.  This counter may
               experience a discontinuity when the DAC module
               (re)starts, as indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthServerEntry 19 }

    radiusDynAuthClientCoAAuthOnlyRequest 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'
               sent to this Dynamic Authorization Client.  This
               counter may experience a discontinuity when the DAC
               module (re)starts, as indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
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            REFERENCE
                    "RFC 3576, Section 2.2, Change-of-Authorization
                     Messages (CoA)."
            ::= { radiusDynAuthServerEntry 20 }

    radiusDynAuthClientCoARetransmissions OBJECT-TYPE
            SYNTAX      Counter32
            UNITS       "retransmissions"
            MAX-ACCESS read-only
            STATUS      current
            DESCRIPTION
                    "The number of RADIUS CoA-request packets
                     retransmitted to this RADIUS Dynamic Authorization
                     Server.  This counter may experience a discontinuity
                     when the DAC module (re)starts, as indicated by the
                     value of radiusDynAuthClientCounterDiscontinuity."
            REFERENCE
                    "RFC 3576, Section 2.2, Change-of-Authorization
                     Messages (CoA)."
            ::= { radiusDynAuthServerEntry 21 }

    radiusDynAuthClientCoAAcks  OBJECT-TYPE
            SYNTAX      Counter32
            UNITS       "replies"
            MAX-ACCESS read-only
            STATUS      current
            DESCRIPTION
                    "The number of RADIUS CoA-ACK packets received from
                     this Dynamic Authorization Server.  This counter may
                     experience a discontinuity when the DAC module
                     (re)starts, as indicated by the value of
                     radiusDynAuthClientCounterDiscontinuity."
            REFERENCE
                    "RFC 3576, Section 2.2, Change-of-Authorization
                     Messages (CoA)."
            ::= { radiusDynAuthServerEntry 22 }

    radiusDynAuthClientCoANaks OBJECT-TYPE
            SYNTAX      Counter32
            UNITS       "replies"
            MAX-ACCESS read-only
            STATUS      current
            DESCRIPTION
                    "The number of RADIUS CoA-NAK packets received from
                     this Dynamic Authorization Server.  This includes the
                     RADIUS CoA-NAK packets received with a Service-Type
                     attribute with value 'Authorize Only' and the RADIUS
                     CoA-NAK packets received because no session context
```

```
                  was found.  This counter may experience a discontinuity
                  when the DAC module (re)starts, as indicated by the
                  value of radiusDynAuthClientCounterDiscontinuity."
           REFERENCE
                 "RFC 3576, Section 2.2, Change-of-Authorization
                  Messages (CoA)."
           ::= { radiusDynAuthServerEntry 23 }

    radiusDynAuthClientCoANakAuthOnlyRequest 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'
                  received from this Dynamic Authorization Server.  This
                  counter may experience a discontinuity when the DAC
                  module (re)starts, as indicated by the value of
                  radiusDynAuthClientCounterDiscontinuity."
           REFERENCE
                 "RFC 3576, Section 2.2, Change-of-Authorization
                  Messages (CoA)."
           ::= { radiusDynAuthServerEntry 24 }

    radiusDynAuthClientCoANakSessNoContext OBJECT-TYPE
           SYNTAX      Counter32
           UNITS       "replies"
           MAX-ACCESS read-only
           STATUS      current
           DESCRIPTION
                 "The number of RADIUS CoA-NAK packets received from
                  this Dynamic Authorization Server because no session
                  context was found; i.e., it includes an Error-Cause
                  attribute with value 503 ('Session Context Not Found').
                  This counter may experience a discontinuity when the
                  DAC module (re)starts as indicated by the value of
                  radiusDynAuthClientCounterDiscontinuity."
           REFERENCE
                 "RFC 3576, Section 2.2, Change-of-Authorization
                  Messages (CoA)."
           ::= { radiusDynAuthServerEntry 25 }

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

             DESCRIPTION
                    "The number of malformed RADIUS CoA-Ack and CoA-NAK
                     packets received from this Dynamic Authorization
                     Server. Bad authenticators and unknown types are
                     not included as malformed CoA-Ack and CoA-NAK packets.
                     This counter may experience a discontinuity when the
                     DAC module (re)starts, as indicated by the value of
                     radiusDynAuthClientCounterDiscontinuity."
             REFERENCE
                    "RFC 3576, Section 2.2, Change-of-Authorization
                     Messages (CoA), and Section 2.3, Packet Format."
             ::= { radiusDynAuthServerEntry 26 }

     radiusDynAuthClientCoABadAuthenticators OBJECT-TYPE
             SYNTAX   Counter32
             UNITS   "replies"
             MAX-ACCESS read-only
             STATUS   current
             DESCRIPTION
                    "The number of RADIUS CoA-Ack and CoA-NAK packets
                     that contained invalid Authenticator field
                     received from this Dynamic Authorization Server.
                     This counter may experience a discontinuity when the
                     DAC module (re)starts, as indicated by the value of
                     radiusDynAuthClientCounterDiscontinuity."
             REFERENCE
                    "RFC 3576, Section 2.2, Change-of-Authorization
                     Messages (CoA), and Section 2.3, Packet Format."
             ::= { radiusDynAuthServerEntry 27 }

     radiusDynAuthClientCoAPendingRequests OBJECT-TYPE
             SYNTAX   Gauge32
             UNITS   "requests"
             MAX-ACCESS read-only
             STATUS   current
             DESCRIPTION
                    "The number of RADIUS CoA-request packets destined for
                     this server that have not yet timed out or received a
                     response. This variable is incremented when an
                     CoA-Request is sent and decremented due to receipt of
                     a CoA-Ack, a CoA-NAK, or a timeout, or a
                     retransmission."
             REFERENCE
                    "RFC 3576, Section 2.2, Change-of-Authorization
                     Messages (CoA)."
             ::= { radiusDynAuthServerEntry 28 }

     radiusDynAuthClientCoATimeouts OBJECT-TYPE

```
        SYNTAX      Counter32
        UNITS       "timeouts"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
              "The number of CoA request timeouts to this server.
               After a timeout, the client may retry to the same
               server or give up.  A retry to the same server is
               counted as a retransmit and as a timeout.  A send to
               a different server is counted as a CoA-Request and
               as a timeout.  This counter may experience a
               discontinuity when the DAC module (re)starts, as
               indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA)."
        ::= { radiusDynAuthServerEntry 29 }

radiusDynAuthClientCoAPacketsDropped OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "replies"
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
              "The number of incoming CoA-Ack and CoA-NAK from this
               Dynamic Authorization Server silently discarded by the
               client application for some reason other than
               malformed, bad authenticators, or unknown types.  This
               counter may experience a discontinuity when the DAC
               module (re)starts, as indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
        REFERENCE
              "RFC 3576, Section 2.2, Change-of-Authorization
               Messages (CoA), and Section 2.3, Packet Format."
        ::= { radiusDynAuthServerEntry 30 }

radiusDynAuthClientUnknownTypes OBJECT-TYPE
        SYNTAX      Counter32
        UNITS       "replies"
        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
               DAC module (re)starts, as indicated by the value of
               radiusDynAuthClientCounterDiscontinuity."
```

               REFERENCE
                     "RFC 3576, Section 2.3, Packet Format."
              ::= { radiusDynAuthServerEntry 31 }

     radiusDynAuthClientCounterDiscontinuity 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 DAC
                      module within the managed entity."
              ::= { radiusDynAuthServerEntry 32 }

     -- conformance information

     radiusDynAuthClientMIBConformance
              OBJECT IDENTIFIER ::= { radiusDynAuthClientMIB 2 }
     radiusDynAuthClientMIBCompliances
              OBJECT IDENTIFIER ::= { radiusDynAuthClientMIBConformance 1 }
     radiusDynAuthClientMIBGroups
              OBJECT IDENTIFIER ::= { radiusDynAuthClientMIBConformance 2 }
     -- compliance statements

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

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

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

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


        GROUP               radiusDynAuthClientNoSessGroup
        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)."

        ::= { radiusDynAuthClientMIBCompliances 1 }

   -- units of conformance

   radiusDynAuthClientMIBGroup OBJECT-GROUP
        OBJECTS { radiusDynAuthClientDisconInvalidServerAddresses,
                  radiusDynAuthClientCoAInvalidServerAddresses,
                  radiusDynAuthServerAddressType,
                  radiusDynAuthServerAddress,
                  radiusDynAuthServerClientPortNumber,
                  radiusDynAuthServerID,
                  radiusDynAuthClientRoundTripTime,
                  radiusDynAuthClientDisconRequests,
                  radiusDynAuthClientDisconRetransmissions,
                  radiusDynAuthClientDisconAcks,
                  radiusDynAuthClientDisconNaks,
                  radiusDynAuthClientMalformedDisconResponses,
                  radiusDynAuthClientDisconBadAuthenticators,
                  radiusDynAuthClientDisconPendingRequests,
                  radiusDynAuthClientDisconTimeouts,
                  radiusDynAuthClientDisconPacketsDropped,
                  radiusDynAuthClientCoARequests,
                  radiusDynAuthClientCoARetransmissions,
                  radiusDynAuthClientCoAAcks,
                  radiusDynAuthClientCoANaks,
                  radiusDynAuthClientMalformedCoAResponses,
                  radiusDynAuthClientCoABadAuthenticators,
                  radiusDynAuthClientCoAPendingRequests,
                  radiusDynAuthClientCoATimeouts,
                  radiusDynAuthClientCoAPacketsDropped,
                  radiusDynAuthClientUnknownTypes,
                  radiusDynAuthClientCounterDiscontinuity
                }
        STATUS  current
```

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

        radiusDynAuthClientAuthOnlyGroup OBJECT-GROUP
                OBJECTS { radiusDynAuthClientDisconAuthOnlyRequests,
                          radiusDynAuthClientDisconNakAuthOnlyRequest,
                          radiusDynAuthClientCoAAuthOnlyRequest,
                          radiusDynAuthClientCoANakAuthOnlyRequest
                        }
                STATUS  current
                DESCRIPTION
                      "The collection of objects supporting the RADIUS
                       messages including Service-Type attribute with
                       value 'Authorize Only'."
                ::= { radiusDynAuthClientMIBGroups 2 }

        radiusDynAuthClientNoSessGroup OBJECT-GROUP
                OBJECTS { radiusDynAuthClientDisconNakSessNoContext,
                          radiusDynAuthClientCoANakSessNoContext
                        }
                STATUS  current
                DESCRIPTION
                      "The collection of objects supporting the RADIUS
                       messages that are referring to non-existing sessions."
                ::= { radiusDynAuthClientMIBGroups 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:

radiusDynAuthServerAddress and radiusDynAuthServerAddressType

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

radiusDynAuthServerID

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

radiusDynAuthServerClientPortNumber

   This can be used to determine the destination port number to which
   the DAC is sending. This information could be useful in mounting
   an attack on 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 145 under mib-2.

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