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RADIUS Dynamic Authorization Client 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) (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
              " Stefaan De Cnodder
```

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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
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```
                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."
```

```
        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
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```
                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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