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RADIUS Dynamic Authorization Server 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 RADIUS dynamic authorization server

(DAS) functions that support the dynamic authorization extensions as defined in [RFC 3576](#).

Table of Contents

1.	Requirements notation	3
2.	Introduction	4
3.	The Internet-Standard Management Framework	5
4.	Terminology	6
5.	Overview	7
6.	RADIUS Dynamic Authorization Server MIB Definitions	9
7.	Security Considerations	19
8.	IANA considerations	21
9.	Acknowledgements	22
10.	References	23
10.1	Normative References	23
10.2	Informative References	23
	Authors' Addresses	24
	Intellectual Property and Copyright Statements	25

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](#)].

2. 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. It complements the managed objects used for managing RADIUS authentication and accounting clients as described in [[RFC2618](#)] and [[RFC2620](#)], respectively.

3. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of \[RFC3410\]](#).

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, [RFC2578](#) [[RFC2578](#)], STD 58, [RFC2579](#) [[RFC2579](#)] and STD 58, [RFC2580](#) [[RFC2580](#)].

4. Terminology

Dynamic Authorization Server (DAS)

The component that resides on the NAS which processes the Disconnect and CoA requests sent by the Dynamic Authorization Client as described in [[RFC3576](#)].

Dynamic Authorization Client (DAC)

The component which sends the Disconnect and CoA requests to the Dynamic Authorization Server as described in [[RFC3576](#)].

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.

5. Overview

The RADIUS dynamic authorization extensions defined in [[RFC3576](#)], distinguish between the client function and the server function. In RADIUS dynamic authorization, clients send Disconnect-Requests and CoA-Requests, and servers reply with Disconnect-Acks, CoA-Acks, and CoA-NAKs. Typically NAS devices implement the DAS function, and thus would be expected to implement the RADIUS dynamic authorization server MIB, while 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 DASSs. 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:

[RFC2618] describes the MIB for a RADIUS authentication client.

[RFC2619] describes the MIB for a RADIUS authentication server.

[RFC2620] describes the MIB for a RADIUS accounting client.

[RFC2621] describes the MIB for a RADIUS accounting server.

[DYNCLNT] describes the MIB for a RADIUS dynamic authorization client.

A NAS typically implements the MIBs for a RADIUS authentication client, a RADIUS accounting client, and a RADIUS dynamic authorization server. However, there is not strict relationship between these three MIBs, i.e. one MIB can be implemented without implementing the other MIBs. Similarly, for the other 3 MIBs mentioned above, a typical case would be where the MIBs for a RADIUS authentication server, a RADIUS accounting server, and a RADIUS dynamic authorization client are implemented by the same device. However, also for these 3 MIBs, they can be implemented independent from each other. A RADIUS proxy might implement any of these 6 MIBs, but can also implement any subset of these MIBs.

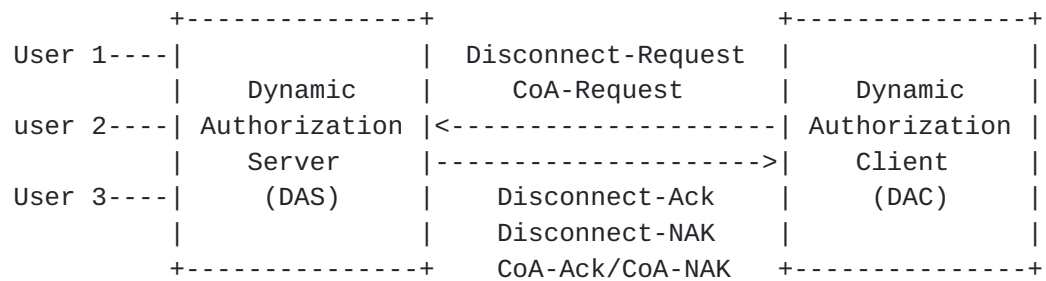


Figure 1: Mapping of clients and servers.

This MIB module for the dynamic authorization server contains the following:

1. Two scalar objects
2. One Dynamic Authorization Client Table. This table contains one row for each DAC that the DAS shares a secret with.

6. RADIUS Dynamic Authorization Server MIB Definitions

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

IMPORTS

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

radiusDynAuthServerMIB MODULE-IDENTITY

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DESCRIPTION

 "The MIB module for entities implementing the server
 side of the Dynamic Authorization extensions Remote
 Access Dialin User Service (RADIUS) protocol.

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 version of this MIB module was published in RFC yyyy;
 for full legal notices see the RFC itself. Supplementary
 information may be available on

<http://www.ietf.org/copyrights/ianamib.html>."

-- RFC Ed.: replace yyyy with actual RFC number & remove this note

REVISION "200502070000Z" -- 7 February 2005

DESCRIPTION "Initial version as published in RFC yyyy."

-- RFC Ed.: replace yyyy with actual RFC number & remove this note

::= { radiusDynamicAuthorization 1 }

radiusDynamicAuthorization OBJECT IDENTIFIER ::= { mib-2 xxx }

-- The value xxx to be assigned by IANA.

radiusDynAuthServerMIBObjects OBJECT IDENTIFIER ::=

 { radiusDynAuthServerMIB 1 }

radiusDynAuthServer OBJECT IDENTIFIER ::=

 { radiusDynAuthServerMIBObjects 1 }

radiusDynAuthServerInvalidClientAddresses OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

 "The number of RADIUS dynamic authorization messages
 (both Disconnect and CoA) received from unknown
 addresses."

::= { radiusDynAuthServer 1 }

radiusDynAuthServerIdentifier OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

 "The NAS-Identifier of the RADIUS dynamic authorization
 server."

REFERENCE

 "[RFC 2865, Section 5.32](#), NAS-Identifier."

::= { radiusDynAuthServer 2 }

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."

::= { radiusDynAuthServer 3 }

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,
radiusDynAuthServDupDisconRequests	Counter32,
radiusDynAuthServDisconAcks	Counter32,
radiusDynAuthServDisconNaks	Counter32,
radiusDynAuthServDisconUserSessRemoved	Counter32,
radiusDynAuthServMalformedDisconRequests	Counter32,
radiusDynAuthServDisconBadAuthenticators	Counter32,
radiusDynAuthServDisconPacketsDropped	Counter32,
radiusDynAuthServCoARequests	Counter32,
radiusDynAuthServDupCoARequests	Counter32,
radiusDynAuthServCoAAcks	Counter32,
radiusDynAuthServCoANaks	Counter32,
radiusDynAuthServCoAUserSessChanged	Counter32,
radiusDynAuthServMalformedCoARequests	Counter32,
radiusDynAuthServCoABadAuthenticators	Counter32,
radiusDynAuthServCoAPacketsDropped	Counter32,
radiusDynAuthServUnknownTypes	Counter32

}

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."
 ::= { 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."
REFERENCE
 "[RFC 3576, Section 2.1](#), Disconnect Messages (DM)."
 ::= { radiusDynAuthClientEntry 4 }

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."
REFERENCE
 "[RFC 3576, Section 2.1](#), Disconnect Messages (DM)."
 ::= { radiusDynAuthClientEntry 5 }

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"
REFERENCE
 "[RFC 3576, Section 2.1](#), Disconnect Messages (DM)."
::= { radiusDynAuthClientEntry 6 }

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."
REFERENCE
 "[RFC 3576, Section 2.1](#), Disconnect Messages (DM)."
::= { radiusDynAuthClientEntry 7 }

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."
REFERENCE
 "[RFC 3576, Section 2.1](#), Disconnect Messages (DM)."
::= { radiusDynAuthClientEntry 8 }

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."
REFERENCE
 "[RFC 3576, Section 2.1](#), Disconnect Messages (DM), and
 [Section 2.3](#), Packet Format."
::= { radiusDynAuthClientEntry 9 }

radiusDynAuthServDisconBadAuthenticators OBJECT-TYPE

SYNTAX Counter32
UNITS "requests"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of RADIUS Disconnect-Request packets
which contained invalid Signature attributes
received from this Dynamic Authorization Client."

REFERENCE

"[RFC 3576, Section 2.1](#), Disconnect Messages (DM), and
[Section 2.3](#), Packet Format."

::= { radiusDynAuthClientEntry 10 }

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."

REFERENCE

"[RFC 3576, Section 2.1](#), Disconnect Messages (DM), and
[Section 2.3](#), Packet Format."

::= { radiusDynAuthClientEntry 11 }

radiusDynAuthServCoARequests OBJECT-TYPE

SYNTAX Counter32
UNITS "requests"
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The number of CoA requests received from this
Dynamic Authorization Client."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization
Messages (CoA)."

::= { radiusDynAuthClientEntry 12 }

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."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization Messages (CoA)."

::= { radiusDynAuthClientEntry 13 }

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."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization Messages (CoA)."

::= { radiusDynAuthClientEntry 14 }

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."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization Messages (CoA)."

::= { radiusDynAuthClientEntry 15 }

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"

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization

Messages (CoA)."
 ::= { radiusDynAuthClientEntry 16 }

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."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization Messages (CoA), and [Section 2.3](#), Packet Format."

::= { radiusDynAuthClientEntry 17 }

radiusDynAuthServCoABadAuthenticators OBJECT-TYPE

SYNTAX Counter32
UNITS "requests"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The number of RADIUS CoA-Request packets which contained invalid Signature attributes received from this Dynamic Authorization client."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization Messages (CoA), and [Section 2.3](#), Packet Format."

::= { radiusDynAuthClientEntry 18 }

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 clisdfauthenticators or unknown types."

REFERENCE

"[RFC 3576, Section 2.2](#), Change-of-Authorization Messages (CoA), and [Section 2.3](#), Packet Format."

::= { radiusDynAuthClientEntry 19 }

radiusDynAuthServUnknownTypes OBJECT-TYPE


```
SYNTAX      Counter32
UNITS       "requests"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of incoming packets of unknown types
     which were received on the Dynamic Authorization port."
REFERENCE
    "RFC 3576, Section 2.3, Packet Format."
 ::= { radiusDynAuthClientEntry 20 }

-- 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."
    MODULE      -- this module
    MANDATORY-GROUPS { radiusDynAuthServerMIBGroup }
    ::= { radiusDynAuthServerMIBCompliances 1 }

-- units of conformance

radiusDynAuthServerMIBGroup OBJECT-GROUP
    OBJECTS { radiusDynAuthServerInvalidClientAddresses,
               radiusDynAuthServerIdentifier,
               radiusDynAuthClientAddressType,
               radiusDynAuthClientAddress,
               radiusDynAuthServDisconRequests,
               radiusDynAuthServDupDisconRequests,
               radiusDynAuthServDisconAcks,
               radiusDynAuthServDisconNaks,
               radiusDynAuthServDisconUserSessRemoved,
               radiusDynAuthServMalformedDisconRequests,
               radiusDynAuthServDisconBadAuthenticators,
               radiusDynAuthServDisconPacketsDropped,
               radiusDynAuthServCoARequests,
               radiusDynAuthServDupCoARequests,
```



```
        radiusDynAuthServCoAAcks,  
        radiusDynAuthServCoANaks,  
        radiusDynAuthServCoAUserSessChanged,  
        radiusDynAuthServMalformedCoARequests,  
        radiusDynAuthServCoABadAuthenticators,  
        radiusDynAuthServCoAPacketsDropped,  
        radiusDynAuthServUnknownTypes  
    }  
STATUS    current  
DESCRIPTION  
    "The collection of objects providing management of  
    a RADIUS Dynamic Authorization Server."  
 ::= { radiusDynAuthServerMIBGroups 1 }
```

END

7. 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.

The other readable objects are not really considered as being sensitive or vulnerable. These objects are:

radiusDynAuthServerInvalidClientAddresses,
radiusDynAuthServDisconRequests,
radiusDynAuthServDupDisconRequests,
radiusDynAuthServDisconAcks,
radiusDynAuthServDisconNaks,
radiusDynAuthServDisconUserSessRemoved,
radiusDynAuthServMalformedDisconRequests,
radiusDynAuthServDisconBadAuthenticators,
radiusDynAuthServDisconPacketsDropped,
radiusDynAuthServCoARequests,
radiusDynAuthServDupCoARequests,
radiusDynAuthServCoAAcks,
radiusDynAuthServCoANaks,
radiusDynAuthServCoAUserSessChanged,
radiusDynAuthServMalformedCoARequests,
radiusDynAuthServCoABadAuthenticators,
radiusDynAuthServCoAPacketsDropped, and
radiusDynAuthServUnknownTypes.

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.

8. IANA considerations

IANA is requested to assign an OID xxx under mib-2.

9. Acknowledgements

This document reuses some of the work done in earlier RADIUS MIB specifications [[RFC2618](#)] and [[RFC2620](#)].

The authors would also like to acknowledge the following people for their comments to this document: Anjaneyulu Pata, Dan Romascanu, and Bert Wijnen.

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10.1 Normative References

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