

RADIUS Working Group
INTERNET-DRAFT
<[draft-ietf-radius-clientmib-04.txt](#)>
[24](#) July 1997

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RADIUS Client MIB

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[2.](#) Abstract

This memo defines a set of extensions which instrument RADIUS client functions. These extensions represent a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. Using these extensions IP-based management stations can manage RADIUS clients.

[3.](#) 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 managed objects used for managing RADIUS clients.

Today a wide range of network devices, including routers and NASes, act as RADIUS clients in order to provide authentication, authorization, and accounting services. As a result, the effective management

of RADIUS clients is of considerable importance.

INTERNET-DRAFT

24 July 1997

[4.](#) The SNMPv2 Network Management Framework

The SNMPv2 Network Management Framework consists of four major components. They are:

- o [RFC 1902](#) which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management.
- o [RFC 1905](#) which defines the protocol used for network access to managed objects.
- o [RFC 1907](#) defines the core set of managed objects for the Internet suite of protocols.
- o [RFC 1909](#) which defines the administrative aspects of the framework.

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

[4.1.](#) Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

[5.](#) Overview

The RADIUS protocol, described in [\[1\]](#) and [\[2\]](#), distinguishes between

the client function and the server function; RADIUS clients send requests, and RADIUS servers reply to those requests. In RADIUS authentication, clients send Access-Requests, and servers reply with Access-Accepts, Access-Rejects, and Access-Challenges. In RADIUS accounting, clients send Accounting-Requests, and servers reply with Accounting-Responses. Typically NAS devices implement the client function, and thus would be expected to implement the RADIUS client MIB, while RADIUS servers implement the server function, and thus would be expected to implement the RADIUS server MIB.

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

INTERNET-DRAFT

24 July 1997

[5.1.](#) Selected objects

This MIB module contains two scalars as well as a single table:

- (1) the RADIUS Server Table contains one row for each RADIUS server that the client shares a secret with.

Each entry in the RADIUS Server Table includes twenty entries presenting a view of the activity of the RADIUS client.

[6.](#) Definitions

RADIUS-CLIENT-MIB DEFINITIONS ::= BEGIN

IMPORTS

```
MODULE-IDENTITY, OBJECT-TYPE,
OBJECT-IDENTITY, experimental,
Counter32, Gauge32, Integer32,
IpAddress, TimeTicks          FROM SNMPv2-SMI
TEXTUAL-CONVENTION, RowStatus,
TruthValue, DisplayString     FROM SNMPv2-TC
MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF;
```

```

radius OBJECT-IDENTITY
    STATUS current
    DESCRIPTION
        "The OID assigned to RADIUS MIB work by the IANA."
    ::= { experimental 79 }

radiusClientMIB MODULE-IDENTITY
    LAST-UPDATED "9707211659Z"
    ORGANIZATION "IETF RADIUS Working Group."
    CONTACT-INFO
        " Bernard Aboba
          Microsoft
          One Microsoft Way
          Redmond, WA 98052
          US

          Phone: +1 425 936 6605
          EMail: bernarda@microsoft.com"
    DESCRIPTION
        "The MIB module for entities implementing the client side of
         the Remote Access Dialin User Service (RADIUS) protocol."
    ::= { radius 2 }

radiusClientMIBObjects      OBJECT IDENTIFIER ::= { radiusClientMIB 1 }

radiusClient OBJECT IDENTIFIER ::= { radiusClientMIBObjects 1 }

radiusClientInvalidServerAddresses OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only

```

```

    STATUS current
    DESCRIPTION
        "The total number of RADIUS Access-Response packets
         received from unknown addresses since client start-up."
    ::= { radiusClient 1 }

radiusClientIdentifier OBJECT-TYPE
    SYNTAX DisplayString
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION

```

```

        "The NAS-Identifier of the RADIUS client."
 ::= { radiusClient 2 }

radiusServerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF RadiusServerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The (conceptual) table listing the RADIUS servers with
         which the client shares a secret."
 ::= { radiusClient 3 }

radiusServerEntry OBJECT-TYPE
    SYNTAX      RadiusServerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) representing a RADIUS server
         with which the client shares a secret."
    INDEX       { radiusServerIndex }
 ::= { radiusServerTable 1 }

RadiusServerEntry ::= SEQUENCE {
    radiusServerIndex          Integer32,
    radiusServerAddress        IPAddress,
    radiusClientRoundTripTime  TimeTicks,
    radiusClientAccessRequests Counter32,
    radiusClientAccessRetransmissions Counter32,
    radiusClientAccessAccepts Counter32,
    radiusClientAccessRejects Counter32,
    radiusClientAccessChallenges Counter32,
    radiusClientMalformedAccessResponses Counter32,
    radiusClientAuthenticationBadAuthenticators Counter32,
    radiusClientAuthenticationPendingRequests Counter32,
    radiusClientAuthenticationTimeouts Counter32,
    radiusClientAccountingRequests Counter32,
    radiusClientAccountingRetransmissions Counter32,
    radiusClientAccountingResponses Counter32,
    radiusClientMalformedAccountingResponses Counter32,
    radiusClientAccountingBadAuthenticators Counter32,
    radiusClientAccountingPendingRequests Counter32,
    radiusClientAccountingTimeouts Counter32,
    radiusClientUnknownType    Counter32
}

```

}

radiusServerIndex OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The RADIUS server with which the client interacts."

::= { radiusServerEntry 1 }

radiusServerAddress OBJECT-TYPE

SYNTAX IPAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The IP address of the RADIUS server
referred to in this table entry."

::= { radiusServerEntry 2 }

radiusClientRoundTripTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total roundtrip time of the last packet sent
between the client and the RADIUS server referred
to in this table entry."

::= { radiusServerEntry 3 }

radiusClientAccessRequests OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of RADIUS Access-Request packets sent
to this server since client start-up. This does not
include retransmissions."

::= { radiusServerEntry 4 }

radiusClientAccessRetransmissions OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of RADIUS Access-Request packets
retransmitted to the same server since client start-up."

::= { radiusServerEntry 5 }

radiusClientAccessAccepts OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of RADIUS Access-Accept packets

INTERNET-DRAFT

24 July 1997

 received from this server since client start-up."
 ::= { radiusServerEntry 6 }

radiusClientAccessRejects OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of RADIUS Access-Reject packets
 received from this server since client start-up."
 ::= { radiusServerEntry 7 }

radiusClientAccessChallenges OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of RADIUS Access-Challenge packets
 received from this server since client start-up."
 ::= { radiusServerEntry 8 }

-- "Access-Response" includes an Access-Accept, Access-Challenge
-- or Access-Reject

radiusClientMalformedAccessResponses OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of malformed RADIUS Access-Response
 packets received from this server since client
 start-up. Bad authenticators are not included as
 malformed access responses."
 ::= { radiusServerEntry 9 }

radiusClientAuthenticationBadAuthenticators OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of RADIUS Access-Response packets
 containing invalid authenticators received from this server
 since client start-up."
 ::= { radiusServerEntry 10 }

radiusClientAuthenticationPendingRequests OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of RADIUS Access-Request packets
 destined for this server that have not yet timed out
 or received a response. This variable is incremented
 when an Access-Request is sent and decremented due to

 a timeout or retransmission."
 ::= { radiusServerEntry 11 }

radiusClientAuthenticationTimeouts OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of authentication timeouts to this server
 since client startup. After a timeout the client may
 retry to the same server, send to a different server, or
 give up. A retry to the same server is counted as a
 retransmit as well as a timeout. A send to a different
 server is counted as a Request as well as a timeout."
 ::= { radiusServerEntry 12 }

radiusClientAccountingRequests OBJECT-TYPE

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The total number of RADIUS Accounting-Request packets
 sent since client start-up. This does not include


```

        retransmissions."
 ::= { radiusServerEntry 13 }

radiusClientAccountingRetransmissions OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of RADIUS Accounting-Request packets
        retransmitted to the same server since client start-up.
        Retransmissions include retries where the
        Identifier and Acct-Delay have been updated."
 ::= { radiusServerEntry 14 }

radiusClientAccountingResponses OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of RADIUS Accounting-Response
        packets received from this server since client start-up."
 ::= { radiusServerEntry 15 }

radiusClientMalformedAccountingResponses OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of malformed RADIUS Accounting-Response
        packets received from this server since client start-up.
        Bad authenticators are not included as malformed access

```

```

        responses."
 ::= { radiusServerEntry 16 }

radiusClientAccountingBadAuthenticators OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of RADIUS Accounting-Response
        packets which contained invalid authenticators

```

```

        received from this server since client start-up."
 ::= { radiusServerEntry 17 }

radiusClientAccountingPendingRequests OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of RADIUS Accounting-Request packets
        sent to this server that have not yet timed out or
        received a response. This variable is incremented when an
        Accounting-Request is sent and decremented due to a timeout
        or retransmission."
 ::= { radiusServerEntry 18 }

radiusClientAccountingTimeouts OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of accounting timeouts to this server
        since client startup. After a timeout the client may
        retry to the same server, send to a different server, or
        give up. A retry to the same server is counted as a
        retransmit as well as a timeout. A send to a different
        server is counted as an Accounting-Request as well as a timeout."
 ::= { radiusServerEntry 19 }

radiusClientUnknownType OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The total number of RADIUS packets of unknown type which
        were received from this server since client start-up."
 ::= { radiusServerEntry 20 }

-- conformance information

radiusClientMIBConformance
    OBJECT IDENTIFIER ::= { radiusClientMIB 2 }
radiusClientMIBCompliances
    OBJECT IDENTIFIER ::= { radiusClientMIBConformance 1 }
radiusClientMIBGroups

```

OBJECT IDENTIFIER ::= { radiusClientMIBConformance 2 }

-- compliance statements

radiusClientMIBCompliance MODULE-COMPLIANCE

STATUS current

DESCRIPTION

"The compliance statement for Clients implementing the
RADIUS Client MIB."

MODULE -- this module

MANDATORY-GROUPS { radiusClientMIBGroup }

::= { radiusClientMIBCompliances 1 }

-- units of conformance

radiusClientMIBGroup OBJECT-GROUP

OBJECTS { radiusClientInvalidServerAddresses,
radiusServerAddress,
radiusClientRoundTripTime,
radiusClientAccessRequests,
radiusClientAccessRetransmissions,
radiusClientAccessAccepts,
radiusClientAccessRejects,
radiusClientAccessChallenges,
radiusClientMalformedAccessResponses,
radiusClientAuthenticationBadAuthenticators,
radiusClientAuthenticationPendingRequests,
radiusClientAuthenticationTimeouts,
radiusClientAccountingRequests,
radiusClientAccountingRetransmissions,
radiusClientAccountingResponses,
radiusClientMalformedAccountingResponses,
radiusClientAccountingBadAuthenticators,
radiusClientAccountingPendingRequests,
radiusClientAccountingTimeouts,
radiusClientUnknownType
}

STATUS current

DESCRIPTION

"The basic collection of objects providing management of
RADIUS Clients."

::= { radiusClientMIBGroups 1 }

END

[7.](#) Security considerations

All MIB variables described in this document are read-only.

INTERNET-DRAFT

24 July 1997

[8.](#) Acknowledgments

Thanks to Narendra Gidwani of Microsoft, Allan C. Rubens of MERIT, Carl Rigney of Livingston and Peter Heitman of American Internet Corporation for useful discussions of this problem space.

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