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D. Nelson
Enterasys Networks
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RADIUS Accounting Client MIB for IPv6

Status of This Memo

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Abstract

This memo defines a set of extensions that instrument RADIUS accounting 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 accounting clients.

This memo obsoletes RFC 2620 by deprecating the MIB table containing IPv4-only address formats and defining a new table to add support for version-neutral IP address formats. The remaining MIB objects from RFC 2620 are carried forward into this document. This memo also adds UNITS and REFERENCE clauses to selected objects.

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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. The objects defined within this memo relate to the Remote Authentication Dial-In User Service (RADIUS) Accounting Client as defined in RFC 2866 [RFC2866].

2. Terminology

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 RFC 2119 [RFC2119].

This document uses terminology from RFC 2865 [RFC2865] and RFC 2866 [RFC2866].

This document uses the word "malformed" with respect to RADIUS packets, particularly in the context of counters of "malformed packets". While RFC 2866 does not provide an explicit definition of "malformed", malformed generally means that the implementation has determined the packet does not match the format defined in RFC 2866. Those implementations are used in deployments today, and thus set the de facto definition of "malformed".

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 RFC 3410 [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].

4. Scope of Changes

This document obsoletes RFC 2620 [RFC2620], RADIUS Accounting Client MIB, by deprecating the radiusAccServerTable table and adding a new table, radiusAccServerExtTable, containing radiusAccServerInetAddressType, radiusAccServerInetAddress, and radiusAccClientServerInetAddress. The purpose of these added MIB objects is to support version-neutral IP addressing formats. The

existing table containing radiusAuthServerAddress and radiusAuthClientServerPortNumber is deprecated. The remaining MIB objects from RFC 2620 are carried forward into this document.

RFC 4001 [RFC4001], which defines the SMI Textual Conventions for IPv6 addresses, contains the following recommendation.

'In particular, when revising a MIB module that contains IPv4 specific tables, it is suggested to define new tables using the textual conventions defined in this memo [RFC4001] that support all versions of IP. The status of the new tables SHOULD be "current", whereas the status of the old IP version specific tables SHOULD be changed to "deprecated". The other approach, of having multiple similar tables for different IP versions, is strongly discouraged.'

5. Structure of the MIB Module

The RADIUS accounting protocol, described in RFC 2866 [RFC2866], distinguishes between the client function and the server function. In RADIUS accounting, clients send Accounting-Requests, and servers reply with Accounting-Responses. Typically, Network Access Server (NAS) devices implement the client function, and thus would be expected to implement the RADIUS accounting client MIB, while RADIUS accounting servers implement the server function, and thus would be expected to implement the RADIUS accounting server MIB.

However, it is possible for a RADIUS accounting entity to perform both client and server functions. For example, a RADIUS proxy may act as a server to one or more RADIUS accounting clients, while simultaneously acting as an accounting client to one or more accounting servers. In such situations, it is expected that RADIUS entities combining client and server functionality will support both the client and server MIBs. The client MIB is defined in this document, and the server MIB is defined in [RFC4671].

This MIB module contains two scalars as well as a single table, the RADIUS Accounting Server Table, which contains one row for each RADIUS server with which the client shares a secret. Each entry in the RADIUS Accounting Server Table includes fifteen columns presenting a view of the activity of the RADIUS client.

This MIB imports from [RFC2578], [RFC2580], [RFC3411], and [RFC4001].

6. Deprecated Objects

The deprecated table in this MIB is carried forward from RFC 2620 [RFC2620]. There are two conditions under which it MAY be desirable for managed entities to continue to support the deprecated table:

1. The managed entity only supports IPv4 address formats.
2. The managed entity supports both IPv4 and IPv6 address formats, and the deprecated table is supported for backwards compatibility with older management stations. This option SHOULD only be used when the IP addresses in the new table are in IPv4 format and can accurately be represented in both the new table and the deprecated table.

Managed entities SHOULD NOT instantiate row entries in the deprecated table, containing IPv4-only address objects, when the RADIUS accounting server address represented in such a table row is not an IPv4 address. Managed entities SHOULD NOT return inaccurate values of IP address or SNMP object access errors for IPv4-only address objects in otherwise populated tables. When row entries exist in both the deprecated IPv4-only table and the new IP-version-neutral table that describe the same RADIUS accounting server, the row indexes SHOULD be the same for the corresponding rows in each table, to facilitate correlation of these related rows by management applications.

7. Definitions

```
RADIUS-ACC-CLIENT-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY,
    Counter32, Integer32, Gauge32,
    IpAddress, TimeTicks, mib-2          FROM SNMPv2-SMI
    SnmpAdminString                     FROM SNMP-FRAMEWORK-MIB
    InetAddressType, InetAddress,
    InetPortNumber                     FROM INET-ADDRESS-MIB
    MODULE-COMPLIANCE, OBJECT-GROUP    FROM SNMPv2-CONF;
```

```
radiusAccClientMIB MODULE-IDENTITY
```

```
    LAST-UPDATED "200608210000Z" -- 21 August 2006
    ORGANIZATION "IETF RADIUS Extensions 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 Authentication Dial-In User Service (RADIUS) accounting protocol. Copyright (C) The Internet Society (2006). This version of this MIB module is part of RFC 4670; see the RFC itself for full legal notices."

REVISION "200608210000Z" -- 21 August 2006

DESCRIPTION

"Revised version as published in RFC 4670. This version obsoletes that of RFC 2620 by deprecating the MIB table containing IPv4-only address formats and defining a new table to add support for version-neutral IP address formats. The remaining MIB objects from RFC 2620 are carried forward into this version."

REVISION "199906110000Z" -- 11 Jun 1999

DESCRIPTION "Initial version as published in RFC 2620."

::= { radiusAccounting 2 }

radiusMIB OBJECT-IDENTITY

STATUS current

DESCRIPTION

"The OID assigned to RADIUS MIB work by the IANA."

::= { mib-2 67 }

radiusAccounting OBJECT IDENTIFIER ::= {radiusMIB 2}

radiusAccClientMIBObjects OBJECT IDENTIFIER
::= { radiusAccClientMIB 1 }

radiusAccClient OBJECT IDENTIFIER
::= { radiusAccClientMIBObjects 1 }

radiusAccClientInvalidServerAddresses OBJECT-TYPE

SYNTAX Counter32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of RADIUS Accounting-Response packets received from unknown addresses."

::= { radiusAccClient 1 }

radiusAccClientIdentifier OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The NAS-Identifier of the RADIUS accounting client.
This is not necessarily the same as sysName in MIB
II."

REFERENCE "RFC 2865 section 5.32"

::= { radiusAccClient 2 }

radiusAccServerTable OBJECT-TYPE

SYNTAX SEQUENCE OF RadiusAccServerEntry

MAX-ACCESS not-accessible

STATUS deprecated

DESCRIPTION

"The (conceptual) table listing the RADIUS accounting
servers with which the client shares a secret."

::= { radiusAccClient 3 }

radiusAccServerEntry OBJECT-TYPE

SYNTAX RadiusAccServerEntry

MAX-ACCESS not-accessible

STATUS deprecated

DESCRIPTION

"An entry (conceptual row) representing a RADIUS
accounting server with which the client shares a
secret."

INDEX { radiusAccServerIndex }

::= { radiusAccServerTable 1 }

RadiusAccServerEntry ::= SEQUENCE {

radiusAccServerIndex

Integer32,

radiusAccServerAddress

IpAddress,

radiusAccClientServerPortNumber

Integer32,

radiusAccClientRoundTripTime

TimeTicks,

radiusAccClientRequests

Counter32,

radiusAccClientRetransmissions

Counter32,

radiusAccClientResponses

Counter32,

radiusAccClientMalformedResponses

Counter32,

radiusAccClientBadAuthenticators

Counter32,

radiusAccClientPendingRequests

Gauge32,

radiusAccClientTimeouts

Counter32,

radiusAccClientUnknownTypes

Counter32,

radiusAccClientPacketsDropped

Counter32

}

```
radiusAccServerIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      deprecated
    DESCRIPTION
        "A number uniquely identifying each RADIUS
        Accounting server with which this client
        communicates."
    ::= { radiusAccServerEntry 1 }

radiusAccServerAddress OBJECT-TYPE
    SYNTAX      IpAddress
    MAX-ACCESS  read-only
    STATUS      deprecated
    DESCRIPTION
        "The IP address of the RADIUS accounting server
        referred to in this table entry."
    ::= { radiusAccServerEntry 2 }

radiusAccClientServerPortNumber OBJECT-TYPE
    SYNTAX Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The UDP port the client is using to send requests to
        this server."
    REFERENCE "RFC 2866 section 3"
    ::= { radiusAccServerEntry 3 }

radiusAccClientRoundTripTime OBJECT-TYPE
    SYNTAX TimeTicks
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The time interval between the most recent
        Accounting-Response and the Accounting-Request that
        matched it from this RADIUS accounting server."
    REFERENCE "RFC 2866 section 2"
    ::= { radiusAccServerEntry 4 }

-- Request/Response statistics
--
-- Requests = Responses + PendingRequests + ClientTimeouts
--
-- Responses - MalformedResponses - BadAuthenticators -
-- UnknownTypes - PacketsDropped = Successfully received
```



```
radiusAccClientRequests OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of RADIUS Accounting-Request packets
         sent. This does not include retransmissions."
    REFERENCE "RFC 2866 section 4.1"
    ::= { radiusAccServerEntry 5 }

radiusAccClientRetransmissions OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of RADIUS Accounting-Request packets
         retransmitted to this RADIUS accounting server.
         Retransmissions include retries where the
         Identifier and Acct-Delay have been updated, as
         well as those in which they remain the same."
    REFERENCE "RFC 2866 section 2"
    ::= { radiusAccServerEntry 6 }

radiusAccClientResponses OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of RADIUS packets received on the
         accounting port from this server."
    REFERENCE "RFC 2866 section 4.2"
    ::= { radiusAccServerEntry 7 }

radiusAccClientMalformedResponses OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of malformed RADIUS Accounting-Response
         packets received from this server. Malformed packets
         include packets with an invalid length. Bad
         authenticators and unknown types are not included as
         malformed accounting responses."
    REFERENCE "RFC 2866 section 3"
```

```
::= { radiusAccServerEntry 8 }

radiusAccClientBadAuthenticators OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of RADIUS Accounting-Response
         packets that contained invalid authenticators
         received from this server."
    REFERENCE "RFC 2866 section 3"
    ::= { radiusAccServerEntry 9 }

radiusAccClientPendingRequests OBJECT-TYPE
    SYNTAX Gauge32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The 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 receipt of an Accounting-Response, a timeout,
         or a retransmission."
    REFERENCE "RFC 2866 section 2"
    ::= { radiusAccServerEntry 10 }

radiusAccClientTimeouts OBJECT-TYPE
    SYNTAX Counter32
    UNITS "timeouts"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of accounting timeouts to this server.
         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."
    REFERENCE "RFC 2866 section 2"
    ::= { radiusAccServerEntry 11 }

radiusAccClientUnknownTypes OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
```

```

MAX-ACCESS read-only
STATUS deprecated
DESCRIPTION
    "The number of RADIUS packets of unknown type that
       were received from this server on the accounting port."
REFERENCE "RFC 2866 section 4"
::= { radiusAccServerEntry 12 }

```

```

radiusAccClientPacketsDropped OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS deprecated
    DESCRIPTION
        "The number of RADIUS packets that were received from
           this server on the accounting port and dropped for some
           other reason."
    ::= { radiusAccServerEntry 13 }

```

-- New MIB objects added in this revision

```

radiusAccServerExtTable OBJECT-TYPE
    SYNTAX SEQUENCE OF RadiusAccServerExtEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "The (conceptual) table listing the RADIUS accounting
           servers with which the client shares a secret."
    ::= { radiusAccClient 4 }

```

```

radiusAccServerExtEntry OBJECT-TYPE
    SYNTAX      RadiusAccServerExtEntry
    MAX-ACCESS not-accessible
    STATUS      current
    DESCRIPTION
        "An entry (conceptual row) representing a RADIUS
           accounting server with which the client shares a
           secret."
    INDEX       { radiusAccServerExtIndex }
    ::= { radiusAccServerExtTable 1 }

```

```

RadiusAccServerExtEntry ::= SEQUENCE {
    radiusAccServerExtIndex          Integer32,
    radiusAccServerInetAddressType  InetAddressType,
    radiusAccServerInetAddress      InetAddress,
    radiusAccClientServerInetPortNumber  InetPortNumber,
    radiusAccClientExtRoundTripTime  TimeTicks,

```

```

radiusAccClientExtRequests          Counter32,
radiusAccClientExtRetransmissions  Counter32,
radiusAccClientExtResponses        Counter32,
radiusAccClientExtMalformedResponses Counter32,
radiusAccClientExtBadAuthenticators Counter32,
radiusAccClientExtPendingRequests Gauge32,
radiusAccClientExtTimeouts         Counter32,
radiusAccClientExtUnknownTypes     Counter32,
radiusAccClientExtPacketsDropped   Counter32,
radiusAccClientCounterDiscontinuity TimeTicks
}

```

```

radiusAccServerExtIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..2147483647)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying each RADIUS
        Accounting server with which this client
        communicates."
    ::= { radiusAccServerExtEntry 1 }

```

```

radiusAccServerInetAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of address format used for the
        radiusAccServerInetAddress object."
    ::= { radiusAccServerExtEntry 2 }

```

```

radiusAccServerInetAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The IP address of the RADIUS accounting
        server referred to in this table entry, using
        the version-neutral IP address format."
    ::= { radiusAccServerExtEntry 3 }

```

```

radiusAccClientServerInetPortNumber OBJECT-TYPE
    SYNTAX      InetPortNumber ( 1..65535 )
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION

```

"The UDP port the client is using to send requests to this accounting server. The value zero (0) is invalid."

REFERENCE "RFC 2866 section 3"

::= { radiusAccServerExtEntry 4 }

radiusAccClientExtRoundTripTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time interval between the most recent Accounting-Response and the Accounting-Request that matched it from this RADIUS accounting server."

REFERENCE "RFC 2866 section 2"

::= { radiusAccServerExtEntry 5 }

-- Request/Response statistics

--

-- Requests = Responses + PendingRequests + ClientTimeouts

--

-- Responses - MalformedResponses - BadAuthenticators -

-- UnknownTypes - PacketsDropped = Successfully received

radiusAccClientExtRequests OBJECT-TYPE

SYNTAX Counter32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of RADIUS Accounting-Request packets sent. This does not include retransmissions. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 4.1"

::= { radiusAccServerExtEntry 6 }

radiusAccClientExtRetransmissions OBJECT-TYPE

SYNTAX Counter32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of RADIUS Accounting-Request packets retransmitted to this RADIUS accounting server."

Retransmissions include retries where the Identifier and Acct-Delay have been updated, as well as those in which they remain the same. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 2"

::= { radiusAccServerExtEntry 7 }

radiusAccClientExtResponses OBJECT-TYPE

SYNTAX Counter32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of RADIUS packets received on the accounting port from this server. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 4.2"

::= { radiusAccServerExtEntry 8 }

radiusAccClientExtMalformedResponses OBJECT-TYPE

SYNTAX Counter32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of malformed RADIUS Accounting-Response packets received from this server. Malformed packets include packets with an invalid length. Bad authenticators and unknown types are not included as malformed accounting responses. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 3"

::= { radiusAccServerExtEntry 9 }

radiusAccClientExtBadAuthenticators OBJECT-TYPE

SYNTAX Counter32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of RADIUS Accounting-Response packets that contained invalid authenticators received from this server. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 3"

::= { radiusAccServerExtEntry 10 }

radiusAccClientExtPendingRequests OBJECT-TYPE

SYNTAX Gauge32

UNITS "packets"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The 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 receipt of an Accounting-Response, a timeout, or a retransmission. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 2"

::= { radiusAccServerExtEntry 11 }

radiusAccClientExtTimeouts OBJECT-TYPE

SYNTAX Counter32

UNITS "timeouts"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of accounting timeouts to this server. 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. This counter may experience a discontinuity when the RADIUS Accounting Client module within the managed entity is reinitialized, as indicated by the current value of radiusAccClientCounterDiscontinuity."

REFERENCE "RFC 2866 section 2"

```
::= { radiusAccServerExtEntry 12 }

radiusAccClientExtUnknownTypes OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of RADIUS packets of unknown type that
        were received from this server on the accounting port.
        This counter may experience a discontinuity when the
        RADIUS Accounting Client module within the managed
        entity is reinitialized, as indicated by the current
        value of radiusAccClientCounterDiscontinuity."
    REFERENCE "RFC 2866 section 4"
    ::= { radiusAccServerExtEntry 13 }

radiusAccClientExtPacketsDropped OBJECT-TYPE
    SYNTAX Counter32
    UNITS "packets"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of RADIUS packets that were received from
        this server on the accounting port and dropped for some
        other reason. This counter may experience a
        discontinuity when the RADIUS Accounting Client module
        within the managed entity is reinitialized, as indicated
        by the current value of
        radiusAccClientCounterDiscontinuity."
    ::= { radiusAccServerExtEntry 14 }

radiusAccClientCounterDiscontinuity OBJECT-TYPE
    SYNTAX TimeTicks
    UNITS "centiseconds"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of centiseconds since the last
        discontinuity in the RADIUS Accounting Client
        counters. A discontinuity may be the result of a
        reinitialization of the RADIUS Accounting Client
        module within the managed entity."
    ::= { radiusAccServerExtEntry 15 }
```



```
-- conformance information

radiusAccClientMIBConformance OBJECT IDENTIFIER
    ::= { radiusAccClientMIB 2 }

radiusAccClientMIBCompliances OBJECT IDENTIFIER
    ::= { radiusAccClientMIBConformance 1 }

radiusAccClientMIBGroups OBJECT IDENTIFIER
    ::= { radiusAccClientMIBConformance 2 }

-- units of conformance

radiusAccClientMIBCompliance MODULE-COMPLIANCE
    STATUS deprecated
    DESCRIPTION
        "The compliance statement for accounting clients
        implementing the RADIUS Accounting Client MIB.
        Implementation of this module is for IPv4-only
        entities, or for backwards compatibility use with
        entities that support both IPv4 and IPv6."
    MODULE -- this module
        MANDATORY-GROUPS { radiusAccClientMIBGroup }

    ::= { radiusAccClientMIBCompliances 1 }

radiusAccClientExtMIBCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for accounting
        clients implementing the RADIUS Accounting
        Client IPv6 Extensions MIB. Implementation of
        this module is for entities that support IPv6,
        or support IPv4 and IPv6."
    MODULE -- this module
        MANDATORY-GROUPS { radiusAccClientExtMIBGroup }

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

    OBJECT radiusAccServerInetAddress
    SYNTAX InetAddress ( SIZE (4|16) )
    DESCRIPTION
```

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

::= { radiusAccClientMIBCompliances 2 }

-- units of conformance

radiusAccClientMIBGroup OBJECT-GROUP

OBJECTS { radiusAccClientIdentifier,
radiusAccClientInvalidServerAddresses,
radiusAccServerAddress,
radiusAccClientServerPortNumber,
radiusAccClientRoundTripTime,
radiusAccClientRequests,
radiusAccClientRetransmissions,
radiusAccClientResponses,
radiusAccClientMalformedResponses,
radiusAccClientBadAuthenticators,
radiusAccClientPendingRequests,
radiusAccClientTimeouts,
radiusAccClientUnknownTypes,
radiusAccClientPacketsDropped
}

STATUS deprecated

DESCRIPTION

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

::= { radiusAccClientMIBGroups 1 }

radiusAccClientExtMIBGroup OBJECT-GROUP

OBJECTS { radiusAccClientIdentifier,
radiusAccClientInvalidServerAddresses,
radiusAccServerInetAddressType,
radiusAccServerInetAddress,
radiusAccClientServerInetPortNumber,
radiusAccClientExtRoundTripTime,
radiusAccClientExtRequests,
radiusAccClientExtRetransmissions,
radiusAccClientExtResponses,
radiusAccClientExtMalformedResponses,
radiusAccClientExtBadAuthenticators,
radiusAccClientExtPendingRequests,
radiusAccClientExtTimeouts,
radiusAccClientExtUnknownTypes,
radiusAccClientExtPacketsDropped,
radiusAccClientCounterDiscontinuity

```
    }  
    STATUS current  
    DESCRIPTION  
        "The basic collection of objects providing management of  
        RADIUS Accounting Clients."  
    ::= { radiusAccClientMIBGroups 2 }
```

END

8. Security Considerations

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

There are a number of managed objects in this MIB that may contain sensitive information. These are:

radiusAcctServerIPAddress

This can be used to determine the address of the RADIUS accounting server with which the client is communicating. This information could be useful in mounting an attack on the accounting server.

radiusAcctServerInetAddress

This can be used to determine the address of the RADIUS accounting server with which the client is communicating. This information could be useful in mounting an attack on the accounting server.

radiusAcctClientServerPortNumber

This can be used to determine the port number on which the RADIUS accounting client is sending. This information could be useful in impersonating the client in order to send data to the accounting server.

radiusAcctClientServerInetPortNumber

This can be used to determine the port number on which the RADIUS accounting client is sending. This information could be useful in impersonating the client in order to send data to the accounting server.

It is thus important to control even GET access to these objects and possibly to even encrypt the values of these object when sending them over the network via SNMP. Not all versions of SNMP provide features for such a secure environment.

SNMP versions prior to SNMPv3 do not provide a secure environment. Even if the network itself is secure (for example by using IPsec), 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.

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.

9. References

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Appendix A. Acknowledgements

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Author's Address

David B. Nelson
Enterasys Networks
50 Minuteman Road
Andover, MA 01810
USA

EMail: dnelson@enterasys.com

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