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Diameter Base Protocol MIB
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Abstract

Along with providing support for certain basic authentication, authorization and accounting functions, the Diameter protocol is designed to provide a framework for AAA applications.

This document defines the Management Information Base (MIB) module which describes the minimum set of objects needed to manage an implementation of the Diameter protocol.

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1. 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 ([RFC2578], [RFC2579], [RFC2580]). In particular, it describes managed objects used for managing the base Diameter protocol [RFC3588].

2. Requirements Language

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].

3. Overview

This MIB defines objects supporting the management of the Diameter base protocol as defined in RFC 3588 [RFC3588]. Objects related to Diameter applications are defined in separate documents.

4. Diameter Base Protocol MIB Definitions

```
DIAMETER-BASE-PROTOCOL-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
    InetAddressType,
    InetAddress
        FROM INET-ADDRESS-MIB -- [RFC4001]
    MODULE-IDENTITY,
    OBJECT-TYPE,
    NOTIFICATION-TYPE,
    Counter32,
    Unsigned32,
    Gauge32,
    TimeTicks,
    mib-2
        FROM SNMPv2-SMI -- [RFC2578]
```

```
SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB -- [RFC3411]
NOTIFICATION-GROUP,
MODULE-COMPLIANCE,
OBJECT-GROUP
    FROM SNMPv2-CONF -- [RFC2580]
RowStatus,
TruthValue,
StorageType
    FROM SNMPv2-TC; -- [RFC2579]
```

```
diameterBaseProtocolMIB MODULE-IDENTITY
    LAST-UPDATED "201001150000Z" -- 15 January 2010
    ORGANIZATION "IETF dime Working Group."
    CONTACT-INFO
        "Glen Zorn
        Network Zen
        1463 East Republican Street, #358
        Seattle, WA 98112
        USA
        Email: gwz@net-zen.net"
    DESCRIPTION
        "The MIB module for entities implementing the
        Diameter Base Protocol.

        Copyright (C) The IETF Trust (2010). This initial
        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 and remove this note

    REVISION "201001150000Z" -- 15 January 2010
    DESCRIPTION "Initial version as published in RFC yyyy"

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

    ::= { mib-2 XXX }

-- RFC Ed.: replace XXX with value assigned by IANA
--          and remove this note

-- Top-Level Components of this MIB.

diameterBaseNotifications OBJECT IDENTIFIER ::=
    { diameterBaseProtocolMIB 0 }
```

```

diameterBaseObjects      OBJECT IDENTIFIER ::=
                          { diameterBaseProtocolMIB 1 }
diameterBaseConform      OBJECT IDENTIFIER ::=
                          { diameterBaseProtocolMIB 2 }
dbpLocalCfgs            OBJECT IDENTIFIER ::= { diameterBaseObjects 1 }
dbpLocalStats           OBJECT IDENTIFIER ::= { diameterBaseObjects 2 }
dbpPeerCfgs             OBJECT IDENTIFIER ::= { diameterBaseObjects 3 }
dbpPeerStats            OBJECT IDENTIFIER ::= { diameterBaseObjects 4 }
dbpRealmCfgs            OBJECT IDENTIFIER ::= { diameterBaseObjects 5 }
dbpRealmStats           OBJECT IDENTIFIER ::= { diameterBaseObjects 6 }
dbpNotifCfgs            OBJECT IDENTIFIER ::= { diameterBaseObjects 7 }

-- Protocol Error Notifications

dbpProtocolErrorNotifEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting the value of this object to True(1)
         enables the dbpProtocolErrorNotif notification."
    DEFVAL      {false}
    ::= { dbpNotifCfgs 1 }

dbpProtocolErrorNotif NOTIFICATION-TYPE
    OBJECTS {
        dbpPeerId,
        dbpPerPeerStatsProtocolErrors
    }
    STATUS      current
    DESCRIPTION
        "An dbpProtocolError Notification is sent when both the
         following conditions are true:
         1) the value of dbpProtocolErrorNotifEnabled is True(1)
         2) the value of dbpPerPeerStatsProtocolErrors changes
         It can be utilized by an NMS to trigger
         logical/physical entity table maintenance polls.
         An agent must not generate more than one
         dbpProtocolError 'notification event' in a five second
         period, where a 'notification event' is the
         transmission of a single Notification PDU to a list of
         Notification destinations.
         If additional protocol errors occur within the
         five second 'throttling' period, then these
         notification events should be suppressed by the agent.
         An NMS should periodically check the value of
         dbpPerPeerStatsProtocolErrors to detect any missed
         dbpProtocolError notification events, e.g. due to

```

```
        throttling or transmission loss."
 ::= { diameterBaseNotifications 1 }

-- Transient Error Notifications

dbpTransientFailureNotifEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting the value of this object to True(1)
         enables the dbpTransientFailure Notification."
 ::= { dbpNotifCfgs 2 }

dbpTransientFailureNotif NOTIFICATION-TYPE
    OBJECTS {
        dbpPeerId,
        dbpPerPeerStatsTransientFailures
    }
    STATUS      current
    DESCRIPTION
        "An dbpTransientFailure Notification is sent when both
         the following conditions are true:
         1) the value of dbpTransientFailureNotifEnabled
            is True(1)
         2) the value of dbpPerPeerStatsTransientFailures
            changes
         It can be utilized by an NMS to trigger
         logical/physical entity table maintenance polls.
         An agent must not generate more than one
         dbpTransientFailure 'notification event' in a five
         second period, where a 'notification event' is the
         transmission of a single notification PDU to a list
         of notification destinations.
         If additional transient failures occur
         within the five second 'throttling' period, then
         these notification events should be suppressed
         by the agent.
         An NMS should periodically check the value of
         dbpPerPeerStatsTransientFailures to detect any
         missed dbpTransientFailure notification events,
         e.g. due to throttling or transmission loss."
 ::= { diameterBaseNotifications 2 }

-- Permanent Failure Notifications
```

```
dbpPermanentFailureNotifEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting the value of this object to True(1)
         enables the dbpPermanentFailure notification."
    DEFVAL      { false }
    ::= { dbpNotifCfgs 3 }

dbpPermanentFailureNotif NOTIFICATION-TYPE
    OBJECTS {
        dbpPeerId,
        dbpPerPeerStatsPermanentFailures
    }
    STATUS      current
    DESCRIPTION
        "An dbpPermanentFailure notification is sent when
         both the following conditions are true:
         1) the value of dbpPermanentFailureNotifEnabled
            is True(1)
         2) the value of dbpPerPeerStatsPermanentFailures
            changes
         It can be utilized by an NMS to trigger
         logical/physical entity table maintenance polls.
         An agent must not generate more than one
         dbpPermanentFailure 'notification event' in a five
         second period, where a 'notification event' is the
         transmission of a single notification PDU to a list
         of notification destinations.
         If additional permanent failures occur within the
         five second 'throttling' period, then these
         trap-events should be suppressed by the agent.
         An NMS should periodically check the value of
         dbpPerPeerStatsPermanentFailures to detect
         any missed dbpPermanentFailure trap-events,
         e.g. due to throttling or transmission loss."
    ::= { diameterBaseNotifications 3 }
```

-- Connection Down Notifs

```
dbpPeerConnectionDownNotifEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting the value of this object to True(1)
```

```

        enables the dbpPeerConnectionDown notification."
    DEFVAL      { false }
    ::= { dbpNotifCfgs 4 }
dbpPeerConnectionDownNotif NOTIFICATION-TYPE
    OBJECTS {
        dbpLocalId,
        dbpPeerId
    }
    STATUS      current
    DESCRIPTION
        "An dbpPeerConnectionDown notification is sent when
        both the following conditions are true:
        1) the value of dbpPeerConnectionDownNotifEnabled is
           True(1)
        2) dbpPerPeerStatsState changes to closed(1)
        It can be utilized by an NMS to trigger
        logical/physical
        entity table maintenance polls.  An agent must not
        generate more than one dbpPeerConnectionDown
        'notification event' in a five second period, where a
        'notification event' is the transmission of a single
        notification PDU to a list of notification
        destinations.
        If additional 'transport down' events occur within the
        five second 'throttling' period, then these trap-events
        should be suppressed by the agent."
    ::= { diameterBaseNotifications 4 }

```

```
-- Connection Up Notifications
```

```

dbpPeerConnectionUpNotifEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "Setting the value of this object to True(1)
        enables the dbpPeerConnectionUp notification."
    DEFVAL      { false }
    ::= { dbpNotifCfgs 5 }

dbpPeerConnectionUpNotif NOTIFICATION-TYPE
    OBJECTS {
        dbpLocalId,
        dbpPeerId
    }
    STATUS      current
    DESCRIPTION

```

"An dbpPeerConnectionUp notification is sent when both the following conditions are true:
 1) the value of dbpPeerConnectionUpNotifEnabled is

True(1)

2) the value of dbpPerPeerStatsState changes to either rOpen(6) or iOpen(7)

It can be utilized by an NMS to trigger logical/physical entity table maintenance polls.

An agent must not generate

more than one dbpPeerConnectionUp

'notification event' in a

five second period, where a 'notification event' is the

transmission of a single notification PDU to a

list of notification destinations.

If additional 'connection up' events

occur within the five second 'throttling' period,

then these trap-events should be suppressed by the

agent."

::= { diameterBaseNotifications 5 }

-- Local Configs

dbpLocalId OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The implementation-specific identification string for the Diameter software in use on the system; for example: 'diameterd'"

::= { dbpLocalCfgs 1 }

dbpLocalIpAddrTable OBJECT-TYPE

SYNTAX SEQUENCE OF DbpLocalIpAddrEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table listing the Diameter local host's IP Addresses."

::= { dbpLocalCfgs 2 }

dbpLocalIpAddrEntry OBJECT-TYPE

SYNTAX DbpLocalIpAddrEntry

MAX-ACCESS not-accessible

```
STATUS          current
DESCRIPTION
    "A row entry representing a Diameter
    local host IP Address."
INDEX           { dbpLocalIpAddrIndex }
 ::= { dbpLocalIpAddrTable 1 }

DbpLocalIpAddrEntry ::= SEQUENCE {
    dbpLocalIpAddrIndex Unsigned32,
    dbpLocalIpAddrType  InetAddressType,
    dbpLocalIpAddress   InetAddress
}

dbpLocalIpAddrIndex OBJECT-TYPE
SYNTAX          Unsigned32 (1..4294967295 )
MAX-ACCESS      not-accessible
STATUS          current
DESCRIPTION
    "A number uniquely identifying an IP Address
    supported by this Diameter host."
 ::= { dbpLocalIpAddrEntry 1 }

dbpLocalIpAddrType OBJECT-TYPE
SYNTAX          InetAddressType
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The type of internet address stored
    in dbpLocalIpAddress."
 ::= { dbpLocalIpAddrEntry 2 }

dbpLocalIpAddress OBJECT-TYPE
SYNTAX          InetAddress
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The IP-Address of the host, which is of the type
    specified in dbpLocalIpAddrType."
 ::= { dbpLocalIpAddrEntry 3 }

dbpLocalTcpListenPort OBJECT-TYPE
SYNTAX          Unsigned32 (1..65535)
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "Diameter TCP 'listen' port."
 ::= { dbpLocalCfgs 3 }
```

```
dbpLocalSctpListenPort OBJECT-TYPE
    SYNTAX      Unsigned32 (1..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Diameter SCTP 'listen' port."
    ::= { dbpLocalCfgs 4 }

dbpLocalOriginHost OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION "This object represents the Local Origin Host."
    DEFVAL     { "" }
    ::= { dbpLocalCfgs 5 }

dbpLocalRealm OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION "This object represents the Local Realm Name."
    DEFVAL     { "" }
    ::= { dbpLocalCfgs 6 }

dbpLocalStatsTotalMessagesIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The total number of Diameter Base Protocol
        messages received."
    ::= { dbpLocalStats 1 }

dbpLocalStatsTotalMessagesOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The total number of Diameter Base Protocol
        messages transmitted."
    ::= { dbpLocalStats 2 }

dbpLocalStatsTotalUpTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object represents the total time this Diameter
```

```
server has been up until now."  
 ::= { dbpLocalStats 3 }
```

```
dbpLocalResetTime OBJECT-TYPE  
SYNTAX      TimeTicks  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION  
    "If the server keeps persistent state (e.g., a process)  
    and supports a 'reset' operation (e.g., can be told to  
    re-read configuration files), this value will be the  
    time elapsed (in hundredths of a second) since the  
    server was 'reset'. For software that does not  
    have persistence or does not support a 'reset'  
    operation, this value will be zero."  
 ::= { dbpLocalStats 4 }
```

```
dbpLocalConfigReset OBJECT-TYPE  
SYNTAX      INTEGER { other(1),  
                    initializing(2),  
                    running(3) }  
MAX-ACCESS  read-write  
STATUS      current  
DESCRIPTION  
    "Status/action object to reinitialize any persistent  
    server state. When set to reset(2), any persistent  
    server state (such as a process) is reinitialized as  
    if the server had just been started. This value will  
    never be returned by a read operation. When read,  
    one of the following values will be returned:  
    other(1) - server in some unknown state;  
    initializing(2) - server (re)initializing;  
    running(3) - server currently running."  
DEFVAL      { other }  
 ::= { dbpLocalStats 5 }
```

```
dbpLocalApplTable OBJECT-TYPE  
SYNTAX      SEQUENCE OF DbpLocalApplEntry  
MAX-ACCESS  not-accessible  
STATUS      current  
DESCRIPTION  
    "The table listing the Diameter applications  
    supported by this server."  
 ::= { dbpLocalCfgs 7 }
```

```
dbpLocalApplEntry OBJECT-TYPE  
SYNTAX      DbpLocalApplEntry  
MAX-ACCESS  not-accessible
```

```

STATUS      current
DESCRIPTION
    "A row entry representing a Diameter
    application on this server."
INDEX       { dbpLocalApplIndex }
 ::= { dbpLocalApplTable 1 }

DbpLocalApplEntry ::= SEQUENCE {
    dbpLocalApplIndex  Unsigned32,
    dbpLocalApplStorageType  StorageType,
    dbpLocalApplRowStatus  RowStatus
}

dbpLocalApplIndex OBJECT-TYPE
    SYNTAX      Unsigned32 ( 1..4294967295 )
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying a
        supported Diameter application. Upon reload,
        dbpLocalApplIndex values may be changed."
    ::= { dbpLocalApplEntry 1 }

dbpLocalApplStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The storage type for this conceptual row. None of
        the columnar objects is writable when the conceptual
        row is permanent."
    REFERENCE   "Textual Conventions for SMIV2, Section 2."
    DEFVAL      { nonVolatile }
    ::= { dbpLocalApplEntry 2 }

dbpLocalApplRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The status of this conceptual row.

        To create a row in this table, a manager must
        set this object to either createAndGo(4) or
        createAndWait(5).

        Until instances of all corresponding columns are
        appropriately configured, the value of the

```

corresponding instance of the dbpLocalApplRowStatus column is 'notReady'.

In particular, a newly created row cannot be made active until the corresponding dbpLocalApplIndex has been set.

dbpLocalApplIndex may not be modified while the value of this object is active(1): An attempt to set these objects while the value of dbpLocalApplRowStatus is active(1) will result in an inconsistentValue error.

Entries in this table with dbpLocalApplRowStatus equal to active(1) remain in the table until destroyed.

Entries in this table with dbpLocalApplRowStatus equal to values other than active(1) will be destroyed after timeout (5 minutes)."

```
::= { dbpLocalApplEntry 3 }
```

dbpPeerTable OBJECT-TYPE

SYNTAX SEQUENCE OF DbpPeerEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table listing information regarding the discovered or configured Diameter peer servers."

```
::= { dbpPeerCfgs 1 }
```

dbpPeerEntry OBJECT-TYPE

SYNTAX DbpPeerEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A row entry representing a discovered or configured Diameter peer server."

INDEX { dbpPeerIndex }

```
::= { dbpPeerTable 1 }
```

DbpPeerEntry ::= SEQUENCE {

dbpPeerIndex Unsigned32,

dbpPeerId SnmpAdminString,

dbpPeerPortConnect Unsigned32,

dbpPeerPortListen Unsigned32,

dbpPeerProtocol INTEGER,

dbpPeerSecurity INTEGER,

dbpPeerFirmwareRevision Unsigned32,

```
dbpPeerStorageType          StorageType,
dbpPeerRowStatus            RowStatus }

dbpPeerIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying each Diameter peer
         with which the host server communicates.
         Upon reload, dbpPeerIndex values may be changed."
    ::= { dbpPeerEntry 1 }

dbpPeerId OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The server identifier for the Diameter peer.
         It must be unique and non-empty."
    ::= { dbpPeerEntry 2 }

dbpPeerPortConnect OBJECT-TYPE
    SYNTAX      Unsigned32 (1..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The connection port this server used
         to connect to the Diameter peer.
         If there is no active connection, this
         value will be zero(0)."
    ::= { dbpPeerEntry 3 }

dbpPeerPortListen OBJECT-TYPE
    SYNTAX      Unsigned32 (1..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The port the server is listening on."
    ::= { dbpPeerEntry 4 }

dbpPeerProtocol OBJECT-TYPE
    SYNTAX      INTEGER { tcp(1),
                          sctp(2) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The transport protocol (tcp/sctp) the
```

```
        Diameter peer is using."
 ::= { dbpPeerEntry 5 }

dbpPeerSecurity OBJECT-TYPE
    SYNTAX      INTEGER { other(1),
                          tls(2),
                          ipsec(3) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The security the Diameter peer is using.

        other(1) - Unknown Security Protocol
        tls(2)   - Transport Layer Security Protocol
        ipsec(3) - Internet Protocol Security"
    DEFVAL     { other }
 ::= { dbpPeerEntry 6 }

dbpPeerFirmwareRevision OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Firmware revision of peer.  If no firmware
        revision, the revision of the Diameter software
        module may be reported instead."
 ::= { dbpPeerEntry 7 }

dbpPeerStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The storage type for this conceptual row.
        Only the dbpPeerPortListen object is writable when
        the conceptual row is permanent."
    REFERENCE   "Textual Conventions for SMIV2, Section 2."
    DEFVAL     { nonVolatile }
 ::= { dbpPeerEntry 8 }

dbpPeerRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Status of the peer entry: creating the entry
        enables the peer, destroying the entry disables
        the peer."
```

```
 ::= { dbpPeerEntry 9 }

dbpPeerIpAddrTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DbpPeerIpAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing the Diameter
        peer IP addresses."
    ::= { dbpPeerCfgs 2 }

dbpPeerIpAddrEntry OBJECT-TYPE
    SYNTAX      DbpPeerIpAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row entry representing a
        peer Diameter server."
    INDEX       {
        dbpPeerIndex,
        dbpPeerIpAddressIndex }
    ::= { dbpPeerIpAddrTable 1 }

DbpPeerIpAddrEntry ::= SEQUENCE {
    dbpPeerIpAddressIndex Unsigned32,
    dbpPeerIpAddressType InetAddressType,
    dbpPeerIpAddress      InetAddress }

dbpPeerIpAddressIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying an IP Address
        supported by this Diameter peer."
    ::= { dbpPeerIpAddrEntry 1 }

dbpPeerIpAddressType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of address stored in dbpPeerIpAddress."
    ::= { dbpPeerIpAddrEntry 2 }

dbpPeerIpAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
```

```

STATUS      current
DESCRIPTION
    "The active IP Address(es) used for connections."
 ::= { dbpPeerIpAddrEntry 3 }

```

```

dbpAppAdvToPeerTable OBJECT-TYPE
SYNTAX      SEQUENCE OF DbpAppAdvToPeerEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The table listing the applications advertised by
    this host to each peer and the types of service
    supported: accounting, authentication or both."
 ::= { dbpLocalCfgs 8 }

```

```

dbpAppAdvToPeerEntry OBJECT-TYPE
SYNTAX      DbpAppAdvToPeerEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A row entry representing a discovered or
    configured Diameter peer server."
INDEX       { dbpPeerIndex,
              dbpAppAdvToPeerVendorId,
              dbpAppAdvToPeerIndex }
 ::= { dbpAppAdvToPeerTable 1 }

```

```

DbpAppAdvToPeerEntry ::= SEQUENCE {
    dbpAppAdvToPeerVendorId      Unsigned32,
    dbpAppAdvToPeerIndex        Unsigned32,
    dbpAppAdvToPeerServices      INTEGER,
    dbpAppAdvToPeerStorageType   StorageType,
    dbpAppAdvToPeerRowStatus     RowStatus }

```

```

dbpAppAdvToPeerVendorId OBJECT-TYPE
SYNTAX      Unsigned32 ( 1..4294967295 )
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The IANA Enterprise Code value assigned to
    the vendor of the Diameter device."
 ::= { dbpAppAdvToPeerEntry 1 }

```

```

dbpAppAdvToPeerIndex OBJECT-TYPE
SYNTAX      Unsigned32 ( 1..4294967295 )
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION

```

```

        "A number uniquely identifying a Diameter
        application advertised as supported by
        this host to each peer. Upon reload,
        dbpAppAdvToPeerIndex values may be
        changed"
 ::= { dbpAppAdvToPeerEntry 2 }

dbpAppAdvToPeerServices OBJECT-TYPE
    SYNTAX      INTEGER { acct(1),
                        auth(2),
                        both(3) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of services supported for each application,
        accounting, authentication or both."
 ::= { dbpAppAdvToPeerEntry 3 }

dbpAppAdvToPeerStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The storage type for this conceptual row.
        None of the objects are writable when the
        conceptual row is permanent."
    REFERENCE   "Textual Conventions for SMIV2, Section 2."
    DEFVAL      { nonVolatile }
 ::= { dbpAppAdvToPeerEntry 4 }

dbpAppAdvToPeerRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Status of the entry: creating the entry causes the
        application to be advertised, destroying the entry
        ceases advertisement."
 ::= { dbpAppAdvToPeerEntry 5 }

-- Applications advertised BY peers

dbpAppAdvFromPeerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DbpAppAdvFromPeerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing the applications advertised by

```

```

        each peer to this host and the types of service
        supported: accounting, authentication or both."
 ::= { dbpPeerCfgs 3 }

dbpAppAdvFromPeerEntry OBJECT-TYPE
    SYNTAX          DbpAppAdvFromPeerEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A row entry representing a discovered or
        configured Diameter peer server."
    INDEX           {
                    dbpPeerIndex,
                    dbpAppAdvFromPeerVendorId,
                    dbpAppAdvFromPeerIndex
                    }
 ::= { dbpAppAdvFromPeerTable 1 }

DbpAppAdvFromPeerEntry ::= SEQUENCE {
    dbpAppAdvFromPeerVendorId Unsigned32,
    dbpAppAdvFromPeerIndex   Unsigned32,
    dbpAppAdvFromPeerType    INTEGER
}

dbpAppAdvFromPeerVendorId OBJECT-TYPE
    SYNTAX          Unsigned32 (1..4294967295 )
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "The IANA Enterprise Code value assigned to
        the vendor of the Diameter application."
 ::= { dbpAppAdvFromPeerEntry 1 }

dbpAppAdvFromPeerIndex OBJECT-TYPE
    SYNTAX          Unsigned32 (1..4294967295 )
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A number uniquely identifying the applications
        advertised as supported from each Diameter peer."
 ::= { dbpAppAdvFromPeerEntry 2 }

dbpAppAdvFromPeerType OBJECT-TYPE
    SYNTAX          INTEGER {
                    acct(1),
                    auth(2),
                    both(3)
                    }

```

```

MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
    "The type of services supported for each application,
    accounting, authentication or both.
    acct(1) - accounting
    auth(2) - authentication
    both(3) - both accounting and authentication."
 ::= { dbpAppAdvFromPeerEntry 3 }

-- table of vendor-IDs supported by each peer

dbpPeerVendorTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF DbpPeerVendorEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "The table listing the Vendor IDs
        supported by the peer."
    ::= { dbpPeerCfgs 4 }

dbpPeerVendorEntry OBJECT-TYPE
    SYNTAX          DbpPeerVendorEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A row entry representing a
        Vendor ID supported by the peer."
    INDEX          {
                    dbpPeerIndex,
                    dbpPeerVendorIndex
                  }
    ::= { dbpPeerVendorTable 1 }

DbpPeerVendorEntry ::= SEQUENCE {
    dbpPeerVendorIndex      Unsigned32,
    dbpPeerVendorId        Unsigned32,
    dbpPeerVendorStorageType StorageType,
    dbpPeerVendorRowStatus RowStatus
}

dbpPeerVendorIndex OBJECT-TYPE
    SYNTAX          Unsigned32 ( 1..4294967295 )
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A number uniquely identifying the Vendor
        ID supported by the peer. Upon reload,
```

```
        dbpPeerVendorIndex values may be changed."
 ::= { dbpPeerVendorEntry 1 }

dbpPeerVendorId OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295 )
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The active vendor ID used for peer connections."
 ::= { dbpPeerVendorEntry 2 }

dbpPeerVendorStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The storage type for this conceptual row.
        None of the objects are writable when the
        conceptual row is permanent."
    REFERENCE   "Textual Conventions for SMIV2, Section 2."
    DEFVAL      { nonVolatile }
 ::= { dbpPeerVendorEntry 3 }

dbpPeerVendorRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The status of this conceptual row.

        To create a row in this table, a manager must
        set this object to either createAndGo(4) or
        createAndWait(5).

        Until instances of all corresponding columns are
        appropriately configured, the value of the
        corresponding instance of the dbpPeerVendorRowStatus
        column is 'notReady'.

        In particular, a newly created row cannot be made
        active until the corresponding dbpPeerVendorId has been
        set. Also, a newly created row cannot be made active
        until the corresponding 'dbpPeerIndex' has been set.

        dbpPeerVendorId may not be modified while the
        value of this object is active(1):
        An attempt to set these objects while the value of
```

dbpPeerVendorRowStatus is active(1) will result in an inconsistentValue error.

Entries in this table with dbpPeerVendorRowStatus equal to active(1) remain in the table until destroyed.

Entries in this table with dbpPeerVendorRowStatus equal to values other than active(1) will be destroyed after timeout (5 minutes)."

```
::= { dbpPeerVendorEntry 4 }
```

```
dbpPerPeerStatsTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF DbpPerPeerStatsEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The table listing the Diameter peer statistics."
```

```
::= { dbpPeerStats 1 }
```

```
dbpPerPeerStatsEntry OBJECT-TYPE
```

```
SYNTAX DbpPerPeerStatsEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"A row entry representing a Diameter peer."
```

```
INDEX { dbpPeerIndex }
```

```
::= { dbpPerPeerStatsTable 1 }
```

```
DbpPerPeerStatsEntry ::= SEQUENCE {
```

```

  dbpPerPeerStatsState          INTEGER,
  dbpPerPeerStatsStateDuration  TimeTicks,
  dbpPerPeerStatsLastDiscCause  INTEGER,
  dbpPerPeerStatsWhoInitDisconnect  INTEGER,
  dbpPerPeerStatsDWCCurrentStatus  INTEGER,
  dbpPerPeerStatsTimeoutConnAtmpts  Counter32,
  dbpPerPeerStatsASRsIn          Counter32,
  dbpPerPeerStatsASRsOut         Counter32,
  dbpPerPeerStatsASAsIn          Counter32,
  dbpPerPeerStatsASAsOut         Counter32,
  dbpPerPeerStatsACRsIn          Counter32,
  dbpPerPeerStatsACRsOut         Counter32,
  dbpPerPeerStatsACAsIn          Counter32,
  dbpPerPeerStatsACAsOut         Counter32,
  dbpPerPeerStatsCERsIn          Counter32,
  dbpPerPeerStatsCERsOut         Counter32,
  dbpPerPeerStatsCEAsIn          Counter32,
  dbpPerPeerStatsCEAsOut         Counter32,
```

```

dbpPerPeerStatsDWRsIn           Counter32,
dbpPerPeerStatsDWRsOut         Counter32,
dbpPerPeerStatsDWAsIn          Counter32,
dbpPerPeerStatsDWAsOut         Counter32,
dbpPerPeerStatsDPRsIn          Counter32,
dbpPerPeerStatsDPRsOut         Counter32,
dbpPerPeerStatsDPAsIn          Counter32,
dbpPerPeerStatsDPAsOut         Counter32,
dbpPerPeerStatsRARsIn          Counter32,
dbpPerPeerStatsRARsOut         Counter32,
dbpPerPeerStatsRAAsIn          Counter32,
dbpPerPeerStatsRAAsOut         Counter32,
dbpPerPeerStatsSTRsIn          Counter32,
dbpPerPeerStatsSTRsOut         Counter32,
dbpPerPeerStatsSTAsIn          Counter32,
dbpPerPeerStatsSTAsOut         Counter32,
dbpPerPeerStatsDWReqTimer      TimeTicks,
dbpPerPeerStatsRedirectEvents   Counter32,
dbpPerPeerStatsAccDupRequests   Counter32,
dbpPerPeerStatsMalformedReqsts Counter32,
dbpPerPeerStatsAccsNotRecorded Counter32,
dbpPerPeerStatsAccRetrans       Counter32,
dbpPerPeerStatsTotalRetrans     Counter32,
dbpPerPeerStatsAccPendReqstsOut Gauge32,
dbpPerPeerStatsAccReqstsDropped Counter32,
dbpPerPeerStatsHByHDropMessages Counter32,
dbpPerPeerStatsEToEDupMessages Counter32,
dbpPerPeerStatsUnknownTypes     Counter32,
dbpPerPeerStatsProtocolErrors   Counter32,
dbpPerPeerStatsTransientFailures Counter32,
dbpPerPeerStatsPermanentFailures Counter32,
dbpPerPeerStatsTransportDown    Counter32 }

```

dbpPerPeerStatsState OBJECT-TYPE

```

SYNTAX      INTEGER { closed(1),
                    waitConnAck(2),
                    waitICea(3),
                    elect(4),
                    waitReturns(5),
                    rOpen(6),
                    iOpen(7),
                    closing(8) }

```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Connection state in the Peer State Machine of the peer with which this Diameter server is communicating."

```

closed          - Connection closed with this peer.
waitConnAck    - Waiting for an acknowledgment
                 from this peer.
waitICea       - Waiting for a Capabilities-Exchange-
                 Answer from this peer.
elect           - When the peer and the server are both
                 trying to bring up a connection with
                 each other at the same time. An
                 election process begins which
                 determines which socket remains open.
waitReturns    - Waiting for election returns.
r-open         - Responder transport connection is
                 used for communication.
i-open         - Initiator transport connection is
                 used for communication.
closing        - Actively closing and doing cleanup."
 ::= { dbpPerPeerStatsEntry 1 }

```

dbpPerPeerStatsStateDuration OBJECT-TYPE

```

SYNTAX          TimeTicks
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION     "Peer state duration."
 ::= { dbpPerPeerStatsEntry 2 }

```

dbpPerPeerStatsLastDiscCause OBJECT-TYPE

```

SYNTAX          INTEGER { rebooting(1),
                          busy(2),
                          doNotWantToTalk(3),
                          election(4) }
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION     "The last cause for a peer's disconnection.

rebooting      - A scheduled reboot is imminent.
busy           - The peer's internal resources are
                 constrained, and it has determined
                 that the transport connection needs
                 to be shutdown.
doNotWantToTalk - The peer has determined that
                 it does not see a need for the
                 transport connection to exist,
                 since it does not expect any
                 messages to be exchanged in
                 the foreseeable future.
electionLost   - The peer has determined that it

```

```

                has lost the election process
                and has therefore disconnected
                the transport connection."
 ::= { dbpPerPeerStatsEntry 3 }

dbpPerPeerStatsWhoInitDisconnect OBJECT-TYPE
    SYNTAX      INTEGER { host(1),
                          peer(2) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Did the host or peer initiate the disconnect?

        host - If this server initiated the disconnect.
        peer - If the peer with which this server was
              connected initiated the disconnect."
 ::= { dbpPerPeerStatsEntry 4 }

dbpPerPeerStatsDWCurentStatus OBJECT-TYPE
    SYNTAX      INTEGER { okay(1),
                          suspect(2),
                          down(3),
                          reopen(4) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "okay      - Indicates the connection is presumed working.
        suspect    - Indicates the connection is possibly
                    congested or down.
        down       - The peer is no longer reachable, causing
                    the transport connection to be shutdown.
        reopen     - Three watchdog messages are exchanged with
                    accepted round trip times, and the connection
                    to the peer is considered stabilized."
 ::= { dbpPerPeerStatsEntry 5 }

dbpPerPeerStatsTimeoutConnAtmpts OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "If there is no transport connection with a peer,
        this is the number of times the server attempts
        to connect to that peer. This is reset on
        disconnection."
 ::= { dbpPerPeerStatsEntry 6 }

dbpPerPeerStatsASRsIn OBJECT-TYPE
```

```
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Abort-Session-Request messages
    received from the peer."
 ::= { dbpPerPeerStatsEntry 7 }
```

```
dbpPerPeerStatsASRsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Abort-Session-Request
    messages sent to the peer."
 ::= { dbpPerPeerStatsEntry 8 }
```

```
dbpPerPeerStatsASAsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Abort-Session-Answer
    messages received from the peer."
 ::= { dbpPerPeerStatsEntry 9 }
```

```
dbpPerPeerStatsASAsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Abort-Session-Answer
    messages sent to the peer."
 ::= { dbpPerPeerStatsEntry 10 }
```

```
dbpPerPeerStatsACRsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Accounting-Request messages
    received from the peer."
 ::= { dbpPerPeerStatsEntry 11 }
```

```
dbpPerPeerStatsACRsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
```

DESCRIPTION
"Number of Accounting-Request messages
sent to the peer."
 ::= { dbpPerPeerStatsEntry 12 }

dbpPerPeerStatsACAsIn OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of Accounting-Answer messages
received from the peer."
 ::= { dbpPerPeerStatsEntry 13 }

dbpPerPeerStatsACAsOut OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of Accounting-Answer messages
sent to the peer."
 ::= { dbpPerPeerStatsEntry 14 }

dbpPerPeerStatsCERsIn OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of Capabilities-Exchange-Request
messages received from the peer."
 ::= { dbpPerPeerStatsEntry 15 }

dbpPerPeerStatsCERsOut OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of Capabilities-Exchange-Request
messages sent to the peer."
 ::= { dbpPerPeerStatsEntry 16 }

dbpPerPeerStatsCEAsIn OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of Capabilities-Exchange-Answer
messages received from the peer."

```
 ::= { dbpPerPeerStatsEntry 17 }

dbpPerPeerStatsCEAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Capabilities-Exchange-Answer
        messages sent to the peer."
    ::= { dbpPerPeerStatsEntry 18 }

dbpPerPeerStatsDWRsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Device-Watchdog-Request
        messages received from the peer."
    ::= { dbpPerPeerStatsEntry 19 }

dbpPerPeerStatsDWRsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Device-Watchdog-Request
        messages sent to the peer."
    ::= { dbpPerPeerStatsEntry 20 }

dbpPerPeerStatsDWAsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Device-Watchdog-Answer
        messages received from the peer."
    ::= { dbpPerPeerStatsEntry 21 }

dbpPerPeerStatsDWAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Device-Watchdog-Answer
        messages sent to the peer."
    ::= { dbpPerPeerStatsEntry 22 }

dbpPerPeerStatsDPRsIn OBJECT-TYPE
```

```
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Disconnect-Peer-Request messages
    received."
 ::= { dbpPerPeerStatsEntry 23 }
```

```
dbpPerPeerStatsDPRsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Disconnect-Peer-Request messages
    sent."
 ::= { dbpPerPeerStatsEntry 24 }
```

```
dbpPerPeerStatsDPAsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Disconnect-Peer-Answer messages
    received."
 ::= { dbpPerPeerStatsEntry 25 }
```

```
dbpPerPeerStatsDPAsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Disconnect-Peer-Answer messages
    sent."
 ::= { dbpPerPeerStatsEntry 26 }
```

```
dbpPerPeerStatsRARsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Re-Auth-Request messages
    received."
 ::= { dbpPerPeerStatsEntry 27 }
```

```
dbpPerPeerStatsRARsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
```

```
DESCRIPTION
    "Number of Re-Auth-Request messages
    sent."
 ::= { dbpPerPeerStatsEntry 28 }

dbpPerPeerStatsRAAsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Re-Auth-Answer messages
        received."
 ::= { dbpPerPeerStatsEntry 29 }

dbpPerPeerStatsRAAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Re-Auth-Answer messages
        sent."
 ::= { dbpPerPeerStatsEntry 30 }

dbpPerPeerStatsSTRsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Session-Termination-Request
        messages received from the peer."
 ::= { dbpPerPeerStatsEntry 31 }

dbpPerPeerStatsSTRsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Session-Termination-Request
        messages sent to the peer."
 ::= { dbpPerPeerStatsEntry 32 }

dbpPerPeerStatsSTAsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Session-Termination-Answer
        messages received from the peer."
```

```
 ::= { dbpPerPeerStatsEntry 33 }

dbpPerPeerStatsSTAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Session-Termination-Answer
         messages sent to the peer."
    ::= { dbpPerPeerStatsEntry 34 }

dbpPerPeerStatsDWReqTimer OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Device-Watchdog Request Timer, which
         is the interval between packets sent to
         peers."
    ::= { dbpPerPeerStatsEntry 35 }

dbpPerPeerStatsRedirectEvents OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Redirect Event count, which is the number
         of redirects sent from a peer."
    ::= { dbpPerPeerStatsEntry 36 }

dbpPerPeerStatsAccDupRequests OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of duplicate Diameter Accounting-Request
         packets received."
    ::= { dbpPerPeerStatsEntry 37 }

dbpPerPeerStatsMalformedReqsts OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of malformed Diameter
         packets received."
    ::= { dbpPerPeerStatsEntry 38 }
```

```
dbpPerPeerStatsAccsNotRecorded OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter Accounting-Request packets
         which were received and responded to but not
         recorded."
    ::= { dbpPerPeerStatsEntry 39 }

dbpPerPeerStatsAccRetrans OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter Accounting-Request packets
         retransmitted to this Diameter server."
    ::= { dbpPerPeerStatsEntry 40 }

dbpPerPeerStatsTotalRetrans OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter packets retransmitted
         to this Diameter server, not to include Diameter
         Accounting-Request packets retransmitted."
    ::= { dbpPerPeerStatsEntry 41 }

dbpPerPeerStatsAccPendReqstsOut OBJECT-TYPE
    SYNTAX      Gauge32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter Accounting-Request packets
         sent to this peer that have not yet timed out or
         received a response. This variable is incremented when an
         Accounting-Request is sent to this server and decremented
         due to receipt of an Accounting-Response, a timeout or
         a retransmission."
    ::= { dbpPerPeerStatsEntry 42 }

dbpPerPeerStatsAccReqstsDropped OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Accounting-Requests to this server"
```

```
        that have been dropped."
 ::= { dbpPerPeerStatsEntry 43 }

dbpPerPeerStatsHByHDropMessages OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "An answer message that is received with an unknown
        Hop-by-Hop Identifier. Does not include Accounting
        Requests dropped."
 ::= { dbpPerPeerStatsEntry 44 }

dbpPerPeerStatsEToEDupMessages OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Duplicate answer messages that are to be locally
        consumed. Does not include duplicate Accounting
        Requests received."
 ::= { dbpPerPeerStatsEntry 45 }

dbpPerPeerStatsUnknownTypes OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter packets of unknown type
        which were received."
 ::= { dbpPerPeerStatsEntry 46 }

dbpPerPeerStatsProtocolErrors OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of protocol errors returned to peer,
        but not including redirects."
 ::= { dbpPerPeerStatsEntry 47 }

dbpPerPeerStatsTransientFailures OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Transient Failure count."
 ::= { dbpPerPeerStatsEntry 48 }
```

```

dbpPerPeerStatsPermanentFailures OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of permanent failures returned to peer."
    ::= { dbpPerPeerStatsEntry 49 }

```

```

dbpPerPeerStatsTransportDown OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of unexpected transport failures."
    ::= { dbpPerPeerStatsEntry 50 }

```

```

dbpRealmMessageRouteTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DbpRealmMessageRouteEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing the Diameter
        Realm-based Message Route information."
    ::= { dbpRealmStats 1 }

```

```

dbpRealmMessageRouteEntry OBJECT-TYPE
    SYNTAX      DbpRealmMessageRouteEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row entry representing a Diameter
        Realm Based Message Route server."
    INDEX      { dbpRealmMessageRouteIndex }
    ::= { dbpRealmMessageRouteTable 1 }

```

```

DbpRealmMessageRouteEntry ::= SEQUENCE {
    dbpRealmMessageRouteIndex      Unsigned32,
    dbpRealmMessageRouteRealm      SnmpAdminString,
    dbpRealmMessageRouteApp        Unsigned32,
    dbpRealmMessageRouteType       INTEGER,
    dbpRealmMessageRouteAction     INTEGER,
    dbpRealmMessageRouteACRsIn     Counter32,
    dbpRealmMessageRouteACRsOut    Counter32,
    dbpRealmMessageRouteACAsIn     Counter32,
    dbpRealmMessageRouteACAsOut    Counter32,
    dbpRealmMessageRouteRARsIn     Counter32,
    dbpRealmMessageRouteRARsOut    Counter32,
    dbpRealmMessageRouteRAAsIn     Counter32,

```

```

dbpRealmMessageRouteRAAsOut      Counter32,
dbpRealmMessageRouteSTRsIn       Counter32,
dbpRealmMessageRouteSTRsOut      Counter32,
dbpRealmMessageRouteSTAsIn       Counter32,
dbpRealmMessageRouteSTAsOut      Counter32,
dbpRealmMessageRouteASRsIn       Counter32,
dbpRealmMessageRouteASRsOut      Counter32,
dbpRealmMessageRouteASAsIn       Counter32,
dbpRealmMessageRouteASAsOut      Counter32,
dbpRealmMessageRouteAccRetrans    Counter32,
dbpRealmMessageRouteAccDupReqsts Counter32,
dbpRealmMessageRoutePendReqstsOut Gauge32,
dbpRealmMessageRouteReqstsDrop   Counter32 }

```

```

dbpRealmMessageRouteIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying each Realm."
    ::= { dbpRealmMessageRouteEntry 1 }

```

```

dbpRealmMessageRouteRealm OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Realm name"
    ::= { dbpRealmMessageRouteEntry 2 }

```

```

dbpRealmMessageRouteApp OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Application id used to route packets
        to this realm."
    ::= { dbpRealmMessageRouteEntry 3 }

```

```

dbpRealmMessageRouteType OBJECT-TYPE
    SYNTAX      INTEGER { acct(1),
                        auth(2),
                        both(3) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The types of service supported for each
        realm application: accounting,

```

```
        authentication or both."
 ::= { dbpRealmMessageRouteEntry 4 }

dbpRealmMessageRouteAction OBJECT-TYPE
    SYNTAX      INTEGER { local(1),
                          relay(2),
                          proxy(3),
                          redirect(4) }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The action is used to identify how a
        message should be treated based on the realm,
        application and type.
        local      - Diameter messages that resolve to a
                    route entry with the Local Action set to
                    Local can be satisfied locally, and do
                    not need to be routed to another server.
        relay      - All Diameter messages that fall within
                    this category MUST be routed to a
                    next-hop server, without modifying any
                    non-routing AVPs.
        proxy      - All Diameter messages that fall within this
                    category MUST be routed to a next-hop
                    server.
        redirect   - Diameter messages that fall within this
                    category MUST have the identity of the home
                    Diameter server(s) appended, and returned
                    to the sender of the message."
 ::= { dbpRealmMessageRouteEntry 5 }

dbpRealmMessageRouteACRsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Accounting-Request messages
        received from the realm."
 ::= { dbpRealmMessageRouteEntry 6 }

dbpRealmMessageRouteACRsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Accounting-Request messages
        sent to the realm."
 ::= { dbpRealmMessageRouteEntry 7 }
```

```
dbpRealmMessageRouteACAsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Accounting-Answer messages
         received from the realm."
    ::= { dbpRealmMessageRouteEntry 8 }

dbpRealmMessageRouteACAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Accounting-Answer messages
         sent to the realm."
    ::= { dbpRealmMessageRouteEntry 9 }

dbpRealmMessageRouteRARsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Re-Auth-Request messages
         received from the realm."
    ::= { dbpRealmMessageRouteEntry 10 }

dbpRealmMessageRouteRARsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Re-Auth-Request messages
         sent to the realm."
    ::= { dbpRealmMessageRouteEntry 11 }

dbpRealmMessageRouteRAAsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Re-Auth-Answer messages
         received from the realm."
    ::= { dbpRealmMessageRouteEntry 12 }

dbpRealmMessageRouteRAAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
```

```
STATUS      current
DESCRIPTION
    "Number of Re-Auth-Answer messages
    sent to the realm."
 ::= { dbpRealmMessageRouteEntry 13 }
```

```
dbpRealmMessageRouteSTRsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Session-Termination-Request messages
    received from the realm."
 ::= { dbpRealmMessageRouteEntry 14 }
```

```
dbpRealmMessageRouteSTRsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Session-Termination-Request messages
    sent to the realm."
 ::= { dbpRealmMessageRouteEntry 15 }
```

```
dbpRealmMessageRouteSTAsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Session-Termination-Answer messages
    received from the realm."
 ::= { dbpRealmMessageRouteEntry 16 }
```

```
dbpRealmMessageRouteSTAsOut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Session-Termination-Answer messages
    sent to the realm."
 ::= { dbpRealmMessageRouteEntry 17 }
```

```
dbpRealmMessageRouteASRsIn OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Abort-Session-Request messages
```

```
        received from the realm."
 ::= { dbpRealmMessageRouteEntry 18 }

dbpRealmMessageRouteASRsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Abort-Session-Request messages
         sent to the realm."
 ::= { dbpRealmMessageRouteEntry 19 }

dbpRealmMessageRouteASAsIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Abort-Session-Answer messages
         received from the realm."
 ::= { dbpRealmMessageRouteEntry 20 }

dbpRealmMessageRouteASAsOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Abort-Session-Answer messages
         sent to the realm."
 ::= { dbpRealmMessageRouteEntry 21 }

dbpRealmMessageRouteAccRetrans OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter accounting packets
         retransmitted to this realm."
 ::= { dbpRealmMessageRouteEntry 22 }

dbpRealmMessageRouteAccDupReqsts OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of duplicate Diameter accounting
         packets sent to this realm."
 ::= { dbpRealmMessageRouteEntry 23 }
```

```

dbpRealmMessageRoutePendReqstsOut OBJECT-TYPE
    SYNTAX      Gauge32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of Diameter Accounting-Request packets
        sent to this peer that have not yet timed out or
        received a response. This variable is incremented when an
        Accounting-Request is sent to this server and decremented
        due to receipt of an Accounting-Response, a timeout or
        a retransmission."
    ::= { dbpRealmMessageRouteEntry 24 }

dbpRealmMessageRouteReqstsDrop OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The number of reqsts dropped by this realm."
    ::= { dbpRealmMessageRouteEntry 25 }

dbpRealmKnownPeersTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DbpRealmKnownPeersEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing the Diameter
        Realms and known peers."
    ::= { dbpRealmCfgs 1 }

dbpRealmKnownPeersEntry OBJECT-TYPE
    SYNTAX      DbpRealmKnownPeersEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row entry representing a Diameter
        Realm and known peers."
    INDEX      { dbpRealmMessageRouteIndex,
                 dbpRealmKnownPeersIndex }
    ::= { dbpRealmKnownPeersTable 1 }

DbpRealmKnownPeersEntry ::= SEQUENCE {
    dbpRealmKnownPeersIndex      Unsigned32,
    dbpRealmKnownPeers          Unsigned32,
    dbpRealmKnownPeersChosen    INTEGER }

dbpRealmKnownPeersIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)

```

```
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "A sequential identifier number."
 ::= { dbpRealmKnownPeersEntry 1 }

dbpRealmKnownPeers OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The index of the peer this realm knows about.
     This is an ordered list, where the ordering
     signifies the order in which the peers are
     tried. Same as the dbpPeerIndex"
 ::= { dbpRealmKnownPeersEntry 2 }

dbpRealmKnownPeersChosen OBJECT-TYPE
SYNTAX INTEGER { roundRobin(1),
                 loadBalance(2),
                 firstPreferred(3),
                 mostRecentFirst(4),
                 other(5) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "How the realm chooses which peer to send
     packets to.
     roundRobin - The peer used for each transaction
                 is selected based on the order in
                 which peers are configured.
     loadBalance - The peer used for each transaction
                 is based on the load metric (maybe
                 implementation dependent) of all
                 peers defined for the realm, with
                 the least loaded server selected
                 first.
     firstPreferred - The first defined server is always
                     used for transactions unless
                     failover occurs.
     mostRecentFirst - The most recently used server is
                     used first for each transaction."
 ::= { dbpRealmKnownPeersEntry 3 }

-- Conformance
-- dbpMIBCompliances

diameterBaseProtocolMIBCompliances
```

```
                OBJECT IDENTIFIER ::= { diameterBaseConform 1 }
diameterBaseProtocolMIBGroups
                OBJECT IDENTIFIER ::= { diameterBaseConform 2 }

-- Compliance Statements

diameterBaseProtocolCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statement for Diameter Base
        Protocol entities."
    MODULE -- this module
        MANDATORY-GROUPS { dbpLocalCfgGroup,
                            dbpPeerCfgGroup,
                            dbpPeerStatsGroup,
                            dbpRealmCfgGroup,
                            dbpRealmStatsGroup,
                            dbpNotificationsGroup,
                            dbpNotifCfgGroup }

                ::= { diameterBaseProtocolMIBCompliances 1 }

-- Units of Conformance

dbpLocalCfgGroup OBJECT-GROUP
    OBJECTS {
        dbpLocalRealm,
        dbpLocalOriginHost,
        dbpLocalId,
        dbpLocalIpAddrType,
        dbpLocalIpAddress,
        dbpLocalTcpListenPort,
        dbpLocalSctpListenPort,
        dbpLocalStatsTotalMessagesIn,
        dbpLocalStatsTotalMessagesOut,
        dbpLocalStatsTotalUpTime,
        dbpLocalResetTime,
        dbpLocalConfigReset,
        dbpLocalApplStorageType,
        dbpLocalApplRowStatus,
        dbpAppAdvToPeerServices,
        dbpAppAdvToPeerStorageType,
        dbpAppAdvToPeerRowStatus
    }
    STATUS      current
    DESCRIPTION
```

```

        "A collection of objects providing configuration common
        to the server."
 ::= { diameterBaseProtocolMIBGroups 1 }

dbpPeerCfgGroup OBJECT-GROUP
  OBJECTS {
    dbpPeerId,
    dbpPeerPortConnect,
    dbpPeerPortListen,
    dbpPeerProtocol,
    dbpPeerSecurity,
    dbpPeerFirmwareRevision,
    dbpPeerStorageType,
    dbpPeerRowStatus,
    dbpPeerIpAddressType,
    dbpPeerIpAddress,
    dbpPeerVendorId,
    dbpPeerVendorStorageType,
    dbpPeerVendorRowStatus,
    dbpAppAdvFromPeerType
  }
  STATUS current
  DESCRIPTION
    "A collection of objects providing configuration
    of the Diameter peers."
 ::= { diameterBaseProtocolMIBGroups 2 }

dbpPeerStatsGroup OBJECT-GROUP
  OBJECTS {
    dbpPerPeerStatsState,
    dbpPerPeerStatsStateDuration,
    dbpPerPeerStatsLastDiscCause,
    dbpPerPeerStatsWhoInitDisconnect,
    dbpPerPeerStatsDWCurrentStatus,
    dbpPerPeerStatsTimeoutConnAtmpts,
    dbpPerPeerStatsASRsIn,
    dbpPerPeerStatsASRsOut,
    dbpPerPeerStatsASAsIn,
    dbpPerPeerStatsASAsOut,
    dbpPerPeerStatsACRsIn,
    dbpPerPeerStatsACRsOut,
    dbpPerPeerStatsACAsIn,
    dbpPerPeerStatsACAsOut,
    dbpPerPeerStatsCERsIn,
    dbpPerPeerStatsCERsOut,
    dbpPerPeerStatsCEAsIn,
    dbpPerPeerStatsCEAsOut,
    dbpPerPeerStatsDWRsIn,

```

```

    dbpPerPeerStatsDWRsOut,
    dbpPerPeerStatsDWAsIn,
    dbpPerPeerStatsDWAsOut,
    dbpPerPeerStatsDPRsIn,
    dbpPerPeerStatsDPRsOut,
    dbpPerPeerStatsDPAsIn,
    dbpPerPeerStatsDPAsOut,
    dbpPerPeerStatsRARsIn,
    dbpPerPeerStatsRARsOut,
    dbpPerPeerStatsRAAsIn,
    dbpPerPeerStatsRAAsOut,
    dbpPerPeerStatsSTRsIn,
    dbpPerPeerStatsSTRsOut,
    dbpPerPeerStatsSTAsIn,
    dbpPerPeerStatsSTAsOut,
    dbpPerPeerStatsDWReqTimer,
    dbpPerPeerStatsRedirectEvents,
    dbpPerPeerStatsAccDupRequests,
    dbpPerPeerStatsMalformedReqsts,
    dbpPerPeerStatsAccsNotRecorded,
    dbpPerPeerStatsAccRetrans,
    dbpPerPeerStatsTotalRetrans,
    dbpPerPeerStatsAccPendReqstsOut,
    dbpPerPeerStatsAccReqstsDropped,
    dbpPerPeerStatsHByHDropMessages,
    dbpPerPeerStatsEToEDupMessages,
    dbpPerPeerStatsUnknownTypes,
    dbpPerPeerStatsProtocolErrors,
    dbpPerPeerStatsTransientFailures,
    dbpPerPeerStatsPermanentFailures,
    dbpPerPeerStatsTransportDown,
    dbpPerPeerStatsDWCCurrentStatus,
    dbpPerPeerStatsDWReqTimer,
    dbpPerPeerStatsRedirectEvents,
    dbpPerPeerStatsAccDupRequests,
    dbpPerPeerStatsEToEDupMessages
}
STATUS          current
DESCRIPTION
    "A collection of objects providing statistics
    of the Diameter peers."
 ::= { diameterBaseProtocolMIBGroups 3 }

```

```

dbpNotificationsGroup NOTIFICATION-GROUP
NOTIFICATIONS {
    dbpProtocolErrorNotif,
    dbpTransientFailureNotif,

```

```
        dbpPermanentFailureNotif,
        dbpPeerConnectionDownNotif,
        dbpPeerConnectionUpNotif
    }
    STATUS          current
    DESCRIPTION
        "The set of notifications which an agent is required
        to implement."
    ::= { diameterBaseProtocolMIBGroups 4 }

dbpNotifCfgGroup OBJECT-GROUP
    OBJECTS
        {
            dbpProtocolErrorNotifEnabled,
            dbpTransientFailureNotifEnabled,
            dbpPermanentFailureNotifEnabled,
            dbpPeerConnectionDownNotifEnabled,
            dbpPeerConnectionUpNotifEnabled
        }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing configuration for
        base protocol notifications."
    ::= { diameterBaseProtocolMIBGroups 5 }

dbpRealmCfgGroup OBJECT-GROUP
    OBJECTS
        {
            dbpRealmKnownPeers,
            dbpRealmKnownPeersChosen
        }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing configuration for
        Realm."
    ::= { diameterBaseProtocolMIBGroups 6 }

dbpRealmStatsGroup OBJECT-GROUP
    OBJECTS
        {
            dbpRealmMessageRouteRealm,
            dbpRealmMessageRouteApp,
            dbpRealmMessageRouteType,
            dbpRealmMessageRouteAction,
            dbpRealmMessageRouteACRsIn,
            dbpRealmMessageRouteACRsOut,
            dbpRealmMessageRouteACAsIn,
            dbpRealmMessageRouteACAsOut,
            dbpRealmMessageRouteRARsIn,
            dbpRealmMessageRouteRARsOut,
            dbpRealmMessageRouteRAAsIn,
```

```

        dbpRealmMessageRouterRAAsOut,
        dbpRealmMessageRouteSTRsIn,
        dbpRealmMessageRouteSTRsOut,
        dbpRealmMessageRouteSTAsIn,
        dbpRealmMessageRouteSTAsOut,
        dbpRealmMessageRouteASRsIn,
        dbpRealmMessageRouteASRsOut,
        dbpRealmMessageRouteASAsIn,
        dbpRealmMessageRouteASAsOut,
        dbpRealmMessageRouteAccRetrans,
        dbpRealmMessageRouteAccDupReqsts,
        dbpRealmMessageRoutePendReqstsOut,
        dbpRealmMessageRouteReqstsDrop
    }
    STATUS          current
    DESCRIPTION
        "A collection of objects providing statistics
        of realm message routing."
    ::= { diameterBaseProtocolMIBGroups 7 }

END

```

5. IANA Considerations

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Descriptor	OBJECT IDENTIFIER value
-----	-----
diameterBaseProtocolMIB	{ mib-2 XXX }

Editor's Note (to be removed prior to publication) The IANA is requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

6. Security Considerations

There are managed objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

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

- o diameterHostAddress
- o diameterPeerServerAddress
- o diameterPeerIpAddress

These can be used to determine the address of the Diameter host, and/or peers with which the host is communicating. This information could be useful in impersonating the host or peer.

It is important to control 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.

SNMPv1 by itself is not 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 (read) the objects in this MIB.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC3414] and the View-based Access Control Model [RFC3415] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, 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.

7. Contributors

This document is based upon and derived from work done by Jay Koehler, Mark Eklund and Hai Li.

8. Acknowledgements

Thanks to David Battle for his participation and suggestions in designing the table structures; Kevin Lingle, Sumanth Mithra, Tolga Asveren, Tina Tsou, Mark Jones, John Loughney and Biswaranjan Panda for reviewing the MIB and making invaluable suggestions; and Greg Weber for his help in representing the MIB at IETF meetings.

9. References

9.1. Normative References

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- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIV2)", STD 58, RFC 2578, April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIV2", STD 58, RFC 2579, April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIV2", STD 58, RFC 2580, April 1999.
- [RFC3411] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks", STD 62, RFC 3411, December 2002.
- [RFC3588] Calhoun, P., Loughney, J., Guttman, E., Zorn, G., and J. Arkko, "Diameter Base Protocol", RFC 3588, September 2003.
- [RFC4001] Daniele, M., Haberman, B., Routhier, S., and J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", RFC 4001, February 2005.

9.2. Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.
- [RFC3414] Blumenthal, U. and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", STD 62, RFC 3414, December 2002.
- [RFC3415] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3415, December 2002.

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January 15, 2010

Diameter Credit Control Application MIB
draft-ietf-dime-diameter-cc-appl-mib-03.txt

Abstract

Along with providing support for certain basic authentication, authorization and accounting functions, the Diameter base protocol is intended to provide a framework for AAA applications.

This document defines the Management Information Base (MIB) module which describes the minimum set of objects needed to manage an implementation of the Diameter Credit Control application.

Status of this Memo

This Internet-Draft is submitted to IETF in full conformance with the provisions of BCP 78 and BCP 79.

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1. 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 ([RFC2578], [RFC2579], [RFC2580]). In particular, it describes managed objects used for managing the Diameter Credit Control Application [RFC4006].

Discussion of this draft may be directed to the dime Working Group of the IETF (dime@ietf.org)..

2. Requirements Language

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].

3. Overview

The base Diameter protocol [RFC3588] is never used alone; it is always extended for a particular application.

This MIB defines objects supporting the management of the Diameter Credit Control Application protocol as described in [RFC4006]. The MIB specification for the Diameter base protocol [I-D.ietf-dime-diameter-base-protocol-mib] SHOULD be implemented prior to the implementation of this MIB.

4. Diameter Credit Control Application MIB Definitions

```
DIAMETER-CC-APPLICATION-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Unsigned32,
```

```
Counter32,
mib-2
    FROM SNMPv2-SMI -- [RFC2578]

MODULE-COMPLIANCE,
OBJECT-GROUP
    FROM SNMPv2-CONF -- [RFC2580]
StorageType,
RowStatus
    FROM SNMPv2-TC -- [RFC2579]
InetAddressType,
InetAddress
    FROM INET-ADDRESS-MIB -- [RFC4001]
SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB; -- [RFC3411]

diameterCCAMIB MODULE-IDENTITY
    LAST-UPDATED "201001150000Z" -- 15 January 2010
    ORGANIZATION "IETF dime Working Group."
    CONTACT-INFO
        "Subash Comerica
        Cisco Systems
        Global Development Centre, Prestige Waterford
        No. 9 Brunton Road
        BGL3/MZ/
        Bangalore, Karnataka 560025
        India
        Phone: +91 80 4103 6427
        Email: subashtc@cisco.com"
    DESCRIPTION
        "The MIB module for entities implementing the
        Diameter Credit Control Application, RFC 4006.

        Copyright (C) The Internet Society (2010). This initial
        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 and remove this note

    REVISION "201001150000Z" -- 15 January 2010
    DESCRIPTION "Initial version as published in RFC yyyy"

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

 ::= { mib-2 XXX }
```

```

-- RFC Ed.: replace XXX with value assigned by IANA
--           and remove this note

-- Top-Level Components of this MIB.
diameterCcAppMIB          OBJECT IDENTIFIER ::=
                          { diameterCCAMIB 2 }
diameterCcAppTraps       OBJECT IDENTIFIER ::=
                          { diameterCcAppMIB 0 }
diameterCcAppObjects     OBJECT IDENTIFIER ::=
                          { diameterCcAppMIB 1 }
diameterCcAppConform     OBJECT IDENTIFIER ::=
                          { diameterCcAppMIB 2 }

dccaHostCfgs             OBJECT IDENTIFIER ::= { diameterCcAppObjects 1 }
dccaPeerCfgs             OBJECT IDENTIFIER ::= { diameterCcAppObjects 2 }
dccaPeerStats           OBJECT IDENTIFIER ::= { diameterCcAppObjects 3 }

dccaHostID OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The implementation identification string for
         the Diameter software in use on the system,
         for example; 'diameterd'"
    ::= { dccaHostCfgs 1 }

dccaHostIpAddrTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DccaHostIpAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing the Diameter
         Credit Control host's IP Addresses."
    ::= { dccaHostCfgs 2 }

dccaHostIpAddrEntry OBJECT-TYPE
    SYNTAX      DccaHostIpAddrEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row entry representing a Diameter
         Credit Control host IP Address."
    INDEX      { dccaHostIpAddrIndex }
    ::= { dccaHostIpAddrTable 1 }

DccaHostIpAddrEntry ::= SEQUENCE {
    dccaHostIpAddrIndex Unsigned32,

```

```
        dccaHostIpAddrType  InetAddressType,
        dccaHostIpAddress   InetAddress
    }

dccaHostIpAddrIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295 )
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying the number
        of IP Addresses supported by this Diameter
        Credit Control host."
    ::= { dccaHostIpAddrEntry 1 }

dccaHostIpAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The type of internet address stored
        in dccaHostIpAddress."
    ::= { dccaHostIpAddrEntry 2 }

dccaHostIpAddress OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The IP-Address of the host, which is of the
        type specified in dccaHostIpAddrType."
    ::= { dccaHostIpAddrEntry 3 }

dccaPeerTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DccaPeerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing information regarding
        the discovered or configured Diameter
        Credit Control peers."
    ::= { dccaPeerCfgs 1 }

dccaPeerEntry OBJECT-TYPE
    SYNTAX      DccaPeerEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row entry representing a discovered
```

```

        or configured Diameter Credit Control
        peer."
INDEX      { dccaPeerIndex }
 ::= { dccaPeerTable 1 }

DccaPeerEntry ::= SEQUENCE {
    dccaPeerIndex      Unsigned32,
    dccaPeerId         SnmpAdminString,
    dccaPeerFirmwareRevision Unsigned32,
    dccaPeerStorageType StorageType,
    dccaPeerRowStatus  RowStatus }

dccaPeerIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A number uniquely identifying each Diameter
        Credit Control peer with which this host
        communicates."
    ::= { dccaPeerEntry 1 }

dccaPeerId OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The server identifier for the Diameter
        Credit Control peer."
    ::= { dccaPeerEntry 2 }

dccaPeerFirmwareRevision OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "Firmware revision of peer.  If no firmware
        revision, the revision of the Diameter
        Credit Control software
        module may be reported instead."
    ::= { dccaPeerEntry 3 }

dccaPeerStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The storage type for this conceptual row. None

```

of the columnar objects is writable when the conceptual row is permanent."

REFERENCE

"Textual Conventions for SMIV2, Section 2."

DEFVAL { nonVolatile }

::= { dccaPeerEntry 4 }

dccaPeerRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this conceptual row.

To create a row in this table, a manager must set this object to either createAndGo(4) or createAndWait(5).

Until instances of all corresponding columns are appropriately configured, the value of the corresponding instance of the dccaPeerRowStatus column is 'notReady'.

In particular, a newly created row cannot be made active until the corresponding dccaPeerId has been set.

dccaPeerId may not be modified while the value of this object is active(1):
An attempt to set these objects while the value of dccaPeerRowStatus is active(1) will result in an inconsistentValue error.

Entries in this table with dccaPeerRowStatus equal to active(1) remain in the table until destroyed.

Entries in this table with dccaPeerRowStatus equal to values other than active(1) will be destroyed after timeout (5 minutes).

If a dccaPeerId being created via SNMP already exists in another active dccaPeerEntry, then a newly created row cannot be made active until the original row with the dccaPeerId value is destroyed.

Upon reload, dccaPeerIndex values may be changed."

```

 ::= { dccaPeerEntry 5 }

dccaPeerVendorTable OBJECT-TYPE
    SYNTAX          SEQUENCE OF DccaPeerVendorEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "The table listing the Vendor IDs
         supported by the peer."
 ::= { dccaPeerCfgs 2 }

dccaPeerVendorEntry OBJECT-TYPE
    SYNTAX          DccaPeerVendorEntry
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A row entry representing a
         Vendor ID supported by the peer."
    INDEX           {
                    dccaPeerIndex,
                    dccaPeerVendorIndex
                  }
 ::= { dccaPeerVendorTable 1 }

DccaPeerVendorEntry ::= SEQUENCE {
    dccaPeerVendorIndex      Unsigned32,
    dccaPeerVendorId         Unsigned32,
    dccaPeerVendorStorageType StorageType,
    dccaPeerVendorRowStatus  RowStatus
}

dccaPeerVendorIndex OBJECT-TYPE
    SYNTAX          Unsigned32 (1..4294967295 )
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A number uniquely identifying the Vendor
         ID supported by the peer."
 ::= { dccaPeerVendorEntry 1 }

dccaPeerVendorId OBJECT-TYPE
    SYNTAX          Unsigned32
    MAX-ACCESS      read-create
    STATUS          current
    DESCRIPTION
        "The active Vendor IDs used for peer
         connections."
 ::= { dccaPeerVendorEntry 2 }

```

dccaPeerVendorStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The storage type for this conceptual row. An agent implementing the table must allow adding dccaPeerVendorId into the table. None of the columnar objects is writable when the conceptual row is permanent."

REFERENCE

"Textual Conventions for SMIV2, Section 2."

DEFVAL { nonVolatile }

::= { dccaPeerVendorEntry 3 }

dccaPeerVendorRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this conceptual row.

To create a row in this table, a manager must set this object to either createAndGo(4) or createAndWait(5).

Until instances of all corresponding columns are appropriately configured, the value of the corresponding instance of the dccaPeerVendorRowStatus column is 'notReady'.

In particular, a newly created row cannot be made active until the corresponding dccaPeerVendorId has been set.

dccaPeerVendorId may not be modified while the value of this object is active(1):
An attempt to set these objects while the value of dccaPeerVendorRowStatus is active(1) will result in an inconsistentValue error.

Entries in this table with dccaPeerVendorRowStatus equal to active(1) remain in the table until destroyed.

Entries in this table with dccaPeerVendorRowStatus equal to values other than active(1) will be destroyed

after timeout (5 minutes).

If the peer vendor id being created via SNMP already exists in another active dccaPeerVendorEntry, then a newly created row cannot be made active until the original row with the peer vendor id value is destroyed.

Upon reload, dccaPeerVendorIndex values may be changed."

```
::= { dccaPeerVendorEntry 4 }
```

```
-- per-peer statistics
```

```
dccaPerPeerStatsTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF DccaPerPeerStatsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table listing the Diameter
        Credit Control per-peer Statistics."
    ::= { dccaPeerStats 1 }
```

```
dccaPerPeerStatsEntry OBJECT-TYPE
    SYNTAX      DccaPerPeerStatsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A row entry representing a Diameter
        Credit Control Peer."
    INDEX       { dccaPeerIndex }
    ::= { dccaPerPeerStatsTable 1 }
```

```
DccaPerPeerStatsEntry ::= SEQUENCE {
    dccaPerPeerStatsCCRIn           Counter32,
    dccaPerPeerStatsCCROut          Counter32,
    dccaPerPeerStatsCCRDropped      Counter32,
    dccaPerPeerStatsCCCAIn          Counter32,
    dccaPerPeerStatsCCCAOut         Counter32,
    dccaPerPeerStatsCCADropped      Counter32,
    dccaPerPeerStatsRARIn           Counter32,
    dccaPerPeerStatsRARDropped      Counter32,
    dccaPerPeerStatsRAAOut          Counter32,
    dccaPerPeerStatsRAADropped      Counter32,
    dccaPerPeerStatsSTROut          Counter32,
```

```

dccaPerPeerStatsSTRDropped Counter32,
dccaPerPeerStatsSTAIIn Counter32,
dccaPerPeerStatsSTADropped Counter32,
dccaPerPeerStatsAAROut Counter32,
dccaPerPeerStatsAARDropped Counter32,
dccaPerPeerStatsAAAIIn Counter32,
dccaPerPeerStatsAAADropped Counter32,
dccaPerPeerStatsASRIIn Counter32,
dccaPerPeerStatsASRDropped Counter32,
dccaPerPeerStatsASAOut Counter32,
dccaPerPeerStatsASADropped Counter32 }

```

dccaPerPeerStatsCCRIn OBJECT-TYPE

```

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter Credit-Control-Request
    (CCR) messages received, per peer."
 ::= { dccaPerPeerStatsEntry 2 }

```

dccaPerPeerStatsCCROut OBJECT-TYPE

```

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter Credit-Control-Request (CCR)
    messages sent, per peer."
 ::= { dccaPerPeerStatsEntry 3 }

```

dccaPerPeerStatsCCRDropped OBJECT-TYPE

```

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter Credit-Control-Request (CCR)
    messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 4 }

```

dccaPerPeerStatsCCAIIn OBJECT-TYPE

```

SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter Credit-Control-Answer (CCA)
    messages received, per peer."
 ::= { dccaPerPeerStatsEntry 5 }

```

```
dccaPerPeerStatsCCAOOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Credit-Control-Answer (CCA)
        messages sent, per peer."
    ::= { dccaPerPeerStatsEntry 6 }
```

```
dccaPerPeerStatsCCADropped OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Credit-Control-Answer (CCA)
        messages dropped, per peer."
    ::= { dccaPerPeerStatsEntry 7 }
```

```
dccaPerPeerStatsRARIn OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Re-Auth-Request (RAR)
        messages received, per peer."
    ::= { dccaPerPeerStatsEntry 8 }
```

```
dccaPerPeerStatsRARDropped OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Re-Auth-Request (RAR)
        messages dropped, per peer."
    ::= { dccaPerPeerStatsEntry 9 }
```

```
dccaPerPeerStatsRAAOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Re-Auth-Answer (RAA)
        messages transmitted, per peer."
    ::= { dccaPerPeerStatsEntry 10 }
```

```
dccaPerPeerStatsRAADropped OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
```

```
STATUS      current
DESCRIPTION
    "Number of Diameter Re-Auth-Answer (RAA)
    messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 11 }
```

```
dccaPerPeerStatsSTROut OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Diameter
    Session-Termination-Request (STR)
    messages transmitted, per peer."
 ::= { dccaPerPeerStatsEntry 12 }
```

```
dccaPerPeerStatsSTRDropped OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Diameter
    Session-Termination-Request (STR)
    messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 13 }
```

```
dccaPerPeerStatsSTAIN OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Diameter
    Session-Termination-Answer (STA)
    messages received, per peer."
 ::= { dccaPerPeerStatsEntry 14 }
```

```
dccaPerPeerStatsSTADropped OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "Number of Diameter
    Session-Termination-Answer (STA)
    messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 15 }
```

```
dccaPerPeerStatsAAROut OBJECT-TYPE
SYNTAX      Counter32
```

```
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter AA-Request (AAR)
    messages transmitted, per peer."
 ::= { dccaPerPeerStatsEntry 16 }
```

```
dccaPerPeerStatsAARDropped OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter AA-Request (AAR)
    messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 17 }
```

```
dccaPerPeerStatsAAAIn OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter AA-Answer (AAA)
    messages received, per peer."
 ::= { dccaPerPeerStatsEntry 18 }
```

```
dccaPerPeerStatsAAADropped OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter AA-Answer (AAA)
    messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 19 }
```

```
dccaPerPeerStatsASRIn OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of Diameter Abort-Session-Request
    (ASR) messages received, per peer."
 ::= { dccaPerPeerStatsEntry 20 }
```

```
dccaPerPeerStatsASRDropped OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
```

```
        "Number of Diameter Abort-Session-Request
        (ASR) messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 21 }

dccaPerPeerStatsASAOut OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Abort-Session-Answer
        (ASA) messages transmitted, per peer."
 ::= { dccaPerPeerStatsEntry 22 }

dccaPerPeerStatsASADropped OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Number of Diameter Abort-Session-Answer
        (ASA) messages dropped, per peer."
 ::= { dccaPerPeerStatsEntry 23 }

-- Conformance dccaMIBCompliances

dccaMIBCompliances
    OBJECT IDENTIFIER ::= { diameterCcAppConform 1 } dccaMIBGroups
    OBJECT IDENTIFIER ::= { diameterCcAppConform 2 }

-- Compliance Statements

dccaMIBCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statement for Diameter Credit
        Control application entities."
    MODULE -- this module
    MANDATORY-GROUPS { dccaPeerStatsGroup }

    GROUP
        dccaHostCfgGroup
    DESCRIPTION
        "This group is only mandatory for a system that
        supports Local DCCA Host configuration."

    GROUP
        dccaPeerCfgGroup
    DESCRIPTION
```

"This group is only mandatory for a system that supports DCCA Peer configuration."

::= { dccaMIBCompliances 1 }

-- Units of Conformance

```
dccaHostCfgGroup OBJECT-GROUP
  OBJECTS {
    dccaHostIpAddrType,
    dccaHostIpAddress,
    dccaHostID
  }
  STATUS current
  DESCRIPTION
    "A collection of objects providing
    configuration common to the server."
  ::= { dccaMIBGroups 1 }
```

```
dccaPeerCfgGroup OBJECT-GROUP
  OBJECTS {
    dccaPeerId,
    dccaPeerVendorId,
    dccaPeerStorageType,
    dccaPeerVendorStorageType,
    dccaPeerFirmwareRevision,
    dccaPeerRowStatus,
    dccaPeerVendorRowStatus
  }
  STATUS current
  DESCRIPTION
    "A collection of objects providing peer
    configuration common to the server."
  ::= { dccaMIBGroups 2 }
```

```
dccaPeerStatsGroup OBJECT-GROUP
  OBJECTS {
    dccaPerPeerStatsCCRIn,
    dccaPerPeerStatsCCROut,
    dccaPerPeerStatsCCRDropped,
    dccaPerPeerStatsCCAIIn,
    dccaPerPeerStatsCCAOOut,
    dccaPerPeerStatsCCADropped,
    dccaPerPeerStatsRARIn,
    dccaPerPeerStatsRARDropped,
    dccaPerPeerStatsRAAOOut,
    dccaPerPeerStatsRAADropped,
    dccaPerPeerStatsSTROut,
```

```

    dccaPerPeerStatsSTRDropped,
    dccaPerPeerStatsSTAIIn,
    dccaPerPeerStatsSTADropped,
    dccaPerPeerStatsAAROut,
    dccaPerPeerStatsAARDropped,
    dccaPerPeerStatsAAAIIn,
    dccaPerPeerStatsAAADropped,
    dccaPerPeerStatsASRIIn,
    dccaPerPeerStatsASRDropped,
    dccaPerPeerStatsASAOOut,
    dccaPerPeerStatsASADropped
  }
  STATUS      current
  DESCRIPTION
    "A collection of objects providing peer
    statistics common to the server."
  ::= { dccaMIBGroups 3 }

```

END

5. IANA Considerations

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

Descriptor -----	OBJECT IDENTIFIER value -----
diameterCCAMIB	{ mib-2 XXX }

Editor's Note (to be removed prior to publication) The IANA is requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

6. Security Considerations

SNMPv1 by itself is not 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 (read) the objects in this MIB.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC3414] and the View-based Access

Control Model [RFC3415] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, 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.

7. Acknowledgements

Thanks to Sumanth Mithra and Biswaranjan Panda for helpful suggestions and feedback.

8. References

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Diameter Support for Proxy Mobile IPv6 Localized Routing
draft-ietf-dime-pmip6-lr-01

Abstract

In Proxy Mobile IPv6, packets received from a Mobile Node (MN) by the Mobile Access Gateway (MAG) to which it is attached are typically tunneled to a Local Mobility Anchor (LMA) for routing. The term "localized routing" refers to a method by which packets are routed directly by the MAG without involving the LMA. In order to establish a localized routing session between two Mobile Access Gateways in a Proxy Mobile IPv6 domain, two tasks must be accomplished:

1. The usage of local routing must be authorized for both MAGs and
2. The address of the MAG to which the Correspondent Node (CN) is attached must be ascertained

This document specifies how to accomplish these tasks using the Diameter protocol.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

Proxy Mobile IPv6 (PMIPv6) [RFC5213] allows the Mobility Access Gateway to optimize media delivery by locally routing packets within itself, avoiding tunneling them to the Mobile Node's Local Mobility Anchor. This is referred to as "local routing" in RFC 5213. However, this mechanism is not applicable to the typical scenario in which the MN and CN are connected to different MAGs and are registered to different LMAs. In this scenario (as described in [I-D.ietf-netext-pmip6-lr-ps]), the relevant information needed to set up a localized routing path (e.g., the addresses of the Mobile Access Gateways to which the MN and CN are respectively attached) is distributed between their respective Local Mobility Anchors. This may complicate the setup and maintenance of localized routing.

Therefore, in order to establish a localized routing path between the two Mobile Access Gateways, the Mobile Node's MAG must identify the LMA that is managing the Correspondent Node's traffic and then obtain the address of the Correspondent Node's MAG from that LMA. In Proxy Mobile IPv6, the LMA to be assigned to the CN may be maintained as a configured entry in the Correspondent Node's policy profile located on an Authentication, Authorization and Accounting (AAA) server. However, there is no relevant work discussing how AAA-based mechanisms can be used by the Mobile Node's MAG to discover the address of the Correspondent Node's LMA during the setup of localized routing. The method by which the Mobile Node's MAG interacts with the Correspondent Node's LMA to identify the Correspondent Node's MAG is also unspecified.

This document describes AAA support for the authorization and discovery of PMIPv6 mobility entities during localized routing. In LMA discovery, Diameter [RFC3588] is used to authorize the localized routing service and provide the Mobile Node's MAG/LMA with information regarding the Correspondent Node's LMA. In MAG discovery, AAA is used to determine whether Mobile Node's MAG is allowed to fetch the address of the Correspondent Node's MAG from the Correspondent Node's LMA. If MAG discovery is successful, the Correspondent Node's LMA will respond to the Mobile Node's MAG with the address of the Correspondent Node's MAG.

2. Solution Overview

MAG/LMA resolution is a prerequisite to the establishment of a direct routing path between MAG1 and MAG2 (associated with MN1 and MN2 respectively). This document addresses how to resolve the destination MN's MAG by means of interaction between the LMA and the AAA server. Figure 1 shows the reference architecture for Local

Routing Service Authorization. This reference architecture assumes

- o MN1 and MN2 belong to different LMAs
- o the MAG and LMA support Diameter client functionality

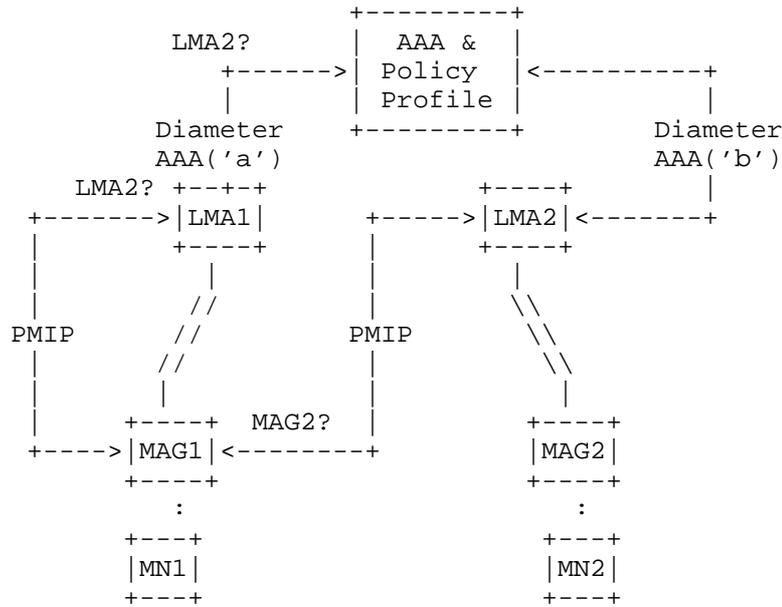


Figure 1: Local Routing Service Authorization Reference Architecture

The interaction of the MAG and LMA with the AAA server according to the extension specified in this document considers the follows features:

- a. The LMA1 interaction with the AAA server is used to authorize the localized routing service and fetch the IP address of LMA2 from the AAA server ('a' in (Figure 1))
- b. LMA2 interaction with the AAA server is used to determine whether MAG1 is allowed to obtain the IP address of MAG2 ('b' in (Figure 1))

3. Localized Routing Service Authorization

Figure 2 shows a scenario where MAG1 acts as a Diameter client, processing the data packet from MN1 to MN2 and requesting

authorization of localized routing. In this scenario, MN1 and MN2 are anchored to LMA1 and LMA2 respectively. In order to setup a localized routing path with MAG2, MAG1 must first locate the entity that maintains the data required to setup the path (i.e., LMA2) by sending a Local Routing Optimization Request message ([I-D.wu-netext-local-ro]) to LMA1. Note that the discovery of LMA2 is only done once; upon LMA1 know LMA2 address from AAA server, LMA1 may associate LMA2 address with MN's data for future use (e.g., handover case). The Diameter client in LMA1 sends an AA-Request (AAR) message to the Diameter server. The message contains an instance of the MIP6-Feature-Vector (MFV) AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit Section 7 set and an instance of the MIP6-Home-Link-Prefix AVP ([RFC5447], Section 4.2.4) containing the IP address of MN2.

The Diameter server checks if localized routing is allowed between MAG1 and MAG2 and if so, responds with an AA-Answer (AAA) message encapsulating an instance of the MIP6-Agent-Info AVP [RFC5779] containing the IP address and/or Fully Qualified Domain Name (FQDN) of LMA2. LMA1 then determines the IP address of LMA2 using the data returned in the MIP6-Agent-Info and responds to MAG1 with the address of LMA2. MAG1 then requests the address of MAG2 from LMA2 and uses that address to setup the localized routing path between itself and MAG2 via a Proxy Binding Update (PBU)/Proxy Binding Acknowledgement (PBA) message exchange [RFC5213].

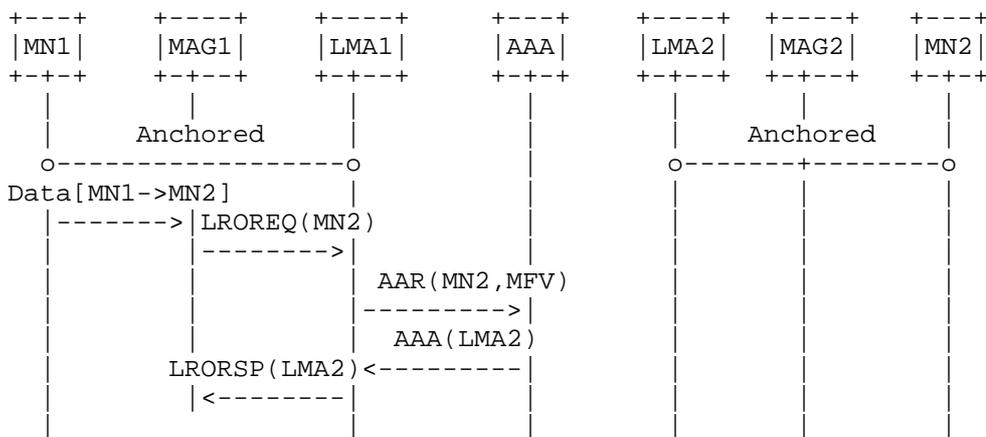


Figure 2: MAG-initiated Localized Routing Authorization

Figure 3 shows another scenario, in which the LMA1 acts as a Diameter client, processing the data packet from MN1 to MN2 and requesting the authorization of localized routing. In this scenario, MN1 and MN2 are anchored to LMA1 and LMA2 respectively. In contrast with the

signaling flow of Figure 2, the difference is that it is LMA1 instead of MAG1 which initiates the setup of the localized routing path.

The Diameter client in LMA1 sends an AA-Request (AAR) message to the Diameter server. The message contains an instance of the MIP6-Feature-Vector AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit set and an instance of the MIP6-Home-Link-Prefix AVP ([RFC5447], Section 4.2.4) containing the IP address of MN2. The Diameter server checks if localized routing is allowed between MAG1 and MAG2 and if so, responds with an AA-Answer (AAA) message encapsulating an instance of the MIP6-Agent-Info AVP [RFC5779] containing the IP address and/or Fully Qualified Domain Name (FQDN) of LMA2. LMA1 then determines the IP address of LMA2 using the data returned in the MIP6-Agent-Info AVP and forwards it to MAG1 in the Local Routing Optimization message ([I-D.wu-netext-local-ro]).

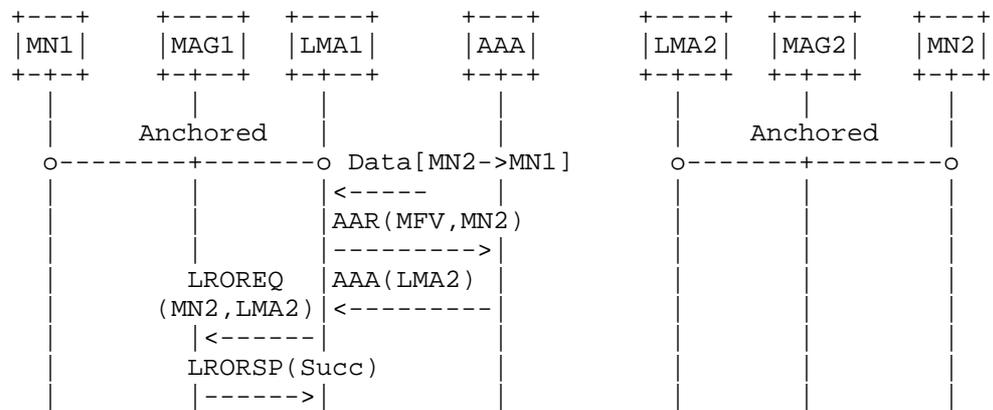


Figure 3: LMA-initiated Localized Routing Authorization

Figure 4 shows another scenario, similar to the scenario of Figure 3, the LMA1 does not respond to MAG1 with LMA2 address, instead, setup localized routing path directly between itself and LMA2 via localized routing signaling.

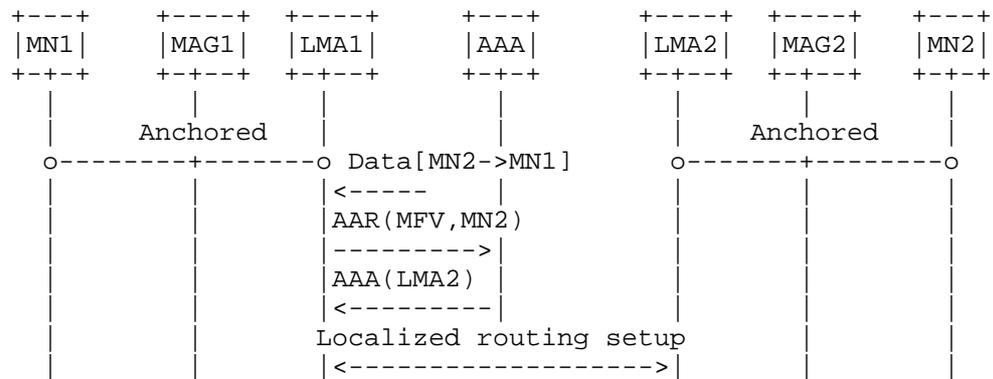


Figure 4: LMA-initiated Localized Routing Authorization

4. Diameter Server Authorizes MAG Location Query

Figure 5 shows a scenario in which LMA2 acts as a Diameter client, receiving location request and requesting authorization for MAG location lookup. In this scenario, MN1 and MN2 are anchored to LMA1 and LMA2 respectively. Upon receiving an upstream data packet, MAG1 needs to determine the recipient of localized routing, i.e., LMA2. And then MAG1 solicits LMA2 to look up the IP address of the MAG to which MN2 is currently attached (in this case, MAG2) by sending a Local Routing Optimization Request message containing the IP addresses/HNPs of MN1 and MN2. LMA2 validates the request from MAG1 by sending an AAR to the AAA server containing the IP address/HNP of MN1 (encapsulated in an instance of the MIP6-Home-Link-Prefix AVP) and an instance of the MIP6-Feature-Vector AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit set. If the authorization is successful, LMA2 then looks up the IP address of MAG2 based on the IP address/HNP of MN2 and responds to MAG1 with the IP address of MAG2.

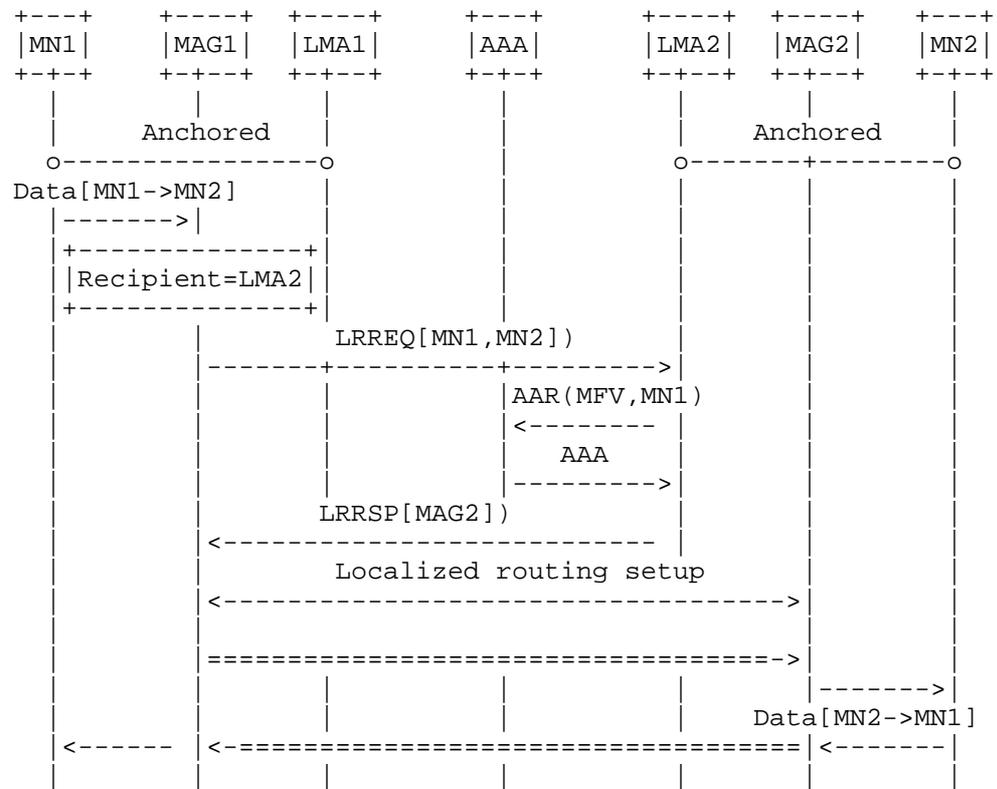


Figure 5: Diameter Server Authorizes MAG Location Query

5. Local Routing Service Authorization in Networks with Multiple AAA Servers

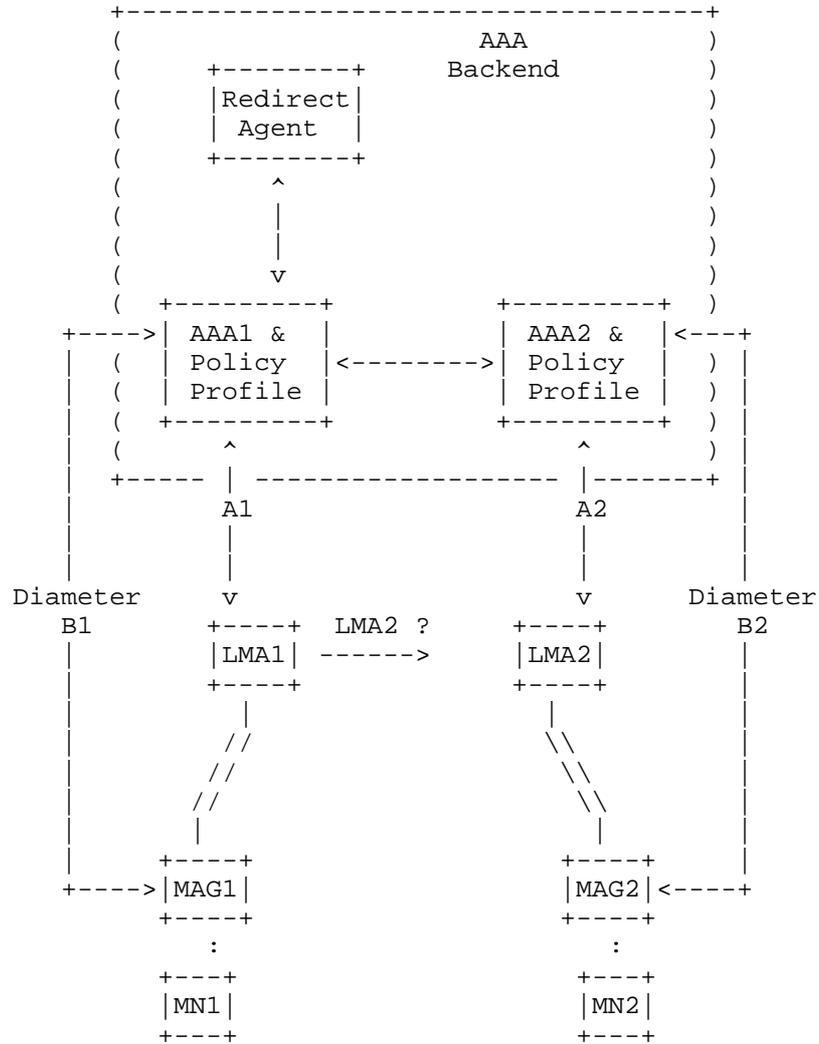


Figure 6: Use of a Diameter Redirect Agent to Support Local Routing Service Authorization in Networks with Multiple AAA servers

Referring to an architecture with multiple AAA servers (as illustrated in Figure 6), AAA1 may not maintain the LMA to be assigned to MN2 as a configured entry in the Correspondent Node's Policy profile, as AAA2 holds this information in its policy store. In such a case, AAA1 contacts a Diameter redirect agent [RFC3588] to

request the AAA server being responsible for maintaining MN2's policy profile. AAA2 checks if localized routing is allowed between MAG1 and MAG2 and if so, responds with the IP address of LMA2 corresponding to MN2 and sends the results back to LMA1 via AAA1. Details about the use of redirect agents in this context are beyond scope of this document.

6. Security Considerations

The security considerations for the Diameter NASREQ [RFC4005] and Diameter Proxy Mobile IPv6 [RFC5779] applications are also applicable to this document.

The service authorization solicited by the MAG or the LMA relies upon the existing trust relationship between the MAG/LMA and the AAA server.

7. IANA Considerations

This specification specifies a new value in the Mobility Capability registry [RFC5447] for use with the MIPv6-Feature-Vector AVP: INTER_MAG_ROUTING_SUPPORTED (0x0000080000000000).

8. Contributors

Paulo Loureiro, Jinwei Xia and Yungui Wang all contributed to early versions of this document.

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Realm-Based Redirection In Diameter
draft-ietf-dime-realm-based-redirect-03

Abstract

RFC 3588 allows a Diameter redirect agent to specify one or more individual hosts to which a Diameter message may be redirected by an upstream Diameter node. However, in some circumstances an operator may wish to redirect messages to an alternate domain without specifying individual hosts. This document specifies a mechanism by which this can be achieved. New applications may incorporate this capability by reference to the present document.

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1. Introduction

The usual redirect indication, as described in Section 6.1.7 and Sections 6.12-6.14 of [RFC3588], returns one or more individual host names to the upstream Diameter node. However, consider the case where an operator has offered a specific service but no longer wishes to do so. The operator has arranged for an alternative domain to provide the service. To aid in the transition to the new arrangement, the original operator maintains a redirect server to indicate the alternative destination to upstream nodes. However, the original operator has no interest in configuring a list of hosts in the alternative operator's domain, and would prefer simply to provide redirect indications to the domain as a whole.

Within this specification, the term "realm-based redirection" is used to refer to a mode of operation where the redirect indication specifies a realm and the upstream Diameter node reroutes the message to the realm rather than an individual host.

1.1. Requirements Language

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].

2. Support of Realm-Based redirection Within Applications

Because realm-based redirection is not part of base Diameter behaviour, support for realm-based redirection by the agent cannot be guaranteed without advertisement at the application level. Designers of new applications wishing to include support for realm-based redirection can incorporate the mechanism specified here by reference to this document.

3. Realm-Based Redirection

This section specifies an extension to [RFC3588] to achieve realm-based redirection. The elements of this solution are:

- o a new result code, `DIAMETER_REALM_REDIRECT_INDICATION` (3xxx TBD);
- o one new attribute-value pair (AVP), `Redirect-Realm`; and
- o associated behaviour at Diameter nodes implementing this specification.

3.1. Behaviour of Diameter Nodes

3.1.1. Behaviour at the Redirect Agent

This specification modifies Section 2.7 of [RFC3588] to permit REDIRECT routing table entries to contain an alternative realm instead of individual home server identities.

This specification modifies Section 6.1.7 of [RFC3588]. If the realm-based routing table for a request contains a realm rather than one or more home server identities, the redirect agent MUST proceed as follows:

- o If the peer from which the request was received did not advertise an application incorporating the realm-based routing capability in the CER/CEA exchange, the redirect agent SHOULD set the 'E' bit in the answer and set the Result Code to DIAMETER_UNABLE_TO_DELIVER. As an alternative, the redirect agent MAY if so configured provide a host-based redirect as described in Section 6.1.7 of [RFC3588].
- o Otherwise, if an application supporting the use of realm-based redirection was negotiated with the peer, the redirect agent MUST set the Result-Code AVP to DIAMETER_REALM_REDIRECT_INDICATION rather than DIAMETER_REDIRECT_INDICATION. Furthermore, the redirect agent MUST a Redirect-Realm AVP containing the realm from the routing table entry in its answer message instead of one or more Redirect-Host AVPs. To prevent confusion at Diameter nodes receiving the answer message, the message MUST include the Error-Reporting-Host AVP if the host setting the Result-Code AVP is different from the identity encoded in the Origin-Host AVP, in conformity with Section 7.1 of [RFC3588]. All other aspects of Section 6.1.7 remain the same as for host-based redirection.

3.1.2. Behaviour of Other Diameter Nodes

A Diameter node conforming to this specification which receives an answer with the result code value DIAMETER_REALM_REDIRECT_INDICATION SHOULD attempt to reroute the request to the indicated realm using normal discovery procedures to find an appropriate destination host. The receiving Diameter node SHOULD update its cache of routing entries according to the direction provided by the Redirect-Max-Cache-Time AVP, if present. The cache entry SHOULD be associated with a redirect usage of REALM_AND_APPLICATION.

3.2. The Redirect-Realm AVP

The Redirect-Realm AVP (code TBD) is of type DiameterIdentity. It specifies a realm to which a node receiving a redirect indication

containing the result code value `DIAMETER_REALM_REDIRECT_INDICATION` and the Redirect-Realm AVP SHOULD route the original request. The V flag for the Redirect-Realm AVP MUST NOT be set.

Section 6.14 of [RFC3588] is modified to permit the Redirect- Max-Cache-Time AVP to be used also to specify the persistence of cache entries created by the Redirect-Realm AVP.

4. Security Considerations

Because realm-based redirection implies a change in business relationships, the node acting on the redirect indication SHOULD verify that the new realm is authorized to perform the requested service. Similarly the originator of the request SHOULD perform an authorization check of the path as described in Section 2.10 of [RFC3588].

5. IANA Considerations

This specification adds a new AVP code [TBD] Redirect-Realm in the AVP Code registry under Authentication, Authorization, and Accounting (AAA) Parameters.

This specification allocates a new Result-Code value `DIAMETER_REALM_REDIRECT_INDICATION` (3xxx TBD) in the Result-Code AVP Values (code 268) - Protocol Errors registry under Authentication, Authorization, and Accounting (AAA) Parameters.

6. Acknowledgements

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