第 V 部

ネットワーク管理とセキュリティ

第5部
ネットワーク管理とセキュリティ

第1章 Introduction

The WIDE-Netman-Working-Group has been carrying out research and development to make the Internet more manageable and secure. The current focus is on monitoring and control of mobile devices, mobile networks and the network infrastructure to support mobility.

第2章 NEMO-MIB: A MIB module for Network Mobility

The Network Mobility (NEMO) Basic Support protocol enables Mobile Networks to attach to different points in the Internet. The protocol is designed so that network mobility is transparent to the nodes inside the Mobile Network. The re-design of NEMO-MIB as an extension of the MIPv6-MIB has been completed. The document[36] is now a Proposed standard.

The complete specification document is available as [36] at `http://www.rfc-editor.org/rfc/rfc5488.txt`.

Network Working Group
Request for Comments: 5488
Category: Standards Track

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April 2009

Network Mobility (NEMO) Management Information Base

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

Abstract

This memo defines a portion of the Management Information Base (MIB), the Network Mobility (NEMO) support MIB, for use with network management protocols in the Internet community. In particular, the NEMO MIB will be used to monitor and control a Mobile IPv6 node with NEMO functionality.

Table of Contents

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, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Overview

2.1. The Mobile IPv6 Protocol and NEMO Entities

Mobile IPv6 (MIPv6) [RFC3775] specifies a protocol that allows nodes to remain reachable while moving around in the IPv6 Internet. The Network Mobility (NEMO) Basic Support Protocol [RFC3963] is an extension to the Mobile IPv6 protocol that facilitates the movement of an entire network. The goals of Network Mobility support and

related terminology are discussed in [RFC4886] and [RFC4885], respectively.

Typically, mobile routers implement NEMO functionality for achieving network mobility. However, a mobile router may also function as a mobile node. In the context of this document, an entity that implements the NEMO protocol is a NEMO entity.

This document defines a set of managed objects (MOs) that can be used to monitor and control NEMO entities.

2.2. Relationship to Other MIB Modules

This document focuses on the management of a NEMO entity. It is assumed that implementations will support the ifTable from the IF-MIB [RFC2863]. The MOBILEIPV6-MIB [RFC4295] defines the managed objects for a mobile node. Implementations supporting both the mobile node and NEMO functionality SHOULD implement the managed objects defined for the NEMO entities and mobile nodes from both the MOBILEIPV6-MIB and NEMO-MIB. The NEMO-MIB uses the textual conventions defined in the INET-ADDRESS-MIB [RFC4001].

2.3. Terminology

The terminology used in this document is consistent with the definitions used in the Mobile IPv6 protocol specification [RFC3775] and the NEMO Basic Support specification [RFC3963].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 [RFC2119].

2.4. MIB Design

The NEMO MIB comprises the following groups of definitions:

nemoCore: a generic group containing objects that are common to all NEMO entities.

nemoHa: this group models the home agent service. It is composed of objects specific to the services and associated advertisement parameters offered by the home agent on each of its links. It also contains objects pertaining to the maintenance of the home agent list on each of the links on which the service is offered.

nemoMr: this group models the mobile router service. It is composed of objects specific to the Dynamic Home Agent discovery function and related parameters. It also contains objects that record the movement of the mobile router.

nemoNotifications: defines the set of notifications that will be used to asynchronously monitor the NEMO entities.

The tables contained in the above groups are as follows:

```
   nemoBindingCacheTable: models the Binding Cache on the home agent and
      correspondent node.  It contains details of the Binding Update
      requests that have been received and accepted.

   nemoMrEgressIfTable: contains information on the configured egress
      interfaces.

   nemoMrBLTable: models the Binding Update List on the mobile router.
      It contains information about the registration requests sent by
      the mobile router and the corresponding results.

   nemoHaCounterTable: contains registration statistics for all mobile
      routers registered with the home agent.

   nemoHaMobileNetworkPrefixTable: contains the list of the mobile
      network prefixes that are maintained by the home agent.

3.  The NEMO MIB

     NEMO-MIB DEFINITIONS ::= BEGIN
     IMPORTS
       MODULE-IDENTITY,  mib-2, Unsigned32, Counter32,
       Gauge32,
       OBJECT-TYPE, NOTIFICATION-TYPE
                  FROM SNMPv2-SMI
       TEXTUAL-CONVENTION,
       TruthValue, DateAndTime, TimeStamp
                  FROM SNMPv2-TC
       SnmpAdminString
                  FROM SNMP-FRAMEWORK-MIB
       MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
                  FROM SNMPv2-CONF
       InetAddressType, InetAddress, InetAddressPrefixLength
                  FROM INET-ADDRESS-MIB
       InterfaceIndex
                  FROM IF-MIB
       mip6BindingHomeAddressType, mip6BindingHomeAddress,
       mip6MnBLEntry, mip6BindingCacheEntry,
       mip6MnBLCOAType, mip6MnBLCOA
                  FROM MOBILEIPV6-MIB
       ;

     nemoMIB MODULE-IDENTITY
         LAST-UPDATED "200903100000Z"      -- 10 March 2009
         ORGANIZATION "IETF MEXT Working Group"
         CONTACT-INFO
            "           Sri Gundavelli
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"

DESCRIPTION

```
          CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO,
          PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
          DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER
          CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN
          CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE
          OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS
          SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH
          DAMAGE.

          This version of this MIB module is part of RFC 5488;
          see the RFC itself for full legal notices."

          REVISION    "200903100000Z"      -- 10 March 2009
          DESCRIPTION "Initial version, published as RFC 5488."

               ::= { mib-2  184 }

    -- The NEMO MIB has the following primary groups

    nemoNotifications        OBJECT IDENTIFIER ::= { nemoMIB 0 }
    nemoObjects              OBJECT IDENTIFIER ::= { nemoMIB 1 }
    nemoConformance          OBJECT IDENTIFIER ::= { nemoMIB 2 }
    nemoCore                 OBJECT IDENTIFIER ::= { nemoObjects 1 }
    nemoMr                   OBJECT IDENTIFIER ::= { nemoObjects 2 }
    nemoCn                   OBJECT IDENTIFIER ::= { nemoObjects 3 }
    nemoHa                   OBJECT IDENTIFIER ::= { nemoObjects 4 }

     -- The sub groups

    nemoSystem               OBJECT IDENTIFIER ::= { nemoCore 1 }
    nemoBindings             OBJECT IDENTIFIER ::= { nemoCore 2 }
    nemoConfiguration        OBJECT IDENTIFIER ::= { nemoCore 3 }
    nemoStats                OBJECT IDENTIFIER ::= { nemoCore 4 }

    nemoMrSystem             OBJECT IDENTIFIER ::= { nemoMr 1 }
    nemoMrConf               OBJECT IDENTIFIER ::= { nemoMr 2 }
    nemoMrRegistration       OBJECT IDENTIFIER ::= { nemoMr 3 }
    nemoMrGlobalStats        OBJECT IDENTIFIER ::= { nemoMr 4 }

    nemoHaAdvertisement      OBJECT IDENTIFIER ::= { nemoHa 1 }
    nemoHaStats              OBJECT IDENTIFIER ::= { nemoHa 2 }
    nemoHaRegistration       OBJECT IDENTIFIER ::= { nemoHa 3 }
    nemoHaGlobalStats        OBJECT IDENTIFIER ::= { nemoHaStats 1 }

    -- Textual Conventions
  NemoBURequestRejectionCode ::= TEXTUAL-CONVENTION
        STATUS        current
        DESCRIPTION
                "The value of the status field in the Binding
                 Acknowledgment message when the Binding Update
                 was rejected for NEMO-specific reasons.
                "
        REFERENCE
                "RFC 3963: Section 4.2"
        SYNTAX  INTEGER {
```

```
              mobileRouterOperationNotPermitted (140),
              invalidPrefix                     (141),
              notAuthorizedForPrefix            (142),
              forwardingSetupFailed             (143)
             }

 --
 --
 -- nemoSystem group
 --
 --

 nemoCapabilities OBJECT-TYPE
     SYNTAX      BITS {
                      mobileRouter       (0),
                      homeAgentSupport   (1)
                  }
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
             "This object indicates the NEMO functions that
              are supported by this managed entity.  Multiple
              NEMO functions may be supported by a single
              entity.
             "
     REFERENCE
             "RFC 3963: Section 3"
     ::= { nemoSystem 1 }

 nemoStatus OBJECT-TYPE
     SYNTAX      INTEGER { enabled(1), disabled(2) }
     MAX-ACCESS  read-write
     STATUS      current
     DESCRIPTION
             "This object indicates whether the NEMO
              function is enabled for the managed entity.  If it
              is enabled, the agent discovery and registration
              functions will be operational.

              Changing the status from enabled(1) to disabled(2)
              will terminate the agent discovery and registration
              functions.  On the other hand, changing the status
              from disabled(2) to enabled(1) will start the agent
              discovery and registration functions.

              The value of this object MUST remain unchanged
              across reboots of the managed entity.
             "
     ::= { nemoSystem 2 }

nemoCounterDiscontinuityTime OBJECT-TYPE
   SYNTAX      TimeStamp
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
```

```
            "The value of sysUpTime on the most recent occasion at
             which any one or more of this NEMO entity's counters,
             viz., counters with OID prefix 'nemoMrConf',
             'nemoMrRegnCounters', 'nemoMrGlobalStats', or
             'nemoHaGlobalStats', suffered a discontinuity.  If
             no such discontinuities have occurred since the last
             re-initialization of the local management subsystem,
             then this object will have a zero value.
            "
    ::= { nemoStats 1 }
 --
 --
 --   nemoConfiguration group
 --
 --

nemoMrBLTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NemoMrBLEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table corresponds to the Binding Update List
             (BL) that includes NEMO-related information and that
             is maintained by the mobile router.  The table
             holds a row for every binding that the mobile
             router has established or is trying to establish.
             Entries from the table are deleted as the lifetime
             of the binding expires.
            "
    REFERENCE
            "RFC 3775: Sections 4.5, 11.1
             RFC 3963: Section 5.2"
    ::= { nemoMrRegistration 1 }

nemoMrBLEntry  OBJECT-TYPE
    SYNTAX      NemoMrBLEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "An entry pertaining to NEMO-related information
             contained in a Binding Update sent by a NEMO-enabled
             mobile router to its home agent.
            "
    AUGMENTS {mip6MnBLEntry}
::= { nemoMrBLTable 1 }

NemoMrBLEntry ::= SEQUENCE {
    nemoMrBLMode     INTEGER,
    nemoMrBLMrFlag   TruthValue,
    nemoMrBLHomeAddressPrefixLength   InetAddressPrefixLength,
    nemoMrBLCareofAddressPrefixLength InetAddressPrefixLength,
    nemoMrBLActiveEgressIfIndex       InterfaceIndex,
    nemoMrBLEstablishedHomeTunnelIfIndex InterfaceIndex
    }
nemoMrBLMode OBJECT-TYPE
```

```
    SYNTAX      INTEGER {
      implicitMode (1),
      explicitMode (2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "implicitMode(1): the Mobile Network Prefix Option
             is not included in the Binding Update by the mobile
             router.

             explicitMode(2): the mobile router included one or
             more Mobile Network Prefix Options in the Binding
             Update.
            "
    REFERENCE
            "RFC 3963: Section 5.2"
    ::= { nemoMrBLEntry 1 }

nemoMrBLMrFlag OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "true(1): the mobile router sent the Binding Update
             with Mobile Router Flag set.

             false(2): the mobile router did not send the Binding
             Update with Mobile Router Flag set.  This implies that
             the mobile router is acting as a mobile node.
            "
    REFERENCE
            "RFC 3963: Sections 4.1, 5.1"
    ::= { nemoMrBLEntry 2 }

nemoMrBLHomeAddressPrefixLength  OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The prefix length of the mobile router's home network.
            "
    REFERENCE
        "RFC 3963: Section 3"
    ::= { nemoMrBLEntry 3 }

nemoMrBLCareofAddressPrefixLength  OBJECT-TYPE
    SYNTAX      InetAddressPrefixLength
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The prefix length of the care-of address of the
             mobile router.
            "
    REFERENCE
```

```
            "RFC 3963: Section 3"
        ::= { nemoMrBLEntry 4 }

    nemoMrBLActiveEgressIfIndex OBJECT-TYPE
        SYNTAX      InterfaceIndex
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The interface index of the currently active
                 egress interface.
                "
        REFERENCE
            "RFC 3963: Section 5.5"
        ::= { nemoMrBLEntry 5 }

    nemoMrBLEstablishedHomeTunnelIfIndex  OBJECT-TYPE
        SYNTAX      InterfaceIndex
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The interface index of the tunnel established
                 between the mobile router and the home agent
                 for NEMO traffic.
                "
        REFERENCE
            "RFC 3963: Section 5.5"
        ::= { nemoMrBLEntry 6 }

    -- Mobile Router Registration Group Counters

    nemoMrRegnCounters OBJECT IDENTIFIER ::= { nemoMrRegistration 2 }

    nemoMrMobilityMessagesSent OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The total number of mobility messages, i.e., IPv6
                 datagrams with Mobility Header, sent by the mobile
                 node.  This will include Binding Updates sent by a
                 mobile router with the Mobile Router Flag set.

                 Discontinuities in the value of this counter can
                 occur at re-initialization of the management system,
                 and at other times as indicated by the value of
                 nemoCounterDiscontinuityTime.
                "
        REFERENCE
                "RFC 3775: Sections 4.2, 6.1
                 RFC 3963: Section 4.1"
        ::= {  nemoMrRegnCounters 1 }

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

```
    STATUS      current
    DESCRIPTION
            "The total number of mobility messages, i.e., IPv6
             datagrams with Mobility Header, received by the
             mobile node.  This will include Binding
             Acknowledgements with Mobile Router Flag set that
             are sent to a mobile router.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3775: Sections 4.2, 6.1
             RFC 3963: Sections 4.1, 4.2"
    ::= {  nemoMrRegnCounters 2 }

nemoMrPrefixRegMode OBJECT-TYPE
    SYNTAX INTEGER {
              implicitMode       (1),
              explicitMode       (2)
           }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
            "This object indicates the mode in which the mobile
             network prefixes will be registered with the home
             agent.

             implicitMode(1): the Mobile Network Prefix Option will
             not be included in the Binding Update by the mobile
             router.

             explicitMode(2): the mobile router will include one or
             more Mobile Network Prefix Options in the Binding
             Update.

             The value of this object MUST remain unchanged
             across reboots of the managed entity.
            "
    REFERENCE
            "RFC 3963: Section 5.2"

    ::= { nemoMrRegistration 3 }

nemoHaMobileNetworkPrefixTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NemoHaMobileNetworkPrefixEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This table contains the mobile network prefixes
             that the home agent maintains for the mobile router.
             The mobile network prefixes in this table are
             registered by Binding Updates or are manually
```

```
                pre-configured.
               "
        REFERENCE
                "RFC 3963: Section 6.1.2"
        ::= { nemoHaRegistration 1 }

    nemoHaMobileNetworkPrefixEntry OBJECT-TYPE
        SYNTAX      NemoHaMobileNetworkPrefixEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "An entry for a mobile network prefix.

                 The instances of the columnar objects in this entry
                 pertain to an interface for a particular value of
                 mip6BindingHomeAddressType, mip6BindingHomeAddress,
                 and nemoHaMobileNetworkPrefixSeqNo.

                 The nemoHaMobileNetworkPrefixSeqNo object is used to
                 distinguish between multiple instances of
                 the mobile network prefix in the same Binding Update
                 for the same set of mip6BindingHomeAddressType and
                 mip6BindingHomeAddress.

                 There is no upper-bound on the maximum number of
                 mobile network prefixes in a Binding Update but, for
                 practical purposes, the upper bound of the value
                 nemoHaMobileNetworkPrefixSeqNo is set to 1024.

                 Implementers need to be aware that if the total
                 number of octets in mip6BindingHomeAddress
                 exceeds 112, then OIDs of column
                 instances in this row will have more than 128
                 sub-identifiers and cannot be accessed using
                 SNMPv1, SNMPv2c, or SNMPv3.
                "
        INDEX  { mip6BindingHomeAddressType,
                 mip6BindingHomeAddress,
                 nemoHaMobileNetworkPrefixSeqNo
    }
    ::= { nemoHaMobileNetworkPrefixTable 1 }

    NemoHaMobileNetworkPrefixEntry ::= SEQUENCE {
        nemoHaMobileNetworkPrefixSeqNo       Unsigned32,
        nemoHaMobileNetworkPrefixType        InetAddressType,
        nemoHaMobileNetworkPrefix            InetAddress,
        nemoHaMobileNetworkPrefixLength      Unsigned32,
        nemoHaMobileNetworkPrefixSource      INTEGER
    }

    nemoHaMobileNetworkPrefixSeqNo OBJECT-TYPE
        SYNTAX      Unsigned32 (1..1024)
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
```

```
            "A Binding Update may have multiple mobile network
             prefixes.

             This object, along with mip6BindingHomeAddressType
             and mip6BindingHomeAddress, uniquely identifies a
             row containing a single mobile network prefix for
             a mobile router in this table.
            "
    REFERENCE
            "RFC 3963: Sections 2, 6.1, 6.2"
    ::= { nemoHaMobileNetworkPrefixEntry 1 }

nemoHaMobileNetworkPrefixType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The address type for the mobile network prefix
             that follows.
            "
    ::= { nemoHaMobileNetworkPrefixEntry 2 }

nemoHaMobileNetworkPrefix OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "A mobile network prefix related to the
             corresponding Binding Update.

             The type of the address represented by this object
             is specified by the corresponding
             nemoHaMobileNetworkPrefixType object.
            "
    REFERENCE
            "RFC 3963: Sections 2, 6.1, 6.2"
    ::= { nemoHaMobileNetworkPrefixEntry 3 }

nemoHaMobileNetworkPrefixLength OBJECT-TYPE
    SYNTAX      Unsigned32 (0..128)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The length of the prefix specified by the corresponding
             nemoHaMobileNetworkPrefix object.
            "
    REFERENCE
            "RFC 3963: Sections 4.3, 6.1, 6.2"
    ::= { nemoHaMobileNetworkPrefixEntry 4 }


nemoHaMobileNetworkPrefixSource OBJECT-TYPE
    SYNTAX      INTEGER {
             configured    (1),
             bindingUpdate (2)
```

```
                }

        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The information source of the mobile network prefix
                 configured with the Binding Update.

                 configured(1): indicates that the mobile network prefix
                 has been manually pre-configured.

                 bindingUpdate(2): indicates that the information is
                 introduced to the home agent by the Mobile Network
                 Prefix Option in the Binding Updates received by the
                 home agent.
                "
        REFERENCE
                "RFC 3963: Sections 4.3, 6.1, 6.2"
        ::= { nemoHaMobileNetworkPrefixEntry 5 }

    nemoBindingCacheTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF NemoBindingCacheEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
               "This table models the Binding Cache that includes
                NEMO-related information and that is maintained by the
                home agent.  Entries in this table are not required
                to survive a reboot of the home agent.
               "
        REFERENCE
                "RFC 3775: Sections 4.5, 9.1, 10.1,
                 RFC 3963: Section 6.1"
        ::= { nemoBindings 1 }

    nemoBindingCacheEntry  OBJECT-TYPE
        SYNTAX      NemoBindingCacheEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "An entry containing additional information related
                 to NEMO-enabled entries in the Binding Cache table
                 of the home agent.
                "
        AUGMENTS {mip6BindingCacheEntry}
    ::= { nemoBindingCacheTable 1 }

    NemoBindingCacheEntry ::= SEQUENCE {
         nemoBindingMrFlag     TruthValue,
         nemoBindingMrMode     INTEGER
        }

    nemoBindingMrFlag OBJECT-TYPE
        SYNTAX      TruthValue
        MAX-ACCESS  read-only
```

```
    STATUS      current
    DESCRIPTION
            "true(1): indicates that the Binding Cache entry is from
             an entity acting as a mobile router.

             false(2): implies that the Binding Cache entry is from
             an entity acting as a mobile node.
            "
    REFERENCE
            "RFC 3963: Sections 6.1.1, 6.2"
    ::= { nemoBindingCacheEntry 1 }

nemoBindingMrMode OBJECT-TYPE
    SYNTAX      INTEGER {
      implicitMode(1),
      explicitMode(2)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "implicitMode(1): the Mobile Network Prefix Option is
             not included in the Binding Update by the mobile
             router.

             explicitMode(2): the mobile router included one or
             more Mobile Network Prefix Options in the Binding
             Update.
            "
    REFERENCE
            "RFC 3963: Sections 5.2, 6.1.1, 6.2"
    ::= { nemoBindingCacheEntry 2 }

--
-- nemoMrEgressIfTable
--
nemoMrEgressIfTable        OBJECT-TYPE
     SYNTAX      SEQUENCE OF NemoMrEgressIfEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
             "A table representing the egress interfaces that
              will be used by the mobile router for roaming to
              foreign networks.  Each entry in this table
              represents a configured egress interface.
             "
     ::= { nemoMrSystem 1 }

nemoMrEgressIfEntry OBJECT-TYPE
     SYNTAX      NemoMrEgressIfEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
             "An entry in the egress interface table.  It
              represents a single egress interface entry.
             "
```

```
      INDEX  { nemoMrEgressIfIndex }
      ::= { nemoMrEgressIfTable 1 }

NemoMrEgressIfEntry ::=
      SEQUENCE {
       nemoMrEgressIfIndex             InterfaceIndex,
       nemoMrEgressIfPriority          Unsigned32,
       nemoMrEgressIfDescription       SnmpAdminString,
       nemoMrEgressIfRoamHoldDownTime  Gauge32
      }

nemoMrEgressIfIndex  OBJECT-TYPE
      SYNTAX      InterfaceIndex
      MAX-ACCESS  not-accessible
      STATUS      current
      DESCRIPTION
              "The index of the interface on the mobile router.
              "
      ::= { nemoMrEgressIfEntry 1 }

nemoMrEgressIfPriority   OBJECT-TYPE
      SYNTAX      Unsigned32 (0..255)
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
              "The priority configured to the egress interface.
               This value will be configured to a value between 0
               and 255.
              "
      ::= { nemoMrEgressIfEntry 2 }

nemoMrEgressIfDescription   OBJECT-TYPE
      SYNTAX      SnmpAdminString
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
              "A human-readable textual description of the egress
               interface on the mobile router.
              "
      ::= { nemoMrEgressIfEntry 3 }

nemoMrEgressIfRoamHoldDownTime  OBJECT-TYPE
      SYNTAX      Gauge32
      UNITS       "seconds"
      MAX-ACCESS  read-only
      STATUS      current
      DESCRIPTION
              "This object indicates the time for which the
               egress interface will be held down during roaming
               to avoid interface flapping.
              "
      ::= { nemoMrEgressIfEntry 4 }

nemoMrDiscoveryRequests OBJECT-TYPE
    SYNTAX      Counter32
```

```
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Total number of Modified Dynamic Home Agent Address
             Discovery Requests, with Mobile Router Support Flag
             set, sent by the mobile router.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3775: Sections 10.5, 11.4.1
             RFC 3963: Section 7.1"
       ::= { nemoMrConf 1 }

nemoMrDiscoveryReplies OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Total number of Modified Dynamic Home Agent Address
             Discovery Replies, with Mobile Router Support Flag
             set, received by the mobile router.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3775: Sections 10.5, 11.4.1
             RFC 3963: Section 7.2"
       ::= { nemoMrConf 2 }

nemoMrDiscoveryRepliesRouterFlagZero OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Total number of Modified Dynamic Home Agent Address
             Discovery Replies, with Mobile Router Support Flag set
             to 0 although the flag in the corresponding request
             is set to 1.  It implies that there is no home agent
             that supports mobile router functionality in the home
             network.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3775: Sections 10.5, 11.4.1
```

```
                RFC 3963: Section 7.2"
           ::= { nemoMrConf 3 }

    nemoMrMovedHome OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "Number of times the mobile router has detected
                 movement from a foreign network to its home
                 network.

                 Discontinuities in the value of this counter can
                 occur at re-initialization of the management system,
                 and at other times as indicated by the value of
                 nemoCounterDiscontinuityTime.
                "
        REFERENCE
            "RFC 3963: Section 3"
            ::= { nemoMrConf 4 }

    nemoMrMovedOutofHome OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "Number of times the mobile router has detected
                 movement to a foreign network from the home
                 network, has acquired a care-of address, and
                 has initiated the care-of address registration
                 process.

                 Discontinuities in the value of this counter can
                 occur at re-initialization of the management system,
                 and at other times as indicated by the value of
                 nemoCounterDiscontinuityTime.
                "
        REFERENCE
            "RFC 3963: Section 3"
            ::= { nemoMrConf 5 }

    nemoMrMovedFNtoFN OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "Number of times the mobile router has detected
                 movement to/from a foreign network from/to another
                 foreign network.  Note that 'movement' implies
                 movement in layer 3, i.e., the mobile router's care-of
                 address changed, and it initiated the care-of address
                 registration process.

                 If there are multiple egress interfaces, this counter
                 counts the total number of movements.  The movement
```

```
             as a mobile node of the mobile entity is not counted.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963: Section 3"
        ::= { nemoMrConf 6 }

nemoMrBetterIfDetected OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Number of times the NEMO entity has found an egress
             interface with better priority.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
        ::= { nemoMrConf 7 }

--
-- nemoStats:nemoMrGlobalStats
--

nemoMrBindingAcksWONemoSupport  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Acknowledgements without
             NEMO support received by the mobile router.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963: Section 5.3"
        ::= { nemoMrGlobalStats 1 }


nemoMrBindingAcksRegTypeChangeDisallowed  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Acknowledgements
             received by the mobile router with status code
```

```
                indicating 'Registration type change disallowed'
                (Code 139).

                Discontinuities in the value of this counter can
                occur at re-initialization of the management system,
                and at other times as indicated by the value of
                nemoCounterDiscontinuityTime.
               "
        REFERENCE
                "RFC 3775: Section 9.5.1
                 RFC 3963: Section 6.2"
            ::= { nemoMrGlobalStats 2 }

    nemoMrBindingAcksOperationNotPermitted  OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The total number of Binding Acknowledgements
                 received by the mobile router with status code
                 indicating 'Mobile Router Operation not permitted'
                 (Code 140).

                 Discontinuities in the value of this counter can
                 occur at re-initialization of the management system,
                 and at other times as indicated by the value of
                 nemoCounterDiscontinuityTime.
                "
        REFERENCE
                "RFC 3963: Section 6.6"
            ::= { nemoMrGlobalStats 3 }

    nemoMrBindingAcksInvalidPrefix  OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The total number of Binding Acknowledgements
                 received by the mobile router with status code
                 indicating 'Invalid Prefix' (Code 141).

                 Discontinuities in the value of this counter can
                 occur at re-initialization of the management system,
                 and at other times as indicated by the value of
                 nemoCounterDiscontinuityTime.
                "
        REFERENCE
                "RFC 3963: Section 6.6"
            ::= { nemoMrGlobalStats 4 }

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

```
            "The total number of Binding Acknowledgements
             received by the mobile router with status code
             indicating 'Not Authorized for Prefix' (Code 142).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963 : Section 6.6"
        ::= { nemoMrGlobalStats 5 }

nemoMrBindingAcksForwardingSetupFailed OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Acknowledgements
             received by the mobile router with status code
             indicating 'Forwarding Setup failed' (Code 143).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963: Section 6.6"
        ::= { nemoMrGlobalStats 6 }

nemoMrBindingAcksOtherError OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Acknowledgements
             received by the mobile router (Mobile Router Flag is
             set) with status code other than:

             successfully processed                  --(Code 0  )
             mobileRouterOperationNotPermitted (140) --(Code 140)
             invalidPrefix                     (141) --(Code 141)
             notAuthorizedForPrefix            (142) --(Code 142)
             forwardingSetupFailed             (143) --(Code 143)

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963 : Section 6.6"
        ::= { nemoMrGlobalStats 7 }
```

```
--
-- nemoStats:nemoHaGlobalStats
--

nemoHaBUAcksWONemoSupport  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Acknowledgements
             without NEMO support sent by the home agent.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963: Section 5.3"
        ::= { nemoHaGlobalStats 1 }

nemoHaBUAcksRegTypeChangeDisallowed  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Update requests
             rejected by the home agent with status code
             in the Binding Acknowledgement indicating
             'Registration type change disallowed' (Code 139).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3775: Section 9.5.1
             RFC 3963: Section 6.2"
        ::= { nemoHaGlobalStats 2 }

nemoHaBUAcksOperationNotPermitted  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Update requests
             rejected by the home agent with status code in
             the Binding Acknowledgement indicating 'Mobile
             Router Operation not permitted' (Code 140).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
```

```
            "
    REFERENCE
            "RFC 3963: Section 6.6"
        ::= { nemoHaGlobalStats 3 }

nemoHaBUAcksInvalidPrefix  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Update requests
             rejected by the home agent with status code in
             the Binding Acknowledgement indicating 'Invalid
             Prefix' (Code 141).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963: Section 6.6"
        ::= { nemoHaGlobalStats 4 }

nemoHaBUAcksNotAuthorizedForPrefix OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Update requests
             rejected by the home agent with status code in
             the Binding Acknowledgement indicating 'Not
             Authorized for Prefix' (Code 142).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoCounterDiscontinuityTime.
            "
    REFERENCE
            "RFC 3963: Section 6.6"
        ::= { nemoHaGlobalStats 5 }

nemoHaBUAcksForwardingSetupFailed OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The total number of Binding Update requests
             rejected by the home agent with status code in
             the Binding Acknowledgement indicating 'Forwarding
             Setup failed' (Code 143).

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
```

```
                and at other times as indicated by the value of
                nemoCounterDiscontinuityTime.
               "
        REFERENCE
                "RFC 3963: Section 6.6"
            ::= { nemoHaGlobalStats 6 }

    nemoHaBUAcksOtherError OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The total number of Binding Update requests
                 from mobile routers (Mobile Router Flag is set)
                 rejected by the home agent with status code
                 other than:

                 mobileRouterOperationNotPermitted (140)
                 invalidPrefix                     (141)
                 notAuthorizedForPrefix            (142)
                 forwardingSetupFailed             (143)

                 Discontinuities in the value of this counter can
                 occur at re-initialization of the management system,
                 and at other times as indicated by the value of
                 nemoCounterDiscontinuityTime.
                "
        REFERENCE
                "RFC 3963: Section 6.6"
            ::= { nemoHaGlobalStats 7 }

    nemoHaCounterTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF NemoHaCounterEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "A table containing registration statistics for all
                 mobile routers registered with the home agent.
                "
        ::= { nemoHaStats 2 }

    nemoHaCounterEntry  OBJECT-TYPE
        SYNTAX      NemoHaCounterEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "Home agent registration statistics for a mobile
                 router.

                 Implementers need to be aware that if the total
                 number of octets in mip6BindingHomeAddress
                 exceeds 113, then OIDs of column instances in
                 this row will have more than 128 sub-identifiers and
                 cannot be accessed using SNMPv1, SNMPv2c, or SNMPv3.
                "
```

```
    INDEX   { mip6BindingHomeAddressType,
              mip6BindingHomeAddress
            }
    ::= { nemoHaCounterTable 1 }

NemoHaCounterEntry      ::= SEQUENCE {
    nemoHaBURequestsAccepted       Counter32,
    nemoHaBURequestsDenied         Counter32,
    nemoHaBCEntryCreationTime      DateAndTime,
    nemoHaBUAcceptedTime           DateAndTime,
    nemoHaBURejectionTime          DateAndTime,
    nemoHaRecentBURejectionCode    NemoBURequestRejectionCode,
    nemoHaCtrDiscontinuityTime     TimeStamp
    }

nemoHaBURequestsAccepted OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Total number of Binding Update requests from the
             mobile router accepted by the home agent.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoHaCtrDiscontinuityTime.
            "
    ::= { nemoHaCounterEntry 1 }

nemoHaBURequestsDenied   OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "Total number of Binding Update requests from the
             mobile router rejected by the home agent.

             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             nemoHaCtrDiscontinuityTime.
            "
    ::= { nemoHaCounterEntry 2 }

nemoHaBCEntryCreationTime   OBJECT-TYPE
    SYNTAX      DateAndTime (SIZE (11))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The time when the current Binding Cache entry was
             created for the mobile router.  An implementation
             MUST return all 11 bytes of the DateAndTime
             textual-convention so that a manager may retrieve
             the offset from GMT time.
```

```
            "
    ::= { nemoHaCounterEntry 3 }

nemoHaBUAcceptedTime  OBJECT-TYPE
    SYNTAX      DateAndTime (SIZE (11))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The time at which the last Binding Update was
             accepted by the home agent for this mobile router.
             An implementation MUST return all 11 bytes of the
             DateAndTime textual-convention so that a manager
             may retrieve the offset from GMT time.
            "
    ::= { nemoHaCounterEntry 4 }

nemoHaBURejectionTime  OBJECT-TYPE
    SYNTAX      DateAndTime (SIZE (11))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The time at which the last Binding Update was
             rejected by the home agent for this mobile router.
             If there have been no rejections, then this object
             will be inaccessible.  An implementation MUST return
             all 11 bytes of the DateAndTime textual-convention
             so that a manager may retrieve the offset from GMT
             time.
            "
    ::= { nemoHaCounterEntry 5 }

nemoHaRecentBURejectionCode  OBJECT-TYPE
    SYNTAX      NemoBURequestRejectionCode
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
            "The Status code (>= 128) in the latest Binding
             Acknowledgment indicating a rejection, sent to this
             mobile router.

             If a Binding Update request is rejected and a Binding
             Acknowledgment is not sent to this mobile router,
             then this will be the value of the Status code that
             corresponds to the reason of the rejection.  If there
             have been no Binding Update request rejections, then
             this object will be inaccessible.
            "
    ::= { nemoHaCounterEntry 6 }

nemoHaCtrDiscontinuityTime OBJECT-TYPE
   SYNTAX      TimeStamp
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
           "The value of sysUpTime on the most recent occasion
```

```
            at which any one or more of the counters in this row,
            viz., instances of 'nemoHaBURequestsAccepted' and
            'nemoHaBURequestsDenied', suffered a discontinuity.
            If no such discontinuity has occurred since the
            last re-initialization of the local management
            subsystem, then this object will have a zero value.
           "
   ::= { nemoHaCounterEntry 7 }

--
--
-- nemoNotifications
--
--

nemoHomeTunnelEstablished NOTIFICATION-TYPE
    OBJECTS   {
                nemoMrBLActiveEgressIfIndex,
                nemoMrBLEstablishedHomeTunnelIfIndex,
                mip6MnBLCOAType,
                mip6MnBLCOA,
                nemoMrBLHomeAddressPrefixLength,
                nemoMrBLCareofAddressPrefixLength
              }

    STATUS    current
    DESCRIPTION
            "This notification is sent by the mobile router
             every time the tunnel is established between the
             home agent and the mobile router.
            "
    REFERENCE
            "RFC 3963: Section 5.5"
        ::= { nemoNotifications 1 }

nemoHomeTunnelReleased NOTIFICATION-TYPE
    OBJECTS {
                nemoMrBLActiveEgressIfIndex,
                nemoMrBLEstablishedHomeTunnelIfIndex,
                mip6MnBLCOAType,
                mip6MnBLCOA,
                nemoMrBLHomeAddressPrefixLength,
                nemoMrBLCareofAddressPrefixLength
            }
    STATUS    current
    DESCRIPTION
            "This notification is sent by the mobile router
             every time the tunnel is deleted between the home
             agent and the mobile router.
            "
    REFERENCE
            "RFC 3963: Section 5.5"
        ::= { nemoNotifications 2}

-- Conformance information
```

```
nemoGroups      OBJECT IDENTIFIER ::= { nemoConformance 1 }
nemoCompliances OBJECT IDENTIFIER ::= { nemoConformance 2 }

-- Units of conformance
nemoSystemGroup    OBJECT-GROUP
     OBJECTS {
               nemoCapabilities,
               nemoStatus
         }
      STATUS  current
      DESCRIPTION
              "A collection of objects for basic NEMO
               monitoring.
              "
      ::= { nemoGroups 1 }

nemoBindingCacheGroup    OBJECT-GROUP
     OBJECTS {
               nemoBindingMrFlag,
               nemoBindingMrMode
         }
      STATUS  current
      DESCRIPTION
              "A collection of objects for monitoring the
               NEMO extensions of the Binding Cache.
              "
      ::= { nemoGroups 2 }

nemoStatsGroup    OBJECT-GROUP
     OBJECTS {
               nemoCounterDiscontinuityTime
         }
      STATUS  current
      DESCRIPTION
              "A collection of objects for
               monitoring NEMO statistics.
              "
      ::= { nemoGroups 3 }

nemoMrConfGroup   OBJECT-GROUP
     OBJECTS {
               nemoMrEgressIfPriority,
               nemoMrEgressIfDescription,
               nemoMrEgressIfRoamHoldDownTime,
               nemoMrDiscoveryRequests,
               nemoMrDiscoveryReplies,
               nemoMrDiscoveryRepliesRouterFlagZero,
               nemoMrMovedHome,
               nemoMrMovedOutofHome,
               nemoMrMovedFNtoFN,
               nemoMrBetterIfDetected
         }
      STATUS  current
      DESCRIPTION
              "A collection of objects for monitoring
```

```
              the configuration-related information on
              the mobile router.
             "
     ::= { nemoGroups 4 }

nemoMrRegistrationGroup  OBJECT-GROUP
     OBJECTS {
               nemoMrBLMode,
               nemoMrBLMrFlag,
               nemoMrBLHomeAddressPrefixLength,
               nemoMrBLCareofAddressPrefixLength,
               nemoMrBLActiveEgressIfIndex,
               nemoMrBLEstablishedHomeTunnelIfIndex,
               nemoMrMobilityMessagesSent,
               nemoMrMobilityMessagesRecd,
               nemoMrPrefixRegMode,
               nemoMrBindingAcksWONemoSupport,
               nemoMrBindingAcksRegTypeChangeDisallowed,
               nemoMrBindingAcksOperationNotPermitted,
               nemoMrBindingAcksInvalidPrefix,
               nemoMrBindingAcksNotAuthorizedForPrefix,
               nemoMrBindingAcksForwardingSetupFailed,
               nemoMrBindingAcksOtherError
    }
     STATUS  current
     DESCRIPTION
             "A collection of objects for monitoring
              the registration details and statistics for
              the mobile router.
             "
     ::= { nemoGroups 5 }

nemoHaSystemGroup    OBJECT-GROUP
    OBJECTS {
              nemoHaMobileNetworkPrefixType,
              nemoHaMobileNetworkPrefix,
              nemoHaMobileNetworkPrefixLength,
              nemoHaMobileNetworkPrefixSource
   }
    STATUS  current
    DESCRIPTION
            "A collection of objects for basic NEMO
             configuration monitoring at the home agent.
            "
    ::= { nemoGroups 6 }

nemoHaStatsGroup   OBJECT-GROUP
    OBJECTS {
              nemoHaBURequestsAccepted,
              nemoHaBURequestsDenied,
              nemoHaBCEntryCreationTime,
              nemoHaBUAcceptedTime,
              nemoHaBURejectionTime,
              nemoHaRecentBURejectionCode,
              nemoHaCtrDiscontinuityTime
```

```
    }
     STATUS  current
     DESCRIPTION
             "A collection of objects for monitoring NEMO
              registration-related statistics pertaining to
              the mobile routers registered with the home agent.
             "
     ::= { nemoGroups 7 }

nemoHaGlobalStatsGroup   OBJECT-GROUP
     OBJECTS {
               nemoHaBUAcksWONemoSupport,
               nemoHaBUAcksRegTypeChangeDisallowed,
               nemoHaBUAcksOperationNotPermitted,
               nemoHaBUAcksInvalidPrefix,
               nemoHaBUAcksNotAuthorizedForPrefix,
               nemoHaBUAcksForwardingSetupFailed,
               nemoHaBUAcksOtherError
    }
     STATUS  current
     DESCRIPTION
             "A collection of objects for monitoring basic
              NEMO advertisement and registration statistics
              on a home agent.
             "
     ::= { nemoGroups 8 }

nemoNotificationGroup   NOTIFICATION-GROUP
     NOTIFICATIONS {
              nemoHomeTunnelEstablished,
              nemoHomeTunnelReleased
    }
     STATUS  current
     DESCRIPTION
             "A collection of notifications from a home agent
              or correspondent node to the manager about the
              tunnel status of the mobile router.
             "
     ::= { nemoGroups 9 }

-- Compliance statements
nemoCoreCompliance MODULE-COMPLIANCE
      STATUS  current
      DESCRIPTION
             "The compliance statement for SNMP entities
              that implement the NEMO-MIB.
              "
      MODULE  -- this module
          MANDATORY-GROUPS { nemoSystemGroup
                           }
      ::= { nemoCompliances 1 }

nemoCompliance2 MODULE-COMPLIANCE
      STATUS  current
      DESCRIPTION
```

```
            "The compliance statement for SNMP entities that
             implement the NEMO-MIB and support monitoring of
             the Binding Cache.

             There are a number of INDEX objects that cannot be
             represented in the form of OBJECT clauses in SMIv2,
             but for which there are compliance requirements,
             expressed in OBJECT-clause form in this description:

             -- OBJECT      mip6BindingHomeAddressType
             -- SYNTAX      InetAddressType { ipv6(2) }
             -- DESCRIPTION
             --     This MIB module requires support for global
             --     IPv6 addresses for the mip6BindingHomeAddress
             --     object.
             --
             -- OBJECT      mip6BindingHomeAddress
             -- SYNTAX      InetAddress (SIZE(16))
             -- DESCRIPTION
             --     This MIB module requires support for global
             --     IPv6 addresses for the mip6BindingHomeAddress
             --     object.
             --
             "
     MODULE  -- this module
         MANDATORY-GROUPS { nemoSystemGroup,
                            nemoBindingCacheGroup
                          }
     ::= { nemoCompliances 2 }

nemoCoreReadOnlyCompliance MODULE-COMPLIANCE
     STATUS  current
     DESCRIPTION
            "The compliance statement for SNMP entities
             that implement the NEMO-MIB without support
             for read-write (i.e., in read-only mode).
             "
     MODULE  -- this module
         MANDATORY-GROUPS { nemoSystemGroup
                          }
     OBJECT      nemoStatus
     MIN-ACCESS  read-only
     DESCRIPTION
            "Write access is not required."
     ::= { nemoCompliances 3 }

nemoReadOnlyCompliance2 MODULE-COMPLIANCE
     STATUS  current
     DESCRIPTION
            "The compliance statement for SNMP entities that
             implement the NEMO-MIB without support for read-write
             (i.e., in read-only mode) and with support for
             monitoring of the Binding Cache.

             There are a number of INDEX objects that cannot be
```

```
                represented in the form of OBJECT clauses in SMIv2,
                but for which there are compliance requirements,
                expressed in OBJECT-clause form in this description:

                -- OBJECT      mip6BindingHomeAddressType
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6BindingHomeAddress
                --     object.
                --
                -- OBJECT      mip6BindingHomeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6BindingHomeAddress
                --     object.
                --
                "
        MODULE  -- this module
            MANDATORY-GROUPS { nemoSystemGroup,
                               nemoBindingCacheGroup
                             }
        OBJECT      nemoStatus
        MIN-ACCESS  read-only
        DESCRIPTION
               "Write access is not required."
        ::= { nemoCompliances 4 }

    nemoMrCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
               "The compliance statement for SNMP entities that
                implement the NEMO-MIB for monitoring configuration-
                related information, registration details, and
                statistics on a mobile router.

                There are a number of INDEX objects that cannot be
                represented in the form of OBJECT clauses in SMIv2,
                but for which there are compliance requirements,
                expressed in OBJECT-clause form in this description:

                -- OBJECT      mip6MnHomeAddressType
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnHomeAddress
                --     object.
                --
                -- OBJECT      mip6MnHomeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnHomeAddress
                --     object.
```

```
                --
                -- OBJECT      mip6MnBLNodeAddressType
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                --
                -- OBJECT      mip6MnBLNodeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                "
        MODULE  -- this module
            MANDATORY-GROUPS { nemoStatsGroup,
                               nemoMrConfGroup,
                               nemoMrRegistrationGroup
                             }
        ::= { nemoCompliances 5 }

nemoMrReadOnlyCompliance2 MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
                "The compliance statement for SNMP entities that
                 implement the NEMO-MIB without support for read-
                 write (i.e., in read-only mode) and with support for
                 monitoring of configuration-related information,
                 registration details, and statistics on a mobile
                 router.

                 There are a number of INDEX objects that cannot be
                 represented in the form of OBJECT clauses in SMIv2,
                 but for which there are compliance requirements,
                 expressed in OBJECT-clause form in this description:

                 -- OBJECT      mip6MnHomeAddressType
                 -- SYNTAX      InetAddressType { ipv6(2) }
                 -- DESCRIPTION
                 --     This MIB module requires support for global
                 --     IPv6 addresses for the mip6MnHomeAddress
                 --     object.
                 --
                 -- OBJECT      mip6MnHomeAddress
                 -- SYNTAX      InetAddress (SIZE(16))
                 -- DESCRIPTION
                 --     This MIB module requires support for global
                 --     IPv6 addresses for the mip6MnHomeAddress
                 --     object.
                 --
                 -- OBJECT      mip6MnBLNodeAddressType
                 -- SYNTAX      InetAddressType { ipv6(2) }
                 -- DESCRIPTION
                 --     This MIB module requires support for global
```

```
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                --
                -- OBJECT      mip6MnBLNodeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                "
        MODULE  -- this module
            MANDATORY-GROUPS { nemoStatsGroup,
                               nemoMrConfGroup,
                               nemoMrRegistrationGroup
                             }

        OBJECT      nemoMrPrefixRegMode
        MIN-ACCESS  read-only
        DESCRIPTION
               "Write access is not required."
        ::= { nemoCompliances 6 }


    nemoHaCoreCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
               "The compliance statement for SNMP entities that
                implement the NEMO-MIB for configuration monitoring
                at the home agent.

                There are a number of INDEX objects that cannot be
                represented in the form of OBJECT clauses in SMIv2,
                but for which there are compliance requirements,
                expressed in OBJECT-clause form in this description:

                -- OBJECT      mip6BindingHomeAddressType
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6BindingHomeAddress
                --     object.
                --
                -- OBJECT      mip6BindingHomeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6BindingHomeAddress
                --     object.
                --
                "
        MODULE  -- this module
            MANDATORY-GROUPS { nemoHaSystemGroup
                             }
        ::= { nemoCompliances 7 }
```

```
nemoHaCompliance2 MODULE-COMPLIANCE
     STATUS  current
     DESCRIPTION
            "The compliance statement for SNMP entities that
             implement the NEMO-MIB with support for monitoring
             of the home agent functionality, specifically the
             home-agent-registration-related statistics.

             There are a number of INDEX objects that cannot be
             represented in the form of OBJECT clauses in SMIv2,
             but for which there are compliance requirements,
             expressed in OBJECT-clause form in this description:
             -- OBJECT      mip6BindingHomeAddressType
             -- SYNTAX      InetAddressType { ipv6(2) }
             -- DESCRIPTION
             --     This MIB module requires support for global
             --     IPv6 addresses for the mip6BindingHomeAddress
             --     object.
             --
             -- OBJECT      mip6BindingHomeAddress
             -- SYNTAX      InetAddress (SIZE(16))
             -- DESCRIPTION
             --     This MIB module requires support for global
             --     IPv6 addresses for the mip6BindingHomeAddress
             --     object.
             --
             "
     MODULE  -- this module
         MANDATORY-GROUPS { nemoHaSystemGroup,
                            nemoHaStatsGroup,
                            nemoHaGlobalStatsGroup
                          }
     ::= { nemoCompliances 8 }

nemoNotificationCompliance MODULE-COMPLIANCE
     STATUS  current
     DESCRIPTION
            "The compliance statement for SNMP entities that
             implement the NEMO-MIB and support Notification
             from the home agent.
             "
     MODULE  -- this module
         MANDATORY-GROUPS { nemoNotificationGroup
                          }
     ::= { nemoCompliances 9 }

END
```

4. IANA Considerations

IANA has assigned a base arc in the mib-2 (Standards Track) OID tree for the 'nemoMIB' (184).

5. Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write. 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. These are the tables and objects and their sensitivity/vulnerability:

nemoStatus: The value of this object is used to enable or disable the NEMO functionality on a NEMO entity. Access to this MO may be abused to disrupt the communication that depends on NEMO.

nemoMrPrefixRegMode: The value of this object is used to control the mode in which mobile network prefixes will be registered with the home agent. Access to this object may be abused to disrupt the setting up of mobile network prefixes.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

nemoHaMobileNetworkPrefixType

nemoHaMobileNetworkPrefix

nemoHaMobileNetworkPrefixLength:

The above address-related objects may be considered to be particularly sensitive and/or private. The mobile-network-prefix-related objects reveal the configuration of the mobile router and, as such, may be considered to be sensitive.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

6. Acknowledgments

The authors would like to thank Alex Petrescu, Pascal Thubert, Kent Leung, T.J Kniveton, Thierry Ernst, Alberto Garcia, Marcelo Bagnulo, Vijay K. Gurbani, Bert Wijnen, Chris Newman, Dan Romanascu, and Jari Arkko for their review comments on this document.

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第３章　PMIPv6-MIB: A MIB module for Proxy MobileIPv6

Network-based mobility management protocol enables IP mobility for a host without requiring its participation in any mobility related signaling. This protocol is referred to as Proxy Mobile IPv6 (PMIPv6). We have defined the MIB, the PMIPv6-MIB, for this protocol. This document[61] is now in the final stages of discussion in the Network-based mobility working group of the IETF.

The complete specification document is available as [61] at `http://www.ietf.org/id/draft-ietf-netlmm-pmipv6-mib-01.txt`.

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INTERNET-DRAFT　　Cyber Solutions Inc.

Intended Status: Proposed Standard
Expires: March 14, 2010

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September 15, 2009

Proxy Mobile IPv6 Management Information Base
<draft-ietf-netlmm-pmipv6-mib-01.txt>

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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This document is a product of the NETLMM Working Group. Comments should be addressed to the authors or the mailing list at netlmm@ietf.org

This Internet-Draft will expire on March 14, 2010.

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Abstract

This memo defines a portion of the Management Information Base (MIB), the Proxy Mobile-IPv6 MIB, for use with network management protocols in the Internet community. In particular, the Proxy Mobile-IPv6 MIB

will be used to monitor and control the mobile access gateway (MAG) node and the local mobility anchor (LMA) functions of a Proxy Mobile IPv6 (PMIPv6) entity.

Table of Contents

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, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Overview

2.1. The Proxy Mobile IPv6 Protocol and entities

Proxy Mobile IPv6 (PMIPv6) [PMIPv6] is an extension to the Mobile IPv6 (MIPv6) protocol which facilitates network-based localized mobility management (NETLMM) for IPv6 nodes in a PMIPv6 domain. There are three types of entities envisaged by the PMIPv6 protocol.

mobile node (MN): In the PMIPv6 context the term mobile node is used to refer to an IP host or router whose mobility is managed by the network.

local mobility anchor (LMA): Local Mobility Anchor is the home agent for the mobile node in a Proxy Mobile IPv6 domain. It is the topological anchor point for the mobile node's home

network prefix(es) and is the entity that manages the mobile node's binding state. The local mobility anchor has the functional capabilities of a home agent as defined in Mobile IPv6 base specification [RFC3775] with the additional capabilities required for supporting Proxy Mobile IPv6 protocol as defined in the PMIPv6 specification [RFC5213].

mobile access gateway (MAG): Mobile Access Gateway is the entity on an access router that manages the mobility-related signaling for a mobile node that is attached to its access link. It is responsible for tracking the mobile node's movements to and from the access link and for signaling the mobile node's local mobility anchor.

This document defines a set of managed objects (MOs) that can be used to monitor and control PMIPv6 entities.

2.2. Terminology

The terminology used in this document is consistent with the definitions used in the Mobile IPv6 protocol specification[RFC3775] and in NETLMM Goals document [RFC4831].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 [RFC2119].

3. Proxy Mobile IPv6 Monitoring and Control Requirements

For managing a PMIPv6 entity it is necessary to monitor the following:

- o capabilities of PMIPv6 entities
- o traffic due to PMIPv6 signalling
- o binding related details (at LMA and MAG)
- o binding related statistics (at LMA and MAG)

4. MIB Design.

The basic principle has been to keep the MIB as simple as possible and at the same time to make it effective enough so that the essential needs of monitoring and control are met.

It is assumed that the Proxy Mobile IPv6 Management Information Base (PMIPV6-MIB) will always be implemented in conjunction with the MOBILEIPV6-MIB [RFC4295] and the ifTable from the IF-MIB [RFC2863]. The PMIP6-MIB uses the textual conventions defined in the INET-ADDRESS-MIB [RFC4001].

The PMIPV6-MIB is composed of the following groups of definitions:

- pmip6Core: a generic group containing objects that are common to all the Proxy Mobile IPv6 entities.
- pmip6Mag: this group models the mobile access gateway service.

```
        - pmip6Lma: this group models the local mobility anchor
          service.
        - pmip6Notifications: defines the set of notifications that
          will be used to asynchronously monitor the Proxy Mobile
          IPv6 entities.

    The tables contained in the above groups are as follows:
        - pmip6BindingCacheTable         : models the Binding Cache
                                           on the local mobility
                                           anchor.
        - pmip6MagProxyCOATable          : models the Proxy Care-of
                                           Addresses configured on the
                                           egress interfaces of the
                                           mobile access gateway.
        - pmip6MagHomeNetworkPrefixTable : contains the Home Network
                                           Prefixes assigned to the
                                           mobile node's connected
                                           interfaces.
        - pmip6MagBLTable                : models the Binding Update List
                                           (BL) that includes Proxy MIPv6
                                           related information and is
                                           maintained by the mobile
                                           access gateway.
        - pmip6MagMnProfileTable         : contains the mobile node's
                                           policy profile that includes
                                           the essential operational
                                           parameters that are required
                                           by the network entities for
                                           managing the mobile node's
                                           mobility service.
        - pmip6LmaLMAATable              : contains the LMA Addresses
                                           that are configured on the
                                           local mobility anchor. Each
                                           LMA Address acts as a
                                           transport endpoint of the
                                           tunnel between the local
                                           mobility anchor and the mobile
                                           access gateway.
        - pmip6LmaHomeNetworkPrefixTable : contains the list of Home
                                           Network Prefixes assigned to
                                           the mobile node's connected
                                           interfaces.

5.  The Proxy Mobile-IPv6 MIB.


      PMIPV6-MIB DEFINITIONS ::= BEGIN
       IMPORTS
         MODULE-IDENTITY,  mib-2, Integer32, Counter32, Gauge32,
         OBJECT-TYPE, NOTIFICATION-TYPE
                    FROM SNMPv2-SMI
         PhysAddress
                    FROM RFC1213-MIB
         TEXTUAL-CONVENTION, TimeStamp,
```

```
   TruthValue, DateAndTime
              FROM SNMPv2-TC
   MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
              FROM SNMPv2-CONF
   InetAddressType, InetAddress, InetAddressPrefixLength
              FROM INET-ADDRESS-MIB
   Ipv6AddressIfIdentifierTC
              FROM IP-MIB
   mip6MnBLEntry, mip6BindingCacheEntry
              FROM MOBILEIPV6-MIB
   ;


pmip6MIB MODULE-IDENTITY
    LAST-UPDATED "200907070000Z"        --  7th July, 2009
    ORGANIZATION "IETF NETLMM Working Group"
    CONTACT-INFO
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        Support Group E-mail: netlmm@ietf.org"


        DESCRIPTION
         "The MIB module for monitoring and controlling PMIPv6 entities.
```

```
            "
        -- Authors' note:
        --    It is not clear if the Copyright notice should be a part of
        --    above description. It was a requirement sometime ago but the
        --    submission tool at ietf.org complained so it is removed
        --    for now.

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


              REVISION    "200907070000Z"      -- 7th July 2009
              DESCRIPTION "Initial version, published as RFC XXXX."


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


           ::= { mib-2  YYY } -- will be assigned by IANA


        -- IANA Reg.: Please assign a value for "YYY" under the 'mib-2'
        -- subtree and record the assignment in the SMI Numbers
        -- registry.
        --
        -- RFC Ed.: When the above assignment has been made, please
        --     remove the above note
        --     replace "YYY" here with the assigned value and
        --     remove this note.

    -- ------------------------------------------------------------
    -- Textual Conventions
    -- ------------------------------------------------------------

    Pmip6MNIdentifier  ::=  TEXTUAL-CONVENTION
        STATUS  current
        DESCRIPTION
            "The identity of a mobile node in the Proxy Mobile IPv6
             domain. This is the stable identifier of a mobile node
             that the mobility entities in a Proxy Mobile IPv6 domain
             can always acquire and use it for predictably identifying
             a mobile node. This is typically an identifier such as
             Network Access Identifier (NAI) [RFC-4282] or other
             identifier such as a Media Access Control (MAC) address.
            "
        REFERENCE
            "RFC 5213: Section 2.2"
        SYNTAX  OCTET STRING (SIZE (0..255))

    Pmip6MNLlIdentifier ::=  TEXTUAL-CONVENTION
        STATUS  current
        DESCRIPTION
            "An identifier that identifies the attached interface of a
             mobile node.  For those interfaces that have a link-layer
```

```
          identifier, this identifier can be based on that.  The
          link-layer identifier in some cases is generated by the
          mobile node and conveyed to the mobile access gateway.  This
          identifier of the attached interface must be stable as seen
          by any of the mobile access gateways in a given Proxy Mobile
          IPv6 domain.  In some other cases, there might not be any
          link-layer identifier associated with the mobile node's
          interface. An identifier value of ALL_ZERO is not considered
          a valid identifier and cannot be used as an interface
          identifier.
        "
    REFERENCE
        "RFC 5213: Section 2.2"
    SYNTAX  OCTET STRING (SIZE (0..255))

Pmip6MNIndex ::= TEXTUAL-CONVENTION
    DISPLAY-HINT "d"
    STATUS       current
    DESCRIPTION
        "A unique integer value, greater than zero, assigned to each
         mobile node in a PMIPv6-Domain by the management system.
         It is recommended that values are assigned contiguously
         starting from 1.  The value for each mobile node must remain
         constant at least from one re-initialization of the entity's
         network management system to the next re-initialization.
        "
    SYNTAX       Integer32 (1..2147483647)

Pmip6PBUAccessTechnologyType ::=  TEXTUAL-CONVENTION
    STATUS  current
    DESCRIPTION
        "This specifies the access technology which connects the
         mobile node to the access link on the mobile access gateway.
        "
    REFERENCE
        "RFC 5213: Section 8.5"
    SYNTAX INTEGER
    {
              reserved               (0),
              logicalNetworkInterface(1),
              pointToPointInterface  (2),
              ethernet               (3),
              wirelessLan            (4),
              wimax                  (5)
    }

      -- The PMIPv6 MIB has the following 5 primary groups


      pmip6Notifications     OBJECT IDENTIFIER ::= { pmip6MIB 0 }
      pmip6Objects           OBJECT IDENTIFIER ::= { pmip6MIB 1 }
      pmip6Conformance       OBJECT IDENTIFIER ::= { pmip6MIB 2 }
      pmip6Core              OBJECT IDENTIFIER ::= { pmip6Objects 1 }
      pmip6Mag               OBJECT IDENTIFIER ::= { pmip6Objects 2 }
      pmip6Lma               OBJECT IDENTIFIER ::= { pmip6Objects 3 }
```

```
 -- The sub groups

pmip6System            OBJECT IDENTIFIER ::= { pmip6Core 1 }
pmip6Bindings          OBJECT IDENTIFIER ::= { pmip6Core 2 }
pmip6Conf              OBJECT IDENTIFIER ::= { pmip6Core 3 }
pmip6Stats             OBJECT IDENTIFIER ::= { pmip6Core 4 }


pmip6MagSystem         OBJECT IDENTIFIER ::= { pmip6Mag 1 }
pmip6MagConf           OBJECT IDENTIFIER ::= { pmip6Mag 2 }
pmip6MagRegistration   OBJECT IDENTIFIER ::= { pmip6Mag 3 }

pmip6LmaSystem         OBJECT IDENTIFIER ::= { pmip6Lma 1 }
pmip6LmaConf           OBJECT IDENTIFIER ::= { pmip6Lma 2 }

-- The pmip6Configuration group has the following sub groups



-- The pmip6Stats group has the following sub groups


pmip6BindingRegCounters OBJECT IDENTIFIER ::= { pmip6Stats 1 }

--
--
-- pmip6System group
--
--
pmip6Capabilities OBJECT-TYPE
    SYNTAX      BITS {
                     mobilityAccessGateway  (0),
                     localMobilityAnchor    (1)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the PMIPv6 functions that
         are supported by this managed entity.  Multiple
         Proxy Mobile IPv6 functions may be supported by
         a single entity.
        "
    REFERENCE
            "RFC 3775 : Section 3.2, 4.1"
    ::= { pmip6System 1 }

pmip6Status OBJECT-TYPE
    SYNTAX      INTEGER { enabled(1), disabled(2) }
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This object indicates whether the Proxy Mobile
         IPv6 function is enabled for the managed entity.

         The value of this object SHOULD remain unchanged
```

```
           across reboots of the managed entity.
          "
      ::= { pmip6System 2 }

pmip6MobileNodeGeneratedTimestampInUse OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This flag indicates whether or not the mobile node
         generated timestamp mechanism is in use in that
         Proxy Mobile IPv6 domain.
         true(1) if the local mobility anchors and mobile
         access gateways in that Proxy Mobile IPv6 domain
         apply the mobile node generated timestamp
         considerations.
         false(0) indicates that the mobile node generated
         timestamp mechanism is not in use in that Proxy
         Mobile IPv6 domain.
         The default value for this flag is set to value of 0.
        "
    REFERENCE
        "RFC 5213: Section 5.5, 9.3"
       ::= { pmip6Conf 1 }

pmip6FixedMagLinkLocalAddressOnAllAccessLinksType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The InetAddressType of the
         pmip6FixedMagLinkLocalAddressOnAllAccessLinks
         that follows.
        "
       ::= { pmip6Conf 2 }
pmip6FixedMagLinkLocalAddressOnAllAccessLinks OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This variable indicates the link-local address value
         that all the mobile access gateways should use on
         any of the access links shared with any of the
         mobile nodes in that Proxy Mobile IPv6 domain.  If
         this variable is initialized to ALL_ZERO value, it
         implies the use of fixed link-local address mode is
         not enabled for that Proxy Mobile IPv6 domain."
    REFERENCE
        "RFC 5213: Section 2.2, 6.8, 6.9.1.1, 6.9.3, 9.3"
       ::= { pmip6Conf 3 }

pmip6FixedMagLinkLayerAddressOnAllAccessLinks OBJECT-TYPE
    SYNTAX      PhysAddress
    MAX-ACCESS  read-write
    STATUS      current
```

```
    DESCRIPTION
        "This variable indicates the link-layer address value
         that all the mobile access gateways should use on
         any of the access links shared with any of the mobile
         nodes in that Proxy Mobile IPv6 domain. For access
         technologies where there is no link-layer address,
         this variable MUST be initialized to ALL_ZERO value.
        "
    REFERENCE
        "RFC 5213: Section 6.9.3, 9.3"
       ::= { pmip6Conf 4 }


pmip6MagProxyCOATable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Pmip6MagProxyCOAEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table models the Proxy Care-of Addresses configured
         on the egress interfaces of the mobile access gateway
         and is the transport endpoint of the tunnel between the
         local mobility anchor and the mobile access gateway.

         Entries in this table are not required to survive
         a reboot of the managed entity.
        "
    REFERENCE
        "RFC 5213: Section 2.2, 6.10"
    ::= { pmip6MagSystem 1 }

pmip6MagProxyCOAEntry OBJECT-TYPE
    SYNTAX      Pmip6MagProxyCOAEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This entry represents a conceptual row in the
         Proxy-CoA table. It represents each Proxy-CoA
         on the mobile access gateway.

         Implementers need to be aware that if the total
         number of octets in mip6BindingHomeAddress
         exceeds 113 then OIDs of column
         instances in this row will have more than 128
         sub-identifiers and cannot be accessed using
         SNMPv1, SNMPv2c, or SNMPv3.
        "
    INDEX  { pmip6MagProxyCOAType, pmip6MagProxyCOA }
    ::= { pmip6MagProxyCOATable 1 }

Pmip6MagProxyCOAEntry ::=
    SEQUENCE {
     pmip6MagProxyCOAType   InetAddressType,
     pmip6MagProxyCOA       InetAddress,
     pmip6MagProxyCOAState  INTEGER
    }
```

```
pmip6MagProxyCOAType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The InetAddressType of the pmip6MagProxyCOA
         that follows.
        "
    ::= { pmip6MagProxyCOAEntry 1 }

pmip6MagProxyCOA OBJECT-TYPE
    SYNTAX      InetAddress
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Proxy-CoA configured on the egress interface of the
         mobile access gateway.

         The type of the address represented by this object
         is specified by the corresponding
         pmip6MagProxyCOAType object.
        "
    REFERENCE
        "RFC 5213: Section 2.2, 6.10"
    ::= { pmip6MagProxyCOAEntry 2 }

pmip6MagProxyCOAState  OBJECT-TYPE
    SYNTAX      INTEGER {
                          unknown(1),
                          activated(2),
                          tunneled(3)
                }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the state of the Proxy-CoA:
            unknown     -- The state of the Proxy-CoA
                           cannot be determined.
            activated   -- The Proxy-CoA is ready to establish
                           tunnel
            tunneled    -- The Proxy-CoA is used to set up the
                           bi-directional tunnel.
        "
    ::= { pmip6MagProxyCOAEntry 3 }


pmip6MagEnableMagLocalRouting OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "This flag indicates whether or not the mobile access
         gateway is allowed to enable local routing of the
         traffic exchanged between a visiting mobile node and
         a correspondent node that is locally connected to one
```

```
            of the interfaces of the mobile access gateway.
            The correspondent node can be another visiting mobile
            node as well, or a local fixed node.
            true(1) indicates the mobile access gateway routes the
            traffic locally.
            false(0) indicates that the mobile access gateway
            reverse tunnels all the traffic to the mobile node's
            local mobility anchor.

            The default value for this flag is set to false."
        REFERENCE
            "RFC 5213: Section 9.2"
           ::= { pmip6MagConf 1 }


    pmip6MagHomeNetworkPrefixTable   OBJECT-TYPE
         SYNTAX      SEQUENCE OF PMip6MagHomeNetworkPrefixEntry
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
             "A table representing the Home Network Prefixes
              assigned to the mobile node's connected interfaces.
              This table shows the prefixes registered in the
              binding update list entry.
             "
         REFERENCE
             "RFC 5213: Section 2, 6.1, 6.2"
         ::= { pmip6MagConf 2 }

    pmip6MagHomeNetworkPrefixEntry OBJECT-TYPE
         SYNTAX      PMip6MagHomeNetworkPrefixEntry
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
             "An entry in the Home Network Prefixes table.

              Implementers need to be aware that if the total
              number of octets in pmip6MagHomeNetworkPrefix
              exceeds 114 then OIDs of column
              instances in this row will have more than 128
              sub-identifiers and cannot be accessed using
              SNMPv1, SNMPv2c, or SNMPv3.
             "
         INDEX  { pmip6MagBLMnIdentifier, pmip6MagBLlMnIdentifier,
                  pmip6MagHomeNetworkPrefixType,
                  pmip6MagHomeNetworkPrefix }
         ::= { pmip6MagHomeNetworkPrefixTable 1 }


    PMip6MagHomeNetworkPrefixEntry ::=
         SEQUENCE {
          pmip6MagHomeNetworkPrefixType      InetAddressType,
          pmip6MagHomeNetworkPrefix          InetAddress,
          pmip6MagHomeNetworkPrefixLength    InetAddressPrefixLength,
          pmip6MagHomeNetworkPrefixLifeTime  Gauge32
```

```
    }


pmip6MagHomeNetworkPrefixType  OBJECT-TYPE
     SYNTAX      InetAddressType
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
         "The InetAddressType of the pmip6MagHomeNetworkPrefix
          that follows.
         "
     ::= { pmip6MagHomeNetworkPrefixEntry 1 }


pmip6MagHomeNetworkPrefix   OBJECT-TYPE
     SYNTAX      InetAddress
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
         "The mobile network prefix that is delegated to the
          mobile node. The type of the address represented by
          this object is specified by the corresponding
          pmip6MagHomeNetworkPrefixType object.
         "
     REFERENCE
         "RFC 5213: Section 2"

     ::= { pmip6MagHomeNetworkPrefixEntry 2 }


pmip6MagHomeNetworkPrefixLength   OBJECT-TYPE
     SYNTAX      InetAddressPrefixLength
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
         "The prefix length of the Home Network Prefix.
         "
     ::= { pmip6MagHomeNetworkPrefixEntry 3 }


pmip6MagHomeNetworkPrefixLifeTime   OBJECT-TYPE
     SYNTAX      Gauge32
     UNITS       "seconds"
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
         "The lifetime (in seconds) granted to the mobile
          node for this registration.
         "
     REFERENCE
         "RFC 5213: Section 6.2, 6.7"
     ::= { pmip6MagHomeNetworkPrefixEntry 4 }
```

```
pmip6MagBLTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Pmip6MagBLEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table corresponds to the Binding Update List(BL)
         that includes Proxy MIPv6 related information and
         is maintained by the mobile access gateway.
         Entries from the table are deleted as
         the lifetime of the binding expires.
        "
    REFERENCE
        "RFC 3775: Section 4.5, 11.1,
         RFC 5213: Section 6.1"
    ::= { pmip6MagRegistration 1 }


pmip6MagBLEntry  OBJECT-TYPE
    SYNTAX      Pmip6MagBLEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry containing additional information contained
         in a Binding Update sent by the mobile access gateway
         to the local mobility anchor.
        "
    AUGMENTS {mip6MnBLEntry}
::= { pmip6MagBLTable 1 }

Pmip6MagBLEntry ::= SEQUENCE {
    pmip6MagBLFlag                    TruthValue,
    pmip6MagBLMnIdentifier            Pmip6MNIdentifier,
    pmip6MagBLlMnIdentifier           Pmip6MNLlIdentifier,
    pmip6MagBLMagLinkLocalAddressType InetAddressType,
    pmip6MagBLMagLinkLocalAddress     InetAddress,
    pmip6MagBLMagIfIdentifierToMn     Ipv6AddressIfIdentifierTC,
    pmip6MagBLTunnelIfIdentifier      Ipv6AddressIfIdentifierTC,
    pmip6MagBLAccessTechnologyType  Pmip6PBUAccessTechnologyType,
    pmip6MagBLTimeRecentlyAccepted    DateAndTime
    }


pmip6MagBLFlag OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "true(1) if the mobile access gateway sent the proxy
         binding update with Proxy Registration Flag that
         indicates to the local mobility anchor that the
         registration is the proxy binding update and is from
         a mobile access gateway.
         false(0) implies that the mobile access gateway is
         behaving as a simple mobile node.
        "
```

```
    REFERENCE
        "RFC 5213: Section 8.1"
    ::= { pmip6MagBLEntry 1 }

pmip6MagBLMnIdentifier OBJECT-TYPE
    SYNTAX     Pmip6MNIdentifier
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The Identifier of the attached mobile node. This
         identifier is acquired during the mobile node's
         attachment to the access link.
        "
    REFERENCE
        "RFC 5213: Section 2.2, 6.1, 8.1"
    ::= { pmip6MagBLEntry 2 }

pmip6MagBLlMnIdentifier OBJECT-TYPE
    SYNTAX      Pmip6MNLlIdentifier
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The link-layer identifier of the mobile node's
         connected interface.  This can be acquired from the
         received Router Solicitation messages from the mobile
         node or during the mobile node's attachment to the
         access network. If this identifier is not available,
         this variable length field MUST be set to two (octets)
         and MUST be initialized to a value of ALL_ZERO.
        "
    REFERENCE
        "RFC 5213: Section 2.2, 6.1, 8.1"
    ::= { pmip6MagBLEntry 3 }

pmip6MagBLMagLinkLocalAddressType OBJECT-TYPE
    SYNTAX     InetAddressType
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The InetAddressType of the pmip6MagBLMagLinkLocalAddress
         that follows.
        "
    ::= { pmip6MagBLEntry 4 }

pmip6MagBLMagLinkLocalAddress OBJECT-TYPE
    SYNTAX     InetAddress
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The Link-local address of the mobile access gateway on
         the access link shared with the mobile node.
         This is the address that is present in the Link-local
         Address option of the corresponding Proxy Binding Update
         message.
        "
```

```
        REFERENCE
            "RFC 3963 : Section 4.1, 5.1"
        ::= { pmip6MagBLEntry 5 }

    pmip6MagBLMagIfIdentifierToMn OBJECT-TYPE
        SYNTAX     Ipv6AddressIfIdentifierTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The interface identifier (if-id) of the point-to-point
             link between the mobile node and the mobile access
             gateway. This is internal to the mobile access gateway
             and is used to associate the Proxy Mobile IPv6 tunnel
             to the access link where the mobile node is attached.
            "
        REFERENCE
            "RFC 5213: Section 6.1, 8.1"
        ::= { pmip6MagBLEntry 6 }

    pmip6MagBLTunnelIfIdentifier OBJECT-TYPE
        SYNTAX     Ipv6AddressIfIdentifierTC
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The tunnel interface identifier (tunnel-if-id) of the
             bi-directional tunnel between the mobile node's local
             mobility anchor and the mobile access gateway.  This
             is internal to the mobile access gateway. The tunnel
             interface identifier is acquired during the tunnel
             creation.
            "
        REFERENCE
            "RFC 5213: Section 6.1, 8.1"
        ::= { pmip6MagBLEntry 7 }

     pmip6MagBLAccessTechnologyType OBJECT-TYPE
        SYNTAX      Pmip6PBUAccessTechnologyType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The type of the access
             technology by which the mobile node is currently
             attached to the mobile access gateway.
            "
        REFERENCE
            "RFC 5213: Section 6.9.1.1, 6.9.1.5, 8.1"
        ::= { pmip6MagBLEntry 8 }

     pmip6MagBLTimeRecentlyAccepted OBJECT-TYPE
        SYNTAX      DateAndTime
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The 64-bit timestamp value of the most recently
             accepted Proxy Binding Update message sent for this
```

```
         mobile node.  This is the time-of-day on the mobile
         access gateway, when the proxy binding acknowledgement
         message with the Status field set to 0
         was received.  If the Timestamp option is not present
         in the Proxy Binding Update message (i.e., when the
         sequence number based scheme is in use), the value MUST
         be set to ALL_ZERO.
        "
    REFERENCE
        "RFC 5213: Section 5.1, 8.1"
    ::= { pmip6MagBLEntry 9 }

pmip6MagMnProfileTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Pmip6MagMnProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table corresponds to the mobile node's policy
         profile that includes the essential operational
         parameters that are required by the network entities
         for managing the mobile node's mobility service.
         It contains policy profiles of mobile nodes that are
         connected to the mobile access gateway.
        "
    REFERENCE
        "RFC 5213: Section 6.2"
    ::= { pmip6MagRegistration 2 }


pmip6MagMnProfileEntry  OBJECT-TYPE
    SYNTAX      Pmip6MagMnProfileEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry containing information about the
         mobile node's policy profile.
        "
    INDEX { pmip6MagMnIndex }
::= { pmip6MagMnProfileTable 1 }

Pmip6MagMnProfileEntry ::=
    SEQUENCE {
     pmip6MagMnIndex                          Pmip6MNIndex,
     pmip6MagMnIdentifier                     Pmip6MNIdentifier,
     pmip6MagMnLocalMobilityAnchorAddressType  InetAddressType,
     pmip6MagMnLocalMobilityAnchorAddress      InetAddress
    }

pmip6MagMnIndex OBJECT-TYPE
    SYNTAX      Pmip6MNIndex
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The index for a mobile node in the Proxy Mobile IPv6
         domain.
```

```
            "
        ::= { pmip6MagMnProfileEntry 1 }

    pmip6MagMnIdentifier OBJECT-TYPE
        SYNTAX      Pmip6MNIdentifier
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The identity of a mobile node in the Proxy Mobile IPv6
             domain.
            "
        REFERENCE
            "RFC 5213: Section 2.2"
        ::= { pmip6MagMnProfileEntry 2 }

    pmip6MagMnLocalMobilityAnchorAddressType OBJECT-TYPE
        SYNTAX     InetAddressType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The InetAddressType of the
             pmip6MagMnLocalMobilityAnchorAddress that follows.
            "
        ::= { pmip6MagMnProfileEntry 3 }

    pmip6MagMnLocalMobilityAnchorAddress OBJECT-TYPE
        SYNTAX     InetAddress
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The global address that is configured on the interface
             of the local mobility anchor and is the transport
             endpoint of the bi-directional tunnel established
             between the local mobility anchor and the mobile access
             gateway.  This is the address to which the mobile
             access gateway sends the Proxy Binding Update messages.
            "
        REFERENCE
            "RFC 5213: Section 2.2"
        ::= { pmip6MagMnProfileEntry 4 }



    pmip6BindingCacheTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF Pmip6BindingCacheEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This table models the Binding Cache on the local
             mobility anchor.
             Entries from the table are deleted as
             the lifetime of the binding expires.

             Entries in this table are not required to survive
             a reboot of the managed entity.
```

```
        "
    REFERENCE
        "RFC 3775: Section 4.5, 9.1, 10.1,
         RFC 5213: Section 5.1"
    ::= { pmip6Bindings 1 }


pmip6BindingCacheEntry  OBJECT-TYPE
    SYNTAX      Pmip6BindingCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry containing additional information contained
         in the binding cache table
         of the local mobility anchor.
        "
    AUGMENTS {mip6BindingCacheEntry}
::= { pmip6BindingCacheTable 1 }

Pmip6BindingCacheEntry ::= SEQUENCE {
     pmip6BindingPBUFlag                 TruthValue,
     pmip6BindingMnIdentifier            Pmip6MNIdentifier,
     pmip6BindingMnLlIdentifier          Pmip6MNLlIdentifier,
     pmip6BindingMagLinkLocalAddressType InetAddressType,
     pmip6BindingMagLinkLocalAddress     InetAddress,
     pmip6BindingTunnelIfIdentifier    Ipv6AddressIfIdentifierTC,
     pmip6BindingAccessTechnologyType
                                    Pmip6PBUAccessTechnologyType,
     pmip6BindingTimeRecentlyAccepted     DateAndTime
    }

pmip6BindingPBUFlag OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "true(1) if the local mobility anchor accepted the
         binding update with Proxy Registration Flag from a
         mobile access gateway.
         false(0) implies that the binding cache is from a
         mobile node.
        "
    REFERENCE
        "RFC 5213: Section 5.1, 8.1"
    ::= { pmip6BindingCacheEntry 1 }

pmip6BindingMnIdentifier OBJECT-TYPE
    SYNTAX      Pmip6MNIdentifier
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The identifier of the registered mobile node,
         MN-Identifier.  This identifier is obtained from the
         Mobile Node Identifier Option [RFC-4283] present in
         the received Proxy Binding Update message.
```

```
            "
        REFERENCE
            "RFC 5213: Section 2.2, 5.1, 8.1"
        ::= { pmip6BindingCacheEntry 2 }

    pmip6BindingMnLlIdentifier OBJECT-TYPE
        SYNTAX      Pmip6MNLlIdentifier
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The link-layer identifier of the mobile node's
             connected interface on the access link.  This
             identifier can be acquired from the Mobile Node
             Link-layer Identifier option, present in the received
             Proxy Binding Update message.  If the option was not
             present in the request, this variable length field
             MUST be set to two (octets) and MUST be initialized to
             a value of ALL_ZERO.
            "
        REFERENCE
            "RFC 5213: Section 2.2, 5.1, 8.1"
        ::= { pmip6BindingCacheEntry 3 }


    pmip6BindingMagLinkLocalAddressType OBJECT-TYPE
        SYNTAX      InetAddressType
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The InetAddressType of the
             pmip6BindingMagLinkLocalAddress that follows.
            "
        ::= { pmip6BindingCacheEntry 4 }

    pmip6BindingMagLinkLocalAddress OBJECT-TYPE
        SYNTAX      InetAddress
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "The link-local address of the mobile access gateway on
             the point-to-point link shared with the mobile node.
             This is generated by the local mobility anchor after
             accepting the initial Proxy Binding Update message.
             This is the address that is present in the Link-local
             Address option of the corresponding Proxy Binding
             Acknowledgement message.
            "
        REFERENCE
            "RFC 5213: Section 5.1, 6.9.1.2, 8.2"
        ::= { pmip6BindingCacheEntry 5 }

     pmip6BindingTunnelIfIdentifier OBJECT-TYPE
        SYNTAX      Ipv6AddressIfIdentifierTC
        MAX-ACCESS  read-only
        STATUS      current
```

```
   DESCRIPTION
       "The tunnel interface identifier (tunnel-if-id) of the
        bi-directional tunnel between the local mobility anchor
        and the mobile access gateway where the mobile node is
        currently anchored. This is internal to the local
        mobility anchor.  The tunnel interface identifier is
        acquired during the tunnel creation.
       "
   REFERENCE
       "RFC 5213: Section 5.1, 8.1"
   ::= { pmip6BindingCacheEntry 6 }

pmip6BindingAccessTechnologyType OBJECT-TYPE
   SYNTAX      Pmip6PBUAccessTechnologyType
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
       "The access technology type, by which the mobile node
        is currently attached.  This is obtained from the
        Access Technology Type option, present in the Proxy
        Binding Update message.
       "
   REFERENCE
       "RFC 5213: Section 5.1, 8.1"
   ::= { pmip6BindingCacheEntry 7 }

pmip6BindingTimeRecentlyAccepted OBJECT-TYPE
   SYNTAX      DateAndTime
   MAX-ACCESS  read-only
   STATUS      current
   DESCRIPTION
       "The 64-bit timestamp value of the most recently
        accepted Proxy Binding Update message sent for this
        mobile node.  This is the time-of-day on the local
        mobility anchor, when the message was received.  If
        the Timestamp option is not present in the Proxy
        Binding Update message (i.e., when the sequence number
        based scheme is in use), the value MUST be set to
        ALL_ZERO.
       "
   REFERENCE
       "RFC 5213: Section 5.1, 8.1"
   ::= { pmip6BindingCacheEntry 8 }


---
---
--- pmip6Stats group
---
---



 --
 -- pmip6Stats:pmip6BindingRegcounters
```

```
--


pmip6MissingMnIdentifierOption  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message
         rejected by the local mobility anchor with status
         code in the Binding Acknowledgment message indicating
         'Missing mobile node identifier option' (Code 160).

         Discontinuities in the value of this counter can
         occur at re-initialization of the mobile router.
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.3.1, 8.9"
        ::= { pmip6BindingRegCounters 1 }

pmip6MagNotAuthorizedForProxyReg OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message
         rejected by the local mobility anchor with status
         code in the Binding Acknowledgment message indicating
         'Not authorized to send proxy binding updates'
         (Code 154).

         Discontinuities in the value of this counter can
         occur at re-initialization of the mobile router,
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.3.1, 8.9"
        ::= { pmip6BindingRegCounters 2 }

pmip6NotLMAForThisMobileNode  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message rejected
         by the local mobility anchor with status code in the
         Binding Acknowledgment message indicating
         'Not local mobility anchor for this mobile node'
         (Code 153).

         Discontinuities in the value of this counter can
         occur at re-initialization of the management system,
```

```
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.3.1, 8.9"
        ::= { pmip6BindingRegCounters 3 }


pmip6ProxyRegNotEnabled  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message rejected
         by the local mobility anchor with status code in the
         Binding Acknowledgment message indicating
         'Proxy Registration not enabled' (Code 152).
         Discontinuities in the value of this counter can
         occur at re-initialization of the management system,
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.3.1, 6.9.1.2, 8.9"
        ::= { pmip6BindingRegCounters 4 }


pmip6MissingHomeNetworkPrefixOption  OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message rejected
         by the local mobility anchor with status code in the
         Binding Acknowledgment message indicating
         'Missing home network prefix option' (Code 158).
         Discontinuities in the value of this counter can
         occur at re-initialization of the management system,
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.3.1, 8.9"
        ::= { pmip6BindingRegCounters 5 }

pmip6MissingHandOffIndicatorOption OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message rejected
         by the local mobility anchor with status code in the
         Binding Acknowledgment message indicating
         'Missing handoff indicator option' (Code 161).
         Discontinuities in the value of this counter can
```

```
            occur at re-initialization of the management system,
            and at other times as indicated by the value of
            pmip6CounterDiscontinuityTime.
           "
        REFERENCE
            "RFC 5213: Section 5.3.1, 8.9"
            ::= { pmip6BindingRegCounters 6 }

    pmip6MissingAccessTechTypeOption OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Total number of Proxy Binding Update message rejected
            by the local mobility anchor with status code in the
            Binding Acknowledgment message indicating
            'Missing access technology type option' (Code 162).
            Discontinuities in the value of this counter can
            occur at re-initialization of the management system,
            and at other times as indicated by the value of
            pmip6CounterDiscontinuityTime.
           "
        REFERENCE
            "RFC 5213: Section 5.3.1, 8.9"
            ::= { pmip6BindingRegCounters 7 }

    pmip6NotAuthorizedForHomeNetworkPrefix OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Total number of Proxy Binding Update message rejected
            by the local mobility anchor with status code in the
            Binding Acknowledgment message indicating
            'Mobile node not authorized for one or more of the
            requesting home network prefixes' (Code 155).

            Discontinuities in the value of this counter can
            occur at re-initialization of the management system,
            and at other times as indicated by the value of
            pmip6CounterDiscontinuityTime.
           "
        REFERENCE
            "RFC 5213: Section 5.3.2, 6.9.1.2, 8.9"
            ::= { pmip6BindingRegCounters 8 }

    pmip6TimestampMismatch OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Total number of Proxy Binding Update message rejected
            by the local mobility anchor with status code in the
            Binding Acknowledgment message indicating
            'Invalid timestamp value (the clocks are out of sync)'
```

```
          (Code 156)
          Discontinuities in the value of this counter can
          occur at re-initialization of the management system,
          and at other times as indicated by the value of
          pmip6CounterDiscontinuityTime.
         "
    REFERENCE
        "RFC 5213: Section 5.5, 6.9.1.2, 8.9"
        ::= { pmip6BindingRegCounters 9 }

pmip6TimestampLowerThanPrevAccepted OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message rejected
         by the local mobility anchor with status code in the
         Binding Acknowledgment message indicating
         'The timestamp value is lower than the previously
         accepted value' (Code 157).
         Discontinuities in the value of this counter can
         occur at re-initialization of the management system,
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.5, 6.9.1.2, 8.9"
        ::= { pmip6BindingRegCounters 10 }

pmip6BcePbuPrefixSetDoNotMatch OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Total number of Proxy Binding Update message rejected
         by the local mobility anchor with status code in the
         Binding Acknowledgment message indicating
         'All the home network prefixes listed in the Binding
         Cache Entry do not match all the prefixes in the
         received Proxy Binding Update' (Code 159).
         Discontinuities in the value of this counter can
         occur at re-initialization of the management system,
         and at other times as indicated by the value of
         pmip6CounterDiscontinuityTime.
        "
    REFERENCE
        "RFC 5213: Section 5.4.1.1, 8.9"
        ::= { pmip6BindingRegCounters 11 }


pmip6InitialBindingRegistrations OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```

```
            "Total number of Proxy Binding Update messages that
             newly creates the Binding Cache entry.
             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             pmip6CounterDiscontinuityTime.
            "
        REFERENCE
            "RFC 5213: Section 5.3.2"
            ::= { pmip6BindingRegCounters 12 }

    pmip6BindingLifeTimeExtensionNoHandOff OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Total number of Proxy Binding Update message for
             extending the binding lifetime, received from the
             same mobile access gateway that last updated the
             binding.
             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             pmip6CounterDiscontinuityTime.
            "
        REFERENCE
            "RFC 5213: Section 5.3.3"
            ::= { pmip6BindingRegCounters 13 }

    pmip6BindingLifeTimeExtensionAfterHandOff OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Total number of Proxy Binding Update message for
             extending the binding lifetime, received from a new
             mobile access gateway where the mobile node's
             mobility session is handed off.
             Discontinuities in the value of this counter can
             occur at re-initialization of the management system,
             and at other times as indicated by the value of
             pmip6CounterDiscontinuityTime.
            "
        REFERENCE
            "RFC 5213: Section 5.3.4"
            ::= { pmip6BindingRegCounters 14 }

    pmip6BindingDeRegistrations OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
            "Total number of Proxy Binding Update message with the
             lifetime value of zero.
             Discontinuities in the value of this counter can
```

```
          occur at re-initialization of the management system,
          and at other times as indicated by the value of
          pmip6CounterDiscontinuityTime.
         "
     REFERENCE
         "RFC 5213: Section 5.3.5"
         ::= { pmip6BindingRegCounters 15 }

 pmip6BindingBindingAcks OBJECT-TYPE
     SYNTAX      Counter32
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
         "Total number of Proxy Binding Acknowledgement
          messages.
          Discontinuities in the value of this counter can
          occur at re-initialization of the management system,
          and at other times as indicated by the value of
          pmip6CounterDiscontinuityTime.
         "
     REFERENCE
         "RFC 5213: Section 5.3.5"
         ::= { pmip6BindingRegCounters 16 }

 pmip6CounterDiscontinuityTime OBJECT-TYPE
     SYNTAX      TimeStamp
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
         "The value of sysUpTime on the most recent occasion
          at which any one or more of this PMIPv6 entities
          global counters, viz., counters with OID prefix
          'pmip6BindingRegCounters' suffered a discontinuity.
          If no such discontinuities have occurred since the
          last re-initialization of the local management
          subsystem, then this object will have a zero value.
         "
         ::= { pmip6BindingRegCounters 17 }



pmip6LmaLMAATable OBJECT-TYPE
   SYNTAX      SEQUENCE OF Pmip6LmaLMAAEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "This table models the LMA Addresses configured
        on the local mobility anchor. Each LMA Address acts as
        a transport endpoint of the tunnel between the local
        mobility anchor and the mobile access gateway and is
        the transport endpoint of the tunnel between the local
        mobility anchor and the mobile access gateway.

        Entries in this table are not required to survive
        a reboot of the managed entity.
```

```
            "
        REFERENCE
            "RFC 5213: Section 2.2, 5.6"
        ::= { pmip6LmaSystem 1 }

    pmip6LmaLMAAEntry OBJECT-TYPE
        SYNTAX      Pmip6LmaLMAAEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "This entry represents a conceptual row in the
             LMAA table. It represents each LMAA
             on the local mobility anchor.

             Implementers need to be aware that if the total
             number of octets in mip6BindingHomeAddress
             exceeds 113 then OIDs of column
             instances in this row will have more than 128
             sub-identifiers and cannot be accessed using
             SNMPv1, SNMPv2c, or SNMPv3.
            "
        INDEX  { pmip6LmaLMAAType, pmip6LmaLMAA }
        ::= { pmip6LmaLMAATable 1 }


    Pmip6LmaLMAAEntry ::=
        SEQUENCE {
         pmip6LmaLMAAType   InetAddressType,
         pmip6LmaLMAA       InetAddress,
         pmip6LmaLMAAState  INTEGER
        }

    pmip6LmaLMAAType OBJECT-TYPE
        SYNTAX      InetAddressType
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
                "The InetAddressType of the pmip6LmaLMAA
                 that follows.
                "
        ::= { pmip6LmaLMAAEntry 1 }

    pmip6LmaLMAA OBJECT-TYPE
        SYNTAX      InetAddress
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "The LMAA configured on the local mobility anchor.

             The type of the address represented by this object
             is specified by the corresponding
             pmip6LmaLMAAType object.
            "
        REFERENCE
            "RFC 5213: Section 2.2, 5.6"
```

```
    ::= { pmip6LmaLMAAEntry 2 }

pmip6LmaLMAAState  OBJECT-TYPE
    SYNTAX      INTEGER {
                            unknown(1),
                            activated(2),
                            tunneled(3)
                    }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object indicates the state of the LMAA:
            unknown     -- The state of the LMAA
                           cannot be determined.
            activated   -- The LMAA is ready to establish
                           tunnel
            tunneled    -- The LMAA is used to set up the
                           bi-directional tunnel.
        "
    ::= { pmip6LmaLMAAEntry 3 }



pmip6LmaMinDelayBeforeBCEDelete OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
     "This variable specifies the amount of time in
         milliseconds the local mobility anchor MUST wait before
         it deletes a Binding Cache entry of a mobile node, upon
         receiving a Proxy Binding Update message from a mobile
         access gateway with a lifetime value of 0.
         During this wait time, if the local mobility anchor
         receives a Proxy Binding Update for the same mobility
         binding, with lifetime value greater than 0, then it
         must update the binding cache entry with the accepted
         binding values. By the end of this wait-time, if the
         local mobility anchor did not receive any valid Proxy
         Binding Update message for that mobility binding, it
         MUST delete the Binding Cache entry. This delay
         essentially ensures a mobile node's Binding Cache entry
         is not deleted too quickly and allows some time for the
         new mobile access gateway to complete the signaling for
         the mobile node.
       The default value for this variable is 10000
         milliseconds.
        "
    REFERENCE
        "RFC 5213: Section 5.3.5, 9.1"
       ::= { pmip6LmaConf 1 }

pmip6LmaMaxDelayBeforeNewBCEAssign OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  read-write
```

```
        STATUS      current
        DESCRIPTION
            "This variable specifies the amount of time in
             milliseconds the local mobility anchor MUST wait for
             the de-registration message for an existing mobility
             session before it decides to create a new mobility
             session.
             The default value for this variable is 1500
             milliseconds. Note that there is a dependency between
             this value and the values used in the retransmission
             algorithm for Proxy Binding Updates. The retransmissions
             need to happen before MaxDelayBeforeNewBCEAssign runs
             out, as otherwise there are situations where a
             de-registration from a previous mobile access gateway
             may be lost, and the local mobility anchor creates
             needlessly a new mobility session and new prefixes for
             the mobile node.  This affects situations where there
             is no information from the lower layers about the type
             of a handoff or other parameters that can be used for
             identifying the mobility session, however.
            "
        REFERENCE
            "RFC 5213: Section 5.4.1.2, 5.4.1.3, 9.1"
           ::= { pmip6LmaConf 2 }

    pmip6LmaTimestampValidityWindow OBJECT-TYPE
        SYNTAX      Integer32 (1..65535)
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "This variable specifies the maximum amount of time
             difference in milliseconds between the timestamp in the
             received Proxy Binding Update message and the current
             time-of-day on the local mobility anchor, that is
             allowed by the local mobility anchor for the received
             message to be considered valid.
             The default value for this variable is 300 milliseconds.
             This variable must be adjusted to suit the deployments.
            "
        REFERENCE
            "RFC 5213: Section 5.5, 9.1"
           ::= { pmip6LmaConf 3 }

    pmip6LmaHomeNetworkPrefixTable   OBJECT-TYPE
         SYNTAX      SEQUENCE OF PMip6LmaHomeNetworkPrefixEntry
         MAX-ACCESS  not-accessible
         STATUS      current
         DESCRIPTION
             "A table representing the Home Network Prefixes
              assigned to the mobile node's connected interfaces.
              This table shows the prefixes registered in the
              binding cache entry.
             "
         REFERENCE
             "RFC 5213: Section 2, 5.1, 5.2"
```

```
     ::= { pmip6LmaConf 4 }

pmip6LmaHomeNetworkPrefixEntry OBJECT-TYPE
     SYNTAX      PMip6LmaHomeNetworkPrefixEntry
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
         "An entry in the Home Network Prefixes table.

          Implementers need to be aware that if the total
          number of octets in pmip6LmaHomeNetworkPrefix
          exceeds 114 then OIDs of column
          instances in this row will have more than 128
          sub-identifiers and cannot be accessed using
          SNMPv1, SNMPv2c, or SNMPv3.
         "
     INDEX  { pmip6BindingMnIdentifier,
              pmip6BindingMnLlIdentifier,
              pmip6LmaHomeNetworkPrefixType,
              pmip6LmaHomeNetworkPrefix }
     ::= { pmip6LmaHomeNetworkPrefixTable 1 }

PMip6LmaHomeNetworkPrefixEntry ::=
     SEQUENCE {
      pmip6LmaHomeNetworkPrefixType      InetAddressType,
      pmip6LmaHomeNetworkPrefix          InetAddress,
      pmip6LmaHomeNetworkPrefixLength    InetAddressPrefixLength,
      pmip6LmaHomeNetworkPrefixLifeTime  Gauge32
    }


pmip6LmaHomeNetworkPrefixType  OBJECT-TYPE
     SYNTAX      InetAddressType
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
         "The InetAddressType of the pmip6LmaHomeNetworkPrefix
          that follows.
         "
     ::= { pmip6LmaHomeNetworkPrefixEntry 1 }


pmip6LmaHomeNetworkPrefix   OBJECT-TYPE
     SYNTAX      InetAddress
     MAX-ACCESS  not-accessible
     STATUS      current
     DESCRIPTION
         "The mobile network prefix that is delegated to the
          mobile node. The type of the address represented by
          this object is specified by the corresponding
          pmip6LmaHomeNetworkPrefixType object.
         "
     REFERENCE
         "RFC 5213: Section 2"
```

```
        ::= { pmip6LmaHomeNetworkPrefixEntry 2 }


    pmip6LmaHomeNetworkPrefixLength   OBJECT-TYPE
        SYNTAX      InetAddressPrefixLength
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
                "The prefix length of the Home Network Prefix.
                "
        ::= { pmip6LmaHomeNetworkPrefixEntry 3 }

    pmip6LmaHomeNetworkPrefixLifeTime   OBJECT-TYPE
        SYNTAX      Gauge32
        UNITS       "seconds"
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
            "The lifetime (in seconds) granted to the mobile
             node for this registration.
            "
        REFERENCE
            "RFC 5213: Section 5.3"
        ::= { pmip6LmaHomeNetworkPrefixEntry 4 }


      --
      -- pmip6Notifications
      --
      --

      pmip6MagHomeTunnelEstablished NOTIFICATION-TYPE
          OBJECTS   {
                      pmip6MagBLTunnelIfIdentifier,
                    -- pmip6MagProxyCOAType,
                    -- pmip6MagProxyCOA
                       pmip6MagProxyCOAState
                     }
          STATUS    current
          DESCRIPTION
              "This notification is sent by the Proxy MobileIPv6
               entities every time the tunnel is established between
               the local mobility anchor and mobile access gateway.
              "
          REFERENCE
              "RFC 5213: Section 5.6.1"
              ::= { pmip6Notifications 1 }


      pmip6MagHomeTunnelReleased NOTIFICATION-TYPE
          OBJECTS {
                     pmip6MagBLTunnelIfIdentifier,
                   -- pmip6MagProxyCOAType,
                   -- pmip6MagProxyCOA
                      pmip6MagProxyCOAState
```

```
            }
    STATUS    current
    DESCRIPTION
        "This notification is sent by the Proxy MobileIPv6
         entities every time the tunnel between the local
         mobility anchor and mobile access gateway is released.
        "
    REFERENCE
        "RFC 5213: Section 5.6.1"
        ::= { pmip6Notifications 2}

pmip6LmaHomeTunnelEstablished NOTIFICATION-TYPE
    OBJECTS   {
                pmip6BindingTunnelIfIdentifier,
              -- pmip6LmaLMAAType,
              -- pmip6LmaLMAA,
                 pmip6LmaLMAAState
               }
    STATUS    current
    DESCRIPTION
        "This notification is sent by the Proxy MobileIPv6
         entities every time the tunnel is established between
         the local mobility anchor and mobile access gateway.
        "
    REFERENCE
        "RFC 5213: Section 5.6.1"
        ::= { pmip6Notifications 3 }


pmip6LmaHomeTunnelReleased NOTIFICATION-TYPE
    OBJECTS {
              pmip6BindingTunnelIfIdentifier,
            -- pmip6LmaLMAAType,
            -- pmip6LmaLMAA,
               pmip6LmaLMAAState
             }
    STATUS    current
    DESCRIPTION
        "This notification is sent by the Proxy MobileIPv6
         entities every time the tunnel between the local
         mobility anchor and mobile access gateway is released.
        "
    REFERENCE
        "RFC 5213: Section 5.6.1"
        ::= { pmip6Notifications 4}

 -- Conformance information
pmip6Groups      OBJECT IDENTIFIER ::= { pmip6Conformance 1 }
pmip6Compliances OBJECT IDENTIFIER ::= { pmip6Conformance 2 }


 -- Units of conformance
pmip6SystemGroup    OBJECT-GROUP
     OBJECTS {
         pmip6Capabilities,
```

```
            pmip6Status,
            pmip6MobileNodeGeneratedTimestampInUse,
            pmip6FixedMagLinkLocalAddressOnAllAccessLinksType,
            pmip6FixedMagLinkLocalAddressOnAllAccessLinks,
            pmip6FixedMagLinkLayerAddressOnAllAccessLinks

        }
        STATUS  current
        DESCRIPTION
            " A collection of objects for basic PMIPv6
              monitoring."
        ::= { pmip6Groups 1 }

    pmip6BindingCacheGroup    OBJECT-GROUP
        OBJECTS {
            pmip6BindingPBUFlag,
            pmip6BindingMnIdentifier,
            pmip6BindingMnLlIdentifier,
            pmip6BindingMagLinkLocalAddressType,
            pmip6BindingMagLinkLocalAddress,
            pmip6BindingTunnelIfIdentifier,
            pmip6BindingAccessTechnologyType,
            pmip6BindingTimeRecentlyAccepted
        }
        STATUS  current
        DESCRIPTION
            " A collection of objects for monitoring the
              PMIPv6 extensions of the Binding Cache."
        ::= { pmip6Groups 2 }

    pmip6StatsGroup    OBJECT-GROUP
        OBJECTS {
            pmip6MissingMnIdentifierOption,
            pmip6MagNotAuthorizedForProxyReg,
            pmip6NotLMAForThisMobileNode,
            pmip6ProxyRegNotEnabled,
            pmip6MissingHomeNetworkPrefixOption,
            pmip6MissingHandOffIndicatorOption,
            pmip6MissingAccessTechTypeOption,
            pmip6NotAuthorizedForHomeNetworkPrefix,
            pmip6TimestampMismatch,
            pmip6TimestampLowerThanPrevAccepted,
            pmip6BcePbuPrefixSetDoNotMatch,
            pmip6InitialBindingRegistrations,
            pmip6BindingLifeTimeExtensionNoHandOff,
            pmip6BindingLifeTimeExtensionAfterHandOff,
            pmip6BindingDeRegistrations,
            pmip6BindingBindingAcks,
            pmip6CounterDiscontinuityTime
        }
        STATUS  current
        DESCRIPTION
            " A collection of objects for basic PMIPv6
              statistics monitoring.
            "
```

```
     ::= { pmip6Groups 3 }

pmip6MagSystemGroup    OBJECT-GROUP
     OBJECTS {
   --  pmip6MagProxyCOAType,
   --  pmip6MagProxyCOA
       pmip6MagProxyCOAState
    }
     STATUS  current
     DESCRIPTION
         " A collection of objects for monitoring the
           PMIPv6 system related objects on a mobile router."
     ::= { pmip6Groups 4 }

pmip6MagConfigurationGroup    OBJECT-GROUP
     OBJECTS {
     --  pmip6MagHomeNetworkPrefixType,
     --  pmip6MagHomeNetworkPrefix,
         pmip6MagHomeNetworkPrefixLength,
         pmip6MagHomeNetworkPrefixLifeTime,
         pmip6MagEnableMagLocalRouting
    }
     STATUS  current
     DESCRIPTION
         " A collection of objects for monitoring the
           configuration related objects on a mobile access
           gateway.
         "
     ::= { pmip6Groups 5 }

pmip6MagRegistrationGroup    OBJECT-GROUP
     OBJECTS {
         pmip6MagBLFlag,
         pmip6MagBLMnIdentifier,
         pmip6MagBLlMnIdentifier,
         pmip6MagBLMagLinkLocalAddressType,
         pmip6MagBLMagLinkLocalAddress,
         pmip6MagBLMagIfIdentifierToMn,
         pmip6MagBLTunnelIfIdentifier,
         pmip6MagBLAccessTechnologyType,
         pmip6MagBLTimeRecentlyAccepted,
       -- pmip6MagMnIndex,
         pmip6MagMnIdentifier,
         pmip6MagMnLocalMobilityAnchorAddressType,
         pmip6MagMnLocalMobilityAnchorAddress
    }
     STATUS  current
     DESCRIPTION
         " A collection of objects for monitoring the
           registration related objects on a mobile access
           gateway.
         "
     ::= { pmip6Groups 6 }

pmip6LmaSystemGroup    OBJECT-GROUP
```

```
        OBJECTS {
            pmip6LmaLMAAState
        }
        STATUS  current
        DESCRIPTION
            " A collection of objects for monitoring the
              system related objects on a LMA."
        ::= { pmip6Groups 7 }

    pmip6LmaConfigurationGroup    OBJECT-GROUP
        OBJECTS {
            pmip6LmaMinDelayBeforeBCEDelete,
            pmip6LmaMaxDelayBeforeNewBCEAssign,
            pmip6LmaTimestampValidityWindow,
            pmip6LmaHomeNetworkPrefixLength,
            pmip6LmaHomeNetworkPrefixLifeTime
        }
        STATUS  current
        DESCRIPTION
            " A collection of objects for Monitoring the
              configuration related objects on a LMA."     -- Check
        ::= { pmip6Groups 8 }

     pmip6MagNotificationGroup   NOTIFICATION-GROUP
        NOTIFICATIONS {
                 pmip6MagHomeTunnelEstablished,
                 pmip6MagHomeTunnelReleased
        }
        STATUS  current
        DESCRIPTION
            "A collection of notifications from a home agent
             or correspondent node to the Manager about the
             tunnel status of the mobile router.
            "
        ::= { pmip6Groups 9 }

     pmip6LmaNotificationGroup   NOTIFICATION-GROUP
        NOTIFICATIONS {
                 pmip6LmaHomeTunnelEstablished,
                 pmip6LmaHomeTunnelReleased
        }
        STATUS  current
        DESCRIPTION
            "A collection of notifications from a home agent
             or correspondent node to the Manager about the
             tunnel status of the mobile router.
            "
        ::= { pmip6Groups 10 }


     -- Compliance statements
    pmip6CoreCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities
```

```
            which implement the MOBILEIPV6-MIB.
            There are a number of INDEX objects that cannot be
            represented in the form of OBJECT clauses in
            SMIv2, but for which there are compliance
            requirements, expressed in OBJECT clause form in
            this
            description:
            -- OBJECT      pmip6BindingHomeAddressType
            -- SYNTAX      InetAddressType { ipv6(2) }
            -- DESCRIPTION
            --   This MIB module requires support for global
            --   ipv6 addresses for the pmip6BindingHomeAddress
            --   object.
            --
            "
        MODULE  -- this module
            MANDATORY-GROUPS { pmip6SystemGroup
                             }
        ::= { pmip6Compliances 1 }

    pmip6Compliance2 MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities
            which implement the MOBILEIPV6-MIB.
            There are a number of INDEX objects that cannot be
            represented in the form of OBJECT clauses in
            SMIv2, but for which there are compliance
            requirements, expressed in OBJECT clause form in
            this description:

             -- OBJECT      mip6BindingHomeAddressType
             -- SYNTAX      InetAddressType { ipv6(2) }
             -- DESCRIPTION
             --     This MIB module requires support for global
             --     IPv6 addresses for the mip6BindingHomeAddress
             --     object.
             --
             -- OBJECT      mip6BindingHomeAddress
             -- SYNTAX      InetAddress (SIZE(16))
             -- DESCRIPTION
             --     This MIB module requires support for global
             --     IPv6 addresses for the mip6BindingHomeAddress
             --     object.
             --
            "
        MODULE  -- this module
            MANDATORY-GROUPS { pmip6SystemGroup,
                               pmip6BindingCacheGroup,
                               pmip6StatsGroup
                             }
        ::= { pmip6Compliances 2 }

    pmip6CoreReadOnlyCompliance MODULE-COMPLIANCE
        STATUS  current
```

```
        DESCRIPTION
            "The compliance statement for SNMP entities
             that implement the PMIPV6-MIB without support.
             for read-write (i.e., in read-only mode).
             "
        MODULE  -- this module
            MANDATORY-GROUPS { pmip6SystemGroup
                             }
        ::= { pmip6Compliances 3 }

    pmip6ReadOnlyCompliance2 MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities
             that implement the PMIPV6-MIB without support.
             for read-write (i.e., in read-only mode).

             There are a number of INDEX objects that cannot be
             represented in the form of OBJECT clauses in
             SMIv2, but for which there are compliance
             requirements, expressed in OBJECT clause form in
             this description:

              -- OBJECT      mip6BindingHomeAddressType
              -- SYNTAX      InetAddressType { ipv6(2) }
              -- DESCRIPTION
              --     This MIB module requires support for global
              --     IPv6 addresses for the mip6BindingHomeAddress
              --     object.
              --
              -- OBJECT      mip6BindingHomeAddress
              -- SYNTAX      InetAddress (SIZE(16))
              -- DESCRIPTION
              --     This MIB module requires support for global
              --     IPv6 addresses for the mip6BindingHomeAddress
              --     object.
              --
             "
        MODULE  -- this module
            MANDATORY-GROUPS { pmip6SystemGroup,
                               pmip6BindingCacheGroup
                             }
        ::= { pmip6Compliances 4 }

    pmip6MagCoreCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities
             which implement the PMIPV6-MIB.
             There are a number of INDEX objects that cannot be
             represented in the form of OBJECT clauses in
             SMIv2, but for which there are compliance
             requirements, expressed in OBJECT clause form in
             this description:
              -- OBJECT      pmip6MagProxyCOAType
```

```
            -- SYNTAX      InetAddressType { ipv6(2) }
            -- DESCRIPTION
            --     This MIB module requires support for global
            --     IPv6 addresses for the pmip6MagProxyCOA
            --     object.
            --
            -- OBJECT      pmip6MagProxyCOA
            -- SYNTAX      InetAddress (SIZE(16))
            -- DESCRIPTION
            --     This MIB module requires support for global
            --     IPv6 addresses for the pmip6MagProxyCOAType
            --     object.
            --
            -- OBJECT      pmip6MagHomeNetworkPrefixType
            -- SYNTAX      InetAddressType { ipv6(2) }
            -- DESCRIPTION
            --     This MIB module requires support for global
            --     IPv6 addresses for the pmip6MagHomeNetworkPrefix
            --     object.
            --
           "
     MODULE  -- this module
         MANDATORY-GROUPS { pmip6MagSystemGroup
                          }
     ::= { pmip6Compliances 5 }

pmip6MagCompliance2 MODULE-COMPLIANCE
     STATUS  current
     DESCRIPTION
         "The compliance statement for SNMP entities that
          implement the PMIPV6-MIB for monitoring configuration
          related information, registration details, and
          statistics on a mobile access gateway.

          There are a number of INDEX objects that cannot be
          represented in the form of OBJECT clauses in
          SMIv2, but for which there are compliance
          requirements, expressed in OBJECT clause form in
          this description:

            -- OBJECT      pmip6MagProxyCOAType
            -- SYNTAX      InetAddressType { ipv6(2) }
            -- DESCRIPTION
            --     This MIB module requires support for global
            --     IPv6 addresses for the pmip6MagProxyCOA
            --     object.
            --
            -- OBJECT      pmip6MagProxyCOA
            -- SYNTAX      InetAddress (SIZE(16))
            -- DESCRIPTION
            --     This MIB module requires support for global
            --     IPv6 addresses for the pmip6MagProxyCOAType
            --     object.
            --
            -- OBJECT      pmip6MagHomeNetworkPrefixType
```

```
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the pmip6MagHomeNetworkPrefix
                --     object.
                --
                -- OBJECT      pmip6MagHomeNetworkPrefix
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the pmip6MagHomeNetworkPrefix
                --     object.
                --

                -- OBJECT      mip6MnHomeAddressType
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnHomeAddress
                --     object.
                --
                -- OBJECT      mip6MnHomeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnHomeAddress
                --     object.
                --
                -- OBJECT      mip6MnBLNodeAddressType
                -- SYNTAX      InetAddressType { ipv6(2) }
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                --
                -- OBJECT      mip6MnBLNodeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
               "
          MODULE  -- this module
              MANDATORY-GROUPS { pmip6MagSystemGroup,
                                 pmip6MagConfigurationGroup,
                                 pmip6MagRegistrationGroup
                               }
          ::= { pmip6Compliances 6 }

     pmip6MagReadOnlyCompliance MODULE-COMPLIANCE
          STATUS  current
          DESCRIPTION
              "The compliance statement for SNMP entities that
               implement the PMIPV6-MIB without support for read-
               write (i.e., in read-only mode) and with support
```

```
for monitoring configuration related information,
registration details, and statistics on a mobile
access gateway.

There are a number of INDEX objects that cannot be
represented in the form of OBJECT clauses in
SMIv2, but for which there are compliance
requirements, expressed in OBJECT clause form in
this description:

 -- OBJECT      pmip6MagProxyCOAType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6MagProxyCOA
 --     object.
 --
 -- OBJECT      pmip6MagProxyCOA
 -- SYNTAX      InetAddress (SIZE(16))
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6MagProxyCOAType
 --     object.
 --
 -- OBJECT      pmip6MagHomeNetworkPrefixType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6MagHomeNetworkPrefix
 --     object.
 --
 -- OBJECT      pmip6MagHomeNetworkPrefix
 -- SYNTAX      InetAddress (SIZE(16))
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6MagHomeNetworkPrefix
 --     object.
 --

 -- OBJECT      mip6MnHomeAddressType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the mip6MnHomeAddress
 --     object.
 --
 -- OBJECT      mip6MnHomeAddress
 -- SYNTAX      InetAddress (SIZE(16))
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the mip6MnHomeAddress
 --     object.
 --
 -- OBJECT      mip6MnBLNodeAddressType
 -- SYNTAX      InetAddressType { ipv6(2) }
```

```
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                --
                -- OBJECT      mip6MnBLNodeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
               "
        MODULE  -- this module
            MANDATORY-GROUPS { pmip6MagSystemGroup,
                               pmip6MagConfigurationGroup,
                               pmip6MagRegistrationGroup
                             }
        ::= { pmip6Compliances 7 }


    pmip6LmaCoreCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities
             which implement the PMIPV6-MIB.
             There are a number of INDEX objects that cannot be
             represented in the form of OBJECT clauses in
             SMIv2, but for which there are compliance
             requirements, expressed in OBJECT clause form in
             this description:
              -- OBJECT      pmip6LmaLMAAType
              -- SYNTAX      InetAddressType { ipv6(2) }
              -- DESCRIPTION
              --     This MIB module requires support for global
              --     IPv6 addresses for the pmip6LmaLMAA
              --     object.
              --
              -- OBJECT      pmip6LmaLMAA
              -- SYNTAX      InetAddress (SIZE(16))
              -- DESCRIPTION
              --     This MIB module requires support for global
              --     IPv6 addresses for the pmip6LmaLMAA
              --     object.
              --
             "
        MODULE  -- this module
            MANDATORY-GROUPS { pmip6LmaSystemGroup
                             }
        ::= { pmip6Compliances 8 }

    pmip6LmaCompliance2 MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
            "The compliance statement for SNMP entities that
             implement the PMIPV6-MIB for monitoring configuration
```

```
related information, registration details, and statistics
on a mobile access gateway.

There are a number of INDEX objects that cannot be
represented in the form of OBJECT clauses in
SMIv2, but for which there are compliance
requirements, expressed in OBJECT clause form in
this description:

 -- OBJECT      pmip6LmaLMAAType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6LmaLMAA
 --     object.
 --
 -- OBJECT      pmip6LmaLMAA
 -- SYNTAX      InetAddress (SIZE(16))
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6LmaLMAA
 --     object.
 --
 -- OBJECT      pmip6LmaHomeNetworkPrefixType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6LmaHomeNetworkPrefix
 --     object.
 --
 -- OBJECT      pmip6LmaHomeNetworkPrefix
 -- SYNTAX      InetAddress (SIZE(16))
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the pmip6LmaHomeNetworkPrefix
 --     object.
 --

 -- OBJECT      mip6MnHomeAddressType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the mip6MnHomeAddress
 --     object.
 --
 -- OBJECT      mip6MnHomeAddress
 -- SYNTAX      InetAddress (SIZE(16))
 -- DESCRIPTION
 --     This MIB module requires support for global
 --     IPv6 addresses for the mip6MnHomeAddress
 --     object.
 --
 -- OBJECT      mip6MnBLNodeAddressType
 -- SYNTAX      InetAddressType { ipv6(2) }
 -- DESCRIPTION
```

```
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
                --
                -- OBJECT      mip6MnBLNodeAddress
                -- SYNTAX      InetAddress (SIZE(16))
                -- DESCRIPTION
                --     This MIB module requires support for global
                --     IPv6 addresses for the mip6MnBLNodeAddress
                --     object.
               "
          MODULE  -- this module
              MANDATORY-GROUPS { pmip6LmaSystemGroup,
                                 pmip6LmaConfigurationGroup
                               }
          ::= { pmip6Compliances 9 }

     pmip6MagNotificationCompliance MODULE-COMPLIANCE
          STATUS  current
          DESCRIPTION
                 "The compliance statement for SNMP entities that
                  implement the PMIPv6-MIB and support Notification
                  from the mobile access gateway.
                  "
          MODULE  -- this module
              MANDATORY-GROUPS { pmip6MagNotificationGroup
                               }
          ::= { pmip6Compliances 10 }

     pmip6LmaNotificationCompliance MODULE-COMPLIANCE
          STATUS  current
          DESCRIPTION
                 "The compliance statement for SNMP entities that
                  implement the PMIPv6-MIB and support Notification
                  from the LMA.
                  "
          MODULE  -- this module
              MANDATORY-GROUPS { pmip6LmaNotificationGroup
                               }
          ::= { pmip6Compliances 11 }

     END
```

6. Security Considerations

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write. 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. These are the tables and objects and the corresponding sensitivity/vulnerability:

nemoStatus: The value of this object is used to enable or disable the PMIPv6 functionality on a PMIPv6 entity. Access to this MO

may be abused to disrupt the communication that depends on PMIPv6.

pmip6MobileNodeGeneratedTimestampInUse :
pmip6FixedMagLinkLocalAddressOnAllAccessLinksType:
pmip6FixedMagLinkLocalAddressOnAllAccessLinks:
pmip6FixedMagLinkLayerAddressOnAllAccessLinks:
pmip6MagEnableMagLocalRouting:
pmip6MagHomeNetworkPrefixLifeTime:
pmip6LmaMinDelayBeforeBCEDelete:
pmip6LmaMaxDelayBeforeNewBCEAssign:
pmip6LmaTimestampValidityWindow:
pmip6LmaHomeNetworkPrefixLifeTime:
Access to the above MOs may be abused to misconfigure PMIPv6 entities and disrupt communications.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

pmip6LmaHomeNetworkPrefixType:
pmip6LmaHomeNetworkPrefix:
pmip6LmaHomeNetworkPrefixLength:
The above address-related objects may be considered to be particularly sensitive and/or private.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

7. IANA Considerations

IANA should assign a base arc in the 'mib-2' (standards track) OID tree for the 'pmip6MIB' MODULE-IDENTITY defined in the PMIPv6 MIB.

8. References

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9. Acknowledgments

The following groups and individuals have contributed to this draft with discussions and comments:
WIDE-netman group

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Changes since draft-ietf-netlmm-pmipv6-mib-00.txt
a. Addded appendix for change history
b. Changed MAX-ACCESS of pmip6MagHomeNetworkPrefixLifeTime
read-write -> read-only

第4章 Next Works

We are investigating the following issues.

a. Discovering configuration of mobile networks using the information in the MIP6-MIB and NEMO-MIB.
b. Collecting information from multiple devices on a mobile network — reliably and effeciently.

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