NETLMM Working Group
INTERNET-DRAFT
Intended Status: Proposed Standard
Expires: February 19, 2011

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August 20, 2010

Proxy Mobile IPv6 Management Information Base
<draft-ietf-netlmm-pmipv6-mib-03.txt>

Status of this Memo

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) and the local mobility anchor (LMA) functions of a Proxy Mobile IPv6 (PMIPv6) entity.

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1. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP).

Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

2. Overview

2.1. The Proxy Mobile IPv6 Protocol Entities

Proxy Mobile IPv6 (PMIPv6) [RFC5213] 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 signaling
- 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 PMIPV6-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. Objects belonging to this group will be implemented on the corresponding Proxy Mobile IPv6 entity. pmip6BindingCacheTable belongs to this group.
- pmip6Mag: this group models the mobile access gateway service. Objects belonging to this group will be implemented on the corresponding MAG. The tables belonging

to this group have the "pmip6Mag" prefix.
- pmip6Lma: this group models the local mobility anchor service. Objects belonging to this group will be implemented on the corresponding LMA. The tables belonging to this group have the "pmip6Lma" prefix.
- 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 interfaces of all mobile nodes attached to the MAG. Each interface is distinguished by the attached mobile node's identifier (MN-Identifier) and the link layer identifier (MN-LL-Identifier).
- 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 connected interfaces of the mobiles nodes anchored on an LMA.

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 "201008160000Z"        --  16th August, 2010
    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    "201008160000Z"      -- 16th August 2010
       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
       DISPLAY-HINT "255a"
       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 for predictably identifying
            a mobile node. Various forms of identifiers can be used to
            identify a mobile node (MN).  Two examples are a Network
            Access Identifier (NAI) [RFC4282] and an opaque identifier
            applicable to a particular application.
           "
       REFERENCE
           "RFC 4283: Section 3"
       SYNTAX  OCTET STRING (SIZE (0..255))

   Pmip6MNLlIdentifier ::=  TEXTUAL-CONVENTION
       DISPLAY-HINT "255a"
       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 8.6"
       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 that is currently attached to the PMIPv6-Domain
            by the management system.
```

```
            It is recommended that the 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,
             http://www.iana.org/assignments/mobility-parameters/
             mobility-parameters.txt"
        SYNTAX INTEGER
        {
                  reserved               (0),
                  logicalNetworkInterface(1),
                  pointToPointInterface  (2),
                  ethernet               (3),
                  wirelessLan            (4),
                  wimax                  (5),
                  threeGPPGERAN          (6),
                  threeGPPUTRAN          (7),
                  threeGPPETRAN          (8),
                  threeGPP2eHRPD         (9),
                  threeGPP2HRPD          (10),
                  threeGPP21xRTT         (11),
                  threeGPP2UMB           (12)
        }

          -- 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 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 that 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
                               a tunnel. This state SHOULD be
                               indicated when the MAG is up but has
                               no mobile node.
                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 connected interfaces of mobile nodes
              attached to the MAG.
             "
         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 parameter (in seconds) that will be
                 advertised in Router Advertisements by the MAG for
                 this Home Network Prefix.
                "
            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. In this case the remaining objects will
             not be accessible.
            "
        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 [RFC4283] 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 messages
                  rejected by the local mobility anchor with status
                  code in the Binding Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 Acknowledgement 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 length 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 a 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 that 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 length 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.  However, 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.
                "
            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 length 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 connected interfaces of all the
              mobile nodes anchored at the LMA.
             "
         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 an 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 an LMA."
        ::= { 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 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      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:

- pmip6Status: 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. Acknowledgements

The following groups and individuals have contributed to this draft with discussions and comments:

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Appendix. History of Changes

Changes since draft-ietf-netlmm-pmipv6-mib-00.txt
a. Fixed editorial nits, missing references

Changes since draft-ietf-netlmm-pmipv6-mib-00.txt
a. Added appendix for change history
b. Changed MAX-ACCESS of pmip6MagHomeNetworkPrefixLifeTime
read-write -> read-only
Changes since draft-ietf-netlmm-pmipv6-mib-02.txt
a. Fixed editorial nits.
b. Added DISPLAY-HINT, fixed DESCRIPTION and REFERENCE of
Pmip6MNLlIdentifier ::= TEXTUAL-CONVENTION
c. Fixed DESCRIPTION of
Pmip6MNIndex ::= TEXTUAL-CONVENTION
d. Fixed DESCRIPTION of
Pmip6PBUAccessTechnologyType ::= TEXTUAL-CONVENTION
e. Fixed DESCRIPTION of
pmip6MagProxyCOAState OBJECT-TYPE
pmip6MagHomeNetworkPrefixTable OBJECT-TYPE
pmip6MagHomeNetworkPrefixLifeTime OBJECT-TYPE
pmip6BindingPBUFlag OBJECT-TYPE
pmip6LmaMinDelayBeforeBCEDelete OBJECT-TYPE
pmip6LmaHomeNetworkPrefixTable OBJECT-TYPE
pmip6CoreCompliance MODULE-COMPLIANCE