Mobile IPv6 Management Information Base

Status of This Memo

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

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Abstract

This memo defines a portion of the Management Information Base (MIB), the Mobile-IPv6 MIB, for use with network management protocols in the Internet community. In particular, the Mobile-IPv6 MIB will be used to monitor and control the mobile node, home agent, and correspondent node functions of a Mobile IPv6 (MIPv6) 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 Mobile IPv6 Protocol Entities

Mobile IPv6 (MIPv6) [RFC3775] specifies a protocol that allows nodes to remain reachable while moving around in the IPv6 Internet. An entity that implements the MIPv6 protocol is a MIPv6 entity. There are three types of entities envisaged by the MIPv6 protocol.

mobile node (MN): A node that can change its point of attachment from one link to another, while still being reachable via its home address.

correspondent node (CN): A peer node with which a mobile node is communicating. The correspondent node may be either mobile or stationary. (Note that a correspondent node does not necessarily require MIPv6 support.)

home agent (HA): A router on a mobile node’s home link with which the mobile node has registered its current care-of address. While the mobile node is away from home, the home agent intercepts packets on the home link destined to the mobile node’s home address, encapsulates them, and routes them to the mobile node’s registered care-of address.

This document defines a set of managed objects (MOs) that can be used to monitor and control MIPv6 entities.
2.2. Terminology

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

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. Mobile IPv6 Monitoring and Control Requirements

For managing a MIPv6 entity it is necessary to monitor the following:

- capabilities of MIPv6 entities
- traffic due to MIPv6
- binding-related statistics (at home agent, correspondent node, and mobile node)
- binding details (at home agent and correspondent node)
- history of Binding Updates (at home agent, correspondent node, and mobile node)

The MIPv6 protocol document stipulates that several MIPv6-related parameters should be manually configurable. The MIPv6 MIB should define managed objects that can be used to configure the related parameters, for example:

- the preference value the home agent will use in Router Advertisements;
- the lifetime value the home agent will use in Router Advertisements;
- whether a home agent will send ICMP Mobile Prefix Advertisements to mobile nodes;
- whether a home agent will respond to ICMP Mobile Prefix Solicitation messages from mobile nodes; and
- whether a home agent will process multicast group membership control messages from mobile nodes.
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 envisaged that wherever possible existing MIBs will be used (e.g., IPSec MIB, Neighbor Discovery MIB, Tunnel MIB [RFC4087]) for monitor and control of MIPv6 entities.

It is assumed that the Mobile IPv6 Management Information Base (MOBILEIPV6-MIB) will always be implemented in conjunction with the IPv6-capable version of the IP-MIB [RFC4293]. The MOBILEIPV6-MIB uses the textual conventions defined in the INET-ADDRESS-MIB [RFC4001].

The Mobile-IPv6 MIB is composed of the following groups of definitions:

- **mip6Core**: a generic group containing objects that are common to all the Mobile IPv6 entities.
- **mip6Ha**: this group models the home agent service. It is composed of objects specific to the services and associated advertisement parameters offered by the home agent on each of its links. It also contains objects pertaining to the maintenance of the home agent list on each of the links on which the service is offered.
- **mip6Mn**: this group models the mobile node service. It is composed of objects specific to the Dynamic Home Agent discovery function and related parameters. It also contains objects that record the movement of the mobile node.
- **mip6Cn**: models the correspondent node and is primarily scoped to its participation in the Return Routability procedure for achieving Route Optimization triggered by the mobile node.
- **mip6Notifications**: defines the set of notifications that will be used to asynchronously monitor the Mobile IPv6 entities.

The tables contained in the above groups are as follows:

- **mip6BindingCacheTable**: models the binding cache on the home agent and correspondent node. It contains details of the Binding Update requests that have been received and accepted.
- **mip6BindingHistoryTable**: tracks the history of the binding cache.
- **mip6NodeTrafficTable**: the mobile node-wise traffic counters.
mip6MnHomeAddressTable : contains all the home addresses pertaining to the mobile node and the corresponding registration status.
mip6MnBLTable : models the Binding Update List on the mobile node. It contains information about the registration requests sent by the mobile node and the corresponding results.
mip6CnCounterTable : contains the mobile node-wise registration statistics.
mip6HaConfTable : contains the configurable advertisement parameters for all the interfaces on which the home agent service is advertised.
mip6HaCounterTable : contains registration statistics for all mobile nodes registered with the home agent.
mip6HaListTable : contains the list of all routers that are acting as home agents on each of the interfaces on which the home agent service is offered by this router.
mip6HaGlAddrTable : contains the global addresses of the home agents.
5. The Mobile-IPv6 MIB.

MOBILEIPV6-MIB DEFINITIONS ::= BEGIN
IMPORTS
  MODULE-IDENTITY, mib-2, Unsigned32, Integer32, Counter32,
  Gauge32, Counter64,
  OBJECT-TYPE, NOTIFICATION-TYPE
  FROM SNMPv2-SMI
  TEXTUAL-CONVENTION,
  TruthValue, DateAndTime, TimeStamp
  FROM SNMPv2-TC
  MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
  FROM SNMPv2-CONF
  InetAddressType, InetAddress
  FROM INET-ADDRESS-MIB
  ipv6InterfaceIfIndex
  FROM IP-MIB

mip6MIB MODULE-IDENTITY
  LAST-UPDATED "200602010000Z"        -- 1st February 2006
  ORGANIZATION "IETF mip6 Working Group"
  CONTACT-INFO
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DESCRIPTION
"The MIB module for monitoring Mobile-IPv6 entities.

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"

REVISION "200602010000Z" -- 1st February 2006
DESCRIPTION "Initial version, published as RFC 4295."

::= { mib-2 133 }

-- The major groups

mip6Notifications OBJECT IDENTIFIER ::= { mip6MIB 0 }
mip6Objects OBJECT IDENTIFIER ::= { mip6MIB 1 }
mip6Conformance OBJECT IDENTIFIER ::= { mip6MIB 2 }
mip6Core OBJECT IDENTIFIER ::= { mip6Objects 1 }
mip6Mn OBJECT IDENTIFIER ::= { mip6Objects 2 }
mip6Cn OBJECT IDENTIFIER ::= { mip6Objects 3 }
mip6Ha OBJECT IDENTIFIER ::= { mip6Objects 4 }

-- The sub groups

mip6System OBJECT IDENTIFIER ::= { mip6Core 1 }
mip6Bindings OBJECT IDENTIFIER ::= { mip6Core 2 }
mip6Stats OBJECT IDENTIFIER ::= { mip6Core 3 }
mip6MnSystem OBJECT IDENTIFIER ::= { mip6Mn 1 }
mip6MnConf OBJECT IDENTIFIER ::= { mip6Mn 2 }
mip6MnRegistration OBJECT IDENTIFIER ::= { mip6Mn 3 }
mip6CnSystem OBJECT IDENTIFIER ::= { mip6Cn 1 }
mip6CnStats OBJECT IDENTIFIER ::= { mip6Cn 2 }
mip6HaAdvertisement OBJECT IDENTIFIER ::= { mip6Ha 1 }
mip6HaStats OBJECT IDENTIFIER ::= { mip6Ha 2 }

-- Textual Conventions
Mip6BURequestRejectionCode ::= TEXTUAL-CONVENTION
  STATUS current
  DESCRIPTION "The value of the status field in the Binding
               Acknowledgment message when the Binding Update
               was rejected."
  REFERENCE "RFC 3775 : Section 6.1.8"
  SYNTAX INTEGER {
    reasonUnspecified              (1),  --(Code 128)
    admProhibited                  (2),  --(Code 129)
    insufficientResource           (3),  --(Code 130)
    homeRegistrationNotSupported   (4),  --(Code 131)
    notHomeSubnet                  (5),  --(Code 132)
    notHomeAgentForThisMobileNode  (6),  --(Code 133)
    duplicateAddressDetectionFailed (7),  --(Code 134)
    sequenceNumberOutOfWindow     (8),  --(Code 135)
    expiredHomeNonceIndex          (9),  --(Code 136)
    expiredCareofNonceIndex        (10), --(Code 137)
    expiredNonces                  (11), --(Code 138)
    registrationTypeChangeDisallowed(12)  --(Code 139)
}
mip6Capabilities OBJECT-TYPE
SYNTAX     BITS {
    mobileNode         (0),
    homeAgent          (1),
    correspondentNode  (2)
}
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "This object indicates the Mobile IPv6 functions that are supported by this managed entity. Multiple Mobile IPv6 functions may be supported by a single entity."
REFERENCE "RFC 3775 : Section 3.2, 4.1"
 ::= { mip6System 1 }

mip6Status OBJECT-TYPE
SYNTAX     INTEGER { enabled(1), disabled(2) }
MAX-ACCESS read-write
STATUS     current
DESCRIPTION "This object indicates whether the Mobile IPv6 function is enabled for the managed entity. If it is enabled, the agent discovery and registration functions will be operational.
Changing the status from enabled(1) to disabled(2) will terminate the agent discovery and registration functions. On the other hand, changing the status from disabled(2) to enabled(1) will start the agent discovery and registration functions.
The value of this object SHOULD remain unchanged across reboots of the managed entity."
 ::= { mip6System 2 }

-- mip6BindingCache
mip6BindingCacheTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Mip6BindingCacheEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"This table models the Binding Cache on the managed entity. The cache is maintained by home agents and correspondent nodes. It contains both correspondent registration entries and home registration entries.

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"
::= { mip6Bindings 1 }

mip6BindingCacheEntry OBJECT-TYPE
SYNTAX      Mip6BindingCacheEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"This entry represents a conceptual row in the binding cache table. It represents a single Binding Update.

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

INDEX  { mip6BindingHomeAddressType, mip6BindingHomeAddress }
::= { mip6BindingCacheTable 1 }
Mip6BindingCacheEntry ::= SEQUENCE {
    mip6BindingHomeAddressType InetAddressType,
    mip6BindingHomeAddress InetAddress,
    mip6BindingCOAType InetAddressType,
    mip6BindingCOA InetAddress,
    mip6BindingTimeRegistered DateAndTime,
    mip6BindingTime Granted Gauge32,
    mip6BindingTimeRemaining Gauge32,
    mip6BindingHomeRegn TruthValue,
    mip6BindingMaxSeq Unsigned32,
    mip6BindingUsageTS DateAndTime,
    mip6BindingUsageCount Gauge32,
    mip6BindingAdminStatus INTEGER
}

mip6BindingHomeAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The InetAddressType of the mip6BindingHomeAddress that follows."
::= { mip6BindingCacheEntry 1 }

mip6BindingHomeAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The home address of the mobile node corresponding to the Binding Cache entry. This field is used as the key for searching the mobile node's current care-of address in the Binding Cache."

The type of the address represented by this object is specified by the corresponding mip6BindingHomeAddressType object.

REFERENCE "RFC 3775 : Section 9.1"
::= { mip6BindingCacheEntry 2 }
mip6BindingCOAType OBJECT-TYPE
SYNTAX     InetAddressType
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The InetAddressType of the mip6BindingCOA that
follows.
"
::= { mip6BindingCacheEntry 3 }

mip6BindingCOA   OBJECT-TYPE
SYNTAX     InetAddress
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The care-of address of the mobile node indicated by
the home address field (mip6BindingHomeAddress) in
this Binding Cache entry.

The type of the address represented by this object
is specified by the corresponding mip6BindingCOAType
object.
"
REFERENCE
"RFC 3775 : Section 9.1"
::= { mip6BindingCacheEntry 4 }

mip6BindingTimeRegistered OBJECT-TYPE
SYNTAX     DateAndTime
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The timestamp when this Binding Cache entry was
created.
"
::= { mip6BindingCacheEntry 5 }

mip6BindingTimeGranted OBJECT-TYPE
SYNTAX     Gauge32
UNITS       "seconds"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The lifetime in seconds granted to the mobile node
for this registration.
"
::= { mip6BindingCacheEntry 6 }
mip6BindingTimeRemaining OBJECT-TYPE
SYNTAX Gauge32
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The lifetime in seconds remaining for this registration."
REFERENCE "RFC 3775 : Section 9.1"
::= { mip6BindingCacheEntry 7 }

mip6BindingHomeRegn OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This object indicates whether or not this Binding Cache entry is a home registration entry (applicable only on nodes that support home agent functionality)."
REFERENCE "RFC 3775 : Section 9.1"
::= { mip6BindingCacheEntry 8 }

mip6BindingMaxSeq OBJECT-TYPE
SYNTAX Unsigned32 (0..65536)
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The maximum value of the Sequence Number field received in previous Binding Updates for this home address (mip6BindingHomeAddress)."
REFERENCE "RFC 3775 : Section 9.1, 9.5.1"
::= { mip6BindingCacheEntry 9 }
mip6BindingUsageTS OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The timestamp when this entry was last looked up.
"
REFERENCE
 "RFC 3775 : Section 9.1"
 ::= { mip6BindingCacheEntry 10 }

mip6BindingUsageCount OBJECT-TYPE
SYNTAX      Gauge32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of times this entry was looked up.
"
REFERENCE
 "RFC 3775 : Section 9.1"
 ::= { mip6BindingCacheEntry 11 }

mip6BindingAdminStatus OBJECT-TYPE
SYNTAX      INTEGER {
           active     (1),
           inactive   (2)
           }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
 "This is an administrative object used to control
the status of a binding cache entry. By default
the value will be ‘active’(1).
A value of ‘inactive’(2) will indicate that the
validity of the entry is suspended. It does not
exist in the binding cache for all practical
purposes.
The state can be changed from ‘active’ to
‘inactive’ by operator intervention.
Causing the state to change to ‘inactive’ results
in the entry being deleted from the cache.
Attempts to change the status from ‘inactive’
to ‘active’ will be rejected.
"
REFERENCE
 "RFC 3775 : Section 9.1"
 ::= { mip6BindingCacheEntry 12 }
mip6BindingHistoryTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Mip6BindingHistoryEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "A table containing a record of the bindings."
 ::= { mip6Bindings 2 }

mip6BindingHistoryEntry OBJECT-TYPE
SYNTAX      Mip6BindingHistoryEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The record of a binding.

Implementors need to be aware that if the total number of octets in mip6BindingHstHomeAddress exceeds 112, then OIDs of column instances in this row will have more than 128 sub-identifiers and cannot be accessed using SNMPv1, SNMPv2c, or SNMPv3."

INDEX   { mip6BindingHstHomeAddressType, mip6BindingHstHomeAddress, mip6BindingHstIndex}
 ::= { mip6BindingHistoryTable 1 }
Mip6BindingHistoryEntry ::= SEQUENCE {
  mip6BindingHstHomeAddressType InetAddressType,
  mip6BindingHstHomeAddress InetAddress,
  mip6BindingHstIndex Unsigned32,
  mip6BindingHstCOAType InetAddressType,
  mip6BindingHstCOA InetAddress,
  mip6BindingHstTimeRegistered DateAndTime,
  mip6BindingHstTimeExpired DateAndTime,
  mip6BindingHstHomeRegn TruthValue,
  mip6BindingHstUsageTS DateAndTime,
  mip6BindingHstUsageCount Gauge32
}

mip6BindingHstHomeAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The InetAddressType of the
mip6BindingHstHomeAddress that follows.
"
::= { mip6BindingHistoryEntry 1 }

mip6BindingHstHomeAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "Mobile node’s home address.
The type of the address represented by this object is specified by the corresponding
mip6BindingHstHomeAddressType object."
::= { mip6BindingHistoryEntry 2 }

mip6BindingHstIndex OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The index to uniquely identify this record along with the mobile node’s HomeAddress type and HomeAddress. It should be monotonically increasing. It may wrap after reaching its max value."
::= { mip6BindingHistoryEntry 3 }
mip6BindingHstCOAType OBJECT-TYPE
SYNTAX     InetAddressType
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The InetAddressType of the mip6BindingHstCOA that follows.
"
 ::= { mip6BindingHistoryEntry 4 }

mip6BindingHstCOA OBJECT-TYPE
SYNTAX     InetAddress
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Mobile node’s care-of address. One mobile node can have multiple bindings with different care-of addresses. The type of the address represented by this object is specified by the corresponding mip6BindingHstCOAType object.
"
 ::= { mip6BindingHistoryEntry 5 }

mip6BindingHstTimeRegistered OBJECT-TYPE
SYNTAX     DateAndTime
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The timestamp when this Binding Cache entry was created.
"
 ::= { mip6BindingHistoryEntry 6 }

mip6BindingHstTimeExpired OBJECT-TYPE
SYNTAX     DateAndTime
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The timestamp when this Binding Cache entry expired.
"
 ::= { mip6BindingHistoryEntry 7 }
mip6BindingHstHomeRegn OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION "This object indicates whether or not this Binding
Cache entry is a home registration entry (applicable
only on nodes that support home agent
functionality)."
 ::= { mip6BindingHistoryEntry 8 }

mip6BindingHstUsageTS OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The timestamp when this entry was last looked up."
 ::= { mip6BindingHistoryEntry 9 }

mip6BindingHstUsageCount OBJECT-TYPE
SYNTAX Gauge32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of times this entry was looked up."
 ::= { mip6BindingHistoryEntry 10 }

-- mip6TrafficCounters
-- MIPv6 Traffic will be characterized by
-- IPv6 datagrams which satisfy at least one of the following
-- conditions
-- - the datagrams are tunneled to the mobile node by the HA
-- - the datagrams are reverse tunneled by the MN to the HA
-- - the datagrams have the Routing header type 2 set.
-- - the datagrams have the Home Address option set in the
--   Destination Option extension header
-- - the datagrams have the mobility header

mip6TotalTraffic OBJECT IDENTIFIER ::= { mip6Stats 1 }
-- REFERENCE
-- "RFC 3775 : Section 4.1, 6.3, 6.4"
mip6InOctets OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of octets in the MIPv6 datagrams received by the MIPv6 entity. This will include datagrams with the Mobility Header, the Home Address option in the Destination Option extension header (Next Header value = 60), or the type 2 Routing Header. It will also include the IPv6 datagrams that are reverse tunneled to a home agent from a mobile node’s home address.
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 mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6TotalTraffic 1 }

mip6HCInOctets OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of octets in the MIPv6 datagrams received by the MIPv6 entity. This will include datagrams with the Mobility Header, the Home Address option in the Destination Option extension header (Next Header value = 60), or the type 2 Routing Header. It will also include the IPv6 datagrams that are reverse tunneled to a home agent from a mobile node’s home address.
This object is a 64-bit version of mip6InOctets.
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 mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6TotalTraffic 2 }
mip6InPkts OBJECT-TYPE
  SYNTAX    Counter32
  MAX-ACCESS read-only
  STATUS    current
  DESCRIPTION
             "The number of MIPv6 datagrams received by the MIPv6 entity. This will include datagrams with the Mobility Header, the Home Address option in the Destination Option extension header (Next Header value = 60), or the type 2 Routing Header. It will also include the IPv6 datagrams that are reverse tunneled to a home agent from a mobile node’s home address. 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 mip6CounterDiscontinuityTime."

REFERENCE
             "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6TotalTraffic 3 }

mip6HCInPkts OBJECT-TYPE
  SYNTAX    Counter64
  MAX-ACCESS read-only
  STATUS    current
  DESCRIPTION
             "The number of MIPv6 datagrams received by the MIPv6 entity. This will include datagrams with the Mobility Header, the Home Address option in the Destination Option extension header (Next Header value = 60), or the type 2 Routing Header. It will also include the IPv6 datagrams that are reverse tunneled to a home agent from a mobile node’s home address. This object is a 64-bit version of mip6InPkts. 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 mip6CounterDiscontinuityTime."

REFERENCE
             "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6TotalTraffic 4 }
mip6OutOctets  OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The total number of octets in the MIPv6 datagrams
               sent by the MIPv6 entity. This will include
datagrams with the Mobility Header, the Home Address
option in the Destination Option extension header
(Next Header value = 60), or the type 2 Routing
Header. It will also include the IPv6 datagrams that
are reverse tunneled to a home agent from a mobile
node's home address.
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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6TotalTraffic 5 }

mip6HCOutOctets  OBJECT-TYPE
SYNTAX        Counter64
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The total number of octets in the MIPv6 datagrams
               sent by the MIPv6 entity. This will include
datagrams with the Mobility Header, the Home Address
option in the Destination Option extension header
(Next Header value = 60), or the type 2 Routing
Header. It will also include the IPv6 datagrams that
are reverse tunneled to a home agent from a mobile
node's home address.
This object is a 64-bit version of mip6OutOctets.
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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6TotalTraffic 6 }
mip6OutPkts OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of MIPv6 datagrams sent by the MIPv6 entity. This will include the datagrams with Mobility Header, the Home Address option in the Destination Option extension header (Next Header value = 60), or the type 2 Routing Header. It will also include the IPv6 datagrams that are reverse tunneled to a home agent from a mobile node’s home address.
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 mip6CounterDiscontinuityTime.
"
REFERENCE "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6TotalTraffic 7 }

mip6HCOutPkts OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The number of MIPv6 datagrams sent by the MIPv6 entity. This will include datagrams with the Mobility Header, the Home Address option in the Destination Option extension header (Next Header value = 60), or the type 2 Routing Header. It will also include the IPv6 datagrams that are reverse tunneled to a home agent from a mobile node’s home address.
This object is a 64-bit version of mip6OutPkts. 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 mip6CounterDiscontinuityTime.
"
REFERENCE "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6TotalTraffic 8 }
mip6CounterDiscontinuityTime 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 MIPv6 entities
    global counters, viz., counters with OID prefix
    'mip6TotalTraffic' or 'mip6CnGlobalStats' or
    'mip6HaGlobalStats' 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.
    "
  ::= { mip6TotalTraffic 9 }

-- mip6NodeTrafficCounters

mip6NodeTrafficTable OBJECT-TYPE
  SYNTAX      SEQUENCE OF Mip6NodeTrafficEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "A table containing MIPv6 traffic counters per mobile
    node."
  ::= { mip6Stats 2 }

mip6NodeTrafficEntry OBJECT-TYPE
  SYNTAX      Mip6NodeTrafficEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "The MIPv6 traffic statistics for a mobile node.
     
    Implementors need to be aware that if the total
    number of octets in mip6BindingHomeAddress
    exceeds 113, then OIDs of column
    instances in this row will have more than 128
    sub-identifiers and cannot be accessed using
    SNMPv1, SNMPv2c, or SNMPv3.
    "
  INDEX  { mip6BindingHomeAddressType, mip6BindingHomeAddress }
  ::= { mip6NodeTrafficTable 1 }
Mip6NodeTrafficEntry ::= 
  SEQUENCE {
    mip6NodeInOctets Counter32, 
mip6HCNodeInOctets  Counter64, 
mip6NodeInPkts Counter32, 
mip6HCNodeInPkts Counter64, 
mip6NodeOutOctets Counter32, 
mip6HCNodeOutOctets Counter64, 
mip6NodeOutPkts Counter32, 
mip6HCNodeOutPkts Counter64, 
mip6NodeCtrDiscontinuityTime TimeStamp
  }

mip6NodeInOctets OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The total number of octets in the MIPv6 datagrams received from the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the Home Address option in the Destination Option extension header (Next Header value = 60). It will also include the IPv6 datagrams that are reverse tunneled to a home agent from the mobile node's home address. 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 mip6NodeCtrDiscontinuityTime."

REFERENCE
  "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"

 ::= { mip6NodeTrafficEntry 1 }
mip6HCNodeInOctets  OBJECT-TYPE
SYNTAX        Counter64
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The total number of octets in the MIPv6 datagrams received from the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the Home Address option in the Destination Option extension header (Next Header value = 60). It will also include the IPv6 datagrams that are reverse tunneled to a home agent from the mobile node’s home address. This object is a 64-bit version of mip6NodeInOctets. 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 mip6NodeCtrDiscontinuityTime."

REFERENCE
   "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6NodeTrafficEntry 2 }

mip6NodeInPkts   OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The number of MIPv6 datagrams received from the mobile node by the MIPv6 entity. This will include the datagrams with the Mobility Header or the Home Address option in the Destination Option extension header (Next Header value = 60). It will also include the IPv6 datagrams that are reverse tunneled to a home agent from the mobile node’s home address. 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 mip6NodeCtrDiscontinuityTime."

REFERENCE
   "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6NodeTrafficEntry 3 }
mip6HCNodeInPkts  OBJECT-TYPE
SYNTAX        Counter64
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "The number of MIPv6 datagrams received from the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the Home Address option in the Destination Option extension header (Next Header value = 60). It will also include the IPv6 datagrams that are reverse tunneled to a home agent from the mobile node’s home address. This object is a 64-bit version of mip6NodeInPkts. 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 mip6NodeCtrDiscontinuityTime."

REFERENCE  "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6NodeTrafficEntry 4 }

mip6NodeOutOctets  OBJECT-TYPE
SYNTAX         Counter32
MAX-ACCESS     read-only
STATUS         current
DESCRIPTION    "The total number of octets in the MIPv6 datagrams sent to the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the type 2 Routing Header. It will also include the IPv6 datagrams that are tunneled by a home agent to the mobile node. 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 mip6NodeCtrDiscontinuityTime."

REFERENCE  "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6NodeTrafficEntry 5 }
mip6HCNodeOutOctets  OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The total number of octets in the MIPv6 datagrams sent to the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the type 2 Routing Header. It will also include the IPv6 datagrams that are tunneled by a home agent to the mobile node.
This object is a 64-bit version of mip6NodeOutOctets. 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 mip6NodeCtrDiscontinuityTime.
"
REFERENCE
 "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6NodeTrafficEntry 6 }

mip6NodeOutPkts    OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of MIPv6 datagrams sent to the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the type 2 Routing Header. It will also include the IPv6 datagrams that are tunneled by a home agent to the mobile node.
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 mip6NodeCtrDiscontinuityTime.
"
REFERENCE
 "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
 ::= { mip6NodeTrafficEntry 7 }
mip6HCNodeOutPkts OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The number of MIPv6 datagrams sent to the mobile node by the MIPv6 entity. This will include datagrams with the Mobility Header or the type 2 Routing Header. It will also include the IPv6 datagrams that are tunneled by a home agent to the mobile node. This object is a 64-bit version of mip6NodeOutOctets. 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 mip6NodeCtrDiscontinuityTime."

REFERENCE
 "RFC 3775 : Section 6.1, 6.3, 6.4, 10.4.5"
::= { mip6NodeTrafficEntry 8 }

mip6NodeCtrDiscontinuityTime OBJECT-TYPE
SYNTAX      TimeStamp
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The value of sysUpTime on the most recent occasion at which any one or more of the counters in this row suffered a discontinuity. The relevant counters are the specific instances of any Counter32 or Counter64 objects in this row. If no such discontinuities have occurred since the last re-initialization of the local management subsystem, then this object contains a zero value."
::= { mip6NodeTrafficEntry 9 }

-- mip6MnSystem Group

mip6MnHomeAddressTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Mip6MnHomeAddressEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "A table containing registration status for all the home addresses pertaining to the mobile node."
::= { mip6MnSystem 1 }
mip6MnHomeAddressEntry OBJECT-TYPE
SYNTAX Mip6MnHomeAddressEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The registration status for a home address.
Implementors need to be aware that if the total
number of octets in mip6MnHomeAddress
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   { mip6MnHomeAddressType, mip6MnHomeAddress }
::= { mip6MnHomeAddressTable 1 }

Mip6MnHomeAddressEntry ::= SEQUENCE {
   mip6MnHomeAddressType InetAddressType,
mip6MnHomeAddress InetAddress,
mip6MnHomeAddressState INTEGER
}

mip6MnHomeAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The InetAddressType of the mip6MnHomeAddress that
follows."
::= { mip6MnHomeAddressEntry 1 }
mip6MnHomeAddress OBJECT-TYPE
SYNTAX      InetAddress
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "A unicast routable address assigned to the mobile
 node.  This is used as the 'permanent address' of the
 mobile node in the sense that it remains unchanged
 regardless of the mobile node’s current point of
 attachment.  If mobile node doesn’t have a home
 address assigned yet, then this object will take the
default 'unspecified' value ::0.

The type of the address represented by this object
is specified by the corresponding
mip6MnHomeAddressType object."

REFERENCE
 "RFC 3775 : Section 3.2"
 ::= { mip6MnHomeAddressEntry 2 }

mip6MnHomeAddressState OBJECT-TYPE
SYNTAX      INTEGER {
    unknown(1),
    home(2),
    registered(3),
    pending(4),
    isolated(5)
}
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "This object indicates the state of the mobile node:
 unknown -- The state of the mobile node
cannot be determined.
 home    -- mobile node is on the home network.
 registered -- mobile node is on a foreign network
 and is registered with the home
 agent.
 pending  -- mobile node has sent registration
 request to the home agent and is
 waiting for the reply.
 isolated -- mobile node is isolated from network,
i.e., it is not in its home network,
it is not registered, and no
registration ack is pending.
"
 ::= { mip6MnHomeAddressEntry 3 }
-- Mobile Node Discovery and Advertisement Group Counters

mip6MnDiscoveryRequests OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of ICMP Dynamic Home Agent Address
Discovery Requests sent by the mobile node. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 10.5, 11.4.1"
::= { mip6MnConf 1 }

mip6MnDiscoveryReplies OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of ICMP Dynamic Home Agent Address
Discovery Replies received by the mobile node. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 10.5, 11.4.1"
::= { mip6MnConf 2 }
mip6MnDiscoveryTimeouts OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of ICMP Dynamic Home Agent Address
Discovery Requests that timed out.
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 10.5, 11.4.1, 12"
::= { mip6MnConf 3 }

mip6MnPrefixSolicitationsSent OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of ICMP Mobile Prefix Solicitations
sent by the mobile node.
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 10.5, 11.4.2"
::= { mip6MnConf 4 }
mip6MnPrefixAdvsRecd OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of ICMP Mobile Prefix Advertisements received by the mobile node. This will include the ICMP Mobile Prefix Advertisements that failed the validity checks. 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 mip6CounterDiscontinuityTime."
REFERENCE
"RFC 3775 : Section 10.6, 11.4.3"
::= { mip6MnConf 5 }

mip6MnPrefixAdvsIgnored OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Mobile Prefix Advertisements discarded by the validity check. 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 mip6CounterDiscontinuityTime."
REFERENCE
"RFC 3775 : Section 10.6, 11.4.3"
::= { mip6MnConf 6 }
mip6MnMovedToFN OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of times the mobile node has detected movement to a foreign network from another foreign network or from the home network, has reconstructed its care-of address and has initiated the care-of address registration process. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 11.5.1"
::= { mip6MnConf 7 }

mip6MnMovedToHN OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Number of times the mobile node has detected movement from a foreign network to its home network. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 11.5.4"
::= { mip6MnConf 8 }

-- Mobile Node Registration Group

-- Registration table of mobile node
mip6MnBLTable OBJECT-TYPE
SYNTAX      SEQUENCE OF Mip6MnBLEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "This table corresponds to the Binding Update List
 (BL) that is maintained by the mobile node. The list
 holds an item for every binding that the mobile node
 has established or is trying to establish. Both
 correspondent and home registrations are included in
 this table. Entries from the table are deleted as
 the lifetime of the binding expires.
"

REFERENCE
 "RFC 3775 : Section 4.5, 11.1"
 ::= { mip6MnRegistration 1 }

mip6MnBLEntry OBJECT-TYPE
SYNTAX      Mip6MnBLEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "Information about a Binding Update sent by the
 mobile node either to its home agent or to one of
 its correspondent nodes.

Implementors need to be aware that if the total
 number of octets in mip6MnHomeAddress and
 mip6MnBLNodeAddress exceeds 111, 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 { mip6MnHomeAddressType,
mip6MnHomeAddress,
mip6MnBLNodeAddressType,
mip6MnBLNodeAddress
 }
 ::= { mip6MnBLTable 1 }
Mip6MnBLEntry ::= SEQUENCE {
    mip6MnBLNodeAddressType   InetAddressType,
    mip6MnBLNodeAddress       InetAddress,
    mip6MnBLCOAType           InetAddressType,
    mip6MnBLCOA               InetAddress,
    mip6MnBLLifeTimeRequested Unsigned32,
    mip6MnBLLifeTimeGranted   Unsigned32,
    mip6MnBLMaxSeq            Unsigned32,
    mip6MnBLSentTime          DateAndTime,
    mip6MnBLAccepted          TruthValue,
    mip6MnBLAcceptedTime      DateAndTime,
    mip6MnBLRetransmissions   Gauge32,
    mip6MnBLDon'tSendBUFlag   TruthValue
}

mip6MnBLNodeAddressType OBJECT-TYPE
SYNTAX     InetAddressType
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
  "The InetAddressType of the mip6MnBLNodeAddress that follows.
"
 ::= { mip6MnBLEntry 1 }

mip6MnBLNodeAddress OBJECT-TYPE
SYNTAX     InetAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
  "The address of the agent as used in the destination
  address of the Binding Update. The agent
  may be a home agent or a correspondent node.

  The type of the address represented by this object
  is specified by the corresponding
  mip6MnBLNodeAddressType object.
"
REFERENCE
  "RFC 3775 : Section 11.1"
 ::= { mip6MnBLEntry 2 }
mip6MnBLCOAType  OBJECT-TYPE  
SYNTAX        InetAddressType  
MAX-ACCESS    read-only  
STATUS        current  
DESCRIPTION    "The InetAddressType of the mip6MnBLCOA that follows."
::= { mip6MnBLEntry 3 }

mip6MnBLCOA  OBJECT-TYPE  
SYNTAX        InetAddress  
MAX-ACCESS    read-only  
STATUS        current  
DESCRIPTION    "Care-of address that the mobile node intends to register in the Binding Update request. The type of the address represented by this object is specified by the corresponding mip6MnBLCOAType object."
::= { mip6MnBLEntry 4 }

mip6MnBLLifeTimeRequested  OBJECT-TYPE  
SYNTAX        Unsigned32  
UNITS         "seconds"  
MAX-ACCESS    read-only  
STATUS        current  
DESCRIPTION    "The lifetime requested by the mobile node (in seconds) in the Binding Update."
::= { mip6MnBLEntry 5 }
mip6MnBLLifeTimeGranted OBJECT-TYPE
SYNTAX     Unsigned32
UNITS      "seconds"
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The lifetime granted to the mobile node for this binding. This field will be inaccessible if the Binding Update request has not been accepted. The lifetime remaining (lR) can be calculated using the current time (cT), mip6MnBLAcceptedTime (aT) and mip6MnBLLifeTimeGranted (lG) as follows:
\[ lR = lG - (cT - aT) \]
When lR is zero, this entry will be deleted from the Binding Update List and consequently from this table.
"
::= { mip6MnBLEntry 6 }

mip6MnBLMaxSeq OBJECT-TYPE
SYNTAX     Unsigned32 (0..65536)
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The maximum value of the Sequence Number field sent in previous Binding Updates to this destination.
"
REFERENCE
"RFC 3775 : Section 11.1"
::= { mip6MnBLEntry 7 }

mip6MnBLTimeSent OBJECT-TYPE
SYNTAX     DateAndTime
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The time when the last (re-)transmission occurred."
REFERENCE
"RFC 3775 : Section 11.1"
::= { mip6MnBLEntry 8 }
mip6MnBLAccepted OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "true(1) if the mobile node has received a
  binding acknowledgment indicating that service has
  been accepted (status code 0 or 1); false(2)
  otherwise. false(2) implies that the registration
  is still pending.
  "
 ::= { mip6MnBLEntry 9 }

mip6MnBLAcceptedTime OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The time at which the mobile node receives a binding
  acknowledgment indicating that Binding Update has
  been accepted (status code 0 or 1);
  This object will be inaccessible if the Binding
  Update request is still pending.
  "
 ::= { mip6MnBLEntry 10 }

mip6MnBLRetransmissions OBJECT-TYPE
SYNTAX      Gauge32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The number of Binding Update retransmissions.
  "
REFERENCE
  "RFC 3775 : Section 11.1"
 ::= { mip6MnBLEntry 11 }
mip6MnBLDontSendBUFlag OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION "true(1) indicates that future binding updates will not be sent to mip6MnBLNodeAddress. false(2) implies that binding updates will be sent to mip6MnBLNodeAddress. The mobile node sets this flag in the when it receives an ICMP Parameter Problem, Code 1, error message in response to a return routability message or Binding Update sent to mip6MnBLNodeAddress."

REFERENCE "RFC 3775 : Section 11.1"
 ::= { mip6MnBLEntry 12 }

-- Mobile Node Registration Group Counters
mip6MnRegnCounters OBJECT IDENTIFIER ::= { mip6MnRegistration 2 }

mip6MnMobilityMessagesSent OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The total number of mobility messages, i.e., IPv6 datagrams with Mobility Header, sent by the mobile node. There are 3 types of mobility messages, viz., Home Test Init, Care-of Test Init, and Binding Updates, that are sent by mobile nodes. 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 mip6CounterDiscontinuityTime."

REFERENCE "RFC 3775 : Section 4.2, 6.1"
 ::= { mip6MnRegnCounters 1 }
mip6MnMobilityMessagesRecd OBJECT-TYPE
SYNTAX       Counter32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"The total number of mobility messages, i.e., IPv6
datagrams with Mobility Header, received by the
mobile node. There are 5 types of mobility
messages, viz., Home Test, Care-of Test, Binding
Acknowledgment, Binding Refresh Request, and Binding
Error, that are sent to mobile nodes.
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 4.2, 6.1"
::= { mip6MnRegnCounters 2 }

mip6MnBUstoHA  OBJECT-TYPE
SYNTAX       Counter32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"Total number of Binding Updates sent to the mobile
node's home agent(s).
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 11.7.1"
::= { mip6MnRegnCounters 3 }
mip6MnBUAcksFromHA  OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of valid binding acknowledgments received from the mobile node’s home agent(s). 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 mip6CounterDiscontinuityTime."

REFERENCE     "RFC 3775 : Section 11.7.3"
::= {  mip6MnRegnCounters 4 }

mip6MnBUsToCN OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of Binding Updates sent to correspondent nodes by the mobile node. 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 mip6CounterDiscontinuityTime."

REFERENCE     "RFC 3775 : Section 11.7.2"
::= {  mip6MnRegnCounters 5 }

mip6MnBUAcksFromCN OBJECT-TYPE
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of valid Binding Update acks received from all the correspondent nodes. 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 mip6CounterDiscontinuityTime."

REFERENCE     "RFC 3775 : Section 11.7.3"
::= {  mip6MnRegnCounters 6 }
mip6MnBindingErrorsFromCN OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Error messages received by mobile node from CN. 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 mip6CounterDiscontinuityTime."
::= {mip6MnRegnCounters 7}

mip6MnICMPErrorsRecd OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of ICMP Error messages of type ICMP Parameter Problem, Code 1 or Code 2, received by the mobile node from a correspondent node in response to a return routability procedure, a Binding Update, or a packet with the Home Address option. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 11.3.5"
::= {mip6MnRegnCounters 8}
mip6MnBRRequestsRecd OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The total number of Binding Refresh requests received by the mobile node from correspondent nodes. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 11.7.4"
 ::= { mip6MnRegnCounters 9 }

-- Registration Group counters used for Correspondent Node
mip6CnGlobalStats OBJECT IDENTIFIER ::= { mip6CnStats 1 }
mip6CnHomeTestInitsRecd OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Home Test Init messages received. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 9.4.1"
 ::= { mip6CnGlobalStats 1 }
mip6CnHomeTestsSent OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Home Test messages sent. If a Home Test Init message is found to be valid, a Home Test message will be generated and sent. Otherwise the Home Test message is silently discarded. 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 mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 9.4.3"
::= { mip6CnGlobalStats 2 }

mip6CnCareOfTestInitsRecd OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Care-of Test Init messages received."

REFERENCE
"RFC 3775 : Section 9.4.2"
::= { mip6CnGlobalStats 3 }

mip6CnCareOfTestsSent OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Care-of Test messages sent. If a Care-of Test Init message is found to be valid, a Care-of Test message will be generated and sent. Otherwise the Care-of Test message is silently discarded. 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 mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 9.4.4"
::= { mip6CnGlobalStats 4 }
mip6CnBUsRecd       OBJECT-TYPE
SYNTAX            Counter32
MAX-ACCESS        read-only
STATUS            current
DESCRIPTION
"Total number of Binding Updates received by the
correspondent node from mobile nodes.
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 9.5.1"
 ::= { mip6CnGlobalStats 5 }

mip6CnBUAcksSent    OBJECT-TYPE
SYNTAX            Counter32
MAX-ACCESS        read-only
STATUS            current
DESCRIPTION
"Total number of acknowledgments sent by the
correspondent node for the Binding Updates received.
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 9.5.4"
 ::= { mip6CnGlobalStats 6 }

mip6CnBRsSent       OBJECT-TYPE
SYNTAX            Counter32
MAX-ACCESS        read-only
STATUS            current
DESCRIPTION
"Total number of Binding Refresh Request messages
sent by the correspondent node.
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 9.5.5"
 ::= { mip6CnGlobalStats 7 }
mip6CnBindingErrors OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Error messages sent by the correspondent node to the mobile node. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 9.3.3"
::= { mip6CnGlobalStats 8 }

mip6CnBUsAccepted OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Updates accepted by the correspondent node. If a Binding Acknowledgment message is sent for the Binding Update request, the Status code field in the message will have a value less than 128. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 9.5.1, 9.5.4"
::= { mip6CnGlobalStats 9 }
mip6CnBUUsRejected OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Update requests rejected by the correspondent node. If a Binding Acknowledgment message has been sent for the Binding Update request, the Status code field in the message will have a value greater than or equal to 128. Otherwise the Binding Update request will be silently discarded. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 9.5.1, 9.5.4"
::= { mip6CnGlobalStats 10 }

mip6CnReasonUnspecified OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Update requests rejected by the correspondent node with status code in the Binding Acknowledgment message indicating 'reason unspecified' (Code 128). 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 6.1.8"
::= { mip6CnGlobalStats 11 }
mip6CnInsufficientResource OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by
the correspondent node with status code in the
Binding Acknowledgment message indicating
‘insufficient resources’ (Code 130).
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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1.8"
::= { mip6CnGlobalStats 12 }

mip6CnHomeRegnNotSupported OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by
correspondent node with status code in the Binding
Acknowledgment message indicating ‘home registration
not supported’ (Code 131).
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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6CnGlobalStats 13 }
mip6CnSeqNumberOutOfWindow OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Updates rejected by correspondent node with status code in the Binding Acknowledgment message indicating 'sequence number out of window' (Code 135). 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 mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 6.1.8, 9.5.1"
::= { mip6CnGlobalStats 14 }

mip6CnExpiredHomeNonceIndex OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of Binding Updates rejected by correspondent node with status code in the Binding Acknowledgment message indicating 'expired home nonce index' (Code 136). 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 mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 6.1.8, 9.5.1"
::= { mip6CnGlobalStats 15 }
mip6CnExpiredCareOfNonceIndex OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of Binding Updates rejected by correspondent node with status code in the Binding Acknowledgment message indicating 'expired care-of nonce index' (Code 137). 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 mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1.8, 9.5.1"
::= { mip6CnGlobalStats 16 }

mip6CnExpiredNonce OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of Binding Updates rejected by correspondent node with status code in the Binding Acknowledgment message indicating 'expired nonces' (Code 138), i.e., the correspondent node no longer recognizes the Home Nonce Index value and the Care-of Nonce Index value. 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 mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 6.1.8, 9.5.1"
::= { mip6CnGlobalStats 17 }
mip6CnRegTypeChangeDisallowed OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The total number of Binding Updates rejected by correspondent node with status code in the Binding Acknowledgment message indicating 'registration type change disallowed' (Code 139), i.e., a binding already exists for the given home address and the home registration flag has a different value than the Home Registration (H) bit in the Binding Update. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 6.1.8, 9.5.1"
 ::= { mip6CnGlobalStats 18 }

-- The Correspondent Node statistics by mobile node
mip6CnCounterTable OBJECT-TYPE
SYNTAX SEQUENCE OF Mip6CnCounterEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "A table containing each mobile ."
 ::= { mip6CnStats 2 }
mip6CnCounterEntry OBJECT-TYPE
SYNTAX Mip6CnCounterEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The set of correspondent node counters for a mobile node.
Implementors need to be aware that if the total number of octets in mip6BindingHomeAddress exceeds 113, then OIDs of column instances in this row will have more than 128 sub-identifiers and cannot be accessed using SNMPv1, SNMPv2c, or SNMPv3."
INDEX { mip6BindingHomeAddressType, mip6BindingHomeAddress }
::= { mip6CnCounterTable 1 }
Mip6CnCounterEntry ::= SEQUENCE {
mip6CnBURequestsAccepted Counter32,
mip6CnBURequestsRejected Counter32,
mip6CnBCEntryCreationTime DateAndTime,
mip6CnBUAcceptedTime DateAndTime,
mip6CnBURejectionTime DateAndTime,
mip6CnBURejectionCode Mip6BURequestRejectionCode,
mip6CnCtrDiscontinuityTime TimeStamp
}
mip6CnBURequestsAccepted OBJECT-TYPE --(Code 0,1)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Update requests from the mobile node accepted by the correspondent node. If Binding Acknowledgment messages are sent, then the status code in the message will have a value less than 128. 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 mip6CnCtrDiscontinuityTime."
::= { mip6CnCounterEntry 1 }
mip6CnBURequestsRejected OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests from the mobile node that have been rejected by the correspondent node. This includes the Binding Update requests for which a Binding Acknowledgment message has been sent with status code value greater than or equal to 128 and the Binding Acknowledgment requests that have been silently discarded. 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 mip6CnCtrDiscontinuityTime."

::= { mip6CnCounterEntry 2 }

mip6CnBCEntryCreationTime OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time when the current Binding Cache entry was created for the mobile node."

::= { mip6CnCounterEntry 3 }

mip6CnBUAcceptedTime OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time at which the last Binding Update was accepted by the correspondent node and the corresponding Binding Cache entry was updated."

::= { mip6CnCounterEntry 4 }
mip6CnBURejectionTime OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The time at which the last Binding Update message was rejected by the correspondent node. If there have been no rejections, then this object will be inaccessible."
::= { mip6CnCounterEntry 5 }

mip6CnBURejectionCode OBJECT-TYPE
SYNTAX Mip6BURequestRejectionCode
MAX-ACCESS read-only
STATUS current
DESCRIPTION "If a Binding Acknowledgment is sent to the mobile node, this is the status code (> 128) that is returned in the Binding Acknowledgment. In case a Binding Acknowledgment is not sent to the mobile node, then this will be the value of the Status code that corresponds to the reason of the rejection. If there have been no rejections, then this object will be inaccessible."
REFERENCE "RFC 3775 : Section 6.1.8"
::= { mip6CnCounterEntry 6 }

mip6CnCtrDiscontinuityTime 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 counters in this row, viz., instances of ‘mip6CnBURequestsAccepted’ and ‘mip6CnBURequestsRejected’, 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."
::= { mip6CnCounterEntry 7 }

-- Home agent group
mip6HaAdvsRecd OBJECT-TYPE
SYNTAX       Counter32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"Total number of valid Router Advertisements received with the Home Agent (H) bit set, on all the links on which it is serving as a Home Agent. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of mip6CounterDiscontinuityTime."

REFERENCE  
"RFC 3775 : Section 7"
::= { mip6HaAdvertisement 1 }

mip6HaAdvsSent OBJECT-TYPE
SYNTAX       Counter32
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"Total number of unsolicited multicast Router Advertisements sent with the Home Agent (H) bit set, on all the links on which the router is serving as a Home Agent. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of mip6CounterDiscontinuityTime."

REFERENCE  
"RFC 3775 : Section 7"
::= { mip6HaAdvertisement 2 }

mip6HaConfTable OBJECT-TYPE
SYNTAX       SEQUENCE OF Mip6HaConfEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  
"A table containing configurable advertisement parameters for all interfaces on which the home agent service is advertised. It is RECOMMENDED that the last written values of the objects in the conceptual rows of this
table will remain unchanged across reboots of the managed entity provided that the interfaces have not been renumbered after the reboot.

::= { mip6HaAdvertisement 3 }

mip6HaConfEntry OBJECT-TYPE
SYNTAX     Mip6HaConfEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
"Advertisement parameters for an interface. The instances of the columnar objects in this entry pertain to the interface that is uniquely identified by the ipv6InterfaceIfIndex of the interface. The same ipv6InterfaceIfIndex object is used to uniquely identify instances of the columnar objects of this conceptual row."

INDEX   { ipv6InterfaceIfIndex }
 ::= { mip6HaConfTable 1 }

Mip6HaConfEntry ::= SEQUENCE {
mip6HaAdvPreference               Integer32,
mip6HaAdvLifetime                 Integer32,
mip6HaPrefixAdv                   INTEGER,
mip6HaPrefixSolicitation          INTEGER,
mip6HaMCastCtlMsgSupport          INTEGER
}

mip6HaAdvPreference OBJECT-TYPE
SYNTAX     Integer32 (0..65536)
MAX-ACCESS read-write
STATUS      current
DESCRIPTION
"The preference value for the home agent to be used in the Router Advertisements. Higher value denotes greater preference."

REFERENCE
"RFC 3775 : Section 7.4, 8.4"
 ::= { mip6HaConfEntry 1 }
mip6HaAdvLifetime  OBJECT-TYPE
SYNTAX      Integer32 (1..65535)
UNITS       "seconds"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
   "The lifetime value for the home agent to be
   used in the Router Advertisements."
REFERENCE
   "RFC 3775 : Section 7.4"
 ::= { mip6HaConfEntry 2 }

mip6HaPrefixAdv  OBJECT-TYPE
SYNTAX      INTEGER { enabled(1), disabled(2) }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
   "Indicates whether the home agent should support
   sending of the ICMP Mobile Prefix Advertisements.
   If it is disabled(2), the home agent will not
   send ICMP Mobile Prefix Advertisements to the
   mobile nodes.
   The state can be changed from enabled(1) to
   disabled(2) and vice versa by operator
   intervention.
   Causing the state to change from enabled(1) to
   disabled(2) will result in the home agent
   disabling the Prefix advertisement function.
   On the other hand, changing the status from
   disabled(2) to enabled(1) will start the prefix
   advertisement function."
REFERENCE
   "RFC 3775 : Section 8.4"
 ::= { mip6HaConfEntry 3 }
mip6HaPrefixSolicitation OBJECT-TYPE
SYNTAX      INTEGER { enabled(1), disabled(2) }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "Indicates whether the home agent should respond to ICMP Mobile Prefix Solicitation messages it receives from the mobile nodes. By default, the value will be set to enabled(1). If it is disabled(2), the home agent will not respond to any ICMP Mobile Prefix Solicitation messages. The state can be changed from enabled(1) to disabled(2), by operator intervention. Causing the state to change from enabled(1) to disabled(2) will result in the home agent not responding to any ICMP Mobile Prefix Solicitation messages it receives from the mobile nodes."
REFERENCE   "RFC 3775 : Section 8.4"
::= { mip6HaConfEntry 4}

mip6HaMCastCtlMsgSupport OBJECT-TYPE
SYNTAX      INTEGER { enabled(1), disabled(2) }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "Indicates whether the home agent should enable support for the processing of the multicast group membership control messages it receives from the mobile nodes. By default, the value will be set to enabled(1). If it is disabled(2), the home agent will not process any multicast group control messages it receives from the mobile nodes. The state can be changed from enabled(1) to disabled(2), by operator intervention. Causing the state to change from enabled(1) to disabled(2) will result in the home agent disabling the processing of the multicast group control messages it received from the mobile nodes."
REFERENCE   "RFC 3775 : Section 10.4.3"
::= { mip6HaConfEntry 5}
-- Registration Group counters HA

mip6HaGlobalStats OBJECT IDENTIFIER ::= { mip6HaStats 1 }

mip6HaHomeTestInitsRecd OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Home Test Init messages received by
the home agent. This will include Home Test Init
messages that failed the validity checks.
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
mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 5.2.5"
::= { mip6HaGlobalStats 1 }

mip6HaHomeTestsSent OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Home Test messages sent by the
home agent.
Discontinuities in the value of this counter can
occur at re-initialization of the management system,
and at other times as indicated by the value of
mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 5.2.5"
::= { mip6HaGlobalStats 2 }
mip6HaBUsRecd  OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Total number of Binding Updates received by the
home agent. Discontinuities in the value of this counter can
occur at re-initialization of the management system,
and at other times as indicated by the value of
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 3 }

mip6HaBUAcksSent  OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Total number of Binding Acknowledgments sent
by the home agent. Discontinuities in the value of this counter can
occur at re-initialization of the management system,
and at other times as indicated by the value of
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 4 }

mip6HaBRAdviceSent  OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"Total number of Binding Acknowledgments sent
by the home agent with Binding Refresh Advice
mobility option included. 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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 5 }
mip6HaBUsAccepted OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Total number of Binding Updates accepted by this HA. Binding Acknowledgment with status code of 0 or 1. 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 6 }

mip6HaPrefDiscoverReqd OBJECT-TYPE -- (Code 1)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The total number of Binding Acknowledgments sent by the home agent with status code indicating ‘accepted but prefix discovery necessary’ (Code 1). 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 mip6CounterDiscontinuityTime."
REFERENCE "RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 7 }
mip6HaReasonUnspecified OBJECT-TYPE -- (Code 128)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'reason
unspecified' (Code 128).
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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 8 }

mip6HaAdmProhibited OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'administratively
prohibited' (Code 129).
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
mip6CounterDiscontinuityTime."

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 9 }
mip6HaInsufficientResource OBJECT-TYPE  -- (Code 130)
SYNTAX          Counter32
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION
"Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'insufficient
resources' (Code 130). 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 mip6CounterDiscontinuityTime.
"

REFERENCE
"RFC 3775 : Section 9.5.2"
::= { mip6HaGlobalStats 10 }

mip6HaHomeRegnNotSupported OBJECT-TYPE     -- (Code 131)
SYNTAX           Counter32
MAX-ACCESS       read-only
STATUS           current
DESCRIPTION
"Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'home
registration not supported' (Code 131). 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 mip6CounterDiscontinuityTime.
"

REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 11 }
mip6HaNotHomeSubnet OBJECT-TYPE -- (Code 132)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'not home subnet'
(Code 132).
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 12 }

mip6HaNotHomeAgentForThisMN OBJECT-TYPE -- (Code 133)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'not home agent
for this mobile node' (Code 133).
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
mip6CounterDiscontinuityTime.
"
REFERENCE
"RFC 3775 : Section 10.3.2"
::= { mip6HaGlobalStats 13 }
mip6HaDupAddrDetectionFailed OBJECT-TYPE -- (Code 134)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by the home agent with status code in the Binding Acknowledgment message indicating 'Duplicate Address Detection failed' (Code 134). 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 mip6CounterDiscontinuityTime."
REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6HaGlobalStats 14 }

mip6HaSeqNumberOutOfWindow OBJECT-TYPE -- (Code 135)
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of Binding Update requests rejected by the home agent with status code in the Binding Acknowledgment message indicating 'sequence number out of window' (Code 135). 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 mip6CounterDiscontinuityTime."
REFERENCE
"RFC 3775 : Section 9.5.1"
::= { mip6HaGlobalStats 15 }
mip6HaExpiredHomeNonceIndex OBJECT-TYPE -- (Code 136)
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'expired home
nonce index' (Code 136). 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
mip6CounterDiscontinuityTime.
"
REFERENCE     "RFC 3775 : Section 9.5.1"
::= { mip6HaGlobalStats 16 }

mip6HaRegTypeChangeDisallowed OBJECT-TYPE -- (Code 139)
SYNTAX        Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "Total number of Binding Update requests rejected by
the home agent with status code in the Binding
Acknowledgment message indicating 'registration
type change disallowed' (Code 139), i.e., a binding
already exists for the given home address and the
home registration flag has a different value than
the Home Registration (H) bit in the Binding Update.
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
mip6CounterDiscontinuityTime.
"
REFERENCE     "RFC 3775 : Section 9.5.1"
::= { mip6HaGlobalStats 17 }

-- Home agent registration Counters per node
mip6HaCounterTable OBJECT-TYPE
SYNTAX            SEQUENCE OF Mip6HaCounterEntry
MAX-ACCESS        not-accessible
STATUS            current
DESCRIPTION       "A table containing registration statistics for all mobile nodes registered with the home agent.
"
::= { mip6HaStats 2 }

mip6HaCounterEntry OBJECT-TYPE
SYNTAX            Mip6HaCounterEntry
MAX-ACCESS        not-accessible
STATUS            current
DESCRIPTION       "Home agent registration statistics for a mobile node.

Implementors need to be aware that if the total number of octets in mip6BindingHomeAddress exceeds 113, then OIDs of column instances in this row will have more than 128 sub-identifiers and cannot be accessed using SNMPv1, SNMPv2c, or SNMPv3.
"
INDEX    { mip6BindingHomeAddressType,
mip6BindingHomeAddress
}
::= { mip6HaCounterTable 1 }

Mip6HaCounterEntry ::= SEQUENCE {
mip6HaBURequestsAccepted Counter32,
mip6HaBURequestsDenied Counter32,
mip6HaBCEntryCreationTime DateAndTime,
mip6HaBUAcceptedTime DateAndTime,
mip6HaBURejectionTime DateAndTime,
mip6HaRecentBURejectionCode Mip6BURequestRejectionCode,
mip6HaCtrDiscontinuityTime TimeStamp
}
mip6HaBURequestsAccepted OBJECT-TYPE
SYNTAX          Counter32
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION     "Total number of service requests for the mobile node accepted by the home agent. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of mip6HaCtrDiscontinuityTime."
::= { mip6HaCounterEntry 1 }

mip6HaBURequestsDenied   OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "Total number of service requests for the mobile node rejected by the home agent. Discontinuities in the value of this counter can occur at re-initialization of the management system, and at other times as indicated by the value of mip6HaCtrDiscontinuityTime."
::= { mip6HaCounterEntry 2 }

mip6HaBCEntryCreationTime   OBJECT-TYPE
SYNTAX      DateAndTime
UNITS       "seconds"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "The time when the current Binding Cache entry was created for the mobile node."
::= { mip6HaCounterEntry 3 }

mip6HaBUAcceptedTime  OBJECT-TYPE
SYNTAX          DateAndTime
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION     "The time at which the last Binding Update was accepted by the home agent for this mobile node."
::= { mip6HaCounterEntry 4 }
mip6HaBURejectionTime  OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time at which the last Binding Update was rejected by the home agent for this mobile node.
If there have been no rejections, then this object will be inaccessible."
 ::= { mip6HaCounterEntry 5 }

mip6HaRecentBURejectionCode  OBJECT-TYPE
SYNTAX Mip6BURequestRejectionCode
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"If a Binding Acknowledgment is sent to the mobile node, this is the status code (> 128) that is returned in the Binding Acknowledgment.
In case a Binding Acknowledgment is not sent to the mobile node, then this will be the value of the status code that corresponds to the reason of the rejection.
If there have been no rejections, then this object will be inaccessible."
 ::= { mip6HaCounterEntry 6 }

mip6HaCtrDiscontinuityTime  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 counters in this row, viz., instances of 'mip6HaBURequestsAccepted' and 'mip6HaBURequestsRejected', 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."
 ::= { mip6HaCounterEntry 7 }

--- Home Agent List Table
mip6HaListTable OBJECT-TYPE
SYNTAX SEQUENCE OF Mip6HaListEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "This table models the Home Agents List that contains
the list of all routers that are acting as home
agents on each of the interfaces on which the home
agent service is offered by this router."

REFERENCE "RFC 3775 : Section 10.1"
 ::= { mip6HaAdvertisement 4 }

mip6HaListEntry OBJECT-TYPE
SYNTAX Mip6HaListEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "Information about a router that is offering home
agent service.
The instances of the columnar objects in this entry
pertain to an interface for a particular value of
mip6HaLinkLocalAddressType and
mip6HaLinkLocalAddress. The interface is uniquely
identified by its ipv6InterfaceIfIndex. The same
ipv6InterfaceIfIndex object is used in conjunction
with the mip6HaLinkLocalAddressType and
mip6HaLinkLocalAddress to uniquely identify
instances of the columnar objects of this row.

Implementors need to be aware that if the total
number of octets in mip6HaLinkLocalAddress
exceeds 112, then OIDs of column instances in
this row will have more than 128 sub-identifiers and
cannot be accessed using SNMPv1, SNMPv2c, or SNMPv3.

INDEX { ipv6InterfaceIfIndex, mip6HaLinkLocalAddressType,
mip6HaLinkLocalAddress }
 ::= { mip6HaListTable 1 }

Mip6HaListEntry ::= SEQUENCE {
mip6HaLinkLocalAddressType InetAddressType,
mip6HaLinkLocalAddress InetAddress,
mip6HaPreference Integer32,
mip6HaRecvLifeTime Gauge32,
mip6HaRecvTimeStamp DateAndTime }
mip6HaLinkLocalAddressType  OBJECT-TYPE
SYNTAX     InetAddressType
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The address type for the link-local address
    of the home agent that follows.
"
REFERENCE
"RFC 3775 : Section 10.1"
::= { mip6HaListEntry 1 }

mip6HaLinkLocalAddress  OBJECT-TYPE
SYNTAX     InetAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The link local address of the home agent.

    The type of the address represented by this object
    is specified by the corresponding
    mip6HaLinkLocalAddressType object.
"
REFERENCE
"RFC 3775 : Section 10.1"
::= { mip6HaListEntry 2 }

mip6HaPreference   OBJECT-TYPE
SYNTAX     Integer32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The preference value of this home agent.
    Higher values indicate a more preferable home
    agent. The preference value is obtained from
    the preference field of the received Router
    Advertisement.
"
REFERENCE
"RFC 3775 : Section 10.1"
::= { mip6HaListEntry 3 }
mip6HaRecvLifeTime OBJECT-TYPE
SYNTAX Gauge32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The lifetime for this home agent."
REFERENCE "RFC 3775 : Section 10.1"
::= { mip6HaListEntry 4 }

mip6HaRecvTimeStamp OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The time when the home agent advertisement was received."
::= { mip6HaListEntry 5 }

--
-- The list of global addresses of a home agent in the
-- home agent list
--

mip6HaGlAddrTable OBJECT-TYPE
SYNTAX SEQUENCE OF Mip6HaGlAddrEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "This table contains the global addresses of the home agents in the Home Agents List."
REFERENCE "RFC 3775 : Section 10.1"
::= { mip6HaAdvertisement 5 }
mip6HaGlAddrEntry  OBJECT-TYPE
SYNTAX         Mip6HaGlAddrEntry
MAX-ACCESS     not-accessible
STATUS         current
DESCRIPTION "A global address for a home agent in the Home Agents List.
The instances of the columnar objects in this entry pertain to an interface for a particular value of mip6HaLinkLocalAddressType, mip6HaLinkLocalAddress and mip6HaGaAddrSeqNo.
The mip6HaGaAddrSeqNo object is used to distinguish between multiple instances of the home agent global addresses on the same interface for the same set of mip6HaLinkLocalAddressType, mip6HaLinkLocalAddress, values.
There is no upper-bound on the maximum number of global addresses on an interface but, for practical purposes, the upper-bound of the value mip6HaGaAddrSeqNo is set to 1024.
The interface is uniquely identified by its ipv6InterfaceIfIndex. The same ipv6InterfaceIfIndex object is used in conjunction with the mip6HaLinkLocalAddressType, mip6HaLinkLocalAddress, and mip6HaGaAddrSeqNo to uniquely identify instances of the columnar objects of this row.
Implementors need to be aware that if the total number of octets in mip6HaLinkLocalAddress exceeds 111, 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   { ipv6InterfaceIfIndex,   mip6HaLinkLocalAddressType, mip6HaLinkLocalAddress, mip6HaGaAddrSeqNo }
 ::= { mip6HaGlAddrTable 1 }

Mip6HaGlAddrEntry :::= SEQUENCE {
mip6HaGaAddrSeqNo               Integer32,
mip6HaGaGlobalAddressType      InetAddressType,
mip6HaGaGlobalAddress          InetAddress
}
mip6HaGaAddrSeqNo OBJECT-TYPE
SYNTAX Integer32 (1..1024)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The index that along with ipv6InterfaceIfIndex,
mip6HaLinkLocalAddressType, and
mip6HaLinkLocalAddress uniquely identifies this row."
REFERENCE "RFC 3775 : Section 10.1"
::= { mip6HaGlAddrEntry 1 }

mip6HaGaGlobalAddressType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The address type for the global address of the
home agent that follows."
::= { mip6HaGlAddrEntry 2 }

mip6HaGaGlobalAddress OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION "A global address of the home agent.
The type of the address represented by this object
is specified by the corresponding
mip6HaGaGlobalAddressType object."
::= { mip6HaGlAddrEntry 3 }

--
-- Notifications
--
mip6MnRegistered NOTIFICATION-TYPE
OBJECTS   {
    mip6BindingTimeRegistered,
mip6BindingCOAType,
mip6BindingCOA
}
STATUS    current
DESCRIPTION
"This notification is sent by a home agent when
a mobile node registers with the home agent
for the first time.
Notifications will not be sent for subsequent
updates and/or refreshes.
The MO instances in the notifications will be
identified by the mip6BindingHomeAddressType
and mip6BindingHomeAddress for the mobile node
in the mip6BindingCacheTable.
"
REFERENCE
"RFC 3775 : Section 10.3.1"
::= { mip6Notifications 1 }

mip6MnDeRegistered NOTIFICATION-TYPE
OBJECTS   {
    mip6BindingTimeRegistered,
mip6BindingCOAType,
mip6BindingCOA
}
STATUS    current
DESCRIPTION
"This notification is sent by a home agent every
time a mobile node de-registers with the home
agent by sending a Binding Update that requests
the home agent to delete a binding.
The MO instances in the notifications will be
identified by the mip6BindingHomeAddressType
and mip6BindingHomeAddress for the mobile node
in the mip6BindingCacheTable.
"
REFERENCE
"RFC 3775 : Section 10.3.2"
::= { mip6Notifications 2 }
mip6MnCOAChanged NOTIFICATION-TYPE

OBJECTS {  
mip6BindingTimeRegistered,  
mip6BindingCOAType,  
mip6BindingCOA  
}

STATUS current

DESCRIPTION

"This notification is sent by a home agent every time a mobile node sends a Binding Update with a new care-of address (for an existing Binding Cache entry). Notifications will not be sent for subsequent updates and/or refreshes for the same Care-of address. The registration of a new care-of address may indicate that the mobile node has moved or that the primary care-of address of the mobile node has become deprecated. The MO instances in the notifications will be identified by the mip6BindingHomeAddressType and mip6BindingHomeAddress for the mobile node in the mip6BindingCacheTable."

REFERENCE

"RFC 3775 : Section 11.5.2, 11.7.1"

::= { mip6Notifications 3 }

mip6MnBindingExpiredAtHA NOTIFICATION-TYPE

OBJECTS {  
mip6BindingTimeRegistered,  
mip6BindingCOAType,  
mip6BindingCOA  
}

STATUS current

DESCRIPTION

"This notification is sent by a home agent when a binding for the mobile node at the home agent expired (no timely Binding Updates were received). The MO instances in the notifications will be identified by the mip6BindingHomeAddressType and mip6BindingHomeAddress for the mobile node in the mip6BindingCacheTable."

REFERENCE

"RFC 3775 : Section 10.3.2"

::= { mip6Notifications 4 }
mip6MnBindingExpiredAtCN NOTIFICATION-TYPE
OBJECTS   {
    mip6BindingTimeRegistered,
    mip6BindingCOAType,
    mip6BindingCOA
 }
STATUS   current
DESCRIPTION
"This notification is sent by a correspondent node when a binding for the mobile node at the correspondent node expired (no timely Binding Updates were received). The MO instances in the notifications will be identified by the mip6BindingHomeAddressType and mip6BindingHomeAddress for the mobile node in the mip6BindingCacheTable.
"
::= { mip6Notifications 5 }
-- Conformance information
mip6Groups OBJECT IDENTIFIER ::= { mip6Conformance 1 }
mip6Compliances OBJECT IDENTIFIER ::= { mip6Conformance 2 }

-- Units of conformance
mip6SystemGroup OBJECT-GROUP
OBJECTS {
  mip6Capabilities,
  mip6Status
}
STATUS current
DESCRIPTION
"A collection of objects for basic MIPv6 monitoring."
::= { mip6Groups 1 }

mip6BindingCacheGroup OBJECT-GROUP
OBJECTS {
  mip6BindingCOAType,
  mip6BindingCOA,
  mip6BindingTimeRegistered,
  mip6BindingTimeGranted,
  mip6BindingTimeRemaining,
  mip6BindingMaxSeq,
  mip6BindingHomeRegn,
  mip6BindingUsageTS,
  mip6BindingUsageCount,
  mip6BindingAdminStatus
}
STATUS current
DESCRIPTION
"A collection of objects for monitoring the Binding Cache."
::= { mip6Groups 2 }
mip6BindingHstGroup OBJECT-GROUP
   OBJECTS {
      mip6BindingHstCOAType,
      mip6BindingHstCOA,
      mip6BindingHstTimeRegistered,
      mip6BindingHstTimeExpired,
      mip6BindingHstHomeRegn,
      mip6BindingHstUsageTS,
      mip6BindingHstUsageCount
   }
   STATUS current
   DESCRIPTION
   " A collection of objects for monitoring the Binding History. This can be used to monitor the movement of the mobile node."
   ::= { mip6Groups 3 }

mip6TotalTrafficGroup OBJECT-GROUP
   OBJECTS {
      mip6InOctets,
      mip6HCInOctets,
      mip6InPkts,
      mip6HCInPkts,
      mip6OutOctets,
      mip6HCOutOctets,
      mip6OutPkts,
      mip6HCOutPkts,
      mip6CounterDiscontinuityTime
   }
   STATUS current
   DESCRIPTION
   " A collection of objects for monitoring the total MIPv6 traffic."
   ::= { mip6Groups 4 }
mip6NodeTrafficGroup OBJECT-GROUP
OBJECTS {
  mip6NodeInOctets,
  mip6HCNodeInOctets,
  mip6NodeInPkts,
  mip6HCNodeInPkts,
  mip6NodeOutOctets,
  mip6HCNodeOutOctets,
  mip6NodeOutPkts,
  mip6HCNodeOutPkts,
  mip6NodeCtrDiscontinuityTime
}
STATUS current
DESCRIPTION
"A collection of objects for monitoring the MIPv6 traffic due to a mobile node.
"
::= { mip6Groups 5 }

mip6MnSystemGroup OBJECT-GROUP
OBJECTS {
  mip6MnHomeAddressState
}
STATUS current
DESCRIPTION
"A collection of objects for basic monitoring of the mobile node.
"
::= { mip6Groups 6 }

mip6MnConfGroup OBJECT-GROUP
OBJECTS {
  mip6MnDiscoveryRequests,
  mip6MnDiscoveryReplies,
  mip6MnDiscoveryTimeouts,
  mip6MnPrefixSolicitationsSent,
  mip6MnPrefixAdvsRecd,
  mip6MnPrefixAdvsIgnored,
  mip6MnMovedToFN,
  mip6MnMovedToHN
}
STATUS current
DESCRIPTION
"A collection of objects for monitoring the advertisement-related info on the mobile node.
"
::= { mip6Groups 7 }
mip6MnRegistrationGroup  OBJECT-GROUP
   OBJECTS {
      mip6MnBLCOAType,
      mip6MnBLCOA,
      mip6MnBLLifeTimeRequested,
      mip6MnBLLifeTimeGranted,
      mip6MnBLMaxSeq,
      mip6MnBLTimeSent,
      mip6MnBLAccepted,
      mip6MnBLAcceptedTime,
      mip6MnBLRetransmissions,
      mip6MnBLDontSendBUFlag,
      -- Binding Update List
      --
      mip6MnMobilityMessagesSent,
      mip6MnMobilityMessagesRecd,
      mip6MnBUstoHA,
      mip6MnBUAcksFromHA,
      mip6MnBUstoCN,
      mip6MnBUAcksFromCN,
      mip6MnBindingErrorsFromCN,
      mip6MnICMPErrorsRecd,
      mip6MnBRRequestsRecd
   }
   STATUS current
   DESCRIPTION
      " A collection of objects for monitoring
      the registration statistics for the mobile node."
   ::= { mip6Groups 8 }
mip6CnStatsGroup OBJECT-GROUP
OBJECTS {
mip6CnBURequestsAccepted, 
mip6CnBURequestsRejected, 
mip6CnBCEntryCreationTime, 
mip6CnBUAcceptedTime, 
mip6CnBURejectionTime, 
mip6CnBURejectionCode, 
mip6CnCtrDiscontinuityTime
}
STATUS current
DESCRIPTION "A collection of objects for monitoring the control messages and corresponding statistics for each mobile node communicating with the correspondent node."
::= { mip6Groups 9 }

mip6HaSystemGroup OBJECT-GROUP
OBJECTS {
mip6HaAdvsRecd, 
mip6HaAdvsSent, 
mip6HaAdvPreference, 
mip6HaAdvLifetime, 
mip6HaPrefixAdv, 
mip6HaPrefixSolicitation, 
mip6HaMCastCtlMsgSupport
}
STATUS current
DESCRIPTION "A collection of objects for monitoring the advertisement-related parameters and statistics for the home agent."
::= { mip6Groups 10 }
mip6HaListGroup   OBJECT-GROUP
   OBJECTS {
      mip6HaPreference,
      mip6HaRecvLifeTime,
      mip6HaRecvTimeStamp,
      mip6HaGaGlobalAddressType,
      mip6HaGaGlobalAddress
   }
   STATUS  current
   DESCRIPTION
      " A collection of objects for monitoring
          the Home Agent List on the home agent."
   ::= { mip6Groups 11 }

mip6HaStatsGroup   OBJECT-GROUP
   OBJECTS {
      mip6HaBURequestsAccepted,
      mip6HaBURequestsDenied,
      mip6HaBCEntryCreationTime,
      mip6HaBUAcceptedTime,
      mip6HaBURejectionTime,
      mip6HaRecentBURejectionCode,
      mip6HaCtrDiscontinuityTime
   }
   STATUS  current
   DESCRIPTION
      " A collection of objects for monitoring
          registration-related statistics on the home agent."
   ::= { mip6Groups 12 }
mip6CnGlobalStatsGroup OBJECT-GROUP
OBJECTS {
mip6CnHomeTestInitsRecd,  
mip6CnHomeTestsSent,  
mip6CnCareOfTestInitsRecd, 
mip6CnCareOfTestsSent, 
mip6CnBUsRecd,  
mip6CnBUAcksSent, 
mip6CnBRsSent, 
mip6CnBindingErrors,  
mip6CnBUsAccepted,  
mip6CnBUsRejected, 
mip6CnReasonUnspecified, 
mip6CnInsufficientResource, 
mip6CnHomeRegnNotSupported, 
mip6CnSeqNumberOutOfWindow, 
mip6CnExpiredHomeNonceIndex, 
mip6CnExpiredCareOfNonceIndex, 
mip6CnExpiredNonce, 
mip6CnRegTypeChangeDisallowed
}

STATUS current
DESCRIPTION
" A collection of objects for monitoring advertisement and registration statistics on a correspondent node."
::= { mip6Groups 13 }
mip6HaGlobalStatsGroup OBJECT-GROUP
OBJECTS {
    mip6HaHomeTestInitsRecd,
    mip6HaHomeTestsSent,
    mip6HaBUsRecd,
    mip6HaBUAcksSent,
    mip6HaBRAckSent,
    mip6HaBUUsAccepted,
    mip6HaPrefDiscoverReqd,
    mip6HaReasonUnspecified,
    mip6HaAdmProhibited,
    mip6HaInsufficientResource,
    mip6HaHomeRegnNotSupported,
    mip6HaNotHomeSubnet,
    mip6HaNotHomeAgentForThisMN,
    mip6HaDupAddrDetectionFailed,
    mip6HaSeqNumberOutOfRange,
    mip6HaExpiredHomeNonceIndex,
    mip6HaRegTypeChangeDisallowed
}

}  STATUS  current
DESCRIPTION "A collection of objects for monitoring
advertisement and registration statistics on
a home agent."
::= { mip6Groups 14 }

mip6BindingCacheCtlGroup OBJECT-GROUP
OBJECTS {
    mip6BindingAdminStatus
}

}  STATUS  current
DESCRIPTION "A collection of objects for controlling the
Binding Cache."
::= { mip6Groups 15 }
mip6NotificationGroup NOTIFICATION-GROUP
NOTIFICATIONS {
   mip6MnRegistered,
   mip6MnDeRegistered,
   mip6MnCOAChanged,
   mip6MnBindingExpiredAtHA,
   mip6MnBindingExpiredAtCN
}
STATUS current
DESCRIPTION
"A collection of notifications from a home agent or correspondent node to the Manager about the status of a mobile node."
::= { mip6Groups 16 }

-- Compliance statements
mip6CoreCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB.
"
MODULE -- this module
MANDATORY-GROUPS { mip6SystemGroup }
::= { mip6Compliances 1 }

mip6Compliance2 MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB and support
monitoring of the Binding Cache and the Total
Traffic.
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 { mip6SystemGroup,
mip6BindingCacheGroup,
mip6TotalTrafficGroup
}
::= { mip6Compliances 2 }
mip6Compliance3 MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB and
support monitoring of the Binding Cache,
the Binding History, the total traffic, and
the mobile node-wide traffic.
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.
--
-- OBJECT mip6BindingHstHomeAddressType
-- SYNTAX InetAddressType { ipv6(2) }
-- DESCRIPTION
-- This MIB module requires support for global
-- ipv6 addresses for the
-- mip6BindingHstHomeAddress object.
--
-- OBJECT mip6BindingHstHomeAddress
-- SYNTAX InetAddress (SIZE(16))
-- DESCRIPTION
-- This MIB module requires support for global
-- ipv6 addresses for the
-- mip6BindingHstHomeAddress object.
--"

MODULE -- this module
MANDATORY-GROUPS { mip6SystemGroup,
                   mip6BindingCacheGroup,
                   mip6BindingHstGroup,
                   mip6TotalTrafficGroup,
                   mip6NodeTrafficGroup
                  }
::= { mip6Compliances 3 }

mip6CoreReadOnlyCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION "The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB without support for read-write (i.e., in read-only mode)."

MODULE -- this module
MANDATORY-GROUPS { mip6SystemGroup }

OBJECT   mip6Status
MIN-ACCESS read-only
DESCRIPTION "Write access is not required."

::= { mip6Compliances 4 }

mip6ReadOnlyCompliance2 MODULE-COMPLIANCE
STATUS current
DESCRIPTION "The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB without support for read-write (i.e., in read-only mode) and support monitoring of the Binding Cache and Total Traffic. 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 { mip6SystemGroup,  
mip6BindingCacheGroup,  
mip6TotalTrafficGroup  
}

OBJECT      mip6Status  
MIN-ACCESS  read-only  
DESCRIPTION    "Write access is not required."

OBJECT      mip6BindingAdminStatus  
MIN-ACCESS  read-only  
DESCRIPTION    "Write access is not required."
::= { mip6Compliances 5 }  

mip6ReadOnlyCompliance3 MODULE-COMPLIANCE  
STATUS current  
DESCRIPTION    "The compliance statement for SNMP entities  
that implement the MOBILEIPV6-MIB without support  
for read-write (i.e., in read-only mode) and support  
monitoring of the Binding Cache, the Binding History,  
the total traffic, and the mobile node-wide traffic.  
There are a number of INDEX objects that cannot be  
represented in the form of OBJECT clauses in SMIPv2,  
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.  
--  
-- OBJECT      mip6BindingHstHomeAddressType  
-- SYNTAX      InetAddressType { ipv6(2) }  
-- DESCRIPTION    -- This MIB module requires support for global  
-- ipv6 addresses for the  
-- mip6BindingHstHomeAddress object.
-- OBJECT  mip6BindingHstHomeAddress  
-- SYNTAX   InetAddress (SIZE(16))  
-- DESCRIPTION  
-- This MIB module requires support for global  
-- ipv6 addresses for the  
-- mip6BindingHstHomeAddress object.  
--  
"  
MODULE  -- this module  
MANDATORY-GROUPS {  
  mip6SystemGroup,  
  mip6BindingCacheGroup,  
  mip6BindingHstGroup,  
  mip6TotalTrafficGroup,  
  mip6NodeTrafficGroup  
}  

OBJECT  mip6Status  
MIN-ACCESS  read-only  
DESCRIPTION  
"Write access is not required."  

OBJECT  mip6BindingAdminStatus  
MIN-ACCESS  read-only  
DESCRIPTION  
"Write access is not required."  
::= { mip6Compliances 6 }  

mip6MnCoreCompliance MODULE-COMPLIANCE  
STATUS  current  
DESCRIPTION  
"The compliance statement for SNMP entities  
that implement the MOBILEIPV6-MIB and  
support monitoring of the basic mobile node  
functionality.  
There are a number of INDEX objects that cannot be  
represented in the form of OBJECT clauses in SMIV2,  
but for which there are compliance requirements,  
expressed in OBJECT clause form in this description:  
-- OBJECT  
  mip6MnHomeAddressType  
-- SYNTAX   InetAddressType { ipv6(2) }  
-- DESCRIPTION  
-- This MIB module requires support for global  
-- ipv6 addresses for the mip6MnHomeAddress  
-- object.  
--  
-- OBJECT  
  mip6MnHomeAddress  
-- SYNTAX   InetAddress (SIZE(16))  
-- DESCRIPTION  
-- This MIB module requires support for global  

-- ipv6 addresses for the mip6MnHomeAddress
-- object.
"

MODULE -- this module
MANDATORY-GROUPS { mip6MnSystemGroup
)
::= { mip6Compliances 7 }

mip6MnCompliance2 MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB and
support monitoring of the mobile node
functionality specifically the Discovery- and
Registration-related statistics,
There are a number of INDEX objects that cannot be
represented in the form of OBJECT clauses in SMIv2,
but for which there are compliance requirements,
expressed in OBJECT clause form in this description:
-- OBJECT      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.
mip6CnCoreCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB and support monitoring of the basic correspondent node functionality."

mip6CnCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB and support monitoring of the basic correspondent node functionality.
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.
**mip6HaCoreCompliance MODULE-COMPLIANCE**

**STATUS** current

**DESCRIPTION**

"The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB and support monitoring of the basic home agent functionality."

**mip6HaCompliance2 MODULE-COMPLIANCE**

**STATUS** current

**DESCRIPTION**

"The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB and support monitoring of the home agent functionality specifically the Home Agent List and the home-agent-registration-related statistics. There are a number of INDEX objects that cannot be represented in the form of OBJECT clauses in SMIv2, but for which there are compliance requirements, expressed in OBJECT clause form in this description:"

---

**OBJECT** mip6BindingHomeAddressType

**SYNTAX** InetAddressType { ipv6(2) }

**DESCRIPTION**

This MIB module requires support for global ipv6 addresses for the mip6BindingHomeAddress object.

---

**OBJECT** mip6BindingHomeAddress

**SYNTAX** InetAddress (SIZE(16))

**DESCRIPTION**

This MIB module requires support for global ipv6 addresses for the mip6BindingHomeAddress object.

---

**OBJECT** mip6HaLinkLocalAddressType
-- SYNTAX     InetAddressType { ipv6z(4) }
-- DESCRIPTION
--     This MIB module requires support for local
--     ipv6 addresses for the mip6HaLinkLocalAddress
--     object.
--
-- OBJECT     mip6HaLinkLocalAddress
-- SYNTAX     InetAddress (SIZE(20))
-- DESCRIPTION
--     This MIB module requires support for local
--     ipv6 addresses for the mip6HaLinkLocalAddress
--     object.
--

" 

MODULE -- this module
MANDATORY-GROUPS { mip6HaSystemGroup,
                   mip6HaListGroup,
                   mip6HaStatsGroup,
                   mip6HaGlobalStatsGroup,
                   mip6TotalTrafficGroup
 }
::= { mip6Compliances 12 }

mip6HaCompliance3 MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB and
support monitoring and control of the home agent
functionality specifically the Home Agent List
and the home-agent-registration-related statistics,

There are a number of INDEX objects that cannot be
represented in the form of OBJECT clauses in SMIV2,
but for which there are compliance requirements,
expressed in OBJECT clause form in this description:
-- OBJECT     mip6BindingHomeAddressType
-- SYNTAX     InetAddressType { ipv6(2) }
-- DESCRIPTION
--     This MIB module requires support for global
--     ipv6 addresses for the mip6BindingHomeAddress
--     object.
--
-- OBJECT     mip6BindingHomeAddress
-- SYNTAX     InetAddress (SIZE(16))
-- DESCRIPTION
--     This MIB module requires support for global
--     ipv6 addresses for the mip6BindingHomeAddress

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-- object.
--
-- OBJECT  mip6HaLinkLocalAddressType
-- SYNTAX   InetAddressType { ipv6z(4) }
-- DESCRIPTION
-- This MIB module requires support for local
-- ipv6 addresses for the mip6HaLinkLocalAddress
-- object.
--
-- OBJECT  mip6HaLinkLocalAddress
-- SYNTAX   InetAddress (SIZE(20))
-- DESCRIPTION
-- This MIB module requires support for local
-- ipv6 addresses for the mip6HaLinkLocalAddress
-- object.
--
""

MODULE  -- this module
MANDATORY-GROUPS { mip6HaSystemGroup,
mip6HaListGroup,
mip6HaStatsGroup,
mip6HaGlobalStatsGroup,
mip6BindingCacheCtlGroup,
mip6TotalTrafficGroup
}
::= { mip6Compliances 13 }
mip6HaCoreReadOnlyCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION "The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB without support
for read-write (i.e., in read-only mode) and
support monitoring of the basic home agent
functionality."

MODULE -- this module
MANDATORY-GROUPS { mip6HaSystemGroup }

OBJECT mip6HaAdvPreference
MIN-ACCESS read-only
DESCRIPTION "Write access is not required."

OBJECT mip6HaAdvLifetime
MIN-ACCESS read-only
DESCRIPTION "Write access is not required."

OBJECT mip6HaPrefixAdv
MIN-ACCESS read-only
DESCRIPTION "Write access is not required."

OBJECT mip6HaPrefixSolicitation
MIN-ACCESS read-only
DESCRIPTION "Write access is not required."

OBJECT mip6HaMCastCtlMsgSupport
MIN-ACCESS read-only
DESCRIPTION "Write access is not required."

::= { mip6Compliances 14 }
mip6HaReadOnlyCompliance2  MODULE-COMPLIANCE
STATUS  current
DESCRIPTION
"The compliance statement for SNMP entities
that implement the MOBILEIPV6-MIB without support
for read-write (i.e., in read-only mode) and
support monitoring of the home agent
functionality specifically the Home Agent List
and the home-agent-registration-related statistics.

There are a number of INDEX objects that cannot be
represented in the form of OBJECT clauses in SMIv2,
but for which there are compliance requirements,
expressed in OBJECT clause form in this description:
-- OBJECT  mip6BindingHomeAddressType
-- SYNTAX   InetAddressType { ipv6(2) }
-- DESCRIPTION
--   This MIB module requires support for global
--   ipv6 addresses for the mip6BindingHomeAddress
--   object.
--
-- OBJECT  mip6BindingHomeAddress
-- SYNTAX   InetAddress (SIZE(16))
-- DESCRIPTION
--   This MIB module requires support for global
--   ipv6 addresses for the mip6BindingHomeAddress
--   object.
--
-- OBJECT  mip6HaLinkLocalAddressType
-- SYNTAX   InetAddressType { ipv6z(4) }
-- DESCRIPTION
--   This MIB module requires support for local
--   ipv6 addresses for the mip6HaLinkLocalAddress
--   object.
--
-- OBJECT  mip6HaLinkLocalAddress
-- SYNTAX   InetAddress (SIZE(20))
-- DESCRIPTION
--   This MIB module requires support for local
--   ipv6 addresses for the mip6HaLinkLocalAddress
--   object.
"

MODULE -- this module
MANDATORY-GROUPS { mip6HaSystemGroup,
                   mip6HaListGroup,
                   mip6HaStatsGroup,
                   mip6HaGlobalStatsGroup,
mip6TotalTrafficGroup
}

OBJECT      mip6HaAdvPreference
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT      mip6HaAdvLifetime
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT      mip6HaPrefixAdv
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT      mip6HaPrefixSolicitation
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT      mip6HaMCastCtlMsgSupport
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

::= { mip6Compliances 15 }
"The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB without support for read-write (i.e., in read-only mode) and support monitoring and control of the home agent functionality specifically the Home Agent List and the home-agent-registration-related statistics,

There are a number of INDEX objects that cannot be represented in the form of OBJECT clauses in SMIV2, but for which there are compliance requirements, expressed in OBJECT clause form in this description:

-- OBJECT      mip6BindingHomeAddressType
-- SYNTAX      InetAddressType { ipv6(2) }
-- DESCRIPTION
-- This MIB module requires support for global
-- ipv6 addresses for the mip6BindingHomeAddress
-- object.
--
-- OBJECT      mip6BindingHomeAddress
-- SYNTAX      InetAddress (SIZE(16))
-- DESCRIPTION
-- This MIB module requires support for global
-- ipv6 addresses for the mip6BindingHomeAddress
-- object.
--
-- OBJECT      mip6HaLinkLocalAddressType
-- SYNTAX      InetAddressType { ipv6z(4) }
-- DESCRIPTION
-- This MIB module requires support for local
-- ipv6 addresses for the mip6HaLinkLocalAddress
-- object.
--
-- OBJECT      mip6HaLinkLocalAddress
-- SYNTAX      InetAddress (SIZE(20))
-- DESCRIPTION
-- This MIB module requires support for local
-- ipv6 addresses for the mip6HaLinkLocalAddress
-- object.
--
"
OBJECT      mip6HaAdvPreference
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT      mip6HaAdvLifetime
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT      mip6HaPrefixAdv
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT      mip6HaPrefixSolicitation
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT      mip6HaMCastCtlMsgSupport
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT      mip6BindingAdminStatus
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

::= { mip6Compliances 16 }

mip6NotificationCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
  "The compliance statement for SNMP entities that implement the MOBILEIPV6-MIB and support Notification from home agent or correspondent node to management stations about the mobile node status. 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 { mip6NotificationGroup
                 }
::= { mip6Compliances 17 }

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:

mip6Status: The value of this object is used to enable or disable the MIPv6 functionality on a MIPv6 entity. Access to this MO may be abused to disrupt the MIPv6 communication.

mip6HaAdvPreference: Access to this object may be abused to force MNs into selecting the wrong HA.

mip6HaAdvLifetime: Access to this object may be abused to set the advertised lifetime to incorrect values. That will have an adverse impact on the MIPv6 communication.

mip6BindingAdminStatus: The value of this object is used to control the status of a Binding Cache entry. Access to this object may be abused to deny Mobile IPv6 connectivity to a legitimate user or to grant Mobile IPv6 connectivity to an illegal user.

mip6HaPrefixAdv: The value of this object indicates whether the home agent will send ICMP Mobile Prefix Advertisements to the mobile node. Access to this object may be abused to send unwanted/wrong prefix information or to deny the mobile node from receiving information about the changes in the home prefixes. This may result in disruption of the Mobile IPv6 connectivity.

mip6HaPrefixSolicitation: The value of this object indicates whether the home agent should respond to ICMP Mobile Prefix Solicitation messages from a mobile node. Access to this object may be abused to deny the mobile node information about its home prefix. This may result in disruption of the Mobile IPv6 connectivity.

mip6HaMCastCtlMsgSupport: The value of this object decides whether the home agent should process the multicast group membership control messages it receives from mobile nodes. Access to this object may be used to subvert administrate policy on multicasting or to disrupt the multicast communication with the mobile node.
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:

The address-related objects in this MIB may be considered to be particularly sensitive and/or private. The care-of-address-related objects reveal the location and movement of the mobile node. This information may be considered to be private and sensitive and must be carefully handled.

- \texttt{mip6BindingHstCOAType}
- \texttt{mip6BindingHstCOA}
- \texttt{mip6MnBLCOAType}
- \texttt{mip6MnBLCOA}

The mobile node’s home-address- and home-agent-related information may be considered to be sensitive too as these may provide clues to a malicious party on ways to disrupt the mobile nodes communication channels.

- \texttt{mip6BindingHstHomeAddressType},
- \texttt{mip6BindingHstHomeAddress},
- \texttt{mip6MnHomeAddressType},
- \texttt{mip6MnHomeAddress}

The correspondent node’s address-related MOs will reveal the nodes with whom the mobile node is corresponding. This information may be considered private and sensitive.

- \texttt{mip6MnBLNodeAddressType},
- \texttt{mip6MnBLNodeAddress}

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 implementors 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 has assigned a base arc in the 'mib-2' (standards track) OID tree for the 'mip6MIB' MODULE-IDENTITY defined in the Mobile-IPv6 MIB. The mib-2 number is 133 for mip6MIB.

8. References

8.1. Normative References


8.2. Informative References


9. Acknowledgements

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

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Acknowledgement

Funding for the RFC Editor function is provided by the IETF Administrative Support Activity (IASA).