Network Working Group
Internet-Draft
Intended status: Experimental
Expires: August 8, 2013

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February 4, 2013

LISP MIB
draft-ietf-lisp-mib-09

Abstract

This document defines managed objects for the Locator/ID Separation Protocol (LISP). These objects provide information useful for monitoring LISP devices, including basic configuration information, LISP status, and operational statistics.

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1. Requirements Notation

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 [RFC2119].

2. Introduction

This draft describes the Management Information Base (MIB) module for use with network management protocols in the Internet community. Specifically, the MIB for managing Locator/ID Separation Protocol (LISP) devices is described.

LISP [RFC6830] specifies a network-based architecture and mechanisms that implement a new semantic for IP addressing using two separate name spaces: Endpoint Identifiers (EIDs), used within sites, and Routing Locators (RLOCs), used on the transit networks that make up the Internet infrastructure. To achieve this separation, LISP defines protocol mechanisms for mapping from EIDs to RLOCs.

From a data plane perspective, LISP traffic is handled exclusively at the network layer by devices performing Ingress Tunnel Router (ITR) and Egress Tunnel Router (ETR) LISP functions. Data plane operations performed by these devices are described in [RFC6830]. Additionally, data plane interworking between legacy (Internet) and LISP sites is implemented by devices performing Proxy ITR (PITR) and Proxy ETR (PETR) functions. The data plane operations of these devices is described in [RFC6832].

From a control plane perspective, LISP employs mechanisms related to creating, maintaining, and resolving mappings from EIDs to RLOCs. LISP ITRs, ETRs, PITRs, and PETRs perform specific control plane functions, and these control plane operations are described in [RFC6830]. Additionally, LISP infrastructure devices supporting LISP control plane functionality include Map-Servers and Map-Resolvers, and the control plane operations of these devices are described in [RFC6833]. Finally, while not specifically required, this document assumes the existence of a database to store and propagate those mappings globally.

3. The Internet-Standard Management Framework

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

Managed objects are accessed via a virtual information store, termed

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

4. Definition of Terms

Endpoint ID (EID): a 32-bit (for IPv4) or 128-bit (for IPv6) value used in the source and destination address fields of the first (inner-most) IP header of a LISP packet. A source EID is allocated to a host from an EID-prefix block associated with the site where the host is located. A host determines a destination address in the same way that it determines a destination address today, for example through a DNS lookup or SIP exchange.

Routing Locator (RLOC): a 32-bit (for IPv4) or 128-bit (for IPv6) value used in the source and destination address fields of the second (outer-most) IP header of a LISP packet. RLOC addresses are allocated to an egress tunnel router (ETR) and numbered from topologically-aggregatable blocks assigned to a site at each point to which it attaches to the global Internet.

EID-to-RLOC Map-Cache: a short-lived, on-demand table maintained locally in an ITR or PITR that stores, tracks, and is responsible for timing-out and otherwise validating EID-to-RLOC mappings. This table is distinct from the full "database" of EID-to-RLOC mappings in that it is dynamic and relatively small. At a given moment in time, it consists only of entries for those sites to which the ITR or PITR is currently communicating or has communicated with within the configured TTL period.

EID-to-RLOC Mapping-Database: a global distributed database that contains all known EID-to-RLOC mappings. Each potential ETR typically contains a small piece of the database consisting of only the EID-to-RLOC mappings for the EID prefix(es) for which the ETR is "authoritative" and the RLOC(s) by which those EID prefix(es) are reachable from the global Internet.

Ingress Tunnel Router (ITR): a router that accepts an IP packet with a single IP header (more precisely, an IP packet that does not contain a LISP header), treats this "inner" IP destination address as an EID and performs an EID-to-RLOC mapping lookup, and then prepends an "outer" IP header with one of its own globally-routable RLOCs in the source address field and the RLOC resulting from the mapping lookup in the destination address field. That

is, in general an ITR receives an IP packet from site end-systems on one side and sends a LISP-encapsulated IP packet toward the Internet on the other side.

Egress Tunnel Router (ETR): a router that accepts an IP packet where the destination address in the "outer" IP header is one of its own RLOCs, strips the "outer" header, and forwards the packet based on the next IP header found. That is, in general an ETR receives LISP-encapsulated IP packets from the Internet on one side and sends decapsulated IP packets toward site end-systems on the other side.

xTR: a term of general reference to an ITR or ETR when direction of data flow is not part of the context description. xTR refers to the router that is the tunnel endpoint and performs both ITR and ETR functionality. For example, "An xTR can be located at the Customer Edge (CE) router," meaning both ITR and ETR functionality is activated at the CE router.

Proxy ITR (PITR): a router that acts like an ITR but does so on behalf of non-LISP sites which send packets to destinations at LISP sites. The PITR, also known as a PTR, is defined and described in [RFC6832].

Proxy ETR (PETR): a router that acts like an ETR but does so on behalf of LISP sites which send packets to destinations at non-LISP sites. The PETR is defined and described in [RFC6832].

LISP Site: a set of routers in an edge network that are under a single technical administration. LISP routers which reside in the edge network are the demarcation points to separate the edge network from the core network.

Map-Server: a LISP network infrastructure component which learns EID-to-RLOC mapping entries from an authoritative source such as an ETR through static configuration, or another out-of-band mechanism. A Map-Server advertises these mappings into the distributed mapping database.

Map-Resolver: a LISP network infrastructure component which accepts LISP Encapsulated Map-Requests, typically from an ITR, and quickly determines whether or not the destination IP address is part of the EID namespace. If it is, the Map-Resolver finds the appropriate EID-to-RLOC mapping by consulting the distributed mapping database. If it is not, a Negative Map-Reply is immediately returned.

Map-Request: a LISP Map-Request message type sent by an ITR or PITR to a Map-Resolver when it needs a mapping for an EID, wants to test an RLOC for reachability, or wants to refresh a mapping before TTL expiration.

Map-Reply: a LISP Map-Reply message type returned in response to a Map-Request for a destination EID that exists in the mapping database and contains the locator-set and associated policy for the queried EID. Information returned in a Map-Reply is stored in the EID-to-RLOC Map-Cache.

Negative Map-Reply: a LISP Map-Reply message type that contains an empty locator-set. Returned in response to a Map-Request if the destination EID does not exist in the mapping database. Typically, this means that the "EID" being requested is an IP address connected to a non-LISP site. Information returned in a Negative Map-Reply is stored in the EID-to-RLOC Map-Cache.

5. LISP MIB Objectives

The objectives for defining this LISP MIB module are as follows:

- Provide a means for obtaining a list of enabled LISP features and the current status of configuration attributes related to those features. As an example, LISP capabilities which could be enabled include ITR, ETR, PITR, PETR, MS or MR support for IPv4 or IPv6 address families. Other examples include, indicating whether rloc-probing is enabled, and indicating the configured map-cache limit value.

- Provide a means for obtaining the current attributes of various LISP tables, such as the EID-to-RLOC policy data contained in the Map-Cache, or the local EID-to-RLOC policy data contained in the Mapping-Database.

- Provide a means for obtaining the current operational statistics of various LISP functions, such as the number of packets encapsulated and decapsulated by the device. Other counters of operational interest, depending on LISP function, include things like the current number of map-cache entries, and the total number and rate of map-requests received and sent.

6. Structure of LISP MIB Module

6.1. Overview of Defined Notifications

No LISP MIB notifications are defined.

6.2. Overview of Defined Tables

The LISP MIB module is composed of the following tables of objects:

lispFeatures - This table provides information representing the various lisp features that can be enabled on LISP devices.

lispIidToVrf - This table provides information representing the mapping of a LISP instance ID to a VRF (Virtual Routing/ Forwarding).

lispGlobalStats - This table provides global statistics for a given Instance ID per address-family on a LISP device.

lispMappingDatabase - This table represents the EID-to-RLOC database that contains the EID-prefix to RLOC mappings configured on an ETR. In general, this table would be representative of all such mappings for a given site that this device belongs to.

lispMappingDatabaseLocator - This table represents the set of routing locators contained in the EID-to-RLOC database configured on an ETR.

lispMapCache - This table represents the short-lived, on-demand table on an ITR that stores, tracks, and is responsible for timing-out and otherwise validating EID-to-RLOC mappings.

lispMapCacheLocator - This table represents the set of locators per EID prefix contained in the map-cache table of an ITR.

lispConfiguredLocator - This table represents the set of routing locators configured on a LISP device.

lispEidRegistration - This table provides the properties of each EID prefix that is registered with this device when configured to be a Map-Server.

lispEidRegistrationEtr - This table provides the properties of the different ETRs that send registers, for a given EID prefix, to this device when configured to be a Map-Server.

lispEidRegistrationLocator - This table provides the properties of the different locators per EID prefix that is registered with this device when configured to be a Map-Server.

lispUseMapServer - This table provides the properties of all Map-Servers that this device is configured to use.

lispUseMapResolver - This table provides the properties of all Map-Resolvers that this device is configured to use.

lispUseProxyEtr - This table provides the properties of all Proxy ETRs that this device is configured to use.

7. LISP MIB Definitions

```
LISP-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE,
    mib-2, Unsigned32, Counter64,
    Integer32, TimeTicks            FROM SNMPv2-SMI        -- [RFC2578]
    TruthValue, TEXTUAL-CONVENTION,
    TimeStamp                       FROM SNMPv2-TC         -- [RFC2579]
    MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF       -- [RFC2580]
    MplsL3VpnName
                FROM MPLS-L3VPN-STD-MIB                    -- [RFC4382]
    AddressFamilyNumbers
                FROM IANA-ADDRESS-FAMILY-NUMBERS-MIB;      -- [IANA]

lispMIB MODULE-IDENTITY
    LAST-UPDATED "201302040000Z" -- 04 February 2013
    ORGANIZATION
            "IETF Locator/ID Separation Protocol (LISP) Working Group"
    CONTACT-INFO
            "Email: lisp@ietf.org
            WG charter:
            http://www.ietf.org/html.charters/lisp-charter.html"
   DESCRIPTION
            "Locator/ID Separation Protocol (LISP) MIB Textual
             Conventions module. The LISP MIB is intended for
             management of LISP routers.

            Copyright (C) The IETF Trust (2013)."
   REVISION     "201302040000Z" -- 04 February 2013
   DESCRIPTION  "Initial version of the IETF LISP-MIB module. Published
                as RFC xxxx."
-- RFC Ed.: RFC-editor pls fill in xxxx
     ::= { mib-2 XXX }
-- RFC Ed.: assigned by IANA, see section 10 for details

--
```

```
-- Textual Conventions
--

LispAddressType ::= TEXTUAL-CONVENTION
    DISPLAY-HINT "39a"
    STATUS current
    DESCRIPTION
        "LISP architecture can be applied to a wide variety of
         address-families. This textual-convention is a
         generalization for representing addresses that belong to those
         address-families. For convenience, this document refers to any
         such address as a LISP address. LispAddressType
         textual-convention consists of the following four-tuple:
          1. IANA Address Family Number: A field of length 2-octets,
             whose value is of the form following the assigned
             AddressFamilyNumbers textual-convention described in
             [IANA]. The enumerations are listed in [IANA].  Note that
             this list of address family numbers is maintained by IANA.
          2. Length of LISP address: A field of length 1-octet, whose
             value indicates the octet-length of the next (third) field
             of this LispAddressType four-tuple.
          3. LISP address: A field of variable length as indicated in
             the previous (second) field, whose value is an address of
             the IANA Address Family indicated in the first field of
             this LispAddressType four-tuple.  Note that any of the
             IANA Address Families can be represented. Particularly
             when the address family is LISP Canonical Address Format
             (LCAF) [LCAF] with IANA assigned Address Family Number
             16387, then the first octet of this field indicates the
             LCAF type, and the rest of this field is same as the
             encoding format of the LISP Canonical Address after the
             length field, as defined in [LCAF].
          4. Mask-length of address: A field of length 1-octet, whose
             value is the mask-length to be applied to the LISP
             address specified in the previous (third) field.

         To illustrate the use of this object, consider the LISP MIB
         Object below entitled lispMapCacheEntry. This object begins
         with the following entities:

         lispMapCacheEntry ::= SEQUENCE {
            lispMapCacheEidLength          INTEGER,
            lispMapCacheEid                LispAddressType,
             ... [skip] ...

         Example 1: Suppose that the IPv4 EID prefix stored is
         192.0.2.0/24. In this case, the values within
         lispMapCacheEntry would be:
```

```
   lispMapCacheEidLength  = 8
   lispMapCacheEid = 1, 4, 192.0.2.0, 24
   ... [skip] ...
```

where 8 is the total length in octets of the next object (lispMapCacheEID of type LispAddressType). Then, the value 1 indicates the IPv4 AF (per [IANA]), the value 4 indicates that the AF is 4-octets in length, 192.0.2.0 is the IPv4 address, and the value 24 is the mask-length in bits. Note that the lispMapCacheEidLength value of 8 is used to compute the length of the fourth (last) field in lispMapCacheEid to be 1 octet - as computed by 8 - (2 + 1 + 4) = 1.

Example 2: Suppose that the IPv6 EID prefix stored is 2001:db8:a::/48. In this case, the values within lispMapCacheEntry would be:

```
   lispMapCacheEidLength  = 20
   lispMapCacheEid = 2, 16, 2001:db8:a::, 48
   ... [skip] ...
```

where 20 is the total length in octets of the next object (lispMapCacheEID of type LispAddressType). Then, the value 2 indicates the IPv4 AF (per [IANA]), the value 16 indicates that the AF is 16-octets in length, 2001:db8:a:: is the IPv6 address, and the value 48 is the mask-length in bits. Note that the lispMapCacheEidLength value of 20 is used to compute the length of the fourth (last) field in lispMapCacheEid to be 1 octet - as computed by 20 - (2 + 1 + 16) = 1.

Example 3: As an example where LCAF is used, suppose that the IPv4 EID prefix stored is 192.0.2.0/24 and it is part of LISP Instance ID 101. In this case, the values within lispMapCacheEntry would be:

```
   lispMapCacheEidLength  = 11
   lispMapCacheEid = 16387, 7, 2, 101, 1, 192.0.2.0, 24
   ... [skip] ...
```

where 11 is the total length in octets of the next object (lispMapCacheEID of type LispAddressType). Then, the value 16387 indicates the LCAF AF (see [IANA]), the value 7 indicates that the LCAF AF is 7-octets in length in this case, 2 indicates that LCAF Type 2 encoding is used (see [LCAF]), 101 gives the Instance ID, 1 gives the AFI (per [IANA]) for an IPv4 address, 192.0.2.0 is the IPv4

```
        address, and 24 is the mask-length in bits. Note that the
        lispMapCacheEidLength value of 11 octets is used to compute
        the length of the last field in lispMapCacheEid to be 1 octet,
        as computed by 11 - (2 + 1 + 1 + 1 + 1 + 1 + 4) = 1."

    REFERENCE
          "RFC6830, Section 14.2,
           draft-ietf-lisp-lcaf-00.txt."
    SYNTAX OCTET STRING (SIZE (5..39))


   --
   -- Top level components of this MIB.
   --
   lispObjects       OBJECT IDENTIFIER ::= { lispMIB 1 }
   lispConformance   OBJECT IDENTIFIER ::= { lispMIB 2 }



   lispFeaturesTable OBJECT-TYPE
       SYNTAX     SEQUENCE OF LispFeaturesEntry
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "This table represents the various LISP features
           that can be enabled on LISP devices."
       REFERENCE
           "RFC6830, Section 4.0., Section 5.5., Section 6.3."
       ::= { lispObjects 1 }

   lispFeaturesEntry OBJECT-TYPE
       SYNTAX     LispFeaturesEntry
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "An entry (conceptual row) in the lispFeaturesTable."
       INDEX      { lispFeaturesInstanceID,
                    lispFeaturesAddressFamily }
       ::= { lispFeaturesTable 1 }

   LispFeaturesEntry ::= SEQUENCE {
       lispFeaturesInstanceID                  Unsigned32,
       lispFeaturesAddressFamily               AddressFamilyNumbers,
       lispFeaturesItrEnabled                  TruthValue,
       lispFeaturesEtrEnabled                  TruthValue,
       lispFeaturesProxyItrEnabled             TruthValue,
       lispFeaturesProxyEtrEnabled             TruthValue,
       lispFeaturesMapServerEnabled            TruthValue,
```

```
        lispFeaturesMapResolverEnabled             TruthValue,
        lispFeaturesMapCacheSize                   Unsigned32,
        lispFeaturesMapCacheLimit                  Unsigned32,
        lispFeaturesEtrMapCacheTtl                 Unsigned32,
        lispFeaturesRlocProbeEnabled               TruthValue,
        lispFeaturesEtrAcceptMapDataEnabled        TruthValue,
        lispFeaturesEtrAcceptMapDataVerifyEnabled  TruthValue,
        lispFeaturesRouterTimeStamp                TimeStamp
    }

    lispFeaturesInstanceID OBJECT-TYPE
        SYNTAX     Unsigned32 (0..16777215)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This represents the Instance ID of the LISP header.
            An Instance ID in the LISP address encoding helps
            uniquely identify the AFI-based address space to which
            a given EID belongs. It's default value is 0."
         ::= { lispFeaturesEntry 1 }

    lispFeaturesAddressFamily OBJECT-TYPE
        SYNTAX     AddressFamilyNumbers
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The IANA address family number of destination address
            of packets that this LISP device is enabled to process."
         ::= { lispFeaturesEntry 2 }

    lispFeaturesItrEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of ITR role on this device. If
            this object is TRUE, then ITR feature is enabled."
        ::= { lispFeaturesEntry 3 }

    lispFeaturesEtrEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of ETR role on this device. If
            this object is TRUE, then ETR feature is enabled."
        ::= { lispFeaturesEntry 4 }
```

```
   lispFeaturesProxyItrEnabled OBJECT-TYPE
       SYNTAX     TruthValue
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "Indicates the status of Proxy-ITR role on this device.
           If this object is TRUE, then Proxy-ITR feature is enabled."
       ::= { lispFeaturesEntry 5 }

   lispFeaturesProxyEtrEnabled OBJECT-TYPE
       SYNTAX     TruthValue
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "Indicates the status of Proxy-ETR role on this device.
           If this object is TRUE, then Proxy-ETR feature is enabled."
       ::= { lispFeaturesEntry 6 }

   lispFeaturesMapServerEnabled OBJECT-TYPE
       SYNTAX     TruthValue
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "Indicates the status of Map Server role on this device.
           If this object is TRUE, then Map Server feature is
           enabled."
       ::= { lispFeaturesEntry 7 }

   lispFeaturesMapResolverEnabled OBJECT-TYPE
       SYNTAX     TruthValue
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "Indicates the status of Map Resolver role on this device.
           If this object is TRUE, then Map Resolver feature is
           enabled."
       ::= { lispFeaturesEntry 8 }

   lispFeaturesMapCacheSize OBJECT-TYPE
       SYNTAX     Unsigned32
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "Size of EID-to-RLOC map cache on this device."
       ::= { lispFeaturesEntry 9 }

   lispFeaturesMapCacheLimit OBJECT-TYPE
       SYNTAX     Unsigned32
```

```
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Maximum permissible entries in EID-to-RLOC map cache on
            this device."
        ::= { lispFeaturesEntry 10 }

    lispFeaturesEtrMapCacheTtl OBJECT-TYPE
        SYNTAX     Unsigned32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The stored Record TTL of the EID-to-RLOC map record in
            the map cache."
        ::= { lispFeaturesEntry 11 }

    lispFeaturesRlocProbeEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of rloc-probing feature on this device.
            If this object is TRUE, then this feature is enabled."
        ::= { lispFeaturesEntry 12 }

    lispFeaturesEtrAcceptMapDataEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of accepting piggybacked mapping data
            received in a map-request on this device. If this object is
            TRUE, then this device accepts piggybacked mapping data."
        ::= { lispFeaturesEntry 13 }

    lispFeaturesEtrAcceptMapDataVerifyEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of verifying accepted piggybacked
            mapping data received in a map-request on this device. If
            this object is TRUE, then this device verifies accepted
            piggybacked mapping data."
        ::= { lispFeaturesEntry 14 }

    lispFeaturesRouterTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
```

```
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which LISP feature was enabled
            on this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem,
            then this object contains a zero value."
        ::= { lispFeaturesEntry 15 }
```

```
    lispIidToVrfTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispIidToVrfEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table represents the mapping of LISP Instance ID
            to a VRF."
        REFERENCE
            "RFC6830, Section 5.5."
        ::= { lispObjects 2 }

    lispIidToVrfEntry OBJECT-TYPE
        SYNTAX     LispIidToVrfEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the lispIidToVrfTable."
        INDEX      { lispFeaturesInstanceID }
        ::= { lispIidToVrfTable 1 }

    LispIidToVrfEntry ::= SEQUENCE {
        lispIidToVrfName                    MplsL3VpnName
    }

    lispIidToVrfName OBJECT-TYPE
        SYNTAX     MplsL3VpnName
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The identifier for each VPN that is mapped to the
            given LISP Instance ID."
            ::= { lispIidToVrfEntry 2 }
        REFERENCE
            "RFC 4382, Section 7."


  lispGlobalStatsTable OBJECT-TYPE
      SYNTAX     SEQUENCE OF LispGlobalStatsEntry
      MAX-ACCESS not-accessible
      STATUS     current
      DESCRIPTION
          "This table provides global statistics for a given
          Instance ID per address-family on a LISP device."
      REFERENCE
          "RFC6830, Section 6.1."
      ::= { lispObjects 3 }

  lispGlobalStatsEntry OBJECT-TYPE
```

```
        SYNTAX     LispGlobalStatsEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the
            lispGlobalStatsTable."
        INDEX      { lispFeaturesInstanceID,
                     lispFeaturesAddressFamily }
        ::= { lispGlobalStatsTable 1 }

    LispGlobalStatsEntry ::= SEQUENCE {
        lispGlobalStatsMapRequestsIn        Counter64,
        lispGlobalStatsMapRequestsOut       Counter64,
        lispGlobalStatsMapRepliesIn         Counter64,
        lispGlobalStatsMapRepliesOut        Counter64,
        lispGlobalStatsMapRegistersIn       Counter64,
        lispGlobalStatsMapRegistersOut      Counter64
    }

    lispGlobalStatsMapRequestsIn OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Total number of map requests received by this device for
            any EID prefix of the given address family and Instance ID.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispFeaturesRouterTimeStamp."
        ::= { lispGlobalStatsEntry 1 }

    lispGlobalStatsMapRequestsOut OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Total number of map requests sent by this device for any
            EID prefix of the given address family and Instance ID.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispFeaturesRouterTimeStamp."
        ::= { lispGlobalStatsEntry 2 }
```

```
    lispGlobalStatsMapRepliesIn OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Total number of map replies received by this device for any
            EID prefix of the given address family and Instance ID.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispFeaturesRouterTimeStamp."
        ::= { lispGlobalStatsEntry 3 }

    lispGlobalStatsMapRepliesOut OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Total number of map replies sent by this device for any EID
            prefix of the given address family and Instance ID.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispFeaturesRouterTimeStamp."
        ::= { lispGlobalStatsEntry 4 }

    lispGlobalStatsMapRegistersIn OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Total number of map registers received by this device for
            any EID prefix of the given address family and Instance ID.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispFeaturesRouterTimeStamp."
        ::= { lispGlobalStatsEntry 5 }

    lispGlobalStatsMapRegistersOut OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
```

```
        STATUS     current
        DESCRIPTION
            "Total number of map registers sent by this device for any
            EID prefix of the given address family and Instance ID.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispFeaturesRouterTimeStamp."
        ::= { lispGlobalStatsEntry 6 }


    lispMappingDatabaseTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispMappingDatabaseEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table represents the EID-to-RLOC mapping database that
            contains the EID-prefix to RLOC mappings configured on an
            ETR. In general, this table would be representative of all
            such mappings for the given LISP site to which this device
            belongs."
        REFERENCE
            "RFC6830, Section 6.0."
        ::= { lispObjects 4 }

    lispMappingDatabaseEntry OBJECT-TYPE
        SYNTAX     LispMappingDatabaseEntry

        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the lispMappingDatabaseTable."
        INDEX   { lispMappingDatabaseEidLength,
                  lispMappingDatabaseEid }
        ::= { lispMappingDatabaseTable 1 }

    LispMappingDatabaseEntry ::= SEQUENCE {
        lispMappingDatabaseEidLength        Integer32,
        lispMappingDatabaseEid              LispAddressType,
        lispMappingDatabaseLsb              Unsigned32,
        lispMappingDatabaseEidPartitioned   TruthValue,
        lispMappingDatabaseTimeStamp        TimeStamp,
        lispMappingDatabaseDecapOctets      Counter64,
        lispMappingDatabaseDecapPackets     Counter64,
        lispMappingDatabaseEncapOctets      Counter64,
        lispMappingDatabaseEncapPackets     Counter64
```

```
    }

    lispMappingDatabaseEidLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object gives the octet-length of
            lispMappingDatabaseEid."
        ::= { lispMappingDatabaseEntry 1 }

    lispMappingDatabaseEid OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The EID prefix of the mapping database."
        ::= { lispMappingDatabaseEntry 2 }

    lispMappingDatabaseLsb OBJECT-TYPE
        SYNTAX     Unsigned32 (0..4294967295)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The locator status bits for this EID prefix."
        ::= { lispMappingDatabaseEntry 3 }

    lispMappingDatabaseEidPartitioned OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only

        STATUS     current
        DESCRIPTION
            "Indicates if this device is partitioned from the site that
            contains this EID prefix. If this object is TRUE, then it
            means this device is partitioned from the site."
        ::= { lispMappingDatabaseEntry 4 }

    lispMappingDatabaseTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the EID Prefix information
            represented by this mapping database entry was configured
            on this device.

            If this information was present at the most recent
```

```
            re-initialization of the local management subsystem, then
            this object contains a zero value."
        ::= { lispMappingDatabaseEntry 5 }

    lispMappingDatabaseDecapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were decapsulated
            by this device addressed to a host within this EID-prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispMappingDatabaseTimeStamp."
        ::= { lispMappingDatabaseEntry 6 }

    lispMappingDatabaseDecapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were decapsulated by this
            device addressed to a host within this EID-prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispMappingDatabaseTimeStamp."
        ::= { lispMappingDatabaseEntry 7 }

    lispMappingDatabaseEncapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were encapsulated
            by this device, whose inner header source address matched
            this EID prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of LISP features
            being removed, which can be detected by observing the value
            of lispMappingDatabaseTimeStamp."
```

```
        ::= { lispMappingDatabaseEntry 8 }

     lispMappingDatabaseEncapPackets OBJECT-TYPE
         SYNTAX     Counter64
         MAX-ACCESS read-only
         STATUS     current
         DESCRIPTION
             "The number of LISP packets that were encapsulated by this
             device whose inner header source address matched this EID
             prefix.

             Discontinuities in this monotonically increasing value occur
             at re-initialization of the management system.
             Discontinuities can also occur as a result of LISP features
             being removed, which can be detected by observing the value
             of lispMappingDatabaseTimeStamp."
         ::= { lispMappingDatabaseEntry 9 }


   lispMappingDatabaseLocatorTable OBJECT-TYPE
       SYNTAX     SEQUENCE OF LispMappingDatabaseLocatorEntry
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "This table represents the set of routing locators per EID
           prefix contained in the EID-to-RLOC database configured on
           this ETR."
       REFERENCE
           "RFC6830, Section 6.2."
       ::= { lispObjects 5 }

   lispMappingDatabaseLocatorEntry OBJECT-TYPE
       SYNTAX     LispMappingDatabaseLocatorEntry
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "An entry (conceptual row) in the
           lispMappingDatabaseLocatorTable."
       INDEX  { lispMappingDatabaseEidLength,
                lispMappingDatabaseEid,
                lispMappingDatabaseLocatorRlocLength,
                lispMappingDatabaseLocatorRloc }
       ::= { lispMappingDatabaseLocatorTable 1 }

   LispMappingDatabaseLocatorEntry ::= SEQUENCE {
       lispMappingDatabaseLocatorRlocLength        Integer32,
       lispMappingDatabaseLocatorRloc              LispAddressType,
       lispMappingDatabaseLocatorRlocPriority      Integer32,
```

```
        lispMappingDatabaseLocatorRlocWeight        Integer32,
        lispMappingDatabaseLocatorRlocMPriority     Integer32,
        lispMappingDatabaseLocatorRlocMWeight       Integer32,
        lispMappingDatabaseLocatorRlocState         INTEGER,
        lispMappingDatabaseLocatorRlocLocal         INTEGER,
        lispMappingDatabaseLocatorRlocTimeStamp     TimeStamp,
        lispMappingDatabaseLocatorRlocDecapOctets   Counter64,
        lispMappingDatabaseLocatorRlocDecapPackets  Counter64,
        lispMappingDatabaseLocatorRlocEncapOctets   Counter64,
        lispMappingDatabaseLocatorRlocEncapPackets  Counter64
    }

    lispMappingDatabaseLocatorRlocLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispMappingDatabaseLocatorRloc."
        ::= { lispMappingDatabaseLocatorEntry 1 }

    lispMappingDatabaseLocatorRloc OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is a locator for the given EID prefix in the
            mapping database."
        ::= { lispMappingDatabaseLocatorEntry 2 }

    lispMappingDatabaseLocatorRlocPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast priority of the RLOC."
        ::= { lispMappingDatabaseLocatorEntry 3 }

    lispMappingDatabaseLocatorRlocWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast weight of the RLOC."
        ::= { lispMappingDatabaseLocatorEntry 4 }

    lispMappingDatabaseLocatorRlocMPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
```

```
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast priority of the RLOC."
        ::= { lispMappingDatabaseLocatorEntry 5 }

    lispMappingDatabaseLocatorRlocMWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast weight of the RLOC."
        ::= { lispMappingDatabaseLocatorEntry 6 }

    lispMappingDatabaseLocatorRlocState OBJECT-TYPE
        SYNTAX     INTEGER {
                      up (1),
                      down (2),
                      unreachable (3)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The state of this RLOC as per this device.
            (1 = RLOC is up; 2 = RLOC is down; 3 = RLOC is unreachable)."
        ::= { lispMappingDatabaseLocatorEntry 7 }

    lispMappingDatabaseLocatorRlocLocal OBJECT-TYPE
        SYNTAX     INTEGER {
                      siteself (1),
                      sitelocal (2)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates whether the RLOC is local to this device
            (or remote, meaning local to another device in the same LISP
            site). (1 = RLOC is an address on this device; 2 = RLOC is
            an address on another device)."
        ::= { lispMappingDatabaseLocatorEntry 8 }

    lispMappingDatabaseLocatorRlocTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the RLOC of the EID Prefix
            represented by this mapping database entry was configured
```

```
            on this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem, then
            this object contains a zero value."
        ::= { lispMappingDatabaseLocatorEntry 9 }

    lispMappingDatabaseLocatorRlocDecapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were
            addressed to this RLOC of the EID-prefix and
            were decapsulated.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of database
            mappings getting re-configured or RLOC status changes, which
            can be detected by observing the value of
            lispMappingDatabaseLocatorRlocTimeStamp."
        ::= { lispMappingDatabaseLocatorEntry 10 }

    lispMappingDatabaseLocatorRlocDecapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were addressed to this RLOC
            of the EID-prefix and were decapsulated.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of database
            mappings getting re-configured or RLOC status changes, which
            can be detected by observing the value of
            lispMappingDatabaseLocatorRlocTimeStamp."
        ::= { lispMappingDatabaseLocatorEntry 11 }

    lispMappingDatabaseLocatorRlocEncapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were encapsulated
            by this device using this RLOC address as the source, and
            that were sourced by an address of this EID-prefix.
```

```
            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of database
            mappings getting re-configured or RLOC status changes, which
            can be detected by observing the value of
            lispMappingDatabaseLocatorRlocTimeStamp."
        ::= { lispMappingDatabaseLocatorEntry 12 }

    lispMappingDatabaseLocatorRlocEncapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were encapsulated by this
            device using this RLOC address as the source, and that were
            sourced by an address of this EID-prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of database
            mappings getting re-configured or RLOC status changes, which
            can be detected by observing the value of
            lispMappingDatabaseLocatorRlocTimeStamp."
        ::= { lispMappingDatabaseLocatorEntry 13 }


     lispMapCacheTable OBJECT-TYPE
         SYNTAX     SEQUENCE OF LispMapCacheEntry
         MAX-ACCESS not-accessible
         STATUS     current
         DESCRIPTION
             "This table represents the short-lived, on-demand table on
             an ITR that stores, tracks, and is responsible for
             timing-out and otherwise validating EID-to-RLOC mappings."
         REFERENCE
             "RFC6830, Section 6.0., Section 12.0."
         ::= { lispObjects 6 }

     lispMapCacheEntry OBJECT-TYPE
         SYNTAX     LispMapCacheEntry
         MAX-ACCESS not-accessible
         STATUS     current
         DESCRIPTION
             "An entry (conceptual row) in the
             lispMapCacheTable."
         INDEX      { lispMapCacheEidLength,
                      lispMapCacheEid }
         ::= { lispMapCacheTable 1 }
```

```
    LispMapCacheEntry ::= SEQUENCE {
        lispMapCacheEidLength           Integer32,
        lispMapCacheEid                 LispAddressType,
        lispMapCacheEidTimeStamp        TimeStamp,
        lispMapCacheEidExpiryTime       TimeTicks,
        lispMapCacheEidState            TruthValue,
        lispMapCacheEidAuthoritative    TruthValue,
        lispMapCacheEidDecapOctets      Counter64,
        lispMapCacheEidDecapPackets     Counter64,
        lispMapCacheEidEncapOctets      Counter64,
        lispMapCacheEidEncapPackets     Counter64
    }

    lispMapCacheEidLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispMapCacheEid."
        ::= { lispMapCacheEntry 1 }

    lispMapCacheEid OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The EID prefix in the mapping cache."
        ::= { lispMapCacheEntry 2 }

    lispMapCacheEidTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the EID Prefix information
            represented by this entry was learned by this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem, then
            this object contains a zero value."
        ::= { lispMapCacheEntry 3 }

    lispMapCacheEidExpiryTime OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
```

```
            "The time remaining before the ITR times-out this
            EID prefix."
        ::= { lispMapCacheEntry 4 }

    lispMapCacheEidState OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "This object is used to indicate the activity of this EID
            prefix. If this object is TRUE, then it means this EID
            prefix is seeing activity."
        ::= { lispMapCacheEntry 5 }

    lispMapCacheEidAuthoritative OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "This object is used to indicate whether the EID prefix was
            installed by an authoritative map-reply. If this object is
            TRUE, then it means this EID prefix was installed by an
            authoritative map-reply."
        ::= { lispMapCacheEntry 6 }

    lispMapCacheEidDecapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were decapsulated
            by this device and were sourced from a remote host within
            this EID-prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of cache being
            removed and replaced, which can be detected by observing the
            value of lispMapCacheEidTimeStamp."
        ::= { lispMapCacheEntry 7 }

    lispMapCacheEidDecapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were decapsulated by this
            device and were sourced from a remote host within this
```

```
            EID-prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of cache being
            removed and replaced, which can be detected by observing the
            value of lispMapCacheEidTimeStamp."
        ::= { lispMapCacheEntry 8 }

    lispMapCacheEidEncapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were encapsulated
            by this device using the given EID-prefix in the map cache.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of cache being
            removed and replaced, which can be detected by observing the
            value of lispMapCacheEidTimeStamp."
        ::= { lispMapCacheEntry 9 }

    lispMapCacheEidEncapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were encapsulated by this
            device using the given EID-prefix in the map cache.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of cache being
            removed and replaced, which can be detected by observing the
            value of lispMapCacheEidTimeStamp."
        ::= { lispMapCacheEntry 10 }


    lispMapCacheLocatorTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispMapCacheLocatorEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table represents the set of locators per EID prefix
            contained in the map-cache table of an ITR."
        REFERENCE
```

```
            "RFC6830, Section 6.3."
        ::= { lispObjects 7 }

    lispMapCacheLocatorEntry OBJECT-TYPE
        SYNTAX     LispMapCacheLocatorEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the
            lispMapCacheLocatorTable."
        INDEX      { lispMapCacheEidLength,
                     lispMapCacheEid,
                     lispMapCacheLocatorRlocLength,
                     lispMapCacheLocatorRloc }
        ::= { lispMapCacheLocatorTable 1 }

    LispMapCacheLocatorEntry ::= SEQUENCE {
        lispMapCacheLocatorRlocLength              Integer32,
        lispMapCacheLocatorRloc                    LispAddressType,
        lispMapCacheLocatorRlocPriority            Integer32,
        lispMapCacheLocatorRlocWeight              Integer32,
        lispMapCacheLocatorRlocMPriority           Integer32,
        lispMapCacheLocatorRlocMWeight             Integer32,
        lispMapCacheLocatorRlocState               INTEGER,
        lispMapCacheLocatorRlocTimeStamp           TimeStamp,
        lispMapCacheLocatorRlocLastPriorityChange  TimeTicks,
        lispMapCacheLocatorRlocLastWeightChange    TimeTicks,
        lispMapCacheLocatorRlocLastMPriorityChange TimeTicks,
        lispMapCacheLocatorRlocLastMWeightChange   TimeTicks,
        lispMapCacheLocatorRlocLastStateChange     TimeTicks,
        lispMapCacheLocatorRlocRtt                 TimeTicks,
        lispMapCacheLocatorRlocDecapOctets         Counter64,
        lispMapCacheLocatorRlocDecapPackets        Counter64,
        lispMapCacheLocatorRlocEncapOctets         Counter64,
        lispMapCacheLocatorRlocEncapPackets        Counter64
    }

    lispMapCacheLocatorRlocLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispMapCacheLocatorRloc."
        ::= { lispMapCacheLocatorEntry 1 }

    lispMapCacheLocatorRloc OBJECT-TYPE
        SYNTAX     LispAddressType
```

```
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The locator for the EID prefix in the mapping cache."
        ::= { lispMapCacheLocatorEntry 2 }

    lispMapCacheLocatorRlocPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast priority of the RLOC for this EID prefix
            (0-255); lower more preferred. "
        ::= { lispMapCacheLocatorEntry 3 }

    lispMapCacheLocatorRlocWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast weight of the RLOC for this EID prefix
            (0 - 100) percentage. "
        ::= { lispMapCacheLocatorEntry 4 }

    lispMapCacheLocatorRlocMPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast priority of the RLOC for this EID prefix
            (0-255); lower more preferred."
        ::= { lispMapCacheLocatorEntry 5 }

    lispMapCacheLocatorRlocMWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast weight of the RLOC for this EID prefix
            (0 - 100) percentage."
        ::= { lispMapCacheLocatorEntry 6 }

    lispMapCacheLocatorRlocState OBJECT-TYPE
        SYNTAX     INTEGER {
                     up (1),
                     down (2),
                     unreachable (3)
                   }
```

```
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The state of this RLOC as per this device
            (1 = RLOC is up; 2 = RLOC is down)."
        ::= { lispMapCacheLocatorEntry 7 }

    lispMapCacheLocatorRlocTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the RLOC of EID prefix
            information represented by this entry was learned by
            this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem,
            then this object contains a zero value."
        ::= { lispMapCacheLocatorEntry 8 }

    lispMapCacheLocatorRlocLastPriorityChange OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time elapsed since the last change of the unicast priority
            of the RLOC for this EID prefix. Note that this is
            independent of lispMapCacheLocatorRlocTimeStamp."
        ::= { lispMapCacheLocatorEntry 9 }

    lispMapCacheLocatorRlocLastWeightChange OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time elapsed since the last change of the unicast weight
            of the RLOC for this EID prefix.Note that this is
            independent of lispMapCacheLocatorRlocTimeStamp."
        ::= { lispMapCacheLocatorEntry 10 }

    lispMapCacheLocatorRlocLastMPriorityChange OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since the last change of the multicast priority of the
            RLOC for this EID prefix."
```

```
        ::= { lispMapCacheLocatorEntry 11 }

    lispMapCacheLocatorRlocLastMWeightChange OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since the last change of the multicast weight of the
            RLOC for this EID prefix."
        ::= { lispMapCacheLocatorEntry 12 }

    lispMapCacheLocatorRlocLastStateChange OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since the last change of the up/down state of the
            RLOC for this EID prefix."
        ::= { lispMapCacheLocatorEntry 13 }

    lispMapCacheLocatorRlocRtt OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Round trip time of RLOC probe and map-reply for this RLOC
            address for this prefix."
        ::= { lispMapCacheLocatorEntry 14 }

    lispMapCacheLocatorRlocDecapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were decapsulated
            by this device and were sourced from a remote host within
            this EID-prefix and were encapsulated for this RLOC.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of RLOC of cache
            being removed and replaced, which can be detected by
            observing the value of lispMapCacheLocatorRlocTimeStamp."
        ::= { lispMapCacheLocatorEntry 15 }

    lispMapCacheLocatorRlocDecapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
```

```
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were decapsulated by this
            device and were sourced from a remote host within this
            EID-prefix and were encapsulated for this RLOC.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of RLOC of cache
            being removed and replaced, which can be detected by
            observing the value of lispMapCacheLocatorRlocTimeStamp."
        ::= { lispMapCacheLocatorEntry 16 }

    lispMapCacheLocatorRlocEncapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that matched this
            EID prefix and were encapsulated using this RLOC address.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of RLOC of cache
            being removed and replaced, which can be detected by
            observing the value of lispMapCacheLocatorRlocTimeStamp."
        ::= { lispMapCacheLocatorEntry 17 }

    lispMapCacheLocatorRlocEncapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that matched this EID prefix
            and were encapsulated using this RLOC address.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of RLOC of cache
            being removed and replaced, which can be detected by
            observing the value of lispMapCacheLocatorRlocTimeStamp."
        ::= { lispMapCacheLocatorEntry 18 }


    lispConfiguredLocatorTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispConfiguredLocatorEntry
        MAX-ACCESS not-accessible
        STATUS     current
```

```
        DESCRIPTION
            "This table represents the set of routing locators
            configured on this device. Note that the Proxy-ITR
            configured addresses are treated as routing locators
            and therefore can be part of this table."
        REFERENCE
            "RFC6830, Section 6.3."
        ::= { lispObjects 8 }

    lispConfiguredLocatorEntry OBJECT-TYPE
        SYNTAX     LispConfiguredLocatorEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the
            lispConfiguredLocatorTable."
        INDEX  { lispConfiguredLocatorRlocLength,
                 lispConfiguredLocatorRloc }
        ::= { lispConfiguredLocatorTable 1 }

    LispConfiguredLocatorEntry ::= SEQUENCE {
        lispConfiguredLocatorRlocLength        Integer32,
        lispConfiguredLocatorRloc              LispAddressType,
        lispConfiguredLocatorRlocState         INTEGER,
        lispConfiguredLocatorRlocLocal         INTEGER,
        lispConfiguredLocatorRlocTimeStamp     TimeStamp,
        lispConfiguredLocatorRlocDecapOctets   Counter64,
        lispConfiguredLocatorRlocDecapPackets  Counter64,
        lispConfiguredLocatorRlocEncapOctets   Counter64,
        lispConfiguredLocatorRlocEncapPackets  Counter64
    }

    lispConfiguredLocatorRlocLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispConfiguredLocatorRloc."
        ::= { lispConfiguredLocatorEntry 1 }

    lispConfiguredLocatorRloc OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is a RLOC address configured on this device.
            It can be an RLOC that is local to this device or can be an
```

```
            RLOC which belongs to another ETR within the same site.
            Proxy-ITR address is treated as an RLOC."
        ::= { lispConfiguredLocatorEntry 2 }

    lispConfiguredLocatorRlocState OBJECT-TYPE
        SYNTAX     INTEGER {
                      up (1),
                      down (2),
                      unreachable (3)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The state of this RLOC as per this device. (1 = RLOC is up;
            2 = RLOC is down; 3 = RLOC is unreachable)."
        ::= { lispConfiguredLocatorEntry 3 }

    lispConfiguredLocatorRlocLocal OBJECT-TYPE
        SYNTAX     INTEGER {
                      siteself (1),
                      sitelocal (2)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates whether the RLOC is local to this device (or
            remote, meaning local to another device in the same LISP
            site). (1 = RLOC is an address on this device; 2 = RLOC is
            an address on another device)."
        ::= { lispConfiguredLocatorEntry 4 }

    lispConfiguredLocatorRlocTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the RLOC was configured on
            this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem, then
            this object contains a zero value."
        ::= { lispConfiguredLocatorEntry 5 }

    lispConfiguredLocatorRlocDecapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
```

```
        DESCRIPTION
            "The number of octets of LISP packets that were addressed to
            this RLOC and were decapsulated.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of configured
            RLOC being removed and replaced, which can be detected by
            observing the value of lispConfiguredLocatorRlocTimeStamp."
        ::= { lispConfiguredLocatorEntry 6 }

    lispConfiguredLocatorRlocDecapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were addressed to this RLOC
            and were decapsulated.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of configured
            RLOC being removed and replaced, which can be detected by
            observing the value of lispConfiguredLocatorRlocTimeStamp."
        ::= { lispConfiguredLocatorEntry 7 }

    lispConfiguredLocatorRlocEncapOctets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of octets of LISP packets that were encapsulated
            by this device using this RLOC address as the source.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of configured
            RLOC being removed and replaced, which can be detected by
            observing the value of lispConfiguredLocatorRlocTimeStamp."
        ::= { lispConfiguredLocatorEntry 8 }

    lispConfiguredLocatorRlocEncapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of LISP packets that were encapsulated by this
            device using this RLOC address as the source.
```

```
            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of configured
            RLOC being removed and replaced, which can be detected by
            observing the value of lispConfiguredLocatorRlocTimeStamp."
        ::= { lispConfiguredLocatorEntry 9 }



    lispEidRegistrationTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispEidRegistrationEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table provides the properties of each LISP EID prefix
            that is registered with this device when configured to be
            a Map-Server."
        REFERENCE
            "RFC6833, Section 4.0."
        ::= { lispObjects 9 }

    lispEidRegistrationEntry OBJECT-TYPE
        SYNTAX     LispEidRegistrationEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the lispEidRegistrationTable."
        INDEX      { lispEidRegistrationEidLength,
                     lispEidRegistrationEid }
        ::= { lispEidRegistrationTable 1 }

    LispEidRegistrationEntry ::= SEQUENCE {
        lispEidRegistrationEidLength                Integer32,
        lispEidRegistrationEid                      LispAddressType,
        lispEidRegistrationSiteName                 OCTET STRING,
        lispEidRegistrationSiteDescription          OCTET STRING,
        lispEidRegistrationIsRegistered             TruthValue,
        lispEidRegistrationFirstTimeStamp           TimeStamp,
        lispEidRegistrationLastTimeStamp            TimeStamp,
        lispEidRegistrationLastRegisterSenderLength Integer32,
        lispEidRegistrationLastRegisterSender       LispAddressType,
        lispEidRegistrationAuthenticationErrors     Counter64,
        lispEidRegistrationRlocsMismatch            Counter64
    }

    lispEidRegistrationEidLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
```

```
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispEidRegistrationEid."
        ::= { lispEidRegistrationEntry 1 }

    lispEidRegistrationEid OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The EID prefix that is being registered."
         ::= { lispEidRegistrationEntry 2 }

    lispEidRegistrationSiteName OBJECT-TYPE
        SYNTAX     OCTET STRING (SIZE(0..63))
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Site name used by a Map-Server to distinguish different
            LISP sites that are registering with it."
        ::= { lispEidRegistrationEntry 3 }

    lispEidRegistrationSiteDescription OBJECT-TYPE
        SYNTAX     OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Description for a site name used by a Map-Server. The EID
            prefix that is being registered belongs to this site."
        ::= { lispEidRegistrationEntry 4 }

    lispEidRegistrationIsRegistered OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the registration status of the given EID prefix.
            If this object is TRUE, then it means the EID prefix is
            registered.

            The value FALSE implies the EID prefix is not registered
            with the Map Server. There are multiple scenarios when this
            could happen like authentication failures, routing problems,
            misconfigs to name a few."
        ::= { lispEidRegistrationEntry 5 }

    lispEidRegistrationFirstTimeStamp OBJECT-TYPE
```

```
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the first valid register
            message for the EID Prefix information represented by this
            entry was received by this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem, then
            this object contains a zero value."
        ::= { lispEidRegistrationEntry 6 }

    lispEidRegistrationLastTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the last valid register
            message for the EID Prefix information represented by this
            entry was received by this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem, then
            this object contains a zero value."
        ::= { lispEidRegistrationEntry 7 }

    lispEidRegistrationLastRegisterSenderLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispEidRegistrationLastRegisterSender, the next
            object."
        ::= { lispEidRegistrationEntry 8 }

    lispEidRegistrationLastRegisterSender OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Source address of the last valid register message for the
            given EID prefix that was received by this device."
        ::= { lispEidRegistrationEntry 9 }

    lispEidRegistrationAuthenticationErrors OBJECT-TYPE
        SYNTAX     Counter64
```

```
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Count of total authentication errors of map-registers
            received for the given EID prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of site config
            changes, which can be detected by observing the value of
            lispEidRegistrationFirstTimeStamp."
        ::= { lispEidRegistrationEntry 10 }

    lispEidRegistrationRlocsMismatch OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Count of total map-registers received that had at least one
            RLOC that was not in the allowed list of RLOCs for the given
            EID prefix.

            Discontinuities in this monotonically increasing value occur
            at re-initialization of the management system.
            Discontinuities can also occur as a result of site config
            changes, which can be detected by observing the value of
            lispEidRegistrationFirstTimeStamp."
        ::= { lispEidRegistrationEntry 11 }


     lispEidRegistrationEtrTable OBJECT-TYPE
         SYNTAX     SEQUENCE OF LispEidRegistrationEtrEntry
         MAX-ACCESS not-accessible
         STATUS     current
         DESCRIPTION
             "This table provides the properties of ETRs that register
             the given EID prefix with this device when configured to
             be a Map-Server."
         REFERENCE
             "RFC6830, Section 6.1."
         ::= { lispObjects 10 }

     lispEidRegistrationEtrEntry OBJECT-TYPE
         SYNTAX     LispEidRegistrationEtrEntry
         MAX-ACCESS not-accessible
         STATUS     current
         DESCRIPTION
             "An entry (conceptual row) in the
```

```
            lispEidRegistrationEtrTable."
        INDEX      { lispEidRegistrationEidLength,
                     lispEidRegistrationEid,
                     lispEidRegistrationEtrSenderLength,
                     lispEidRegistrationEtrSender }
        ::= { lispEidRegistrationEtrTable 1 }

    LispEidRegistrationEtrEntry ::= SEQUENCE {
        lispEidRegistrationEtrSenderLength          Integer32,
        lispEidRegistrationEtrSender                LispAddressType,
        lispEidRegistrationEtrLastTimeStamp         TimeStamp,
        lispEidRegistrationEtrTtl                   Unsigned32,
        lispEidRegistrationEtrProxyReply            TruthValue,
        lispEidRegistrationEtrWantsMapNotify        TruthValue
    }

    lispEidRegistrationEtrSenderLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispEidRegistrationEtrSender."
        ::= { lispEidRegistrationEtrEntry 1 }

    lispEidRegistrationEtrSender OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "Source address of the ETR that is sending valid register
            messages for this EID prefix to this device."
        ::= { lispEidRegistrationEtrEntry 2 }

    lispEidRegistrationEtrLastTimeStamp OBJECT-TYPE
        SYNTAX     TimeStamp
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The value of sysUpTime at which the last valid register
            message from this ETR for the EID Prefix information
            represented by this entry was received by this device.

            If this information was present at the most recent
            re-initialization of the local management subsystem,
            then this object contains a zero value."
        ::= { lispEidRegistrationEtrEntry 3 }
```

```
    lispEidRegistrationEtrTtl OBJECT-TYPE
        SYNTAX     Unsigned32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The Record TTL of the registering ETR device for this
            EID prefix."
        ::= { lispEidRegistrationEtrEntry 4 }

    lispEidRegistrationEtrProxyReply OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates proxy-replying status of the registering ETR for
            this EID prefix. If this object is TRUE, then it means the
            Map-Server can proxy-reply."
        ::= { lispEidRegistrationEtrEntry 5 }

    lispEidRegistrationEtrWantsMapNotify OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates whether the EID prefix wants Map-Notifications.
            If this object is TRUE, then it means the EID prefix wants
            Map-Notifications."
        ::= { lispEidRegistrationEtrEntry 6 }


  lispEidRegistrationLocatorTable OBJECT-TYPE
      SYNTAX     SEQUENCE OF LispEidRegistrationLocatorEntry
      MAX-ACCESS not-accessible
      STATUS     current
      DESCRIPTION
          "This table provides the properties of all locators per
          LISP site that are served by this device when configured
          to be a Map-Server."
      REFERENCE
          "RFC6830, Section 6.1."
      ::= { lispObjects 11 }

  lispEidRegistrationLocatorEntry OBJECT-TYPE
      SYNTAX     LispEidRegistrationLocatorEntry
      MAX-ACCESS not-accessible
      STATUS     current
      DESCRIPTION
          "An entry (conceptual row) in the
```

```
            lispEidRegistrationLocatorTable."
        INDEX      { lispEidRegistrationEidLength,
                     lispEidRegistrationEid,
                     lispEidRegistrationEtrSenderLength,
                     lispEidRegistrationEtrSender,
                     lispEidRegistrationLocatorRlocLength,
                     lispEidRegistrationLocatorRloc }
        ::= { lispEidRegistrationLocatorTable 1 }

    LispEidRegistrationLocatorEntry ::= SEQUENCE {
        lispEidRegistrationLocatorRlocLength         Integer32,
        lispEidRegistrationLocatorRloc               LispAddressType,
        lispEidRegistrationLocatorRlocState          INTEGER,
        lispEidRegistrationLocatorIsLocal            TruthValue,
        lispEidRegistrationLocatorPriority           Integer32,
        lispEidRegistrationLocatorWeight             Integer32,
        lispEidRegistrationLocatorMPriority          Integer32,
        lispEidRegistrationLocatorMWeight            Integer32
    }

    lispEidRegistrationLocatorRlocLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispEidRegistrationLocatorRloc."
        ::= { lispEidRegistrationLocatorEntry 1 }

    lispEidRegistrationLocatorRloc OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The locator of the given EID prefix being registered by the
            given ETR with this device."
        ::= { lispEidRegistrationLocatorEntry 2 }

    lispEidRegistrationLocatorRlocState OBJECT-TYPE
        SYNTAX     INTEGER {
                      up (1),
                      down (2)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The cached state of this RLOC received in map-register from
            the ETR by the device, in the capacity of a Map-Server.
```

```
            Value 1 refers to up, value 2 refers to down."
        ::= { lispEidRegistrationLocatorEntry 3 }

    lispEidRegistrationLocatorIsLocal OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates if the given locator is local to the registering
            ETR. If this object is TRUE,  it means the locator is local."
        ::= { lispEidRegistrationLocatorEntry 4 }

    lispEidRegistrationLocatorPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast priority of the RLOC for this EID prefix in the
            register message sent by the given ETR."
        ::= { lispEidRegistrationLocatorEntry 5 }

    lispEidRegistrationLocatorWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast weight of the RLOC for this EID prefix in the
            register message sent by the given ETR."
        ::= { lispEidRegistrationLocatorEntry 6 }

    lispEidRegistrationLocatorMPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast priority of the RLOC for this EID prefix in
            the register message sent by the given ETR."
        ::= { lispEidRegistrationLocatorEntry 7 }

    lispEidRegistrationLocatorMWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast weight of the RLOC for this EID prefix in the
            register message sent by the given ETR."
        ::= { lispEidRegistrationLocatorEntry 8 }
```

```
    lispUseMapServerTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispUseMapServerEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table provides the properties of the map-server(s)
            with which this device is configured to register."
        REFERENCE
            "RFC6833, Section 4.3."
        ::= { lispObjects 12 }

    lispUseMapServerEntry OBJECT-TYPE
        SYNTAX     LispUseMapServerEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the lispUseMapServerTable."
        INDEX      { lispUseMapServerAddressLength,
                     lispUseMapServerAddress }
        ::= { lispUseMapServerTable 1 }

    LispUseMapServerEntry ::= SEQUENCE {
        lispUseMapServerAddressLength Integer32,
        lispUseMapServerAddress       LispAddressType,
        lispUseMapServerState         INTEGER
    }

    lispUseMapServerAddressLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispUseMapServerAddress."
        ::= { lispUseMapServerEntry 1 }

    lispUseMapServerAddress OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "Address of Map-Server configured on this device."
        ::= { lispUseMapServerEntry 2 }

    lispUseMapServerState OBJECT-TYPE
        SYNTAX     INTEGER {
                      up (1),
                      down (2),
```

```
                    unreachable (3)
                }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "State of this Map-Server configured on this device
            (1 = Map-Server is up; 2 = Map-Server is down)."
        ::= { lispUseMapServerEntry 3 }


    lispUseMapResolverTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispUseMapResolverEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table provides the properties of the map-resolver(s)
            this device is configured to use."
        REFERENCE
            "RFC6833, Section 4.4."
        ::= { lispObjects 13 }

    lispUseMapResolverEntry OBJECT-TYPE
        SYNTAX     LispUseMapResolverEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the
            lispUseMapResolverTable."
        INDEX      { lispUseMapResolverAddressLength,
                     lispUseMapResolverAddress }
        ::= { lispUseMapResolverTable 1 }

    LispUseMapResolverEntry ::= SEQUENCE {
        lispUseMapResolverAddressLength   Integer32,
        lispUseMapResolverAddress         LispAddressType,
        lispUseMapResolverState           INTEGER
    }

    lispUseMapResolverAddressLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispUseMapResolverAddress."
        ::= { lispUseMapResolverEntry 1 }

    lispUseMapResolverAddress OBJECT-TYPE
```

```
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "Address of map-resolver configured on this device."
        ::= { lispUseMapResolverEntry 2 }

    lispUseMapResolverState OBJECT-TYPE
        SYNTAX     INTEGER {
                      up (1),
                      down (2)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "State of this Map-Resolver configured on this device
            (1 = Map-Resolver is up; 2 = Map-Resolver is down)."
        ::= { lispUseMapResolverEntry 3 }


    lispUseProxyEtrTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispUseProxyEtrEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table provides the properties of all Proxy ETRs that
            this device is configured to use."
        REFERENCE
            "RFC6830, Section 6.0."
        ::= { lispObjects 14 }

    lispUseProxyEtrEntry OBJECT-TYPE
        SYNTAX     LispUseProxyEtrEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "An entry (conceptual row) in the
            lispUseProxyEtrTable."
        INDEX      { lispUseProxyEtrAddressLength,
                     lispUseProxyEtrAddress }
        ::= { lispUseProxyEtrTable 1 }

    LispUseProxyEtrEntry ::= SEQUENCE {
        lispUseProxyEtrAddressLength        Integer32,
        lispUseProxyEtrAddress              LispAddressType,
        lispUseProxyEtrPriority             Integer32,
        lispUseProxyEtrWeight               Integer32,
        lispUseProxyEtrMPriority            Integer32,
```

```
        lispUseProxyEtrMWeight              Integer32,
        lispUseProxyEtrState                INTEGER
    }

    lispUseProxyEtrAddressLength OBJECT-TYPE
        SYNTAX     Integer32 (5..259)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
            lispUseProxyEtrAddress."
        ::= { lispUseProxyEtrEntry 1 }

    lispUseProxyEtrAddress OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "Address of Proxy ETR configured on this device."
        ::= { lispUseProxyEtrEntry 2 }

    lispUseProxyEtrPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast priority of the PETR locator."
        ::= { lispUseProxyEtrEntry 3 }

    lispUseProxyEtrWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unicast weight of the PETR locator."
        ::= { lispUseProxyEtrEntry 4 }

    lispUseProxyEtrMPriority OBJECT-TYPE
        SYNTAX     Integer32 (0..255)
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast priority of the PETR locator."
        ::= { lispUseProxyEtrEntry 5 }

    lispUseProxyEtrMWeight OBJECT-TYPE
        SYNTAX     Integer32 (0..100)
        MAX-ACCESS read-only
```

```
          STATUS     current
          DESCRIPTION
              "The multicast weight of the PETR locator."
          ::= { lispUseProxyEtrEntry 6 }

      lispUseProxyEtrState OBJECT-TYPE
          SYNTAX     INTEGER {
                        down (0),
                        up (1)
                     }
          MAX-ACCESS read-only
          STATUS     current
          DESCRIPTION
              "State of this Proxy ETR configured on this device
              (0 = Proxy ETR is down; 1 = Proxy ETR is up)."
          ::= { lispUseProxyEtrEntry 7 }


      --
      -- Conformance Information
      --

      lispCompliances OBJECT IDENTIFIER ::= { lispConformance 1 }
      lispGroups      OBJECT IDENTIFIER ::= { lispConformance 2 }


   --
   -- Compliance Statements
   --

   lispMIBComplianceEtr MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP ETRs. It conveys
               information if device supports ETR feature, and relevant
               state associated with that feature."
       MODULE  -- this module
       MANDATORY-GROUPS { lispMIBEtrGroup }

         GROUP   lispMIBItrGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBPetrGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBPitrGroup
```

```
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapServerGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapResolverGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEtrExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBItrExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapServerExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBTuningParametersGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEncapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDecapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDiagnosticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBVrfGroup
        DESCRIPTION
            "This group is optional."

      ::= { lispCompliances 1 }

   lispMIBComplianceItr MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
```

```
            "The compliance statement for LISP ITRs. It conveys
            information if device supports ITR feature, and any
            state associated with that feature."
        MODULE  -- this module
        MANDATORY-GROUPS { lispMIBItrGroup }

          GROUP   lispMIBEtrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBPetrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBPitrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBMapServerGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBMapResolverGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBEtrExtendedGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBItrExtendedGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBMapServerExtendedGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBTuningParametersGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBEncapStatisticsGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBDecapStatisticsGroup
          DESCRIPTION
```

```
            "This group is optional."

        GROUP   lispMIBDiagnosticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBVrfGroup
        DESCRIPTION
            "This group is optional."

      ::= { lispCompliances 2 }

   lispMIBCompliancePetr MODULE-COMPLIANCE
      STATUS  current
      DESCRIPTION
              "The compliance statement for LISP Proxy-ETRs. It conveys
              information if given device supports Proxy-ETR feature,
              and relevant state associated with that feature."
      MODULE  -- this module
      MANDATORY-GROUPS { lispMIBPetrGroup }

        GROUP   lispMIBEtrGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBItrGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBPitrGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapServerGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapResolverGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEtrExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBItrExtendedGroup
        DESCRIPTION
            "This group is optional."
```

```
        GROUP   lispMIBMapServerExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBTuningParametersGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEncapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDecapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDiagnosticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBVrfGroup
        DESCRIPTION
            "This group is optional."

    ::= { lispCompliances 3 }

lispMIBCompliancePitr MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for LISP Proxy-ITRs. It conveys
            information if device supports Proxy-ITR feature, and
            relevant state associated with that feature."
    MODULE  -- this module
    MANDATORY-GROUPS { lispMIBPitrGroup }

      GROUP   lispMIBEtrGroup
      DESCRIPTION
          "This group is optional."

      GROUP   lispMIBItrGroup
      DESCRIPTION
          "This group is optional."

      GROUP   lispMIBPetrGroup
      DESCRIPTION
          "This group is optional."

      GROUP   lispMIBMapServerGroup
```

```
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapResolverGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEtrExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBItrExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBMapServerExtendedGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBTuningParametersGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEncapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDecapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDiagnosticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBVrfGroup
        DESCRIPTION
            "This group is optional."

    ::= { lispCompliances 4 }

  lispMIBComplianceMapServer MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for LISP Map Servers. It
            conveys information if device supports Map Server
            feature, and relevant state associated with that
            feature."
```

```
        MODULE  -- this module
        MANDATORY-GROUPS { lispMIBMapServerGroup }

          GROUP   lispMIBEtrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBItrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBPetrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBPitrGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBMapResolverGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBEtrExtendedGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBItrExtendedGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBMapServerExtendedGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBTuningParametersGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBEncapStatisticsGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBDecapStatisticsGroup
          DESCRIPTION
              "This group is optional."

          GROUP   lispMIBDiagnosticsGroup
```

```
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBVrfGroup
        DESCRIPTION
            "This group is optional."

      ::= { lispCompliances 5 }

   lispMIBComplianceMapResolver MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP Map Resolvers. It
               conveys information if device supports Map Server
               feature, and relevant state associated with that
               feature."
       MODULE  -- this module
       MANDATORY-GROUPS { lispMIBMapResolverGroup }

         GROUP   lispMIBEtrGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBItrGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBPetrGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBPitrGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBMapServerGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBEtrExtendedGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBItrExtendedGroup
         DESCRIPTION
             "This group is optional."

         GROUP   lispMIBMapServerExtendedGroup
```

```
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBTuningParametersGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBEncapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDecapStatisticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBDiagnosticsGroup
        DESCRIPTION
            "This group is optional."

        GROUP   lispMIBVrfGroup
        DESCRIPTION
            "This group is optional."

     ::= { lispCompliances 6 }


    --
    -- Units of Conformance
    --

    lispMIBEtrGroup OBJECT-GROUP
        OBJECTS { lispFeaturesEtrEnabled,
                  lispMappingDatabaseLsb,
                  lispMappingDatabaseLocatorRlocPriority,
                  lispMappingDatabaseLocatorRlocWeight,
                  lispMappingDatabaseLocatorRlocMPriority,
                  lispMappingDatabaseLocatorRlocMWeight,
                  lispMappingDatabaseLocatorRlocState,
                  lispMappingDatabaseLocatorRlocLocal,
                  lispConfiguredLocatorRlocState,
                  lispConfiguredLocatorRlocLocal,
                  lispUseMapServerState
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support basic
                 management of LISP ETRs."
        ::= { lispGroups 1 }
```

```
      lispMIBItrGroup OBJECT-GROUP
          OBJECTS { lispFeaturesItrEnabled,
                    lispFeaturesMapCacheSize,
                    lispMappingDatabaseLsb,
                    lispMapCacheLocatorRlocPriority,
                    lispMapCacheLocatorRlocWeight,
                    lispMapCacheLocatorRlocMPriority,
                    lispMapCacheLocatorRlocMWeight,
                    lispMapCacheLocatorRlocState,
                    lispMapCacheEidTimeStamp,
                    lispMapCacheEidExpiryTime,
                    lispUseMapResolverState,
                    lispUseProxyEtrPriority,
                    lispUseProxyEtrWeight,
                    lispUseProxyEtrMPriority,
                    lispUseProxyEtrMWeight,
                    lispUseProxyEtrState
                  }
          STATUS  current
          DESCRIPTION
                  "A collection of objects to support basic
                   management of LISP ITRs."
          ::= { lispGroups 2 }

      lispMIBPetrGroup OBJECT-GROUP
          OBJECTS { lispFeaturesProxyEtrEnabled
                  }
          STATUS  current
          DESCRIPTION
                  "A collection of objects to support basic
                   management of LISP Proxy-ETRs."
          ::= { lispGroups 3 }

      lispMIBPitrGroup OBJECT-GROUP
          OBJECTS { lispFeaturesProxyItrEnabled,
                    lispConfiguredLocatorRlocState,
                    lispConfiguredLocatorRlocLocal
                  }

          STATUS  current
          DESCRIPTION
                  "A collection of objects to support basic
                   management of LISP Proxy-ITRs."
          ::= { lispGroups 4 }

      lispMIBMapServerGroup OBJECT-GROUP
          OBJECTS { lispFeaturesMapServerEnabled,
                    lispEidRegistrationIsRegistered,
```

```
                  lispEidRegistrationLocatorRlocState
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support basic
                 management of LISP Map Servers."
        ::= { lispGroups 5 }

    lispMIBMapResolverGroup OBJECT-GROUP
        OBJECTS { lispFeaturesMapResolverEnabled
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support basic
                 management of LISP Map Resolvers."
        ::= { lispGroups 6 }

    lispMIBEtrExtendedGroup OBJECT-GROUP
        OBJECTS { lispFeaturesRlocProbeEnabled,
                  lispFeaturesEtrAcceptMapDataEnabled,
                  lispFeaturesEtrAcceptMapDataVerifyEnabled,
                  lispMappingDatabaseEidPartitioned
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support management
                 of LISP features and properties on ETRs."
        ::= { lispGroups 7 }

    lispMIBItrExtendedGroup OBJECT-GROUP
        OBJECTS { lispFeaturesRlocProbeEnabled,
                  lispMapCacheEidState,
                  lispMapCacheEidAuthoritative,
                  lispMapCacheLocatorRlocTimeStamp,
                  lispMapCacheLocatorRlocLastPriorityChange,
                  lispMapCacheLocatorRlocLastWeightChange,
                  lispMapCacheLocatorRlocLastMPriorityChange,
                  lispMapCacheLocatorRlocLastMWeightChange,
                  lispMapCacheLocatorRlocLastStateChange,
                  lispMapCacheLocatorRlocRtt
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support management
                 of LISP features and properties on ITRs."
        ::= { lispGroups 8 }

    lispMIBMapServerExtendedGroup OBJECT-GROUP
```

```
        OBJECTS { lispEidRegistrationSiteName,
                  lispEidRegistrationSiteDescription,
                  lispEidRegistrationIsRegistered,
                  lispEidRegistrationFirstTimeStamp,
                  lispEidRegistrationLastTimeStamp,
                  lispEidRegistrationLastRegisterSenderLength,
                  lispEidRegistrationLastRegisterSender,
                  lispEidRegistrationEtrLastTimeStamp,
                  lispEidRegistrationEtrTtl,
                  lispEidRegistrationEtrProxyReply,
                  lispEidRegistrationEtrWantsMapNotify,
                  lispEidRegistrationLocatorIsLocal,
                  lispEidRegistrationLocatorPriority,
                  lispEidRegistrationLocatorWeight,
                  lispEidRegistrationLocatorMPriority,
                  lispEidRegistrationLocatorMWeight
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support management
                 of LISP features and properties on Map Servers
                 related to EID registrations."
        ::= { lispGroups 9 }

    lispMIBTuningParametersGroup OBJECT-GROUP
        OBJECTS { lispFeaturesMapCacheLimit,
                  lispFeaturesEtrMapCacheTtl
                }
        STATUS  current
        DESCRIPTION
                "A collection of writeable objects used to
                 configure LISP behavior and to tune performance."
        ::= { lispGroups 10 }

    lispMIBEncapStatisticsGroup OBJECT-GROUP
        OBJECTS { lispMappingDatabaseTimeStamp,
                  lispMappingDatabaseEncapOctets,
                  lispMappingDatabaseEncapPackets,
                  lispMappingDatabaseLocatorRlocTimeStamp,
                  lispMappingDatabaseLocatorRlocEncapOctets,
                  lispMappingDatabaseLocatorRlocEncapPackets,
                  lispMapCacheEidTimeStamp,
                  lispMapCacheEidEncapOctets,
                  lispMapCacheEidEncapPackets,
                  lispMapCacheLocatorRlocTimeStamp,
                  lispMapCacheLocatorRlocEncapOctets,
                  lispMapCacheLocatorRlocEncapPackets,
                  lispConfiguredLocatorRlocTimeStamp,
```

```
                  lispConfiguredLocatorRlocEncapOctets,
                  lispConfiguredLocatorRlocEncapPackets
                }
        STATUS  current
        DESCRIPTION
                "A collection of LISP encapsulation statistics
                 by the device."
        ::= { lispGroups 11 }

    lispMIBDecapStatisticsGroup OBJECT-GROUP
        OBJECTS { lispMappingDatabaseTimeStamp,
                  lispMappingDatabaseDecapOctets,
                  lispMappingDatabaseDecapPackets,
                  lispMappingDatabaseLocatorRlocTimeStamp,
                  lispMappingDatabaseLocatorRlocDecapOctets,
                  lispMappingDatabaseLocatorRlocDecapPackets,
                  lispMapCacheEidTimeStamp,
                  lispMapCacheEidDecapOctets,
                  lispMapCacheEidDecapPackets,
                  lispMapCacheLocatorRlocTimeStamp,
                  lispMapCacheLocatorRlocDecapOctets,
                  lispMapCacheLocatorRlocDecapPackets,
                  lispConfiguredLocatorRlocTimeStamp,
                  lispConfiguredLocatorRlocDecapOctets,
                  lispConfiguredLocatorRlocDecapPackets
                }
        STATUS  current
        DESCRIPTION
                "A collection of LISP decapsulation statistics
                 by the device."
        ::= { lispGroups 12 }

    lispMIBDiagnosticsGroup OBJECT-GROUP
        OBJECTS { lispFeaturesRouterTimeStamp,
                  lispGlobalStatsMapRequestsIn,
                  lispGlobalStatsMapRequestsOut,
                  lispGlobalStatsMapRepliesIn,
                  lispGlobalStatsMapRepliesOut,
                  lispGlobalStatsMapRegistersIn,
                  lispGlobalStatsMapRegistersOut,
                  lispEidRegistrationAuthenticationErrors,
                  lispEidRegistrationRlocsMismatch
                }
        STATUS  current
        DESCRIPTION
                "Objects providing additional diagnostics
                related to a LISP router. These are related
                to LISP control plane state."
```

```
        ::= { lispGroups 13 }

    lispMIBVrfGroup OBJECT-GROUP
        OBJECTS { lispIidToVrfName
                }
        STATUS  current
        DESCRIPTION
                "Objects providing information related to VRF
                 configurations on a LISP router."
        ::= { lispGroups 14 }


END
```

8. Relationship to Other MIB Modules

8.1. MIB modules required for IMPORTS

The LISP MIB imports the textual-convention AddressFamilyNumbers from the IANA-ADDRESS-FAMILY-NUMBERS-MIB [IANA].

9. Security Considerations

There are no management objects defined in this MIB module that have a MAX-ACCESS clause of read-write and/or read-create. As long as these MIB modules are implemented correctly, there are no risks that any management objects of this MIB module can modify device settings via direct SNMP SET operations.

There are no readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) that are considered sensitive.

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

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

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an

instance of these MIB modules 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.

10. IANA Considerations

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

Descriptor	OBJECT IDENTIFIER value
lispMib	{ mib-2 XXX }

This document instructs IANA to allocate a new value in the "SMI Network Management MGMT Codes Internet-standard MIB" subregistry of the "Network Management Parameters" registry, according to the following registration data: Decimal: [TBD by IANA] Name: lispMIB Description: Locator/ID Separation Protocol (LISP) References: [RFC XXXX (this RFC)]

11. References

11.1. Normative References

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[RFC6832] Lewis, D., Meyer, D., Farinacci, D., and V. Fuller, "Interworking between Locator/ID Separation Protocol (LISP) and Non-LISP Sites", RFC 6832, January 2013.

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11.2. Informative References

[LCAF] Farinacci, D., Meyer, D., and J. Snijders, "LISP Canonical Address Format", draft-ietf-lisp-lcaf-00.txt (work in progress), August 2012.

[RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", RFC 3410, December 2002.

[RFC6831] Farinacci, D., Meyer, D., Zwiebel, J., and S. Venaas, "The Locator/ID Separation Protocol (LISP) for Multicast Environments", RFC 6831, January 2013.

Appendix A. Open Issues

Open issues for the LISP MIB include the following:

1. This LISP MIB draft does not include LISP Multicast [LISP-MCAST] considerations. Multicast considerations will be added in a separate LISP Multicast MIB draft.

Appendix B. Acknowledgments

A thank you is owed to Dino Farinacci for his inputs and review comments on the initial versions of this draft. In addition, the authors would like to gratefully acknowledge several others who have reviewed and commented on this draft. They include: Darrel Lewis, Isidor Kouvelas, Jesper Skriver, Selina Heimlich, Parna Agrawal, Dan Romascanu, and Luigi Iannone. A special thanks to Brian Haberman, the Internet Area AD, for his very detailed review. Also to Miguel Garcia for reviewing this document as part of the General Area Review Team.

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