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LISP MIB
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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.

Status of This Memo

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

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This Internet-Draft will expire on June 2, 2012.

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1. Requirements Notation

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [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 [LISP] 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. In addition, LISP assumes the existence of a database to store and globally propagate those mappings [LISP-MS] [LISP-ALT].

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 [LISP]. 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 [INTERWORK].

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 [LISP]. 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 [LISP-MS]. Finally, while not specifically required, this document assumes that a LISP+ALT database mapping infrastructure exists as part of the LISP control plane. The control plane operations of the ALT are described in [LISP-ALT]. Note that this MIB does not provide support for the ALT since ALT statistics may be obtained through existing BGP and tunnel MIBs.

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 EID 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: is a 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 [INTERWORK].

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 [INTERWORK].

LISP Site: is 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 though static configuration, or another out-of-band mechanism. A Map-Server advertises these mappings into the distributed mapping database such as that described in [LISP-ALT].

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 system such as that described in [LISP-ALT]. If it is not, a Negative Map-Reply is immediately returned.

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.

LISP+ALT: a static network built using Border Gateway Protocol (BGP, [RFC4271]), BGP multi-protocol extension [RFC4760], and Generic Routing Encapsulation (GRE, [RFC2784]) to construct an overlay network of devices (ALT Routers) which operate on EID-prefixes and use EIDs as forwarding destinations. This LISP+ALT network may, but is not required to be, used by LISP to find EID-to-RLOC mappings. LISP+ALT is described in [LISP-ALT].

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 ten tables of objects, as follows:

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

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.

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  FROM SNMPv2-TC          -- [RFC2579]
    MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF        -- [RFC2580]
    AddressFamilyNumbers
                FROM IANA-ADDRESS-FAMILY-NUMBERS-MIB;     -- [IANA]

lispMIB MODULE-IDENTITY
    LAST-UPDATED "201111300000Z" -- 30 November 2011
    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
            "The mib module for management of LISP routers.

            Copyright (C) The IETF Trust (2011)."
   REVISION     "201111300000Z" -- 30 November 2011
   DESCRIPTION  "Initial Revision"
     ::= { mib-x xxx }

--
-- Textual Conventions
--

LispAddressType ::= TEXTUAL-CONVENTION
    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 variable-length field comprised of the remaining octets of this LispAddressType four-tuple, 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 10.10.10.0/24. In this case, the values within lispMapCacheEntry would be:

```
   lispMapCacheEidLength  = 8
   lispMapCacheEid = 1, 4, 10.10.10.0, 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, 10.10.10.0 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 10.10.10.0/24 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, 10.10.10.0, 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, 10.10.10.0 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 "[LISP]"
     SYNTAX OCTET STRING (SIZE (0..1024))


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



   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 "[LISP]"
       ::= { lisp 1 }

   lispFeaturesEntry OBJECT-TYPE
       SYNTAX     LispFeaturesEntry
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "An entry (conceptual row) in the lispFeaturesTable."
       INDEX      { lispInstanceID,
                    lispAddressFamily }
       ::= { 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,
       lispFeaturesMapRequestsIn                 Counter64,
```

```
        lispFeaturesMapRequestsOut                Counter64,
        lispFeaturesMapRepliesIn                  Counter64,
        lispFeaturesMapRepliesOut                 Counter64,
        lispFeaturesMapRegistersIn                Counter64,
        lispFeaturesMapRegistersOut               Counter64
    }

    lispFeaturesInstanceID OBJECT-TYPE
        SYNTAX     Unsigned32
        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 address family number that the lisp device
             is enabled to lisp process a packet for as a
             destination address family."
         ::= { lispFeaturesEntry 2 }

    lispFeaturesItrEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of ITR role on this device
             (0 = ITR disabled; 1 = ITR enabled)."
        ::= { lispFeaturesEntry 3 }

    lispFeaturesEtrEnabled OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates the status of ETR role on this device
             (0 = ETR disabled; 1 = ETR 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 (0 = PITR disabled; 1 = PITR 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 (0 = PETR disabled; 1 = PETR 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 (0 = MS disabled; 1 = MS 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 (0 = MR disabled; 1 = MR 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 size of EID-to-RLOC map
             cache on this device."
        ::= { lispFeaturesEntry 10 }

    lispFeaturesEtrMapCacheTtl OBJECT-TYPE
        SYNTAX     Unsigned32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time in minutes this device will store 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 (0 = disabled; 1 = 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 (0 = disabled; 1 = enabled)."
        ::= { 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 (0 = disabled;
             1 = enabled)."
        ::= { lispFeaturesEntry 14 }

    lispFeaturesMapRequestsIn 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."
        ::= { lispFeaturesEntry 15 }

    lispFeaturesMapRequestsOut 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."
        ::= { lispFeaturesEntry 16 }

    lispFeaturesMapRepliesIn 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."
        ::= { lispFeaturesEntry 17 }

    lispFeaturesMapRepliesOut 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."
        ::= { lispFeaturesEntry 18 }

    lispFeaturesMapRegistersIn 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."
        ::= { lispFeaturesEntry 19 }

    lispFeaturesMapRegistersOut 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."
        ::= { lispFeaturesEntry 20 }


    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 "[LISP]"
        ::= { lisp 2 }

    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,
        lispMappingDatabaseDecapOctets      Counter64,
        lispMappingDatabaseDecapPackets     Counter64,
        lispMappingDatabaseEncapOctets      Counter64,
        lispMappingDatabaseEncapPackets     Counter64
    }

    lispMappingDatabaseEidLength OBJECT-TYPE
        SYNTAX     Integer32 (0..1024)
        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
        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
             (0 = not partitioned; 1 = partitioned)."
        ::= { lispMappingDatabaseEntry 4 }

    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."
        ::= { lispMappingDatabaseEntry 5 }

    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."
        ::= { lispMappingDatabaseEntry 6 }

    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."
        ::= { lispMappingDatabaseEntry 7 }

    lispMappingDatabaseEncapPackets OBJECT-TYPE
        SYNTAX     Counter64
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The number of Lisp packets that were
             encapsulated by this device that whose inner
             header source address matched this EID prefix."
        ::= { lispMappingDatabaseEntry 8 }


    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 "[LISP]"
        ::= { lisp 3 }

    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,
       lispMappingDatabaseLocatorRlocDecapOctets   Counter64,
       lispMappingDatabaseLocatorRlocDecapPackets  Counter64,
       lispMappingDatabaseLocatorRlocEncapOctets   Counter64,
       lispMappingDatabaseLocatorRlocEncapPackets  Counter64
   }

   lispMappingDatabaseLocatorRlocLength OBJECT-TYPE
       SYNTAX     Integer32
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "This object is used to get the octet-length of
            lispMappingDatabaseLocatorRloc, the next object."
       ::= { lispMappingDatabaseLocatorEntry 3 }

   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 4 }

   lispMappingDatabaseLocatorRlocPriority OBJECT-TYPE
       SYNTAX     Integer32
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "The unicast priority of the RLOC."
       ::= { lispMappingDatabaseLocatorEntry 5 }

   lispMappingDatabaseLocatorRlocWeight OBJECT-TYPE
       SYNTAX     Integer32
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "The unicast weight of the RLOC."
       ::= { lispMappingDatabaseLocatorEntry 6 }
```

```
   lispMappingDatabaseLocatorRlocMPriority OBJECT-TYPE
       SYNTAX     Integer32
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "The multicast priority of the RLOC."
       ::= { lispMappingDatabaseLocatorEntry 7 }

   lispMappingDatabaseLocatorRlocMWeight OBJECT-TYPE
       SYNTAX     Integer32
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "The multicast weight of the RLOC."
       ::= { lispMappingDatabaseLocatorEntry 8 }

   lispMappingDatabaseLocatorRlocState OBJECT-TYPE
       SYNTAX     INTEGER {
                     down (0),
                     up (1),
                     unreachable (2)
                  }
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "The state of this RLOC as per this device.
            (0 = RLOC is down; 1 = RLOC is up;
             2 = RLOC is unreachable)."
       ::= { lispMappingDatabaseLocatorEntry 9 }

   lispMappingDatabaseLocatorRlocLocal OBJECT-TYPE
       SYNTAX     INTEGER {
                     sitelocal (0),
                     siteself (1)
                  }
       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). (0 = RLOC is
            an address on another device; 1 = RLOC is an
            address on this device)."
       ::= { lispMappingDatabaseLocatorEntry 10 }

   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."
        ::= { lispMappingDatabaseLocatorEntry 11 }

    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."
        ::= { lispMappingDatabaseLocatorEntry 12 }

    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."
        ::= { lispMappingDatabaseLocatorEntry 13 }

    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."
        ::= { lispMappingDatabaseLocatorEntry 14 }


    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 "[LISP]"
        ::= { lisp 4 }

    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,
        lispMapCacheEidUpTime           TimeTicks,
        lispMapCacheEidExpiryTime       TimeTicks,
        lispMapCacheEidState            TruthValue,
        lispMapCacheEidAuthoritative    TruthValue,
        lispMapCacheDecapOctets         Counter64,
        lispMapCacheDecapPackets        Counter64,
        lispMapCacheEncapOctets         Counter64,
        lispMapCacheEncapPackets        Counter64
    }

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

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

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

```
        DESCRIPTION
            "The up time of the EID prefix."
        ::= { 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 (0 = EID prefix is idle;
             1 = EID prefix is active)."
        ::= { 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 (0 = EID prefix was not installed by
             an authoritative map-reply; 1 = EID prefix was
             installed by an authoritative map-reply)."
        ::= { lispMapCacheEntry 6 }

    lispMapCacheDecapOctets 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."
        ::= { lispMapCacheEntry 7 }

    lispMapCacheDecapPackets 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."
        ::= { lispMapCacheEntry 8 }

    lispMapCacheEncapOctets 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."
        ::= { lispMapCacheEntry 9 }

    lispMapCacheEncapPackets 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."
        ::= { 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 "[LISP]"
        ::= { lisp 5 }

    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,
        lispMapCacheLocatorRlocUpTime              TimeTicks,
        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
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
             lispMapCacheLocatorRloc, the next object."
        ::= { lispMapCacheLocatorEntry 3 }

    lispMapCacheLocatorRloc OBJECT-TYPE
        SYNTAX     LispAddressType
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The locator for the EID prefix in the mapping cache."
        ::= { lispMapCacheLocatorEntry 4 }

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

```
        ::= { lispMapCacheLocatorEntry 5 }

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

    lispMapCacheLocatorRlocMPriority OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast priority of the RLOC for this EID prefix."
        ::= { lispMapCacheLocatorEntry 7 }

    lispMapCacheLocatorRlocMWeight OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The multicast weight of the RLOC for this EID prefix."
        ::= { lispMapCacheLocatorEntry 8 }

    lispMapCacheLocatorRlocState OBJECT-TYPE
        SYNTAX     INTEGER {
                      down (0),
                      up (1)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The state of this RLOC as per this device
             (0 = RLOC is down; 1 = RLOC is up)."
        ::= { lispMapCacheLocatorEntry 9 }

    lispMapCacheLocatorRlocUpTime OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
                "The up-time of this RLOC."
        ::= { lispMapCacheLocatorEntry 10 }

    lispMapCacheLocatorRlocLastPriorityChange OBJECT-TYPE
```

```
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since the last change of the unicast priority
             of the RLOC for this EID prefix."
        ::= { lispMapCacheLocatorEntry 11 }

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

    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 13 }

    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 14 }

    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 15 }

    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 16 }

    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."
        ::= { lispMapCacheLocatorEntry 17 }

    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."
        ::= { lispMapCacheLocatorEntry 18 }

    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."
        ::= { lispMapCacheLocatorEntry 19 }

    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."
        ::= { lispMapCacheLocatorEntry 20 }


    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 "[LISP]"
        ::= { lisp 6 }

    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,
        lispEidRegistrationFirstRegisterTime        TimeTicks,
        lispEidRegistrationLastRegisterTime         TimeTicks,
        lispEidRegistrationLastRegisterSenderLength Integer32,
        lispEidRegistrationLastRegisterSender       LispAddressType,
        lispEidRegistrationRouteTag                 Unsigned32
        lispEidRegistrationAuthenticationErrors     Counter64,
        lispEidRegistrationRlocsMismatch            Counter64
    }

    lispEidRegistrationEidLength OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
             lispEidRegistrationEid, the next object."
        ::= { 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 (0 = EID prefix is not
             registered; 1 = EID prefix is registered)."
        ::= { lispEidRegistrationEntry 5 }

    lispEidRegistrationFirstRegisterTime OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since a first valid register message for
             the given EID prefix was received by this device."
        ::= { lispEidRegistrationEntry 6 }

    lispEidRegistrationLastRegisterTime OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since the last valid register message for
             the given EID prefix was received by this device."
```

```
        ::= { lispEidRegistrationEntry 6 }

    lispEidRegistrationLastRegisterSenderLength OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
             lispEidRegistrationLastRegisterSender, the next object."
        ::= { lispEidRegistrationEntry 7 }

    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 8 }

    lispEidRegistrationRouteTag OBJECT-TYPE
        SYNTAX     Unsigned32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Value of the routing table tag assigned to the
             given EID prefix."
        ::= { 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."
        ::= { 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."
```

```
        ::= { 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 "[LISP]"
        ::= { lisp 6 }

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

    LispEidRegistrationEtrEntry ::= SEQUENCE {
        lispEidRegistrationEtrSenderLength          Integer32,
        lispEidRegistrationEtrSender                LispAddressType,
        lispEidRegistrationEtrLastRegisterTime      TimeTicks,
        lispEidRegistrationEtrTtl                   TimeTicks,
        lispEidRegistrationEtrProxyReply            TruthValue,
        lispEidRegistrationEtrWantsMapNotify        TruthValue
    }

    lispEidRegistrationEtrSenderLength OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
             lispEidRegistrationEtrSender, the next object."
        ::= { lispEidRegistrationEtrEntry 6 }

    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 7 }

    lispEidRegistrationEtrLastRegisterTime OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Time since the last valid register message from this ETR
             for the given EID prefix was received by this device."
        ::= { lispEidRegistrationEtrEntry 6 }

    lispEidRegistrationEtrTtl OBJECT-TYPE
        SYNTAX     TimeTicks
        MAX-ACCESS read-only
        STATUS     current
            "Time in minutes of the Record TTL of the
             registering ETR device for this EID prefix."
        ::= { lispEidRegistrationEtrEntry 6 }

    lispEidRegistrationEtrProxyReply OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates proxy-replying status of the registering
             ETR for this EID prefix. (0 = Map-Server should not
             proxy-reply; 1 = Map-Server may proxy-reply)."
        ::= { lispEidRegistrationEtrEntry 16 }

    lispEidRegistrationEtrWantsMapNotify OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates whether the EID prefix wants
             Map-Notifications (0 = EID prefix does not want
             Map-Notifications; 1 = EID prefix wants
             Map-Notifications)."
        ::= { lispEidRegistrationEntry 12 }



    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 "[LISP]"
        ::= { lisp 7 }

    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
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This object is used to get the octet-length of
             lispEidRegistrationLocatorRloc, the next object."
        ::= { lispEidRegistrationLocatorEntry 4 }

    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 5 }

    lispEidRegistrationLocatorRlocState OBJECT-TYPE
        SYNTAX     INTEGER {
                      down (0),
                      up (1)
                   }
        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 0 refers to down,
             value 1 refers to up."
        ::= { lispEidRegistrationLocatorEntry 8 }

    lispEidRegistrationLocatorIsLocal OBJECT-TYPE
        SYNTAX     TruthValue
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "Indicates if the given locator is local to the
             registering ETR. Value 1 implies local, value 0
             implies not local."
        ::= { lispEidRegistrationLocatorEntry 13 }

    lispEidRegistrationLocatorRlocPriority OBJECT-TYPE
        SYNTAX     Integer32
        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 9 }

    lispEidRegistrationLocatorRlocWeight OBJECT-TYPE
        SYNTAX     Integer32
        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 10 }

    lispEidRegistrationLocatorRlocMPriority OBJECT-TYPE
        SYNTAX     Integer32
```

```
        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 11 }

    lispEidRegistrationLocatorRlocMWeight OBJECT-TYPE
        SYNTAX     Integer32
        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 12 }


    lispUseMapServerTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispMapServersEntry
        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 "[LISP]"
        ::= { lisp 8 }

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

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

    lispUseMapServerAddressLength OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS not-accessible
        STATUS     current
```

```
        DESCRIPTION
            "This object is used to get the octet-length of
             lispUseMapServerAddress, the next object."
        ::= { 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 {
                      down (0),
                      up (1)
                   }
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "State of this Map-Server configured on this
             device (0 = Map-Server is down; 1 = Map-Server
             is up)."
        ::= { lispUseMapServerEntry 3 }


    lispUseMapResolverTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF LispMapResolversEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "This table provides the properties of the
             map-resolver(s) this device is configured to use."
        REFERENCE "[LISP]"
        ::= { lisp 9 }

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

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

   lispUseMapResolverAddressLength OBJECT-TYPE
       SYNTAX     Integer32
       MAX-ACCESS not-accessible
       STATUS     current
       DESCRIPTION
           "This object is used to get the octet-length of
            lispUseMapResolverAddress, the next object."
       ::= { 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 {
                     down (0),
                     up (1)
                  }
       MAX-ACCESS read-only
       STATUS     current
       DESCRIPTION
           "State of this Map-Resolver configured on this device
            (0 = Map-Resolver is down; 1 = Map-Resolver is up)."
       ::= { 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 "[LISP]"
       ::= { lisp 10 }

   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,
        lispUseProxyEtrState                INTEGER
    }

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

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

    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 3 }
```

```
   --
   -- Conformance Information
   --

   lispMIBConformance OBJECT IDENTIFIER ::= { lispMIB 2 }
   lispMIBCompliances OBJECT IDENTIFIER ::= { lispMIBConformance 1 }
   lispMIBGroups      OBJECT IDENTIFIER ::= { lispMIBConformance 2 }


   --
   -- Compliance Statements
   --

   lispMIBComplianceEtr MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP ETRs."
       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."

      ::= { lispMIBCompliances 1 }

   lispMIBComplianceItr MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP ITRs."
       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."

      ::= { lispMIBCompliances 2 }

   lispMIBCompliancePetr MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP Proxy-ETRs."
       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."

      ::= { lispMIBCompliances 3 }

   lispMIBCompliancePitr MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP Proxy-ITRs."
       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."

      ::= { lispMIBCompliances 4 }

   lispMIBComplianceMapServer MODULE-COMPLIANCE
       STATUS  current
```

```
       DESCRIPTION
               "The compliance statement for LISP Map Servers."
       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."

      ::= { lispMIBCompliances 5 }

   lispMIBComplianceMapResolver MODULE-COMPLIANCE
       STATUS  current
       DESCRIPTION
               "The compliance statement for LISP Map Resolvers."
       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."

      ::= { lispMIBCompliances 6 }


   --
   -- Units of Conformance
   --

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

   lispMIBItrGroup OBJECT-GROUP
       OBJECTS { lispFeaturesItrEnabled,
                 lispMapCacheSize,
                 lispMappingDatabaseLsb,
                 lispMapCacheLocatorRlocPriority,
                 lispMapCacheLocatorRlocWeight,
                 lispMapCacheLocatorRlocMPriority,
                 lispMapCacheLocatorRlocMWeight,
                 lispMapCacheLocatorRlocState,
                 lispMapCacheEidUpTime,
                 lispMapCacheEidExpiryTime,
                 lispUseMapResolverState,
```

```
                lispUseProxyEtrState
              }
      STATUS  current
      DESCRIPTION
              "A collection of objects to support basic
               management of LISP ITRs."
      ::= { lispMIBGroups 2 }

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

   lispMIBPitrGroup OBJECT-GROUP
      OBJECTS { lispFeaturesProxyItrEnabled
              }
      STATUS  current
      DESCRIPTION
              "A collection of objects to support basic
               management of LISP Proxy-ITRs."
      ::= { lispMIBGroups 4 }

   lispMIBMapServerGroup OBJECT-GROUP
      OBJECTS { lispFeaturesMapServerEnabled,
                lispEidRegistrationEidRegisterState,
                lispEidRegistrationLocatorRlocState,
                lispEidRegistrationLocatorRlocPriority,
                lispEidRegistrationLocatorRlocWeight,
                lispEidRegistrationLocatorRlocMPriority,
                lispEidRegistrationLocatorRlocMWeight,
                lispEidRegistrationLocatorRlocRegisterState
              }
      STATUS  current
      DESCRIPTION
              "A collection of objects to support basic
               management of LISP Map Servers."
      ::= { lispMIBGroups 5 }


   lispMIBMapResolverGroup OBJECT-GROUP
      OBJECTS { lispFeaturesMapResolverEnabled
              }
      STATUS  current
      DESCRIPTION
```

```
                "A collection of objects to support basic
                 management of LISP Map Resolvers."
        ::= { lispMIBGroups 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."
        ::= { lispMIBGroups 7 }

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

    lispMIBMapServerExtendedGroup OBJECT-GROUP
        OBJECTS { lispEidRegistrationDescription,
                  lispEidRegistrationEidFirstRegisterTime,
                  lispEidRegistrationEidRegisterSenderLength,
                  lispEidRegistrationEidRegisterSender,
                  lispEidRegistrationEidRouteTag,
                  lispEidRegistrationEidWantsMapNotifies,
                  lispEidRegistrationLocatorRlocFirstRegisterTime,
                  lispEidRegistrationLocatorRlocLastRegisterTime,
                  lispEidRegistrationLocatorRlocProxyReply
                }
        STATUS  current
        DESCRIPTION
                "A collection of objects to support management
```

```
                of LISP features and properties on Map Servers."
        ::= { lispMIBGroups 9 }

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

    lispMIBEncapStatisticsGroup OBJECT-GROUP
        OBJECTS { lispMappingDatabaseEncapOctets,
                  lispMappingDatabaseEncapPackets,
                  lispMappingDatabaseLocatorRlocEncapOctets,
                  lispMappingDatabaseLocatorRlocEncapPackets,
                  lispMapCacheEncapOctets,
                  lispMapCacheEncapPackets,
                  lispMapCacheLocatorRlocEncapOctets,
                  lispMapCacheLocatorRlocEncapPackets
                }
        STATUS  current
        DESCRIPTION
                "A collection of LISP encapsulation statistics
                 by the device."
        ::= { lispMIBGroups 11 }

    lispMIBDecapStatisticsGroup OBJECT-GROUP
        OBJECTS { lispMappingDatabaseDecapOctets,
                  lispMappingDatabaseDecapPackets,
                  lispMappingDatabaseLocatorRlocDecapOctets,
                  lispMappingDatabaseLocatorRlocDecapPackets,
                  lispMapCacheDecapOctets,
                  lispMapCacheDecapPackets,
                  lispMapCacheLocatorRlocDecapOctets,
                  lispMapCacheLocatorRlocDecapPackets
                }
        STATUS  current
        DESCRIPTION
                "A collection of LISP decapsulation statistics
                 by the device."
        ::= { lispMIBGroups 12 }

    lispMIBDiagnosticsGroup OBJECT-GROUP
        OBJECTS { lispFeaturesMapRequestsIn,
                  lispFeaturesMapRequestsOut,
```

```
                lispFeaturesMapRepliesIn,
                lispFeaturesMapRepliesOut,
                lispFeaturesMapRegistersIn,
                lispFeaturesMapRegistersOut,
                lispEidRegistrationEidAuthenticationErrors,
                lispEidRegistrationEidRegisterRlocsMismatch
              }
    STATUS  current
    DESCRIPTION
            "Objects providing additional diagnostics related
             to a LISP router."
    ::= { lispMIBGroups 13 }


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

LISP is an experimental protocol and the LISP MIB is an experimental MIB. No IANA actions are required by this document.

11. References

11.1. Normative References

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Appendix A. Open Issues

Open issues for the LISP MIB include the following:

1. This version of the LISP MIB draft does not include LISP Multicast considerations. Multicast considerations will be added in the next version of this draft.

Appendix B. Acknowledgments

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