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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.

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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

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.

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.

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 through 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](#)].

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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:

- o 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.
- o 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.
- o Provide a means for obtaining the current operational statistics

of various LISP functions, such as the number of packets

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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:

Lisp - 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.

LispSite - This table provides the properties of each lisp site that is served by this device when configured to be a Map-Server.

LispSiteLocator - This table provides the properties of all locators per lisp site that is served by this device when configured to be a Map-Server.

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

LispMapResolvers - 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 Definition

```
LISP-MIB DEFINITIONS ::= BEGIN
IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE,
    Unsigned32, Counter64, TimeTicks,
    NOTIFICATION-TYPE          FROM SNMPv2-SMI          -- [RFC2578]
    MODULE-COMPLIANCE, OBJECT-GROUP
    NOTIFICATION-GROUP        FROM SNMPv2-CONF          -- [RFC2580]
    TEXTUAL-CONVENTION, TruthValue,
    RowStatus                  FROM SNMPv2-TC           -- [RFC2579]
    AddressFamilyNumbers
    FROM IANA-ADDRESS-FAMILY-NUMBERS-MIB              -- [IANA]

lispMIB MODULE-IDENTITY
    LAST-UPDATED "201101050000Z" -- 05 January 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
        "This memo describes the Management Information Base (MIB)
        module for use with network management protocols in the
        management of Locator/ID Separation Protocol (LISP)
        devices.

        Copyright (C) The IETF Trust (2010)."
    REVISION      "201101050000Z" -- 05 January 2011"

 ::= { xxxxx }

--
-- 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 tuples:

1. IANA Address Family Numbers: This tuple follows the AddressFamilyNumbers textual-convention described in [IANA]. The enumerations are listed in [IANA]. Note that the list of address family numbers is maintained by IANA.
2. Length of LISP address: This tuple is an INTEGER to give the octet length of the next tuple.
3. Lisp address: A lisp address can be an address belonging to any of the IANA Address Families. 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 tuple indicates the LCAF type, and the rest of this tuple is same as the encoding format of the LISP Canonical Address after the length field, as defined in [LCAF].
4. Mask-length of lisp address."

REFERENCE "[LISP]"

SYNTAX OCTET STRING (SIZE (0..1024))

lispTable OBJECT-TYPE

SYNTAX SEQUENCE OF lispEntry

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 }

lispEntry OBJECT-TYPE

SYNTAX lispEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) in the lispTable."

INDEX { lispAfi }

::= { lispTable 1 }

lispEntry ::= SEQUENCE {

lispAddressFamily

AddressFamilyNumbers,

lispItrEnabled

TruthValue,

lispEtrEnabled

TruthValue,

lispProxyItrEnabled

TruthValue,

lispProxyEtrEnabled

TruthValue,


```
lispMapServerEnabled          TruthValue,
lispMapResolverEnabled        TruthValue,
lispMapCacheSize              Unsigned32,
lispMapCacheLimit             Unsigned32,
lispEtrMapCacheTtl            Unsigned32,
lispRlocProbeEnabled          TruthValue,
lispEtrAcceptMapDataEnabled   TruthValue,
lispEtrAcceptMapDataVerifyEnabled TruthValue,
lispMapRequestsIn             Counter64,
lispMapRequestsOut            Counter64,
lispMapRepliesIn              Counter64,
lispMapRepliesOut             Counter64,
lispMapRegistersIn            Counter64,
lispMapRegistersOut           Counter64
}

lispAddressFamily OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The address family number of the lisp device that
         is able to lisp process a packet destined for
         that address family."
    ::= { lispEntry 1 }

lispItrEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "Indicates the status of ITR role on this device."
    ::= { lispEntry 2 }

lispEtrEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "Indicates the status of ETR role on this device."
    ::= { lispEntry 3 }

lispProxyItrEnabled OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "Indicates the status of Proxy-ITR role on this
```



```
        device."  
 ::= { lispEntry 4 }
```

```
lispProxyEtrEnabled OBJECT-TYPE  
    SYNTAX      TruthValue  
    MAX-ACCESS  accessible  
    STATUS      current  
    DESCRIPTION  
        "Indicates the status of Proxy-ETR role on this  
        device."  
 ::= { lispEntry 5 }
```

```
lispMapServerEnabled OBJECT-TYPE  
    SYNTAX      TruthValue  
    MAX-ACCESS  accessible  
    STATUS      current  
    DESCRIPTION  
        "Indicates the status of Map Server role on this  
        device."  
 ::= { lispEntry 6 }
```

```
lispMapResolverEnabled OBJECT-TYPE  
    SYNTAX      TruthValue  
    MAX-ACCESS  accessible  
    STATUS      current  
    DESCRIPTION  
        "Indicates the status of Map Resolver role on  
        this device."  
 ::= { lispEntry 7 }
```

```
lispMapCacheSize OBJECT-TYPE  
    SYNTAX      Unsigned32  
    MAX-ACCESS  accessible  
    STATUS      current  
    DESCRIPTION  
        "Size of EID-to-RLOC map cache on this device."  
 ::= { lispEntry 8 }
```

```
lispMapCacheLimit OBJECT-TYPE  
    SYNTAX      Unsigned32  
    MAX-ACCESS  accessible  
    STATUS      current  
    DESCRIPTION  
        "Maximum permissible size of EID-to-RLOC map  
        cache on this device."  
 ::= { lispEntry 9 }
```

```
lispEtrMapCacheTtl OBJECT-TYPE
```


SYNTAX Unsigned32
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Time in minutes this device will store the
mapping record in the map cache."
 ::= { lispEntry 10 }

lispRlocProbeEnabled OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Indicates the status of rloc-probing feature
on this device."
 ::= { lispEntry 11 }

lispEtrAcceptMapData OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Indicates the status of this device for
accepting piggybacked mapping data received
in a map-request."
 ::= { lispEntry 12 }

lispEtrAcceptMapDataVerify OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Indicates the status of this device for
verifying accepted piggybacked mapping data
received in a map-request."
 ::= { lispEntry 13 }

lispMapRequestsIn OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Total number of map requests received by this
device for any EID prefix of the given address
family."
 ::= { lispEntry 14 }

lispMapRequestsOut OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Total number of map requests sent by this device
for any EID prefix of the given address family."
 ::= { lispEntry 15 }

lispMapRepliesIn OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Total number of map replies received by this device
for any EID prefix of the given address family."
 ::= { lispEntry 16 }

lispMapRepliesOut OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Total number of map replies sent by this device for
any EID prefix of the given address family."
 ::= { lispEntry 17 }

lispMapRegistersIn OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Total number of map registers received by this device
for any EID prefix of the given address family."
 ::= { lispEntry 18 }

lispMapRegistersOut OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Total number of map registers sent by this device
for any EID prefix of the given address family."
 ::= { lispEntry 19 }

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 a given site that this device belongs to."
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 INTEGER,
 lispMappingDatabaseEid LispAddressType,
 lispMappingDatabaseLsb Unsigned32,
 lispMappingDatabaseEidPartitioned TruthValue,
 lispMappingDatabaseDecapOctets Counter64,
 lispMappingDatabaseDecapPkts Counter64
 lispMappingDatabaseEncapOctets Counter64,
 lispMappingDatabaseEncapPkts Counter64
 }

lispMappingDatabaseEidLength OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This object gives the length of lispMappingDatabaseEid, the next object."
 ::= { 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  accessible
    STATUS      current
    DESCRIPTION
        "The locator status bits for this EID prefix."
    ::= { lispMappingDatabaseEntry 3 }

lispMappingDatabaseEidPartitioned OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "Indicates if this device is partitioned from
         the site that contains this EID prefix."
    ::= { lispMappingDatabaseEntry 4 }

lispMappingDatabaseDecapOctets OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS  accessible
    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  accessible
    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  accessible
    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  accessible
STATUS      current
DESCRIPTION
    "The number of Lisp packets, that were encapsulated
    by this device, 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 an 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 { lispMappingDatabaseLocatorEidLength
        lispMappingDatabaseLocatorEid
        lispMappingDatabaseLocatorRlocAfi
        lispMappingDatabaseLocatorEncodedRlocLength
        lispMappingDatabaseLocatorEncodedRloc }
 ::= { lispMappingDatabaseLocatorTable 1 }
```

```
lispMappingDatabaseLocatorEntry ::= SEQUENCE {
    lispMappingDatabaseLocatorEidLength    INTEGER,
    lispMappingDatabaseLocatorEid         LispAddressType,
    lispMappingDatabaseLocatorRlocLength   INTEGER,
    lispMappingDatabaseLocatorRloc        LispAddressType,
    lispMappingDatabaseLocatorRlocPriority  INTEGER,
    lispMappingDatabaseLocatorRlocWeight   INTEGER,
    lispMappingDatabaseLocatorRlocMPriority INTEGER,
    lispMappingDatabaseLocatorRlocMWeight  INTEGER,
    lispMappingDatabaseLocatorRlocState    INTEGER,
    lispMappingDatabaseLocatorRlocLocal    INTEGER,
    lispMappingDatabaseLocatorRlocDecapOctets Counter64,
    lispMappingDatabaseLocatorRlocDecapPackets Counter64
}
```



```
    lispMappingDatabaseLocatorRlocEncapOctets Counter64,  
    lispMappingDatabaseLocatorRlocEncapPackets Counter64  
}
```

```
lispMappingDatabaseLocatorEidLength OBJECT-TYPE  
    SYNTAX      INTEGER  
    MAX-ACCESS  not-accessible  
    STATUS      current  
    DESCRIPTION  
        "This object is used to get the length of  
        lispMappingDatabaseLocatorEid, the next  
        object."  
    ::= { lispMappingDatabaseLocatorEntry 1 }
```

```
lispMappingDatabaseLocatorEid OBJECT-TYPE  
    SYNTAX      LispAddressType  
    MAX-ACCESS  not-accessible  
    STATUS      current  
    DESCRIPTION  
        "The EID prefix of the mapping database  
        mapped to the given locator."  
    ::= { lispMappingDatabaseLocatorEntry 2 }
```

```
lispMappingDatabaseLocatorRlocLength OBJECT-TYPE  
    SYNTAX      INTEGER  
    MAX-ACCESS  not-accessible  
    STATUS      current  
    DESCRIPTION  
        "This object is used to get the 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      INTEGER  
    MAX-ACCESS  accessible  
    STATUS      current  
    DESCRIPTION  
        "The unicast priority of the RLOC."
```



```
::= { lispMappingDatabaseLocatorEntry 5 }
```

```
lispMappingDatabaseLocatorRlocWeight OBJECT-TYPE
```

```
SYNTAX      INTEGER  
MAX-ACCESS  accessible  
STATUS      current  
DESCRIPTION
```

```
    "The unicast weight of the RLOC."
```

```
::= { lispMappingDatabaseLocatorEntry 6 }
```

```
lispMappingDatabaseLocatorRlocMPriority OBJECT-TYPE
```

```
SYNTAX      INTEGER  
MAX-ACCESS  accessible  
STATUS      current  
DESCRIPTION
```

```
    "The multicast priority of the RLOC."
```

```
::= { lispMappingDatabaseLocatorEntry 7 }
```

```
lispMappingDatabaseLocatorRlocMWeight OBJECT-TYPE
```

```
SYNTAX      INTEGER  
MAX-ACCESS  accessible  
STATUS      current  
DESCRIPTION
```

```
    "The multicast weight of the RLOC."
```

```
::= { lispMappingDatabaseLocatorEntry 8 }
```

```
lispMappingDatabaseLocatorRlocState OBJECT-TYPE
```

```
SYNTAX      INTEGER  
MAX-ACCESS  accessible  
STATUS      current  
DESCRIPTION
```

```
    "The state of this RLOC as per this device.  
    0 is for up, 1 is for down ..."
```

```
::= { lispMappingDatabaseLocatorEntry 9 }
```

```
lispMappingDatabaseLocatorRlocLocal OBJECT-TYPE
```

```
SYNTAX      INTEGER  
MAX-ACCESS  accessible  
STATUS      current  
DESCRIPTION
```

```
    "Object value is 1 if the RLOC is an address  
    on this device, 0 if otherwise."
```

```
::= { lispMappingDatabaseLocatorEntry 10 }
```

```
lispMappingDatabaseLocatorRlocDecapOctets OBJECT-TYPE
```

```
SYNTAX      Counter64  
MAX-ACCESS  accessible  
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 accessible

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 accessible

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 accessible

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
                  lispMapCacheEidMaskLength }
    ::= { lispMapCacheTable 1 }
```

```
lispMapCacheEntry ::= SEQUENCE {
    lispMapCacheEidLength      INTEGER,
    lispMapCacheEid           LispAddressType,
    lispMapCacheEidUpTime     TimeTicks,
    lispMapCacheEidExpiryTime TimeTicks,
    lispMapCacheEidState      INTEGER,
    lispMapCacheEidAuthoritative TruthValue,
    lispMapCacheDecapOctets   Counter64,
    lispMapCacheDecapPkts     Counter64,
    lispMapCacheEncapOctets   Counter64,
    lispMapCacheEncapPkts     Counter64
}
```

```
lispMapCacheEidLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the 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  accessible
    STATUS      current
    DESCRIPTION
```


"The up time of the EID prefix."
 ::= { lispMapCacheEntry 3 }

lispMapCacheEidExpiryTime OBJECT-TYPE

SYNTAX TimeTicks
MAX-ACCESS accessible
STATUS current

DESCRIPTION

"The time remaining on the EID prefix before
the ITR times-out the prefix."

::= { lispMapCacheEntry 4 }

lispMapCacheEidState OBJECT-TYPE

SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current

DESCRIPTION

"This object is used to indicate the activity
of this EID prefix. A value of 0 implies the
EID prefix is idle. A value of 1 implies the
EID prefix is active."

::= { lispMapCacheEntry 5 }

lispMapCacheEidAuthoritative OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS accessible
STATUS current

DESCRIPTION

"This object is used to indicate whether the
EID prefix was installed by an authoritative
map-reply. A value of 0 implies the EID prefix
was installed by an authoritative map-reply,
and a value of 1, otherwise."

::= { lispMapCacheEntry 6 }

lispMapCacheDecapOctets OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
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 accessible


```
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  accessible
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  accessible
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      { lispMapCacheLocatorEidLength
             lispMapCacheLocatorEid
             lispMapCacheLocatorRlocLength
```



```
        lispMapCacheLocatorRloc }
 ::= { lispMapCacheLocatorTable 1 }

lispMapCacheLocatorEntry ::= SEQUENCE {
    lispMapCacheLocatorEidLength          INTEGER,
    lispMapCacheLocatorEid                LispAddressType,
    lispMapCacheLocatorRlocLength         INTEGER,
    lispMapCacheLocatorRloc               LispAddressType,
    lispMapCacheLocatorRlocPriority        INTEGER,
    lispMapCacheLocatorRlocWeight         INTEGER,
    lispMapCacheLocatorRlocMPriority      INTEGER,
    lispMapCacheLocatorRlocMWeight        INTEGER,
    lispMapCacheLocatorRlocState          INTEGER,
    lispMapCacheLocatorRlocUpTime          TimeTicks,
    lispMapCacheLocatorRlocLastPriorityChange TimeTicks,
    lispMapCacheLocatorRlocLastWeightChange TimeTicks,
    lispMapCacheLocatorRlocLastMPriorityChange TimeTicks,
    lispMapCacheLocatorRlocLastMWeightChange TimeTicks,
    lispMapCacheLocatorRlocLastStateChange TimeTicks,
    lispMapCacheLocatorRlocRtt            TimeTicks,
    lispMapCacheLocatorRlocDecapOctets     Counter64,
    lispMapCacheLocatorRlocDecapPackets    Counter64,
    lispMapCacheLocatorRlocEncapOctets     Counter64,
    lispMapCacheLocatorRlocEncapPackets    Counter64
}

lispMapCacheLocatorEidLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the length of
         lispMapCacheLocatorEid, the next object."
 ::= { lispMapCacheLocatorEntry 1 }

lispMapCacheLocatorEid OBJECT-TYPE
    SYNTAX      LispAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The EID prefix of mapping cache mapped to the locator."
 ::= { lispMapCacheLocatorEntry 2 }

lispMapCacheLocatorRlocLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```


"This object is used to get the 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 INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION

"The unicast priority of the RLOC for this EID prefix."
::= { lispMapCacheLocatorEntry 5 }

lispMapCacheLocatorRlocWeight OBJECT-TYPE

SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION

"The unicast weight of the RLOC for this EID prefix."
::= { lispMapCacheLocatorEntry 6 }

lispMapCacheLocatorRlocMPriority OBJECT-TYPE

SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION

"The multicast priority of the RLOC for this EID prefix."
::= { lispMapCacheLocatorEntry 7 }

lispMapCacheLocatorRlocMWeight OBJECT-TYPE

SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION

"The multicast weight of the RLOC for this EID prefix."
::= { lispMapCacheLocatorEntry 8 }

lispMapCacheLocatorRlocState OBJECT-TYPE

SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current

DESCRIPTION

"The state of this RLOC as per this device.
0 is for up, 1 is for down ..."
 ::= { lispMapCacheLocatorEntry 9 }

lispMapCacheLocatorRlocUpTime OBJECT-TYPE

SYNTAX TimeTicks
MAX-ACCESS accessible
STATUS current

DESCRIPTION

"The up-time of this RLOC."
 ::= { lispMapCacheLocatorEntry 10 }

lispMapCacheLocatorRlocLastPriorityChange OBJECT-TYPE

SYNTAX TimeTicks
MAX-ACCESS accessible
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 accessible
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 accessible
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 accessible
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  accessible
    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  accessible
    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  accessible
    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  accessible
    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 18 }

lispMapCacheLocatorRlocEncapOctets OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS  accessible
    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 accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"The number of Lisp packets that matched this  
EID-prefix and were encapsulated using this  
RLOC address."
```

```
::= { lispMapCacheLocatorEntry 20 }
```

```
lispSiteTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF lispSiteEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This table provides the properties of each lisp  
site that is served by this device when configured  
to be a Map-Server."
```

```
REFERENCE "[LISP]"
```

```
::= { lisp 6 }
```

```
lispSiteEntry OBJECT-TYPE
```

```
SYNTAX lispSiteEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"An entry (conceptual row) in the lispSiteTable."
```

```
INDEX { lispSiteName  
lispSiteEidLength  
lispSiteEid }
```

```
::= { lispSiteTable 1 }
```

```
lispSiteEntry ::= SEQUENCE {
```

```
lispSiteName OCTET STRING,  
lispSiteEidLength INTEGER,  
lispSiteEid LispAddressType,  
lispSiteEidRegisterState TruthValue,  
lispSiteEidFirstRegisterTime TimeTicks,  
lispSiteEidRegisterSenderLength INTEGER,  
lispSiteEidRegisterSender LispAddressType,  
lispSiteEidRouteTag Unsigned32,  
lispSiteEidAuthenticationErrors Counter64,  
lispSiteEidRegisterRlocsMismatch Counter64
```

```
}
```



```
lispSiteName OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..63))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Site name used by a Map-Server to distinguish
        different lisp sites that are registering with it."
    ::= { lispSiteEntry 1 }
```

```
lispSiteEidLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the length of
        lispSiteEid, the next object."
    ::= { lispSiteEntry 2 }
```

```
lispSiteEid OBJECT-TYPE
    SYNTAX      LispAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The EID prefix belonging to this site."
    ::= { lispSiteEntry 3 }
```

```
lispSiteEidRegisterState OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "Indicates the registration status of the given
        EID prefix. Value 1 implies registered, value 0
        implies not registered."
    ::= { lispEntry 4 }
```

```
lispSiteEidFirstRegisterTime OBJECT-TYPE
    SYNTAX      TimeTicks
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "Time since a first valid register message for
        the given EID prefix was received by this device."
    ::= { lispSiteEntry 5 }
```

```
lispSiteEidRegisterSenderLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  accessible
```


STATUS current
DESCRIPTION
"This object is used to get the length of
lispSiteEidRegisterSender, the next object."
 ::= { lispSiteEntry 6 }

lispSiteEidRegisterSender OBJECT-TYPE

SYNTAX LispAddressType
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Source address of the last valid register message for
the given EID prefix that was received by this device."
 ::= { lispSiteEntry 7 }

lispSiteEidRouteTag OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Value of the routing table tag that contains the
given EID prefix."
 ::= { lispSiteEntry 8 }

lispSiteEidAuthenticationErrors OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Count of total authentication errors of map-registers
received for the given EID prefix."
 ::= { lispSiteEntry 9 }

lispSiteEidRegisterRlocsMismatch OBJECT-TYPE

SYNTAX Counter64
MAX-ACCESS accessible
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."
 ::= { lispSiteEntry 10 }

lispSiteLocatorTable OBJECT-TYPE

SYNTAX SEQUENCE OF lispSiteLocatorEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"This table provides the properties of all locators per lisp site that is served by this device when configured to be a Map-Server."

REFERENCE "[[LISP](#)]"

::= { lisp 7 }

lispSiteLocatorEntry OBJECT-TYPE

SYNTAX lispSiteLocatorEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) in the lispSiteLocatorTable."

INDEX { lispSiteLocatorName
lispSiteLocatorEid
lispSiteLocatorEidMaskLength
lispSiteLocatorRlocLength
lispSiteLocatorRloc
lispSiteLocatorRlocState }

::= { lispSiteLocatorTable 1 }

lispSiteLocatorEntry ::= SEQUENCE {

lispSiteLocatorName	OCTET STRING,
lispSiteLocatorEidLength	INTEGER,
lispSiteLocatorEid	LispAddressType,
lispSiteLocatorRlocLength	INTEGER,
lispSiteLocatorRloc	LispAddressType,
lispSiteLocatorRlocState	INTEGER,
lispSiteLocatorRlocPriority	INTEGER,
lispSiteLocatorRlocWeight	INTEGER,
lispSiteLocatorRlocMPriority	INTEGER,
lispSiteLocatorRlocMWeight	INTEGER,
lispSiteLocatorRlocRegisterState	TruthValue,
lispSiteLocatorRlocFirstRegisterTime	TimeTicks,
lispSiteLocatorRlocRegisterTimeLast	TimeTicks,
lispSiteLocatorRlocRegisterSenderLength	INTEGER,
lispSiteLocatorRlocRegisterSender	LispAddressType,
lispSiteLocatorRlocProxyReply	TruthValue

}

lispSiteLocatorIdentifier OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..63))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Site name used by a Map-Server to distinguish different lisp sites that are registering with it."

::= { lispSiteLocatorEntry 1 }


```
lispSiteLocatorEidLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the length of
         lispSiteLocatorEid, the next object."
    ::= { lispSiteLocatorEntry 2 }

lispSiteLocatorEid OBJECT-TYPE
    SYNTAX      LispAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The EID prefix belonging to this site."
    ::= { lispSiteLocatorEntry 3 }

lispSiteLocatorRlocLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the length of
         lispSiteLocatorRloc, the next object."
    ::= { lispSiteLocatorEntry 4 }

lispSiteLocatorRloc OBJECT-TYPE
    SYNTAX      LispAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The locator of the given EID prefix belonging
         to this site."
    ::= { lispSiteLocatorEntry 5 }

lispSiteLocatorRlocState OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "The cached state of this RLOC received in
         map-register by the device, in the capacity of
         a Map-Server. Value 0 refers to down, value 1
         refers to up."
    ::= { lispSiteLocatorEntry 6 }

lispSiteLocatorRlocPriority OBJECT-TYPE
    SYNTAX      INTEGER
```


MAX-ACCESS accessible
STATUS current
DESCRIPTION
"The unicast priority of the RLOC for this EID prefix."
::= { lispSiteLocatorEntry 7 }

lispSiteLocatorRlocWeight OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"The unicast weight of the RLOC for this EID prefix."
::= { lispSiteLocatorEntry 8 }

lispSiteLocatorRlocMPriority OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"The multicast priority of the RLOC for this EID prefix."
::= { lispSiteLocatorEntry 9 }

lispSiteLocatorRlocMWeight OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"The multicast weight of the RLOC for this EID prefix."
::= { lispSiteLocatorEntry 10 }

lispSiteLocatorRlocRegisterState OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Indicates the registration status of the EID prefix by
this locator. Value 1 implies registered, value 0
implies not registered."
::= { lispSiteLocatorEntry 11 }

lispSiteLocatorRlocFirstRegisterTime OBJECT-TYPE
SYNTAX TimeTicks
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"Time since a first valid register message for this
EID prefix was received from this locator."
::= { lispSiteLocatorEntry 12 }

lispSiteLocatorRlocLastRegisterTime OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS accessible

STATUS current

DESCRIPTION

"Time since a last valid register message for this
EID prefix was received from this locator."

::= { lispSiteLocatorEntry 13 }

lispSiteLocatorRlocRegisterSenderLength OBJECT-TYPE

SYNTAX INTEGER

MAX-ACCESS accessible

STATUS current

DESCRIPTION

"This object is used to get the length of
lispSiteLocatorRlocRegisterSender, the next object."

::= { lispSiteLocatorEntry 14 }

lispSiteLocatorRlocRegisterSender OBJECT-TYPE

SYNTAX LispAddressType

MAX-ACCESS accessible

STATUS current

DESCRIPTION

"Source address of the last valid register message for
this EID prefix that was received from this locator."

::= { lispSiteLocatorEntry 15 }

lispSiteLocatorRlocProxyReply OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS accessible

STATUS current

DESCRIPTION

"Indicates proxy-replying status of the registering
locator of this EID prefix."

::= { lispSiteLocatorEntry 16 }

lispMapServersTable OBJECT-TYPE

SYNTAX SEQUENCE OF lispMapServersEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table provides the properties of the map-servers
with which this device is configured to register."

REFERENCE "[[LISP](#)]"

::= { lisp 8 }

lispMapServersEntry OBJECT-TYPE


```
SYNTAX      lispMapServersEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "An entry (conceptual row) in the lispMapServersTable."
INDEX       { lispMapServersAddressLength
              lispMapServersAddress }
 ::= { lispMapServersTable 1 }

lispMapServersEntry ::= SEQUENCE {
    lispMapServersAddressLength INTEGER,
    lispMapServersAddress      LispAddressType,
    lispMapServersState        INTEGER
}

lispMapServersAddressLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the length of
         lispMapServersAddress, the next object."
    ::= { lispMapServersEntry 1 }

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

lispMapServersState OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
        "State of this Map-Server configured on this device.
         Value 0 implies that the Map-Server is down, and a
         value of 1 implies that the Map-Server is up."
    ::= { lispMapServersEntry 3 }

lispMapResolversTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF lispMapResolversEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```


"This table provides the properties of all map
resolvers that this device is configured to use."
REFERENCE "[[LISP](#)]"
::= { lisp 9 }

lispMapResolversEntry OBJECT-TYPE
SYNTAX lispMapResolversEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry (conceptual row) in the lispMapResolversTable."
INDEX { lispMapResolversAddressLength
lispMapResolversAddress }
::= { lispMapResolversTable 1 }

lispMapResolversEntry ::= SEQUENCE {
lispMapResolversAddressLength INTEGER,
lispMapResolversAddress LispAddressType,
lispMapResolversState INTEGER
}

lispMapResolversAddressLength OBJECT-TYPE
SYNTAX INTEGER
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This object is used to get the length of
lispMapResolversAddress, the next object."
::= { lispMapResolversEntry 1 }

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

lispMapResolversState OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS accessible
STATUS current
DESCRIPTION
"State of this map-resolver configured on this device.
Value 0 implies that the map-resolver is down, and a
value of 1 implies that this map-resolver is up."
::= { lispMapResolversEntry 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      INTEGER,
    lispUseProxyEtrAddress            LispAddressType,
    lispUseProxyEtrState              INTEGER
}

lispUseProxyEtrAddressLength OBJECT-TYPE
    SYNTAX      INTEGER
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This object is used to get the 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      TruthValue
    MAX-ACCESS  accessible
    STATUS      current
    DESCRIPTION
```



```
"State of this Proxy ETR configured on this device.  
Value 0 implies that this Proxy ETR is down, and a  
value of 1 implies that this Proxy ETR is up."  
 ::= { lispUseProxyEtrEntry 3 }
```

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

- [INTERWORK] Lewis, D., Meyer, D., Farinacci, D., and V. Fuller, "Interworking LISP with IPv4 and IPv6", [draft-ietf-lisp-interworking-01.txt](#) (work in progress), March 2010.
- [LCAF] Farinacci, D., Meyer, D., and J. Snijders, "LISP Canonical Address Format", [draft-farinacci-lisp-lcaf-01.txt](#) (work in progress), April 2010.
- [LISP] Farinacci, D., Fuller, V., Meyer, D., and D. Lewis, "Locator/ID Separation Protocol (LISP)", [draft-ietf-lisp-07.txt](#) (work in progress), April 2010.
- [LISP-ALT] Farinacci, D., Fuller, V., Meyer, D., and D. Lewis, "LISP Alternative Topology (LISP-ALT)", [draft-ietf-lisp-alt-04.txt](#) (work in progress), April 2010.
- [LISP-MS] Farinacci, D. and V. Fuller, "LISP Map Server", [draft-ietf-lisp-ms-05.txt](#) (work in progress), April 2010.
- [RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, [RFC 1035](#), November 1987.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2404] Madson, C. and R. Glenn, "The Use of HMAC-SHA-1-96 within ESP and AH", [RFC 2404](#), November 1998.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.

- [RFC4634] Eastlake, D. and T. Hansen, "US Secure Hash Algorithms (SHA and HMAC-SHA)", [RFC 4634](#), July 2006.

11.2. Informative References

- [IANA] "IANA-ADDRESS-FAMILY-NUMBERS-MIB DEFINITIONS",
<<http://www.iana.org/assignments/ianaaddressfamilynumbers-mib>>.
- [LISP-MCAST] Farinacci, D., Meyer, D., Zwiebel, J., and S. Venaas, "LISP for Multicast Environments", [draft-ietf-lisp-multicast-03.txt](#) (work in progress), April 2010.
- [LISP-MN] Farinacci, D., Fuller, V., Meyer, D., and D. Lewis, "LISP Mobile Node Architecture", [draft-meyer-lisp-mn-01.txt](#) (work in progress), February 2010.
- [RFC2784] Farinacci, D., Li, T., Hanks, S., Meyer, D., and P. Traina, "Generic Routing Encapsulation (GRE)", [RFC 2784](#), March 2000.
- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.
- [RFC4271] Rekhter, Y., Li, T., and S. Hares, "A Border Gateway Protocol 4 (BGP-4)", [RFC 4271](#), January 2006.
- [RFC4760] Bates, T., Chandra, R., Katz, D., and Y. Rekhter, "Multiprotocol Extensions for BGP-4", [RFC 4760](#), January 2007.

Appendix A. Change Log

This is the first version of [draft-schudel-lisp-mib-00](#).

Appendix B. Open Issues

Open issues for the LISP MIB include the following:

1. This initial 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 C. Acknowledgments

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