LISP Wei Mi, Ed.
Internet-Draft Jingguo Ge
Intended status: Informational IIE/Chinese Academy of Sciences
Expires: June 30, 2021 December 27, 2020

# A High-capacity and Real-time LISP Mapping Framework
# draft-mi-lisp-high-capacity-00

Abstract

This draft describes how the LISP mapping framework designed to be have the capability to provide efficient, real-time, high concurrent services when guarantee the scale.

Table of Contents



## 1. Introduction

There are billions of mobile users and devices accommodated in the current network. With the rapid development of Internet of Things (IoT) technology, the global device number accessed to the network will increase to hundreds of billions by 2030, and these devices will generate data and contents at quadrillion magnitude.

The LISP architecture and protocols [RFC6830] introduces two new numbering spaces, Endpoint Identifiers (EIDs) and Routing Locators (RLOCs) which is intended to provide overlay network functionality. Therefore, the LISP mapping framework is required to have a very large scale and capacity to provide services for all network entities.

This document introduces a high-capacity and real-time LISP mapping framework, which consider the scalability and incremental deployment to meet the challenges, and have the capability to provide efficient, real-time, high concurrent services when guarantee the scale.

## 2. Requirements of High-capacity and Real-time LISP Mapping Framework

### 2.1. Functional Requirements

Identifiers management

It is required to have the capacity to manage the information of all named entities in the network, including:

a. Store the information of each named entity, and each record item may includes registration (attribute) information and mapping information between indentifiers and locators.

b. Maintain the record information, including: add items of newly registered indentifiers; delete the outdated and invalid items; update the mapping information when locators of named entities changes.

c. Provide query service for record information.

Mapping resolution

It is required to provide efficient, real-time mapping service to support mobility and scalable routing.

## 2.2. Service Requirements

Large scale and high capacity

It is required to have the capacity of serving all named entities in the network at an acceptable cost.

Scalability and incremental deployment

It is required to have a flexible and scalable architecture design which can adapt to the contraction and expansion of the ID space.

Real-time and high concurrent

It is required to have the capability to provide real-time, high concurrent services to meet the requirements of network applications.

# 3. The High-capacity and Real-time LISP Mapping Architecture

The high-capacity and real-time LISP mapping has a tiered architecture and each tier consists of multiple service nodes.

a. Tier 0: Tier 0 is the top tier in architecture, which is designed based on the principles of federalism and equal autonomy. Tier 0 consists of T0 nodes which are connected to each other in a fully meshed topology. Each autonomous domain (AD) has one T0 node. The key function of T0 nodes is mapping resolution request information routing in Inter-AD and Intra-AD, no mapping resolution.

b. Tier 1: Tier 1 is the medium tier in architecture, which consists of T1 nodes. T1 nodes are connected to the T0 nodes of their own

AD, and divide the AD into resolution domains (RDs). The key function of T1 nodes are maping resolution and mapping resolution request information routing in Inter-RD.

c. Tier 2: Tire 2 is at the bottom of architecture, which consists of T2 nodes. T2 nodes are connected to the T1 nodes of their own mapping resolution domain, and furtherly divide the RD into local domains (LDs). The key function of T2 nodes are mapping registration and resolution. Authoritative registration and resolution information are stored in T2 nodes.

## 3.1. Key Functions

Service nodes of different tiers of architecture have different functions.

a. Key functions of T0 nodes.

b. Key functions of T1 nodes.

c. Key functions of T2 nodes.

## 3.2. Interfaces

The interfaces between service nodes of different tiers are introduced.

## 3.3. Service Procedures

## 4. Acknowledgements

## 5. IANA Considerations

This memo includes no request to IANA.

## 6. Security Considerations

All drafts are required to have a security considerations section.

## 7. Informative References

[RFC6830] Farinacci, D., Fuller, V., Meyer, D., and D. Lewis, "The Locator/ID Separation Protocol (LISP)", RFC 6830, DOI 10.17487/RFC6830, January 2013, <https://www.rfc-editor.org/info/rfc6830>.

Authors' Addresses

Wei Mi (editor)
IIE/Chinese Academy of Sciences
No.89 Minzhuang Road, Haidian District
Beijing 100190
CN

Phone: +86 10-82546356
EMail: miwei@iie.ac.cn

Jingguo Ge
IIE/Chinese Academy of Sciences
No.89 Minzhuang Road, Haidian District
Beijing 100190
CN

Phone: +86 10-82546559
EMail: gejingguo@iie.ac.cn