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L. Iannone
Telecom ParisTech
R. Jorgensen
Bredbandsfylket Troms
D. Conrad
Virtualized, LLC
G. Huston
APNIC - Asia Pacific Network
Information Center
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LISP EID Block Management Guidelines
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Abstract

This document proposes a framework for the management of the LISP EID Prefix. The framework described relies on hierarchical distribution of the address space, granting temporary usage of sub-prefixes of such space to requesting organizations.

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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

The Locator/ID Separation Protocol (LISP - [\[RFC6830\]](#)) and related mechanisms ([\[RFC6831\]](#), [\[RFC6832\]](#), [\[RFC6833\]](#), [\[RFC6834\]](#), [\[RFC6835\]](#), [\[RFC6836\]](#), [\[RFC6837\]](#)) separates the IP addressing space into two logical spaces, the End-point IDentifier (EID) space and the Routing LOcator (RLOC) space. The first space is used to identify communication end-points, while the second is used to locate EIDs in the Internet routing infrastructure topology.

The document [\[I-D.ietf-lisp-eid-block\]](#) requested an IPv6 address block reservation exclusively for use as EID prefixes in the LISP experiment. The rationale, intent, size, and usage of the EID address block are described in [\[I-D.ietf-lisp-eid-block\]](#).

This document proposes a management framework for the registration of EID prefixes from that block, allowing the requesting organisation exclusive use of those EID prefixes limited to the duration of the LISP experiment.

3. Definition of Terms

This document does not introduce any new terms related to the set of LISP Specifications ([\[RFC6830\]](#), [\[RFC6831\]](#), [\[RFC6832\]](#), [\[RFC6833\]](#), [\[RFC6834\]](#), [\[RFC6835\]](#), [\[RFC6836\]](#), [\[RFC6837\]](#)). To help the reading of this document the terminology introduced by LISP is summarized in [Appendix A](#).

4. EID Prefix Registration Policy

The request registration of EID prefixes MUST be done under the following policies:

1. EID prefixes are made available in the reserved space on a temporary basis and for experimental uses. The requester of an experimental prefix MUST provide a short description of the intended use or experiment that will be carried out (see [Section 6](#)). If the prefix will be used for activities not documented in the original description, the renewal of the

registration may be denied.

2. EID prefix registrations SHOULD be renewed on a regular basis to ensure their use by active participants in the experiment. The registration period is proposed to be 12 months. Registration renewal SHOULD NOT cause a change in the registered EID prefix. The conditions of registration renewal should no different to the conditions of registration.
3. It is preferable not to reuse EID prefixes whose registration is expired. When an EID prefix registration is removed from the registry, then the reuse of the EID prefix in a subsequent registration on behalf of a different end user should be avoided where possible. If the considerations of overall usage of the EID block prefix requires reuse of a previously registered EID prefix, then a minimum delay of at least one week between removal and subsequent registration SHOULD be applied by the registry operator.
4. All registrations of EID prefixes cease at the time of the expiration of the reserved experimental LISP EID Block. The further disposition of these prefixes and the associated registry entries is to be specified in the announcement of the cessation of this experiment.

5. EID Prefixes Registration Requirements

All EID prefix registrations MUST respect the following requirements:

1. All EID prefix registrations MUST use a globally unique EID prefix.
2. If there is more than one registry operator, all operators MUST use the same registry management policies and practices.
3. The EID Prefix registration information as specified in [Section 6](#), MUST be collected upon initial registration and renewal, and made publicly available through interfaces allowing both retrieval of specific registration details (search) and enumeration of the entire registry contents (e.g., [[RFC7481](#)], whois, http, or similar access methods).
4. The registry operator MUST permit the delegation of EID prefixes in the reverse DNS space to holders of registered EID prefixes.
5. Anyone can obtain an entry in the EID prefix registry, on the understanding that the prefix so registered is for the exclusive

use in the LISP experimental network, and that their registration details (as specified in [Section 6](#)) are openly published in the EID prefix registry.

6. EID Prefix Request Template

The following is a basic request template for prefix registration so to ensure a uniform process. Such a template is inspired by the IANA Private Enterprise Number online request form (<http://pen.iana.org/pen/PenApplication.page>).

Note that all details in this registration become part of the registry, and will be published in the LISP EID Prefix Registry.

The EID Prefix Request template MUST at minimum contain:

1. Organization (In case of individuals requesting an EID prefix this section can be left empty)
 - (a) Organization Name
 - (b) Organization Address
 - (c) Organization Phone
2. Contact Person (Mandatory)
 - (a) Name
 - (b) Address
 - (c) Phone
 - (d) Fax (optional)
 - (e) Email
3. EID Prefix Request (Mandatory)
 - (a) Prefix Size
 - + Expressed as an address prefix length.

(b) Prefix Size Rationale

(c) Lease Period

- + Note Well: All EID Prefix registrations will be valid until the earlier date of 12 months from the date of registration or 31 December 2017.
- + All registrations may be renewed by the applicant for further 12 month periods, ending on 31 December 2017.
- + According to the 3+3 year experimentation plan, defined in [[I-D.ietf-lisp-eid-block](#)], all registrations MUST end by 31 December 2017, unless the IETF community decides to grant a permanent LISP EID address block. In the latter case, registrations following the present document policy MUST end by 31 December 2020 and a new policy (to be decided - see [Section 7](#)) will apply starting 1 January 2021.

4. Experiment Description

(a) Experiment and Deployment Description

(b) Interoperability with existing LISP deployments

(c) Interoperability with Legacy Internet

5. Reverse DNS Servers (Optional)

(a) Name server name:

(b) Name server address:

(c) Name server name:

(d) Name server address:

(Repeat if necessary)

[7. Policy Validity Period](#)

Policy outlined in the present document is tied to the existence of the experimental LISP EID block requested in [[I-D.ietf-lisp-eid-block](#)] and valid until 31 December 2017.

If the IETF decides to transform the block in a permanent allocation,

the LISP EID block reserved usage period will be extended for three years (until 31 December 2020) so to give time to the IETF to define, following the policies outlined in [\[RFC5226\]](#), the final size of the EID block and create a transition plan, while the policy in the present document will still apply.

Note that, as stated in [\[I-D.ietf-lisp-eid-block\]](#), the transition of the EID block into a permanent allocation, has the potential to pose policy issues (as recognized in [\[RFC2860\]](#), [section 4.3](#)) and hence discussion with the IANA, the RIR communities, and the IETF community will be necessary to determine appropriate policy for permanent EID prefix management, which will be effective starting 1 January 2021.

8. Security Considerations

This document does not introduce new security threats in the LISP architecture nor in the Legacy Internet architecture.

For accountability reasons, and in line with the security considerations in [\[RFC7020\]](#), each registration request MUST contain accurate information on the requesting entity (company, institution, individual, etc.) and valid and accurate contact information of a referral person (see [Section 6](#)).

9. IANA Considerations

This document provides only management guidelines for the reserved LISP EID prefix requested in [\[I-D.ietf-lisp-eid-block\]](#).

There is an operational requirement for an EID registration service that ensures uniqueness of EIDs according to the requirements described in [Section 5](#). Furthermore, there is an operational requirement for EID registration service that allows a lookup of the contact information of the entity that registered the EID.

IANA and RIPE NCC agreed for the latter to run such service on behalf of the former, for the duration of the experiment and following the procedures outlined in [Section 10](#).

10. Procedures to be followed by RIPE NCC

RIPE NCC will provide the registration service following the EID Prefix Registration Policy ([Section 4](#)) and the EID Prefix Registration Requirements ([Section 5](#)) provided in this document. The request form provided by RIPE NCC will include at least the

information from the template in [Section 6](#). RIPE NCC will make publicly available all received requests. While this document does not suggest any minimum allocation size, RIPE NCC is allowed to introduce such minimum size for management purposes.

[11.](#) Acknowledgments

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[Appendix A](#). LISP Terms

LISP operates on two name spaces and introduces several new network elements. This section provides high-level definitions of the LISP name spaces and network elements and as such, it must not be considered as an authoritative source. The reference to the authoritative document for each term is included in every term description.

Legacy Internet: The portion of the Internet that does not run LISP and does not participate in LISP+ALT or any other mapping system.

LISP site: A LISP site is a set of routers in an edge network that are under a single technical administration. LISP routers that reside in the edge network are the demarcation points to separate the edge network from the core network. See [[RFC6830](#)] for more details.

Endpoint ID (EID): An EID is a 32-bit (for IPv4) or 128-bit (for IPv6) value used in the source and destination address fields of the first (most inner) LISP header of a packet. A packet that is emitted by a system contains EIDs in its headers and LISP headers are prepended only when the packet reaches an Ingress Tunnel Router (ITR) on the data path to the destination EID. The source EID is obtained via existing mechanisms used to set a host's "local" IP address. An EID is allocated to a host from an EID-prefix block associated with the site where the host is located. See [[RFC6830](#)] for more details.

EID-prefix: A power-of-two block of EIDs that are allocated to a site by an address allocation authority. See [[RFC6830](#)] for more details.

EID-Prefix Aggregate: A set of EID-prefixes said to be aggregatable in the [[RFC4632](#)] sense. That is, an EID-Prefix aggregate is defined to be a single contiguous power-of-two EID-prefix block. A prefix and a length characterize such a block. See [[RFC6830](#)] for more details.

Routing LOCator (RLOC): A RLOC is an IPv4 or IPv6 address of an egress tunnel router (ETR). A RLOC is the output of an EID-to-RLOC mapping lookup. An EID maps to one or more RLOCs. Typically, RLOCs are numbered from topologically aggregatable blocks that are assigned to a site at each point to which it attaches to the global Internet; where the topology is defined by the connectivity of provider networks, RLOCs can be thought of as Provider Aggregatable (PA) addresses. See [[RFC6830](#)] for more details.

EID-to-RLOC Mapping: A binding between an EID-Prefix and the RLOC-set that can be used to reach the EID-Prefix. The general term "mapping" always refers to an EID-to-RLOC mapping. See [[RFC6830](#)] for more details.

Ingress Tunnel Router (ITR): An Ingress Tunnel Router (ITR) is a router that accepts receives IP packets from site end-systems on one side and sends LISP-encapsulated IP packets toward the Internet on the other side. The router treats the "inner" IP destination address as an EID and performs an EID-to-RLOC mapping lookup. The router then prepends an "outer" IP header with one of

its globally routable RLOCs in the source address field and the result of the mapping lookup in the destination address field. See [[RFC6830](#)] for more details.

Egress Tunnel Router (ETR): An Egress Tunnel Router (ETR) receives LISP-encapsulated IP packets from the Internet on one side and sends decapsulated IP packets to site end-systems on the other side. An ETR router accepts an IP packet where the destination address in the "outer" IP header is one of its own RLOCs. The router strips the "outer" header and forwards the packet based on the next IP header found. See [[RFC6830](#)] for more details.

Proxy ITR (PITR): A Proxy-ITR (PITR) acts like an ITR but does so on behalf of non-LISP sites which send packets to destinations at LISP sites. See [[RFC6832](#)] for more details.

Proxy ETR (PETR): A Proxy-ETR (PETR) acts like an ETR but does so on behalf of LISP sites which send packets to destinations at non-LISP sites. See [[RFC6832](#)] for more details.

Map Server (MS): A network infrastructure component that learns EID-to-RLOC mapping entries from an authoritative source (typically an ETR). A Map Server publishes these mappings in the distributed mapping system. See [[RFC6833](#)] for more details.

Map Resolver (MR): A network infrastructure component that accepts LISP Encapsulated Map-Requests, typically from an ITR, quickly determines whether or not the destination IP address is part of the EID namespace; if it is not, a Negative Map-Reply is immediately returned. Otherwise, the Map Resolver finds the appropriate EID-to-RLOC mapping by consulting the distributed mapping database system. See [[RFC6833](#)] for more details.

The LISP Alternative Logical Topology (ALT): The virtual overlay network made up of tunnels between LISP+ALT Routers. The Border Gateway Protocol (BGP) runs between ALT Routers and is used to carry reachability information for EID-prefixes. The ALT provides a way to forward Map-Requests toward the ETR that "owns" an EID-prefix. See [[RFC6836](#)] for more details.

ALT Router: The device on which runs the ALT. The ALT is a static network built using tunnels between ALT Routers. These routers are deployed in a roughly-hierarchical mesh in which routers at each level in the topology are responsible for aggregating EID-Prefixes learned from those logically "below" them and advertising summary prefixes to those logically "above" them. Prefix learning and propagation between ALT Routers is done using BGP. When an ALT Router receives an ALT Datagram, it looks up the destination

EID in its forwarding table (composed of EID-Prefix routes it learned from neighboring ALT Routers) and forwards it to the logical next-hop on the overlay network. The primary function of LISP+ALT routers is to provide a lightweight forwarding infrastructure for LISP control-plane messages (Map-Request and Map-Reply), and to transport data packets when the packet has the same destination address in both the inner (encapsulating) destination and outer destination addresses ((i.e., a Data Probe packet). See [[RFC6830](#)] for more details.

Appendix B. Document Change Log

Version 04 Posted December 2014.

- o Added two clarification sentences to address the comments of E. Lear and D. Saucez during WG LC.

Version 03 Posted October 2014.

- o Re-worded the document so to avoid confusion on "allocation" and "assignment". The document now refers to "registration". As for comments by G. Huston and M. Binderberger.

Version 02 Posted July 2014.

- o Deleted the trailing paragraph of [Section 4](#), as for discussion in the mailing list.
- o Deleted the fees policy as of suggestion of G. Huston and discussion during 89th IETF.
- o Re-phrased the availability of the registration information requirement avoiding putting specific numbers (previously requiring 99% up time), as of suggestion of G. Huston and discussion during 89th IETF.

Version 01 Posted February 2014.

- o Dropped the reverse DNS requirement as for discussion during the 88th IETF meeting.
- o Dropped the minimum allocation requirement as for discussion during the 88th IETF meeting.
- o Changed [Section 7](#) from "General Consideration" to "Policy Validity Period", according to J. Curran feedback. The purpose of the section is just to clearly state the period during which the

policy applies.

Version 00 Posted December 2013.

- o Rename of [draft-iannone-lisp-eid-block-mgmt-03.txt](#).

Authors' Addresses

Luigi Iannone
Telecom ParisTech

Email: ggx@gigix.net

Roger Jorgensen
Bredbandsfylket Troms

Email: rogerj@gmail.com

David Conrad
Virtualized, LLC

Email: drc@virtualized.org

Geoff Huston
APNIC - Asia Pacific Network Information Center

Email: gih@apnic.net

