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LISP Distinguished Name Encoding
draft-farinacci-lisp-name-encoding-12

Abstract

This draft defines how to use the AFI=17 Distinguished Names in LISP.

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[1.](#) Introduction

The LISP architecture and protocols [[RFC6830](#)] introduces two new numbering spaces, Endpoint Identifiers (EIDs) and Routing Locators (RLOCs) which are intended to replace most use of IP addresses on the Internet. To provide flexibility for current and future applications, these values can be encoded in LISP control messages using a general syntax that includes Address Family Identifier (AFI) [[RFC1700](#)].

The length of the value field is implicit in the type of address that follows. For AFI 17, a Distinguished Name can be encoded. A name can be a variable length field so the length cannot be determined solely from the AFI value 17. This draft defines a termination character, an 8-bit value of 0 to be used as a string terminator so the length can be determined.

LISP Distinguished Names are useful when encoded either in EID-records or RLOC-records in LISP control messages. As EIDs, they can

be registered in the mapping system to find resources, services, or simply used as a self-documenting feature that accompany other address specific EIDs. As RLOCs, Distinguished Names, along with RLOC specific addresses and parameters, can be used as labels to identify equipment type, location, or any self-documenting string a registering device desires to convey.

2. Definition of Terms

Address Family Identifier (AFI): a term used to describe an address encoding in a packet. An address family currently defined for IPv4 or IPv6 addresses. See [[AFI](#)] and [[RFC1700](#)] for details on other types of information that can be AFI encoded.

3. Distinguished Name Format

An AFI=17 Distinguished Name is encoded as:

```

      0              1              2              3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|           AFI = 17           |       ASCII String ...       |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|           ... ASCII String           |           0           |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

The string of characters are encoded in the ASCII character-set definition [[RFC0020](#)].

When Distinguished Names are encoded for EIDs, the EID-prefix length of the EIDs as they appear in EID-records for all LISP control messages is the length of the string in bits (include the null 0 byte). Where Distinguished Names are encoded anywhere else (i.e. nested in LCAF encodings), then any length field is the length of the ASCII string including the null 0 byte in units of bytes.

When Map-Requests are sent for an EID encoded in Distinguished Name format, an exact match request is performed. So the Map-Server (when configured for proxy-Map-Replying) or the ETR will return a Map-Reply with the same EID-prefix length.

4. Example Use-Cases

This section identifies three specific use-cases for the Distinguished Name format. Two are used for an EID encoding and one for a RLOC-record encoding. When storing public keys in the mapping system, as in [I-D.ietf-lisp-ecdsa-auth], a well known format for a public-key hash can be encoded as a Distinguished Name. When street location to GPS coordinate mappings exist in the mapping system, as in [I-D.farinacci-lisp-geo], the street location can be a free form ascii representation (with whitespace characters) encoded as a Distinguished Name. An RLOC that describes an xTR behind a NAT device can be identified by its router name, as in [I-D.farinacci-lisp-simple-nat], uses a Distinguished Name encoding. As well as identifying the router name (neither an EID or an RLOC) in NAT Info-Request messages uses Distinguished Name encodings.

5. Name Collision Considerations

When a Distinguished Name encoding is used to format an EID, the uniqueness and allocation concerns are no different than registering IPv4 or IPv6 EIDs to the mapping system. See [I-D.ietf-lisp-rfc6833bis] for more details. Also, the use-case documents specified in Section 4 provide allocation recommendations for their specific uses.

6. Security Considerations

There are no security considerations.

7. IANA Considerations

The code-point values in this specification are already allocated in [AFI].

8. References

8.1. Normative References

- [AFI] "Address Family Identifier (AFIs)", ADDRESS FAMILY NUMBERS <http://www.iana.org/numbers.html>, February 2007.
- [I-D.ietf-lisp-rfc6833bis]
Farinacci, D., Maino, F., Fuller, V., and A. Cabellos,
"Locator/ID Separation Protocol (LISP) Control-Plane",
[draft-ietf-lisp-rfc6833bis-30](#) (work in progress), November 2020.

- [RFC0020] Cerf, V., "ASCII format for network interchange", STD 80, [RFC 20](#), DOI 10.17487/RFC0020, October 1969, <<https://www.rfc-editor.org/info/rfc20>>.
- [RFC1700] Reynolds, J. and J. Postel, "Assigned Numbers", [RFC 1700](#), DOI 10.17487/RFC1700, October 1994, <<https://www.rfc-editor.org/info/rfc1700>>.
- [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>>.

[8.2. Informative References](#)

- [I-D.farinacci-lisp-geo]
Farinacci, D., "LISP Geo-Coordinate Use-Cases", [draft-farinacci-lisp-geo-11](#) (work in progress), March 2021.
- [I-D.farinacci-lisp-simple-nat]
Farinacci, D., "A Simple LISP NAT-Traversal Implementation", [draft-farinacci-lisp-simple-nat-01](#) (work in progress), November 2020.
- [I-D.ietf-lisp-ecdsa-auth]
Farinacci, D. and E. Nordmark, "LISP Control-Plane ECDSA Authentication and Authorization", [draft-ietf-lisp-ecdsa-auth-05](#) (work in progress), March 2021.

[Appendix A. Acknowledgments](#)

The author would like to thank the LISP WG for their review and acceptance of this draft.

[Appendix B. Document Change Log](#)

[B.1. Changes to \[draft-farinacci-lisp-name-encoding-12\]\(#\)](#)

- o Submitted May 2021.
- o Update references and document expiry timer.

[B.2. Changes to \[draft-farinacci-lisp-name-encoding-11\]\(#\)](#)

- o Submitted November 2020.
- o Made changes to reflect working group comments.

- o Update references and document expiry timer.

B.3. Changes to [draft-farinacci-lisp-name-encoding-10](#)

- o Submitted August 2020.
- o Update references and document expiry timer.

B.4. Changes to [draft-farinacci-lisp-name-encoding-09](#)

- o Submitted March 2020.
- o Update references and document expiry timer.

B.5. Changes to [draft-farinacci-lisp-name-encoding-08](#)

- o Submitted September 2019.
- o Update references and document expiry timer.

B.6. Changes to [draft-farinacci-lisp-name-encoding-07](#)

- o Submitted March 2019.
- o Update referenes and document expiry timer.

B.7. Changes to [draft-farinacci-lisp-name-encoding-06](#)

- o Submitted September 2018.
- o Update document expiry timer.

B.8. Changes to [draft-farinacci-lisp-name-encoding-05](#)

- o Submitted March 2018.
- o Update document expiry timer.

B.9. Changes to [draft-farinacci-lisp-name-encoding-04](#)

- o Submitted September 2017.
- o Update document expiry timer.

B.10. Changes to [draft-farinacci-lisp-name-encoding-03](#)

- o Submitted March 2017.
- o Update document expiry timer.

B.11. Changes to [draft-farinacci-lisp-name-encoding-02](#)

- o Submitted October 2016.
- o Add a comment that the distinguished-name encoding is restricted to ASCII character encodings only.

B.12. Changes to [draft-farinacci-lisp-name-encoding-01](#)

- o Submitted October 2016.
- o Update document timer.

B.13. Changes to [draft-farinacci-lisp-name-encoding-00](#)

- o Initial draft submitted April 2016.

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