

LISP-Click: A Click implementation of the Locator/ID Separation Protocol

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1. INTRODUCTION

The network research community has recently started to work on the design of an alternate Internet Architecture aiming at solving some scalability issues that the current Internet is facing. The Locator/ID separation paradigm seems to well fit the requirements for this new Internet Architecture. The principle of this paradigm is to separate the identification part from the localization one. In today's Internet, nodes are identified by their IP address and the same IP address is used to localize the node in the Internet. In the Locator/ID separation proposals, locators are used to localize the nodes on the Internet (i.e., packets are routed towards the Locator) while the identification of the node is let independent of the routing infrastructure thanks to the ID. In this work, we only consider LISP (Locator/ID Separation Protocol), proposed by Cisco [1].

LISP is a map-and-encap solution where the inner header addresses are identifiers and outer header addresses are locators. A set of locators is associate to each identifier via a mapping. Mappings are obtained by querying a mapping system ([2], [3], [4]) like in DNS where the DNS is queried to resolve a name. LISP is being discussed at the IETF within the LISP WG group which encourages the community to propose different implementations to make inter-operability tests. From a standardization viewpoint, implementations are used to detect weaknesses in the protocol specifications and determine if performance requirements are achieved. From a research viewpoint, implementations authorize tests in the wild to validate simulations and theoretical analysis. To the best of our knowledge, OpenLISP, a data-plane implementation in the FreeBSD kernel, is the only open source implementation [5] of LISP. OpenLISP is focused on performance while our approach is more focused on extensibility and simplicity for the researchers by implementing LISP in Click.

2. LISP-CLICK ARCHITECTURE

LISP-Click is implemented as a Click 1.7.0 rc1 element. Fig. 1 shows the LISP-Click architecture. When a packet arrives at a device, it passes through a clas-

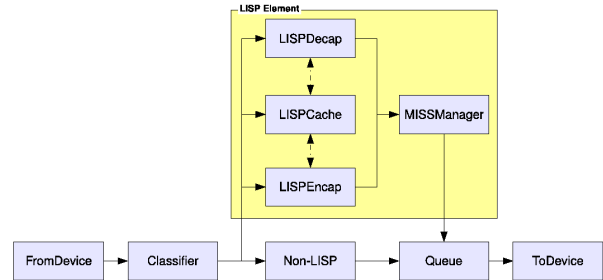


Figure 1: LISP-Click Architecture

sifier. If the packet is related to LISP, it is pushed into a LISP element. Both encapsulation and decapsulation can be performed by the element (by `LISPEncap` and `LISPDecap`, respectively).

Mappings are at the core of LISP and are maintained by `LISPCache` that can be queried by `LISPEncap` and `LISPDecap`. Packets for which no mapping exists, are annotated as *in miss*. For packets with the miss annotation, the `LISPManager` sends a Map-Request for the missing identifier. Otherwise, the packet is normally forwarded.

3. REFERENCES

- [1] D. Farinacci, V. Fuller, D. Oran, D. Meyer, and S. Brim, "Locator/ID Separation Protocol (LISP)," IETF Network Working Group, Internet Draft *draft-farinacci-lisp-10.txt*, November 2008.
- [2] B. Carpenter, "General Identifier-Locator Mapping Considerations," IETF Network Working Group, Internet Draft *draft-carpenter-idloc-map-cons-01.txt*, June 2007.
- [3] D. Farinacci, V. Fuller, and D. Meyer, "LISP Alternative Topology (LISP-ALT)," IETF Network Working Group, Internet Draft *draft-fuller-lisp-alt-03.txt*, October 2008.
- [4] L. Mathy and L. Iannone, "LISP-DHT: Towards a DHT to map identifiers onto locators," in *Proc. of ReArch'08 - Re-Architecting the Internet.*, Dec. 2008.
- [5] L. Iannone, D. Saucez, and O. Bonaventure, "OpenLISP Implementation Report," IETF Network Working Group, Internet Draft *draft-iannone-openlisp-implementation-01.txt*, July 2008.