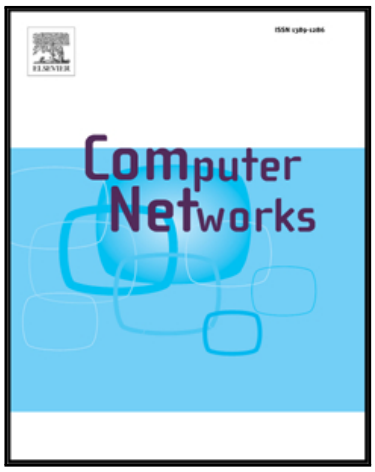


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PII: S1389-1286(17)30441-3
DOI: 10.1016/j.comnet.2017.12.014
Reference: COMPNW 6348

To appear in: *Computer Networks*

Received date: 8 August 2017
Revised date: 26 November 2017
Accepted date: 29 December 2017

Please cite this article as: Yue Li, Luigi Iannone, Assessing Locator/Identifier Separation Protocol interworking performance through RIPE Atlas, *Computer Networks* (2017), doi: 10.1016/j.comnet.2017.12.014

# Assessing Locator/Identifier Separation Protocol interworking performance through RIPE Atlas

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**Abstract**

The Locator/Identifier Separation Protocol (LISP) has been proposed to tackle the BGP scalability issue encountered in legacy Internet architecture, while introducing additional benefits. The key idea of LISP is to split the conventional IP addressing space into two categories: *Identifier* and *Locator*. *Identifier* is used for identification and *Locator* is used for routing. It is currently under standardization in IETF and is deployed in the wild at the same time, thanks to two testbeds: the LISP Beta Network and the LISP-Lab project. The interworking mechanism is proposed to ensure the communication between LISP-speaking sites and legacy Internet. The performance of LISP interworking with legacy Internet is of paramount importance to promote the adoption of LISP in future Internet. The existing research efforts to evaluate LISP interworking lack of large scale experimental results. The objective of this paper is to fill this gap by providing a latency evaluation and routing path measurement about LISP interworking mechanism in real networks. The work is based on a 2 weeks measurement campaign by using RIPE Atlas, which is the largest existing Internet measurement infrastructure for both IPv4 and IPv6. Experimental results show that LISP introduces additional latency, especially for close destinations, but negligible for intercontinental long-distance destinations. The additional latency highly depends on the position of the new network element being in charge of the communication between LISP-sites and the legacy Internet. Although LISP introduces some stretch, its performance is generally stable and its latency is not very high compared to natively forwarding without using LISP.

*Keywords:* LISP, LISP Beta Network, LISP-Lab, RIPE Atlas, experimentation, measurement

## 1. Introduction

In recent years the networking community recognized that the Internet routing architecture faces scalability issues [1]. The reasons of such issues can be found mainly in the ever increasing BGP (Border Gateway Protocol) routing table, yet, mobility, multihoming, and complex inter-domain traffic engineering requirements all contribute to make things worse [2]. The most important cause of such situation is the use of single numbering space, namely the IP addressing space [3] representing at the same time the end-point identifier for communication and the locator, i.e., the location in the Internet topology. To cope with such limitations, several solutions have been proposed to either totally redesign the actual Internet architecture by the method of revolution, or using an evolutionary approach by proposing a smooth transition, but all of them leverage on the locator/identifier separation paradigm.

Among the various proposals of locator/identifier