Network Stitching using LISP

Abstract

Communication between sites connected to disjointed network domains is a common problem encountered in current deployments. Here we present a simple, yet powerful, feature that leverages some basic elements of the LISP protocol architecture. Its main goal is to provide network connectivity across routing and addressing boundaries.

Once in place this feature provides the ability to:
1) encapsulate traffic across networks and overlays that support LISP and
2) support basic traffic engineering policies
3) easy provisioning of IPv4 and IPv6 domains indistinctly, failover support to sites connected to multiple domains

LISP and the Disjointed RLOC problem

- LISP [RFC 6830] segments addressing space into EID/RLOCs (identifiers/locators) and provides a scalable mechanism to support the distribution and use of e-id-rloc mappings.
- As a result the LISP architecture adds one layer of indirection that can be deployed as a network overlay and easily provide a solution to problems such as:
  - Multihoming, Mobility, Over-the-top virtualization, rapid IPv6 migration, multi-tenancy and painless DC migrations

However, core networks (LISP locator space) are not necessarily continuous routing and addressing spaces
When LISP sites access the network with disjointed locator scopes the communication is broken.
- e.g., when sites connect through IPv4-only and IPv6-only connections

Applications and Use cases

- Interestingly enough, the solution has applications beyond overcoming addressing borders on the network core

One-click traffic engineering
- Locator-scope rules can be used to force LISP traffic through specific network landmarks

Failure protection for multi-domain routers
- Locator-scope rules can be used to protect connectivity during temporal network failures

Basic service chaining made easy
- Locator-scopes can be used to provide primary support to service-chaining rules across separate locations on the core

A simple, yet powerful feature solving the disjointed RLOC problem

- Define locator-scopes at the Map Server.
- This gives the MS “awareness” that there are disjoint locator spaces.
- Leverage the RTR (re-encapsulation tunnel router) defined in the LISP specification
- RTR re-encapsulates LISP packets across scopes
- Introduce the concept of an “exit strategy”
- An exit strategy is associated with a locator-scope
- It defines the alternatives available so that ITRs on a locator-scope can reach ETRs on a disjointed scope

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Do you want to know more?
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