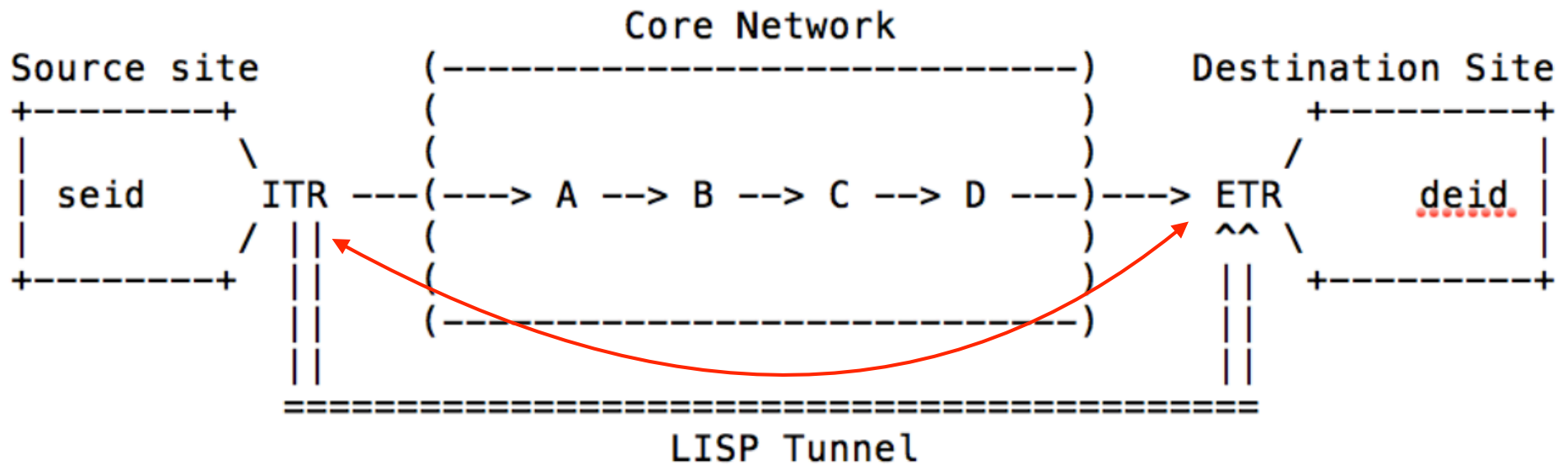# LISP Traffic Engineering

draft-farinacci-lisp-te-12

LISP Working Group - Chicago IETF
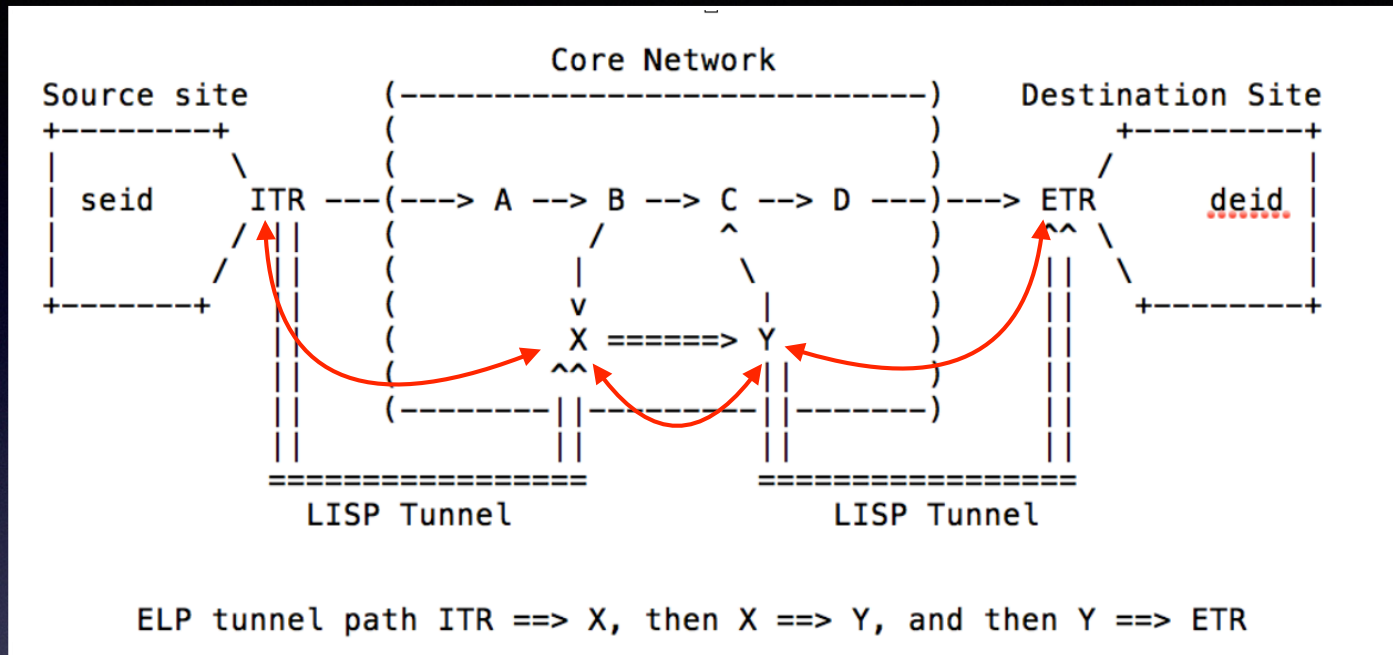*March 2017*

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Typical Overlay

Typical Data Path from ITR to ETR

LISP-TE


```
                                  Core Network
        Source site          (----------------------------)       Destination Site
        +-------+         \      (                            )         /      +--------+
        |        \         (                            )       /        |
        | seid    ITR ---(---> A --> B --> C --> D ---)---> ETR      deid  |
        |        /|||      (           /      ^           )      ^^ \        |
        |       / |||      (          /        \          )      |||  \       |
        +-------+ |||      (         /          \         )      |||   \   +--------+
                  |||      (        v            |        )      |||
                  |||      (        X =======> Y           )      |||
                  |||      (        ^^                      )      |||
                  |||      (--------||--------||---------)      |||
                  |||               ||        ||                |||
                  =================              ==================
                    LISP Tunnel                     LISP Tunnel
```

ELP tunnel path ITR ==> X, then X ==> Y, and then Y ==> ETR

There are various reasons why the path from 'seid' to 'deid' may want
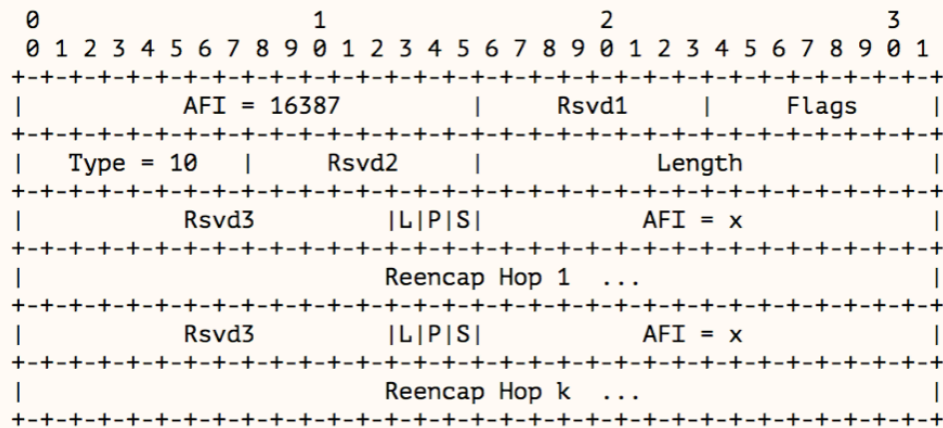to avoid the path from B to C. To list a few:

o There may not be sufficient capacity provided by the networks that
   connect B and C together.

o There may be a policy reason to avoid the ASes that make up the
   path between B and C.

o There may be a failure on the path between B and C which makes the
   path unreliable.

o There may be monitoring or traffic inspection resources close to
   RTRs X and Y that do network accounting or measurement.

o There may be a chain of services performed at RTRs X and Y
   regardless if the path from ITR to ETR is through B and C.
```

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# ELP Use-Case

## RFC8060 (LCAF)

# Different Paths to RLOCs

```
EID-prefix:    10.0.0.0/8
Locator-set:   ETR-A: priority 1, weight 50
               ETR-B: priority 1, weight 50
               ETR-C: priority 2, weight 50
               ETR-D: priority 2, weight 50

If an ELP is going to be used to have a policy path to ETR-A and
possibly another policy path to ETR-B, the locator-set would be
encoded as follows:

EID-prefix:    10.0.0.0/8
Locator-set:   (x, y, ETR-A): priority 1, weight 50
               (q, r, ETR-B): priority 1, weight 50
               ETR-C:         priority 2, weight 50
               ETR-D:         priority 2, weight 50
```

Source-Based Forwarding

```
Using source/destination lookups into the mapping database can yield
different ELPs.  So for example, a premium service flow with
(source=1.1.1.1, dest=10.1.1.1) can be described by using the
following mapping entry:

EID-prefix:    (1.0.0.0/8, 10.0.0.0/8)
Locator-set:   (x, y, ETR-A): priority 1, weight 50
               (q, r, ETR-A): priority 1, weight 50

And all other best-effort sources would use different mapping entry
described by:

EID-prefix:    (0.0.0.0/0, 10.0.0.0/8)
Locator-set:   (x, x', y, y', ETR-A): priority 1, weight 50
               (q, q', r, r', ETR-A): priority 1, weight 50
```

Multicast Forwarding

```
Multicast EID key:    (seid, G)
Locator-set:          ETR-A: priority 1, weight 25
                      ETR-B: priority 1, weight 25
                      g1:    priority 1, weight 25
                      g2:    priority 1, weight 25
```

```
Multicast EID key:    (seid, G)
Locator-set:          (x, y, ETR-A):    priority 1, weight 50
                      (a, g, b, ETR-B): priority 1, weight 50

                  Using ELPs for multicast flows
```

Document History

Versions: 00 01 02 03 04 05 06 07 08 09 10 11 **12**

draft-farinacci-lisp-te: 00 01 02 03 04 06 07 08 09 10 11 12

Mar 2012 | Jul 2012 | Jan 2013 | Jul 2013 | Jan 2014 | Mar 2014 | Sep 2014 | Mar 2015 | Sep 2015 | Mar 2016 | Sep 2016 | Feb 2017

No changes
for **4 years**!

LISP-TE initial draft
Mar 2012

Content Update - Jul 2012

o Add the Lookup bit to allow an ELP to be a list of encapsulation
   and/or mapping database lookup addresses.

o Indicate that ELPs can be used for service chaining.

o Add text to indicate that Map-Notify messages can be sent to new
   RTRs in a ELP so their map-caches can be pre-populated to avoid
   mapping database lookup packet loss.

o Fixes to editorial comments from Gregg.

Chicago IETF
Mar 2017

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Request for Working Group Document