LISP Network Element Deployment Considerations

draft-jakab-lisp-deployment-01

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Cisco Systems
Previously discussed...

- xTR placement
  - Customer edge
  - Provider edge
  - Split ITR/ETR
  - Inter-SP traffic engineering
  - xTRs behind NAT
- Map-Resolvers / Map-Servers
- Proxy tunnel routers
New scenarios

- Placement of P-ITRs and transition
  - EID registrar
  - LISP site (LISP + BGP)
  - CDN
  - ISP

- Should we add sections for … ?
  - EID allocation (new alloc. & PI → EID migration)
  - LISP+ALT router placement
Transition to LISP

• Success depends on
  – Clear gains for early adopters
  – Negligible impact on traffic to legacy sites
    • P-ITR service is key
• As transition advances, P-ITR load per prefix decreases
  – P-ITR usage pattern depends on LISP/Total edge network ratio
• Focus on first stage (high load) P-ITR deployment first, so we can reach large deployed base resulting in lighter load
EID Registrar P-ITR Service

- Should be offered as a fallback at registration, possibly with traffic limitations
- Could reuse ALT routers (if it operates some)
- Not feasible as only service in *first phase*
  - Except very small networks
- Path stretch > 1
LISP+BGP

• Migrating existing edge networks to LISP
• No actual P-ITR, xTRs run BGP as usual
• Advantages:
  – Easy upgrade path
  – Path stretch = 1
• Disadvantages:
  – Still running BGP
  – No decrease in DFZ size at early stage
CDN P-ITR Service (cont.)

• CDN operators having their own distribution infrastructure could leverage their geographical diversity for this service

• Customers are new LISP sites

• Advantages:
  – Path stretch ≈ 1
  – Potential DFZ decrease as all customer’s prefixes get aggregated
  – Very good redundancy

• Disadvantages:
  – Business case unclear
ISP P-ITR Service

Upstream ISP

ISP customer EID aggregates

ISP

P-ITR

LISP (no BGP)

All known EID aggregates

non-LISP

non-LISP
ISP P-ITR Service (cont.)

- ISPs can charge for it or use as a value-add service
- Customers are both non-LISP sites and new LISP sites
- Advantages:
  - Path stretch ≈ 1
  - Better aggregation than LISP+BGP
  - No traffic increase caused for the ISP
- Disadvantages:
  - Low redundancy
CDN Load Balancing

• Augment DNS-based decision making
• Modified Map-Servers, answering based on query source
• Can set exact percentages of traffic flowing to certain RLOCs using priority/weight
Going Forward...

- New EID allocation
  - IPv4 / IPv6
  - Also consider mobility
- PI-to-EID migration
- ALT deployment
- Anything else?