LISP Network Element Deployment Considerations
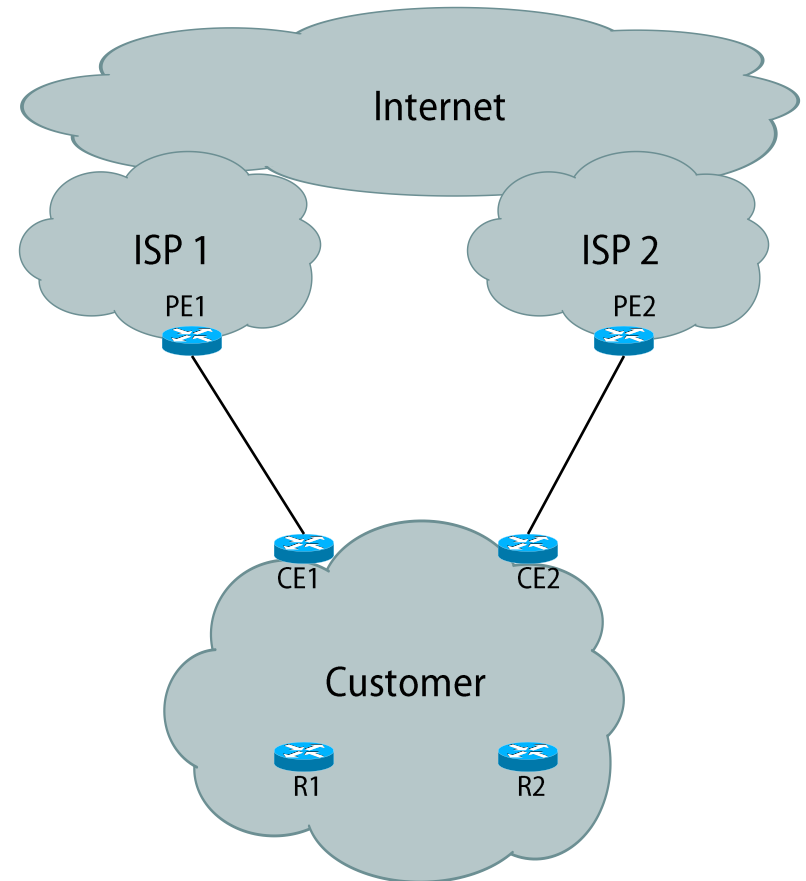
draft-jakab-lisp-deployment-01

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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
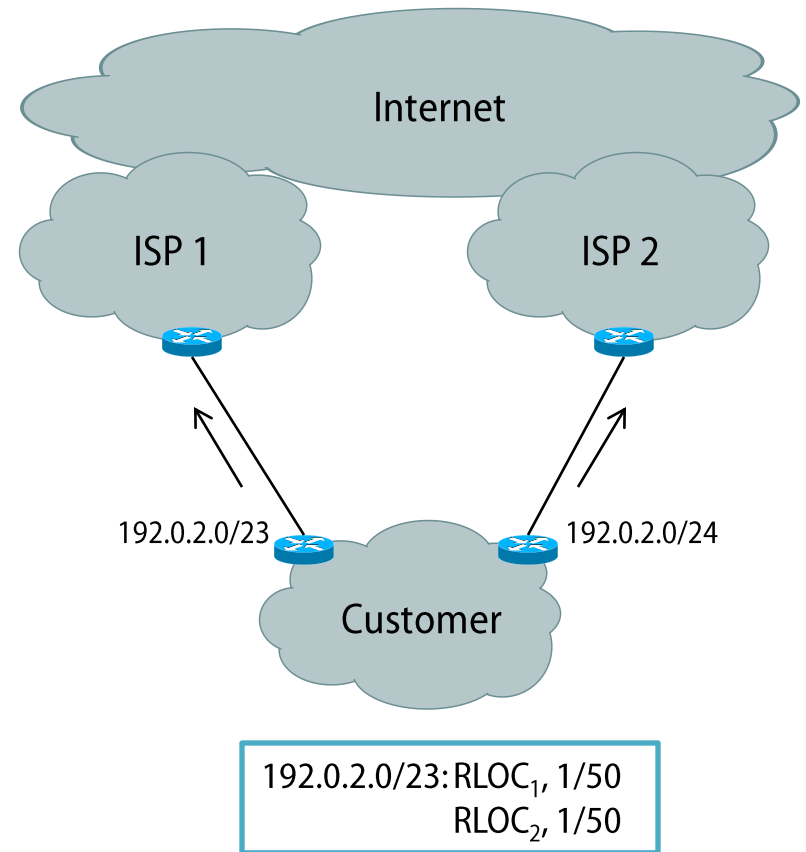
Transition to LISP

- 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
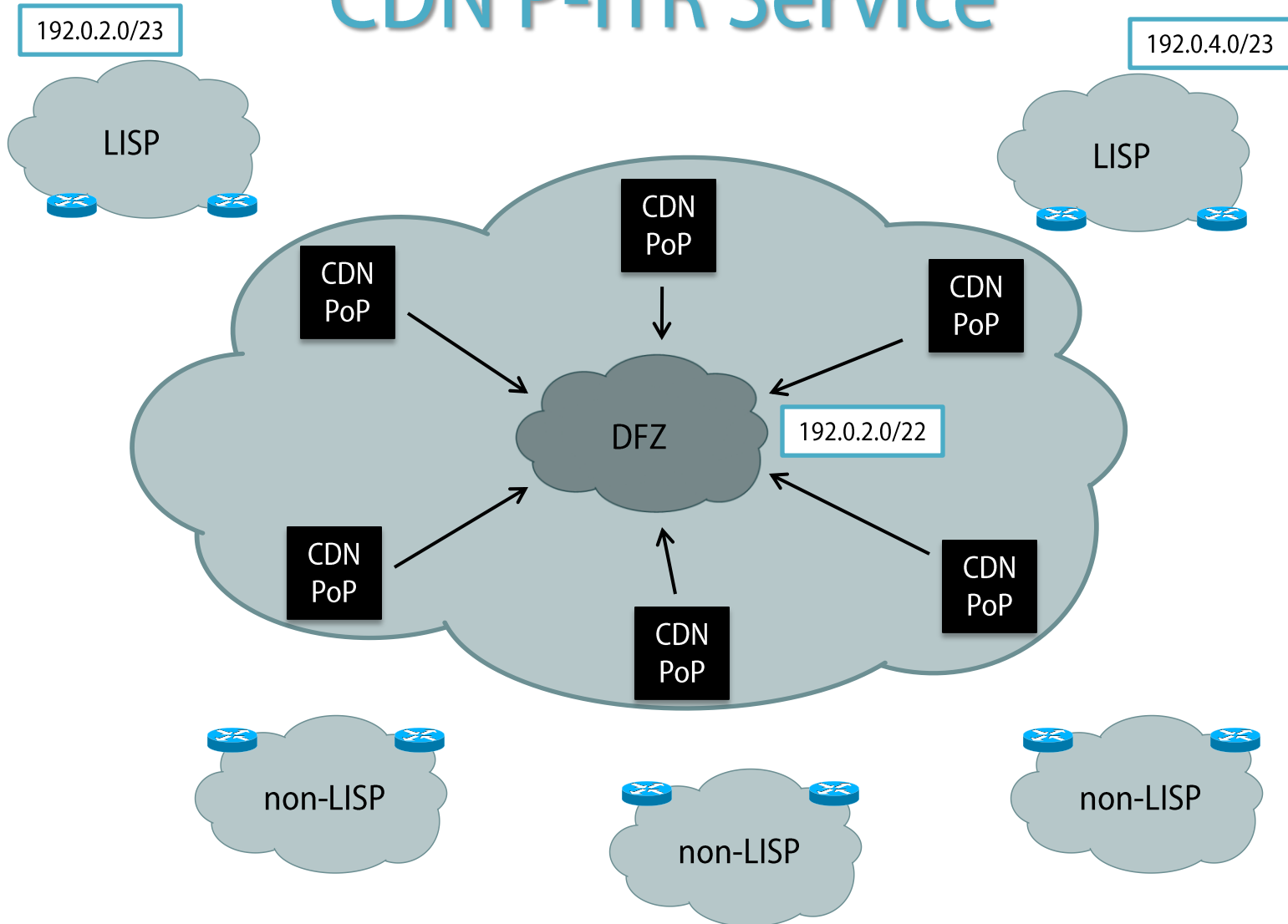
EID Registrar P-ITR Service

- 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

Internet

ISP 1

ISP 2

192.0.2.0/23

192.0.2.0/24

Customer

192.0.2.0/23: RLOC$_1$, 1/50
RLOC$_2$, 1/50

CDN P-ITR Service

192.0.2.0/23

LISP

192.0.4.0/23

LISP

CDN PoP

CDN PoP

CDN PoP

DFZ

192.0.2.0/22

CDN PoP

CDN PoP

CDN PoP

non-LISP

non-LISP

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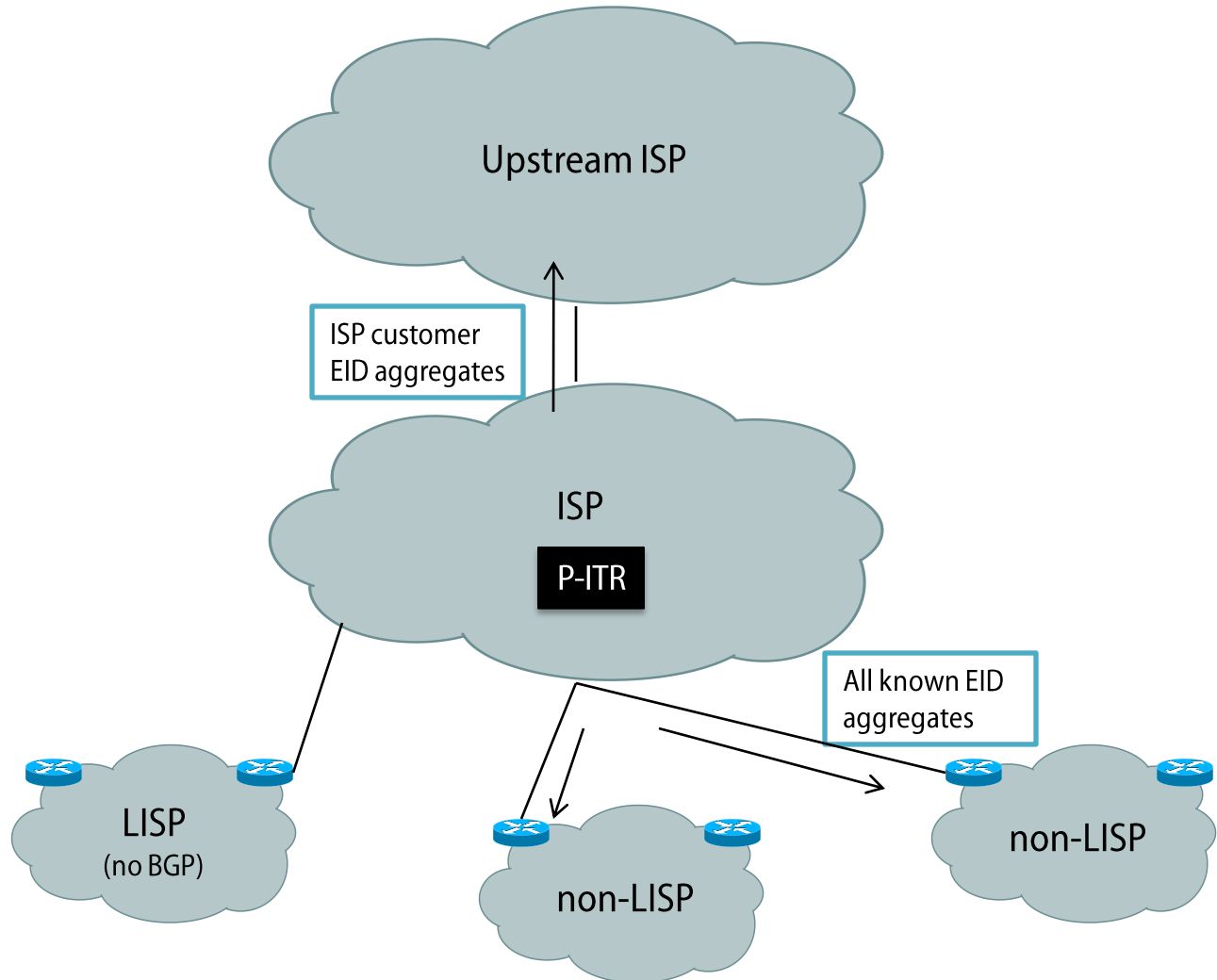
CDN P-ITR Service (cont.)

- 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

All known EID
aggregates

LISP
(no BGP)

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?