LISP Multicast Replication Engineering

draft-coras-lisp-re-02

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Agenda

• Do we really want ubiquitous multicast?

• Do we want multicast sources to be mobile?

• Do we want IPv6 multicast over an IPv4 infrastructure?

• If so, we have to encapsulate multicast inside of unicast.

• And we have to do it in a scalable way.

• LISP-RE allows us to decide where replication points are in the network.

• We will avoid head-end replication in sources and upstream routers.
The Problem

A: multicast capable
B: multicast capable
C: multicast capable
D: multicast capable
E: multicast capable
F: multicast capable
G: multicast capable

sEID multicast capable
unicast-only
unicast encap
xTRs
A Solution

sEID multicast capable

multicast capable

unicast only

unicast only

unicast only

unicast only

multicast capable

multicast capable

multicast capable

unicast encap

unicast encap

multicast encap

xTRs
But When No Multicast in Core

- **A**: sEID multicast capable
- **B**: multicast capable
- **C**: multicast capable
- **D**: multicast capable
- **E**: multicast capable
- **F**: multicast capable
- **G**: multicast capable

Symbols:
- **unicast encap**
- **xTRs**
- **RTRs**
LISP-RE

• Introduces a multi-level RTR hierarchy

• RTRs and levels are registered as RLOCs in a mapping database entry for (S-EID-prefix, G-prefix)

• Protocol signaling (PIM or LISP) is used by ETRs to join to level-(n) RTRs

• Level-(n) RTRs join to level-(n-1) RTRs

• Level-0 RTRs join to ITRs
LISP-RE

- The Mapping Database Entry informs **how** to build distribution trees
- Protocol signaling informs replicators **where** to forward packets per (S-EIDi, Gi)
- Signaling tells downstream if upstream can reach it - if not, join to alternate upstream
Possible Deployment

Mapping Database:
(S-EID, G) ->
- RLOC-1, L0, p0
- RLOC-2, L0, p1
- RLOC-11, L1, p0
- RLOC-12, L1, p0
- RLOC-21, L2, p255
- RLOC-22, L2, p0
- RLOC-23, L2, p0
- RLOC-24, L2, p0

PIM-JP or LISP-Join
This is Fresh Work

- Work began last IETF
- UPC guys are working on optimization algorithms
- Considering how LISP-TE ELPs can be used to describe multi-level RTR paths
- An RTR level could be reachable via a DG
- Testing Network Controller approach
Q&A

Any computer science problem can be solved with another level of indirection