LISP L2 and L3 EID mobility using a unified control plane

draft-portoles-lisp-eid-mobility-00

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Scope of the Draft

Implications and methods for using a common control plane to concurrently support:

- Layer 3 overlays
- Layer 3 overlays w/dispersed subnets
  - Intra-subnet across sites
- Layer 2 overlays
  - unicast and multi-destination
  - Non-IP & IP intra-subnet
  - LISP assisted ARP resolution
- EID Mobility

L3 overlays

- w/o subnet dispersion $\rightleftharpoons$ RFC 6830

- subnet dispersion:
  - Subnet members dispersed across LISP sites
  - Hosts may roam to remote segments which host foreign subnets
  - Cross-site inter-subnet traffic is L3 forwarded
    - ETRs register host EIDs for their locally attached hosts
    - Cross site inter-subnet traffic is sent to the ITR's router MAC (selective proxy reply for remote hosts)
    - Layer 3/Routing lookup at the iTR
    - TTL decrements per L3 forwarding rules

- IP traffic only: Intra and Inter subnet

L2 overlays

- Register MAC addresses as EIDs in the mapping system (EID-AFI = 6) within the scope of an Instance-ID (IID)

- L2 and L3 separation:
  - Dedicate IIDs for L2 purposes (separate from L3 IIDs)
  - IID scoped bridging map cache with MAC EIDs and IP RLOCs (separate from L3 Map Cache)

- Handle Non-IP and IP-Intra-subnet traffic

L2 overlays multi-destination traffic

- ETRs with the same Layer 2 overlay (same IID) configured will join a common L2 multicast group
- Join a replication-list for a MAC-level (S,G) per lisp-signal-free:
  - Broadcast: (0000.0000.0000/0, ffff.ffff.ffff/48)
  - Link-local Multicast: (0000.0000.0000/0, 0100.0000.0000/8)
  - Used as a flood service
- Unknown Unicast considerations:
  - Unknown status may be temporary
  - "No Action" negative map-reply cached ⇔ Forward to Broadcast replication-list
  - Upon discovery of unicast destination (unknown -> known)
    - Send SMR to sending ITRs
    - ITRs refresh their cache and stop flooding

L2 overlays –
Intra-subnet IP and ARP resolution

- Intra-subnet IP traffic may use the L2 overlay
  - Forward on MAC addresses after ARP resolution
  - Either operate in L3 mode or L2 mode for intra-subnet traffic
- Option 1: ARP requests are flooded to all RLOCs in the Layer 2 overlay.
- Option 2: Suppress floods, use information in the Mapping System to reply to ARP requests from the ITR

L2 Overlays – LISP assisted ARP resolution

- ETRs register a MAC to IP binding for each host
- Use the IID corresponding to the layer 2 overlay
- MAC as associated data with the locator - LCAF encoded:

  EID=<afi=lcaf, instance-id-type>**<iid>**<afi=1>**<ip-address>**

  RLOC = <afi=lcaf, afi-list-type>

      <afi=1><rloc-ip-address>

      <afi=lcaf, encap-format-type><VL><rloc-ip-address>

      <afi=6>**<mac-address>**

- Upon Reception of ARP request, an ITR ARP agent will:
  - Cache ARP request
  - Issue Map Request for EID = IP in IID = Layer-2-overlay
  - Cache map-reply in ARP-cache for future replies
  - Assemble an ARP reply with the resolved host source addresses
  - On negative Map Reply fall back to flooding ARP

Next steps

- Review of the draft by WG
- Decision on where to document mobility
  - Part of this draft
  - Separate mobility draft