LISP – Packet Forwarding Flow Diagram

Updated:: 20 October 2012
Ingress Packet

Destination lookup in routing table (RIB) (show ip route)

Is the route matched:
1. default route (0.0.0.0/0 or ::/0)
2. “no route”

NO

Forward Packet Natively (1)

YES

Packet NOT ELIGABLE for LISP encapsulation; native forwarding rules apply

Is SRC within local EID prefix?

NO

Check source address of the packet to be forwarded

YES

Packet ELIGABLE for LISP encapsulation

Check Map-­Cache entries to see which one the destination matches (2)

NO

Drop Packet

YES

“fwd-­encap” action

NO

Drop Packet

LISP Encap Packet to DST RLOC (3)

“drop” action

Send Map-­Request to Map-­Resolver

NO

“send-­request” action

NO

“forward-­native” configured?

YES

LISP Encap Packet to PETR (3)

NO

Fwd Packet Natively

NOTEs:
1) If the destination doesn’t match a default route or “no route” – the only other possible option is a match against a real route with viable next-hop. In this case, the packet is not eligible for LISP encapsulation and the packet is forwarded natively.
2) Because the LISP control plane component installs default map-cache entry with action send-map-request, we will never get a miss.
3) The packet is encapsulated and a destination address lookup is performed on the destination/remote RLOC; once the output interface is known, the source RLOC is filled in.
LISP Packet Forwarding Flow Chart – PITR

Ingress Packet

Is match found?

YES

Drop Packet (3)

NO

Destination lookup for match in:
- routing table (1)
- map-cache with action “send-map-request” (2)

Is longest mask or equal prefix against “send-map-request”? 

NO

Check Map-Cache entries to see which one the destination matches

Packet ELIGABLE for LISP encapsulation

YES

“fwd-encap” action

“drop” action

NO

Drop Packet

“send-request” action

Send Map-Request to Map-Resolver

NO

Drop Packet

“forward-native” action

use-petr configured?

YES

LISP Encap Packet to PETR (5)

NO

Fwd Packet Natively

NOTES:
1) The routing table look-up is done in the table specified in the “eid-table” command (default or vrf)
2) A map-cache entry with action “map-request” is created either by a static entry or via the “route-import” mechanism
3) If the destination doesn’t match a RIB route or “send-map-request” map-cache entry, then the only other possible result is the PITR has no forwarding route. The packet is dropped and a “network unreachable” ICMP is generated.
4) The destination is not a LISP EID and a RIB route is available.
5) Address lookup is performed on the destination/remote RLOC; once the output interface is known, the source RLOC is filled in.

Compare the 2 prefixes found. Take the prefix with longest/most specific mask

Forward Packet Natively (4)

LISP Encap Packet to DST RLOC (5)