LISP Single-Hop DHT Mapping Overlay

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draft-cheng-lisp-shdht-03

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What’s LISP SHDHT?

• LISP SHDHT is a LISP Control Plane proposal based on DHT strategy
  – i.e., a mapping database provides mapping information lookup service for sites running LISP

• Properties of DHTs
  – Self-Configuration
  – Self-maintenance
  – Scalability
  – Robustness
What’s LISP SHDHT?

Main Characters of LISP SHDHT

- **Single Hop — Lookup Efficiently**
  - Each SHDHT Node maintains routing information for all other SHDHT Nodes.

- **Load Balance — Avoid Node Overload**
  - **Node ID:** Each SHDHT node has a unique Node ID which identifies the physical node.
  - **Partition ID:** Each SHDHT node could maintain multiple Partition IDs which represent the assignment of hash space.
SHDHT Overview

Ring of Node ID
- Node 1: 0x123
- Node 2: 0x444
- Node 3: 0xe000
- Node 4: 0xc000

Ring of Partition ID
- Partition ID 0x123: Node 1
- Partition ID 0x444: Node 2
- Partition ID 0xe000: Node 3
- Partition ID 0xc000: Node 4

Node ID
- Node 1: 0x123
- Node 2: 0x444
- Node 3: 0xe000
- Node 4: 0xc000

Partition ID
- Partition ID 0x123: 0x123
- Partition ID 0x444: 0x444
- Partition ID 0xe000: 0xe000
- Partition ID 0xc000: 0xc000
• Comments received on IETF 84th

**Consistency with LISP-MS**

• The whole SHDHT Overlay is composed of multiple SHDHT-Nodes. The structure of the database is not consistent with requirements specified in [LISP-MS].

**Scalability**

• The whole SHDHT Overlay is a ring sharp overlay. Mapping overlay may be implemented by multiple mapping service providers. Scalability of the mapping overlay need to be considered.
SHDHT-MS and SHDHT-MR represent function entities, and could be collocated on the same SHDHT Node.
Domain LISP SHDHT Deployment

Domain SHDHT 1
13.1.0.0/16

Domain SHDHT 2
13.2.0.0/16

Domain SHDHT 3
16.1.0.0/18

SHDHT Node
Border Node
Domain LISP SHDHT Deployment

Border Node:
1. Store EID-to-RLOC mapping just like normal SHDHT Nodes.
2. Maintains an Inter-Domain Routing Table, which contains information of all other domain overlays.
3. Flood cross domain routing and forward the cross domain packets.
Domain LISP SHDHT Deployment

1. Map Request for: 13.2.1.3
2. Match domain EID prefix
3. Look up Inter-domain Routing Table

Domain SHDHT 1
13.1.0.0/16

Domain SHDHT 2
13.2.0.0/16

Domain SHDHT 3
16.1.0.0/18

SHDHT Node
Border Node
• Comments/Feedback?