LISP-DDT

implementation status and deployment considerations

Vince Fuller/Darrel Lewis, Cisco

IETF-85 Atlanta, GA

Agenda

- Brief review of how DDT works
- Implementation and deployment status
- Future direction – soliciting feedback

Review: what is LISP-DDT?

- LISP Delegated Database Tree
  - Hierarchy for Instance IDs and for EID Prefixes
  - Statically Configured
  - Delegations are signed (public-key) and verified when used
- Conceptually, similar to DNS (IN-ADDR hierarchy)
  - but different prefix encoding, messages, etc.
  - we did try using DNS protocol directly, but proved unsuitable
- Borrowed terminology:
  - DDT Node/Map-Server – defines EID topology and delegations
  - DDT Map-Resolver – walks EID topology to find ETR

Implementation Status

- Cisco IOS and NXOS implementations complete
  - –Multi-AF (LCAF) support, public/private EID space separation
- OpenLISP implementation nearly complete
- Verisign implementation in progress
- Development and interoperability testing going on now
  - – running on LISP beta network with around 200 end sites
- Does not include proposed DDT-SEC extensions

Example: DDT Node/MS EID Delegation

- Pretty simple – much easier than ALT
- Root server configuration:

```
lisp ddt authoritative-prefix *
lisp ddt delegate 217.8.111.1 instance-id 0 eid-prefix 85.184.184.0/24
lisp ddt delegate 158.38.1.91 instance-id 0 eid-prefix 153.16.0.0/16
lisp ddt delegate 173.36.254.167 instance-id 0 eid-prefix 153.16.0.0/16
lisp ddt delegate 158.38.1.91 instance-id 0 eid-prefix 2610:d0::/32
lisp ddt delegate 173.36.254.167 instance-id 0 eid-prefix 2610:d0::/32
```

- Sub-delegations for pilot network:

```
lisp ddt authoritative-prefix instance-id 0 eid-prefix 2610:d0::/32
lisp ddt authoritative-prefix instance-id 0 eid-prefix 153.16.0.0/16
lisp ddt delegate 149.20.48.61 instance-id 0 eid-prefix 153.16.0.0/19
lisp ddt delegate 193.162.145.50 instance-id 0 eid-prefix 153.16.32.0/19
lisp ddt delegate 149.20.48.61 instance-id 0 eid-prefix 2610:d0:face::/48
lisp ddt delegate 173.36.254.164 instance-id 0 eid-prefix 2610:d0:face::/48
```

DDT Map Server configuration

- Further sub-delegation to DDT Map Server:

```
lisp ddt authoritative-prefix instance-id 0 eid-prefix 153.16.0.0/19
lisp ddt map-server-peer 149.20.48.61 instance-id 0 eid-prefix 153.16.0.0/19
lisp ddt map-server-peer 173.36.254.164 instance-id 0 eid-prefix 153.16.0.0/19
lisp ddt map-server-peer 198.6.255.37 instance-id 0 eid-prefix 153.16.0.0/19
lisp ddt map-server-peer 206.223.132.89 instance-id 0 eid-prefix 153.16.0.0/19

lisp site vaf-xtr
  eid-prefix 153.16.10.0/24
  authentication-key xxxx
  description Contact: Vince Fuller vaf@cisco.com
```

- “peer” configuration Allows DDT MS to respond with “go ask someone else” if it does not have current ETR registration

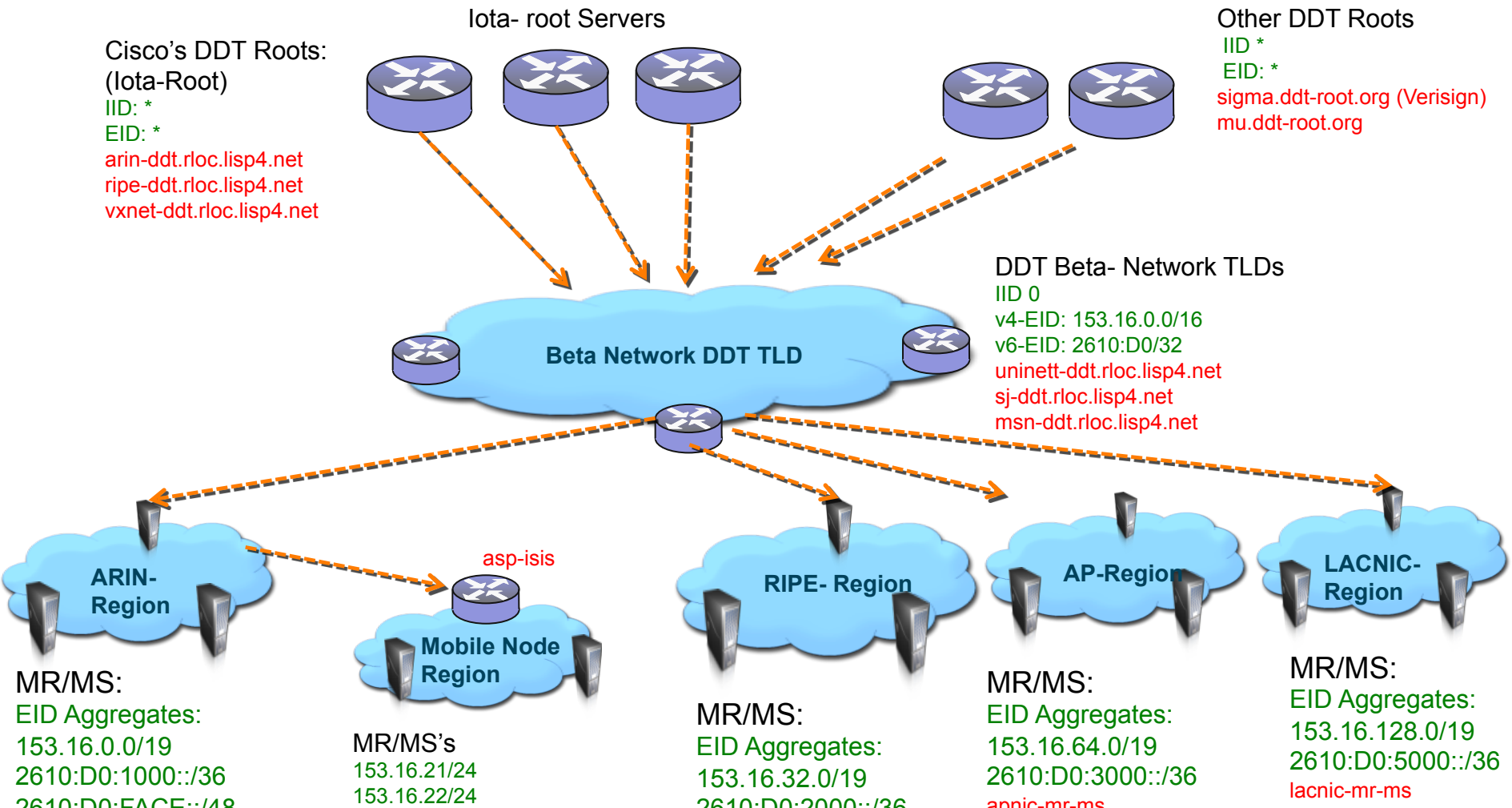
DDT Map Resolver Configuration

- Very simple - just needs to know how to get to root:

```
lisp ddt root 192.149.252.136
lisp ddt root 193.0.0.170
lisp ddt root 199.119.73.8
```

- “root hints” file for DDT
- non-root DDT Map-Servers have this configuration also
- Pilot infrastructure boxes have combined functionality for both DDT Map-Resolver and DDT Map-Server

DDT Beta (IID0) Network Deployment



Organization and Operational Status

- Collaboration among Cisco, Verisign, Intouch NV
  - discussions with others, more welcome
  - close dependency on PITR providers
- Common root: ddt-root.org
  - servers run by different companies/organizations
- Running on LISP pilot network
  - transition from LISP+ALT in March, 2012
  - ALT configurations removed in April, 2012
- Looking at various options for organizational structure
  - emphasis on transparency, scalability, efficiency, simplicity

Thoughts on Future Work

- LISP Mapping Provider “eco-system”(?)
  - need more public DDT providers and PITR providers
- Internet-Scale Deployment(?)
- DDT database syntax specification(?)
  - like RFC1035 sec. 5.3 for DNS
  - as an appendix to draft-ietf-lisp-ddt?
  - as a separate document?
- Explicit specification for split between public and non-public EID space(?)
  - draft mentions “hints” but not how used by DDT-MR/DDT-MS
  - IID registry, with range defined for private use(?)

LISP-DDT and LISP resources

- Recently adopted by WG: draft-ietf-lisp-ddt-00.txt
- www.lisp4.net
  - background information, pointers to other presentations
  - pilot network topology, traffic, etc.
  - LISP Network Operators Group (LNOG)
- lisp.cisco.com
  - Cisco implementation info, image downloads, etc.
- LISP-DDT root operation - http://ddt-root.org