Some New Basic LISP Features

LISP Working Group - Berlin IETF
July 2016

Dino Farinacci and Padma Pillay-Esnault

Agenda

- Briefly Present (but in their entirety):
  - draft-farinacci-lisp-name-encoding-00
  - draft-farinacci-lisp-geo-00
  - draft-farinacci-lisp-eid-anonymity-00

draft-farinacci-lisp-name-encoding-00

- We can encode a “distinguished-name” in an EID-record or RLOC-record with AFI encoding
- Use AFI=17 and null terminate ascii string
- Provides for self-documenting mapping database records
- Provides for multi-stage lookups and groupings
- Supported by LISP-DDT with no changes
  - Lookup for **/root/dino/slides/berlin**
  - Matches **/root/dino** at DDT-root’s children
  - Where **/root/dino/slides/berlin** are registered to Map-Server

Example

lispers.net

Scalable Open Overlay Networking ms1

Site name: `lispers.net`, EID-prefix: `[1]'g-xtr1'`, registered: **yes**, dynamic
Description:
Last registerer: `[0]104.155.143.86`, xTR-ID: `0xcd098572b0b0cbf3`, site-ID: `0`
First registered: `23:38:43`, last registered: `0:00:31`, auth-type: `sha2`, registration flags: `p-s-I-t-r-m-n`
Default registration timeout TTL: `180 seconds`
Forcing proxy Map-Reply: `yes`
Forcing proxy Map-Reply for xTRs behind NATs: `yes`
Send drop-action proxy Map-Reply to PITR: `no`
Proxy Map-Reply action: `not configured`
Allowed RLOC-set: `any`

Registered RLOC-set (replacement-semantics):
`[0]104.155.143.86`, state: `up-state`, up/uw/mp/mw: `0/0/255/0`, rloc-name: "`xtr1`"
`[0]10.240.106.249`, state: `up-state`, up/uw/mp/mw: `254/0/255/0`, RTR
`[0]130.211.169.66`, state: `up-state`, up/uw/mp/mw: `254/0/255/0`, RTR

Individual registrations: `none`

---

*Tue Jun 28 20:10:25 UTC 2016 - Uptime 23:40:47, Version **0.333***

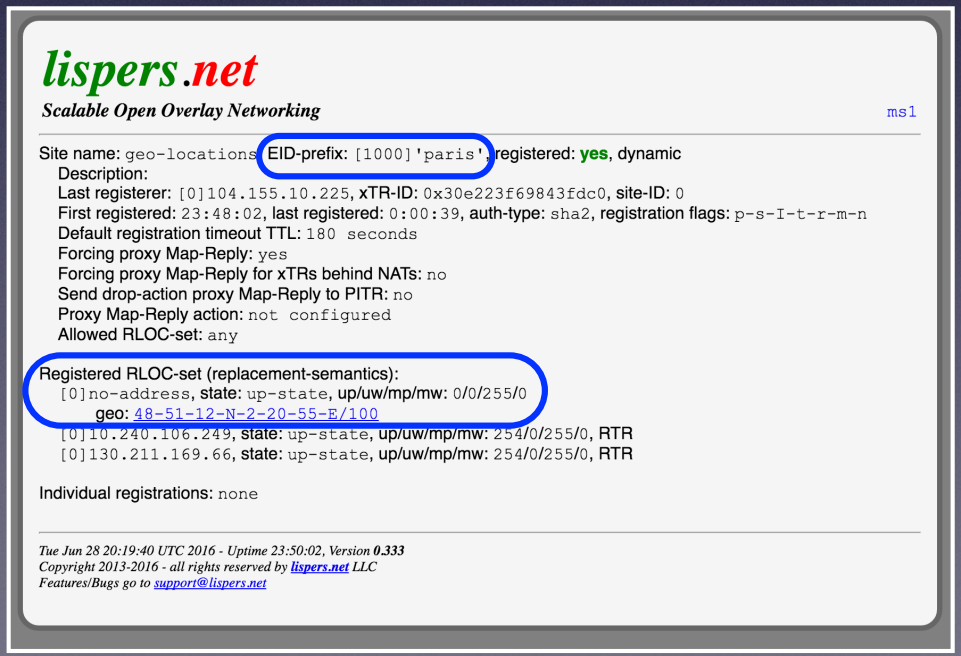
Features/Bugs go to support@lispers.net

draft-farinacci-lisp-geo-00

- We already can encode geo-coordinates as RLOC-records
- Add a radius (in km) to draw a geographical sphere
  - Now we have “geo-prefixes” (in 2D or 3D)
- Can be encoded as EID-records or RLOC-records
- Can test if an EID is in a geographical area
- Can make RLOC selection based on signal quality as well as considering latency requirements

Example

geo-locations	[1000]	no (ams)	--	never	never	--
	[1000]'san-jose'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n
	[1000]'new-york'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n
	[1000]'paris'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n
	[1000]'london'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n
	[1000]'tokyo'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n
	[1000]'sjc'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n
	[1000]'cdg'	yes (dynamic)	[0]104.155.10.225	0:00:08	23:46:31	p-s-l-t-r-m-n



lispers.net

Scalable Open Overlay Networking ms1

Site name: geo-locations, EID-prefix: [1000]'paris', registered: **yes**, dynamic
Description:
Last registerer: [0]104.155.10.225, xTR-ID: 0x30e223f69843fdc0, site-ID: 0
First registered: 23:48:02, last registered: 0:00:39, auth-type: sha2, registration flags: p-s-I-t-r-m-n
Default registration timeout TTL: 180 seconds
Forcing proxy Map-Reply: yes
Forcing proxy Map-Reply for xTRs behind NATs: no
Send drop-action proxy Map-Reply to PITR: no
Proxy Map-Reply action: not configured
Allowed RLOC-set: any

Registered RLOC-set (replacement-semantics):
[0]no-address, state: up-state, up/uw/mp/mw: 0/0/255/0
geo: 48-51-12-N-2-20-55-E/100
[0]10.240.106.249, state: up-state, up/uw/mp/mw: 254/0/255/0, RTR
[0]130.211.169.66, state: up-state, up/uw/mp/mw: 254/0/255/0, RTR

Individual registrations: none

*Tue Jun 28 20:19:40 UTC 2016 - Uptime 23:50:02, Version **0.333***
Copyright 2013-2016 - all rights reserved by lispers.net LLC
Features/Bugs go to support@lispers.net

lispers.net

Scalable Open Overlay Networking ms1

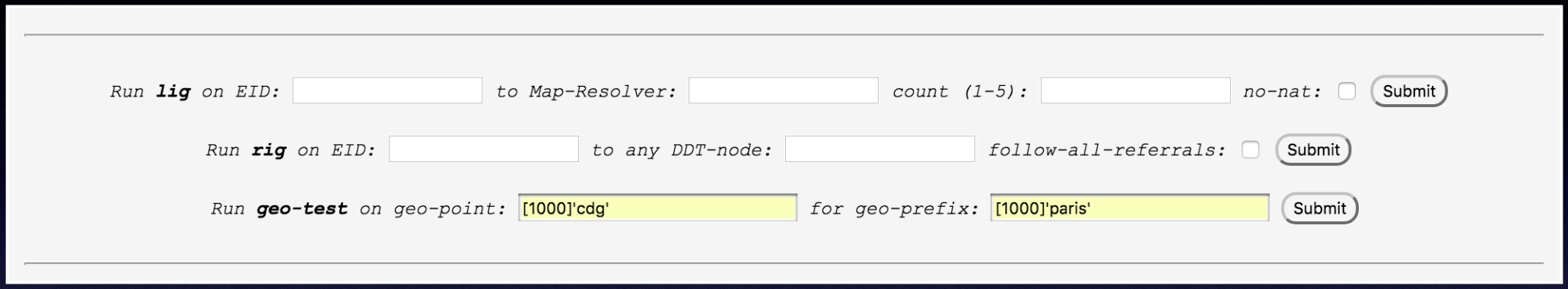
Site name: geo-locations, EID-prefix: [1000]'cdg', registered: **yes**, dynamic
Description:
Last registerer: [0]104.155.10.225, xTR-ID: 0x30e223f69843fdc0, site-ID: 0
First registered: 23:48:28, last registered: 0:00:05, auth-type: sha2, registration flags: p-s-I-t-r-m-n
Default registration timeout TTL: 180 seconds
Forcing proxy Map-Reply: yes
Forcing proxy Map-Reply for xTRs behind NATs: no
Send drop-action proxy Map-Reply to PITR: no
Proxy Map-Reply action: not configured
Allowed RLOC-set: any

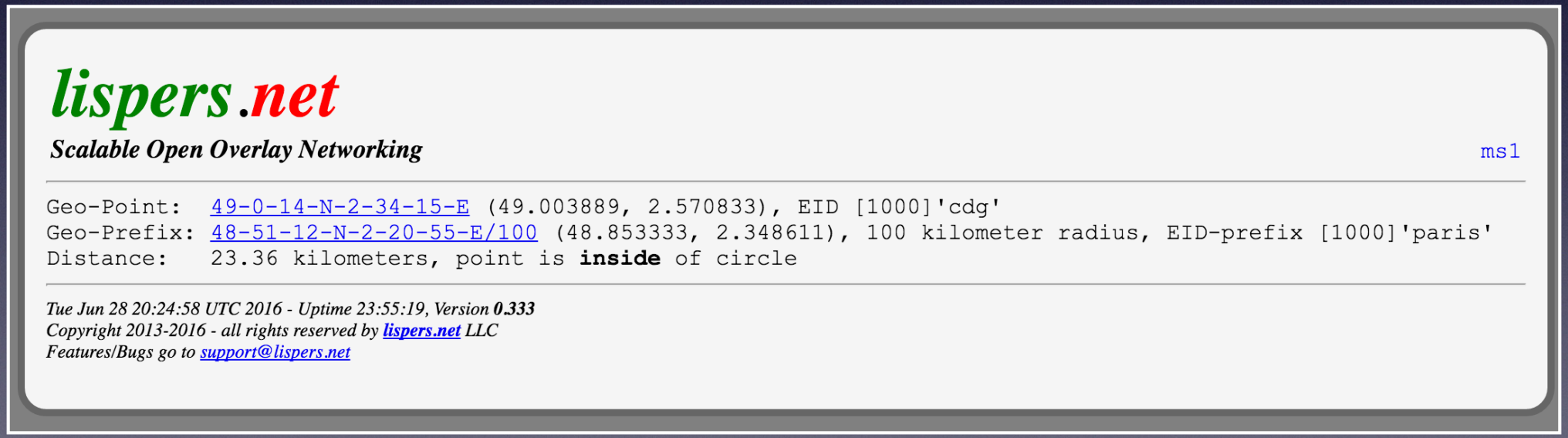
Registered RLOC-set (replacement-semantics):
[0]no-address, state: up-state, up/uw/mp/mw: 0/0/255/0
geo: 49-0-14-N-2-34-15-E
[0]10.240.106.249, state: up-state, up/uw/mp/mw: 254/0/255/0, RTR
[0]130.211.169.66, state: up-state, up/uw/mp/mw: 254/0/255/0, RTR

Individual registrations: none

*Tue Jun 28 20:20:07 UTC 2016 - Uptime 23:50:28, Version **0.333***
Copyright 2013-2016 - all rights reserved by lispers.net LLC
Features/Bugs go to support@lispers.net

Example

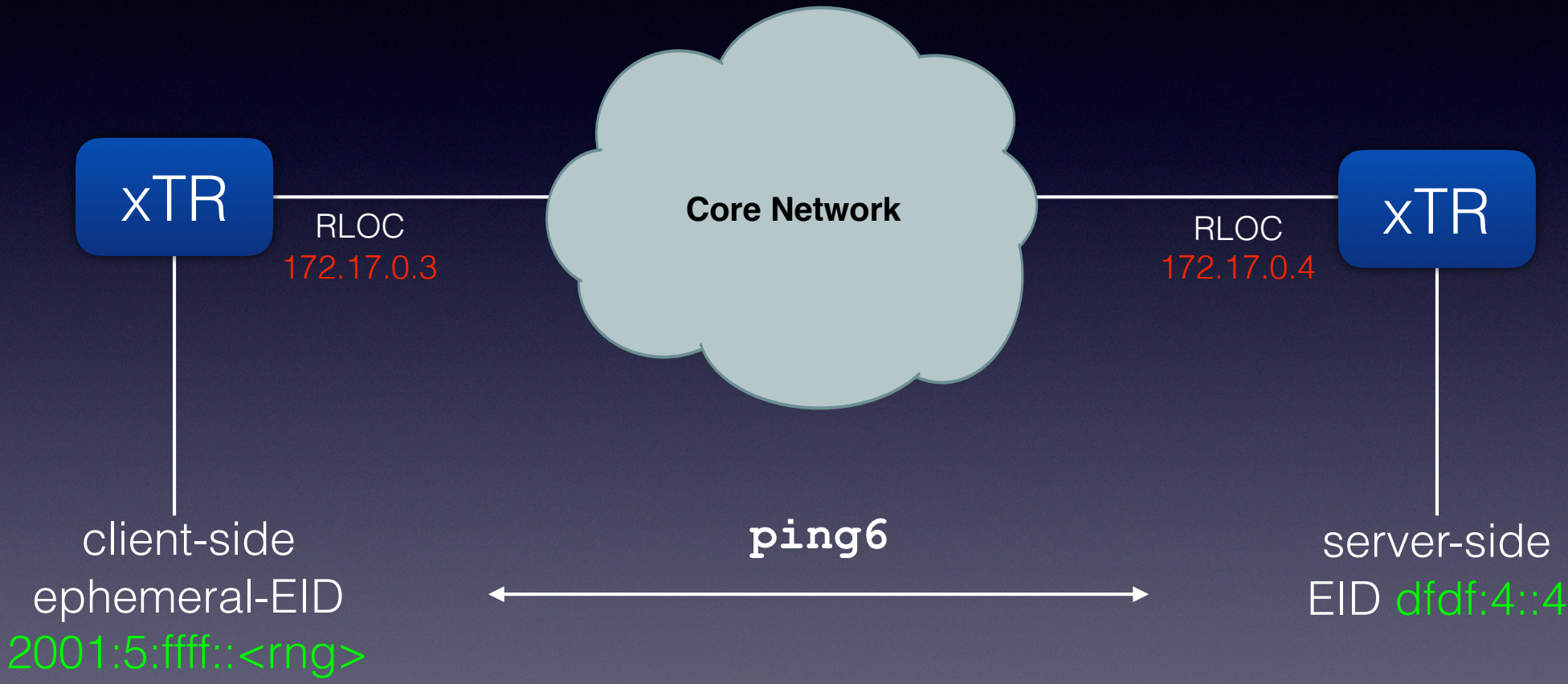

Run lig on EID:
to Map-Resolver:
count (1-5):
no-nat:
Submit
Run rig on EID:
to any DDT-node:
follow-all-referrals:
Submit
Run geo-test on geo-point:
[1000]'cdg'
for geo-prefix:
[1000]'paris'
Submit


lispers.net
Scalable Open Overlay Networking
ms1
Geo-Point: 49-0-14-N-2-34-15-E (49.003889, 2.570833), EID [1000]'cdg'
Geo-Prefix: 48-51-12-N-2-20-55-E/100 (48.853333, 2.348611), 100 kilometer radius, EID-prefix [1000]'paris'
Distance: 23.36 kilometers, point is inside of circle
Tue Jun 28 20:24:58 UTC 2016 - Uptime 23:55:19, Version 0.333
Copyright 2013-2016 - all rights reserved by lispers.net LLC
Features/Bugs go to support@lispers.net

draft-farinacci-lisp-eid-anonymity-00

- A client system can use ephemeral EIDs
- Randomly allocates a value in **2001:5:**ffff::/64
- Register ephemeral-EID with current RLOC-set
- Source from the ephemeral-EID
- Server knows where you are
- Simply a mobility problem, solved with a mobility solution
- No changes to the LISP protocol

Example


xTR
RLOC
172.17.0.3
Core Network
RLOC
172.17.0.4
xTR
client-side
ephemeral-EID
2001:5:ffff::<rng>
ping6
server-side
EID dfdf:4::4

Example

```
root@xtr3:/dino/code/apps# py ping-from-eeid.py dfdf:4::4 loop 3
Configure 2001:5:ffff::d1c1:240e on interface lo ... succeeded
Start ping6 from 2001:5:ffff::d1c1:240e to dfdf:4::4 ...
PING dfdf:4::4(dfdf:4::4) from 2001:5:ffff::d1c1:240e : 56 data bytes
64 bytes from dfdf:4::4: icmp_seq=2 ttl=62 time=190 ms
64 bytes from dfdf:4::4: icmp_seq=3 ttl=62 time=187 ms
64 bytes from dfdf:4::4: icmp_seq=4 ttl=62 time=186 ms
64 bytes from dfdf:4::4: icmp_seq=5 ttl=62 time=184 ms
64 bytes from dfdf:4::4: icmp_seq=6 ttl=62 time=183 ms
64 bytes from dfdf:4::4: icmp_seq=7 ttl=62 time=180 ms
64 bytes from dfdf:4::4: icmp_seq=8 ttl=62 time=279 ms
64 bytes from dfdf:4::4: icmp_seq=9 ttl=62 time=277 ms
64 bytes from dfdf:4::4: icmp_seq=10 ttl=62 time=275 ms

--- dfdf:4::4 ping statistics ---
10 packets transmitted, 9 received, 10% packet loss, time 9019ms
rtt min/avg/max/mdev = 180.774/216.156/279.000/43.453 ms
Deconfigure 2001:5:ffff::d1c1:240e on interface lo ... succeeded
------------------------------------------------------------
Configure 2001:5:ffff::e929:4489 on interface lo ... succeeded
Start ping6 from 2001:5:ffff::e929:4489 to dfdf:4::4 ...
PING dfdf:4::4(dfdf:4::4) from 2001:5:ffff::e929:4489 : 56 data bytes
64 bytes from dfdf:4::4: icmp_seq=2 ttl=62 time=250 ms
64 bytes from dfdf:4::4: icmp_seq=3 ttl=62 time=248 ms
64 bytes from dfdf:4::4: icmp_seq=4 ttl=62 time=247 ms
64 bytes from dfdf:4::4: icmp_seq=5 ttl=62 time=247 ms
64 bytes from dfdf:4::4: icmp_seq=6 ttl=62 time=244 ms
64 bytes from dfdf:4::4: icmp_seq=7 ttl=62 time=244 ms
64 bytes from dfdf:4::4: icmp_seq=8 ttl=62 time=243 ms
64 bytes from dfdf:4::4: icmp_seq=9 ttl=62 time=240 ms
64 bytes from dfdf:4::4: icmp_seq=10 ttl=62 time=239 ms

--- dfdf:4::4 ping statistics ---
10 packets transmitted, 9 received, 10% packet loss, time 9015ms
rtt min/avg/max/mdev = 239.941/245.437/250.853/3.454 ms
Deconfigure 2001:5:ffff::e929:4489 on interface lo ... succeeded
------------------------------------------------------------
Configure 2001:5:ffff::18e1:2d81 on interface lo ... succeeded
Start ping6 from 2001:5:ffff::18e1:2d81 to dfdf:4::4 ...
PING dfdf:4::4(dfdf:4::4) from 2001:5:ffff::18e1:2d81 : 56 data bytes
64 bytes from dfdf:4::4: icmp_seq=2 ttl=62 time=220 ms
64 bytes from dfdf:4::4: icmp_seq=3 ttl=62 time=219 ms
64 bytes from dfdf:4::4: icmp_seq=4 ttl=62 time=218 ms
64 bytes from dfdf:4::4: icmp_seq=5 ttl=62 time=215 ms
64 bytes from dfdf:4::4: icmp_seq=6 ttl=62 time=214 ms
64 bytes from dfdf:4::4: icmp_seq=7 ttl=62 time=212 ms
64 bytes from dfdf:4::4: icmp_seq=8 ttl=62 time=210 ms
64 bytes from dfdf:4::4: icmp_seq=9 ttl=62 time=210 ms
64 bytes from dfdf:4::4: icmp_seq=10 ttl=62 time=208 ms

--- dfdf:4::4 ping statistics ---
10 packets transmitted, 9 received, 10% packet loss, time 9010ms
rtt min/avg/max/mdev = 208.985/214.543/220.513/3.942 ms
Deconfigure 2001:5:ffff::18e1:2d81 on interface lo ... succeeded
------------------------------------------------------------
```

lispers.net

Scalable Open Overlay Networking

mrms

Enter EID for Site-Cache lookup: Submit

LISP-MS Site Information:

Site Name	EID-Prefix or (S,G)	Registered	Last Registerer	Last Registered	First Registered	Registration Flags
any	[0]	no (ams)	--	never	never	--
	[0]3.3.3.3/32	yes (dynamic)	[0]172.17.0.3	0:00:24	0:05:24	p-s-l-t-r-m-n
	[0]dfdf:3::/32	yes (dynamic)	[0]172.17.0.3	0:00:24	0:05:24	p-s-l-t-r-m-n
	[0]'d-xtr3'	yes (dynamic)	[0]172.17.0.3	0:00:24	0:05:24	p-s-l-t-r-m-n
	[0]4.4.4.4/32	yes (dynamic)	[0]172.17.0.4	0:00:22	0:05:23	p-s-l-t-r-m-n
	[0]dfdf:4::/32	yes (dynamic)	[0]172.17.0.4	0:00:22	0:05:22	p-s-l-t-r-m-n
	[0]'d-xtr4'	yes (dynamic)	[0]172.17.0.4	0:00:22	0:05:22	p-s-l-t-r-m-n
	[0]2001:5:ffff::ebbb:6f6e/128	no (dynamic)	[0]172.17.0.3	0:01:45	0:02:18	--
	[0]2001:5:ffff::6a20:a7dc/128	no (dynamic)	[0]172.17.0.3	0:01:30	0:02:07	--
	[0]2001:5:ffff::7612:5728/128	no (dynamic)	[0]172.17.0.3	0:01:30	0:01:56	--
	[0]2001:5:ffff::3030:a228/128	no (dynamic)	[0]172.17.0.3	0:01:15	0:01:45	--
	[0]2001:5:ffff::8127:95bd/128	no (dynamic)	[0]172.17.0.3	0:01:15	0:01:41	--
	[0]2001:5:ffff::d1c1:240e/128	yes (dynamic)	[0]172.17.0.3	0:00:23	0:00:23	p-s-l-t-r-m-n
	[0]2001:5:ffff::e929:4489/128	yes (dynamic)	[0]172.17.0.3	0:00:12	0:00:12	p-s-l-t-r-m-n
	[0]2001:5:ffff::18e1:2d81/128	yes (dynamic)	[0]172.17.0.3	0:00:01	0:00:01	p-s-l-t-r-m-n

*Tue Jun 28 22:49:16 UTC 2016 - Uptime 0:05:33, Version **0.333***

Features/Bugs go to support@lispers.net

Questions/Comments/Tomatoes?