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LDPv6 In The Real World

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Early Days

- LDPv6 began life as “draft-manral-mpls-ldp-ipv6-00” in 2008.
- LDPv6 provides an MPLS control plane for IPv6.
- Finally became RFC 7552 in 2015.

Vendor Implementation

- Juniper released support in Junos 15, 2015.
- Cisco released support in IOS XR 5.3.0, 2015.
- Nokia (ALU) have support.
- HP have support.
- Huawei have support.
- Arrcus have support.
- Notably, IOS XE has no support. Cisco have no plans for it here.

What Works

- Native MPLS forwarding of IPv6 traffic:

```
RP/0/RSP0/CPU0:dr-01-jnb.za#traceroute www.yahoo.com
Mon Sep 14 05:53:14.955 UTC

Type escape sequence to abort.
Tracing the route to 2a00:1288:110:c305::1:8001

 1  ce-0-2-0-0.cr6-01-jnb.za.seacomnet.com (2c0f:feb0:b::1) [MPLS: Label 25337 Exp 0] 166 msec
    ce-0-2-0-0.cr6-02-jnb.za.seacomnet.com (2c0f:feb0:b::2) 162 msec
    ce-0-3-0-0.cr6-02-jnb.za.seacomnet.com (2c0f:feb0:b::1:2) 168 msec
 2  te-0-0-0-7.cr6-01-cpt.za.seacomnet.com (2c0f:feb0:1:2::3fd) [MPLS: Label 25519 Exp 0] 166 msec
    xe-0-0-0-9.cr6-01-cpt.za.seacomnet.com (2c0f:feb0:1:2::632) 174 msec
    te-0-1-0-11.cr6-01-cpt.za.seacomnet.com (2c0f:feb0:1:2::296) 164 msec
 3  xe-0-7-0-0.cr6-01-lhr.uk.seacomnet.com (2c0f:feb0:1:2::801) [MPLS: Label 24781 Exp 0] 168 msec
    xe-0-1-0-1.cr6-02-lhr.uk.seacomnet.com (2c0f:feb0:1:2::d2) 161 msec
    xe-0-0-0-6.cr6-02-lhr.uk.seacomnet.com (2c0f:feb0:1:2::4a2) 160 msec
 4  ae-4-0.pp6-01-lhr.uk.seacomnet.com (2c0f:feb0:e::1:8) 159 msec 171 msec 158 msec
 5  2001:7f8:4::2846:2 161 msec 157 msec 161 msec
 6  ge-4-2-0.pat1.the.yahoo.com (2a00:1288:f010:6::) 187 msec 180 msec 177 msec
 7  2a00:1288:f020:8::1 176 msec
    2a00:1288:f020:7::1 174 msec
    2a00:1288:f020:8::1 172 msec
 8  2a00:1288:110:fc83::1 172 msec
    2a00:1288:110:fe82::1 178 msec
    2a00:1288:110:fe80::1 173 msec
 9  et28.usw1-1-lbc.ir2.yahoo.com (2a00:1288:110:cc2b::1) 170 msec 170 msec
    et27.usw2-1-lbc.ir2.yahoo.com (2a00:1288:110:ce2a::1) 178 msec
 10 media-router-fp74.prod.media.vip.ir2.yahoo.com (2a00:1288:110:c305::1:8001) 175 msec 175 msec 174 msec
RP/0/RSP0/CPU0:dr-01-jnb.za#
```

What Doesn’t Work

- Higher-level MPLS-based services cannot be signaled over LDPv6:
  - l2vpn’s.
  - l3vpn’s.
  - EVPN’s.
  - MVPN’s.
  - RSVP-TE.

- Details of this can be found in RFC 7439:
  - **Gap Analysis for Operating IPv6-Only MPLS Networks**

So Why Do It

- As with IPv4, you can remove native BGPv6 from the core network.
- IPv6 traffic would now be purely label-switched in the core.
- You still maintain a native, dual-stack backbone.
- Simplifies your core network even further.

Watch Out For

- For IOS XR, run 6.0.1 as a minimum, or later.
- Prior to this version, dual-stack TLV’s are not supported.
- If the LDP neighbor ran dual-stack TLV’s, LDP sessions won’t form.
- It would be either IPv4, or IPv6, but not both.

Q&A

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