AusNOG 2019 *MPLS/SR deployment experiences in Australia and SRv6 deployment learnings from Japan*

Aleksandr Karavanin - Cisco

Technology Overview

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Focus - Network Simplification

| | Existing | Existing | Next Gen |
|-----------------------|----------|--------------|----------------------------|
| Technology Arch. | IP/MPLS | Unified MPLS | Segment Routing |
| Provisioning | | | NETCONF, YANG |
| Programmability | | | Path Control Element (PCE) |
| Services (L2/L3 VPN | LDP BGP | LDP BGP | BGP |
| Scaling Mechanism | | BGP-LU | |
| TE, FRR | RSVP | RSVP | Segment Pouting |
| Overlay Protocol | LDP | LDP | Segment Kouting |
| Connectivity Protocol | IGP | IGP | |

Segment Routing

- Ingress node imposes the sequence of instructions that encodes the desired path (the list of segments) in the packet header
 - Rest of the network executes the instructions in the packet's header
- The list of segments is specified in a policy: an SR Policy
- A SID list is represented as <S1, S2, ... Sn> where S1 is the first SID

SR - Two dataplane instantiations



Segment Routing

MPLS

- leverage the mature MPLS HW with only SW upgrade
- 1 segment = 1 label
- a segment list = a label stack

IPv6

- leverages RFC8200 provision for source routing extension header
 - 1 segment = 1 address
 - a segment list = an address list in the SRH

IPv6 adoption is a reality



% Web pages available over IPv6

uluilu cisco Source: 6lab.cisco.com – World maps – Web content

Global IPv6 traffic grew 243% in 2015

Globally IPv6 traffic will grow 16-fold from 2015 to 2020

IPv6 will be 34% of total Internet traffic in 2020

SRv6 – Segment Routing & IPv6

SR for anything else

IPv6 for reachability

- Simplicity
 - Protocol elimination
- SLA
 - FRR and TE
- Overlay
- NFV
- SDN
 - SR is de-facto SDN architecture
- 5G Slicing

SR/SRv6 Adoption in the region

MPLS/SR Typical deployment for NBN RSPs

- MPLS/SR + PWHE (EVPN) to BNG
 - SR underlay

- Dual Stack IPv4/v6 IPoE/PPPoE
- Growth of IPv6 only demand

• BGP Control Plane



Australian broadband: Public IPv4 clients over IPv6 - MAP-T



https://tools.ietf.org/html/rfc7599

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SRv6 DC use case by LINE

https://www.janog.gr.jp/meeting/janog43/application/files/7915/4823/1858/janog43-line-kobayashi.pdf





SRv6 DCI use case by Rakuten

https://www.janog.gr.jp/meeting/janog43/application/files/1515/4837/9199/janog43-wbdci-fujii.pdf

DCI mid/long term roadmap



http://imcreator.com/free/transportation/the-endless-roa

Softbank 5G vision

SRv6 for "Network Slicing" and "Edge Computing"



https://www.softbank.jp/corp/news/press/sbkk/2019/20190424_03/

SR DEMO

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Conclusion

SRv6 is getting momentum!



Simple, scalable, flexible

Unified Data Plane with Network Programmability



Numberous use-cases: FRR, TE, SDN, NFV