SR: simple & complete IP solution

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Acknowledgement

- Pablo Camarillo

SR: a simple and complete solution

✓ Scale

✓ High Availability

✓ VPN

✓ Ultra-Low Latency

✓ OAM and Performance Monitoring
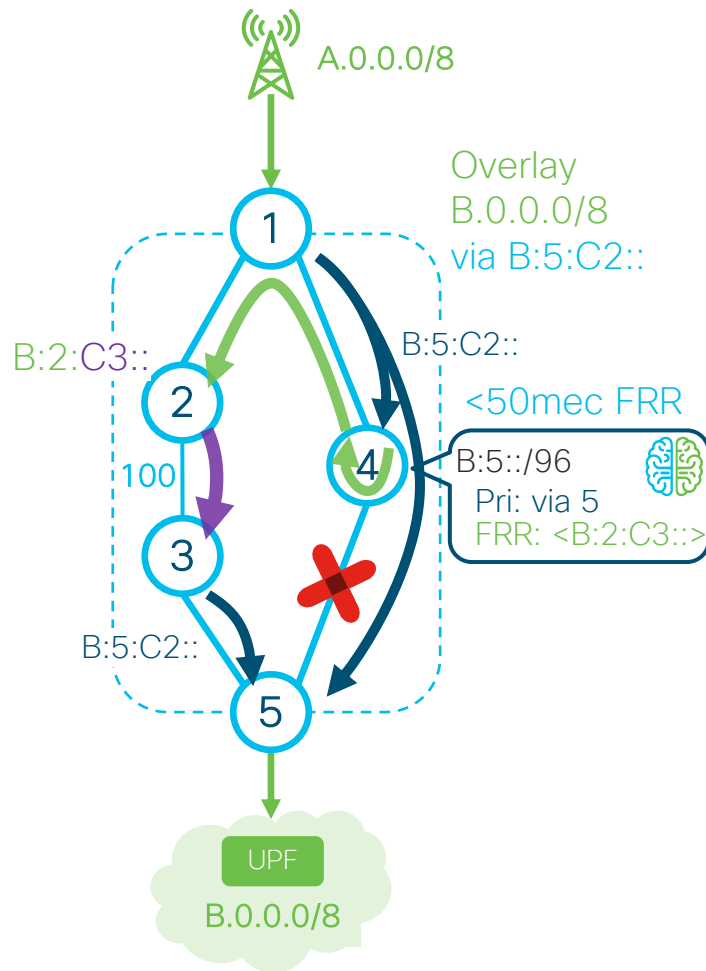
✓ DC / VNF

Scale

- SRv6 leverages
  - IPv6 Address Space
  - IPv6 Summarization

- The policy is in the SRH not in the network
  - No reclassification at domain boundaries
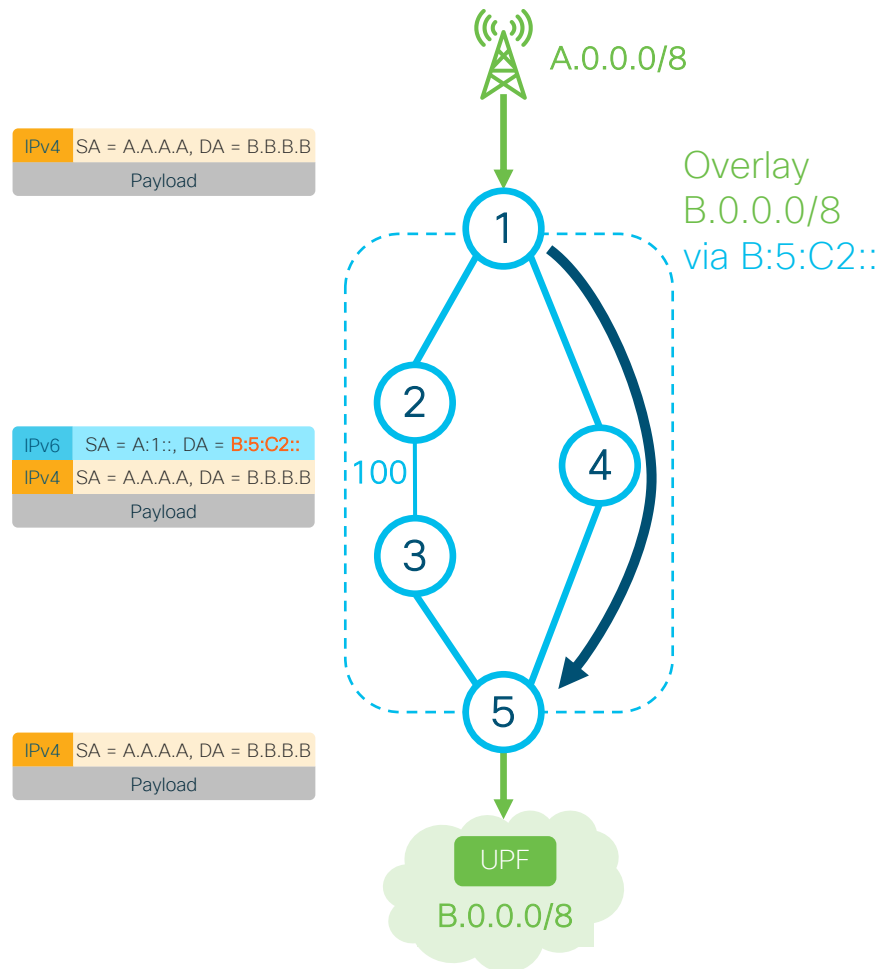 - Metadata for NFV in SRH
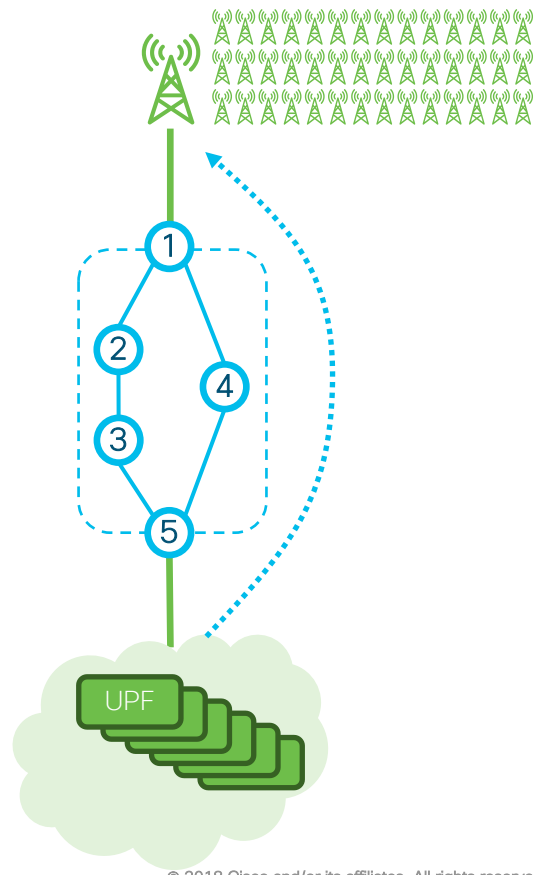
High Availability – TILFA

- 50msec Protection

- Link, node or SRLG failure

- Automated hence Simple

- Per-Destination Optimum backup path

- Incremental deployment
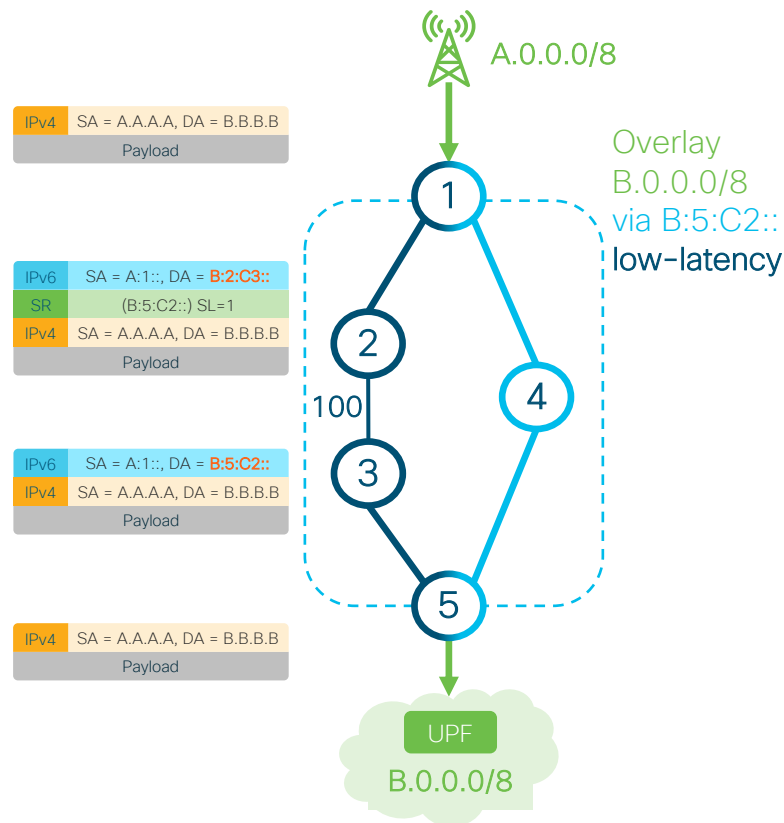
- Distributed and Automated Intelligence

A.0.0.0/8

Overlay
B.0.0.0/8
via B:5:C2::

B:2:C3::

B:5:C2::

<50mec FRR

B:5::/96
Pri: via 5
FRR: <B:2:C3::>

100

B:5:C2::

UPF

B.0.0.0/8

VPN

- Automated
  - No tunnel to configure

- Simple
  - Protocol elimination

- Efficient
  - SRv6 for everything
    > END.DT/DX behaviors

A.0.0.0/8

IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

Overlay
B.0.0.0/8
via B:5:C2::

1

2

4

100

3

IPv6	SA = A:1::, DA = B:5:C2::
IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

5

IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

UPF

B.0.0.0/8

SLA: On-Demand Policy and Automated Steering

- Automated SR TE policy triggered by SLA color of BGP route
  - No RSVP, no tunnel

- Automated Steering
  - No PBR steering complexity

- Inter-domain calculated by SR PCE

- SR native algorithms

A.0.0.0/8

IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

Overlay
B.0.0.0/8
via B:5:C2::
low-latency

IPv6	SA = A:1::, DA = B:2:C3::
SR	(B:5:C2::) SL=1
IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

100

IPv6	SA = A:1::, DA = B:5:C2::
IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

| IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

UPF
B.0.0.0/8

SLA: IGP Flex-Algo

- Per-SLA slices

- Operator customizes its own IGP algorithm
  - Algo 0: lowest cost any plane
  - Algo 128: lowest latency
  - Algo 131: lowest cost only via plane1
  - Algo 132: lowest cost only via plane2

- TI-LFA is applicable within each algorithm

- Seamless integration with ODN/AS and Inter-Domain SRTE/PCE

- Smaller SID list

Low-Cost vs Low-Latency
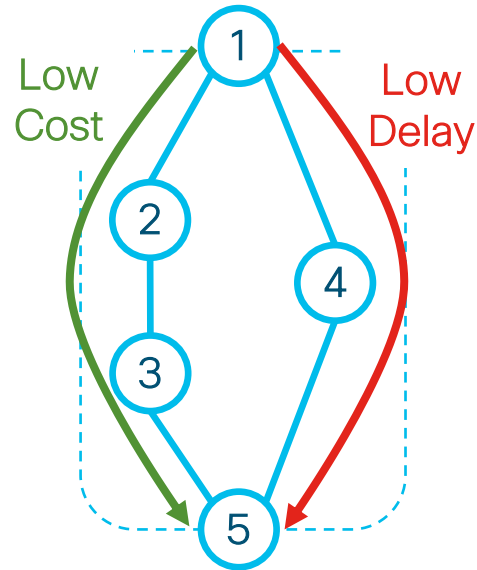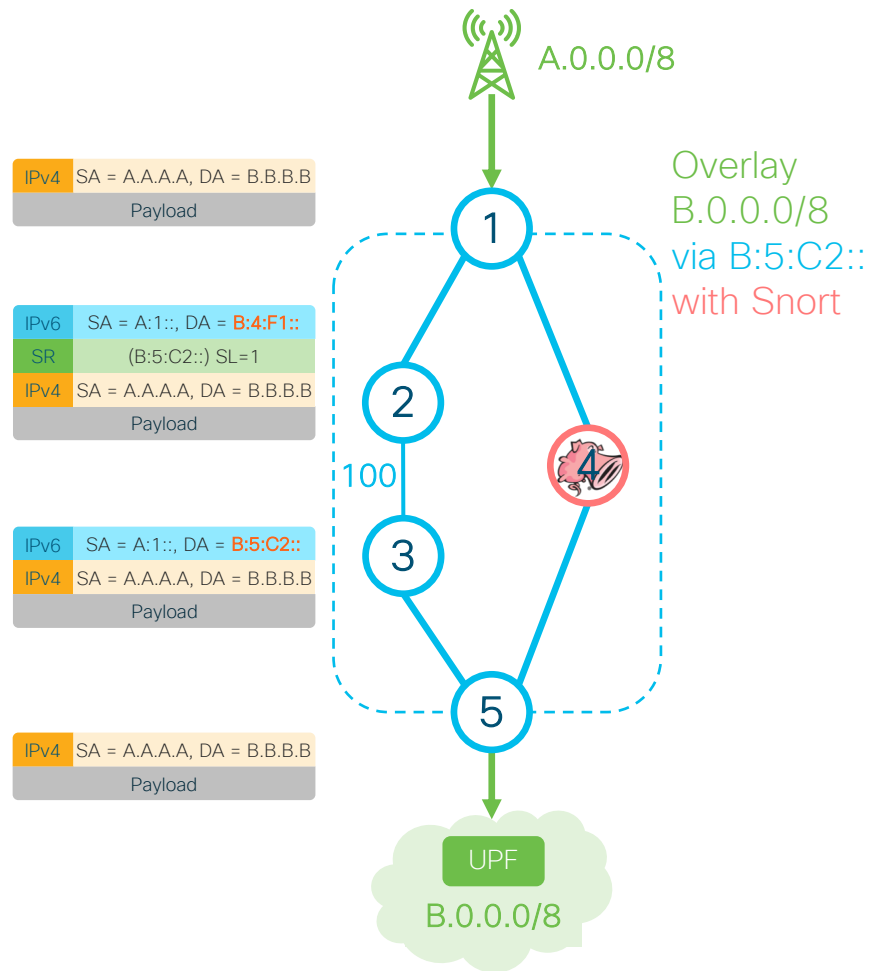
Any Plane vs Left Plane vs Right Plane
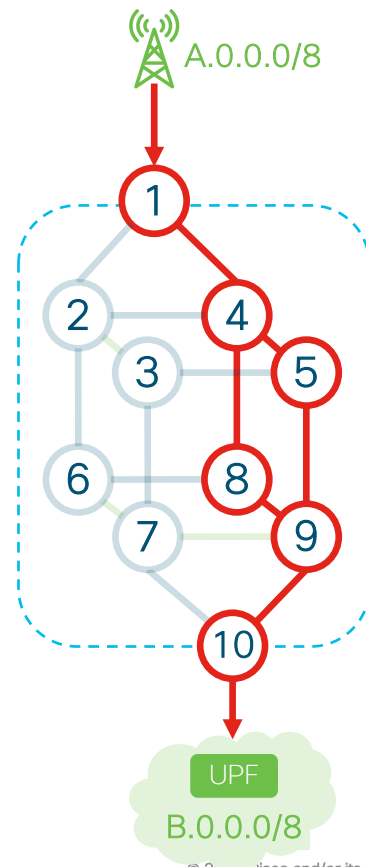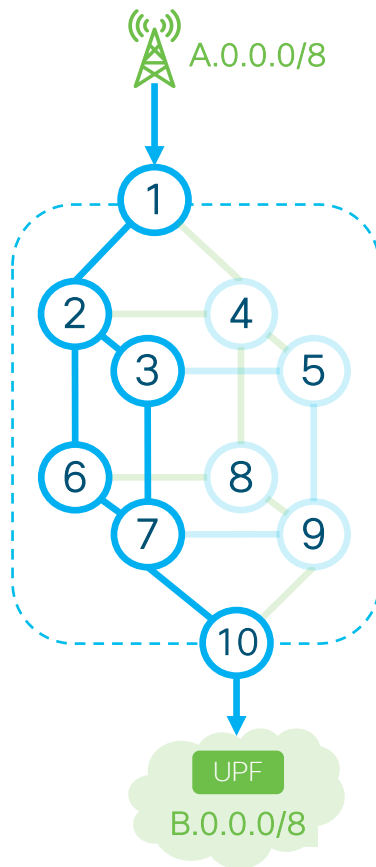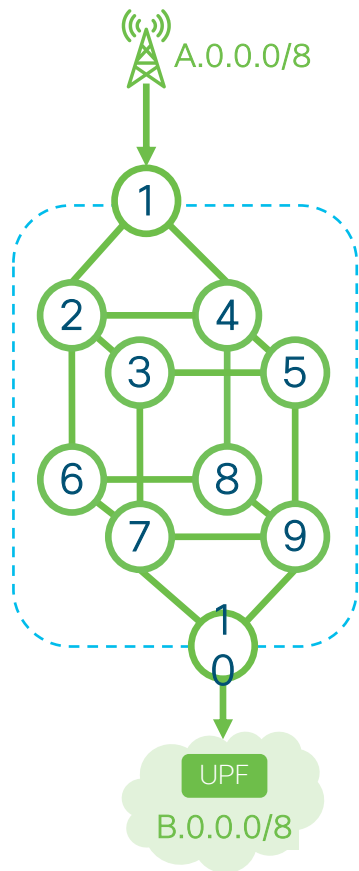
OAM and Performance Monitoring

- OAM
  - Ping/traceroute with ECMP support
  - SID validation
  - DPM

- Performance Monitoring
  - One-way Per-Link Latency/Loss
  - One-way Per-Policy Liveness/Latency/Loss

DC and VNF

- Integrate VNFs in a stateless fabric
  - Distributed or Core DC
  - GiLAN
  - MEC

- Just another type of segment

- Seamless Metadata

- Seamless integration with VPN and TE

- SR-aware Network Functions
  - Open-source Snort, iptables, nftables
  - Leverage native SRv6 support in Linux

A.0.0.0/8

Overlay
B.0.0.0/8
via B:5:C2::
with Snort

| IPv4 | SA = A.A.A.A, DA = B.B.B.B |
| Payload | |

IPv6	SA = A:1::, DA = B:4:F1::
SR	(B:5:C2::) SL=1
IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

IPv6	SA = A:1::, DA = B:5:C2::
IPv4	SA = A.A.A.A, DA = B.B.B.B
Payload	

| IPv4 | SA = A.A.A.A, DA = B.B.B.B |
| Payload | |

100

UPF

B.0.0.0/8

Conclusion

SR – Integrated End-to-End Solution

- Scale

- High-Availability

- Automated Inter-Domain SLA with Seamless Slicing

- OAM and Performance Monitoring

- VPN

- DC, VNF, metadata

Simplicity always prevails

Industry at large backs up SR

Strong customer adoption
WEB, SP, DC, Metro, Enterprise

De-facto SDN Architecture

Standardization
IETF

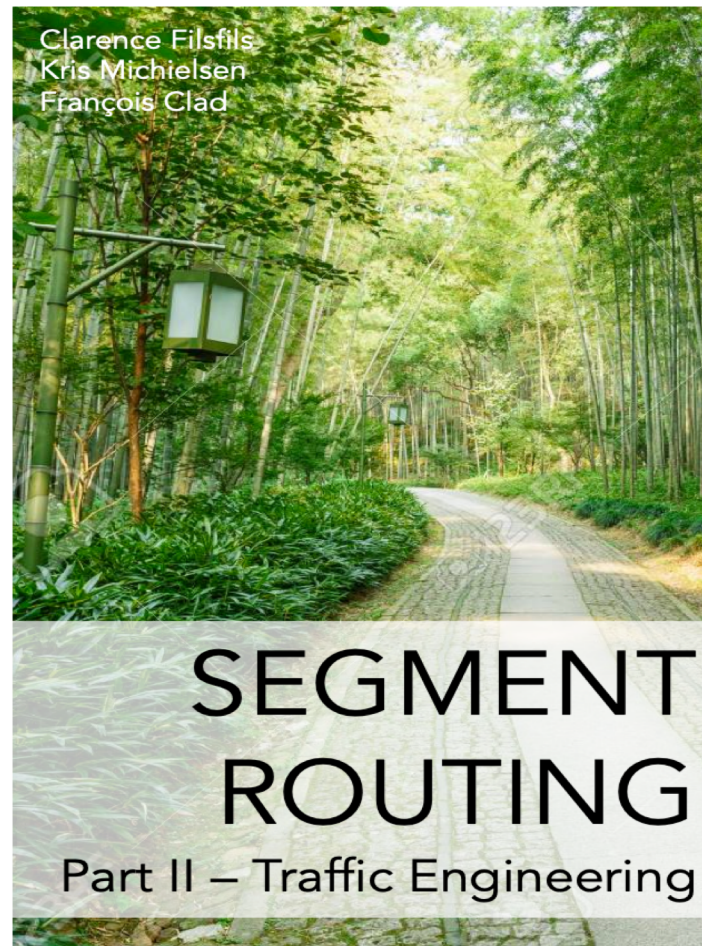**Multi-vendor Consensus**

Open Source
Linux, VPP

SRv6 Status

- Strong Lead Operator team

- Comprehensive IETF definition

- Open-Source: linux and VPP

- Inter-Operability: barefoot, unistarcom…

- VPN and TILFA FCS ☺

- Deployments ☺

SR Book

- Part2 is available!

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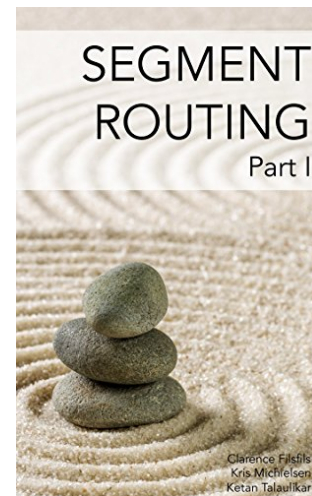
Thank you!

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