

Segment Routing for Service Chaining

draft-dawra-idr-bgp-sr-service-chaining-00
draft-clad-spring-segment-routing-service-chaining-00

Merged Authors List :

Gaurav Dawra, Cisco Systems
Clarence Filsfils, Cisco Systems
Francois Clad, Cisco Systems
Jim Uttaro, Chaitanya Y, AT&T
Pablo Camarilo, Cisco Systems
Daniel Bernier, Bell Canada
Bruno Decraene, Orange
Xiaoahu Xu, Huawei
Stefano Salsano, University of Roma

Presenter :

Gaurav Dawra

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Singapore, Singapore



MUST READ !!!!!!!

draft-filsfils-spring-srv6-network-programming

Also Read

draft-ietf-6man-segment-routing-header

draft-dawra-idr-bgpls-srv6-ext



Agenda

- Problem
- Solution



What we want to do

- Enable Service Chaining based on Segment routing over MPLS/IPv6 Dataplane
- Discover Services and associated SIDs
- Enable Flexible, Scalable Service Chaining Solution.



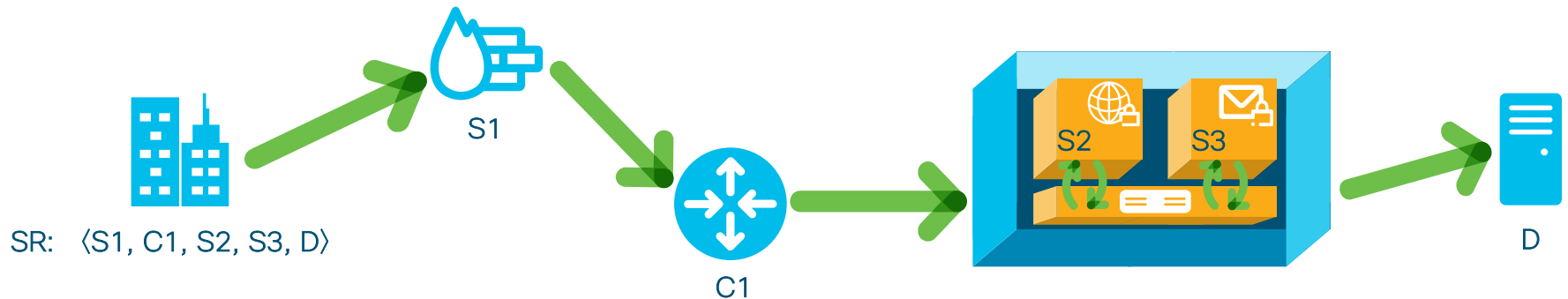
Agenda

- Problem
- Solution



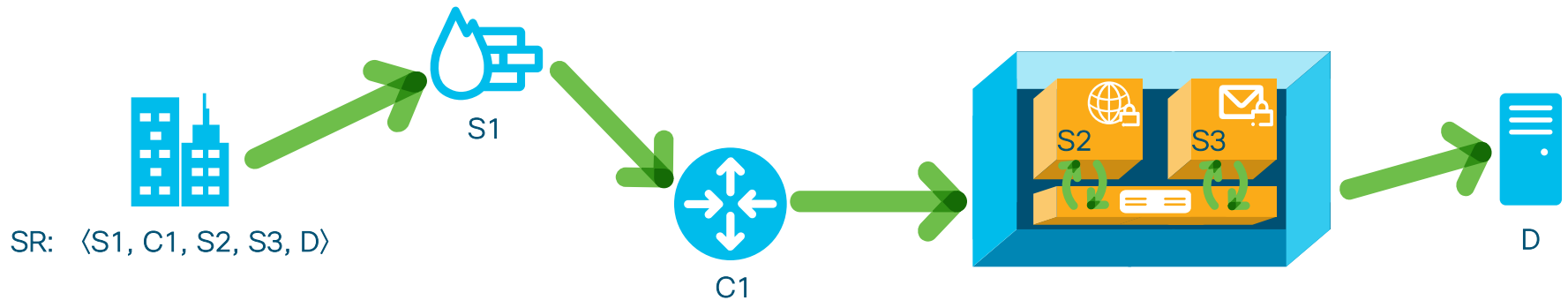
Service Functions

- SR-Aware: Service is bound to an SR endpoint function
 - **Processes all the traffic** headed to the service SID
- SR-Unaware: Service is not able to process SR traffic
 - Requires an SR proxy to operate properly
- **Services** are expressed with **segments**
 - Flexible
 - Scalable
 - Stateless



SR proxies

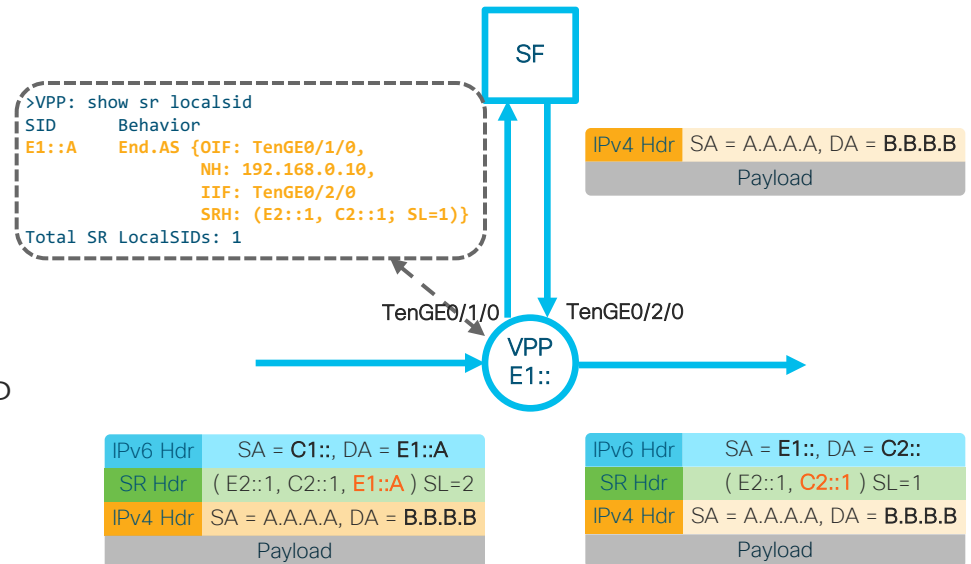
- SR endpoint behaviors realizing the SR processing on behalf of an SR-unaware SF
 - Static proxy
 - Dynamic proxy
 - Shared-memory proxy
 - Masquerading proxy



Static proxy

Statically configured SR information on the proxy.

- Ingress (SR-MPLS or SRv6 endpoint):
 - Active SID is E1::A where function 0xA is associated with End.AS behavior
 - Pop outer IP and ext. headers
 - Forward to SF on OIF (with Eth addr of NH)
- Egress (inbound policy on IIF):
 - Encapsulation with configured IP and SR headers
 - Forward based on next segment



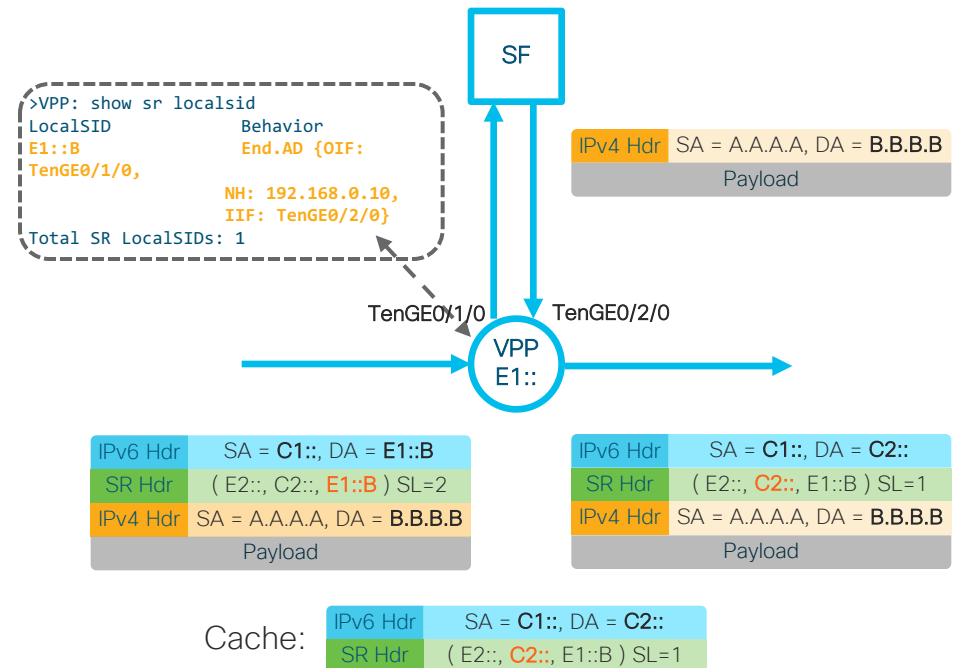
- Inner header can be IPv4, IPv6 or Ethernet
- Per-chain static configuration
- Provides similar functionality as current solutions



Dynamic proxy

Store encapsulation headers in a **local cache** on the proxy.

- Ingress (SR-MPLS or SRv6 endpoint):
 - Active SID is E1::B where function 0xB is associated with End.AD
 - Forward to SF on OIF (with Eth addr of NH)
- Egress (inbound policy on IIF):
 - Restore encapsulation (IP + ext. headers)
 - Forward based on next segment



- Inner header can be IPv4, IPv6 or Ethernet
- Per-chain dynamic configuration



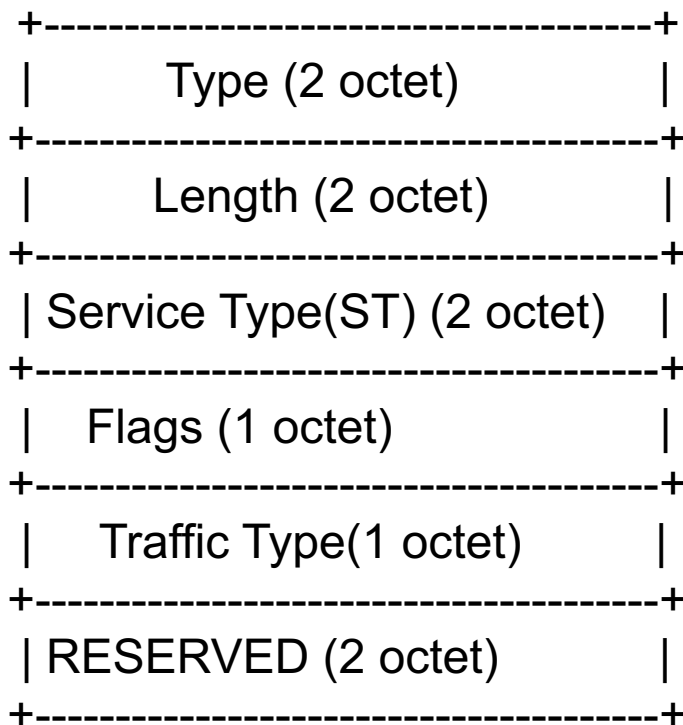
Proposed BGP Extensions

- Extend SR BGP-LS to discover Services
- Proposed BGP-LS Sub-TLVs to encode Service Information



Service Chaining Attribute Sub-TLV

- Separate BGP-LS SAFI 71 or SAFI 72 advertisement for each attached Service



Type:

TBD

Length

Length of Sub-TLV

Service Type:

Registry Service Table Type(STT)

Flags:

Future

Traffic Type: (OR operation)

Bit 0: IPv4

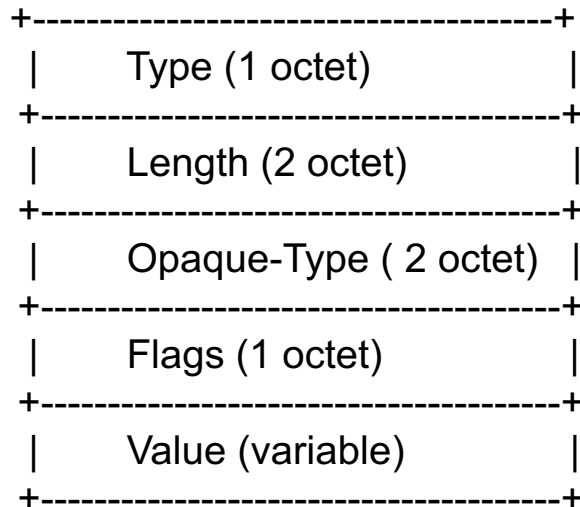
Bit 1: IPv6

Bit 2: L2/Ethernet



Opaque METADATA Sub-TLV

- This TLV is used to encode opaque data such as:
 - Vendor specific (brand, version)
 - Extra Information
- Publisher/Consumer understand Opaque-Type and data encoded



Type:

IANA code type

Length:

Length of the Sub-TLV

Opaque Type:

TBD

Flags:

Flags for opaque data behavior

Value: (Variable)

Meta Data value



Implementation Status

- Proxy functions on open-source software
 - Linux
 - FD.io VPP
- Static proxy on Cisco hardware
- SR-aware open-source services (soon)



Draft: Next Steps

- Seeking WG input and feedback
- Suggestions/comments are welcome!!

