

IETF Hackathon - BGP-LS Extensions for SRv6 Service Chaining

**IETF 122
15–16 March 2025
Bangkok, Thailand
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Hackathon Plan

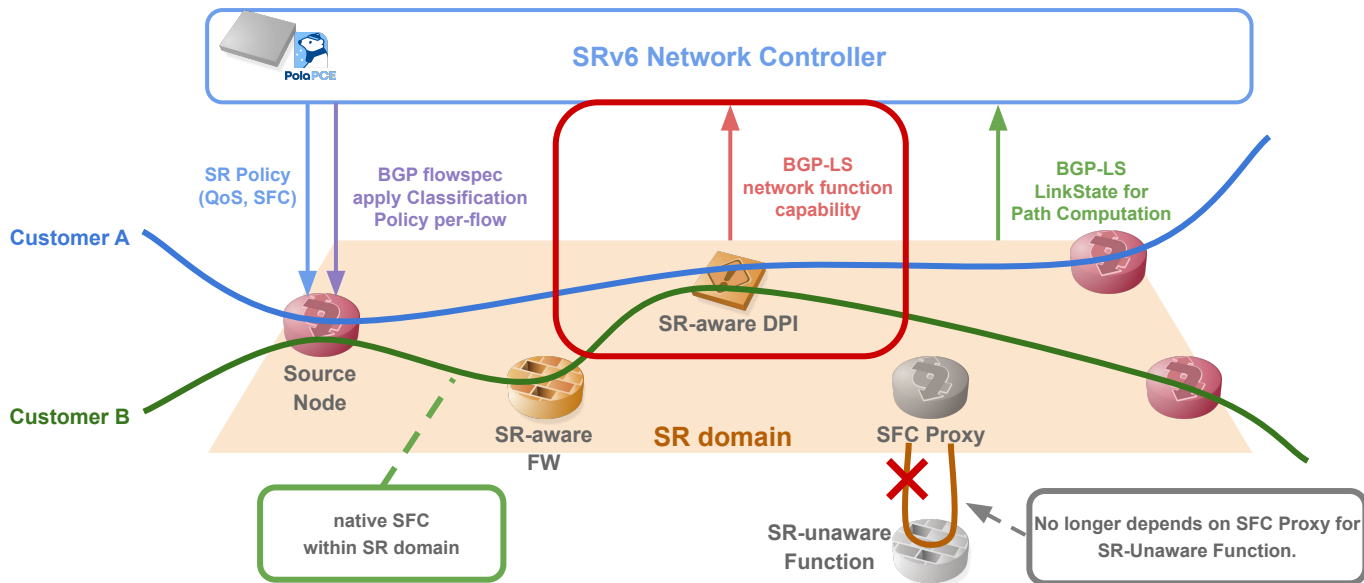
Objective: Comprehensive management of SRv6 SFC using a controller.

- **BGP-LS extensions for SRv6 SFC Architecture**
 - BGP-LS Advertisement of Segment Routing Service Segments
([draft-ietf-idr-bgp-ls-sr-service-segments](#))
- **Hackathon Goal: Implement BGP-LS extensions in the following OSS.**
 - Implement TLVs to [GoBGP](#) and [ExaBGP](#)
 - Implement [Wireshark](#) dissectors
 - Interoperability testing

SRv6 SFC Architecture

The concept that controller manages the entire SRv6 SFC network.

The controller collects information about Service Segments and apply SR Policy based on the information about available Network Functions.



BGP-LS Service Segment

Using Service Segment, SRv6 controller will be able to get Network Function status for service-based Traffic Engineering.

I-D: <https://datatracker.ietf.org/doc/draft-ietf-idr-bgp-ls-sr-service-segments/>

Type (2 octet)
Length (2 octet)
Service Type (ST) (2 octet)
Flags (1 octet)
Traffic Type (1 octet)
RESERVED (2 octet)

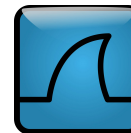
Service Chaining (SC) TLV

Type (2 octet)
Length (2 octet)
Opaque Type (2 octet)
Flags (1 octet)
Value (variable)

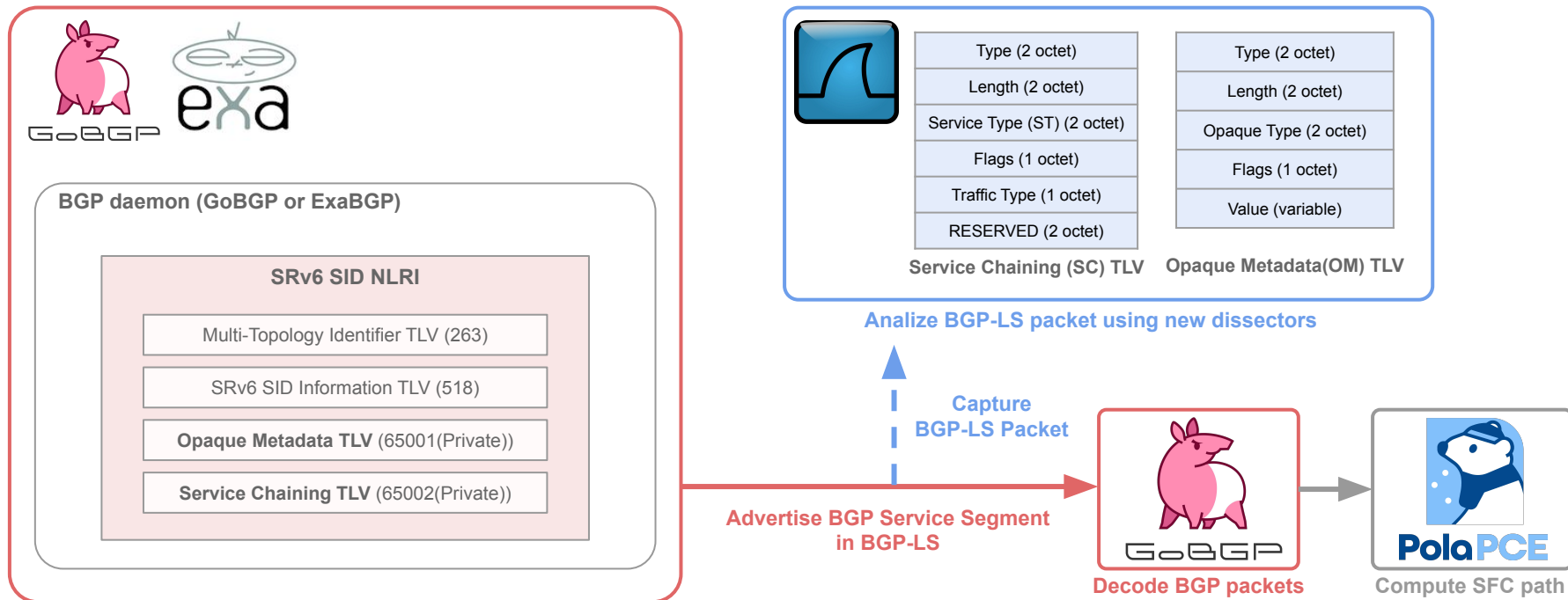
Opaque Metadata(OM) TLV

Implementations (1/3)

- **GoBGP** (<https://github.com/osrg/gobgp>)
 - OSS BGP daemon written in Go
 - Add support related in BGP-LS SRv6 Architecture
- **ExaBGP** (<https://github.com/Exa-Networks/exabgp>)
 - OSS BGP daemon written in Python
 - Add support related in BGP-LS SRv6 Architecture
- **Wireshark** (<https://www.wireshark.org/>)
 - OSS network protocol analyzer
 - Add dissector for PCEP color TLV (draft-ietf-pce-pcep-color)
- **Pola PCE** (<https://nttcom.github.io/pola/>)
 - OSS Path Computation Element written by NTT Com
 - Manage SR policies, including the SFC chain



Implementations (2/2)



Result

```

  Network Layer Reachability Information (NLRI)
    BGP-LS NLRI
      NLRI Type: SRv6 SID NLRI (6)
      NLRI Length: 97
    Link-State NLRI SRv6 SID NLRI
      Protocol ID: BGP (7)
      Identifier: L3 packet topology (0)
    Local Node Descriptors TLV
      Type: 256
      Length: 32
      > Autonomous System TLV
      > BGP-LS Identifier TLV
      > BGP Router-ID TLV
      > BGP Confederation Member TLV
    SRv6 SID Descriptors TLV
      > SRv6 SID Information TLV
      > Multi Topology ID TLV
    Service Chaining TLV
      Type: 65000
      Length: 6
      Service Type: Firewall (33)
    Flags: 0x00
      0... .... = IPv4 Capable flag: Not set
      .0.. .... = IPv6 Capable flag: Not set
      ..0. .... = Ethernet Capable flag: Not set
      ...0 0000 = Reserved: 0x00
      Traffic Type: 3
      Reserved: 0x00
    Opaque Metadata TLV
      Type: 65001
      Length: 12
      Opaque Type: 1
      > Opaque Flag: 0x00
      Opaque Value: 70726f666696c653100

```

What got done

- **GoBGP**
 - **COMPLETED:** SC TLV
 - **COMPLETED:** OM TLV
 - **COMPLETED:** SRv6 SID NLRI
- **ExaBGP**
 - **COMPLETED:** SC TLV
 - **COMPLETED:** OM TLV
 - **COMPLETED:** SRv6 SID NLRI
- **Wireshark**
 - **COMPLETED:** dissectors for parsing SC TLV and OM TLV.

Our Code

- **GoBGP**: <https://github.com/watal/gobgp>
- **ExaBGP**: <https://github.com/yagipy/exabgp>
- **Wireshark Dissector**: <https://gitlab.com/watal/wireshark>

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This work was partially supported by JST, CRONOS, Japan Grant Number JPMJCS24N9.