SRv6 SFC Architecture with SR-aware Functions

draft-watal-spring-srv6-sfc-sr-aware-functions-02

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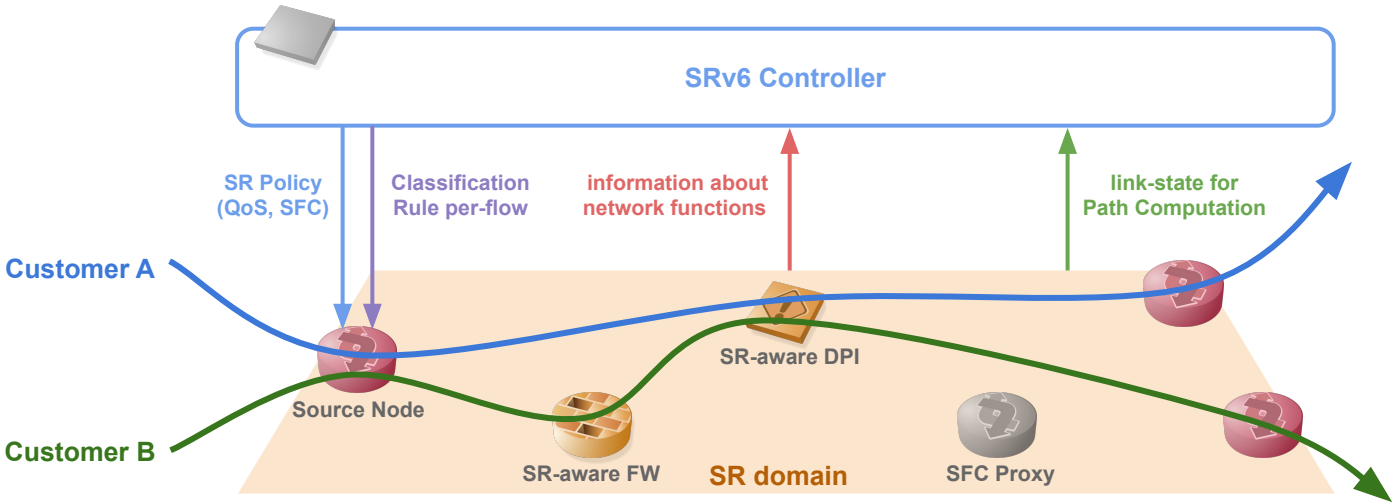
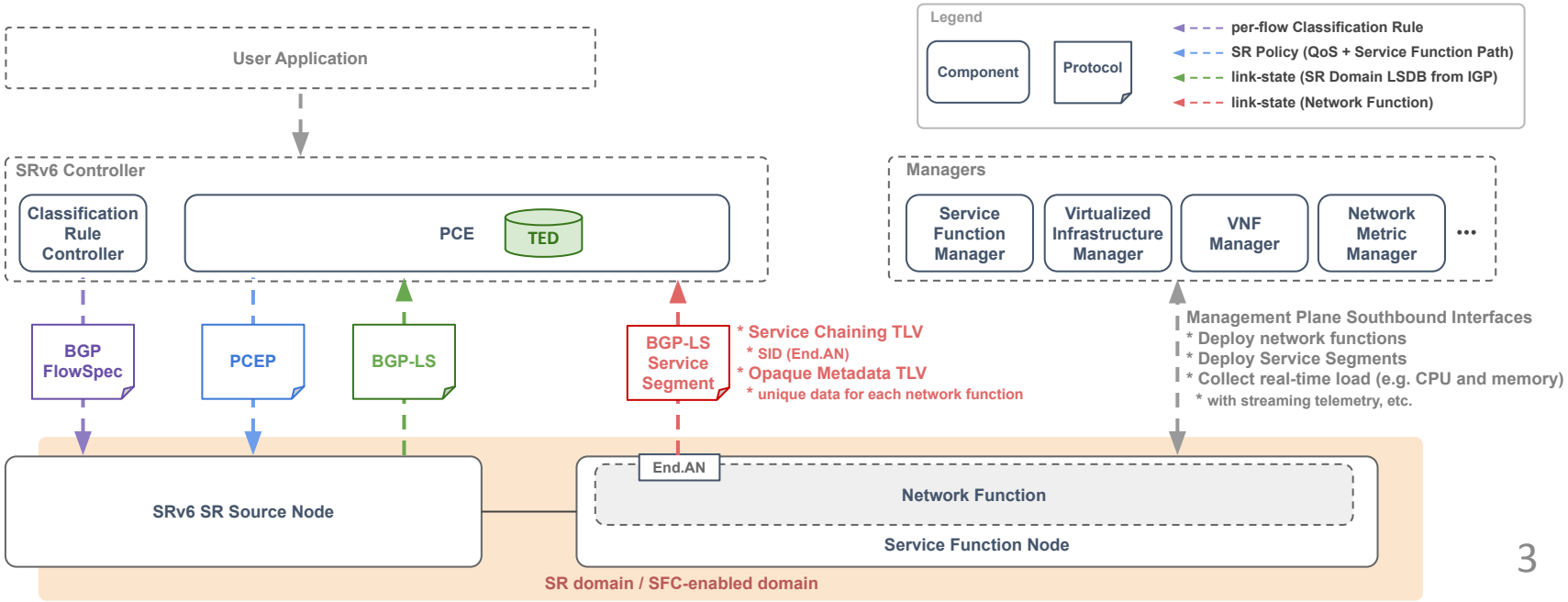
Motivation

- **Provide Comprehensive Management and Simplicity for SRv6 SFC**
  - **Comprehensive Management**: A centralized controller for SFC handles SR policies, link-state, and network metrics
    - **Applies SR policies (QoS, SFC) with PCEP**
    - **Binds specific flows to SR policies with BGP Flowspec**
    - **Collects information about network functions with BGP-LS extensions**
    - **Collects link-state data for path computation with BGP-LS**
  - **Simplicity**: No SFC proxies, reducing the number of nodes and address resource consumption



Protocols in SRv6 SFC Architecture

- **BGP Flowspec with SR Policy extension: Classifies the target flows** at the SR source node
- **PCEP / BGP SR Policy: Establishes service function chains** at the SR source node
- **BGP-LS:** Collects link-state information from the SR domain for **SR policy computation**
- **BGP-LS Service Segment extension: Collects information about network functions** at the SR segment endpoint
  - A PCE receives **link-state and service SIDs (End.AN)** with **BGP-LS** and computes segment lists that meet both QoS and SFC requirements



Updates in Ver. 02

- **We have revised the Service Function Manager**
  - After VNF Manager sets up a network function, the Service Function Manager deploys a Service Segment
  - PCE retrieves Service Segment information from Service Function Nodes with the BGP-LS Service Segment extension, instead of the Service Function Manager

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7.1.  Service Function Manager

   Service Function Manager enables and disables service segments of
   service function nodes.  To manage service segments, it utilizes the
   extensions provided in a BGP-LS service segment, as outlined in
   [I-D.draft-ietf-idr-bgp-ls-sr-service-segments] and TODO: draft-
   watal-idr-bgp-ls-sr-service-segments-enabler, and defines the
   following parameters:

   *  Behavior: End.AN

   *  SID: the SID of End.AN (in IPv6 Address format).  Service segments
      that support slicing are specified here as Flex-Algo SIDs.

   *  Function Name: type of network function

   *  Action: enable

   *  TLV:

      -  Specification of the Anycast Group: when deploying multiple
         Network Functions within the same context, it MUST use the
         Anycast Group TLV to specify the same anycast group SID.

      -  Allows for the specification of unique parameters and context
         associated with a particular network function.
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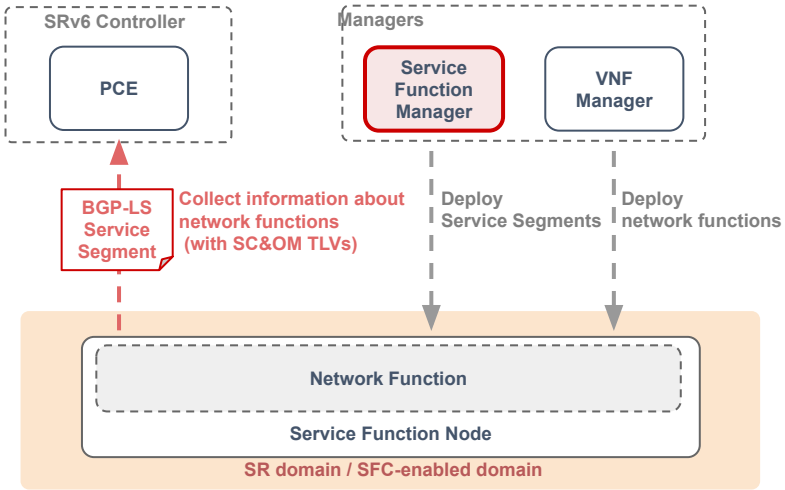
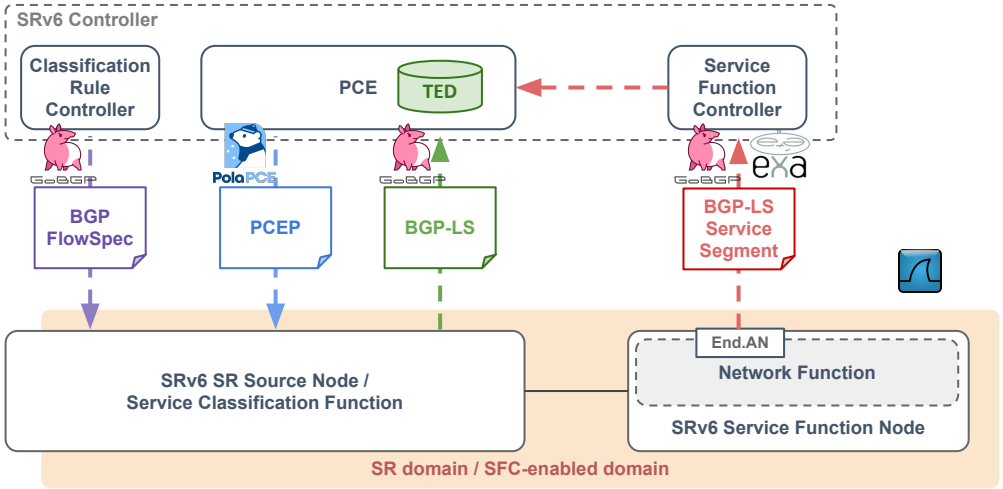


https://author-tools.ietf.org/iddiff?url1=draft-watal-spring-srv6-sfc-sr-aware-functions-01&url2=draft-watal-spring-srv6-sfc-sr-aware-functions-02&difftype=--html

Implementations in This Hackathon

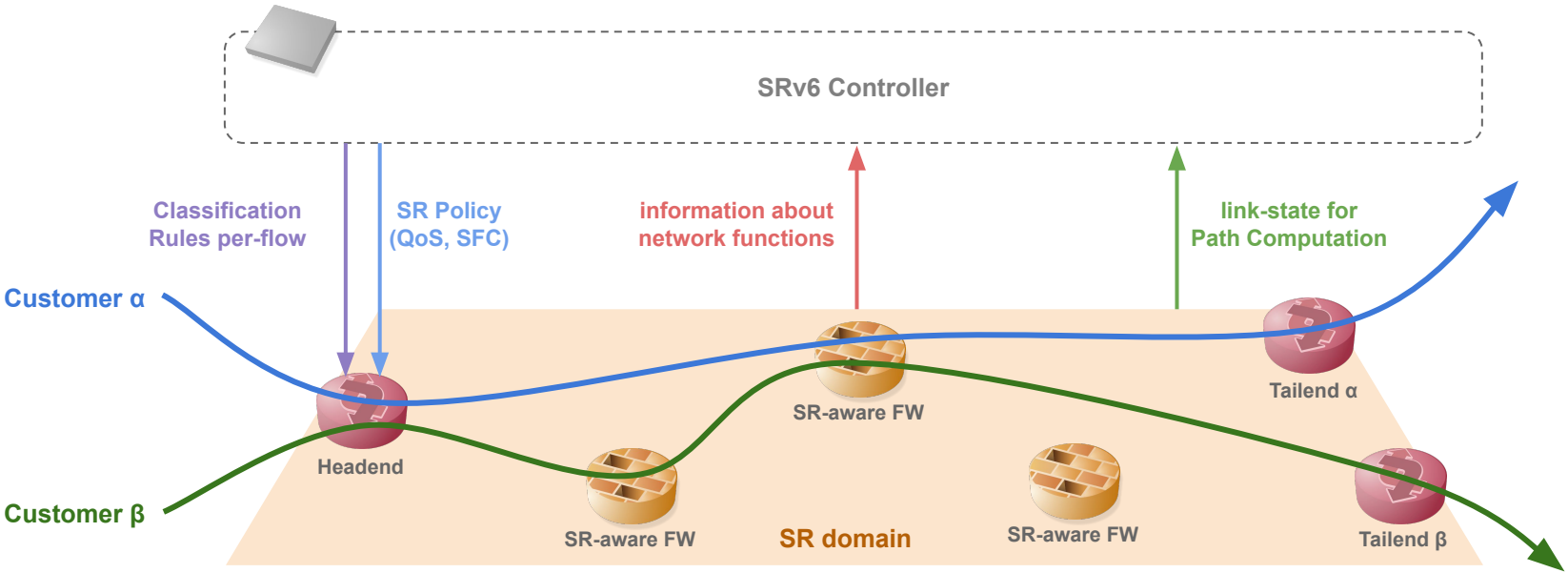
We have implemented the following protocols:

- BGP-LS Advertisement of Segment Routing Service Segments
  - IETF Hackathon - BGP-LS Extensions for SRv6 Service Chaining
    - I-D: BGP-LS SR Service Segments
- BGP Flowspec with SR Policy & PCEP
  - IETF Hackathon - Traffic Steering using BGP FlowSpec with SR Policy
    - I-D: BGP FlowSpec SRv6 Policy
    - I-D: PCEP Color Extensions



Our Use Cases: Redundant Firewall

We aim to implement firewalls at the midpoint to control traffic from multiple customers.



Next Steps

- Welcome your feedback to improve this document.
- Feel free to join our work!

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