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Export of MPLS Segment Routing Label Type Information in
IP Flow Information Export (IPFIX)
draft-tgraf-ipfix-mpls-sr-label-type-03

Abstract

This document introduces additional code points in the Information Element `mplsTopLabelType` for IS-IS, OSPFv2, OSPFv3 MPLS Segment Routing (SR) extensions and a new SID type element to enable Segment Routing label and segment type information in IP Flow Information Export (IPFIX).

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14 RFC 2119 \[RFC2119\]](#) [RFC 8174 \[RFC8174\]](#) when, and only when, they appear in all capitals, as shown here.

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[1.](#) Introduction

Besides existing MPLS control plane protocols such as BGP-4 [[RFC8277](#)], LDP [[RFC5036](#)] and BGP VPN [[RFC4364](#)], three new routing-protocols, OSPFv2 Extensions [[RFC8665](#)], OSPFv3 Extensions [[RFC8666](#)] and IS-IS Extensions [[RFC8667](#)] had been added to propagate Segment Routing labels for the MPLS dataplane [[RFC8660](#)].

Traffic Accounting in Segment Routing Networks [[I-D.ali-spring-sr-traffic-accounting](#)] describes how IPFIX can be leveraged to account traffic to MPLS-SR label dimensions within a Segment Routing domain.

In the Information Model for IP Flow Information Export IPFIX [[RFC5102](#)], the information element #46 mplsTopLabelType describes which MPLS control plane protocol allocated the top-of-stack label in the MPLS label stack. [RFC 7012 section 7.2](#) [[RFC7012](#)] describes the IANA Information Element #46 SubRegistry [[IANA-IPFIX-IE46](#)] where new code points should be added.

[2.](#) MPLS Segment Routing Top Label Type

By introducing three new code points to information element #46 mplsTopLabelType for IS-IS, OSPFv2 and OSPFv3, when Segment Routing with one of these three routing protocols is deployed, we get insight into which traffic is being forwarded based on which MPLS control plane protocol.

A typical use case scenario is to monitor MPLS control plane migrations from LDP to IS-IS or OSPF. By looking at the label value itself, it is not always clear as to which label protocol it belongs, since they could potentially share the same label allocation range. This is the case for IGP-Adjacency SID's and LDP as an example.

3. Segment Routing Segment Identifier Type

By introducing a new information element called SrSidType, which contains the Segment Routing Segment Identifier type according to Segment Routing Architecture [[RFC8402](#)], we get the intended Segment Routing forwarding behaviour in the forwarding plane.

A typical use case scenario is to monitor the forwarding behaviour when Topology Independent Fast Reroute [[I-D.ietf-rtgwg-segment-routing-ti-lfa](#)] or micro loop avoidance [[I-D.bashandy-rtgwg-segment-routing-uloop](#)] tunnel traffic with IGP-Adjacency Segment SID's or when ECMP load balancing should occur with Anycast-SID's.

4. IANA Considerations

This document specifies three additional code points for IS-IS, OSPFv2 and OSPFv3 Segment Routing extension in the existing sub-registry "IPFIX MPLS label type (Value 46)" of the "IPFIX Information Elements" and one new "IPFIX Information Element" with a new sub-registry in the "IP Flow Information Export (IPFIX) Entities" name space.

Value	Description	Reference
TBD1	OSPFv2 Segment Routing	RFC8665
TBD2	OSPFv3 Segment Routing	RFC8666

Figure 1: Updates to "IPFIX Information Element #46" SubRegistry

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ElementID	Name	Abstract Data Type	Data Type Semantics	Description	Reference
TBD4	SrSidType	unsigned8	identifier	This field identifies the Segment Routing Identifier Type of the top-of-stack. SID types for this field are listed in the SR SID type registry.	RFC8402

Figure 2: New "IPFIX Information Element #TBD4"

Value	Description	Reference
TBD5	Prefix-SID	RFC8402
TBD6	Node-SID	RFC8402
TBD7	Anycast-SID	RFC8402
TBD8	Adjacency-SID	RFC8402

TBD9	PeerNode-SID	RFC8402
TBD10	PeerAdj-SID	RFC8402
TBD11	PeerSet-SID	RFC8402

Figure 3: New "IPFIX Information Element #TBD4" SubRegistry

5. Security Considerations

The same security considerations apply as for the IPFIX Protocol [RFC7012](#) [[RFC7012](#)].

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6. Acknowledgements

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