

Export of MPLS Segment Routing Label Type Information in
IP Flow Information Export (IPFIX)
draft-ietf-opsawg-ipfix-mpls-sr-label-type-01

Abstract

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

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1. Introduction

Besides BGP-4 [[RFC8277](#)], LDP [[RFC5036](#)] and BGP VPN [[RFC4364](#)], four new routing-protocols, OSPFv2 Extensions [[RFC8665](#)], OSPFv3 Extensions [[RFC8666](#)], IS-IS Extensions [[RFC8667](#)] and BGP Prefix-SID [[RFC8669](#)] have been added to the list of routing-protocols able to propagate Segment Routing labels for the MPLS data plane [[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 Segment Routing label dimensions within a Segment Routing domain.

In the Information Model for IP Flow Information Export IPFIX [[RFC7012](#)], the information element `mplsTopLabelType(46)` 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 "IPFIX MPLS label type (Value 46)" sub-registry [[IANA-IPFIX-IE46](#)] where new code points should be added.

2. MPLS Segment Routing Top Label Type

By introducing four new code points to information element `mplsTopLabelType(46)` for IS-IS, OSPFv2, OSPFv3 and BGP Prefix-SID, when Segment Routing with one of these four 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 Segment Routing. Such a migration can be done node by node as described in [RFC8661](#) [[RFC8661](#)].

Another use case scenario is to monitor MPLS control plane migrations from dynamic BGP labels according to [RFC8277](#) [[RFC8277](#)] to BGP Prefix-

SID according to [RFC8669](#) [[RFC8669](#)] in context of Seamless MPLS SR [[I-D.hegde-spring-mpls-seamless-sr](#)].

Both use cases can be verified by using `mplsTopLabelType(46)`, `mplsTopLabelIPv4Address(47)`, `mplsTopLabelIPv6Address(140)`, `mplsTopLabelStackSection(70)` and `forwardingStatus(89)` dimensions to get insights into

- o how many packets are forwarded or dropped
- o if dropped, for which reasons
- o the MPLS provider edge loopback address and label protocol

By looking at the MPLS 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, LDP and dynamic BGP labels as an example.

3. IANA Considerations

IANA is requested to allocate four code points in the existing sub-registry "IPFIX MPLS label type (Value 46)" of the "IPFIX Information Elements" registry for IS-IS, OSPFv2, OSPFv3 and BGP Prefix-SID Segment Routing extensions.

Value	Description	Reference	Requester
TBD1	OSPFv2 Segment Routing	RFC8665	[RFC-to-be]
TBD2	OSPFv3 Segment Routing	RFC8666	[RFC-to-be]
TBD3	IS-IS Segment Routing	RFC8667	[RFC-to-be]
TBD4	BGP Segment Routing Prefix-SID	RFC8669	[RFC-to-be]

Figure 1: Updates to "IPFIX MPLS label type (Value 46)" SubRegistry

Note to IANA:

- o Please assign TBD1 to 4 to the next available numbers according to the "IPFIX MPLS label type (Value 46)" sub-registry [[IANA-IPFIX-IE46](#)] procedure.
- o Please replace the [RFC-to-be] with the RFC number assigned to this document.

Note to RFC-editor:

- o Please remove above two IANA notes.

4. Operational Considerations

In the information element `mplsTopLabelType(46)`, the BGP code point 4 refers to the label value in `MP_REACH_NLRI` path attribute described in [section 2 of RFC8277 \[RFC8277\]](#), and the BGP Segment Routing Prefix-SID code point TBD4 to the label index value in the Label-Index TLV described in [section 3.1 of RFC8669 \[RFC8669\]](#).

5. Security Considerations

There exists no extra security considerations regarding the allocation of these new IPFIX information elements compared to [RFC7012 \[RFC7012\]](#).

6. Acknowledgements

I would like to thank to the IE doctors, Paul Aitken and Andrew Feren, as well Benoit Claise, Loa Andersson, Tianran Zhou, Pierre Francois, Bruno Decreane, Paolo Lucente, Hannes Gredler, Ketan Talaulikar, Sabrina Tanamal, Erik Auerswald, Sergey Fomin, Mohamed Boucadair and Tom Petch for their review and valuable comments.

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Author's Address

Thomas Graf
Swisscom
Binzring 17
Zurich 8045
Switzerland

Email: thomas.graf@swisscom.com