              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~~ new IP Flow Information Export
   (IPFIX) code points to identify which traffic is being forwarded based on
   which MPLS control plane protocol is in use within a Segment Routing
   domain. In particular, this document defines four ~~in the~~code points for
   the IPFIX
   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], f~~Four
   new routing protocols ~~routing-protocolsextensions~~, OSPFv2 Extensions
[RFC8665], OSPFv3 Extensions
   [RFC8666], IS-IS Extensions [RFC8667], and BGP Prefix-SID [RFC8669]
   have been ~~added to the list of~~defined as ~~routing protocols routing-
protocols~~ that are able to propagate
   Segment Routing labels for the MPLS data plane [RFC8660].

   ~~Traffic Accounting in Segment Routing Networks~~Also,
   [I-D.ali-spring-sr-traffic-accounting] describes how
IP Flow Information Export (IPFIX)
   [RFC7012] ~~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 s~~Section 7.2 of [RFC7012] describes
the
   "IPFIX MPLS label type (Value 46)" sub-registry [IANA-IPFIX-IE46]
   where new code points should be added. This document defines new code
points to address typical use cases that are discussed in Section 2.

2. MPLS Segment Routing Top Label Type

   By introducing four new code points to ~~information element~~the IPFIX
   mplsTopLabelType IE (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~~it is possible to identify which traffic
is being forwarded based
   on which MPLS control plane protocol is in use.

   A typical use case scenario is to monitor MPLS control plane
   migrations from LDP to IS-IS or OSPF Segment Routing. Such a
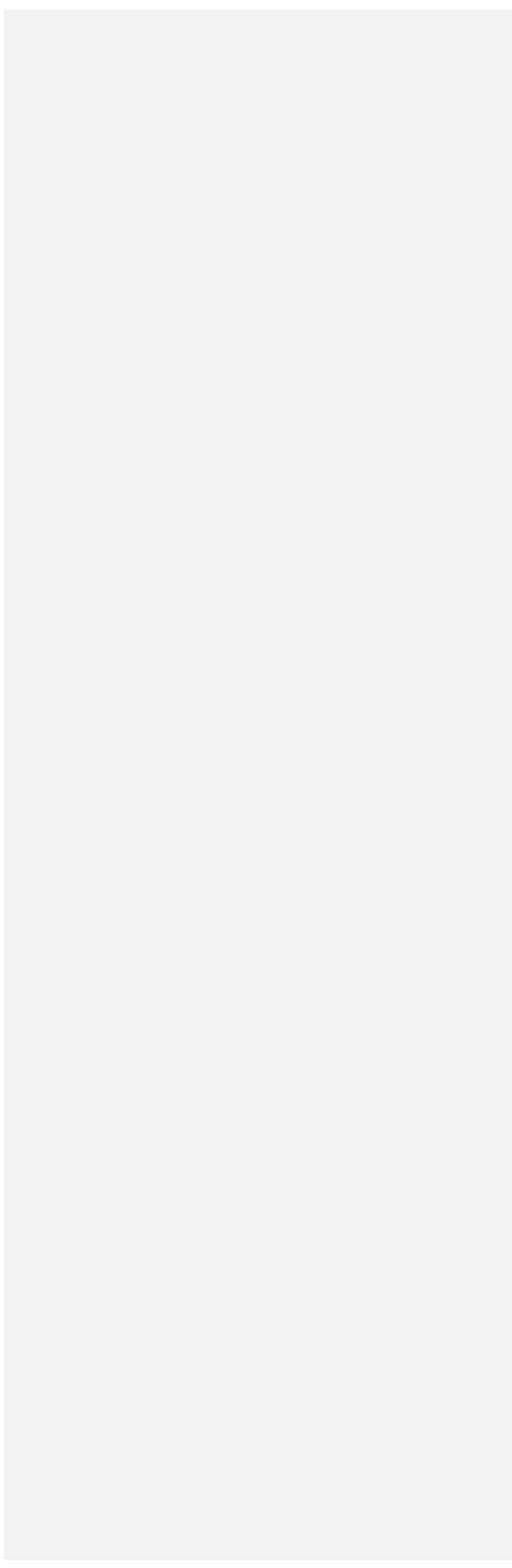   migration can be done node by node as described in ~~RFC8661~~ [RFC8661].

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

Commenté [BMT1]: This is not a routing protocol.

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~~IEs to infer:

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, for example, 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 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

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Author's Address

   Thomas Graf
   Swisscom
   Binzring 17
   Zurich 8045
   Switzerland

   Email: thomas.graf@swisscom.com