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Export of IGP Flexible Algorithm Information in IPFIX
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Abstract

This document introduces a new IPFIX information element (IE) to identify the IGP flexible algorithm information related with the Segment Identifier(SID) or the IPv4/IPv6 prefix.

Status of This Memo

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1. Introduction

[RFC9350] introduces the concept of Flexible Algorithm that allows IGPs (ISIS, OSPFv2 and OSPFv3) to compute constraint-based path over an SR-MPLS or an SRv6 network. In SR, the same prefix can be associated with multiple algorithms.
[I-D.ietf-lsr-algorithm-related-adjacency-sid] comments that, besides the SR-MPLS prefix SID, the algorithm can be also included as part of an SR-MPLS Adjacency-SID advertisement in scenarios where multiple algorithm share the same link resource.

[RFC9502] further extends IGP Flexible Algorithm so that it can be used with regular IPv4 and IPv6 forwarding.

With IGP Flexible Algorithm, a physical network can be divided into multiple logical planes. For each Flex-Algorithm, the path is computed independently.

Below are the typical use cases when monitoring a traffic flow in a network with IGP Flex-Algorithm enabled.

* Which Flex-Algorithm is the SR-MPLS SID or the SRv6 SID locator belongs to ?

* Which Flex-Algorithm is the IPv4/IPv6 prefix related with ?

By only looking at the SR SID or the IP address itself, the above questions could not be answered.

This document introduces a new IP Flow Information Export (IPFIX) information element (IE) to identify the IGP Flexible algorithm related with the SR segment identifier(SID) or the IPv4/IPv6 prefix.

2. Terminology

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 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

This document makes use of the terms defined in [RFC7011], [RFC8402] and [RFC9350].

The following terms are used as defined in [RFC7011]:

* IPFIX
* IPFIX Information Elements
* Metering Process
* Template Record
* Data Record
* Collector

The following terms are used as defined in [RFC8402]:

* Segment Routing (SR)
* Segment List
* SRv6
* SR-MPLS
* Segment Identifier (SID)

The following terms are used as defined in [RFC9350]:

* Flexible Algorithm

3. IGP Flexible Algorithm Information in IPFIX

A new IE "flexAlgo" is defined in this document to identify the Flexible Algorithm information related with an SR-MPLS SID, an SRv6 locator or an IPv4/IPv6 prefix, the IE carries the value of the IGP Algorithm Types as in the IANA "IGP Algorithm Types" registry.

Name: flexAlgo

ElementID: TBD1

Description: The 8-bit value that represents an IGP Flexible Algorithm number related with an SR-MPLS SID, an SRv6 locator or an IPv4/IPv6 prefix. The Flexible Algorithm number are specified in the IANA "IGP Algorithm Types".

Abstract Data Type: unsigned8

Data Type Semantics: identifier

Additional Information: Specified in [RFC9350] and [RFC9502].

Reference: This document.

4. Operational Considerations

When used for monitoring SR-MPLS traffic flows, the IE "flexAlgo" indicates the IGP flexible algorithm of the active SR-MPLS prefix/ adjacency SID or the IGP prefix related with the SR-MPLS SID, as in [RFC8665], [RFC9350] and [I-D.ietf-lsr-algorithm-related-adjacency-sid]. And the "flexAlgo" is valid when the value of IE "IPFIX MPLS label type (Value 46)"[RFC9160] in the data record is 7 (OSPFv2 Segment Routing), 8 (OSPFv3 Segment Routing) or 9(IS-IS Segment Routing). In the absence of the IE "IPFIX MPLS label type" in the IPFIX template record, how to process the "flexAlgo" is implementation specific.

When used for monitoring SRv6 traffic flows, the IE "flexAlgo" indicates the IGP algorithm related with the locator of the active SRv6 SID as in [RFC9350], [RFC9352] and [RFC9513]. And the "flexAlgo" is valid when the value of IE "IPFIX IPv6 SRH Segment Type (Value 500)"[RFC9487] in the data record is 3 (OSPFv3 Segment Routing) or 4 (IS-IS Segment Routing). In the absence of the "IPFIX IPv6 SRH Segment Type", how to process the "flexAlgo" is implementation specific.

When monitoring pure IPv4/IPv6 traffic flows, the IE "flexAlgo" can be used to indicate the IGP algorithm related with the destination IPv4/IPv6 address or the IPv4/IPv6 next hop address.

5. Security Considerations

There are no additional security considerations regarding allocation of these new IPFIX IEs compared to [RFC7012].

Other security considerations for IGP flexible algorithmin [RFC9350] and [RFC9502] apply to this document.

6. IANA Considerations

This document requests IANA to create a new IE under the "IPFIX Information Elements" registry [RFC7012] available at [IANA-IPFIX].

Element ID	Name	Reference
TBD1	flexAlgo	This document

7. References

7.1. Normative References

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