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SR Policies Extensions for NRP in BGP-LS
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Abstract

This document defines a new TLV which enable the headend to report the configuration and the states of SR policies carrying NRP information by using BGP-LS.

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1. Introduction

Segment Routing Policy [RFC9256] is an ordered list of segments (i.e. instructions) that represent a source-routed policy. Packet flows are steered into a SR Policy on a node where it is instantiated called a headend node. The packets steered into an SR Policy carry an ordered list of segments associated with that SR Policy.

[I-D.ietf-teas-ietf-network-slices] provides the definition of IETF network slice for use within the IETF and discusses the general framework for requesting and operating IETF Network Slices, their characteristics, and the necessary system components and interfaces. It also introduces the concept Network Resource Partition (NRP), which is a subset of the resources and associated policies in the underlay network.

[I-D.ietf-teas-ns-ip-mpls] introduces the notion of a Slice-Flow Aggregate which comprises of one or more IETF network slice traffic streams. It also describes the Network Resource Partition (NRP) and the NRP Policy that can be used to instantiate control and data plane behaviors on select topological elements associated with the NRP that supports a Slice-Flow Aggregate.

[I-D.ietf-idr-bgp-ls-sr-policy] describes a mechanism to distribute SR policy information to external components using BGP-LS.

[I-D.ietf-idr-sr-policy-nrp] defines the extensions to BGP SR policy to specify the NRP which the SR Policy candidate path is associated with.

This document defines a new TLV which enable the headend to report the configuration and the states of an SR policy carrying the NRP information by using BPG-LS.

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

3. Carrying NRP TLV in BGP-LS

In order to collect configuration and states of the NRP SR policy, this document defines a new SR Policy state TLV which enable the headend to report the state at the SR Policy CP level.

This TLV is carried in the optional non-transitive BGP Attribute "LINK_STATE Attribute" defined in [RFC7752] associated with the SR Policy CP NLRI type.

This TLV is optional and only one this TLV is advertised for a given CP. If multiple TLVs are present, then the first one is considered valid and the rest are ignored as describe in [I-D.ietf-idr-bgp-ls-sr-policy].

The TLV has the following format:

0										1										2										3									
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1								
Type										Length										Flags										RESERVED									
										NRP ID (4 octets)																													

where:

Type: TBD1.

Length: 6 octets.

Flags: 1 octet of flags. None are defined at this stage. Flags SHOULD be set to zero on transmission and MUST be ignored on receipt.

RESERVED: 1 octet of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.

NRP ID: 4-octet domain significant identifier of Network Resource Partition.

4. Scalability Considerations

The mechanism specified in this document defines the headend to report configuration and states of an SR policy carrying the NRP information by using BGP-LS. BGP-LS SR Policy is used to report the SR Policy attributes and status. As a new attribute of the SR Policy, NRP will not increase the number of the SR Policy reported by BGP-LS.

5. Acknowledgements

TBD.

6. IANA Considerations

IANA maintains a registry called "Border Gateway Protocol - Link State (BGP-LS) Parameters" with a sub-registry called "BGP-LS NLRI and Attribute TLVs". The following TLV codepoints are suggested (for early allocation by IANA):

Codepoint	Description	Reference
TBD	NRP TLV	This document

7. Security Considerations

Procedures and protocol extensions defined in this document do not affect the BGP security model. See the "Security Considerations" section of [RFC4271] for a discussion of BGP security. Security considerations for acquiring and distributing BGP-LS information are discussed in [RFC7752].

8. Informative References

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