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Advertisement of Candidate Path Validity Control Parameters using BGP-LS
draft-chen-idr-bgp-ls-sr-policy-cp-validity-03

Abstract

This document describes a mechanism to collect the configuration and states of SR policies carrying the validity control parameters of the candidate path by using BGP Link-State (BGP-LS) updates. Such information can be used by external components for path computation, re-optimization, service placement, etc.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

SR Policy architecture is specified in [RFC9256]. An SR Policy comprises one or more candidate paths (CP) of which at a given time one and only one may be active (i.e., installed in forwarding and usable for steering of traffic). Each CP in turn may have one or more SID-List of which one or more may be active; when multiple SID-List are active then traffic is load balanced over them.

[I-D.chen-spring-sr-policy-cp-validity] supplemented candidate path validity criterion in [RFC9256]. It defines three validity control parameters under candidate Path to control the validity judgment of candidate Path.

In many network scenarios, the configuration and state of each TE Policy is required by a controller which allows the network operator to optimize several functions and operations through the use of a controller aware of both topology and state information [I-D.ietf-idr-bgp-ls-sr-policy].

Based on the mechanism defined in [I-D.ietf-idr-bgp-ls-sr-policy], this document defines extensions to BGP-LS to distribute the validity control parameters of a candidate path for an SR Policy.

1.1. 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.

2. Carrying CP Validity Sub-TLV in BGP-LS

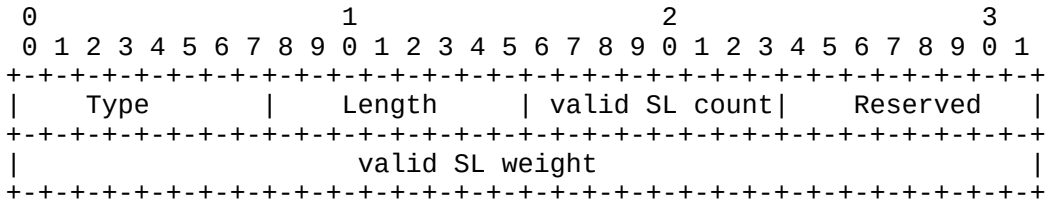
In order to collect configuration and states of SR policies carrying the validity control parameters of the candidate path, this document defines a new SR Policy state TLV which enable the headend to report the validity control parameters of a candidate path.

This TLV is carried in the optional non-transitive BGP Attribute "LINK_STATE Attribute" defined in [RFC9552] 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].

3. CP Validity Sub-TLV

The format of the CP Validity Sub-TLV is defined as follows:



where:

Type: to be assigned by IANA.

Length: the total length of the value field not including Type and Length fields. The total length MUST be 6.

valid SL count:1-octet field which indicates the minimum number of valid segment Lists under the active candidate path. When the number of valid segment Lists under candidate path is greater than or equal

to this field, the candidate path is considered valid. 0 indicates no requirement for SL quantity. 0xff indicates that the candidate path is considered valid only if all the segment Lists are valid.

valid SL weight: 4-octet field which indicates the minimum value of the sum of the weights of the valid segment List under the active candidate Path. When the sum of the weights of the valid segment Lists under the candidate path is greater than or equal to this field, the candidate Path is considered valid. 0 indicates no requirement for weight.0xffffffff indicates that the candidate path is considered valid only if all the segment Lists are valid.

4. Operations

The operations procedures of [RFC9552] can apply to this document. Typically, but not limit to, the SR policies carrying the validity control parameters of the candidate path can be distributed by the ingress node.

5. IANA Considerations

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

Value	Description	Reference
TBD	CP Validity Sub-TLV	This document

6. Security Considerations

Procedures and protocol extensions defined in this document do not affect the base BGP security model. See [RFC6952] for details. The security considerations of the base BGP-LS specification as described in [RFC9552] and BGP-LS SR Policy specification as described in [I-D.ietf-idr-bgp-ls-sr-policy] also apply. It does not introduce additional security issues compared to existing SR policy extensions. The CP Validity information is critical to determining the validity of the CP, and a wrong CP Validity information may cause unexpected forwarding actions and results.

Implementations need to make sure that the CP Validity information is correct to avoid unexpected forwarding actions and results. Additionally, the distribution of CP validity information from a router to an controller needs to be protected. The security considereations in [I-D.ietf-idr-bgp-ls-sr-policy] apply to this distribution procedure.

7. Acknowledgements

TBD.

8. References

8.1. Normative References

[I-D.chen-spring-sr-policy-cp-validity]
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[I-D.ietf-idr-bgp-ls-sr-policy]
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8.2. Informative References

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