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R. Chen
D. Zhao
ZTE Corporation
K. Talaulikar
Cisco Systems, Inc.
Y. Liu
China Mobile
L. Changwang
New H3C Technologies
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Validity of SR Policy Candidate Path
draft-chen-idr-bgp-sr-policy-cp-validity-04

Abstract

This document defines extensions to BGP to distribute the validity control parameters of a candidate path for an SR Policy.

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 two validity control parameters under candidate Path to control the validity judgment of candidate Path.

This document defines extensions to BGP 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

As defined in [I-D.ietf-idr-sr-policy-safi], a new SAFI is defined (the SR Policy SAFI with codepoint 73) as well as a new NLRI. The NLRI contains the SR Policy candidate path and, according to [I-D.ietf-idr-sr-policy-safi], the content of the SR Policy Candidate Path is encoded in the Tunnel Encapsulation Attribute defined in [RFC9012] using a new Tunnel-Type called SR Policy Type with codepoint 15. This document defines CP Validity Sub-TLV to carry the validity control parameters of a candidate path.

The new SR Policy encoding structure with CP Validity Sub-TLV is expressed as below:

```
SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>
   Attributes:
      Tunnel Encaps Attribute (23)
         Tunnel Type: SR Policy (15)
             Binding SID
             SRv6 Binding SID
             Preference
             Priority
             Policy Name
             Policy Candidate Path Name
             Explicit NULL Label Policy (ENLP)
             CP Validity
             Segment List
                 Weight
                 Segment
                 Segment
                 ...
             ...
```

3. CP Validity Sub-TLV

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

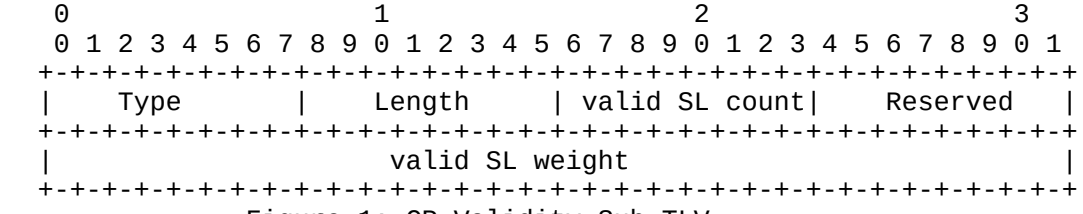

Figure 1: CP Validity Sub-TLV

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 count. 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 document does not bring new operation beyond the description of operations defined in [I-D.ietf-idr-sr-policy-safi]. The existing operations defined in [I-D.ietf-idr-sr-policy-safi] can apply to this document directly.

Typically, but not limit to, the SR policies carrying the validity control parameters of the candidate path are configured by a controller.

After configuration, the SR policies carrying the validity control parameters of the candidate path will be advertised by BGP update messages. The operation of advertisement is the same as defined in [I-D.ietf-idr-sr-policy-safi], as well as the reception.

5. IANA Considerations

This document defines a new sub-TLV in the registry "BGP Tunnel Encapsulation Attribute sub-TLVs" to be assigned by IANA:

Value	Description	Reference
TBD	CP Validity Sub-TLV	This document

6. Security Considerations

The security considerations of BGP [RFC4271] and BGP SR policy [I-D.ietf-idr-sr-policy-safi] apply to the extensions described in this document as well. 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 the controller to the ingress router needs to be protected. The security considereations in [I-D.ietf-idr-sr-policy-safi] apply to this distribution procedure.

7. Acknowledgements

TBD.

8. Normative References

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[I-D.ietf-idr-sr-policy-safi]
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Authors' Addresses

Ran Chen
ZTE Corporation
Nanjing
China
Email: chen.ran@zte.com.cn

Detao Zhao
ZTE Corporation
Nanjing
China
Email: zhao.detao@zte.com.cn

Ketan Talaulikar
Cisco Systems, Inc.
Email: ketant.ietf@gmail.com

Yisong Liu
China Mobile
Beijing
China
Email: liuyisong@chinamobile.com

Changwang Lin
New H3C Technologies
Beijing
China
Email: linchangwang.04414@h3c.com