BGP Extensions to Support Packet Network Slicing in SR Policy
draft-liu-idr-bgp-network-slicing-01

Abstract

   [I-D.peng-teas-network-slicing] defines a unified TN-slice
   identifier, AII(administrative instance identifier), to indicate the
   topology, computing, storage resources of the dedicated virtual
   network for both intra-domain and inter-domain network slicing
   scenarios. This document defines extensions to BGP in order to
   advertise AII in SR policies.

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

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   This Internet-Draft will expire on April 18, 2021.

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1. Introduction

For a packet network, network slicing requires the underlying network
to support partitioning of the network resources to provide the
client with dedicated (private) networking, computing, and storage
resources drawn from a shared pool.

[I-D.peng-teas-network-slicing] defines a unified TN-slice
identifier, AII(administrative instance identifier), to indicate the
topology, computing, storage resources of the dedicated virtual
network for both intra-domain and inter-domain network slicing
scenarios, and how to compute SR-BE or SR-TE path according to TN-
slice Identifier combined with other creteria.

[I-D.ietf-spring-segment-routing-policy] details the concepts of SR
Policy and steering into an SR
Policy.[I-D.ietf-idr-segment-routing-te-policy] specifies the way to
use BGP to distribute one or more of the candidate paths of an SR
Policy to the headend of that policy.

This document defines extensions to BGP in order to advertise AII in
SR-TE policies.

2. SR policy with AII

To distinguish forwarding behavior of different virtual networks,
each segment lists in SR policy need to be computed within the scope
of TN-slice identified by AII. As AII has global significance, all
segments of the same segment list can share a single AII. This
document defines a new AII sub-TLV in Segment List Sub-TLV to
indicate which slice this segment list belongs to,

```
 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=TBD1   |    Length     |     Flags     |   RESERVED    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             AII                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 1: AII sub-TLV in Segment List Sub-TLV

where:

o Type: TBD1

o Length: 6

o 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.

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

o AII: Identifies the TN-slice (AII) information corresponding to the
segment list.

3. Operations

The operations about advertisement and reception of SR policy can
refer to [I-D.ietf-idr-segment-routing-te-policy]. Typically, a
controller or a PCE can compute SR path taking acount of AII
criteria, so that the SR path can be limited in the scope of TN-slice
identified by AII. The AII information contained in Segment List
Sub-TLV can help the headend to translate the segment to AII related
SID, if the Segment Sub-TLV has not provided optional SID
information.

Even if Segment Sub-TLV has provided valid SID information, it is
also beneficial for the headend to know which slice this path belongs
to, according to the AII information contained in Segment List Sub-
TLV.

4. Security Considerations

Procedures and protocol extensions defined in this document do not
affect the security considerations discussed in
[I-D.ietf-idr-segment-routing-te-policy].

5. IANA Considerations

   TBD

6. References

6.1. Normative References

   [I-D.ietf-idr-segment-routing-te-policy]
              Previdi, S., Filsfils, C., Talaulikar, K., Mattes, P.,
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   [I-D.ietf-spring-segment-routing-policy]
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   [I-D.peng-teas-network-slicing]
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              Network Slicing using Segment Routing", draft-peng-teas-
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6.2. Informative References

   [I-D.zch-lsr-isis-network-slicing]
              Zhu, Y., Chen, R., Peng, S., and F. Qin, "IS-IS Extensions
              to Support Transport Network Slices using Segment
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