Anycast-SID FRR for Segment Routing Network
draft-chen-spring-segemt-routing-anycast-frr-00

Abstract

   This document specifies the fast redundancy protection mechanism,
   aimed at providing protection of the domain boundary nodes in Cross
   domain scenario.

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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   This Internet-Draft will expire on June 8, 2018.

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1. Introduction

   This document specifies the fast redundancy protection mechanism,
   aimed at providing protection of the domain boundary nodes in Cross
   domain scenario.

2. Conventions used in this document

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
   document are to be interpreted as described in RFC2119.

3. Motivation

   The procedures specified in this document, in combination with
   [I-D.ietf-spring-segment-routing] provide the fast redundancy
   protection.

   The procedures specified in this document aims at providing
   protection of the domain boundary nodes in Cross domain scenario.

4. Anycast-SID FRR Solution

   The solution consists of three parts.

   o Configure the same anycast prefix and associated prefix-sid for
      each domain boundary node that forms redundant protection, then
      the anycast prefix and associated prefix-sid with Anycast-Group
      flag should be advertised to the neighbor node.

   o Create the anycast-group forwarding entry (i.e. FRR entry) after
      the direct neighbor node of the domain boundary nodes receive the
      prefix-sid with Anycast-Group flag advertisement. The anycast-
      group forwarding entry includes the forwarding information which
      points to each of the domain boundary node , then the forwarding
      entry pointing to the main domain boundary (one of the direct
      connected boundary nodes from the PLR) is set to the active state,

and others are set to the backup state. Only the direct neighbor
of the domain boundary nodes need to set up the anycast-group
forwarding entry.

o   if the neighbor node detects the main domain boundary node
    failure, the neighbor node immediately activates the backup entry.
    Note that the backup entry contains the node-sid of the slave
    boundary node, and the packet will be forwarded based on the node-
    sid, not the anycast prefix-sid again.

```
+-----------------------+  +--------------+  +------------------+
|      SID:20  SID:30   |  |              |  |    SID:60        |
|        A2-----A3------GW11------C1------GW21------A6           |
|       / \     /       |  |\     / \     /|  |        \        |
|      /   \   /        |  | \   /   \   / |  |         \       |
|SID:10/     \ /         |  |  \ /     \ /  |  |          \ SID:80 |
|    A1        /       SID:100  /       /   SID:200       A8      |
|      \     / \        |  | / \     / \ |  |          /        |
|       \   /   \       |  |/   \   /   \|  |         /         |
|        \ /     \      |  |/     \ /     \|  |        /          |
|       A4-----A5------GW12------C2------GW22-------A7           |
|      SID:40  SID:50   |  |              |  |    SID:70        |
+-----------------------+  +--------------+  +------------------+
```
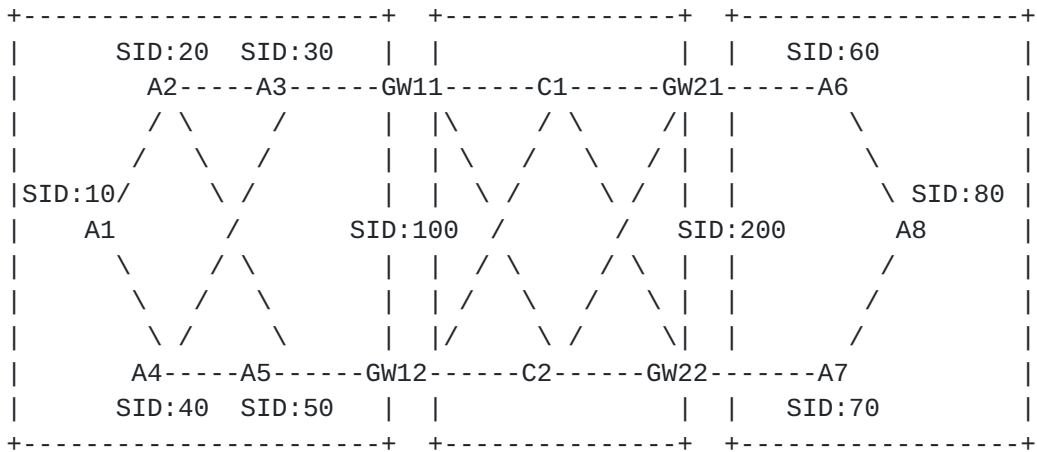
                             Figure 1

The figure above describes a network example with two groups of the
domain boundary nodes. The GW11 and GW12 are in the same anycast
group. They are all configured with the same anycast prefix and the
same prefix-sid 100, in addition, GW11 has node-sid 110 and GW12 has
node-sid 120. All these prefix-sid should be advertised to the
Neighbors(e.g, node A3 and A5), and the anycast-group forwarding
entry will be set up by the direct Neighbor node A3 and A5. For
example, the anycast-group forwarding entry created by A3 contains a
master item which points to anycast-sid 100 and a slave item which
points to node-sid 120.

When A3 detects GW11 failure, it immediately diverting traffic from
GW11 to A4 (e.g. the best next-hop to node-sid 120) according to the
anycast-group forwarding entry.

It is an implementation choice for data-plane whether the slave item
only points to node-sid 120 for cascade table lookup, or integrates
the forwarding information of node-sid 120 (such as a single next-
hop, a TI-LFA FRR index for cascade table lookup, or an ECMP index
for cascade table lookup).

   Note that the anycast-group FRR described in this document could co-
   exist with other FRR solutions, such as LFA/RLFA/TI-LFA. The
   anycast-group FRR solution needn't complex alternate path
   computation, it just reuses the forwarding information which points
   to the slave boundary node.

5. Security Considerations

   TBD.

6. Acknowledgements

   TBD.

7. Normative references

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