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Anycast-SID FRR in SR
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Abstract

This document specifies the fast redundancy protection mechanism, aimed at providing protection of the links and domain boundary nodes for network that use segment routing.

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1. Introduction

This document extends the use of Anycast-SID FRR to provide links and domain boundary nodes that use segment routing.

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](#).

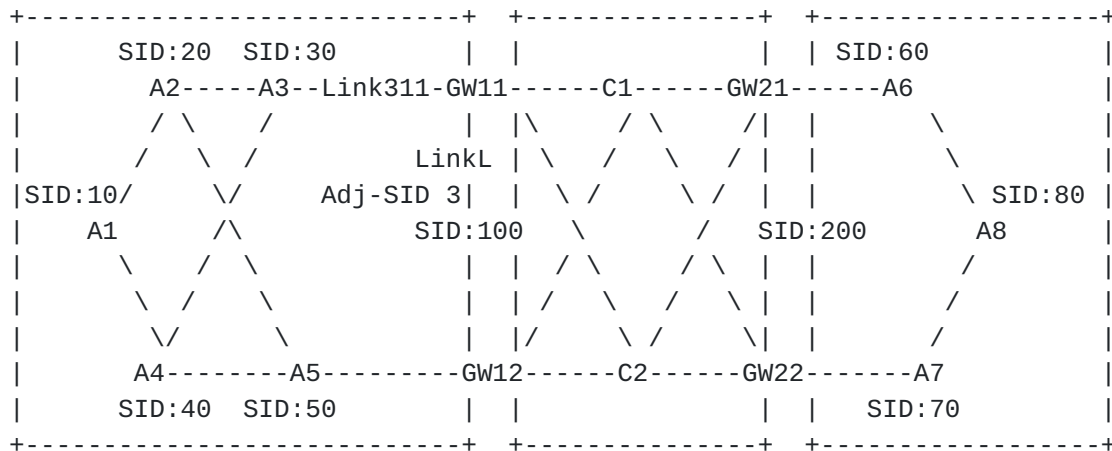
3. Problem statement

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. Suppose that the metric of link between two anycast node is large while other links' metric are small. From A1/A2/A3 perspective, GW11 is an active anycast node and GW12 is a standby, from A4/A5 perspective, GW12 is active an anycast node, and GW11 is a standby.

On the A3 node, it can select the primary or backup TI-LFA FRR[I-D.ietf-rtgwg-segment-routing-ti-lfa] forwarding path (to destination node GW12) which not through the active anycast node GW11 as the backup path to anycast-sid 100. In this example it will select the direct next-hop A2 which is the primary path to destination node GW12.

Supposed that an SID list is {100, 200, 80} which represents the SR-TE path from A1 to A8.

Time1: the active anycast node GW11 DOWN.

Time2: Anycast FRR take effect in the event of node GW11 has failed, the flow will be encapsulated with node-sid of GW12 and directed to next-hop A2.

Time3: route convergence executed, depending on the convergence speed of the nodes, A3 may regard GW12 as the new originator source of anycast prefix, so that any flow that match the anycast prefix will be forwarded to direct next-hop A2 to destination node GW12. However, A2 may not converge so quickly, it will still regard GW11 as the originator source of the anycast prefix, its forwarding entry of anycast-prefix is still to destination GW11 and the next hop is A3. There is a loop here. So A3 has responsibility to generate a micro-loop avoided path {GW12, anycast-prefix} to anycast prefix, that is, it must insert the new originator source to the unloop path.

4. Proposal

4.1. Domain boundary nodes protection

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. The anycast-group forwarding entry may also be created on PLR by default, when it received an anycast-prefix advertisement from two or more originator source.

- 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.

4.2. example

In figure 1, considering that the GW11 DOWN, then

Time1:GW11 DOWN.

Time2: Primary or backup TI-LFA

[[I-D.ietf-rtgwg-segment-routing-ti-lfa](#)]provides protection in the event of GW11 has failed on the A3 node.

Time3: When A3 detects GW11 failure, and the anycast-sid 100 is the top Label in the label stack.The anycast-sid 100 is swapped with the node-sid 120 (node-sid of the GW12) according to the anycast-group forwarding entry. Packets is forwarded to next-hop A2.

5. Security Considerations

TBD.

6. Acknowledgements

TBD.

7. Normative references

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