

SPRING
Internet-Draft
Intended status: Informational
Expires: August 28, 2020

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NET-PGM extension: SRv6 uSID illustration
draft-filsfils-spring-net-pgm-srv6-usid-illus-00

Abstract

This document illustrates the SRv6 "micro segment" (SRv6 uSID or uSID for short) instruction.

Status of This Memo

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[1.](#) Introduction

SRv6 Network Programming [[I-D.ietf-spring-srv6-network-programming](#)] defines a mechanism to build a network program with topological and service segments. It leverages the SRH [[I-D.ietf-6man-segment-routing-header](#)] to encode a network program together with optional metadata shared among the different SIDs.

[[I-D.filsfils-spring-net-pgm-extension-srv6-usid](#)] draft extends SRv6 Network Programming with a new type of SRv6 SID behavior: SRv6 uN. This document illustrates it.

[2.](#) Illustration

This section extends the illustrations for SRv6 Network Programming [[I-D.filsfils-spring-srv6-net-pgm-illustration](#)] to cover uSID. The reference topology is the same with the addition of link 6-8.

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[2.1.](#) Reference diagram

Nodes 1 to 8 are considered within the network domain.

Nodes X and Y are outside the domain.

Nodes 1 and 8 act as PE respectively to nodes X and Y.

All the links within the domain have the same IGP metric. The IGP-metric shortest-path from 1 to 8 is 1-2-7-8 while the latency-metric shortest-path from 1 to 8 is 1-2-3-4-5-6-7-8.

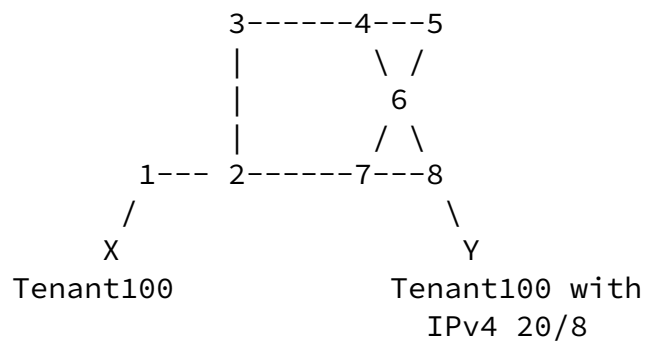


Figure 1: Reference topology

[2.2.](#) SRv6 overlay with underlay optimization

Let us illustrate a low-latency SR-L3VPN service delivered to a packet (X,Y).

PE 1 encapsulates (X, Y) in an outer IPv6 header with DA = 2001:db8:0300:0500:0700:: and SRH (B:8:D0::; SL=1; NH=4). Leveraging the illustration conventions from SRv6 network programming, the following resulting packet leaves node 1 in the direction of node 3:

(A1::, 2001:db8:0300:0500:0700::)(B:8:D0::; SL=1; NH=4)(X, Y)

2001:db8:0300:0500:0700:: is a uSID carrier encoding a source routed stateless path via node 3 then 5 then 7.

B:8:D0:: is an End.DT4 SID instantiated at node 8.

1 sends this packet to 2, as 2 is on the shortest-path to 2001:db8:0300::/48 advertised by 3.

When 2 receives the packet, 2 performs a regular IPv6 FIB lookup. It finds a FIB entry for 2001:db8:0300::/48 and forwards along the shortest path to 3.

When 3 receives the packet, 3 matches 2001:db8:0300::/48 in its "My SID Table" and executes the uN behavior. The updated DA becomes 2001:db8:0500:0700::. Node 3 then performs a lookup on the updated DA and forwards the packet to 5 along the shortest path to 2001:db8:0500::/48.

The following packet leaves node 3:

(A1::, 2001:db8:0500:0700::)(B:8:D0::; SL=1; NH=4)(X, Y)

4 forwards along the shortest path to 2001:db8:0500::/48.

When 5 receives the packet, 5 matches 2001:db8:0500::/48 in its "My SID Table" and executes the uN behavior. The updated DA becomes 2001:db8:0700::. 5 performs a lookup on the updated DA and forwards the packet to 7 along the shortest path to 2001:db8:0700::/48.

The following packet leaves node 5:

(A1::, 2001:db8:0700::)(B:8:D0::; SL=1; NH=4)(X, Y)

6 forwards along the shortest path to 2001:db8:0700::/48.

When 7 receives the packet, 7 matches 2001:db8:0700::/48 in its "My SID Table" and finds the bound function uN. As a result, Node 7 executes the "End with PSP and USD support" pseudocode, decrementing the SL value in the SRH, and updating the DA with the next SID B:8:D0::. Since the SL value is zero the SRH is removed. Node 7 performs a lookup on the updated DA and forwards along the shortest

path.

The following packet leaves node 7:

(A1::, B:8:D0::)(X, Y)

8 receives it, performs the End.DT4 function and sends the IP packet (X, Y) towards its VPN destination.

This example illustrates the benefits highlighted in the next section.

[3.](#) Acknowledgements

The authors would like to acknowledge Francois Clad, Peter Psenak, Ketan Talaulikar, Jakub Horn, Swadesh Agrawal, Zafar Ali, Darren Dukes, Kiran Sadshiran, Junaid Israr, Lakshmanan Srikanth, Asif Islam, Saleem Hafeez, Michael MacKenzie, Sushek Shekar, YuanChao Su, Alexander Preusche, Alberto Donzelli, Miya Kohno, David Smith, Ianik

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