Benchmarking Methodology for IPv6 Segment Routing
draft-vfv-bmwg-srv6-bench-meth-08

IETF 118 Update

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Draft Overview

Problem:

Segment Routing (SR) (RFC 8402) leverages the source routing paradigm and can be applied to the IPv6 data plane (**SRv6**).
However, there is **no standard method** defined to compare **SRv6 packet forwarding capabilities** of network devices.

Solution:

The document complements RFC 5695 and RFC 5180 by defining a **methodology for benchmarking SRv6**.
It builds upon RFC 2544, RFC 5695, RFC 5180, and RFC 8402.
RFC 4814, RFC 8219, and RFC 9004 are included for refinement of some specific points.

Technical Details

For **SRv6**, new tests are added to characterize an **SRv6 Source Node**, an **SRv6 Segment Endpoint Node**, a **Transit Node**

- <u>SR source node</u> processing: insertion of the SRH, with SIDs stored in reverse order, and setting of the IPv6 DA as the first SID of the SR Policy.
- <u>SR segment endpoint node</u> processing: detection of the new active segment, modification of the IPv6 DA of the IPv6 header, and forwarding of the packets.
- <u>SR transit node</u> processing: forwarding of the packets containing the SR header. In SRv6 the transit nodes do not need to be SRv6 aware.

The overall procedure defines several **extensions to RFC 5695**:

- Test SID list longer than 1 SID (2 are recommended, many are optional)
- H.Encaps behavior is recommended, H.Encaps.XXX are possible
- End.X behavior to emulate traffic engineering scenario is recommended
- All flavors are recommended (PSP, USP, USD)
- Extensions for Reporting Format
- At least one protocol for the SID population is recommended (ISIS or OSPF or SR Policy)

Draft's History

- Version -00 submitted on March 2022

- Version -01 presented at IETF 113 – Initial test methodology discussed

- Version -02 presented at IETF 114 – Incorporated comments from the chairs and the mailing list to review the test setup and methodology, trial duration, reset methodology, address randomization, and many others

- Versions -03 and -04 submitted in October 2022 and presented at IETF 115 – Included further comments on longer list of flavors (PSP, USD, USP), test on transit node decapsulation, header behavior specification, readability improvements, etc

- Version -05 submitted on February 2023 – Addressed comments on allowing a longer list of SID as an optional test. Bruno joined as coauthor.

- Version -06 uploaded on March 2023 and presented at IETF 116.

- Version -08 incorporates almost all relevant text from referenced RFC to be the single document to read (except buffering tests that is too long to copy from RFC 9004)

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Outstanding issues

After IETF118 publication deadline but before IETF 118
Bruno has requested good proposals:

- New test specifically to understand the "flow label" support for ECMP

- Recommendation to stress the DUT to understand the maximum SID list supported

- Decrease duplications between section 1 (Introduction) and section 2 (SRv6 forwarding)

Would be implemented in the next version

Next Steps

- As requested at IETF 116-117, we think the draft is stable enough for WG adoption.

- Formal request for adoption after IETF 117 has given a few positive replies

- A WG adopted document would help the draft to get more attention from companies doing tests.
- 3rd party tests are also desired before it would become RFC.

Thank you