

Benchmarking Methodology for IPv6 Segment Routing

draft-vfv-bmwg-srv6-bench-meth-02

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Background

RFC5180 defines the methodology for the benchmarking of IPv6 forwarding devices.

Segment Routing (SR), defined in RFC8402, leverages the source routing paradigm and can be applied to IPv6 data plane (**SRv6**)

- However, there is no standard method defined to compare and contrast the foundational SRv6 packet forwarding capabilities of network devices
- This document aims to complement RFC5695 and RFC5180 by defining a methodology for benchmarking SRv6.
- It builds upon RFC2544, RFC5695, RFC5180 and RFC8402.

Changes from -01

New version to address the comments received at IETF 113:

- Revised Test Setup and Methodology
- Test Setup aligned with [draft-vfv-bmwg-srmpis-bench-meth](#)
- Added new sections on Protocol Addresses, Trial Duration and Traffic Verification
- Included additional consideration on the relationship with RFC5695 and RFC2544
- Traffic Engineering and Services (VPNs) have been put out of the scope.
- References to RFC9004 and ETSI GR-NFV-TST-007

Locator and Endpoint behaviors and Frame Formats and Sizes

It is RECOMMENDED that the DUT and test tool support at least one option for SID stack construction:

- IS-IS Extensions to Support Segment Routing over IPv6 Dataplane (draft-ietf-lsr-isis-srv6-extensions)
- OSPFv3 Extensions for SRv6 (draft-ietf-lsr-ospfv3-srv6-extensions)
- Segment Routing Policy Architecture (draft-ietf-spring-segment-routing-policy)

Similarly to draft-vfv-bmwg-srmpis-bench-meth:

- It is RECOMMENDED that SR policy should be used for the SRH with 2 SIDs.
- It is possible to test longer SRH if there is an interest.

It is RECOMMENDED that the top SID on the list should have an End.X flavor type to emulate TE scenarios.

The tests for SRv6 will use the Frame characteristics similarly to RFC5695, except the need for a bigger MTU to accommodate SRH.

- 8 octets are added in the calculations for the SRH header itself.
- While $n \times 16$ octets are added for SID

Reporting Format

New parameters that MUST be reported are:

- Port numbers involved in the tests and their respective oversubscription ratio.
- Upstream/downstream traffic proportion (equal bidirectional or some other split).
- SRv6 Forwarding Operations (PUSH/ NEXT/ CONTINUE).
- Number of Segments considered in the SRH and the type of behavior used (according to RFC8986).
- SR Policy construction method (PCEP, BGP, manual configuration).
- Type of the payload (IPv6/IPv4, UDP/TCP).

Some parameters MAY be changed:

- Label Distribution protocol and IGP are the same in the context of SRv6. Hence, it is called "Locator and Endpoint behaviors methods".
- Port media type may be reported only one time for all tests if only Ethernet media would be tested

SRv6 Forwarding Benchmarking Tests

RFC5180 defines tests (Throughput, Latency, Frame Loss, System Recovery, Reset) for basic **IPv6** forwarding

For **SRv6**, new tests need to be added to characterize a **SRv6 Source Node**, a **SRv6 Segment Endpoint Node**, a **Transit Node**

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

The overall procedure can be similar to RFC5695 with some extensions:

- Test SID list longer than 1 SID (2 are recommended, many are possible)
- Different Reporting Format

Next Steps

BMWG may consider to adopt this missing piece to cover SRv6

Welcome inputs, comments

Open to new coauthors, contributors

Thank you