

Benchmarking Methodology for IPv6 Segment Routing

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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 the 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 new I-D aims to complement RFC5695 and RFC5180 by defining a methodology for benchmarking SRv6.
- It builds upon RFC2544, RFC5695, RFC5180 and RFC8402.
- RFC 4814, RFC 8219, and RFC 9004 are included for refinement of some specific points

SRv6 Forwarding Benchmarking Tests

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

- The processing of the SR source node corresponds to the insertion of the SRH, with SIDs stored in reverse order, and setting of the IPv6 DA as the first SID of the SR Policy.
- The processing of the SR segment endpoint node corresponds to the detection of the new active segment, modification of the IPv6 DA of the IPv6 header, and forwarding of the packets.
- The processing of the SR transit node corresponds to the 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)
- End.X flavor type to emulate traffic engineering scenario is recommended
- Different Reporting Format
- At least one protocol for the SID population is recommended (ISIS or OSPF or SR Policy)

Changes from -02

Address comments received at IETF 114 and on the mailing list:

- Buffer's size test (back-to-back) is added on the basement of RFC 9004
- Reference to RFC 4814 on how to deal with L2 links that may have staffing (no need for the default Ethernet link)
- Reference to RFC 4814 on how to deal with address randomization for equalization of link's load-balancing (no need for SR itself but needed for IP addresses and transport layer ports)
- Reference to RFC 8219 on how to improve latency measurement if needed (optional)
- Better alignment with the rules on how to use reserved IETF words
- Stronger statement that special capabilities just for tests are prohibited
- SR policies may be installed by many protocols
- Make at least routing protocol mandatory
- Increase for the test time
- Improvement for Reset test methodology (RFC 5695)
- Editor changes

Thanks to Gabor Lencse and Boris Khasanov for the feedback!

Next Steps

BMWG may consider adopting this missing piece to cover SRv6

Welcome inputs, comments

Open to new coauthors, contributors

Thank you