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Analysis Framework For Extensions of SRv6 Encapsulation  
draft-filsfils-spring-analysis-fmwk-ext-srv6-encap-01

## Abstract

This document provides a framework for analysis of multiple proposals to extend SRv6 encapsulation with the objective of minimizing encapsulation size or leveraging legacy equipment. It defines relevant metrics to evaluate each proposal.

## Requirements Language

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 [RFC 2119](#) [[RFC2119](#)].

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## [1.](#) Introduction

Traffic traversing an SR domain is encapsulated in an outer IPv6 header with an optional Segment Routing Header (SRH) for its journey through the SR domain [[I-D.ietf-6man-segment-routing-header](#)].

This document provides a framework for analysis of multiple proposals to extend SRv6 encapsulation with the objective of minimizing encapsulation size or leveraging legacy equipment. It defines relevant metrics to evaluate each proposal.

Future revisions will evaluate and document the metrics for each proposal, compare them and draw conclusions.

## [2.](#) Metrics

Metrics are identified as metric:score. Metric is the abbreviation of the metric name, and score is an integer reporting its evaluation. A proposal with a metric (M) and score of zero is represented as M:0.

A score may vary based on the number and type of instructions in a segment list. Three types of segments are considered: T for

topological, S for service, and V for VPN.

A proposal with a metric (M), computed for a segment list of 5 topological segments followed by 1 VPN segment, with a score of 10 is represented as M(5T.1V):10.

A score may vary based on node parameters. Three parameters are considered: N the number of nodes in the network, I the number of IGP algorithms [[I-D.ietf-lsr-flex-algo](#)] configured at the node, and A the number of adjacency SIDs configured at the node.

A proposal with metric (M), computed for a node in a network of 100 nodes with 1 IGP algorithm and 5 adjacency SIDs configured at the node, with a score of 10 is represented by M(100N.1I.5A):10.

## [2.1.](#) Compliance

The compliance metric (C) records how aligned a proposal is with the SRv6 solution.

- o C.[RFC8402](#): compliance with [[RFC8402](#)]
- o C.SRH: compliance with [[I-D.ietf-6man-segment-routing-header](#)]
- o C.PGM: compliance with [[I-D.ietf-spring-srv6-network-programming](#)]
- o C.IGP: compliance with [[I-D.ietf-lsr-isis-srv6-extensions](#)]
- o C.BGP: compliance with [[I-D.ietf-bess-srv6-services](#)]
- o C.POL: compliance with [[I-D.ietf-spring-segment-routing-policy](#)]
- o C.BLS: compliance with [[I-D.ietf-idr-bgpls-srv6-ext](#)]
- o C.SVC: compliance with [[I-D.ietf-spring-sr-service-programming](#)]
- o C.OAM: compliance with [[I-D.ietf-6man-spring-srv6-oam](#)]

Each of the above metrics are assigned a compliance value:

- o 10: complies with the specification

- o 5: extends the specification
- o 0: redefines the specification

C.TOT is the sum of all C.\* metrics listed above. It provides an overall assessment of the proposal's alignment with the SRv6 RFCs and working group drafts.

## [2.2.](#) Data Plane Efficiency

The data plane efficiency metric (D) records the data plane forwarding efficiency of the proposed solution. Two separate metrics are used:

- o D.PRS(segment list): worst-case number of headers parsed during processing of the segment list.
- o D.LKU(segment list): worst-case number of FIB lookups during processing of the segment list.

## [2.3.](#) State Efficiency

The state efficiency metric (S) records the number of additional FIB entries (states) required by the proposed solution.

- o S(node parameters): the number of additional FIB entries for a node, given a set of parameters.

## [2.4.](#) Encapsulation Size

The encapsulation size metric (E) records the number of bytes required for the proposals

- o E(segment list): the number of bytes required to encapsulate a packet traversing the SR domain with segment list applied at an SR source node. Specifically, the number of bytes from the beginning of the encapsulating IPv6 header to the beginning of the packet

traversing the SR domain, including any and all headers in between.

### [3.](#) Variables For Metrics

For the E, D.PRS, D.LKU metrics the following segment lists are used during analysis.

- o 5T.1V
- o 10T.1V
- o 15T.1V
- o 5T.1S.5T.1V
- o 4T.1S.4T.1S.4T.1V

This list may be updated in subsequent revisions of this document.

For the S metric the following node parameters are used in analysis.

- o 1500N.2I.100A

This list may be updated in subsequent revisions of this document.

### [4.](#) Analysis of Proposals

To be completed in subsequent revisions of this document.

### [5.](#) Normative References

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SRv6 Encapsulation Analysis

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