
The **Updates** on the
Benchmarking Methodology for Source Address Validation
draft-chen-bmwg-savnet-sav-benchmarking-05

Li Chen, Dan Li, **Libin Liu**, Lancheng Qin

IETF 123 Meeting

Background

□ Defining the methodologies for benchmarking the performance of source address validation (SAV) mechanisms

- ◆ Taking the approach of considering a SAV device to be a black box.
- ◆ Defining the methodology in a manner that is agnostic to the mechanisms.
- ◆ Measuring the performance of existing and new SAV implementations.

□ Historical versions

- ◆ draft-chen-bmwg-savnet-sav-benchmarking-00, IETF 120 SAVNET WG and BMWG
- ◆ draft-chen-bmwg-savnet-sav-benchmarking-01, August 7, 2024
- ◆ draft-chen-bmwg-savnet-sav-benchmarking-02, IETF 121 SAVNET WG and BMWG
- ◆ draft-chen-bmwg-savnet-sav-benchmarking-03, IETF 122 BMWG
- ◆ draft-chen-bmwg-savnet-sav-benchmarking-04, May 20, 2025
- ◆ **draft-chen-bmwg-savnet-sav-benchmarking-05, IETF 123 BMWG and SAVNET WG**

Goal and Scope

□ Two objectives

- ◆ Assessing “which SAV mechanisms perform best” over a set of well-defined scenarios
- ◆ Measuring the contribution of sub-systems to the overall SAV system’s performance

□ Scope

- ◆ Evaluating individual SAV device, e.g., hardware or software routers

□ Determining the appropriate SAV deployment for real-world scenarios

Main Updates (v-05 vs. v-03)

□ Updates on SAV performance indicator

- ◆ **False positive rate** ← ~~Proportion of improper blocks~~
- ◆ **False negative rate** ← ~~Proportion of improper permits~~
- ◆ Protocol convergence time
- ◆ Protocol message processing throughput
- ◆ Data plane SAV table refreshing rate
- ◆ Data plane forwarding rate
- ◆ **CPU and memory utilization (New Added)**

□ Updates on Testing intra- and inter-domain SAV

- ◆ **False positive and false negative rates** ← ~~SAV accuracy~~
- ◆ Control plane performance
- ◆ Data plane performance
- ◆ **Resource utilization (New Added)**

□ Some refinements to the document wordings

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False Positive and False Negative Rates

□ SAV performance indicator

◆ **False positive rate** ← ~~Proportion of improper blocks~~

◆ **False negative rate** ← ~~Proportion of improper permits~~

- Blocks and permits are bound with fixed data plane actions, i.e., “discard” , “permit” [1]
- More data plane actions can be applied, i.e., “rate limit” , “redirect” [1]

◆ **CPU and memory utilization**

- Router computation resources are rare and costly
- High resource utilization reduces effect on other processes

□ Benchmarking intra- and inter-domain SAV

◆ **False positive and false negative rates** ← ~~SAV accuracy~~

Minh-Ngoc' s comments
on the mailing list

- ① 1. About SAV Performance Indicators in Section 4
- I prefer to use False Positive Validation Rate and False Negative Validation Rate terms instead of Proportion of Improper Blocks and Improper Permits because they are more well-known terms. It's just my suggestion, It's your choice to decide which one is more suitable.
- Besides False Positive/Negative (Improper Blocks/Permits) rate, I also suggest Validation Accuracy rate
- ② - Resources (CPU/Memory) Utilization used by the SAV process might also be a helpful indicator. Efficient resource utilization is crucial for maintaining network performance. Device CPU load is mentioned in Section 6 "Reporting Format". So, I guess it's related?
- ③ 2. About SAV Accuracy description texts in Section 5.1.1 and 5.2.1
- I suggest to directly use the SAV Performance Indicator terms (Proportion of Improper Blocks/Permits) which are already defined in Section 4 instead of re-explaining again in these paragraphs. For example, in the current version,
"This assessment is quantified by the ratio of legitimate traffic erroneously blocked by the DUT to the total volume of legitimate traffic, alongside the ratio of spoofing traffic mistakenly allowed by the DUT relative to the total volume of spoofing traffic."

[1] General Source Address Validation Capabilities, <https://datatracker.ietf.org/doc/draft-ietf-savnet-general-sav-capabilities/>

Correlation Summary for SAV Performance Indicators and SAV Performance Benchmarking

No.	SAV Perf. Indicator	Benchmarking SAV Perf.
1	False positive rate	SAV accuracy
2	False negative rate	
3	Protocol convergence time	Control plane performance
4	Protocol message processing throughput	
5	Data plane SAV table refreshing rate	Data plane performance
6	Data plane forwarding rate	
7	CPU and memory utilization	Resource utilization

Feedback for Using the Benchmarking Methodology

□ China Mobile tested the SAV device in their intra-domain networks

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[bmwg] Re: Fw: New Version Notification for draft-chen-bmwg-savnet-sav-benchmarking-04.txt
岳胜男 <yueshengnan@chinamobile.com> | Tue, 27 May 2025 07:00 UTC | Show header

Hi Libin,
I tested an intra-domain SAV device using the solution outlined in draft-cheng-savnet-intra-domain-sav-bgp last year. I believe that draft-chen-bmwg-savnet-sav-benchmarking offers useful insights, as well as comprehensive scenarios, for testing SAV devices.
Regards, Shengnan
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□ New H3C acknowledged that the benchmarking methodology is useful

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[bmwg] Re: New Version Notification for draft-chen-bmwg-savnet-sav-benchmarking-04.txt
linchangwang <linchangwang.04414@h3c.com> | Fri, 13 June 2025 03:19 UTC | Show header

Hi Libin,

This document provides a detailed analysis of the SAVNET performance testing approach, which aids in the deployment of SAVNET.

As a device vendor, when deploying, it is necessary to consider the performance comparison between configuring SAVNET and not configuring SAVNET:
```

Hackathon Project: SAVBench

- A software implementing the benchmarking methodology proposed in the document [[draft-chen-bmwg-savnet-sav-benchmarking](#)] on top of SAVOP^[2]
 - ◆ For **operators**, it replicates production-grade network environments for SAV mechanism evaluation, enabling operators to identify deployment-optimized solutions through scenario-based performance benchmarking.
 - ◆ For **vendors**, it facilitates large-scale topology construction with hybrid software/hardware components, allowing comprehensive validation of SAV implementations.

[2] SAVOP: <https://github.com/SAV-Open-Playground>

Next Step

□ Seek feedback and comments

- ◆ Are the SAV performance indicators sufficient?
- ◆ Do the intra-domain and inter-domain SAV tests cover the key real-world scenarios?
- ◆

□ Collaborations are welcome

Thanks! 😊