SAV Open Playground
IETF Hackathon

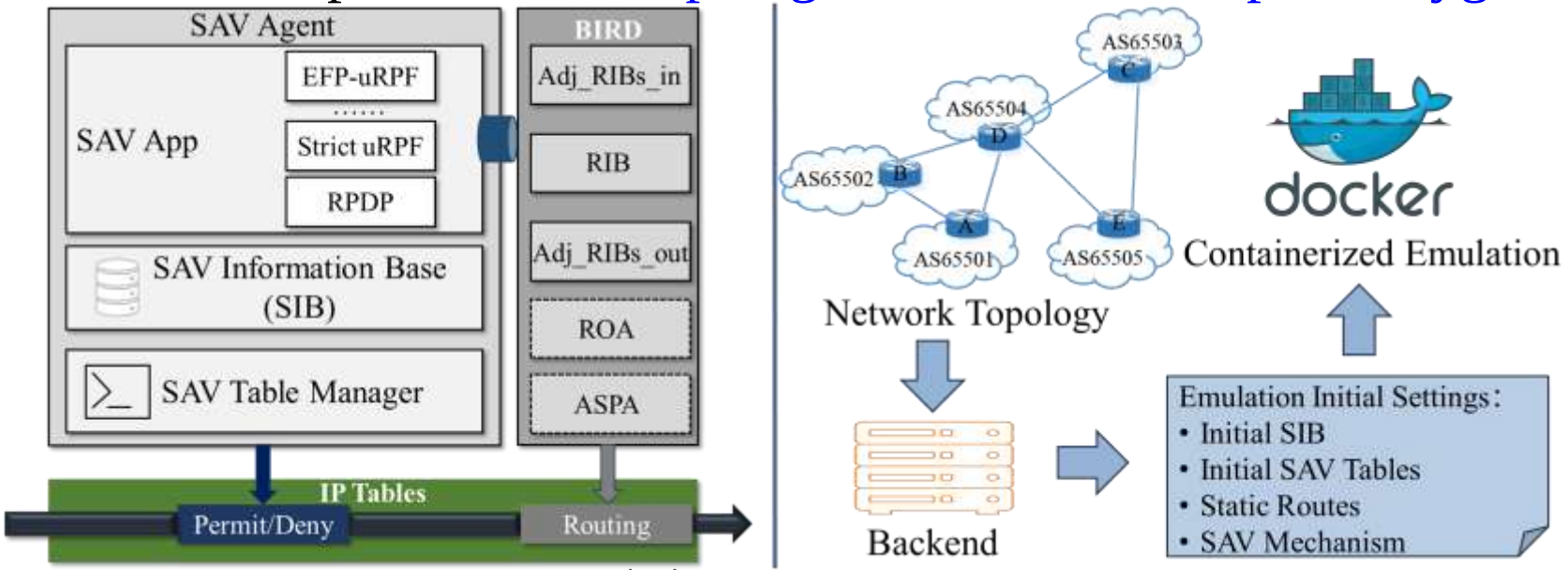
IETF 118
4-5 Nov 2023
Prague, Czechia

Hackathon Plan

- Emulations of SAV mechanisms based on SAV Open Playground (SAVOP)
- Evaluation of SAV mechanisms with SAVOP in terms of the following aspects
  - Validation accuracy in different scenarios, such as limited propagation of prefixes, hidden prefixes, attacks by source address spoofing within a customer cone, attacks by source address spoofing from a provider/peer AS
  - Control plane performance and data plane performance
  - Scalability of SAVOP

SAV Open Playground

- SAV Open Playground (SAVOP) provides an open platform to implement and emulate different SAV mechanisms
- SAVOP is open-source: https://github.com/SAV-Open-Playground



What Got Done

- We have built an Internet topology which includes 200 ASes using the real BGP data from public route collectors provided by RouteViews[1] and RIPE RIS[2].
  - Parsing and extracting AS path attribute from the BGP data and obtaining the neighboring relation between ASes
  - Creating links for the neighboring ASes to build the AS-level Internet topology
  - Obtaining the business relationship between ASes according to the data from CAIDA[3]

[1]http://www.routeviews.org/routeviews/
[2]https://www.ripe.net/analyse/internet-measurements/routing-information-service-ris/ris-raw-data
[3]https://catalog.caida.org/dataset/as_relationships_serial_1

What Got Done

- We have run the emulations of different SAV mechanisms including Loose uRPF, Strict uRPF, FP-uRPF, EFP-uRPF with Algorithm A and B, BAR-SAV[1], Passport[2], and DSAV[3], with the 200-AS network topology in the following scenarios
  - Symmetric routing, NO-EXPORT, and direct server return (DSR)
- We have performed evaluations of SAV mechanisms with SAVOP in terms of validation accuracy, control plane and data plane performance, and scalability.

[1]https://datatracker.ietf.org/doc/draft-ietf-sidrops-bar-sav/
[2]Passport: Secure and Adoptable Source Authentication, NSDI 2008
[3]https://datatracker.ietf.org/meeting/113/materials/slides-113-savnet-dsav-framework-01

What We Learned

- A server with 256GB DDR4 RAM can run 200 SAVOP containers with our current implementation, and we will make SAVOP support emulations cross machines.
- The experimental results show Passport and DSAV perform well in terms of SAV accuracy, yet Passport exhibits low data plane forwarding performance as analyzed, because it requires the router to perform cryptographic computation on each packet, which increases the processing overhead.
- The communication overhead of DSAV can be reduced.

Wrap Up

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Feel free to share any ideas at https://github.com/SAV-Open-Playground/savop/discussions