IETF Hackathon

SAV Open Playground (SAVOP)

IETF 117
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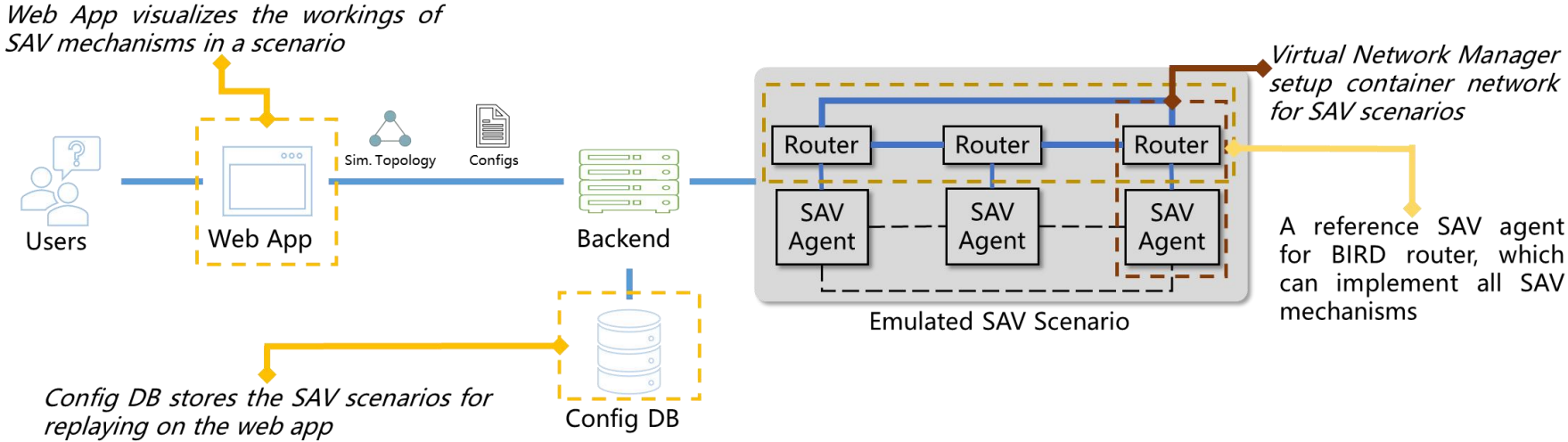
San Francisco, California

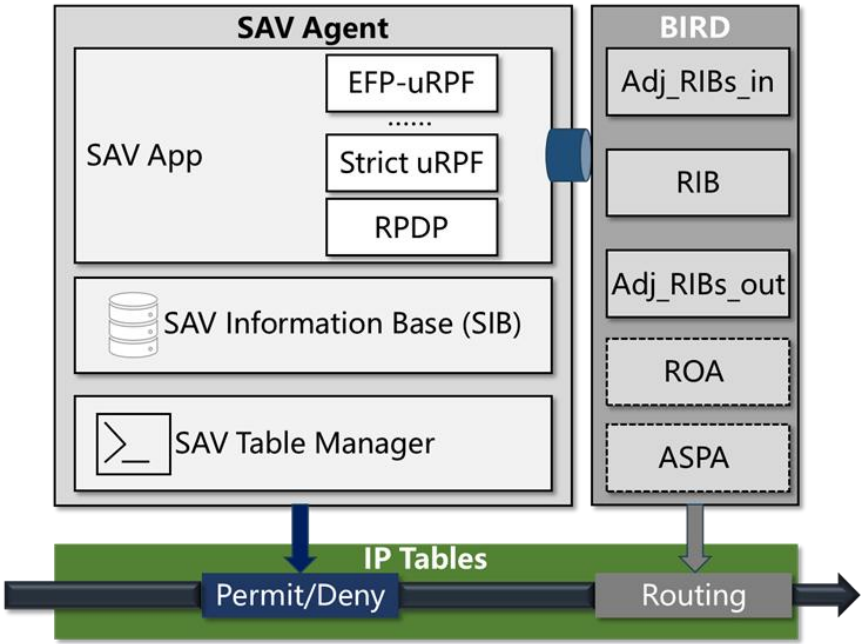
The Overview of SAV Open Playground

- SAV Open Playground (SAVOP) tries to build a virtualized network platform to enable easy implementation of SAV mechanisms
- SAVOP is open-source: https://github.com/SAV-Open-Playground



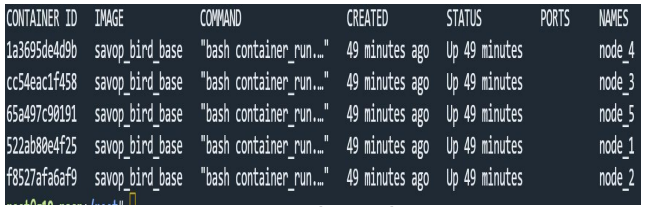
Hackathon Plan

- Enabling flexible deployment of SAV rules based on the SIB and SAV mechanisms
- Emulation of SAV mechanisms based on SAVOP
- Evaluation of SAV mechanisms with SAVOP
  - Case 1: Limited propagation of prefixes, e.g., NO_EXPORT
  - Case 2: Hidden prefixes, e.g., DSR
  - Case 3: Attacks by source address spoofing within a customer cone
  - Case 4: Attacks by source address spoofing from a provider/peer AS



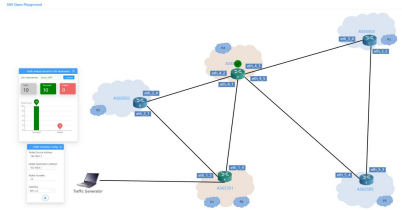
What got done

- We developed a web UI to easily build and visualize the experimental topology
- We built a topology including five ASes on SAVOP and emulated the network environments and SAV mechanisms with specified configurations
- We ran the uRPF-based SAV mechanisms on SAVOP in different scenarios, such as limited propagation of prefixes, hidden prefixes, and attacks by source address spoofing within a customer cone or from a provider/peer AS
- We implemented a traffic generator to verify the behaviors of SAV mechanisms

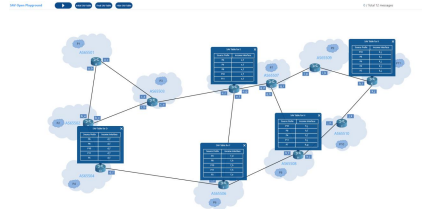


CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1a3695de4d9b	savop_bird_base	"bash container_run.…"	49 minutes ago	Up 49 minutes		node_4
cc54eac1f458	savop_bird_base	"bash container_run.…"	49 minutes ago	Up 49 minutes		node_3
65a497c90191	savop_bird_base	"bash container_run.…"	49 minutes ago	Up 49 minutes		node_5
522ab80e4f25	savop_bird_base	"bash container_run.…"	49 minutes ago	Up 49 minutes		node_1
f8527afa6af9	savop_bird_base	"bash container_run.…"	49 minutes ago	Up 49 minutes		node_2

Network Nodes



Network Topology



SAV Tables

What we learned

- The ubuntu system we use enables loose-uRPF by default, we need to disable it to make the SAVOP emulation environments work normally
- The experimental results show the emulated SAV mechanisms have gaps in different network scenarios, new SAV mechanisms need to be developed to solve the problems
- SAVOP is a great platform to implement and emulate new SAV mechanisms, and can make fair comparisons of different mechanisms
- In some scenarios, the generated traffic is not transmitted as expected, we are now still working on this issue

Wrap Up

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