

IETF 117 SAVNET WG

Recent Progress of SAV Open Playground

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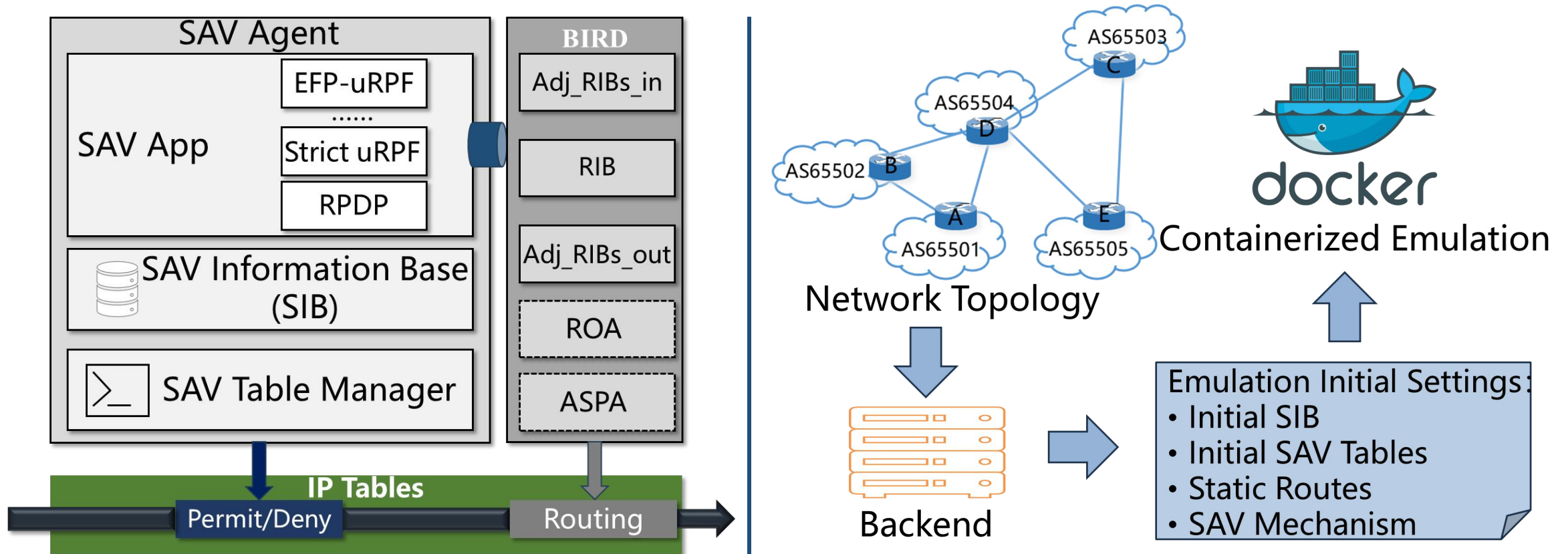
Zhongguancun Laboratory

SAVNET WG Meeting, IETF 117

July 27, 2023

Review of the 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/savop>



SAVOP's Contributions to SAVNET WG

SAVOP helps the completion of WG Charter items.

SAVOP

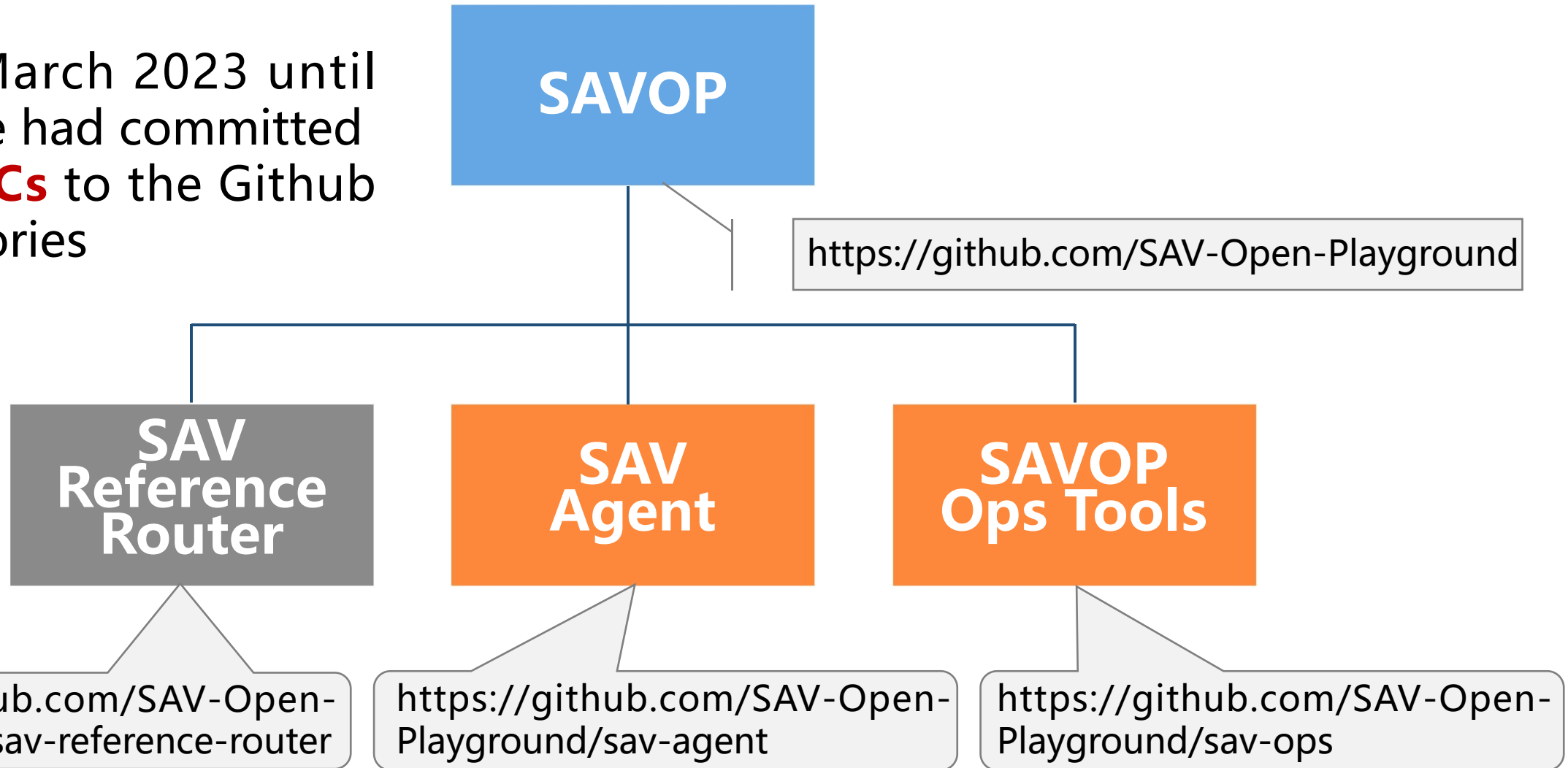
- Implement and emulate the uRPF-based SAV mechanisms in different network scenarios, and analyze the emulation results
- Implement and emulate a new SAV mechanism called RPDP, which is implemented by extending BGP, and demonstrate its accuracy improvement upon existing mechanisms
- Plan to implement new mechanisms for generating SAV rules by extending BGP and emulate them in various network scenarios

Charter of SAVNET WG

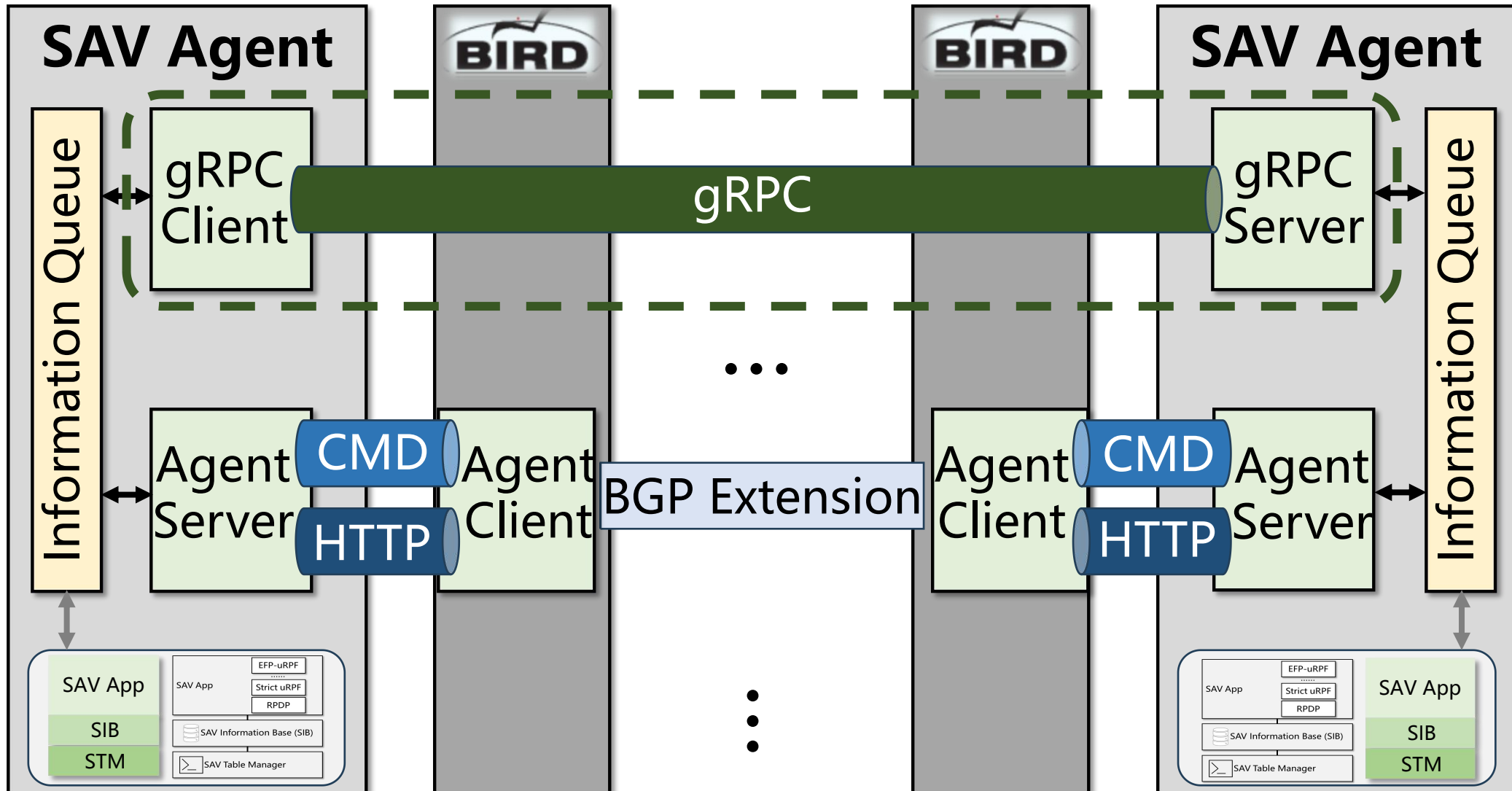
- ...existing SAV mechanisms like uRPF-related technologies may improperly permit spoofed traffic or block legitimate traffic...
- ...should include an analysis of the current solutions and their limitations...
- ...The accuracy of the new SAV mechanisms is expected to improve upon the current ones...
- ...The SAVNET WG will coordinate and collaborate with other WGs as needed. Specific interactions may include (but are not limited to): idr for BGP extensions...

Code Organization

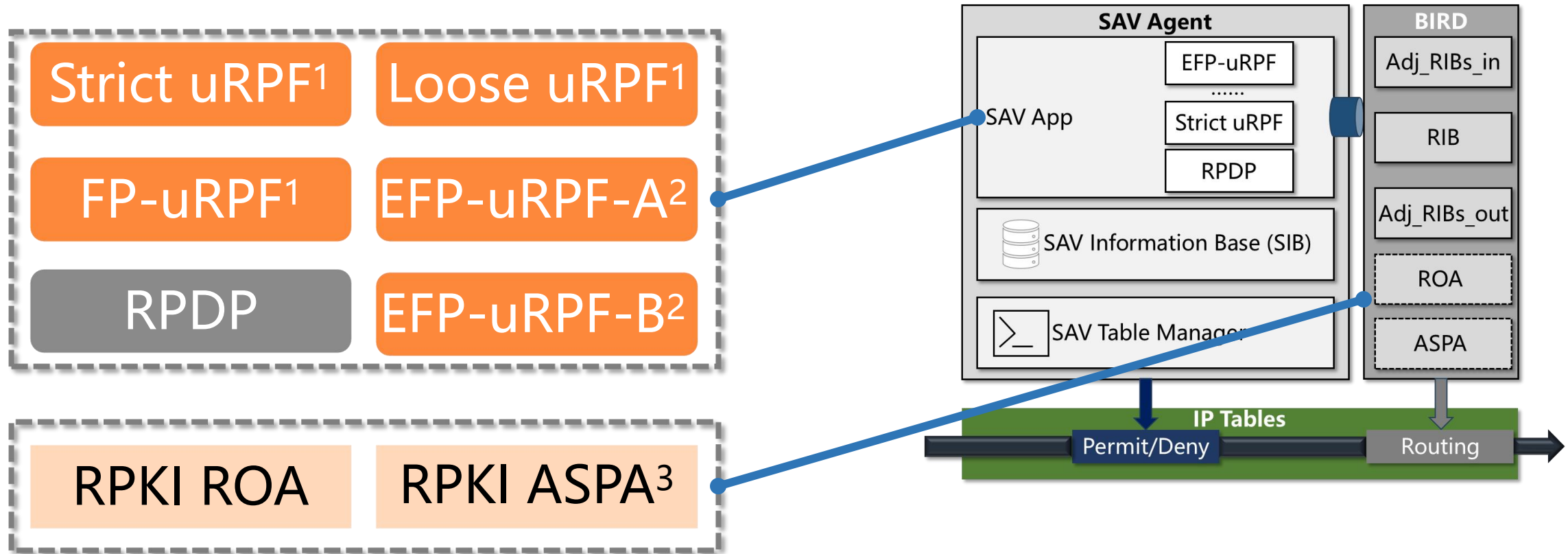
From March 2023 until now, we had committed **15K LoCs** to the Github repositories



Communication Methods between SAV Agents



SAV Mechanisms Implemented by SAV Agent

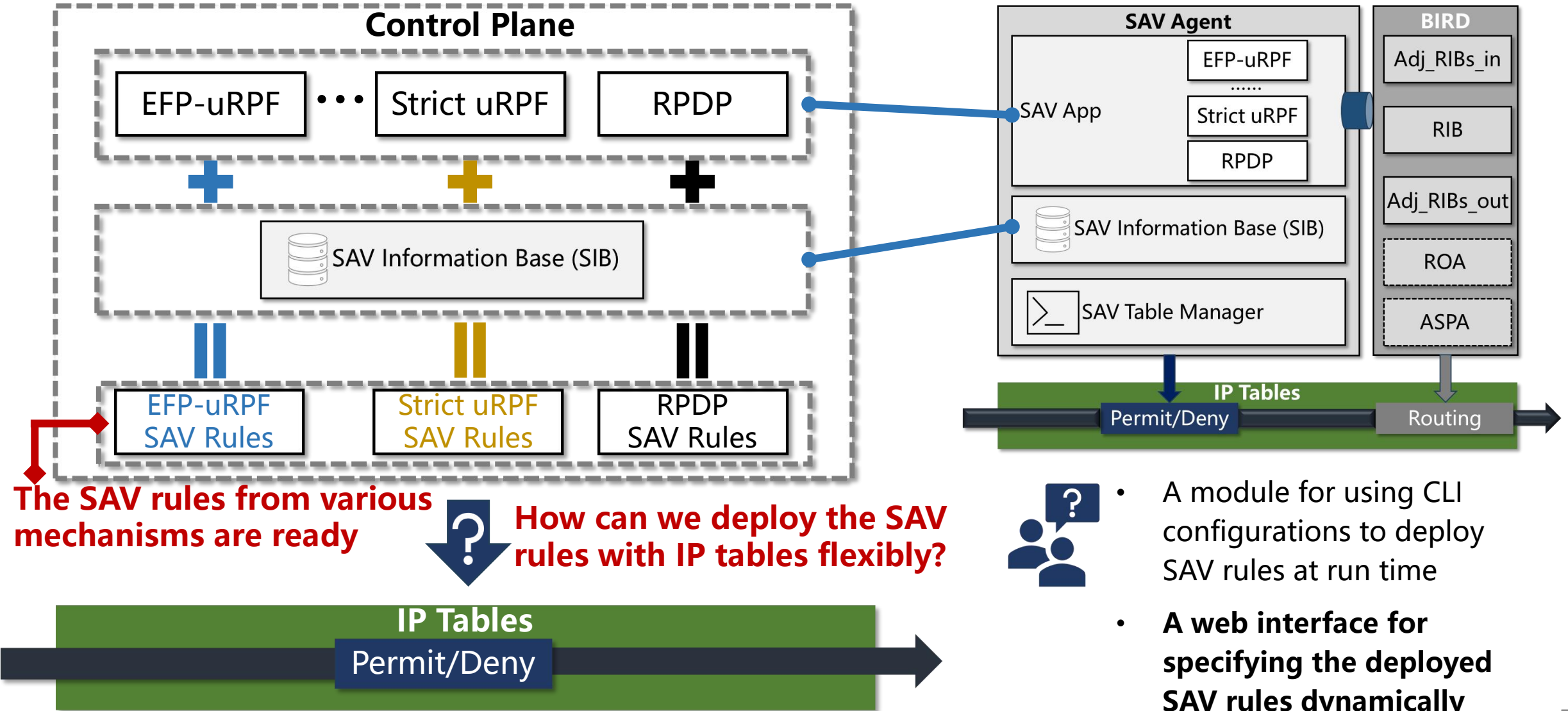


¹RFC3704: <https://datatracker.ietf.org/doc/html/rfc3704>

²RFC8704: <https://datatracker.ietf.org/doc/html/rfc8704>

³NLnetLabs: <https://github.com/NLnetLabs>

Flexible Deployment of SAV Rules



The SAVOP Traffic Generator

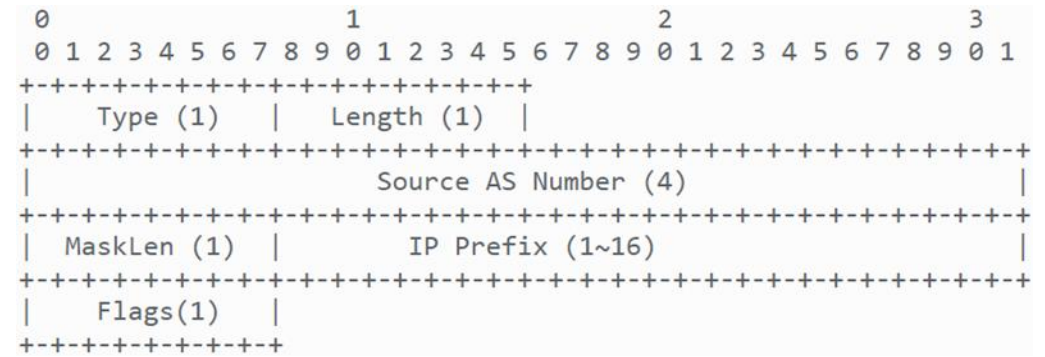
- A UDP-based traffic generator has been implemented and has the following features to support the emulations of various SAV scenarios

Features	Functions
Configuring source and destination addresses flexibly	Generating the traffic with the legitimate source addresses
	Generating the traffic with the spoofing source addresses
Configuring the volume of generated traffic dynamically	Testing whether network configurations for routing work correctly
	Testing whether the SAV table in the data plane work correctly
Reporting the traffic statistics in a real-time manner	Obtaining the functioning results for the legitimate traffic in real time
	Obtaining the functioning results for the spoofing traffic in real time
Supporting flexible deployment of the generator	Making the traffic sender connect to any containerized routers easily
	Making the traffic receiver connect to any containerized routers easily

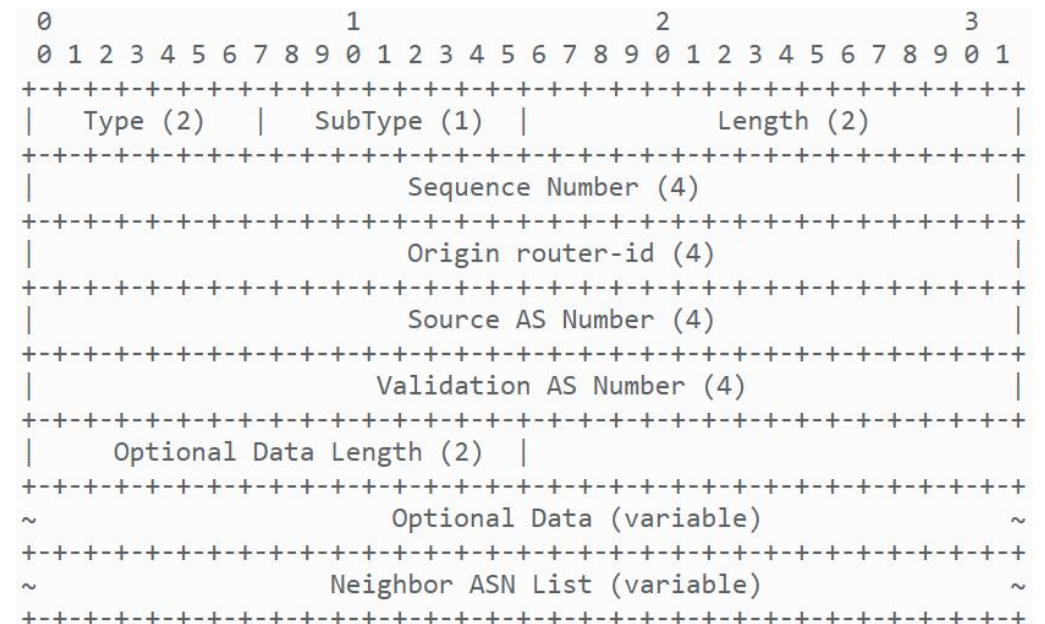
The Future Development Plan of SAVOP

- We have aligned the SAVNET BGP extensions with vendors
 - ◆ <https://datatracker.ietf.org/doc/draft-geng-idr-bgp-savnet/>
 - ◆ New BGP SAFI: 251
 - ◆ Using BGP UPDATE message to propagate SPA
 - MP_REACH_NLRI for updating prefixes
 - MP_UNREACH_NLRI for withdrawing prefixes
 - ◆ Using BGP REFRESH message to propagate SPD

□ We plan to implement the mechanisms of SPA and SPD based on the BGP extensions aligned with vendors and present the outcomes at the IETF 118 meeting



SPA (Source Prefix Advertising) TLV Format



SPD (Source Path Discovery) TLV format

Thank you 😊

Backup

SAVOP Architecture Overview

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SAVOP Architecture

Web App visualizes the workings of SAV mechanisms in a scenario

