Intra-domain Source Address Validation (SAVNET) Architecture

draft-li-savnet-intra-domain-architecture-01

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Main Updates

solution

draft-li-savnet-intra-domain-architecture-00

A preliminary solution to automatically generating accurate SAV rules through message interactions between routers

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An architecture collecting SAV information from multiple information sources for automated and accurate SAV rule generation

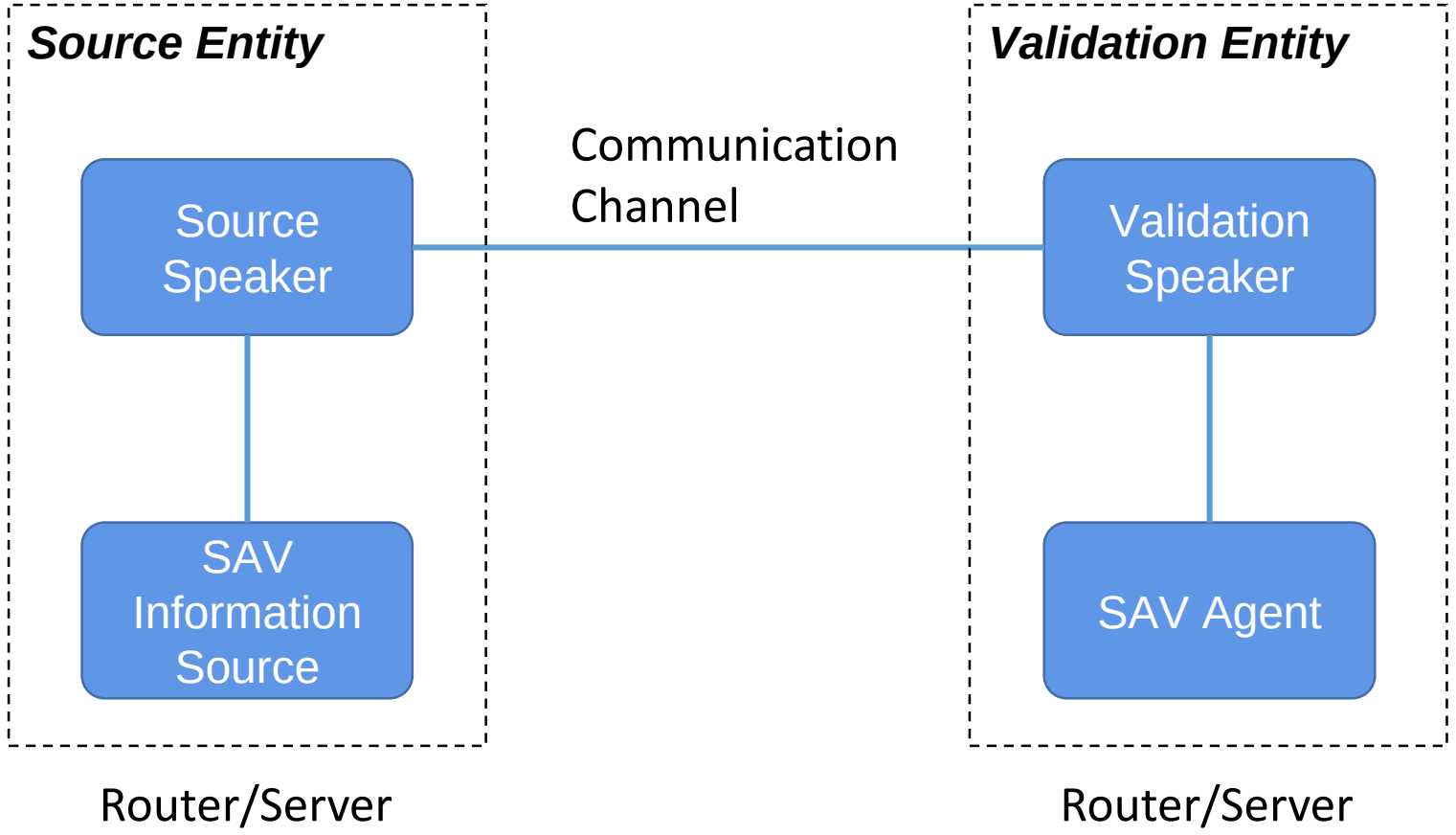
Many thanks to the related comments and suggestions from Alvaro, Igor, Aijun, Joel, Jared, Sriram, …

SAV Information Source

- Required SAV information for SAV rule Generation
  - All source addresses/prefixes even not advertised by route
  - All real incoming directions and limited non-real incoming directions
- Information sources of SAV mechanisms
  - Configuration (e.g., ACL-based filtering)
  - Routing protocols (e.g., strict uRPF and loose uRPF)
  - SAV protocols (new) (e.g., IGP-extended SAV, BGP-extended SAV)
  - etc.
- SAV protocols
  - Newly defined information source representing the proposed protocols for advertising SAV-related information
  - It can provide complete or additional information (e.g., hidden prefixes or real path discovery) for accurate validation

Intra-domain SAVNET Architecture

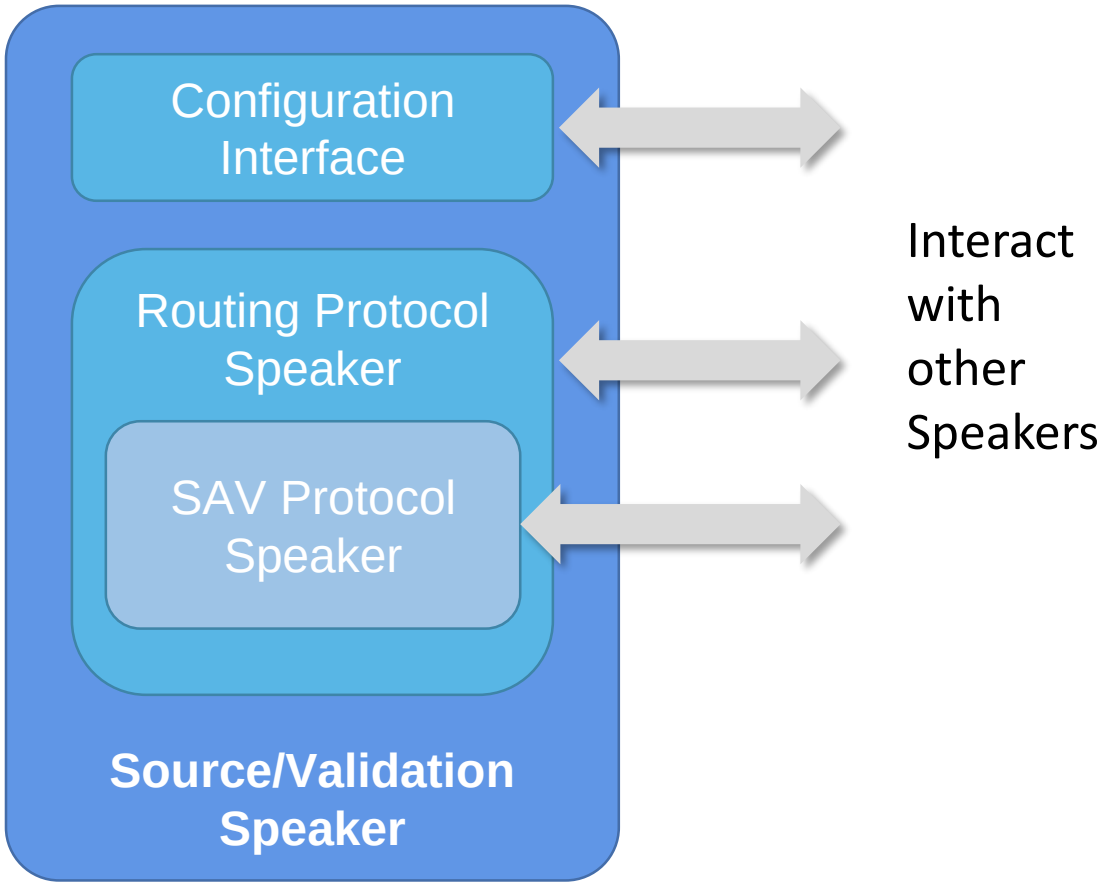
- Source Entity
  - Advertise SAV-related information
- Validation Entity
  - Generate SAV rules and/or conduct validation
- A device can be both the source entity and the validation entity



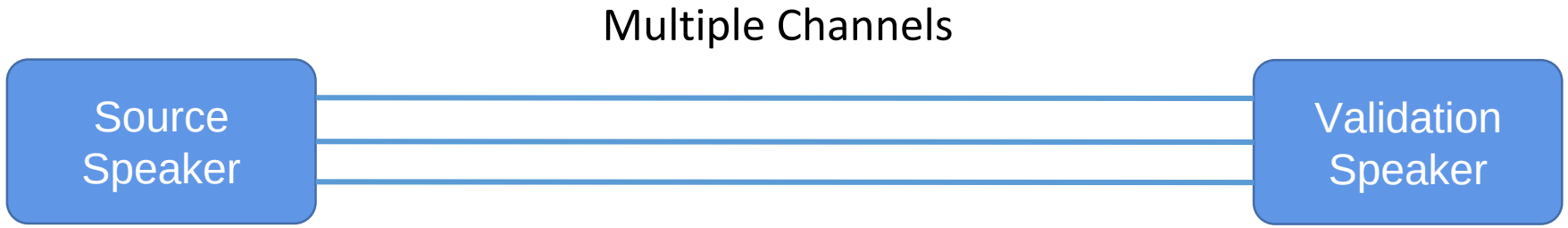
Source Speaker and Validation Speaker

- Source/Validation Speaker
  - An abstracted speaker, which is a union of multiple "speakers" (also information sources)

1. Configuration Interface
   - CLI, YANG, FlowSpec, and any protocols for SAV
2. Routing Protocol Speaker
   - OSPF, IS-IS, BGP, etc.
3. SAV protocol Speaker
   - Can be an extension to the routing protocol speaker



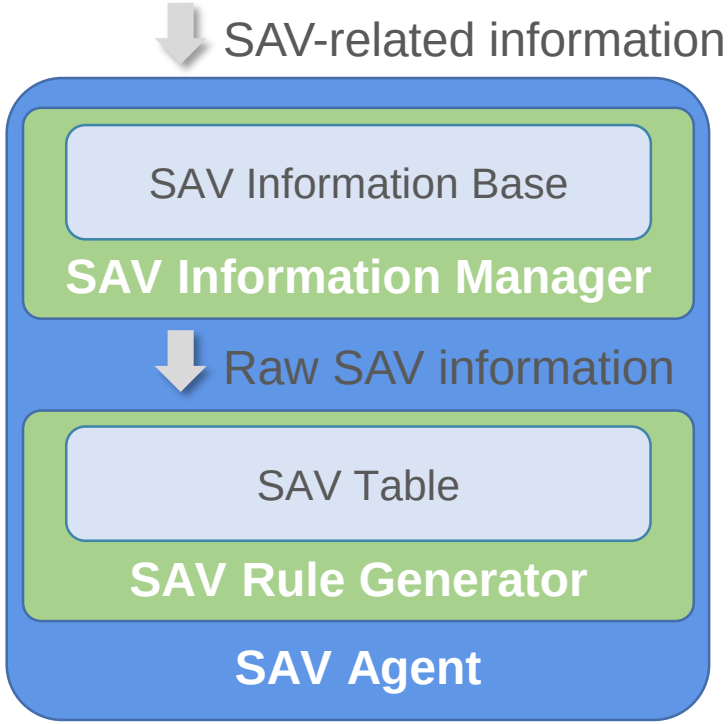
Communication Channel and Messages



- Channels
  - Constructed between configuration interfaces, routing protocol speakers, or SAV protocol speakers
- Messages
  - SAV rule, e.g., <prefix, interfaces, validity state actions>
  - Route information, such as prefixes, links, or feasible paths
  - Forwarding information, e.g., preferred paths of prefixes

SAV Agent

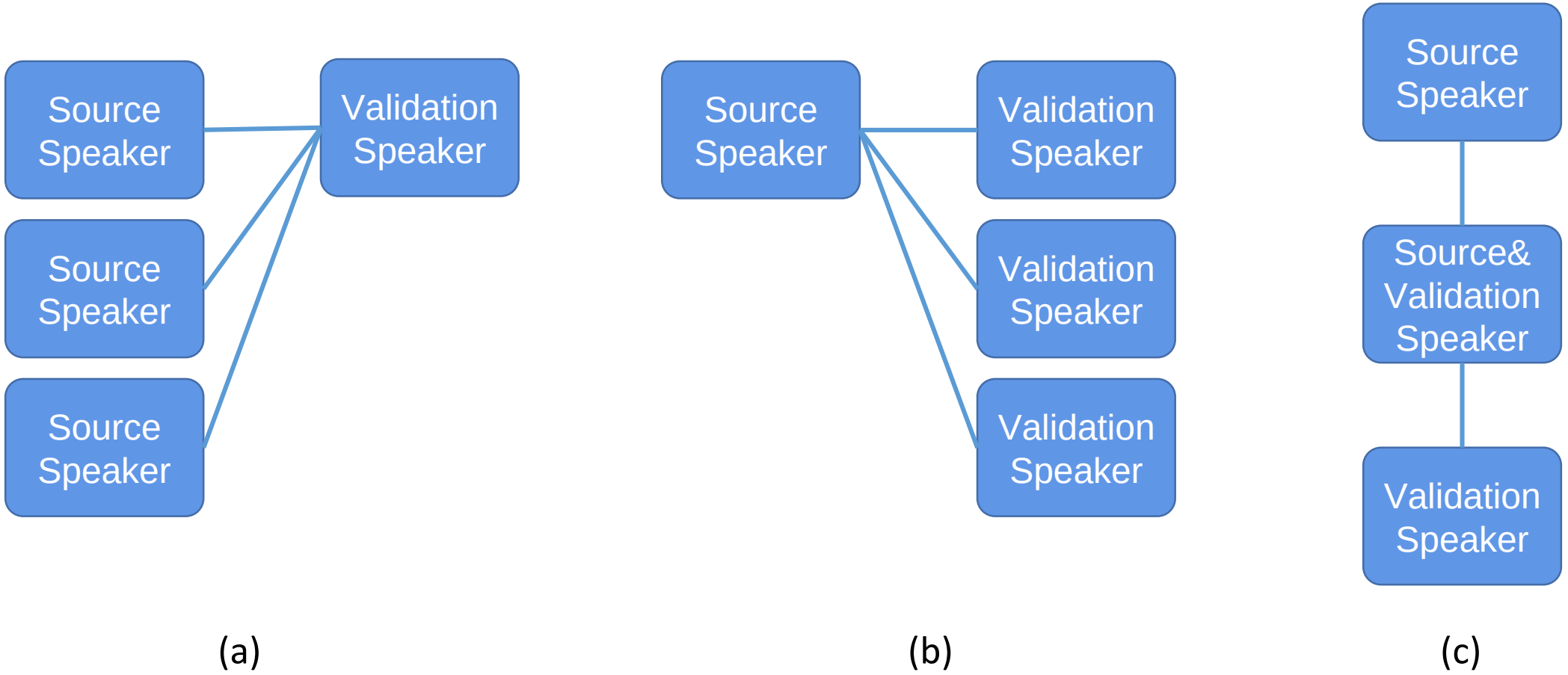
- SAV information Manager
  - Store SAV-related information from the Validation Speaker
  - Raw data with many details
- SAV Rule Generator
  - SAV rule: <prefix, interfaces, validity states>
  - Rules stored in SAV Table (draft-huang-savnet-sav-table)
- Rule conflicts due to multiple information sources
  - Priorities can be set to these sources



Example 1:
High priority source X: <P1, intf1>
Low priority source Y: <P1, intf2>
Output SAV rule: <P1, intf1>

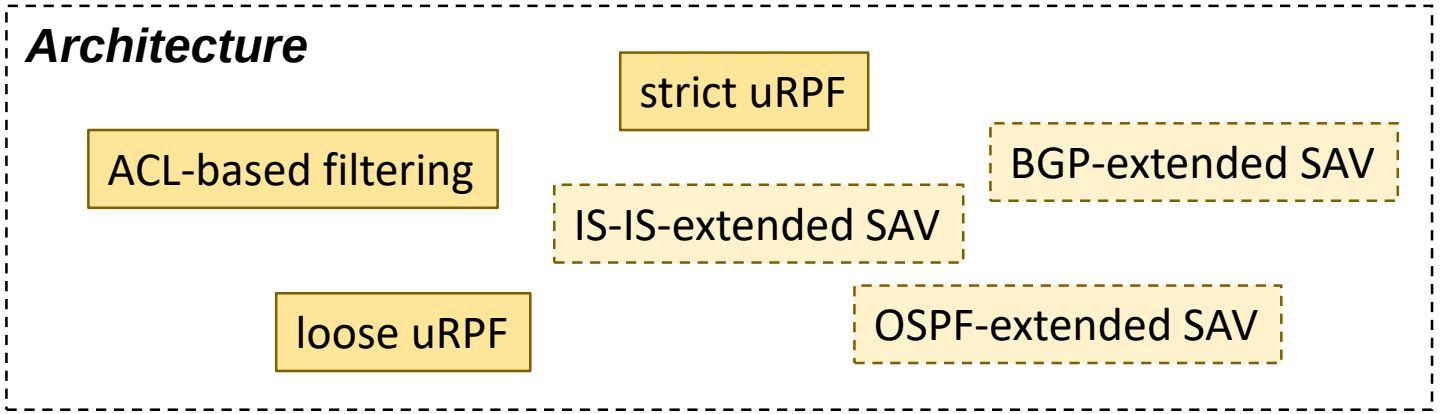
Example 2:
Same priority source X: <P1, intf1>
Same priority source Y: <P1, intf2>
Output SAV rule: <P1, [intf1, intf2]>

Connectivity Models



Conclusion

- Propose a high-level architecture design
  - Besides configuration and routing protocols, SAV protocols are included for improving validation
  - Suitable to any route-based SAV mechanisms. The architecture can be used for
    - Analyzing existing SAV mechanisms
    - Improving validation based on existing mechanisms
    - Designing new SAV mechanisms



Next Steps

- Now a preliminary and incomplete architecture. Just a start.
- Any comments are welcome, and welcome to collaborating in contributing to the draft.
- According to the status of the problem statement draft, update the draft and provide the first complete design of the architecture.

Thanks!