IGP-based Source Address Validation in Intra-domain Network (Intra-domain SAVNET)

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Introduction

- [draft-ietf-savnet-intra-domain-problem-statement] summarizes the problems of existing intra-domain SAV solutions [BCP38, BCP84]
- [draft-ietf-savnet-intra-domain-architecture] proposes the architecture of intra-domain SAVNET to address the problems of existing intra-domain SAV solutions
- [draft-li-savnet-source-prefix-advertisement] proposes a protocol-independent SAV solution (i.e., SPA-based SAVNET) under intra-domain SAVNET architecture
- This document proposes an IGP-based method to implement SPA-based SAVNET in an intra-domain network

Quick Review of SPA-based SAVNET

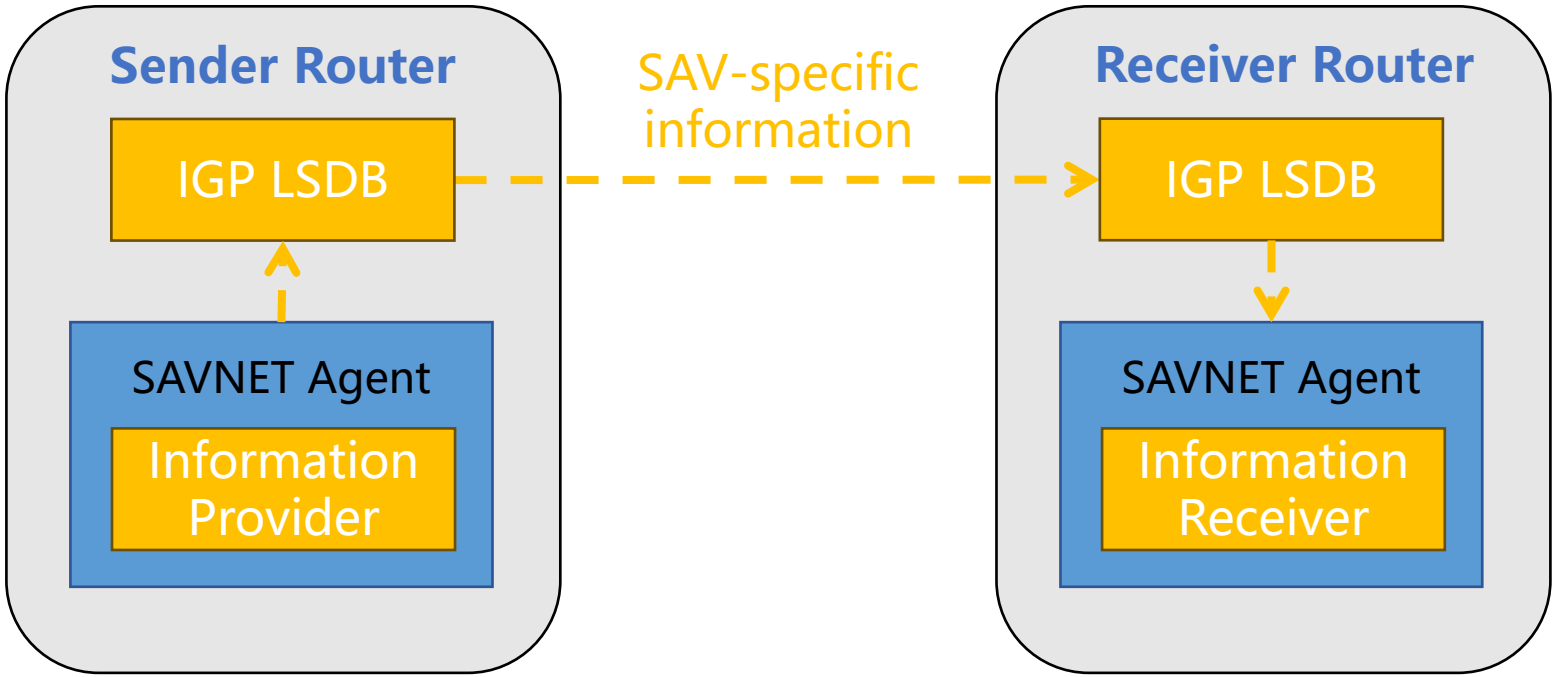
- SPA-based SAVNET requires edge routers provide SAV-specific information to other routers through SPA messages
  - SAV-specific information contains Source Prefix, Interface Type, Subnet Tag, and Only Source Flag
    - Source prefix is learned through the router's local route to the facing subnet
    - Only Source Flag is set by default
  - Edge routers and AS border routers generate prefix allowlists or blocklists by using SPA messages
- How to learn the Interface Type and Subnet Tag, and how to transmit SAV-specific information are not described in SPA-based SAVNET
  - The focus of this document

How to learn the Interface Type and Subnet Tag

- The **Interface Type** is configured based on the topology
- Each subnet is assigned a unique **Subnet Tag** value when it first connects to the edge routers
- The edge router can **automatically** match the Interface Type and Subnet Tag to source prefixes of the corresponding subnet
- Different from ACL-based SAV, manual configurations are not needed when the source prefix of a subnet changes
  - ◆Only Interface Type may need to be updated when the topology changes
    - ➢For example, from Single-homing Interface to Complete Multi-homing Interface
  - ◆Require **less operational overhead** than ACL-based SAV

SAV-specific Information Communication

- The SAVNET Agent of a Sender Router can provide its SAV-specific information to other SAVNET routers by using IGP
  - ◆When an edge router distributes IP prefix information of its subnet via IGP, it can **carry the Interface Type, Subnet Tag, and Only Source Flag with the IP prefix information**



Two Approaches to SAV-specific Information Communication

- Approach #1: Use the existing Administrative Tag Sub-TLV to carry Interface Type, Subnet Tag, and Only Source Flag

- Approach #2: Define a new SAVNET Tag Sub-TLV to carry Interface Type, Subnet Tag, and Only Source Flag

Approach #1

- Use the existing Administrative Tag Sub-TLV to carry Interface Type, Subnet Tag, and Only Source Flag
  - Administrative Tag Sub-TLV of IS-IS [RFC 5130]
  - Administrative Tag Sub-TLV of OSPF [draf-ietf-lsr-ospf-admin-tags]
  - Administrative Tag Sub-TLV of OSPFv3 [draf-ietf-lsr-ospf-admin-tags]
- Limitation
  - Since the Administrative Tag Sub-TLV is not designed for SAV, using the Administrative Tag Sub-TLV may conflict with other routing policies that also use Administrative Tags
    - Additional operations are needed to avoid possible conflicts

Approach #2

- Define a new SAVNET Tag Sub-TLV to carry Interface Type, Subnet Tag, and Only Source Flag
  - A new SAVNET Tag Sub-TLV for IS-IS
  - A new SAVNET Tag Sub-TLV for OSPF
  - A new SAVNET Tag Sub-TLV for OSPFv3
- Advantage
  - Avoid conflicts with routing policies using existing Sub-TLVs and facilitate the operation of SAV

Next Step

- Improve the preliminary design of IGP-based method
- Your comments and suggestions are welcome!
  - Which approach is more appropriate?
  - Can Interface Type, Subnet Tag, and Only Source Flag be configured and updated in an automatic way?
  - ……

Thanks!