IGP Extensions for Source Prefix Identification

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Problem Statement and Requirement

- Existing intra-domain SAV mechanisms have high operational overhead or inaccurate validation problems
  - See draft-ietf-savnet-intra-domain-problem-statement

- To address these problems, intra-domain SAVNET architecture requires routers to exchange SAV-specific information, which helps generate more accurate SAV rules
  - The new intra-domain SAV solution should design an automatic way to communicate SAV-specific information among routers
Key Idea of Source Prefix Identification (SPI)

Asymmetric routing scenario:

- Router A only learns the route to 10.1.0.0/16 from Network N
- Router B only learns the route to 10.0.0.0/16 from Network N

- Each host (or customer) network is assigned a unique tag value (e.g., tag n for Network N)
- Each host-facing (or customer-facing) router provides SPI information to other routers
  - SPI information contains the prefixes learned through its local routes to its host (or customer) network and the tag value of the network
- When a router receives SPI information with the same tag value as its host (or customer) network
  - It considers that the prefixes contained in the SPI information also belong to the host (or customer) network

SPI on host-facing and customer-facing routers:

- Each host (or customer) network is assigned a unique tag value (e.g., tag n for Network N)
- Each host-facing (or customer-facing) router provides SPI information to other routers
  - SPI information contains the prefixes learned through its local routes to its host (or customer) network and the tag value of the network
- When a router receives SPI information with the same tag value as its host (or customer) network
  - It considers that the prefixes contained in the SPI information also belong to the host (or customer) network
Key Idea of Source Prefix Identification (SPI)

- After receiving SPI information from host-facing and customer-facing routers, AS border routers can identify source prefixes of each host network and customer network accordingly.
IGP Extension Considerations

- IS-IS extension consideration
  - Possible solution: carrying the tag in the Administrative Tag Sub-TLV when distributing IP prefix information
  - A new Sub-TLV may be needed for customer-facing routers

- OSPF extension consideration
  - Possible solution: carrying the tag in the Route-Tag when distributing IP prefix reachability information
  - An extension to Route-Tag or a new Sub-TLV may be needed
Next Step

- Improve the design of IGP extensions
- Any comments and suggestions are welcome
- Cooperation is welcome
Thanks!