Source Prefix Advertisement for Intra-domain SAVNET

Presenter: Lancheng Qin

November 2025

Main Updates

- Revise Section 3 (SAV-specific information in Intra-domain SPA)
  - ◆Introduce a Hidden Prefix Registration (HPR) mechanism to address intra-domain hidden prefixes
- Revise Section 4 (SAV Rule Generation Procedure)
- Add Section 5 (Operational Considerations)

SAV-specific Information

- Source Entity Identifier (SEI) identifies the source entity that originates traffic
  - A Source Entity Identifier (SEI) is a unique identifier assigned by the network operator to represent a source entity
    - Source entity can be either a non-BGP customer network or a host connected to a SAVNET router
  - SAVNET routers include the SEI in the routes they advertise within the domain. When other routers receive such route advertisements, they can identify that multiple routes belong to the same source entity by comparing SEIs
    - **SEI can be used to avoid improper blocking under asymmetric routing scenario**
- Hidden Prefix Registration (HPR) provides authoritative information about hidden prefixes legitimately used by the source entity
  - The operator maintains an HPR database that records each registered hidden prefix and binds it to the SEI of the corresponding source entity
    - When a source entity wishes to register a hidden prefix, it must provide authorization proof that it is legitimately allowed to source traffic from that prefix. One possible proof is a Traffic Origin Authorization (TOA) object signed by the prefix holder
  - SAVNET routers can query or periodically retrieve HPR data from the database
    - **HPR can be used to avoid improper blocking under hidden prefix scenario**

SAV Rule Generation Procedure

- At external interfaces facing a non-BGP customer or a set of hosts
  - Identify source entities: For all source entities connected to the router, create a set of their corresponding Source Entity Identifier (SEI) values. Denote this set as Set A.
  - Associate prefixes with SEIs: Using all available SAV-specific information, for each SEI value in Set A, obtain the set of source prefixes associated with the same SEI value.
  - Construct the **allowlist**: Include these prefixes in the allowlist SAV rule of the interface that connects to the corresponding source entity (i.e., the interface associated with the same SEI value
- At external interfaces facing an external AS
  - Extract internal-use prefixes: Select all unique prefixes from the routing information learned via the intra-domain routing protocol
  - Filter out externally valid prefixes: Exclude prefixes that have an external AS number (ASN) listed as the origin in a valid ROA or TOA
  - Construct the **blocklist**: Include the remaining prefixes in the blocklist SAV rule for interfaces facing external ASes

Operational Considerations

- Management of the Hidden Prefix Registration Database
  - Operator maintains the HPRD: recording hidden prefixes and their bound SEIs
  - Each entity (host tenant or non-BGP customer operator) registers its legitimate prefixes
  - Must provide proof of authorization (e.g., valid TOA)
  - Access control enforced — each entity manages only its own data
- Synchronization with SAVNET Routers
  - Routers must stay up-to-date to avoid:
    - Blocking legitimate traffic, or
    - Allowing spoofed traffic
  - Consistency across routers ensures coherent SAV behavior
- SEI Assignment and Configuration
  - For entities connected to multiple routers, all routers must use the same SEI at interfaces facing the same entity for correct prefix identification

Next Step

- Cooperation is welcome!
- Comments and suggestions are welcome

Thanks!