Lowering Improper Block and Improper Admit for SAV
The BAR-SAV Approach

https://datatracker.ietf.org/doc/html/draft-sriram-sidrops-bar-sav-01

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Requirements for a SAV Solution

- Improved fidelity – reduce **improper block** and improper permit
  - Improper block should aim to be no worse than Loose-RPF (i.e., aim for 0%)
- High-quality implementation – a failure should not increase improper block

- Incrementally deployable – offers immediate benefits to early adopters
- Economical – benefits outweigh the costs (especially for early adopters)

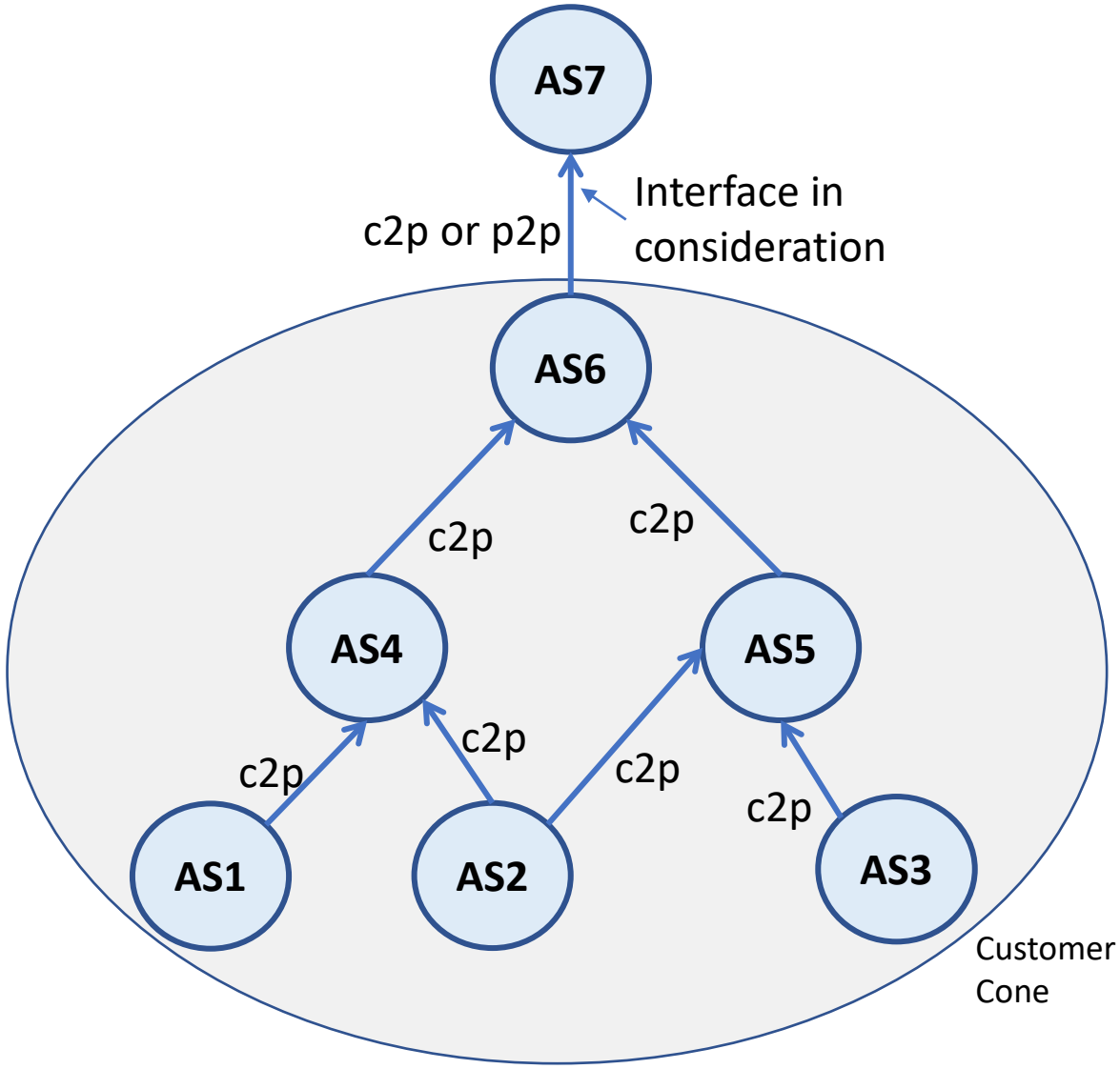
- Ease of adoption – both in terms of "human factors" and available hardware
  - Fewer new concepts and systems to learn and manage for humans
  - Works on existing hardware (and cross-vendor)

- Network effect – late movers are feeling greater pressure to adopt
  - Pressure types: reputational, contractual, economic, legal, technical

BAR-SAV (BGP, ASPA, ROA - SAV)

- History: BCP 38 → RFC 3704 (FP-RPF) → RFC 8704 (EFP-uRPF) → BAR-SAV
- Primary goal is to reduce improper block due to traffic engineering, such as NO_EXPORT, traffic engineering communities, direct server return (DSR), etc.
- An improvement on EFP-uRPF Alg. A [RFC 8704]
  - Improved BGP AS_PATH processing (make use of all ASes, not just origin AS)
  - Makes complementary use of BGP UPDATEs, ASPAs, and ROAs
- BAR-SAV is still using signals (BGP, ASPA, ROA) not designed for SAV purposes
- For a detailed presentation on the BAR-SAV method, please see: https://datatracker.ietf.org/meeting/114/materials/slides-114-sidrops-source-address-validation-using-bgp-updates-aspa-and-roa-bar-sav-00

BAR-SAV Operation



1. **Customer Cone construction**
   Starting with the customer (or peer) ASN, iteratively obtain the set of ASNs using "customer-of" and "previous-AS" relationships in ASPAs and AS_PATHs.
2. **SAV Prefix List construction**
   a. Gather all prefixes in ROAs associated with the ASNs found in Step 1.
   b. Gather all prefixes in BGP UPDATE messages with originating ASN among ASNs found in Step 1.
   c. Combine sets found in Steps 2a and 2b. Keep only the unique prefixes.
   This is the permissible prefix list for SAV for the interface in consideration.

SAV Requirements: BAR-SAV

- Improved fidelity – reduce **improper block** and improper permit
  - Improved detection of hidden prefixes due to traffic engineering (NO_EXPORT, DSR, etc.)
  - Can provide an excellent SAV filter, if a Customer Cone has full adoption of ASPA and ROA
- High-quality implementation – new Implementation Guidelines section (§6.5)
- Incrementally deployable – depends only on BGP and RPKI, not other networks
- Economical – RFC 8704 estimates that a SAV list would take 1%-2% of RAM
- Ease of adoption – both in terms of "human factors" and available hardware
  - No new technologies to learn or manage beyond BGP and RPKI (ROA and ASPA)
  - Only requires support for "allow" CIDR lists for SAV. For example, can use VRF to implement.
- Network effect – providers benefit from customers implementing ASPA and ROA
  - But no pressure on providers to implement BAR-SAV when customers implement it