RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RPKI AS-Cones

Bringing AS-Sets Functionality to RPKI

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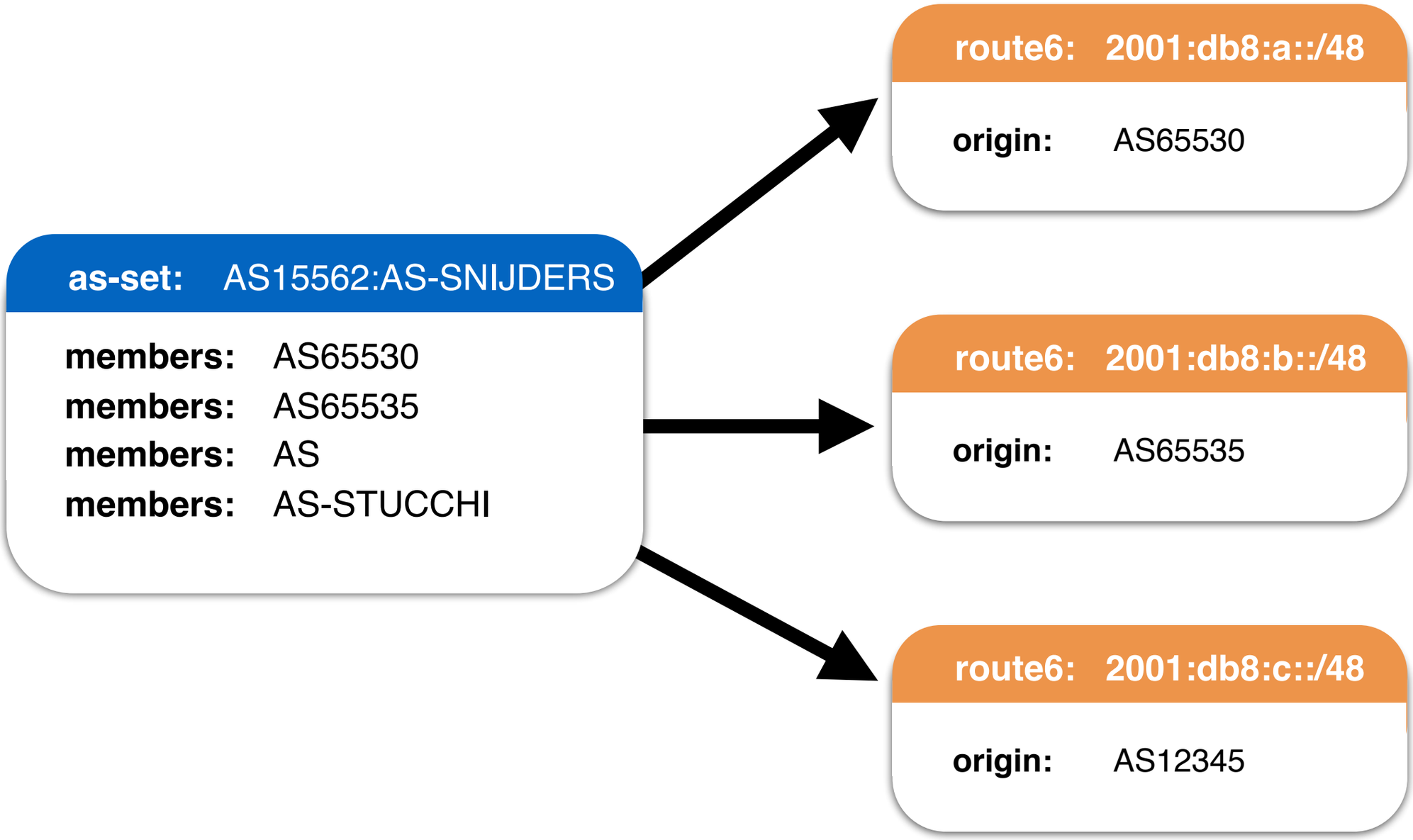
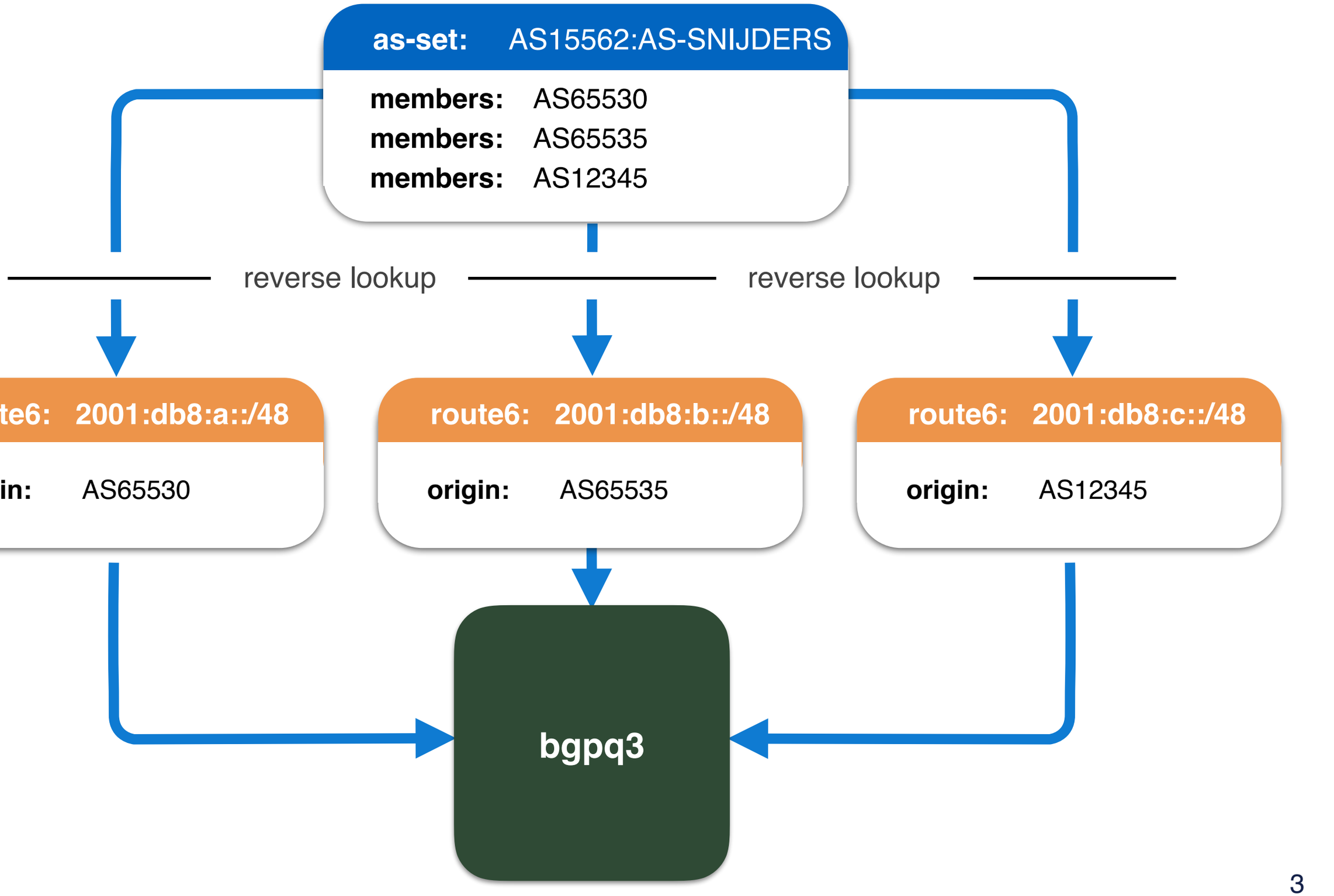
ROUTE Objects and AS-Sets



Generating a Prefix Filter

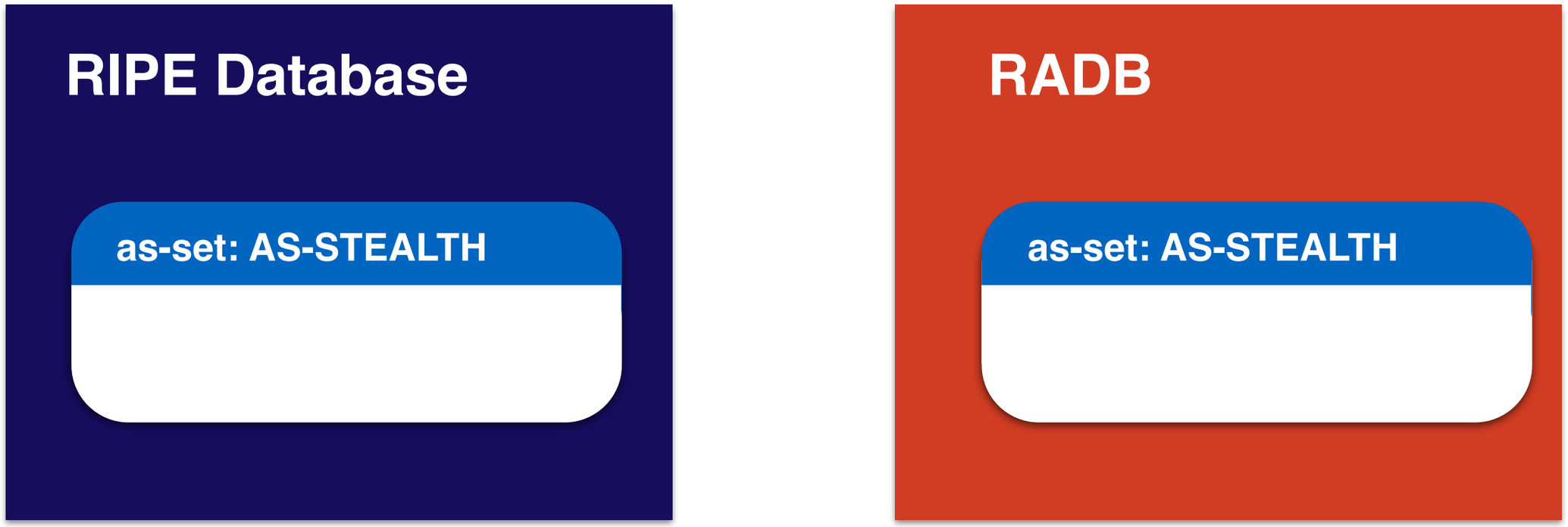


Generating a Prefix Filter

```
$ bgpq3 -h rr.ntt.net -l AS15562-in AS15562:AS-SNIJDERS
no ip prefix-list AS15562-in
ip prefix-list AS15562-in permit 67.221.245.0/24
ip prefix-list AS15562-in permit 165.254.255.0/24
ip prefix-list AS15562-in permit 165.254.255.0/26
ip prefix-list AS15562-in permit 165.254.255.26/32
ip prefix-list AS15562-in permit 165.254.255.64/26
ip prefix-list AS15562-in permit 165.254.255.132/32
ip prefix-list AS15562-in permit 165.254.255.133/32
ip prefix-list AS15562-in permit 165.254.255.144/28
ip prefix-list AS15562-in permit 165.254.255.149/32
ip prefix-list AS15562-in permit 165.254.255.160/28
ip prefix-list AS15562-in permit 192.147.168.0/24
ip prefix-list AS15562-in permit 204.2.30.0/23
ip prefix-list AS15562-in permit 204.42.254.192/26
ip prefix-list AS15562-in permit 209.24.0.0/16
```

Limitations of AS-Sets

- Can exist in multiple IRRs



- AS-STEALTH exists in both the RIPE Database and RADb
- The two are not managed by the same company

How to Discover What AS-Set to Use?

- Ask people in the service order form
- Look at PeeringDB
- Different trust levels based on the IRR

RPKI

- **A ROA is very similar to a ROUTE object**
  - With Prefix and Origin
  - With an additional field: maxLength

- **RPKI is data you can trust**
  - We know the ROAs are created by the holders of the address space

Enter AS-Cones

AS-Cones

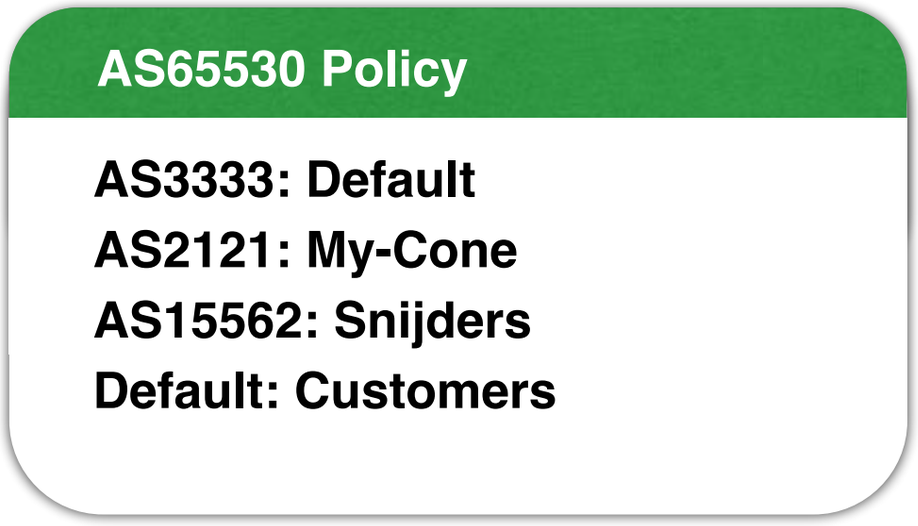
- **New IETF Draft**
  - https://datatracker.ietf.org/doc/draft-ss-grow-rpki-as-cones/

- **Goals**
  - Create more feature parity between IRR and RPKI
  - Make provisioning operations easier
  - Go global, independent from IRR

Features of AS-Cones

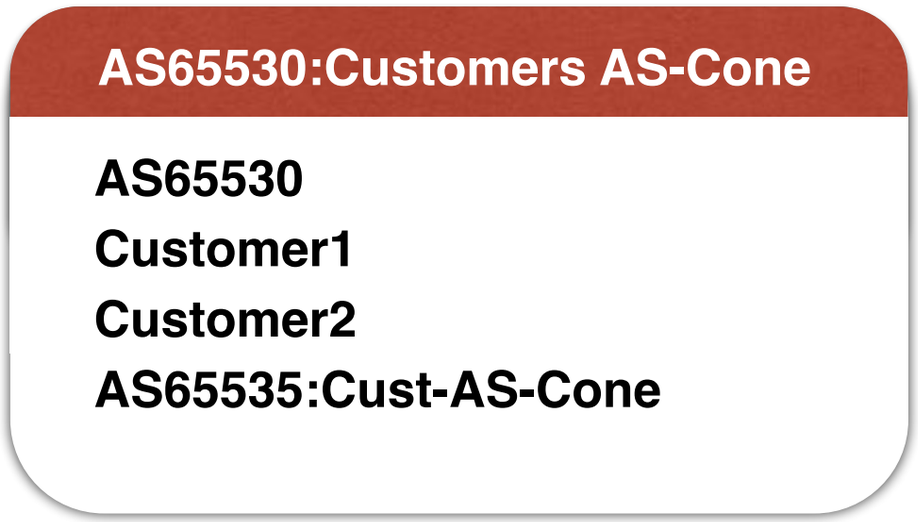
- Granularity of declarations
- Default namespace
- Simple validation process
- Stub networks don’t need to do anything

Policy Object



- **Must contain a “Default” policy**
  - Which, by default, contains only the ASN
- **Every relationship can point only to an AS-Cone**
  - No reference to only one ASN (for this, create an AS-Cone)

AS-Cone Object



- **Contains a list of ASNs or AS-Cones from customer networks**

- **Referenced as ASXXXX:Cone_name**
  - Name must be unique only per ASN

Finding Policies and AS-Cones

- Policies and AS-Cones should be distributed by your favourite Validator
- To generate prefix filters, access the validated cache via an API

Generating Prefix Filters with AS-Cones

- **As an upstream, read the policy definition for your customer network. Check:**
  - If it contains a specific policy declaration, otherwise Default
- **Take the AS-Cone referenced**
- **Walk the AS-Cone, create a list of all the ASN included**
  - If you find circular AS-Cones declaration, discard them
- **For every ASN, pick all the ROAs where it's listed as originator**

AS65530 Policy

AS3333: Default
AS2121: My-Cone
Default: Customers

AS65530:Customers

AS65531
Customer1
Customer2

AS65531:Customers

AS65534
Customer10
Customer20

AS65532:Customers

AS65535
Customer30
Customer40

AS65533:Customers

AS65536
Customer21
Customer22

AS65534:Customers

ASXXXXX

AS65556:Customers

AS6553YY

AS65530:Customers

AS6553X
Customer1XX
Customer2XX

AS65542:Customers

AS655XX

AS65543:Customers

AS655YY

AS65544:Customers

AS655YY

AS65546:Customers

AS65563
Customer1
Customer2

References

- **Material on Github**
  - https://github.com/bgp/draft-ss-grow-rpki-as-cones

- **Discussion welcome in the Grow IETF WG**

Questions

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