# Improving Route Object processes in WHOIS

George Michaelson, APNIC R&D

# Route Object Template

| | | | |
|---|---|---|---|
| route: | [mandatory] | [single] | [primary/look-up key] |
| descr: | [mandatory] | [multiple] | [ ] |
| origin: | [mandatory] | [single] | [primary/inverse key] |
| holes: | [optional] | [multiple] | [ ] |
| country: | [optional] | [single] | [ ] |
| member-of: | [optional] | [multiple] | [ ] |
| inject: | [optional] | [multiple] | [ ] |
| aggr-mtd: | [optional] | [single] | [ ] |
| aggr-bndry: | [optional] | [single] | [ ] |
| export-comps: | [optional] | [single] | [ ] |
| components: | [optional] | [single] | [ ] |
| remarks: | [optional] | [multiple] | [ ] |
| notify: | [optional] | [multiple] | [inverse key] |
| mnt-lower: | [optional] | [multiple] | [inverse key] |
| mnt-routes: | [optional] | [multiple] | [inverse key] |
| mnt-by: | [mandatory] | [multiple] | [inverse key] |
| changed: | [mandatory] | [multiple] | [ ] |
| source: | [mandatory] | [single] | [ ] |

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Asserts an origin-AS in origin: over the prefixes in route:

# ROA Object ASN.1 (RFC6482)

```
RouteOriginAttestation ::= SEQUENCE {
      version [0] INTEGER DEFAULT 0,
      asID  ASID,
      ipAddrBlocks SEQUENCE (SIZE(1..MAX)) OF ROAIPAddressFamily }


   ASID ::= INTEGER


   ROAIPAddressFamily ::= SEQUENCE {
      addressFamily OCTET STRING (SIZE (2..3)),
      addresses SEQUENCE (SIZE (1..MAX)) OF ROAIPAddress }


   ROAIPAddress ::= SEQUENCE {
      address IPAddress,
      maxLength INTEGER OPTIONAL }


   IPAddress ::= BIT STRING
```

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Asserts an origin-AS in asID over the prefixes in ipAddrBlocks with optional maxLength

# Observations

- Route objects
  - Simple use, specify origin-as/prefix relationship
  - *Complex use, to add route qualifiers/aggregation*

- Simple use invokes behavior similar to a ROA

- ROA creation vests with prefix holder only
  - No AS holder input
  - Strong trust in the system to make ROA

- ROUTE: object creation vests in AS and prefix holder
  - Both must countersign a create or update request, if not the same maintainer.

# Observations

- Process delays at APNIC
  - Post- final /8 policy, more people present with prefix only, to be routed by ISP/provider
  - But process to get route object countersigned is clumsy, different provisioning paths in ISP
  - APNIC increasingly asked to intervene, adds delay

- Goal: simplify processes and speed up announcement of new prefixes
  - Change WHOIS permission model to permit simple route: object creation solely on permission of prefix holder.

# Ideas?

- Searching for feedback and suggestions
  - Modest suggestions of our own.
  - Or, what you'd like automated

- Bring RPKI and IRR into alignment
  - "say the same things"
  - Getting a lot to manage
  - Avoid adding to workload

- How about an 'Automatic ROA' creation?
  - Match ROA with route objects. Consistent state in both systems
  - If we go down the 'create a ROA' path
    - Automatic route object
    - Sensible idea? Worth exploring?