



# Using RPKI data for BGP Prefix Filters

Job Snijders - [job@ntt.net](mailto:job@ntt.net)  
LACNIC 30



# What is the RPKI

- “Resource Public Key Infrastructure”
- What NTT, YYCIX, others, use as a source to generate per customer prefix filters
- Publicly available, to help debugging and provide transparency
- By making our source for filter generation publicly available, other parties can inspect what we take into consideration.

# LACNIC has no IRR

- This is **NOT** a problem
- IRR is **old legacy** technology
- LACNIC has excellent RPKI services!
  - So let's use RPKI... :-)

# A route object: the atom

```
$ whois -h rr.ntt.net 192.147.168.0/24
```

```
route:           192.147.168.0/24  
descr:          Job Snijders  
origin:         AS15562  
notify:        job@instituut.net  
mnt-by:        MAINT-JOB  
changed:       job@ntt.net 20161003  
source:        NTTCOM
```

(only the bold lines are relevant in the process)

# Generating a prefix filter

```
job@vurt ~$ whois -h rr.ntt.net '!gAS15562'  
A212  
165.254.255.132/32 165.254.255.26/32  
165.254.255.0/25 165.254.255.144/28  
165.254.255.133/32 192.147.168.0/24  
165.254.255.160/28 165.254.255.149/32  
209.24.0.0/16 204.42.254.192/26  
165.254.255.0/24 67.221.245.0/24  
C  
job@vurt ~$
```

# What is this RPKI thing?

- Remember from the third slide that we **only** care about the CIDR + Origin AS tuple?

## *Route Origin Authorization (ROA)*

```
Origin ASN:          17771
Not valid Before:    2010-12-07 00:00:00
Not valid After:     2011-12-07 23:59:59
Prefixes:            2405:1e00::/32 (max length /48)
                    202.63.96.0/19 (max length /24)
                    49.238.32.0/19 (max length /32)
```



# Using RPKI

- It is a trustworthy authoritative source of data
- We download a JSON dump from the NTT RPKI Cache Validators once a day
  - <https://rpki.gin.ntt.net/api/export.json>
- We convert the JSON into “route:” objects
- We load those IRR objects into rr.ntt.net
- This is to offer customers easier choices
  - Setting up IRR can be cumbersome

# Example output

```
~$ whois -h rr.ntt.net -- "-sRPKI 2001:67c:208c::/48"
route6:      2001:67c:208c::/48
descr:      RPKI ROA for 2001:67c:208c::/48
remarks:    This route object represents routing data retrieved
            from the RPKI
remarks:    The original data can be found here:
            https://rpki.gin.ntt.net/r/AS15562/2001:67c:2...
remarks:    This route object is the result of an automated
            RPKI-to-IRR conversion process.
remarks:    maxLength 48
origin:     AS15562
mnt-by:    MAINT-JOB
changed:    job@ntt.net 20180926
source:    RPKI # Trust Anchor: RIPE NCC RPKI Root
```



# http://irrexplorer.nlnog.net

  

Source code a

Prefix: 199.43.0.43

Matching prefixes

prefix ▲	bgp ◆	level3 ◆	arin ◆	rpki ◆	arin-whois ◆	advice ◆
199.43.0.0/24	10745	22773	10745	10745	10745	Multiple route-object exist with different origins

Showing 1 to 1 of 1 entries

# How to get the RPKI data?

- Free to use: <https://rpki.gin.ntt.net/>
- Free WHOIS server at: **rr.ntt.net**
- Use tools like **bgpq3**  
<https://github.com/snar/bgpq3>
  - **\$ bgpq3 -h rr.ntt.net ASXXXXX**
- Set up your own RPKI validator!
  - <https://github.com/ripe-ncc/rpki-validator-3>
  - <https://github.com/NLnetLabs/routinator>



# The future

- In 2019 NTT will let RPKI objects “supersede” conflicting IRR objects, this will help clean up the IRR
- Lots of other changes planned, using RPKI as IRR data is only an intermediate step towards full RPKI use
- We hope other companies will copy this approach or use our WHOIS/RPKI services.



# Questions?

Job Snijders

NTT Communications

[job@ntt.net](mailto:job@ntt.net)