



# NTT's RPKI Deployment Update

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- ***BGP + RPKI are two different planes*** but they are supposed to work in sync
  - A **lack of automation** increases the risk of incidents
  - A **lack of monitoring** increases the impact of the incidents

# NTT's Prefix Dashboard



Percentage of prefixes covered by ROAs



Percentage of monitored prefixes



BGPalerter is monitoring



RPKI data up to date



6 ROAs are staged

Search

Select RIR



AFRINIC



APNIC



ARIN



LACNIC



RIPE

☐ | Prefix | Description | RIR | Holder | Announced by | Status ↓

☐ | 207.21.128.0/18 | ARIN | 2914 | 2914 | BGP: visible ROA: staged RPKI: valid monitored

☐ | 209.189.0.0/17 | ARIN | 2914 | 2914 | BGP: visible RPKI: valid monitored

☐ | 81.93.176.0/20 | ARIN | 2914 | 2914 | BGP: visible RPKI: valid monitored

☐ | 208.123.221.0/24 | ARIN | 2914 | 2914 | BGP: visible RPKI: valid monitored

☐ | 184.30.224.0/20 | ARIN | 2914 | 2914 | BGP: visible monitored

☐ | 130.94.0.0/16 | ARIN | 2914 | 2914 | BGP: visible RPKI: valid monitored

# NTT's Prefix Dashboard - Summary



## Prefix 207.21.128.0/18

### Summary

DESCRIPTION

AS HOLDER

RIR

2914

ARIN

ANNOUNCED BY

CREATED

ANNOUNCED

2914

03/20/2021 04:29



BGP: visible

ROA: staged

RPKI: valid

monitored

[EDIT](#)

RPKI

Monitoring

Visibility

# NTT's Prefix Dashboard - RPKI management



Prefix 207.21.128.0/18

## Summary

### RPKI

#### CURRENT STATUS

RPKI valid

#### CURRENT ROAS ⓘ

207.21.128.0/18, 18, 2914, ARIN

#### FUTURE STATUS

RPKI valid ⓘ

#### FUTURE ROAS ⓘ

207.21.128.0/18, 18, 2914, ARIN

207.21.128.0/18, 22, 2914, ARIN

#### ROA STATUS

Staged ⓘ

#### COVERING ROAS

<input type="checkbox"/>	Prefix	AS	Max Length	TA	Status ↓	Action
<input type="checkbox"/>	207.21.128.0/18	2914	22	ARIN	staged ⓘ	added
<input type="checkbox"/>	207.21.128.0/18	2914	18	ARIN	stable ⓘ	

# Our Four Stages for ROAs



- **Staged** - the ROA exists only in the local database
  - RPKI validation is performed on a merge of public ROAs and staged ROAs
  - If what currently announced (or what is supposed to be announced) is RPKI valid, **all** the ROAs covering the prefix can be committed
- **Committed** - the ROA is ready to be published
  - The ROA is sent to the proper repo (e.g., RIR)
- **Public** - the ROA is visible on public repos
  - BGP+RPKI is now in sync
- **Stable** - the ROA has been monitored for 24 hours without issues
  - The monitoring will continue forever



# Open-source Software



- BGPalerter, open-source (BSD3 license)
  - <https://github.com/nttgin/BGPalerter>
- rpki-client, open-source (ISC license)
  - <https://github.com/rpki-client/rpki-client-portable>

- Most of the logic is already implemented in BGPalerter
  - <https://github.com/nttgin/BGPalerter>
  - Real-time monitoring for BGP and RPKI
  - It is easy to use
    - Auto-configuration
    - No installation required - It's just a binary that you run
    - No data collection required



# You will get informed if



- Your AS is announcing RPKI invalid prefixes (e.g., not matching prefix length)
- Your AS is announcing prefixes not covered by ROAs
- ROAs covering your prefixes disappeared (e.g., TA malfunction)
- A ROA involving any of your prefixes or ASes was deleted/added/edited

**Additionally, you can “stage” and test ROAs before publishing them**

# Examples of alerts



**incoming-webhook** APP 12:21

rpkidiff

ROAs change detected: added <185.236.24.0/22, 3949, 24, ripe>



**incoming-webhook** APP 12:51

rpkidiff

ROAs change detected: removed <2406:7ec0:6800::/40, 140868, 48, apnic>; removed <2406:7ec0:8300::/48, 4713, 48, apnic>; removed <2406:7ec0:8600::/44, 4713, 44, apnic>

rпки

The route 216.42.128.0/17 announced by AS2914 is not RPKI valid. Valid ROAs: 216.42.0.0/16|AS2914|maxLength:16

# BGPalerter next release



- Alert for expiring ROAs (thanks Job Snijders for the support provided by rpki-client)
- Monitor for downstream/upstream peers
- New pull REST API to retrieve alerts
- Much more...

# Thank you.

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