# NTT's RPKI Deployment Update

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#### **Common Operational Problems with RPKI**



- 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**



CS

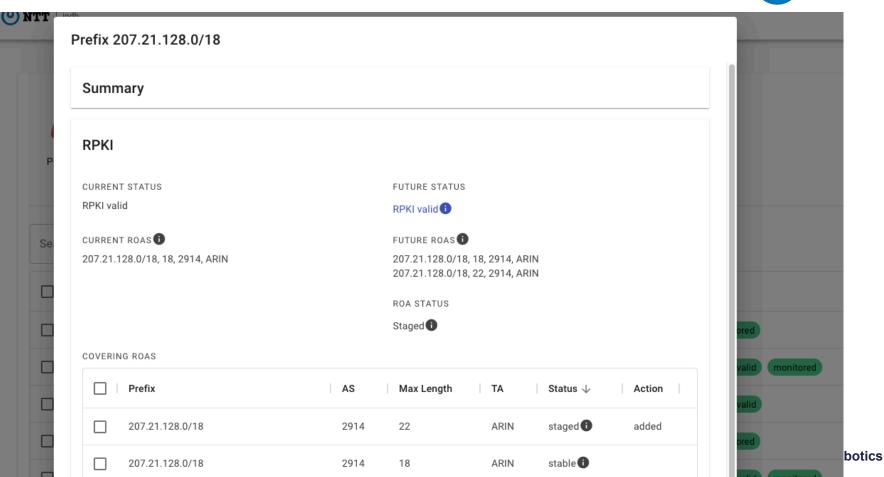
100% Percentage of prefixes covered P by ROAs	100% 🛛 🖉 RI	GPalerter is monitoring PKI data up to date	A	6 ROAs are staged
Search	Select RIR	C 🗹 ARIN 🗹 L	ACNIC 🗹 RIPE	
Prefix	Description	RIR Ho	older Announced by	Status $\psi$
207.21.128.0/18		ARIN 29	14 2914	BGP: visible ROA: staged RPKI: valid monitored
209.189.0.0/17		ARIN 29	14 2914	BGP: visible RPKI: valid monitored
81.93.176.0/20		ARIN 29	14 2914	BGP: visible RPKI: valid monitored
208.123.221.0/24		ARIN 29	14 2914	BGP: visible RPKI: valid monitored
184.30.224.0/20		ARIN 29	14 2914	BGP: visible monitored
130.94.0.0/16		ARIN 29	14 2914	BGP: visible RPKI: valid monitored

#### **NTT's Prefix Dashboard - Summary**



Summary				
DESCRIPTION		AS HOLDER	RIR	
		2914	ARIN	
ANNOUNCED BY	CREATED	ANNOUNCED		
2914	03/20/2021 04:29			
BGP: visible ROA: sta	ged RPKI: valid monitored			EDIT ed RPKI: v

# **NTT's Prefix Dashboard - RPKI management**



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

#### **Open-source Software**



- · Most of the logic is already implemented in BGPalerter
  - <u>https://github.com/nttgin/BGPalerter</u>
  - 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>

#### rpki

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...



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