Collaborating to Advance RPKI: New Initiatives and Global Progress

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4 June 2024

A more consistent RPKI service for the global Internet community

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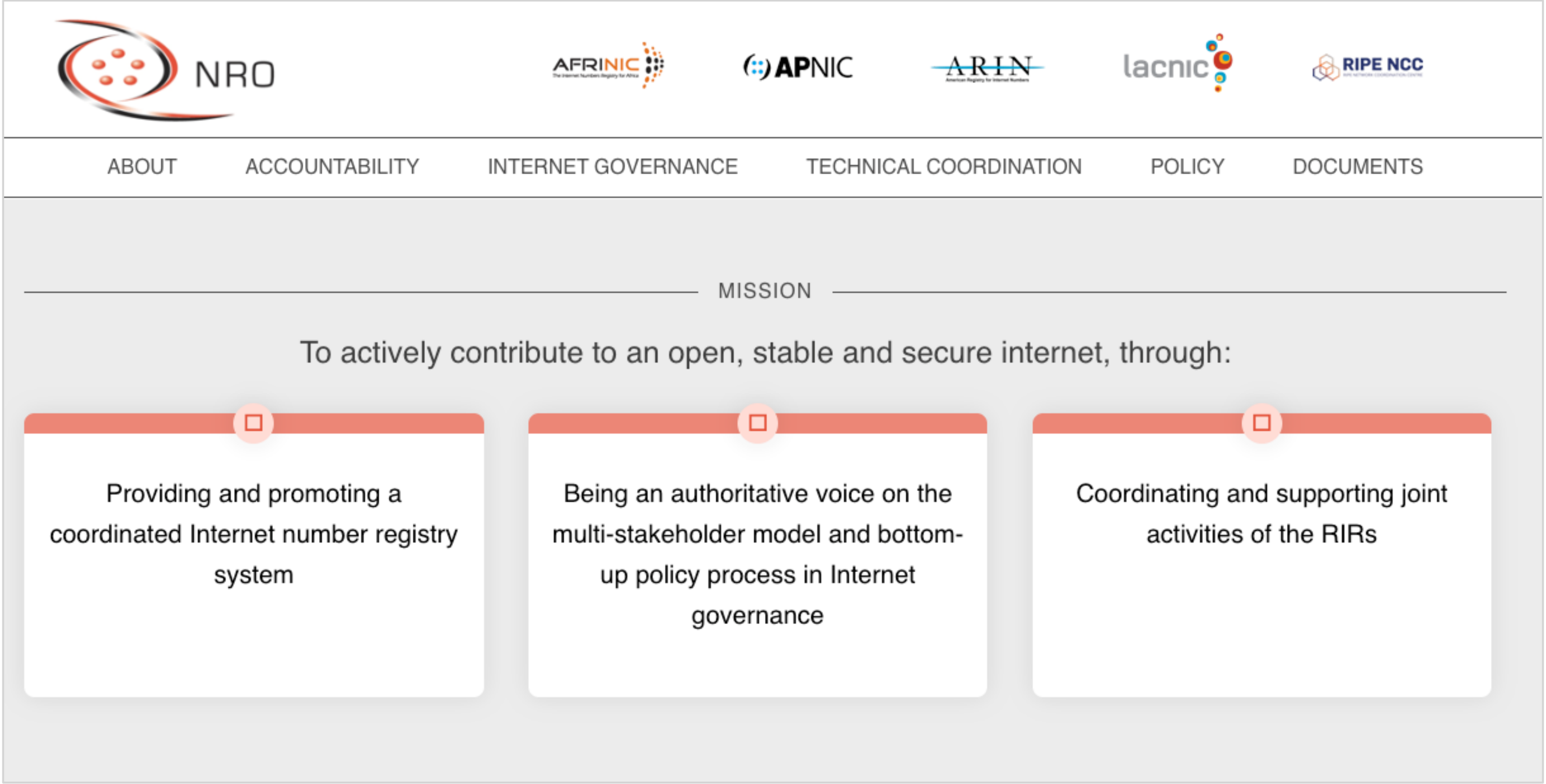
What’s the NRO?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MISSION

To actively contribute to an open, stable and secure internet, through:

- Providing and promoting a coordinated Internet number registry system
- Being an authoritative voice on the multi-stakeholder model and bottom-up policy process in Internet governance
- Coordinating and supporting joint activities of the RIRs

Number Resource Organization

Why is this program important?

- Current diversity/inconsistency among RIRs
  - Differences in RPKI related services being offered - Hosted/delegated, ROAs, AS0, etc
  - Integrations (or lack of) between RPKI and IRR services

MANRS
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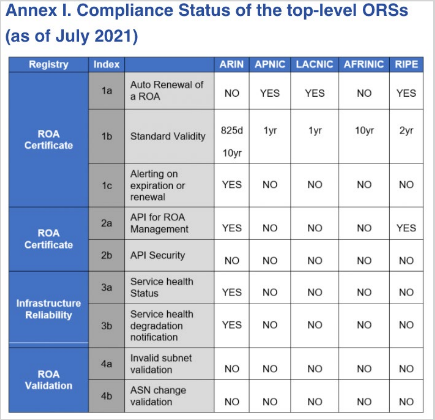
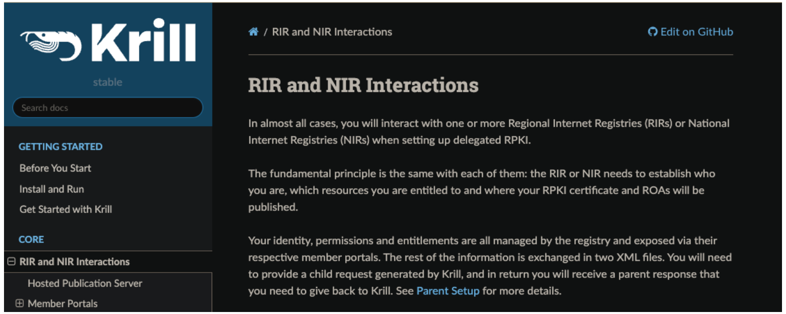
Common ROA Management Requirements and Security Standards for Operators of RPKI Services (ORS)



Annex I. Compliance Status of the top-level ORSs (as of July 2021)

Registry	Index		ARIN	APNIC	LACNIC	AFRINIC	RIPE
ROA Certificate	1a	Auto Renewal of a ROA	NO	YES	YES	NO	YES
	1b	Standard Validity	825d 10yr	1yr	1yr	10yr	2yr
	1c	Alerting on expiration or renewal	YES	NO	NO	NO	NO
ROA Certificate	2a	API for ROA Management	YES	NO	NO	NO	YES
	2b	API Security	NO	NO	NO	NO	NO
Infrastructure Reliability	3a	Service health Status	YES	NO	NO	NO	NO
	3b	Service health degradation notification	YES	NO	NO	NO	NO
ROA Validation	4a	Invalid subnet validation	NO	NO	NO	NO	NO
	4b	ASN change validation	NO	NO	NO	NO	NO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Get Started with Krill
CORE
⊟ RIR and NIR Interactions
Hosted Publication Server
⊞ Member Portals
/ RIR and NIR Interactions
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RIR and NIR Interactions

In almost all cases, you will interact with one or more Regional Internet Registries (RIRs) or National Internet Registries (NIRs) when setting up delegated RPKI.

The fundamental principle is the same with each of them: the RIR or NIR needs to establish who you are, which resources you are entitled to and where your RPKI certificate and ROAs will be published.

Your identity, permissions and entitlements are all managed by the registry and exposed via their respective member portals. The rest of the information is exchanged in two XML files. You will need to provide a child request generated by Krill, and in return you will receive a parent response that you need to give back to Krill. See Parent Setup for more details.

Sources:
https://krill.docs.nlnetlabs.nl/en/stable/parent-interactions.html
https://manrs.org/resources/common-roa-management-requirements-and-security-standards-for-operators-of-rpki-services-ors/

Are those differences hindering the adoption of RPKI?

Program Intro

NRO Strategic Review Process

- Agreement to work toward providing a robust, coordinated and secure RPKI service

The NRO RPKI Program was created

- Purpose: "**To provide a more consistent and uniformly secure, resilient and reliable RPKI service**"
- Removing barriers for RPKI adoption currently experienced by network operators who create RPKI objects through multiple RIRs.

Program Team

The **NRO EC**, as the executive sponsor of the program, with a role of strategic goal prioritisation, approval and funding.

The NRO **RPKI Program Manager**, with a role of operational direction, oversight and support

The **RPKI Steering Group**, which includes RPKI experts from the five RIRs and has a role of specific direction and advise related to agreed objectives

Other RIR **RPKI Subject Matter Experts** (SMEs) and consultative groups, with a role of goal delivery and execution

What do we want to achieve?

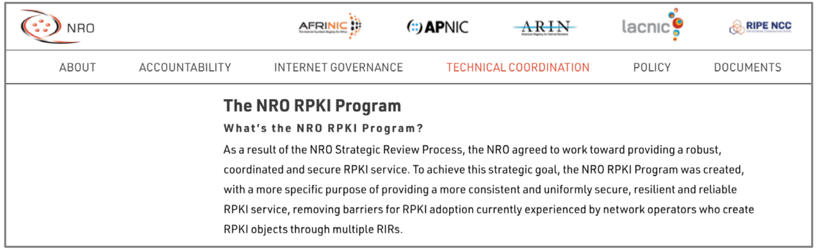
- Purpose: “To provide a more consistent and uniformly secure, resilient and reliable RPKI service”
- More specifically, we want to achieve the following **outcomes**:
  - Definition of what a **single global RPKI system** looks like.
  - Better **understanding** and improved **transparency of the robustness** of the RPKI system
  - **Enhanced security consistency** of the RPKI system across the different RIRs
  - The technical community is kept **informed and engaged** throughout the program, and their **concerns are addressed in a coordinated way**.

Different aspects of consistency

- Consistency across RIRs:
  - In services/features offered
  - In mechanism to manage ROAs (create, read, update and delete)
  - In terms of robustness of the system
- What other aspects of consistency do you think we should consider?

Do you want to know more?

- Visit our webpage:
  - https://www.nro.net/technical-coordination/security/certification/#rpki_program
- Visit our blog series:
  - https://www.arin.net/blog/2024/03/11/improving-rir-alignment-rpki/
  - https://www.arin.net/blog/2024/05/15/nro-rpki-program-series-2/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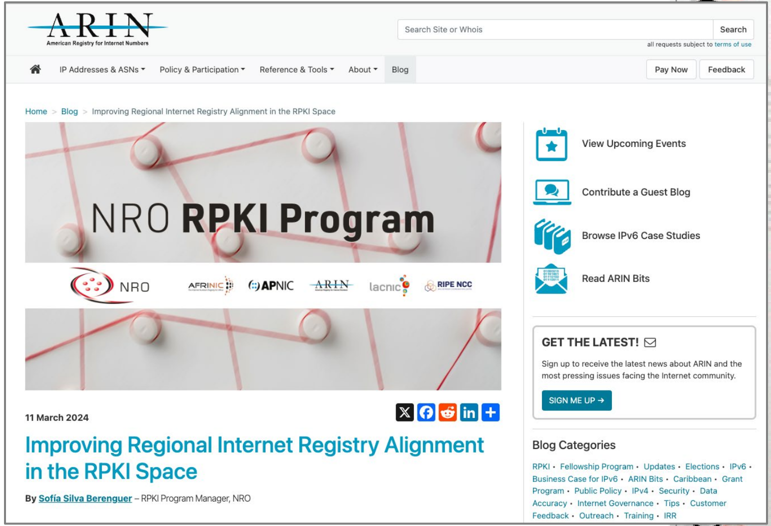
The NRO RPKI Program

What's the NRO RPKI Program?

As a result of the NRO Strategic Review Process, the NRO agreed to work toward providing a robust, coordinated and secure RPKI service. To achieve this strategic goal, the NRO RPKI Program was created, with a more specific purpose of providing a more consistent and uniformly secure, resilient and reliable RPKI service, removing barriers for RPKI adoption currently experienced by network operators who create RPKI objects through multiple RIRs.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11 March 2024

Improving Regional Internet Registry Alignment in the RPKI Space

By Sofía Silva Berenguer – RPKI Program Manager, NRO

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We want to hear from you!

- What are the **main barriers or obstacles** for RPKI adoption that could be solved (or at least improved!) through **better coordination and collaboration** among the RIRs?
- Do you have ideas of initiatives we should consider?
- Please share them sending an email to **rpki_program@nro.net**

Direction of RPKI Deployment

New Standards, Best Practices and Regulations

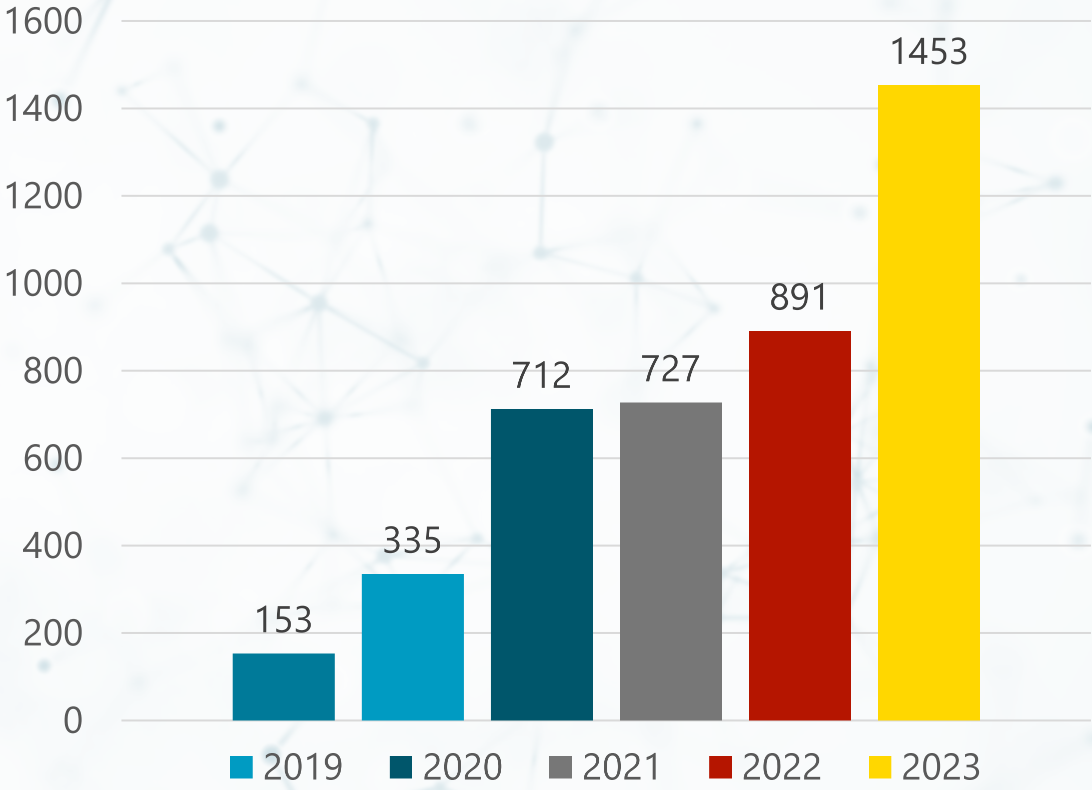
Brad Gorman, Sr. Product Owner, Routing Security
American Registry for Internet Numbers (ARIN)
June 2024

What’s Being Covered Today

- New since last year
- Standards activity
- What’s with the US Government?
- What’s ahead?

A Year of Change

New RPKI registrations at ARIN outpaced previous years



There are 724 new RPKI Resource Certificates as of 31 May 2024

Change was the New Normal for RPKI

Increased efforts to get legacy resources under contract

Education and Training on the how and why of RPKI expanded at conferences, on site and virtually

New feature delivery, consultations and suggestions from the community dominated development schedule

Resource Coverages Hit New Milestones

In October 2023, IPv6 announcements marked RPKI-valid exceeded 50%.

On 1 May 2024, IPv4 announcements marked RPKI-valid exceeded 50%.

RPKI Standards and Drafts

- **RFC 9455/BCP238**
  Avoiding Route Origin Authorizations (ROAs) Containing Multiple IP Prefixes
- draft-ietf-sidrops-cms-signing-time-06
  On the use of the CMS signing-time attribute in RPKI Signed Object
- draft-ietf-sidrops-rfc6482bis-09
  A Profile for Route Origin Authorizations (ROAs)
- draft-ietf-sidrops-signed-tal-14
  RPKI Signed Object for Trust Anchor Key

Where is ASPA?

RPKI is on the US Government’s Radar

The National Cybersecurity Strategy Implementation Plan emphasizes the importance of secure Internet routing.

There is an increasing focus on adopting Resource Public Key Infrastructure (RPKI) to enhance the security and stability of routing for critical infrastructure networks.

The FCC released “Reporting on Border Gateway Protocol Risk Mitigation Progress Notice of Proposed Rulemaking PS Docket Nos. 24-146 and 22-90” on 16 May 2024.

Future RPKI Development at ARIN

IRR/RPKI Integration

- Bring two routing security datasets closer together

RPKI Routing Intelligence

- Offer projected outcome of ROA creation
- Suggest changes to resolve conflicts

API/Web UI Feature Parity

… What do you suggest?

Participation is Key

- RPKI is a community effort, and we all play a part
- Sign up and create ROAs for your resources
- Become active in the IETF community
- Talk to your providers and confirm they use RPKI
- Prepare now so you are not surprised later

How Can You Reach Us?

Call the ARIN Helpdesk

+1.703.227.0660

From the User Dashboard

- Select Ask ARIN
- “Chat with us!”

Routing Security Team

routing.security@arin.net

ANY QUESTIONS ?

Thank You