# ARIN
## American Registry for Internet Numbers

# A Community Update on RPKI-ROA Adoption

John Sweeting – Chief Customer Officer,
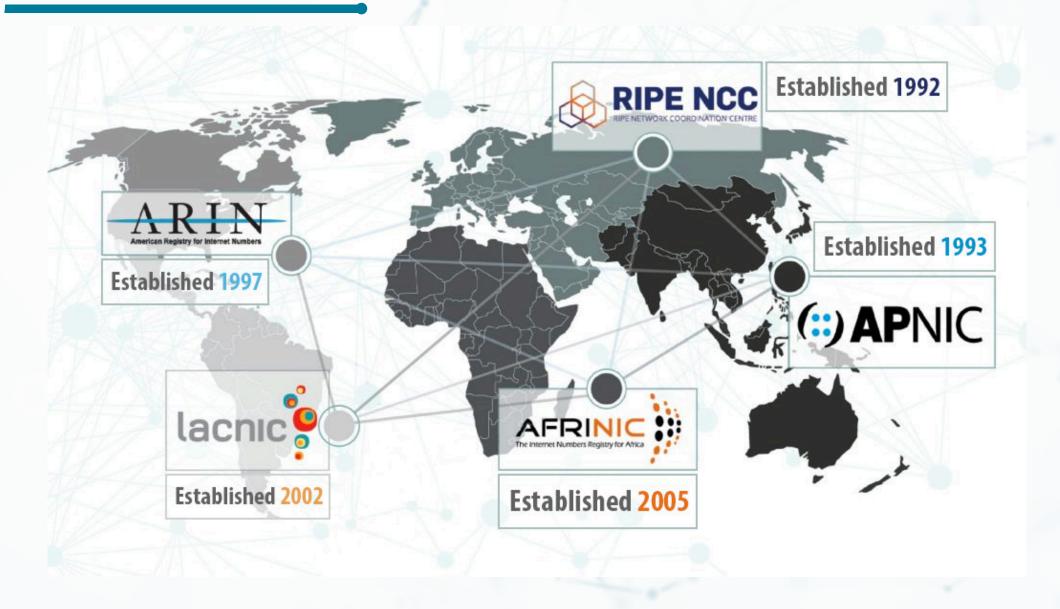American Registry for Internet Numbers (ARIN)

5 March 2024

# ARIN in the RIR System

# RPKI Adoption Update

# RPKI Adoption

As of 26 February 2024:

**Organizations registered to use RPKI: 4,879**

- Hosted – 4,769
- Delegated – 110
  - Repository Publication Service (RPS) – 59

# Additional RPKI Adoption Statistics

**% RPKI Adoption per Entity Type*:**

Government
**8.0% of 834**

Educational Institutions
**11.7% of 2,186**

Commercial/ISPs/
Enterprises/Individuals
**12.4% of 39,554**

**% of Allocated Resources Covered in RPKI ROAs:**

Government
**5.3% of 905.2k /24s**

Educational Institutions
**15.4% of 1,228.6k /24s**

Commercial/ISPs/
Enterprises/ Individuals
**49.3% of 6,477.2k /24s**

*Entities in the ARIN Region and regardless of Agreement status; data as of 26 February*

# ARIN Resources & Agreements

How do I know if my organization's legacy number resources are covered under an ARIN Agreement?

*Need Help? Contact ARIN's Registration Services Department at +1.703.227.0660*

# ACCOUNT MANAGER

- 📊 **Dashboard**
- Tickets
- Your Records ▼
- IP Addresses ▼
  - **Manage Networks**
    Reassignments and reverse DNS
  - **Request**
    Ask for IP addresses
  - **Reassign Addresses**
    View free blocks
  - **User Reassignment Report**
    View all downstream networks and free blocks
- ASNs ▼
- Routing Security
- Transfer Resources
- Payments & Billing
- Downloads & Services

# Dashboard

## Alerts

**The Account Manager Dashboard will notify user if any routes (or ASNs) are not covered by an agreement**

✉ You have **3 unread messages**.

🚩 **1 Network** is ineligible for routing security services such as RPKI and ARIN's IRR. **Learn more**.

## Account Snapshot

👥 **2**
Point of Contact records (POCs)

📈 **2**
Organization Identifiers (Org IDs)

☁ **4**
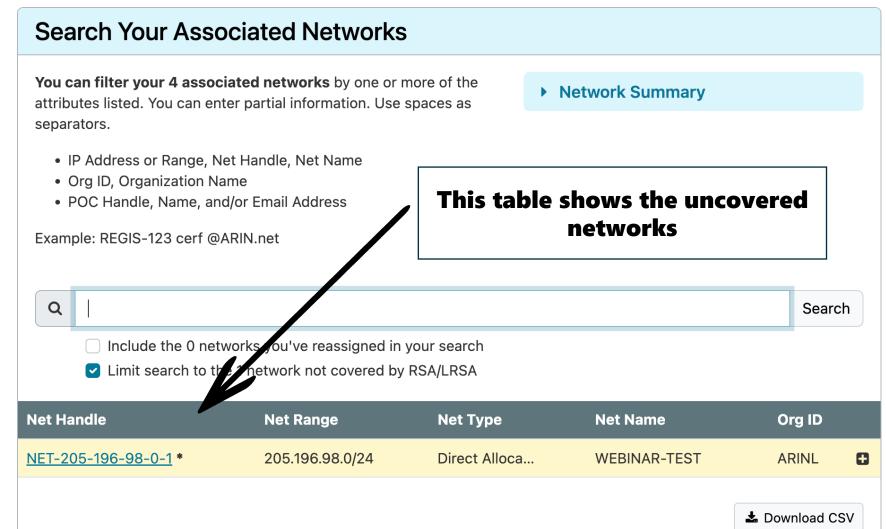Networks (NETs)

🖥 **2**
Autonomous System Numbers (ASNs)

❓ What's New With ARIN Online

Visit ARIN Online Functionality for an overview of all the functionality currently available within ARIN Online.

Feedback  🔔³  👤 Welcome, SPO ▾

# ACCOUNT MANAGER

🎛 Dashboard

Tickets

Your Records ▾

IP Addresses ▾

**Manage Networks**
Reassignments and reverse DNS

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Ask for IP addresses

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ASNs ▾

Routing Security

Transfer Resources

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# Manage Your Networks

## Search Your Associated Networks

**You can filter your 4 associated networks** by one or more of the attributes listed. You can enter partial information. Use spaces as separators.

- IP Address or Range, Net Handle, Net Name
- Org ID, Organization Name
- POC Handle, Name, and/or Email Address

Example: REGIS-123 cerf @ARIN.net

▸ **Network Summary**

This table shows the uncovered networks

🔍 [                                              ]  Search

☐ Include the 0 networks you've reassigned in your search
☑ Limit search to the 1 network not covered by RSA/LRSA

| Net Handle | Net Range | Net Type | Net Name | Org ID |
|---|---|---|---|---|
| NET-205-196-98-0-1 * | 205.196.98.0/24 | Direct Alloca... | WEBINAR-TEST | ARINL ➕ |

⬇ Download CSV

# Benefits of the ARIN Agreement

Access to Routing
Security services:
*Authenticated IRR
*Hosted RPKI-ROAs*

Participation
in ARIN's
governance

Easier to
transfer
resources

A written agreement
that specifies the
registration services
that announce to the
Internet who holds
your IP addresses

*Using ARIN Hosted RPKI-ROA service is, by far, the easiest way to mitigate the risk of outage due to route hijacking*

# What Services are available to Organizations NOT under an ARIN Agreement?

Legacy resource holders have access to a number of ARIN Services even if they are not under an ARIN Agreement, and are also welcome to participate in:

- *ARIN's Policy Development Process (PDP)*
- *Posting to Mailing Lists*
- *Attending ARIN Public Policy and Members Meetings*

| Service | Provided by ARIN? |
|---|---|
| Maintain unique registration in Whois/RDAP | Yes |
| Update and manage publicly available data in Whois/RDAP | Yes |
| Manage reverse DNS delegations | Yes |
| Maintenance of registry records (ARIN Online) | Yes |
| DNS Security (DNSSEC) access | Yes |
| **Resource Public Key Infrastructure (RPKI) access** | **No** |
| **Internet Routing Registry (IRR) access** | **No** |

# Resource Management Services

# What is Authenticated IRR?

The Internet Routing Registry (IRR) is a mechanism for **providing verification** for legitimate BGP announcements by mapping an ASN to a list of networks

ARIN now provides users with the ability to create, update, and delete **objects in ARIN's authenticated IRR database** using ARIN Online or ARIN's RESTful API

# What is RPKI?

RPKI is a public key infrastructure that creates a **chain of resource certificates that follows the same structure** as the way IP addresses and AS numbers are handed down[1]

RPKI gives the legitimate holder of a block of IP addresses the opportunity to make an **authoritative statement about which AS is authorized** to originate their prefix[1]

1 - "RPKI Read the Docs." *Introduction - RPKI Documentation*, https://rpki.readthedocs.io/en/latest/about/introduction.html

# Why is Routing Security Important?

Routing attacks & misconfigurations can:
- DISRUPT your internet connection (usually easy to detect)
- DETOUR your internet traffic (harder to detect)
- Make unauthorized use of your IP addresses (can be very hard to detect)

RPKI establishes a **level of trust**

RPKI gives network operators a **method to make better judgments**

RPKI can **limit the impact** of a configuration mistake or nefarious activity of a bad actor

# How RPKI Data is Used

**1** Resource holders make authoritative statements about which autonomous system (ASN) should originate a prefix(s). This is a Route Origin Authorization (ROA).

**2** 3rd party software commonly known as a validator is used to confirm the data inside the ROA is authentic by verifying with RIR trust anchor, and then stores the valid data in its cache.

**3** Network operators establish an RPKI to Router session between the validator and their Internet connected routers to perform Route Origin Validation (ROV).

**4** The resulting RPKI validity state may then be used by the network operator to generate filters on their routers.

*The more ROAs generated by resource holders leads to better performance of the RPKI ecosystem*

# Three RPKI Deployment Options at ARIN

## Hosted

- Easiest to use; Recommended for most organizations just getting started with RPKI. Nearly 98% of ARIN participants use Hosted RPKI.

## Delegated

- Highest responsibility and uptime requirement; only organizations with in-depth knowledge of RPKI and resources to run a Certificate Authority (CA) and a publication server should select Delegated RPKI.

## Hybrid – Repository Publication Service

- Suggested for organizations that wish to retain cryptographic control, and do not want to maintain the high availability repository and publication functions.

# RPKI Services Development Priorities

**IRR/RPKI integration re-release (Q2 2024)**

- ROA actions create and/or delete linked IRR route objects (after user consent)
- ARIN Authenticated IRR objects reduce negative impact from objects in 3rd party databases

**RPKI/ROA Intelligence (Second Half 2024)**

- Improvement to ROA Functionality – pending consult review in 2024
- Provide foreknowledge of potential impact from ROA creation
- Show ROA validity state based on near real-time data from global BGP table

**RPKI advanced features to ARIN Online interface**

- Download full list of ROAs to a file for off-line processing (API parity)
- Enable ROA changes via file upload (API parity)
- Allow Organizations to opt out from RPKI services

# Participating in the ARIN Community

# ARIN Membership

**Service Members**

Organizations that have signed an ARIN Agreement for IPv4 or IPv6 address space and/or Autonomous System Numbers (ASNs).
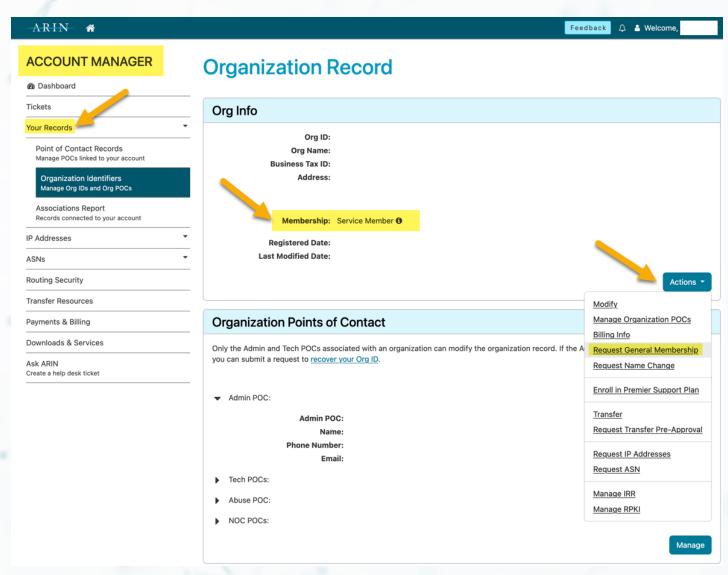
**General Members**

• If ARIN's governance is important to your organization, Service Members can elect to become General Members.
• General Members express commitment to participate in an ARIN Election at least once every three years to maintain their status.
•Organizations may choose to cast a blank ballot.

# Not sure of your Membership Status?

You can check your status in your ARIN Online account. If your organization is a Service Member and currently eligible to request General Membership, you can access the General Member request form through the ACTIONS drop down menu.

# Why Vote?

It fulfills a vital community responsibility by helping direct ARIN's governance and the development of Internet number resource policy.

**By voting in the ARIN Elections, General Members:**
- **Shape** the Future: Your vote determines the leaders who guide ARIN's strategic direction.
- **Foster** Inclusivity: Ensure diverse perspectives are represented in Internet governance and policy development.
- **Protect** a Global Resource: Contribute to a secure, stable, and accessible Internet for all.

# 2024 Election Slate

## ARIN Board of Trustees

Maintains authority over the scope and mission of ARIN and establishes strategic direction and fiscal oversight.

*Three full-term open seats*

## ARIN Advisory Council

Advisory Council forwards consensus-based policy proposals to the Board for ratification.

*Five full-term open seats*

## Number Resource Organization (NRO) Number Council (NC)

Advising the Executive Council concerning the ratification of proposed global IP number resource allocation policies.

*One elected representative from the ARIN region*

To be eligible to vote: Be an organization that is an ARIN General Member in good standing with a designated voting contact.

**Spring**
- Call for Nomination Committee Volunteers

**Summer**
- Call for Nominations for the Board of Trustees, Advisory Council, and NRO Number Council

**Fall**
- Publication of Candidate Slate
- Voting Period

## 2024 Election Timeline

WATCH:

Leadership Development Program videos
arin.net/leadership

# Powered by Participation

- **ARIN 53 Public Policy & Members Meeting**:
  14-17 April - Bridgetown, Barbados
  *In conjunction with CaribNOG 27; in person or virtual attendance options*

- ARIN on the Road: 30 April - Reno, NV

- ARIN on the Road: 2 May - Kansas City, MO

- ARIN on the Road: TBD September - Ottawa, Canada

- **ARIN 54 Public Policy & Members Meeting**:
  24-25 October - Toronto, Canada
  *In conjunction NANOG 92; in person or virtual attendance options*

# ARIN is Here to Help

Email questions to:
routing.security@arin.net or
contact the ARIN Registration
Services at +1.703.227.0660

John Sweeting
Chief Customer Officer

Eddie Diego
Policy Analyst

# ANY QUESTIONS ?

# Thank You