A Community Update on RPKI-ROA Adoption

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Agenda

RPKI Adoption Update
Resource Management Services
Participating in the ARIN Community
ARIN in the RIR System
RPKI Adoption Update
As of 26 February 2024:

Organizations registered to use RPKI: 4,879

- Hosted – 4,769
- Delegated – 110
  - Repository Publication Service (RPS) – 59
% 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
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
The Account Manager Dashboard will notify user if any routes (or ASNs) are not covered by an agreement.
This table shows the uncovered networks:

<table>
<thead>
<tr>
<th>Net Handle</th>
<th>Net Range</th>
<th>Net Type</th>
<th>Net Name</th>
<th>Org ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>NET-205-196-98-0-1 *</td>
<td>205.196.98.0/24</td>
<td>Direct Alloca...</td>
<td>WEBINAR-TEST</td>
<td>ARIN</td>
</tr>
</tbody>
</table>
**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?

<table>
<thead>
<tr>
<th>Service</th>
<th>Provided by ARIN?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain unique registration in Whois/RDAP</td>
<td>Yes</td>
</tr>
<tr>
<td>Update and manage publicly available data in Whois/RDAP</td>
<td>Yes</td>
</tr>
<tr>
<td>Manage reverse DNS delegations</td>
<td>Yes</td>
</tr>
<tr>
<td>Maintenance of registry records (ARIN Online)</td>
<td>Yes</td>
</tr>
<tr>
<td>DNS Security (DNSSEC) access</td>
<td>Yes</td>
</tr>
<tr>
<td>Resource Public Key Infrastructure (RPKI) access</td>
<td>No</td>
</tr>
<tr>
<td>Internet Routing Registry (IRR) access</td>
<td>No</td>
</tr>
</tbody>
</table>

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*
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. 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.

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.
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
• **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

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ANY QUESTIONS

Thank You