

Overcoming Legal Barriers to RPKI Adoption

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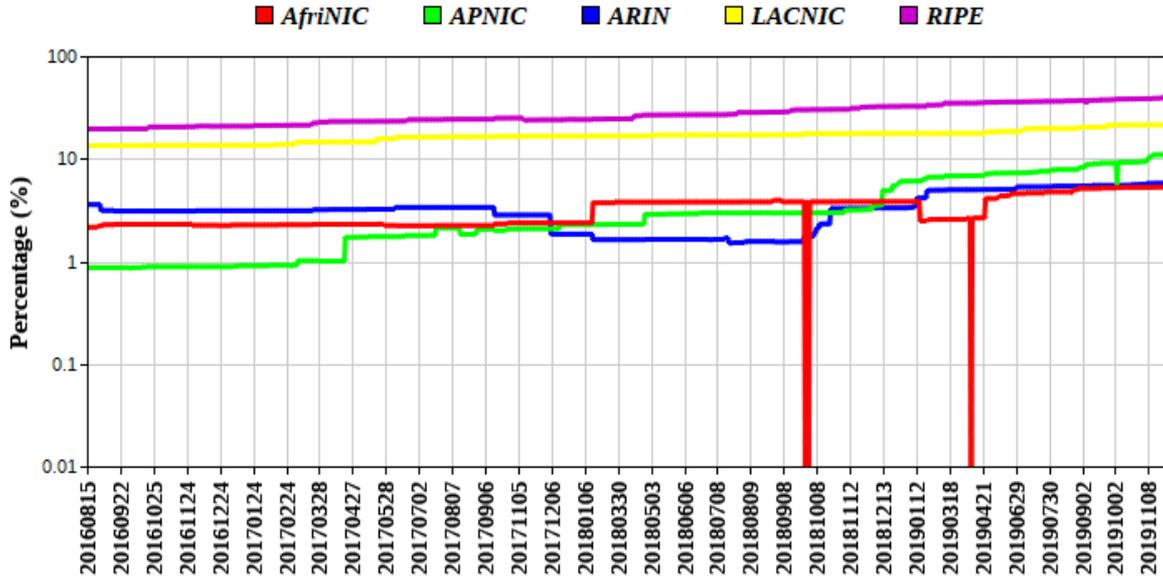
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Global RPKI Deployment

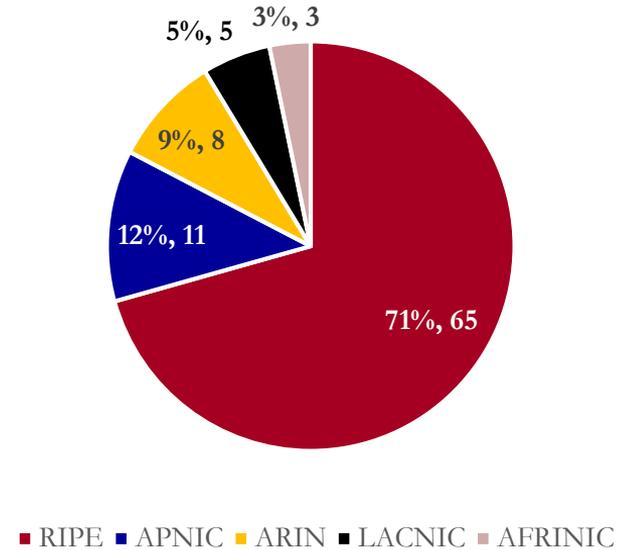
Global: RPKI ROA Deployment Status Over Time
% of *Delegated IPv4 Address Space Covered by ROAs



T RPKI Monitor: 2019-12-05

* from the file "delegated-extended", NRO

ASes Validating Routes



Source: APNIC ROV Deployment Monitor

■ 80% of those engaging in ROV omit the ARIN TAL (Cartwright-Cox, 2018)

Initial Observations

- Real-world developments
 - Filtering by AT&T/interest by Google and Cloudflare
 - New validator software by Cloudflare and NLnet Labs
 - Use of RPKI by NTT to clean up Internet Routing Registry (IRR)
 - Complications surrounding JPNIC's deployment and outage by ARIN
 - ARIN revisions on October 21, 2019
- Legal concerns
 - Need for address holders to sign Registration Services Agreement (RSA)
 - Decision whether to maintain own ROAs or delegate to ARIN
 - Need for ISPs to accept Relying Party Agreement (RPA) on ARIN's website

Existence of the Relying Party Agreement (RPA)

- Current practice: requirement of click-through acceptance of RPA to access ARIN's TAL (unique to ARIN; others use online terms)
- Our recommendation
 - Acknowledge existence of valid arguments for abolishing and keeping RPA
 - Explore incorporation of acceptance into distribution of validator software
 - Explore enterprise-level agreements
- ARIN's decision
 - Retain RPA because of litigiousness of U.S./overhanging negligence liability
 - Enable integration of RPA acceptance into validator software
 - Note: no cases on record re RPKI, TLS, SSL, DNSSec, or IRR

RPA Terms – Indemnification

- Current practice: requirement to indemnify, defend, hold harmless
 - RIPE NCC: online terms include disclaimers of warranties
 - APNIC: online terms include indemnification (no duty to defend)
 - LACNIC and AFRINIC: no clauses
- Our recommendation
 - Replace indemnification with as-is disclaimer/no consequential damages
 - Consider creating separate entity for RPKI to limit liability
- ARIN's decision
 - No indemnification for gross negligence or willful misconduct
 - Inclusion of as-is disclaimer, no consequential damages, limitation of liability

RPA Terms – Prohibited Conduct Clause

- Current practice: prohibition of sharing RPKI-derived information in a “machine-readable format”
 - Blocks use for error reporting and research
 - Blocks real-time uses/integration into IRRs
 - Note: other RIRs have no analogous provision
- Our recommendation: revise to permit research and real-time uses
- ARIN’s decision
 - Allowance of use of RPKI-derived data for informational purposes
 - Creation of Redistributor RPA: can distribute info to third parties who signed RPA and passed through terms limiting liability and indemnification

RSA Terms

- Current practice
 - Willingness to waive indemnification and choice of law when required by law
 - Requirement that legacy holder acknowledge no property rights in addresses
- Our recommendation
 - Publicize willingness to waive clauses when required by law
 - Follow RIPE NCC's creation of a non-member services agreement
- ARIN's decision
 - No changes to terms (still includes blanket indemnification)
 - No publicity about willingness to waive
- Legacy holders sign RSAs for IPv6; RPKI not deploying for IPv6

Other Possible Developments

- Inclusion of RPKI in public and private procurement requirements
- Education about the proper configuration by ISPs (esp. failover)
- Broader disclosure of ARIN's practices
 - Information on uptime, update frequency, response expectations, etc.
 - Expanded Certification Practice Statements
 - Clear guidance about best practices/incentive to deploy them
- More robust software tools (new Cloudflare & NLnet validators)