# Status and Solutions for Whois Data Accuracy

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About ARIN

- One of 5 Regional Internet Registries (RIRs)
- Nonprofit corporation based in Chantilly, VA
- 100% community funded (fees for service)
- Serves over 37,000 organizations based in Canada, the U.S. and many Caribbean and North Atlantic islands
- Core Services
    1. Distribute and register unique **Internet Number Resources**: IPv4, IPv6 and Autonomous System Numbers (ASNs)
    2. Maintain accurate **Whois** directory service containing those Internet numbers (registry)
    3. Facilitate and implement community driven **policy**
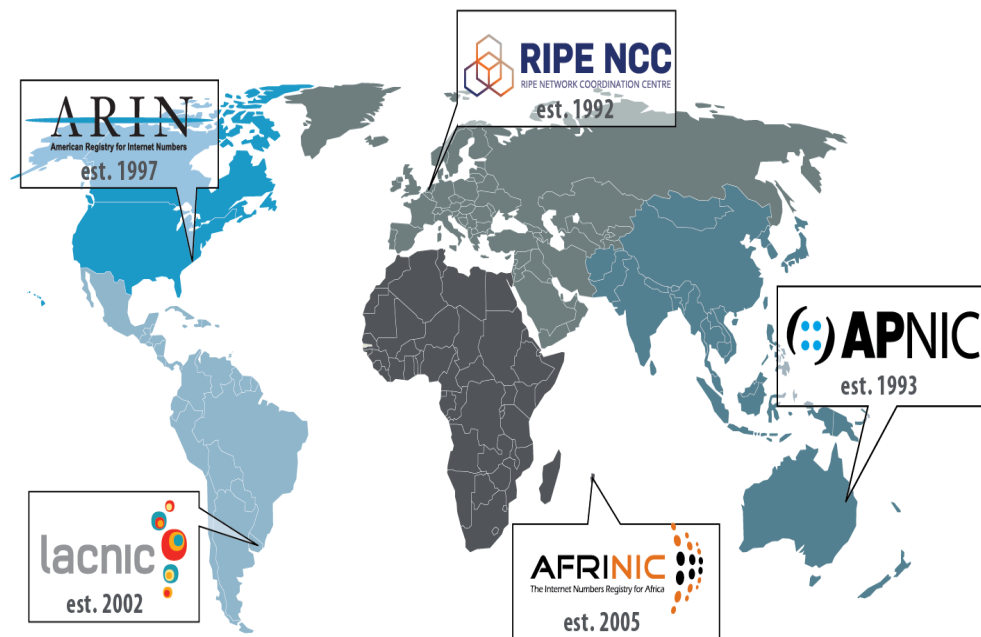
What Information Does ARIN's WHOIS Include?

- Registration information about
  - IPv4 addresses, IPv6 addresses and AS numbers
  - Organizations (Orgs) that hold the IP addresses & ASNs
  - Points of Contact (POC) for resources & organizations
  - Customer reassignment information (from ISPs to their customers)
  - Original registration date and last updated date

- Referential information
  - To the authoritative RIR
  - To an ISP's RWhois server

Why is Accurate Whois Data Important?

- Internet operability and stability
  - Helps network operators identify other network operators to resolve technical and/or abuse issues
- Protection from number resource hijacking
  - Hijackers target outdated and/or inaccurate data
- Enables resource transfers
  - Resource, POC and organization records must be current and up to date in order to request a transfer of resources
- Public safety
  - Used by law enforcement and consumer protection agencies in criminal investigations and to identify the responsible party for service of process
- Assists end users
  - Helps businesses, consumer groups, healthcare organizations and others in combatting abuse

POC and Org Stats

- **743,839** total registered POCs
  - 322,905 are orphaned (43%)

- **754,430** total registered Org IDs (customer records not included)
  - 304,922 are orphaned* (40%)

- Deleting some of this erroneous data could improve the quality and integrity of ARIN's Whois
  - Community consultation coming in the near future

Orphaned ORG – not associated with any number resources

Possible Reasons for Inaccurate Data

- ARIN inherited the Internic database
  - Contained unverified and potentially outdated data from as far back as the 80's
  - Many legacy holders have gone out of business, records still sitting in ARIN database
  - Most legacy holders have no contractual relationship with ARIN
    - May not feel obligated to keep their data accurate
    - May be hesitant to update their data for fear of revocation or requirement to sign a contract
- Some organizations may no longer have a reason to interact regularly with ARIN (IPv4 depletion, large IPv6 allocations, etc.)
- Perceived difficulties in completing M&A transfers
- IPv4 space hijacked or routed without authorization

Potential Implications of Inaccurate Data

- Wasted network operator resources dedicated to responding to potentially misdirected legal requests
- Delayed (or lack of) resolution of network operational and abuse issues
- Increase in attempted hijackings
- Perceived unreliability of the data in ARIN's Whois

What is ARIN Doing to Obtain/Maintain Accurate Data?

- **Policy** *(defined in ARIN's Number Resource Policy Manual)*
  - NRPM 3.6 (Annual POC validation)
  - NRPM 4.2.3.7.1 and 6.5.5.1 (Reassignment Information for IPv4 & IPv6)
  - NRPM 8.2 (Merger & Acquisition Transfers), 8.3 (Specified Recipient Transfers) and 8.3 (Inter-RIR Transfers)

- **Business Practice**
  - All organizations must be legally registered entities in region to be registered in Whois and receive resources
  - Organizations requesting services/resources must be vetted every 12 months
  - Service/resource requests accepted only from registered Points of Contact

- **Contractual Requirement** *(per ARIN's Registration Services Agreement (RSA)*
  - Must comply with all policies (1.c)
  - Must provide and maintain accurate registration information in Whois for themselves and their customers (3.b)
   - Non-compliance could result in termination of RSA and revocation of resources

POC Validation Stats

- **743,839** total POCs registered in ARIN's database
  - 177,742 are *validated
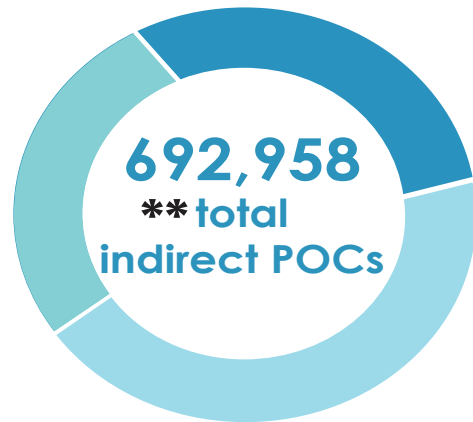 - 243,192 are non-validated
  - 322,905 are **orphaned

*Validated POC – has either responded to ARIN's annual POC validation email or updated their POC record within the past 12 months

**Orphaned POC – not associated with any number resources

Direct/Indirect POC Validation Stats

50,881
* total direct POCs
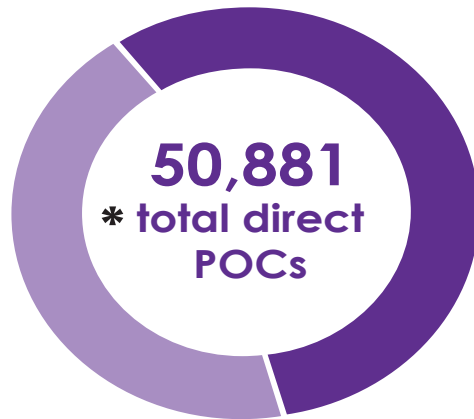
- 28,555 validated (56%)
- 22,326 unvalidated (44%)

692,958
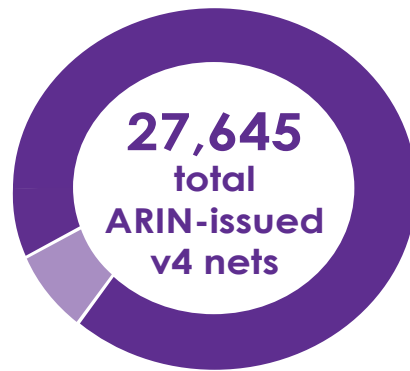**** total indirect POCs**

- 149,187 validated (22%)
- 220,866 unvalidated (32%)
- 322,905 orphaned (46%)

* Recieved resources from ARIN or Predecessor
** Customer reassignments received from an upstream ISP

ARIN Issued vs Legacy Networks

Legacy IPv4 nets are less likely to have at least one validated POC

27,645 total ARIN-issued v4 nets

■ 25,648 (93%) have at least one validated POC

■ 1,997 (7%) have no validated POC

24,974 total legacy nets

■ 11,773 (47%) have at least one validated POC

■ 13,201 (53%) have no validated POC

*Over 345,000 /24s in the legacy networks with no validated POC

POC Validation Process

- **Policy**
  - An email is sent to every POC in the ARIN Database Annually, the POC has 60 days to respond with an affirmative that their contact information is correct
  - If ARIN staff deems a POC to be abandoned or otherwise illegitimate, the POC record shall be marked invalid in public Whois
  - ARIN's system prevents invalid POCs from making db updates except to validate/update their POC record
- **POC Validation Methods**
  - Click the "validate" link in annual POC validation email **OR**
  - Reply to the POC validation email with the word CORRECT in the subject line **OR**
  - Hit validate button in your ARIN online account **OR**
  - Update POC record in ARIN online which automatically validates the POC
    - There is NO requirement for legacy holders to sign contract (RSA) in order to update or validate a POC record

Efforts to Improve Data

- Current Process
  - Annual POC validation by ARIN staff
  - Vetting and verification required during resource requests and transfer requests

- Draft Policy Proposal
  - ARIN-2017-3 "Update to NRPM 3.6: Annual Whois POC validation
    - Similar to current policy with repercussion added for not validating – **removal of the resource record from Whois and termination of reverse DNS services**

- Other Ideas
  - Audit registration records in accordance with NRPM section 12 "Resource Review"
  - Adjust requirements on re-assignment records or direct allocations and assignments

Discussion

- The POC validation and accuracy of the Whois data directly impacts network operators and offers protection from hijacking. We want community feedback to make this process better and the data more accurate. Consider the following:

  - How is Whois accuracy impacting operators?
  - What would motivate operators to update stale records?
  - How could the update process be improved while still protecting resources from being hijacked?