American Registry for Internet Numbers, Ltd.

Summary Results of
Registration Services Department Audit

November 2011

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Audit Overview

The accounting and advisory firm of Baker Tilly was engaged by the American Registry for Internet Numbers (ARIN) to assess ARIN's Registration Services Department (RSD) processes compared to ARIN's Number Resource Policy Manual (NRPM) and industry leading practices in the following areas:

> - Internet Protocol (IP) address space allocation, transfer, and database record maintenance (both public and internal) for version 4 and version 6
> - Fraud detection, prevention, and follow-up
> - Autonomous system number (ASN) allocation, transfer, and record maintenance

Baker Tilly performed the following activities to meet the objectives of this audit:

> - Reviewed relevant documentation (e.g., NRPM, internal procedures, presentations, checklists, worksheets) to gain an understanding of ARIN's current registration processes (for a list of all documents reviewed, please see Appendix A)
> - Conducted interviews with key RSD personnel to understand RSD's policy and procedure governance processes
> - Performed walkthrough sessions with key RSD personnel to understand the processes outlined above
> - Reconciled current practices against the NRPM to identify potential gaps between practices and policies, as well as opportunities for process improvement
> - Reviewed and analyzed the registration practices documented in the policy manuals of the four other Regional Internet Registries to identify industry best practices and assess their applicability to ARIN's registration processes

Summary Results

During the course of the audit and based on the specific procedures performed, Baker Tilly did not identify any people, processes, or technology that were out of compliance with the NRPM. RSD has worked to maintain ARIN's compliance with the continually changing, community-based NRPM with dedicated people, formal processes, and technology. The department's collaborative and cross-trained management and staff understand, value, and support ARIN's mission. They have implemented formal processes, including documented procedures, for the various IP resource management tasks required by the NRPM. In addition, RSD has built an informative website that enhances community awareness and supports electronic allocation requests, organization record updates, and community correspondence.

Baker Tilly identified potential enhancements to improve RSD process consistency and efficiency, including opportunities to:
> - Enhance RSD's documentation of its existing, currently informal quality assurance and monitoring tasks, which validate that it is following ARIN's existing framework of people, processes, and technology in place to maintain compliance with the NRPM
> - Expand RSD's internal procedures to include specific criteria used by RSD related to calculating utilization rates, involving legal counsel in the processing of transfer requests, and determining investigations to conduct based on the annual point of contact (POC) validation process
> - Streamline and automate processes to ensure that procedures are applied consistently and efficiently

Strengths

During the audit, we noted the following strengths:

> Detailed process framework to ensure compliance with the NRPM
  - Documented internal procedures that continually evolve as RSD management and staff identify process enhancements
  - Dedicated procedure owner, who ensures that all procedures are consistent with the NRPM and are kept up-to-date
  - Formal review processes for all requests based on type and size
> Informative website that contains ARIN's current NRPM, policies, and materials to enhance community awareness, and a member portal, ARIN Online, which supports electronic allocation requests, organization record updates, and community correspondence
  - Back-end system, Management Web, used by ARIN management and staff to process requests from members and questions from the community
  - Set of standardized (i.e., canned) messages to allow for consistent communication with the community
> Dedicated RSD management (i.e., Director of Registration Services, Principal Resource Analyst, Technical Specialist, and Senior Resource Analyst) and staff who understand, value, and support ARIN's mission
  - Collaborative team environment and decision-making structure, focused on ensuring compliance with the NRPM
  - Cross-training of all RSD management and staff to ensure understanding of all RSD internal procedures
  - No RSD staff turnover since 2008
> Formal process for RSD to provide feedback to the community during the NRPM policy development process
> Automated annual POC validation process to ensure that a valid POC exists for each ARIN member, as well as a process to lock ARIN Online accounts when a POC is not validated

Themes

The overarching themes that were observed during the audit are presented below along with related recommendations:

#	Themes	Current State	Recommendations for ARIN's Consideration
1	**Quality Assurance Process for RSD's Internal Procedures**	While RSD maintains an informal quality assurance procedure, a formal, documented quality assurance process to ensure compliance with RSD's internal procedures does not exist. Without a formal quality assurance process, there is an increased likelihood that a request may be processed incorrectly or the NRPM may be applied inconsistently.	• Enhance the existing quality assurance process to formally include certain periodic review activities. • Update internal procedures to include the activities required by the formal quality assurance process. • Consider alternative RSD organizational structures to enhance efficiency.
2	**Utilization Calculation Processes**	While RSD uses a defined formula and specific criteria to calculate utilization rates, not all criteria are formally documented, particularly for exceptional cases.	• Expand RSD's internal procedures, to include all specified criteria used to calculate utilization rates.

#	Themes	Current State	Recommendations for ARIN's Consideration
3	Involvement of the Staff Attorney in Transfer Process	RSD works with the Staff Attorney to process certain transfer requests; however, the Staff Attorney is not consistently involved in the transfer process. Specific, documented guidance or criteria to determine when to engage with the Staff Attorney does not exist. This may be challenging to RSD as legal documents that support transfer requests sometimes contain legal jargon. As a result, RSD resources may be inefficiently used, and there is an increased risk of misunderstanding of legal clauses.	• Establish a formal process to incorporate the Staff Attorney in the transfer process. This process should include defining specific criteria that require the involvement of the Staff Attorney when processing transfer requests. • Update internal procedures to include the specific criteria to trigger the involvement of the Staff Attorney in the transfer process.
4	Annual POC Validation Process	When a POC is marked as invalid in the Whois database as a result of the annual Whois POC validation (i.e., a check to confirm accuracy of POC information), the policy does not require RSD to investigate these invalid POCs. As a result, ARIN investigates invalid POCs as time allows; not all invalid POCs are reviewed due to limited resources. Invalid POC information may be an indicator that resources assigned to that POC are unused or fraudulently used. This is a growing concern as the pool of available IPv4 addresses continues to decrease.	• Formalize the current process by which RSD prioritizes the investigation of invalid accounts, as time allows, based on specific criteria. • Update internal procedures to include the specific criteria that RSD uses to identify invalid accounts that should be investigated by RSD as time allows.
5	Fraud Identification Process	While management understands fraud risks and trends, a formal, proactive process to identify fraud does not exist.	• Formalize an ongoing training process whereby RSD analysts are regularly updated on current patterns and methodologies identified within potential fraudulent requests. • In the future, implement an automated check for the identified fraud red flags within ARIN Online. Additionally, develop a process to investigate fraud red flags identified within ARIN Online.

#	Themes	Current State	Recommendations for ARIN's Consideration
6	Fraud Investigation and Reporting Processes	The process for investigating and reporting fraud is time intensive and results in delays in request processing. As a result, this process can take weeks, resulting in noncompliance with ARIN's service level agreement (i.e., promise to provide a response within two days) to its members. Further, this delay increases the probability that the organization is aware of the fraud investigation, allowing the organization to react (e.g., cancel or correct the request) prior to completion of the investigation.	• Work with ARIN management to create a team responsible for directing the investigation and reporting of fraud incidents and escalating incidents as appropriate. This team should consist of the Director of Registration Services, Chief Operating Officer, and Staff Attorney. The team should meet periodically to discuss fraud incidents and collaboratively determine recommended next steps. Recommendations should then be presented to the Chief Executive Officer and General Counsel.
7	Transfer Requests, Transfer Tracking, and Experimental Internet Resource Request Processes	RSD accepts transfer requests and experimental Internet resource requests manually via an email form. Furthermore, transfers are manually tracked within a spreadsheet used internally by RSD. As a result, these processes must be manually entered into Management Web, which takes additional time for RSD staff. In addition, there is a risk that information may be incorrectly or incompletely entered by the RSD staff.	• Work with Engineering to implement automated transfer and experimental Internet resource request processes within ARIN Online, similar to the IPv4, IPv6, and ASN request processes. • Work with Engineering to have Management Web automatically update the transfer tracking spreadsheet, or develop a status report.

Appendix A: Documentation Reviewed

We reviewed the following documentation:

- > ARIN Appeal Process
- > ARIN Charge Codes
- > Fraud Detection Presentation
- > Introduction to ARIN's Database
- > Job Descriptions
  - o Director, Registration Services
  - o Principal Resource Analyst
  - o Senior Resource Analyst
  - o Technical Specialist
- > Labor Distribution for Registration Services Department
  - o June 2011
  - o July 2011
  - o August 2011
  - o September 2011
- > List of Agreements Between ARIN and Its Customers
- > List of Canned Messages
  - o Message for Requesting Information for an Additional Allocation
  - o Message for Requesting Information for an Initial Allocation
- > Number of Requests by Month
  - o ASNs
  - o Transfers
  - o IPv4 and IPv6
- > Number Resource Policy Manual as of September 27, 2011
- > Policy for Handling Resource Transfers
- > Policy for Managing Points of Contact and Organization Identifiers
- > Policy for Managing Resources
- > Policy for Requesting Resources
- > Quick Guide to Requesting Resources
- > Registration Services Department Internal Procedures
- > Regional Internet Registry (RIR) Comparative Policy
- > Transfer Template
- > Transfer Worksheet 2011
- > Whois Questionnaire