Deploying the IETF’s WHOIS Protocol Replacement

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Agenda

- Introduction (10 min)
- What is RDAP (10 min)
- Status of RDAP (10 min)
- Path to Adoption (15 min)
- Q&A (30 min)
History on Replacing the WHOIS Protocol

• SSAC’s SAC 051 Advisory (19 Sep 2011)
  - The ICANN community should evaluate and adopt a replacement domain name registration data access protocol

• Board resolution adopting SAC 051 (28 October 2011)

• Roadmap to Implement SAC 051 (4 June 2012)

• RDAP Community development within IETF WG since 2012

• Contractual provisions in .com, .name, .biz, .info, .org, 2012 RA, and 2013 RAA

• RDAP RFCs expected in the next few months
Registration Data Access Protocol

• Intended to replace the WHOIS (port-43) protocol
• Provides flexibility to support various policies
• Already operating at Regional Internet Registries
• Provide benefits improving on weaknesses in the WHOIS protocol
• Designed with the knowledge of a now mature industry
Status of RDAP Protocol
Web-Extensible Internet Registration Data Service (WEIRDS)

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The Problem

• WHOIS has not scaled well to the needs of the modern Internet:
  1. Unformatted
  2. Unauthenticated
  3. ASCII-only
  4. Insecure
The Problem: Unformatted

• WHOIS defined no specific output format
  • Every WHOIS registry is free to return its results in any form it wishes
  • Difficult to request a reply and extract exactly the piece of information requested
The Problem: Unauthenticated

• Impossible to distinguish one client from another, apart from source IP address
• Can’t distinguish two clients from the same IP address at all (e.g., NATs or PATs)
• Unable to give preferential service to, say, official ICANN queries or to law enforcement
• “Preferential service” might mean higher rate limits, more detailed answers, etc., versus anonymous queries
The Problem: ASCII-only

• There are no provisions for internationalized output
• All participants are forced to use English or at least Anglicized names
The Problem: Not extensible

• There are no provisions in the protocol for options, parameters, or extensions
The Problem: Insecure

• Protocol is a trivial cleartext query/response mechanism
  • Any interloper can see both the question and the response
  • Can also see which registry is being queried, though that’s probably less interesting
Previous Solutions

• WHOIS [RFC3912] has origins in the late 1970s
• RWHOIS [RFC1714] in 1994 was an attempt to introduce a hierarchical lookup structure, but uptake was weak
• IRIS [RFC3981] attempted to do something more modern in 2005, but became highly complex and also saw little deployment
WEIRDS and RDAP

• In 2011, some ICANN staffers approached ARIN to talk about a new alternative involving the IETF

• Based on the requirements of IRIS [RFC3707], the IETF undertook a new, simpler effort

• Formed the “Web Extensible Internet Registration Data Service” (WEIRDS) working group

• BoF in spring 2012, WG formed summer 2012

• Broad participation from RIRs and registries

• Developing the Registration Data Access Protocol (RDAP)
Fundamentals of RDAP

• Transport used is HTTP
• Widely deployed and developed infrastructure
• Lots of open source options
• Allows for use of HTTP authentication
  • Satisfies the differential service requirement
• Allows for use of HTTPS
  • Satisfies the encryption requirement
• Already has support for redirects
Fundamentals of RDAP

• Replies are JSON formatted, which supports UTF-8
  • Satisfies the standard format requirement

• Internationalized domain names (IDN [RFC3409]) supported in both the question and the answer
  • Question is encoded in the URI
  • Combination satisfies the internationalization requirement
Fundamentals of RDAP

• IANA will maintain bootstrap registries for domains, AS numbers, and network blocks
• Registries will be published in JSON
• Clients will periodically download the registry as a way of knowing where to send a query for a given AS range, network block, or TLD
• A query that lands in the wrong place can be redirected using HTTP 303
Fundamentals of RDAP

• Bootstrap data includes the base query location for every registry
• RDAP specification explains how to form direct queries and basic search queries
• Other interesting query formats can be defined later
• Satisfies the extensibility requirement
• Registry of known response fields also provides extensibility
Fundamentals of RDAP

• Basic search is supported in the protocol, but not mandatory to implement
Implementation Status

- Any HTTP client can issue queries and receive replies
- ICANN has partnered with CNNIC to produce an open source implementation
  - https://github.com/cnnic/rdap
- ARIN has had an implementation for network numbers since the beginning
- APNIC has a prototype available
- LACNIC appears to be in private beta
- RIPE NCC has an open source implementation
  - https://github.com/RIPE-NCC/whois
- VeriSign and Afilias are doing proof-of-concept implementations for domain names
Specification Status

• Six documents
• Object inventory
• RDAP over HTTP
• Query format
• Security Considerations
• JSON responses
• Bootstrapping
• https://datatracker.ietf.org/wg/weirds/documents/
Specification Status

• Currently in IETF Last Call
• IESG review on October 30
• Assuming no serious concerns, goes to the RFC Editor queue
• RFC Editor lately takes about a month to publish as an RFC
• Overall, very likely published by the end of 2014
RDAP and ICANN

- RDAP plays a prominent role in addressing the recommendations of the ICANN EWG on Directory Services
Path to Adoption
Simplified Anatomy

Policy:
- Differentiated access
- Searchability
- …

Data:
- Domain name
- Registrant
- Contacts
- …

Protocol:
- RDAP
- WHOIS
Focus of this Effort

Policy:
- Differentiated access
- Searchability
- ...

Data:
- Domain name
- Registrant
- Contacts
- ...

Protocol:
- RDAP
- WHOIS

#ICANN51
RDAP Provides/Enables

- Standardized query, response, and error messages
- Extensibility
- Distributed sources – Redirection (if needed)
- Searchability (where applicable)
- Differentiated access (where applicable)
- Internationalization (pending T&T PDP)
- An incremental step towards a potential policy outcome from the EWG report
High-Level Roadmap

• RDAP attains IETF Proposed Standard status
• RDAP Implementations available
• RDAP operational profile defined
• RDAP deployment
• WHOIS (port-43) turn off
Questions

• Should RDAP deployment be synchronized with Thick Whois policy implementation?

• Once all Registries are Thick, is there a reason for registrars to offer RDAP/WHOIS/Web Whois?

• How long after RDAP deployment to turn off WHOIS?
GDD + Related Sessions

Thursday, 16 October
- DNSSEC Key Rollover Workshop
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