Verisign's RDAP Pilot Implementations

Scott Hollenbeck <shollenbeck@verisign.com>

Senior Director, Verisign Registry Services Lab

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Agenda

- Verisign Pilot Implementation History

- Verisign Pilot Implementation Features

- Verisign Implementation and Query Observations

Verisign Pilot Implementation History
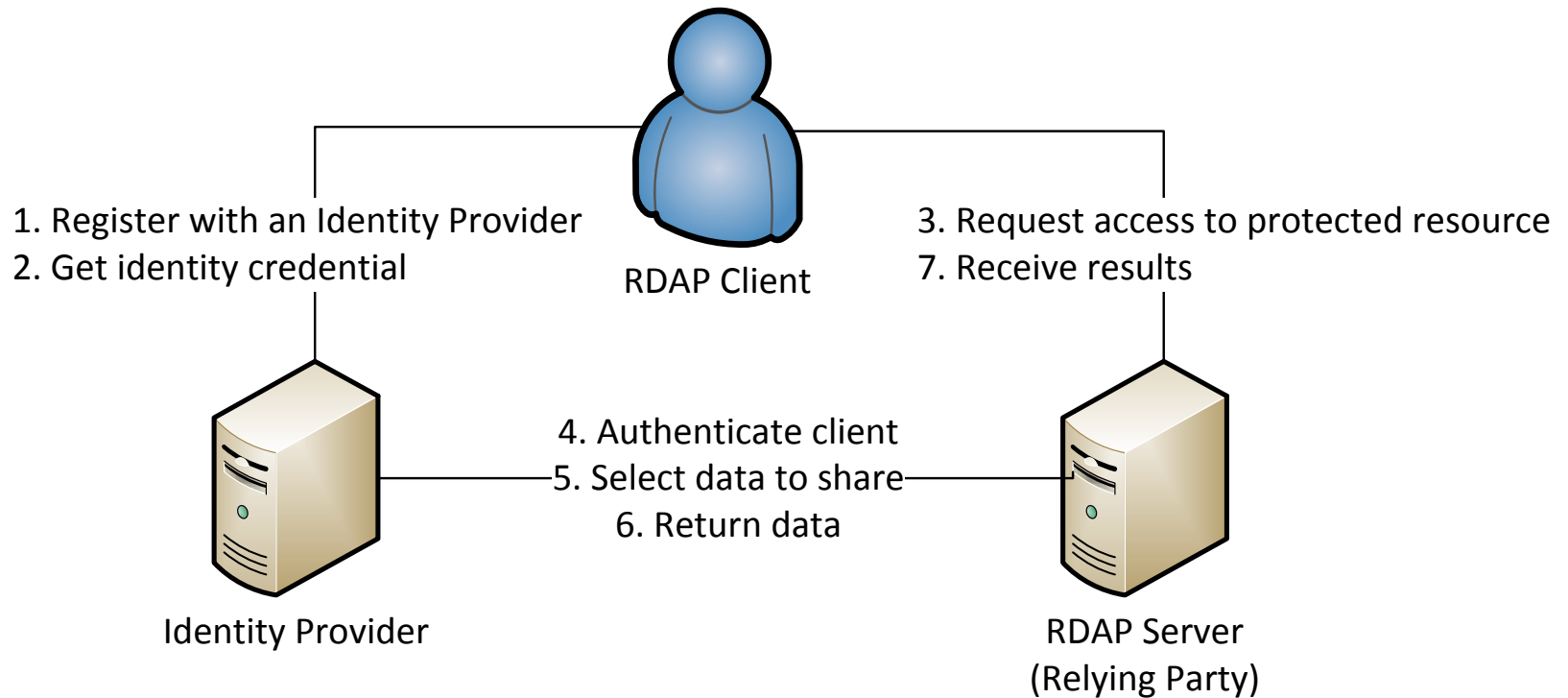
RDAP Pilot Implementation History

- Launched web client and server implementation for .cc and .tv ccTLDs in November 12, 2015

- Launched web client and server implementation for .com and .net gTLDs on October 5, 2017
  - Part of ICANN's RDAP gTLD pilot program
  - "Thin" TLDs

- Launched web client and server implementation for .career gTLD on March 5, 2018
  - "Thick" TLD

- Each includes support for some number of experimental RDAP features

Verisign Pilot Implementation Features

Experimental Feature: Federated Authentication

- Similar to the "single sign-on" concept

- A means of identifying and authenticating entities based on mutual trust between members of a common community, or federation

- Credentials are issued to clients by identity providers

- Credentials are presented by clients to server operators (relying parties)

- Credentials are sent from server to identity provider for validation

- Client selects information to be shared with server

- If all is well – access granted!

- https://datatracker.ietf.org/doc/draft-hollenbeck-regext-rdap-openid/

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Federated Authentication: How it Works

1. Register with an Identity Provider
2. Get identity credential

RDAP Client

3. Request access to protected resource
7. Receive results

4. Authenticate client
5. Select data to share
6. Return data

Identity Provider

RDAP Server
(Relying Party)

Federated Authentication: Software We're Using

- OpenID Connect
  - https://developers.google.com/identity/protocols/OpenIDConnect
  - Apache License 2.0

- OpenID Connect Identity Provider
  - https://www.gluu.org/
  - MIT License

- Other Providers
  - http://openid.net/developers/libraries/
  - Many languages supported with FREE software!

Experimental Feature: Object Tagging

- Core RDAP doesn't support entity query bootstrapping

- Practice of tagging entity handles with an operator-specific suffix such as "-VRSN"

  - Suffixes are registered with IANA

  - Adds structure that supports entity query bootstrapping

- https://datatracker.ietf.org/doc/draft-ietf-regext-rdap-object-tag/

Experimental Feature: Regular Expression Search

- Core RDAP has limited search capability

  - Simple asterisk-based pattern matching of trailing characters, e.g. "example*" or "example.*"

- Extends RDAP search capabilities using POSIX regular expression syntax

  - Supported by many operating systems and databases

- https://datatracker.ietf.org/doc/draft-fregly-regext-rdap-search-regex/

RDAP Pilot for .cc and .tv (Features)

- Data set: "thin" ccTLD

- Core RDAP

  - Domain, name server, and entity lookup

  - Domain, name server, and entity search

- Experimental RDAP

  - Entity object tagging

  - Regular expression search

  - Federated client identification, authentication, and authorization

RDAP Pilot for ccTLDs (Web Interface)

https://rdap.verisignlabs.com/rdap/v1/

RDAP Pilot for .com and .net (Features)

- Data set: "thin" gTLD
- Core RDAP
  - Domain, name server, and entity lookup
  - Domain, name server, and entity search
- Experimental RDAP
  - Entity object tagging
  - Federated client identification, authentication, and authorization

RDAP Pilot for .career (Features)

- Data set: "thick" gTLD

- Core RDAP

  - Domain, name server, and entity lookup

  - Domain, name server, and entity search

- Experimental RDAP

  - Entity object tagging

  - Federated client identification, authentication, and authorization

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RDAP Pilot for gTLDs (Web Interface)

https://rdap-pilot.verisignlabs.com/rdap/v1/

Verisign Implementation and Query Observations

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gTLD Domain Queries

Cumulative Domain Queries over Time
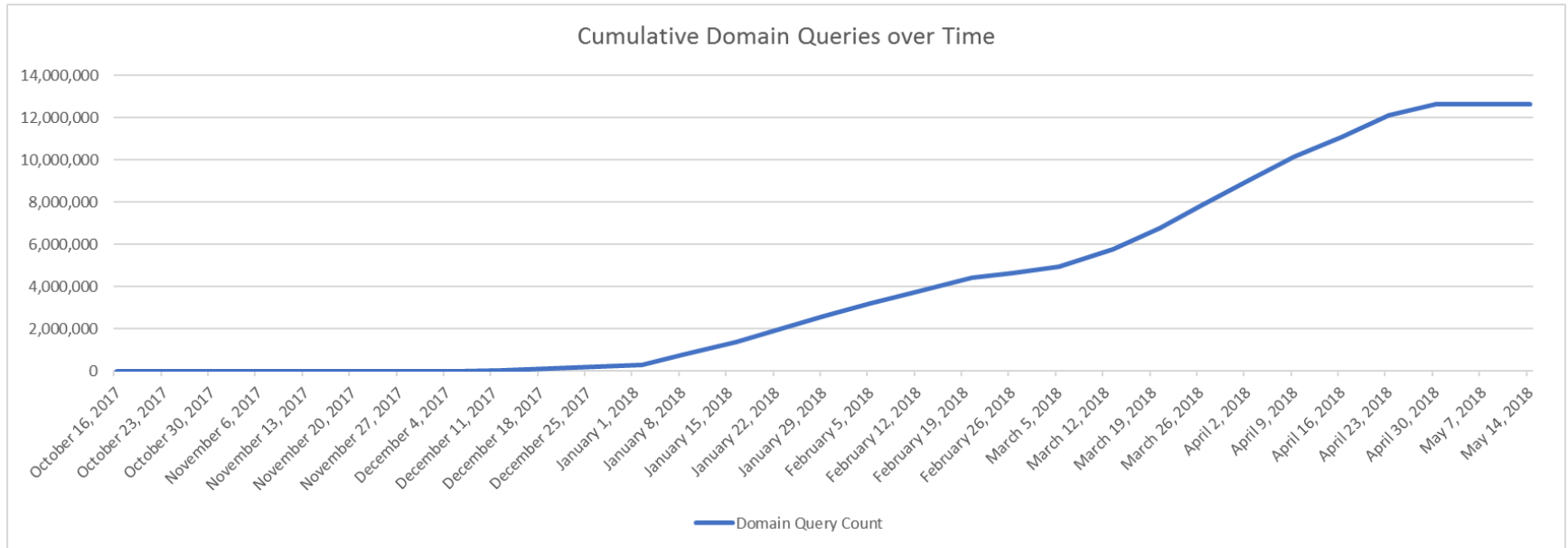
Clients, Name Server, and Entity Queries

Cumulative Clients, Name Server Queries, and Entity Queries over Time

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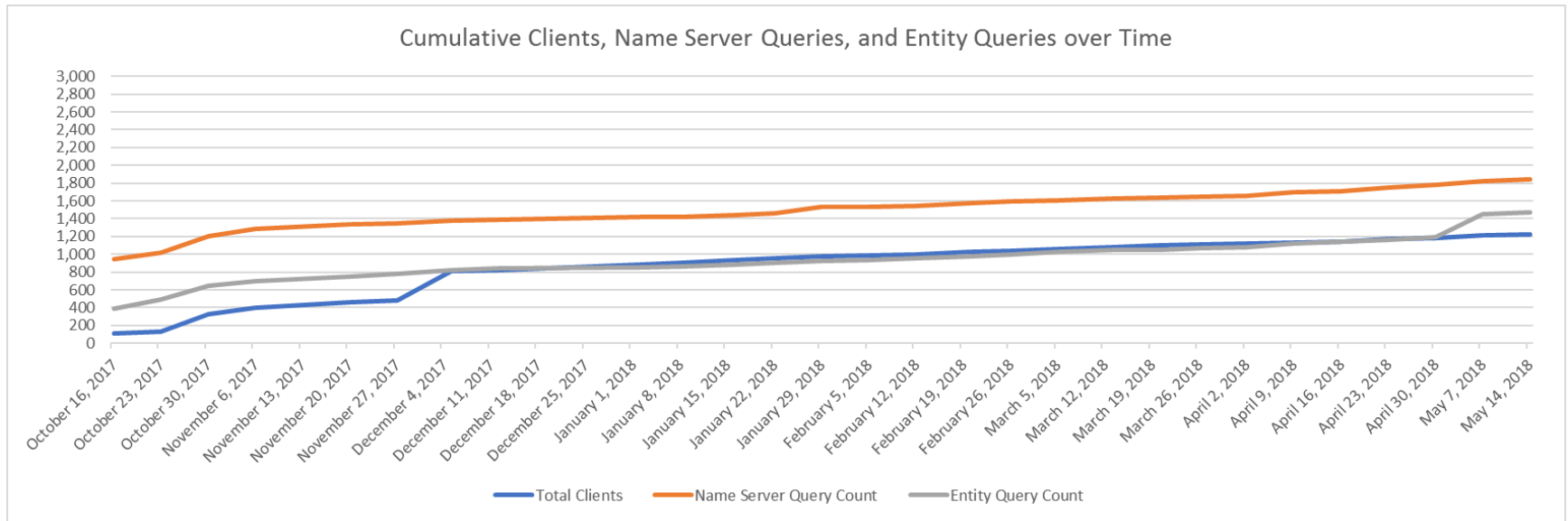
Observations

- Protocol test suites help ensure implementation correctness

  - Viagénie: contact support@viagenie.ca

  - https://github.com/APNIC-net/rdap-conformance

- Clients, name server queries, and entity queries have increased slowly over time

- Domain name queries experienced a rapid increase in early January and ended in early May

  - One university client was a steady customer

- Experimental features work well and help fill gaps in the core RDAP specifications

To Do

- Release open source demonstrator for the OAuth device flow

  - Needed for UI-limited interfaces, such as command line clients

- Registrar integration

  - "Thin" registries can appear "thick" with registrar support for RDAP

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