# RDAP: A Primer on the Registration Data Access Protocol

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# Background

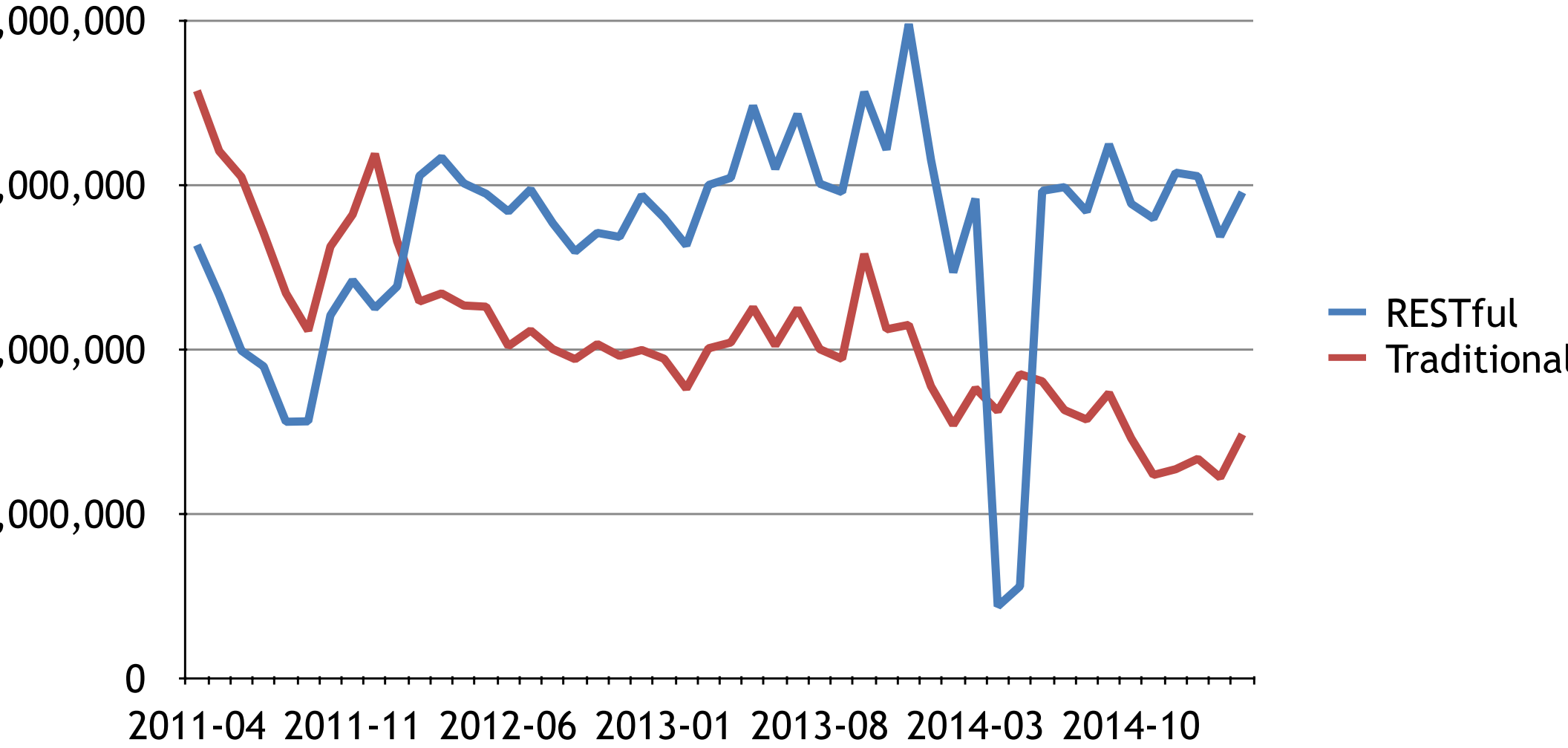
- WHOIS (Port 43)
  - Old, very old
  - Lot's of problems
    - Under specified, no I18N, insecure, no authentication, etc…

# RIRs Begin To Play with RESTful Whois Services

- ARIN
  - Pilot in October 2009
    - Flash and AJAX apps written against it by unknown parties
  - Full Production as of July 2010
- RIPE NCC
  - Announced their RESTful proxy to Whois March 2010
  - Now in production

# RESTful Whois Becomes Quite Popular

(ARIN's monthly totals over time)



# ICANN / IETF Take Notice

- IETF 81(July 2011) – Bar-BOF
- IETF 82 (November 2011) – Official BOF
- IETF 83 (March 2012) – WG Formed
- IETF 92 (March 2015) – RFCs Published
  - RFC 7480 – Usage of HTTP by RDAP
  - RFC 7481 – Security Considerations
  - RFC 7482 – Query Format
  - RFC 7483 – JSON Responses
  - RFC 7484 – Bootstrapping

# The Facets of RDAP

- The Protocol
- Queries
  - Lookups
  - Searches
- Response
  - Discreet result objects
  - Search results
- Security
- Bootstrapping
- Extensibility

# The Protocol

- HTTP <= 1.1 GETs and HEADs
  - No PUTs, POSTs, or DELETEs defined
  - Queries are in the URLs
- HTTPS or HTTP
  - HTTPS highly preferred
- Standard HTTP return codes
  - 200 OK, etc..
  - 3xx Redirects and 4xx errors may have entity bodies
  - Clients can evaluate codes only or look at entity bodies

# Queries in the URL

http://rdap.apnic.net/ip/1.1.1.1

http://rdap.db.ripe.net/ip/1.1.1.1

http://rdg.afilias.info/rdap/domain/dog.info

http://rdap.arin.net/registry/entities?fn=Newton*

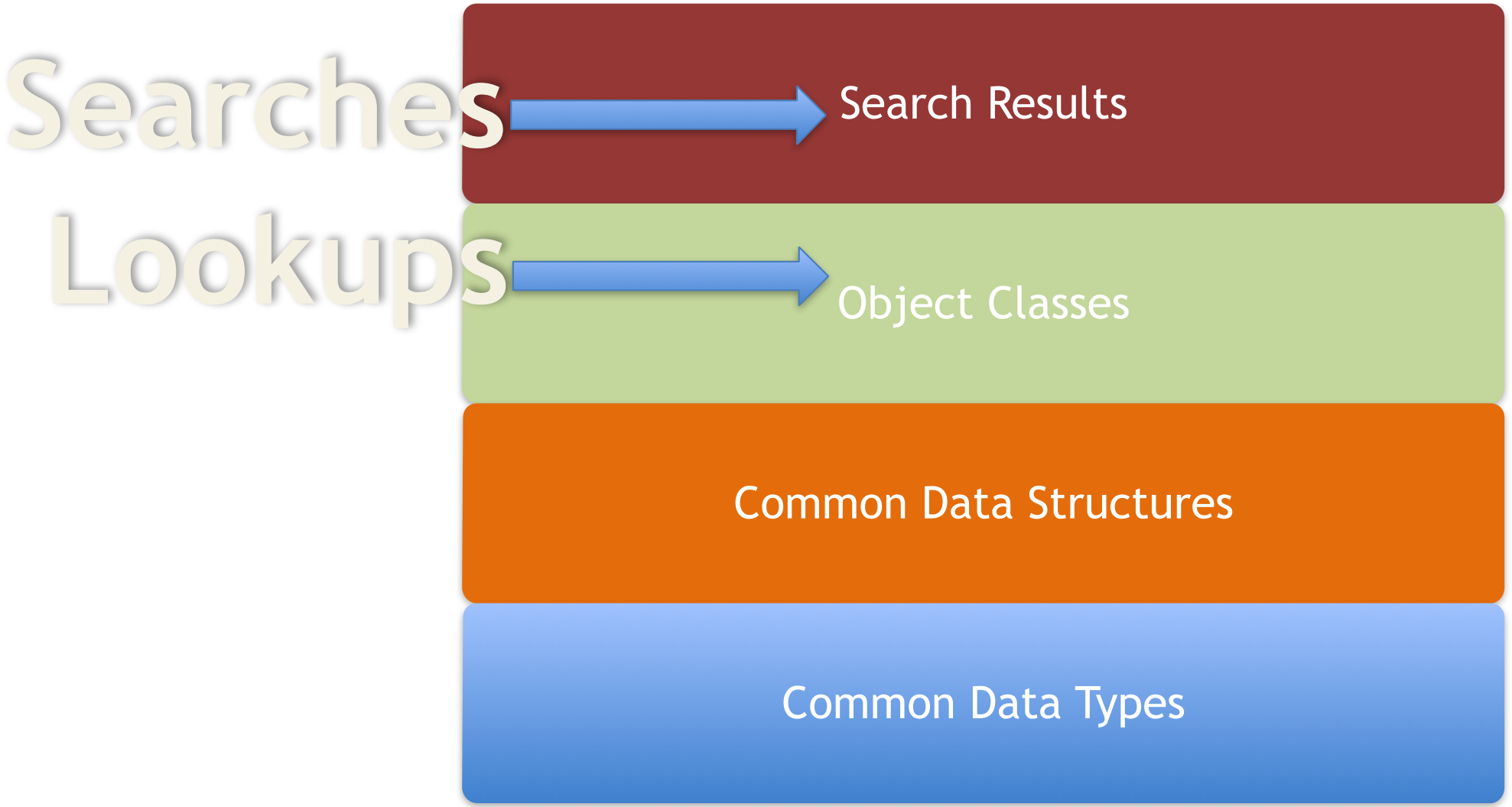
# Lookups

- CIDR or IP (which is just CIDR with 32 or 128 length)
  - Most specific net enclosing
- Autonomous System Number
- Domain name
- Nameserver host name
- Entity by handle
  - Handle is a registry unique identifier
- And /help

# Searches

- Domains
  - By partial domain name match
  - Hostname of nameserver
  - IP address of nameserver
- Nameservers
  - By partial hostname match
  - By IP address
- Entity
  - By partial "natural name" match
  - By partial handle match

# JSON Response



# Security

- All sorts of possibilities when re-using HTTP
  - That's what RFC 7481 says
- Nothing defined – ***YET!***

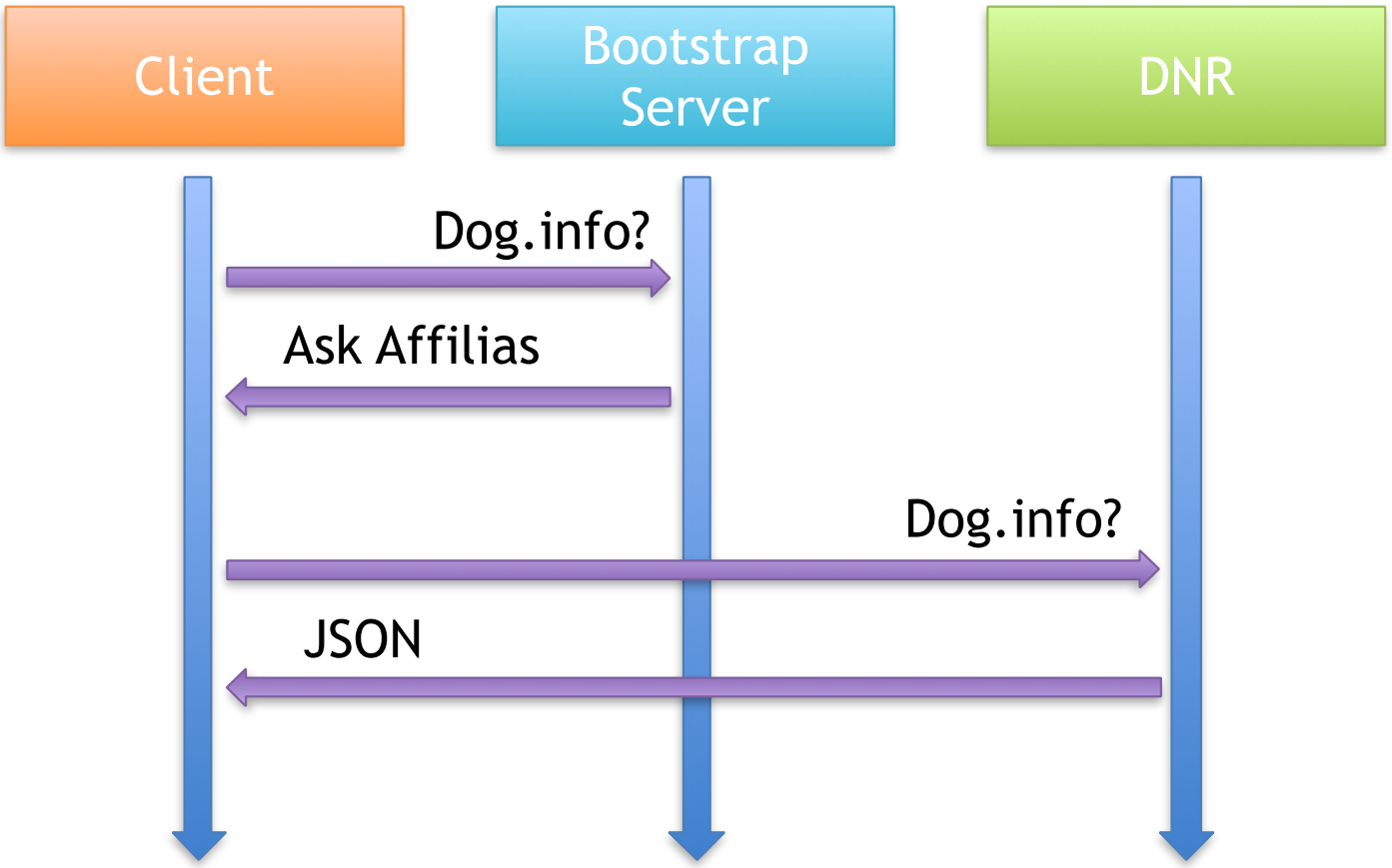
# Bootstrapping

- Or… how to find the right server for a query
- IANA will periodically publish bootstrap JSON files
  - http://data.iana.org/rdap/asn.json
  - http://data.iana.org/rdap/ipv4.json
  - http://data.iana.org/rdap/ipv6.json
  - http://data.iana.org/rdap/dns.json
- Client will periodically go fetch them

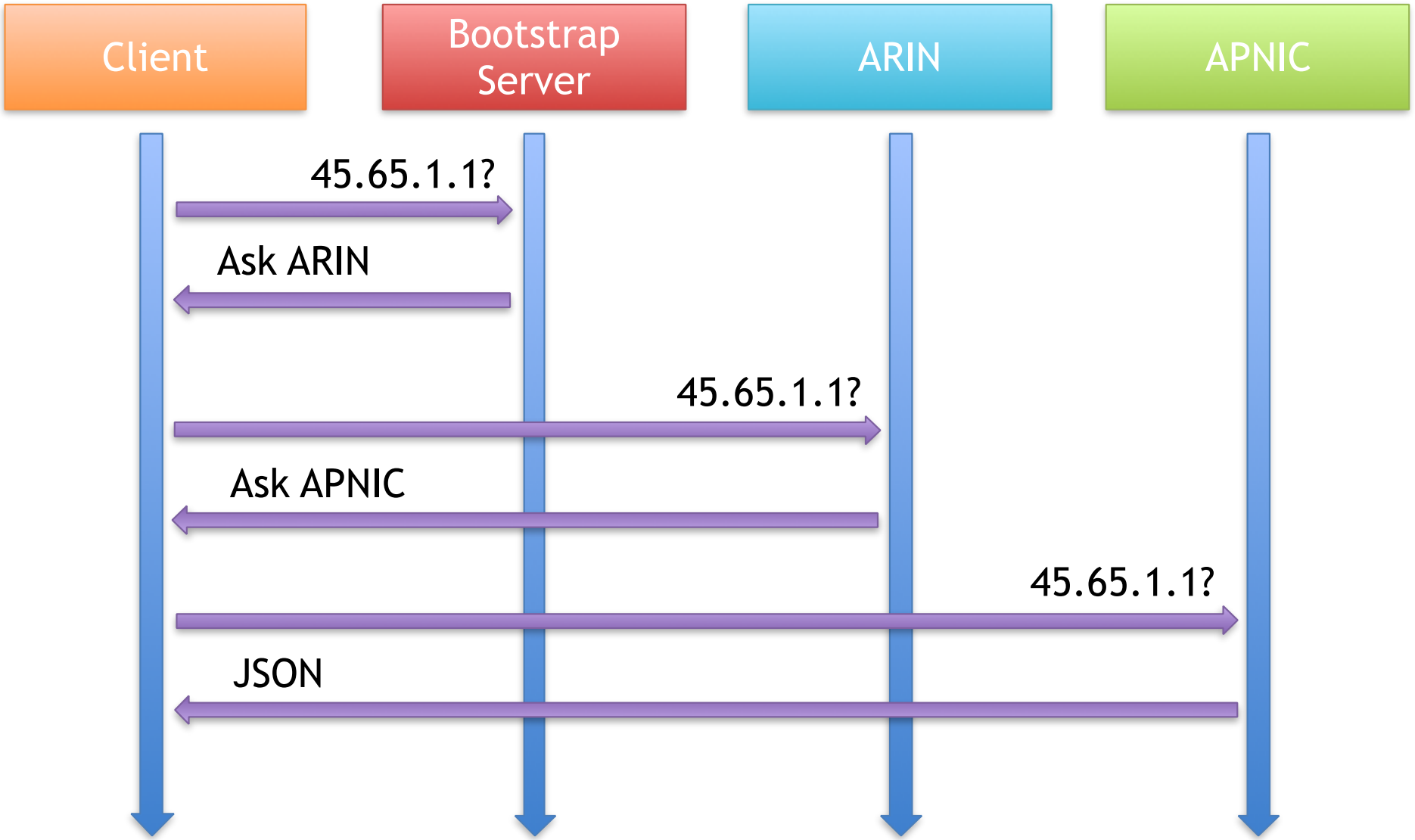
# Bootstrapping in the Real World

- Bootstrap servers help clients, especially clients running in a constrained environment such as a web browser
- Can be more helpful than the official IANA bootstrap files
  - Formulating Reverse DNS redirects
  - Synthesizing Nameserver redirects
  - Educated guesses regarding authoritative servers for Entities

# Bootstrapping for DNRs



# Bootstrapping for RIRs



# Extensibility

- To add new JSON stuff
  - Write a specification (doesn't have to be an RFC, can just be a web page)
  - Registry your JSON prefix
  - Go for it!
- Status values, role type, etc… defined in an IANA registry
  - Just go register new values

# Implementation Gotchas

- 'objectClassName' – MANDITORY
- 'fn' attribute in Entity jCards – MANDITORY
- Self links required for client-side caching
  - And you do want client-side caching, right?

# Where Are We?

- APNIC, LACNIC, ARIN – In Production
  - ARIN also running a bootstrap service
- RIPE NCC, AFRINIC – Pilots Available
- Afilias (.info) – Pilot Available
- CNNIC (.cn) – Pilot Available
- .cz and .br – ??
- IANA – In Production

# What Do We Have?

- Registry servers from RIPE NCC, DNSBelgium and CNNIC and possibly NIC.br
- Clients from ARIN, DNSBelgium, CNNIC, and CentralNIC and possibly NIC.br
  - "gem install nicinfo"
- Bootstrap Server from ARIN
- Conformance Testers from Viagenie, APNIC, and LACNIC


QUESTIONS
ANSWERED
HERE
EVEN THE
SILLY ONES