IANA Developments ccNSO, Wellington 2006

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Coming up:

- Brief Update
- IANA Development Work
- Goals

Very Brief Update on IANA Operations

- Yoshiko Chong joined our staff
  - Formerly of APNIC & JPNIC
- Statistically speaking: modest improvement since Vancouver
  - David will give more stats in public forum (Thu 11:30)
- Working on a whole bunch of stuff…

IANA Development Work

Projects Overview

- Root Zone Management
  - Request Automation
  - Technical Check Automation
- Case Management Systems
  - Unified system
  - Unarchival Project
  - Reporting
- 24×7 Emergency Support
- Policy Improvement
- Tying it all together

RZM Automation Project

Automated workflow for Root Zone Management in IANA, eliminating unnecessary human interventions in request handling.

- Since we last met:
  - Decided to use e-IANA as a base, out of three proposed alternatives
    - e-IANA is Java-based, developed by NASK (.pl), based on specs done by various ccTLDs & CENTR.
    - e-IANA was offered as a community gift for IANA to use at no cost.
- Engaged an expert programmer to review code (we have no in-house Java expertise)
  - Required some rewriting to compile properly, got functional in February. (*http://test.icann.org:8080/eiana/*)
  - Advises it can form a basis for our general requirements, but needs some structural change.

RZM Automation Project (2)

- Since we last met (cont.):
  - Advised around a month ago code is heavily encumbered, needs to be paid for and licensed “due to Polish tax law”.
    - Started negotiations to find reasonable terms
    - Discussions continuing
  - In mean time, told programmer to stop work on e-IANA as they were breaching the proposed contract.
- Net result: still don’t have certainty on base of software (e-IANA, alternative, re-implementation). Aim to resolve very soon.

RZM Automation Project (3)

- Since we last met (cont.):
  - Developing a functional specification that guides future development:
    - Stage 1 functionality: replicates existing dependencies, allows us to drop it in and use day-to-day.
      - Mods needed to e-IANA sw: More granular control of AC/TC permissions, multiple AC/TCs, decoupling user id. from roles, hooks between system and case management, additional state changes & watch-points, technical test condition, admin interface for staff, replace UI with intuitive “wizards”, monitoring/reporting functions, …
    - Stage 2+ functionality:
      - Nice features that have been requested, or staff feel would improve service
        - DNSSEC, Improved authentication, EPP to root zone generation, WHOIS integration, interrogation of queue-state …
      - Removing features that are no longer necessary due to policy clarifications that means IANA has to do less work.

Technical Check Automation

Define minimum, and desired, technical requirements for name servers; Implement in software, allowing TLD managers to immediately fix faults.

- Immediate feedback on technical faults allows applicant to immediately correct deficiencies in application
  - Will allow to “push through” on failure to manual check, for rare exceptions. Only truly bizarre requests will be rejected outright (e.g. 0 name servers, IP address of 555.555.555.555, …)
- Need to define what the technical hurdles are
  - Document forthcoming describing practices
  - Community review process
- Will form component of complete RZM automation system

Case Management

Provide a consistent interface for managing and recording requests for both staff and requestors.

- Created unified case management system
  - Moved from multiple systems to one.
  - Tailored off the shelf package to meet IANA's needs.
- "Unarchiving"
  - Digitising all paper-based files we have, inserting into case management system.
- Reporting
  - Aiming for fine detail on IANA queues, wait-states, etc.
  - #1 benefit for TLDs: ability to drill down on wait-states, expose what is

24×7 Support

Provide an escalation mechanism so TLD operators can contact IANA staff in the event of critical emergency (i.e. TLD is offline, can be fixed by altering the root zone)

- Requested by ccTLDs
- Developed requirements, discussed various options with potential vendors
- Call for vendors; vendors selected
- Aimed to commission service in time for the week, but…
  - … phone company is a little slow at provisioning phone lines
- Will provide you with the details once it works.

Policy review

Identify areas of policy that are suboptimal or deficient, and encourage the community to review and develop policy.

- Automation will likely achieve only modest performance gains
  - Manual steps still required
  - Most of life of a request is outside IANA's hands
  - Corner cases often inflate IANA's statistics
    - i.e. the rare case which is not routine
- An example…

IANA Records

tld1

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns2.foo.com - 1.2.5.55
ADMIN-C: Bill T.
TECH-C: Sarah F.

tld2

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns1.bar.com - 50.100.150.250
ADMIN-C: Guenter V.
TECH-C: Karoline W.

tld3

NAMESERVER 1: ns.tld3 - 20.30.20.30
NAMESERVER 2: ns1.foo.com - 1.2.3.4
ADMIN-C: Francois Y.
TECH-C: Madeleine D.

DNS Root Zone

```
tld1.    IN   NS   ns1.foo.com.
tld1.    IN   NS   ns2.foo.com.

tld2.    IN   NS   ns1.foo.com.
tld2.    IN   NS   ns1.bar.com.

tld3.    IN   NS   ns.tld3.
tld3.    IN   NS   ns1.foo.com.

ns1.foo.com.       IN  A  1.2.3.4
ns2.foo.com.       IN  A  1.2.5.55
ns1.bar.com.       IN  A  50.100.150.250
ns.tld3.           IN  A  20.30.20.30
```

Glue Processing

Typical IANA records and resulting root zone file

IANA Records

tld1

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns2.foo.com - 1.2.5.55
ADMIN-C: Bill T.
TECH-C: Sarah F.

tld2

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns1.bar.com - 50.100.150.250
ADMIN-C: Guenter V.
TECH-C: Karoline W.

tld3

NAMESERVER 1: ns.tld3 - 20.30.20.30
NAMESERVER 2: ns1.foo.com - 6.7.8.9
ADMIN-C: Francois Y.
TECH-C: Madeleine D.

NS Change Request

DNS Root Zone

```
tld1.    IN   NS   ns1.foo.com.
tld1.    IN   NS   ns2.foo.com.

tld2.    IN   NS   ns1.foo.com.
tld2.    IN   NS   ns1.bar.com.

tld3.    IN   NS   ns.tld3.
tld3.    IN   NS   ns1.foo.com.

ns1.foo.com.       IN  A  1.2.3.4
ns2.foo.com.       IN  A  1.2.5.55
ns1.bar.com.       IN  A  50.100.150.250
ns.tld3.           IN  A  20.30.20.30
```

Glue Processing

"tld3" asks for the IP address of a shared nameserver to be changed

IANA Records

tld1

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns2.foo.com - 1.2.5.55
ADMIN-C: Bill T.
TECH-C: Sarah F.

tld2

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns1.bar.com - 50.100.150.250
ADMIN-C: Guenter V.
TECH-C: Karoline W.

tld3

NAMESERVER 1: ns.tld3 - 20.30.20.30
NAMESERVER 2: ns1.foo.com - 6.7.8.9
ADMIN-C: Francois Y.
TECH-C: Madeleine D.

DNS Root Zone

```
tld1.    IN   NS   ns1.foo.com.
tld1.    IN   NS   ns2.foo.com.

tld2.    IN   NS   ns1.foo.com.
tld2.    IN   NS   ns1.bar.com.

tld3.    IN   NS   ns.tld3.
tld3.    IN   NS   ns1.foo.com.

ns1.foo.com.       IN  A  1.2.3.4
ns2.foo.com.       IN  A  1.2.5.55
ns1.bar.com.       IN  A  50.100.150.250
ns.tld3.           IN  A  20.30.20.30
```

1.2.3.4 or 6.7.8.9?

Glue Processing

There is now a conflict between the agreed IP address of the glue record

IANA Records

tld1

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns2.foo.com - 1.2.5.55
ADMIN-C: Bill T. **CONFIRM REQ'D.**
TECH-C: Sarah F. **CONFIRM REQ'D.**

tld2

NAMESERVER 1: ns1.foo.com - 1.2.3.4
NAMESERVER 2: ns1.bar.com - 50.100.150.250
ADMIN-C: Günter V. **CONFIRM REQ'D.**
TECH-C: Karoline W. **CONFIRM REQ'D.**

tld3

NAMESERVER 1: ns.tld3 - 20.30.20.30
NAMESERVER 2: ns1.foo.com - 6.7.8.9
ADMIN-C: François Y. **CONFIRM REQ'D.**
TECH-C: Madeleine D. **CONFIRM REQ'D.**

DNS Root Zone

```
tld1.    IN   NS   ns1.foo.com.
tld1.    IN   NS   ns2.foo.com.

tld2.    IN   NS   ns1.foo.com.
tld2.    IN   NS   ns1.bar.com.

tld3.    IN   NS   ns.tld3.
tld3.    IN   NS   ns1.foo.com.

ns1.foo.com.       IN  A  1.2.3.4
ns2.foo.com.       IN  A  1.2.5.55
ns1.bar.com.       IN  A  50.100.150.250
ns.tld3.           IN  A  20.30.20.30
```

1.2.3.4 or 6.7.8.9?

Glue Processing

Current cautious approach means positive confirmation from all affected TLDs (approx. 2×*n* people)

Glue Issue Impact

- Since November 2005:
  - 3 cases already affected multitude of TLDs

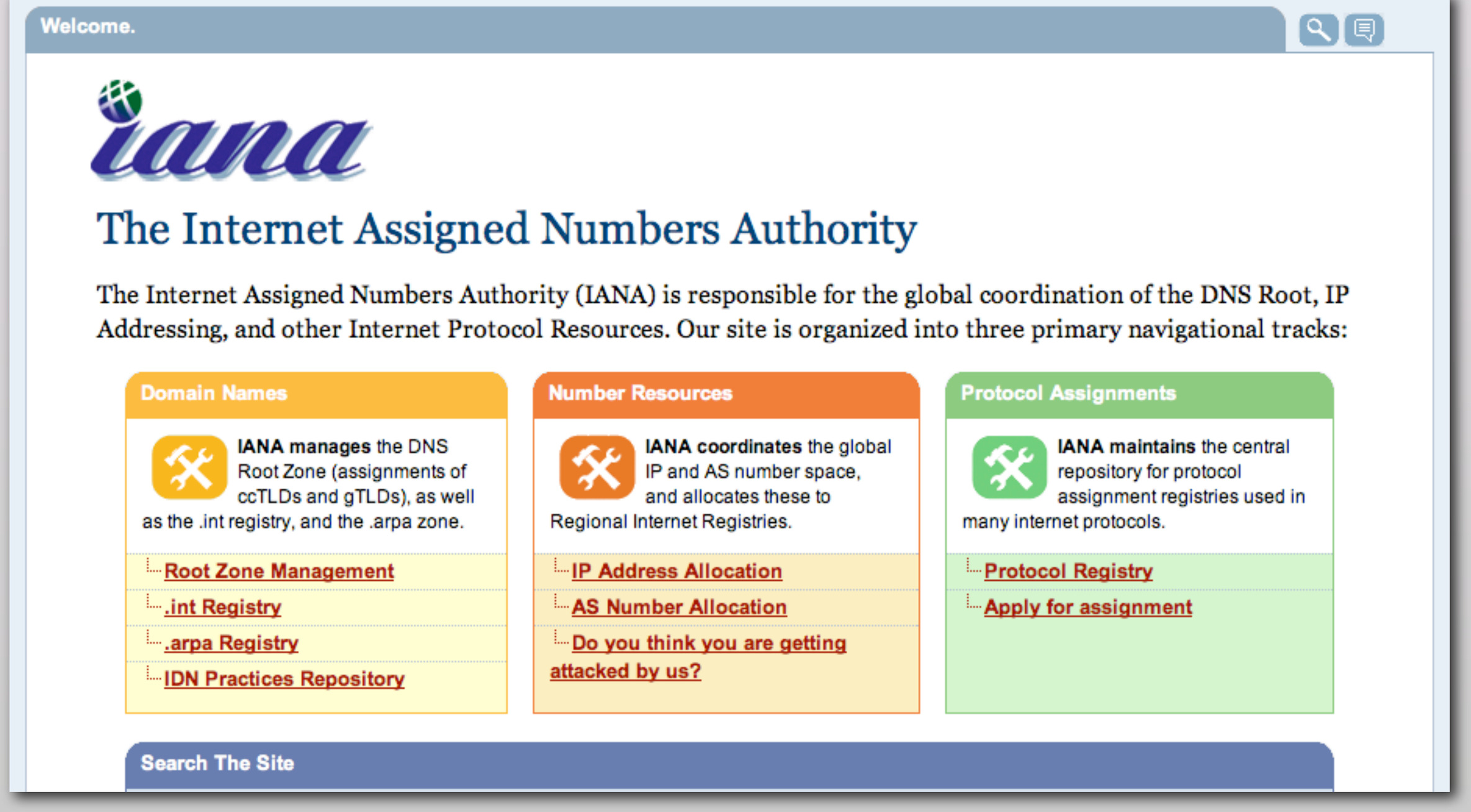
Case	Affects	Requested	Implemented	Duration
1	15 TLDs	13 Apr 2005	?	11.5 months and counting…
2	10 TLDs	14 Nov 2005	8 Dec 2005	3 weeks (emergency; ns was lame)
3	36 TLDs	22 Feb 2006	?	1 month and counting…

- Current model is broken
  - Worst case: denial of service attack, extended brokenness
  - Best case: unacceptably convoluted, wastes everyone's time
- Some possible solutions exist; various levels of pain for IANA

Tying it all together

Improve the website so it is easy to use, functions are easy to find, and documentation makes sense.

- Hard to find resources on the IANA website
- Started cataloguing website (spurred by a request from the ccNSO IANA WG)
- Realised it needed a structural overhaul
- Engaged a developer who, with guidance, has created a prototype that has a new structure.
  - Organised by function & task
- At early stages, will continue to develop and refine with feedback we receive.



Website Preview

Our trial website is available at
test.icann.org

Other systems work

- Root Zone Management highest profile, but small percentage of IANA work.
- New systems development in all three sectors
  - Domain names
  - Number resources
  - Protocol assignments

Goals

Goals for root-zone function

- Deploy automation systems under development
- Encourage community review of policies that impact IANA performance
- Continue to expose IANA's workings so community can make better judgments on what we do
- Disappear!
  - If we do our job correctly, hopefully the community will be well-served and focus on other things

For your consideration

- Current work to document and identify policies, procedures, gaps.
  - Historical lack of clear policies and procedures
  - “Grey areas” often are a cause of delay
- Want to institute (first-ever) public reviews
  - RFC 1591 and ICP 1 only really documented ‘current practice’ - didn’t undergo substantive review.
- Better policies mean we can be more objective in evaluating requests.
- Is a single PDP going to work? How do we agree this stuff?
  - Need to consult/agree with ccTLDs, gTLDs, RSSAC, SSAC, IAB, etc.
- Where does IANA draw the line between policy and procedure?
  - When clarified, IANA more liberated to focus on procedures without making people angry.

Thankyou for your attention!

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