ICANN: Structure and Issues

NASK DOMAIN Seminar
Warsaw, Poland
June, 2001

Herbert Vitzthum
ccTLD Liaison
Introduction

- Herbert Vitzthum
- Home base: Salzburg, Austria
- The former Manager for .at. Still working from Austria as ICANN Staff (Teleworker)
- ccTLD Liaison – the communication channel for ccTLD manager (Country Code Top Level Domains such as .pl, .de, .at ...)
ICANN: The Basic Idea

ICANN =

An Experiment in Technical Self-Management by the global Internet community
ICANN =

Internationalization
of Policy Functions for DNS and
IP Addressing systems

+ 

Private Sector
(non-governmental) Management
What does ICANN do?

Coordinates policies relating to the unique assignment of:

- Internet Domain Names
- Numerical IP Addresses
- Protocol Port and Parameter Numbers

Coordinates the DNS Root Server System - through Root Server System Advisory Committee
“ICANN is in many ways a completely new institutional animal.”

“It is a hybrid between an online community and a real-world governance structure, an untested combination.”

“It is also a new type of international organization: an industry trying to regulate part of itself, across the globe, with little or no input from national governments.”

(10 June 2000)
Domain names & IP addresses

- **Domain names** are the familiar, easy-to-remember names for computers on the Internet
  - e.g., amazon.com, icann.org, nic.or.kr

- Domain names correlate to **Internet Protocol numbers** (IP numbers) (e.g. 192.168.5.130) that serve as routing addresses on the Internet

- The **domain name system** (DNS) translates domain names into IP numbers needed for routing packets of information over the Internet
  
  www.icann.org = 192.168.5.130
Types of Internet Domains

- **Generic Top Level Domains (gTLDs)**
  - `.com`, `.net`, `.org` open to all persons and entities on a global basis
  - `.int` for international treaty organizations
  - `.arpa` for Internet Infrastructure purposes
  - `.gov`, `.mil` for U.S. government, military
  - `.edu` for US universities
More Types of Internet Domains

- Country Code Top Level Domains (ccTLDs)
  - .cn, .hk, .jp, .uk, .ca, .br, .de, .pl, .cc, . . .
  - Imprecise name: ccTLD includes countries and geographically distinct territories
  - Derived from ISO 3166-1 list
  - Registration requirements vary by domain
    - Residency requirement
    - Price (or no charge)
    - Ability to transfer
    - Dispute resolution policy
Basic DNS Registry Structure

*Example: *.com*

- **ICANN**
  (= overall coordinator)

- **Registry**
  (= authoritative database of domain names and corresponding IP addresses)

- **Registrars**
  (= interact with customers/registrants; handle billing; place data in registry database; provide WHOIS service)

- **Registrants**
  (= domain name holders)

**Root Zone File**

**Registry**

**Shared Registry System (SRS)**

- **Registrar A**
- **Registrar B**
- **Registrar C**
The DNS Tree

Root Zone File

TLDs

jp
uk
com
org
edu
coop
ac
icann
keio
med
sfc
<table>
<thead>
<tr>
<th>name</th>
<th>org</th>
<th>city</th>
<th>type</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>NSI</td>
<td>Herndon, VA, US</td>
<td>com</td>
</tr>
<tr>
<td>b</td>
<td>USC-ISI</td>
<td>Marina del Rey, CA, US</td>
<td>edu</td>
</tr>
<tr>
<td>c</td>
<td>PSInet</td>
<td>Herndon, VA, US</td>
<td>com</td>
</tr>
<tr>
<td>d</td>
<td>U of Maryland</td>
<td>College Park, MD, US</td>
<td>edu</td>
</tr>
<tr>
<td>e</td>
<td>NASA</td>
<td>Mt View, CA, US</td>
<td>usg</td>
</tr>
<tr>
<td>f</td>
<td>Internet Software C.</td>
<td>Palo Alto, CA, US</td>
<td>com</td>
</tr>
<tr>
<td>g</td>
<td>DISA</td>
<td>Vienna, VA, US</td>
<td>usg</td>
</tr>
<tr>
<td>h</td>
<td>ARL</td>
<td>Aberdeen, MD, US</td>
<td>usg</td>
</tr>
<tr>
<td>i</td>
<td>NORDUnet</td>
<td>Stockholm, SE</td>
<td>int</td>
</tr>
<tr>
<td>j</td>
<td>NSI (TBD)</td>
<td>Herndon, VA, US</td>
<td>(com)</td>
</tr>
<tr>
<td>k</td>
<td>RIPE</td>
<td>London, UK</td>
<td>int</td>
</tr>
<tr>
<td>l</td>
<td>ICANN</td>
<td>Marina del Rey, CA, US</td>
<td>org</td>
</tr>
<tr>
<td>m</td>
<td>WIDE</td>
<td>Tokyo, JP</td>
<td>edu</td>
</tr>
</tbody>
</table>
Map of the Root Servers

Root nameservers
- Status check map -
Internet Addressing - IPv4

- IPv4 = 32 bits
  - Example: <192.34.0.64>

- Initially, 256 networks … then mix of:
  - Class A (128 with 16 M hosts)
  - Class B (16,384 with 65K hosts)
  - Class C (2M with 256 hosts)

- Now, Classless Inter-Domain addresses
  - Theoretically, up to 4 Billion hosts, hundreds of thousands of networks
Next Generation
Internet - IPv6

- IPv6 = 128 bits of addressing
- Theoretically, $10^{38}$ hosts
- Significant transition effort needed
  - (Sort of like changing engines on the aircraft while in flight)
- IANA officially announced first allocations to RIRs (July 14, 1999)
Regional Internet Registries (RIR)

- **ARIN**
  - North America
  - Latin America
  - Caribbean Islands
  - Sub-Saharan Africa

- **RIPE NCC**
  - Europe
  - Middle East
  - North Africa
  - Parts of Asia

- **APNIC**
  - Most of Asia
  - Australia/New Zealand
  - Pacific Islands
Emerging RIRs

AfriNIC - Africa

LACNIC - Latin America/Caribbean
Most Internet DNS and IP Address coordination functions performed by, or on behalf of, the US government:

- **Defense Advanced Research Projects Agency (DARPA)**
  - Stanford Research Institute (SRI)
  - Information Sciences Institute (ISI) of University of Southern California
- **National Science Foundation (NSF)**
  - IBM, MCI, and Merit
  - AT&T, General Atomics, Network Solutions, Inc. (NSI)
- **National Aeronautics and Space Administration (NASA)**
- **US Department of Energy**
IANA

- “Internet Assigned Numbers Authority”
- A set of technical management functions (root management; IP address bloc allocations) previously performed by the Information Sciences Institute (ISI) at the University of Southern California, under a contract with the U.S. Government
- Includes protocol parameter and port number assignment functions defined by the Internet Engineering Task Force (IETF)
- Now a part of ICANN
IANA

Internet Assigned Numbers Authority

Jon Postel
1943-1998
Need for Change

- **Globalization of Internet**
- **Commercialization of Internet**
- Need for **accountability**
- Need for more **formalized management structure**
- Dissatisfaction with **lack of competition**
- Trademark/domain name **conflicts**
White Paper: new policy/management structure must promote 4 goals:

- Stability
- Competition
- Private, bottom-up coordination
- Representation
Status of Transition from US-Government

1998
- November - ICANN recognized in MoU

1999
- June - Cooperative agreement among ICANN, US Government, root server operators
  - November - ICANN and Network Solutions (NSI) sign gTLD registry and registrar agreements; USG transfers root authority over gTLDs to ICANN

2000
- February - Contract with US Government to complete transfer of IANA functions
- November - Selection of 7 new Top-Level Domains

2001
- January - Transfer of InterNIC functions from NSI to ICANN
ICANN Board of Directors

President and CEO
- M. Stuart Lynn

At Large Directors:
- Karl Auerbach (USA)
- Ivan Moura Campos (Brazil)
- Frank Fitzsimmons (USA)
- Masanobu Katoh (Japan)
- Hans Kraaijenbrink (Netherlands)
- Andy Mueller-Maguhn (Germany)
- Jun Murai (Japan)
- Nii Quaynor (Ghana)
- Linda S. Wilson (USA)

ASO Directors:
- Rob Blokzijl (Netherlands)
- Ken Fockler (Canada)
- Sang-Hyon Kyong (South Korea)

DNSO Directors:
- Amadeu Abril i Abril (Spain)
- Jonathan Cohen (Canada)
- Alejandro Pisanty (Mexico)

PSO Directors:
- Helmut Schink (Germany)
- Vint Cerf (USA) - Chairman
- Phil Davidson (U.K.)
What ICANN is NOT

- Technical Standard-Setting Body
- Internet Police Force
- Consumer Protection Agency
- Economic Development Agency
- Legislature or Court
For the global TLDs (such as .com, .net, .org), ICANN serves as the vehicle for consensus policy development.

Examples of policies:

- Competitive registrars
- Uniform Dispute Resolution Policy
New Top-Level Domains

- First group chosen in November 2000
  - Global Open: <.info>, <.biz>
  - Individuals: <.name>, <.pro>
  - Specialized: <.museum>, <.aero>, <.coop>

- Proof of Concept - Launch with caution, observe carefully, learn from experience

- If successful, there will be future rounds

- Biggest challenge: Launch phase
  - Intellectual Property & Cybersquatting fears
  - Opening day rush & Fairness to everyone

- Danger: Sleazy pre-registration offers (see FTC Warning)
ICANN and Country TLDs

- Basic organizing principle: Local Internet communities make decisions about country code TLDs (ccTLDs)

- ICANN’s role
  - Very hands-off on policy
  - Basic responsibility to delegate ccTLD so as to serve the interests of the local and global Internet communities
  - Maintain stable root server system

- ccTLD managers’ role
  - Technically competent registry and nameserver operations
  - Commitment to administer as trustee for the local community (local laws, culture, customs, preferences, etc.)

- Local government’s role
  - Depends on the local situation
Responsibilities of ccTLDs

- “TLD managers are trustees for the delegated domain, and have a duty to serve the community.”

- “Concerns about "rights" and "ownership" of domains are inappropriate. It is appropriate, however, to be concerned about "responsibilities" and "service" to the community.”
Basic Principles

- TLD managers are trustees for the delegated domain
- Fair Treatment & Non-discrimination
- Documented policies and procedures
- Technically competent operational capability
Principles for ICANN - ccTLD Relationship

- Use original Postel - IANA ccTLD concept:
  - ccTLD manager is trustee for local Internet community
  - competent operation of registry & nameservers
  - consensus efforts to resolve disputes
  - respect views of governments; but be neutral as far as possible

- Recognize ICANN as global consensus forum

- Use flexible agreement structure to accommodate varied circumstances:
  - different ccTLD registry models
  - different local needs
  - different governmental situations

- Complete MOU transition by reaching stable agreements with ccTLDs as soon as possible
Message to You:
(and to all Internet communities)

GET INVOLVED!!!

Consensus means you have to show up to be heard.

www.icann.org
Thank you very much!

Herbert Vitzthum
ICANN ccTLD Liaison
herbert@icann.org
www.icann.org