ICANN Overview

Gulf Region Meeting
Dubai
June, 2001

Andrew McLaughlin
Chief Policy Officer and CFO
ICANN: The Basic Idea

ICANN =
An Experiment in
Technical Self-Management
by the global Internet community
ICANN: The Basic Bargain

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 Address
- Protocol Port and Parameter Numbers

Coordinates the DNS Root Server System
- through Root Server System Advisory Committee
Says *The Economist*:

- “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 organisation: 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., 98.37.241.130) 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
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>, <.tv>, <.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**

- **Shared Registry System (SRS)**:
  - Registrar A
  - Registrar B
  - Registrar C
The DNS Tree

Root Zone File

TLDs
uk  ae  ......  com  org  edu
co  ac

oxford

med  law
## List of the Root Servers

<table>
<thead>
<tr>
<th>name</th>
<th>org</th>
<th>city</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>NSI</td>
<td>Herndon,VA, US</td>
</tr>
<tr>
<td>b</td>
<td>USC-ISI</td>
<td>Marina del Rey,CA, US</td>
</tr>
<tr>
<td>c</td>
<td>PSInet</td>
<td>Herndon,VA, US</td>
</tr>
<tr>
<td>d</td>
<td>U of Maryland</td>
<td>College Park,MD, US</td>
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<td>e</td>
<td>NASA</td>
<td>Mt View, CA, US</td>
</tr>
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<td>f</td>
<td>Internet Software C.</td>
<td>Palo Alto, CA, US</td>
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<tr>
<td>g</td>
<td>DISA</td>
<td>Vienna, VA, US</td>
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<td>h</td>
<td>ARL</td>
<td>Aberdeen, MD, US</td>
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<td>i</td>
<td>NORDUnet</td>
<td>Stockholm, SE</td>
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<td>j</td>
<td>NSI</td>
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<td>m</td>
<td>WIDE</td>
<td>Tokyo, JP</td>
</tr>
</tbody>
</table>
Map of the Root Servers
Root server architecture of today

• Change decision
  – ICANN/IANA

• Verification
  – US Department of Commerce

• Update of the zone file:
  – Zone file management (currently, at A)
  – Synchronized with the database

• Distribution of the zone information
  – To the rest of root servers
Improved root server architecture

• Dedicated primary to be responsible for the root zone
  – Will distribute to the 13 root servers
• Extensive technical deliberation and preparation
  – Improve system to be more secure, robust and reliable
  – Change will be transparent to users
• Existing root server operators have agreed
• ‘When’ is subject to operational readiness of the new structure
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 block 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
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 Principles

White Paper: new policy/management structure must promote 4 goals:

- Stability
- Competition
- Private, bottom-up coordination
- Representation
White Paper Implementation

- Internet community to form non-profit corporation meeting White Paper’s 4 criteria
- US Government (through Commerce Department) to transition centralized coordination functions
- Amendment of Network Solutions agreement to require competitive registrars in gTLD registries
- Request to WIPO to study & recommend solutions for trademark/domain-name conflicts
Status of Transition from USG

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
- May - Revision of com/net/org agreements with VeriSign
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
ICANN and Global TLDs

• 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
  – Selection process was transparent & predictable

• If these are successful, there will be future rounds
  – Goal: Less burdensome, less expensive, more objective

• Biggest challenge: Launch phase
  – *Intellectual Property & cybersquatting fears*
  – *Opening day rush; fairness to everyone*

• Danger: Sleazy pre-registration offers (see FTC Warning)
Top Policy Objectives for Year 2001

• Successful introduction of New Top-Level Domains

• Completion of agreements:
  – ccTLD registry agreements
  – IP Address registry agreements
  – Root server operator agreements

• At Large Study

• DNSO Reform

• UDRP Review

• Whois policy review
Structure of ICANN
ICANN Board of Directors

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.)
ICANN Staff

New Model: Lightweight
(minimal staff = minimal bureaucracy)

Current Staff:

- President and CEO (Mike Roberts, soon Dr. Stuart Lynn)
- Vice President/General Counsel (Louis Touton)
- Chief Policy Officer/CFO (Andrew McLaughlin)
- ccTLD Liaison (Herbert Vitzthum)
- Communications Director (Mary Hewitt)
- Registrar Liaison (Dan Halloran & Ellen Sondheim)
- IANA staff (Joyce Reynolds, Michelle Schipper, Bill Huang)
- Office Manager (Diane Schroeder)
- Network Administrator (Jim Villaruz)
At Large Elections 2000

- Free and open to anyone with a verifiable email address and physical address
- Over 158,000 registered to vote; over 70,000 voted
- 5 Directors elected from 5 different regions
  - North America, Latin America, Europe, Africa, and Asia/Australia/Pacific
- Problems: Nationalism, capture, outreach
At Large Study

• Next steps: Study the process, draw lessons, redesign for the future
  – Chair of study committee: Hon. Carl Bildt (Sweden)
  – Vice-chairs: Pindar Wong (Hong Kong S.A.R., China) and Charles Costello (USA, Carter Center)

• <http://www.atlargestudy.org>
Lessons from the Experiment?

• Private-sector self-management is possible, if narrowly chartered

• Global consensus on policy is difficult to define; even harder to achieve
  – Consensus is a tradition in the technical community in which ICANN is rooted, because you can test solutions & refer to objective data
  – Consensus on policy questions can be elusive, because it depends upon subjective values
Message to You:

BE INVOLVED!!

Consensus means you have to show up to be heard.

www.icann.org
For Further Information:

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http://www.icann.org