ICANN: Structure and Issues

TWNIC Symposium
Taipei, Taiwan
January, 2000

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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 Addresses
- Protocol Port and Parameter Numbers

Coordinates the DNS Root Server System
- through Root Server System Advisory Committee
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

Registry <.com>

Shared Registry System (SRS):

Registrar A
Registrar B
Registrar C
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

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 to new corporation
- Introduce 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
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
- Beware of pre-registration offers!!!
Policy Objectives for Year 2000

• Successful introduction of New Top-Level Domains

• Completion of agreements:
  – ccTLD registry agreements
  – IP Address registry agreements
  – Root server operator agreements
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)
- Vice President/General Counsel (Louis Touton)
- Chief Policy Officer/CFO (Andrew McLaughlin)
- Registrar Liaison (Dan Halloran)
- IANA staff (Joyce Reynolds, Michelle Schipper, Bill Huang)
- Office Manager (Diane Schroeder)
- Network Administrator (Jim Villaruz)
- Technical Advisor (Suzanne Woolf)
What ICANN is NOT

- Technical Standard-Setting Body
- Internet Police Force
- Consumer Protection Agency
- Economic Development Agency
- Legislature or Court
Message to You:

BE INVOLVED!

You Must Speak, In Order To Be Heard

ICANN Wants You!
For Further Information:

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http://www.icann.org