The Internet is for Everyone

9 March 2012

International Telecommunications Union
Place des Nations
CH-1211 Geneva 20
Switzerland

ISOC Contribution for the Secretary-General's 2013 World Telecommunication Policy Forum Report (WTPF) and for WTPF Working Group consideration.

Over the past 40 years, during a time when there were many other networks and networking standards already in place or under development, the Internet has grown from a relatively small research project into a global vehicle for business and social interaction. It is important that we understand why and how this came about in order to secure its future success for the benefit of all of us.

The Internet is successful in large part due to its unique model: shared global ownership, development based on open standards, and freely accessible processes for technology and policy development. The Internet's unprecedented success continues because the Internet model is open, transparent, and collaborative. The model relies on processes and products that are local, bottom-up, and accessible to users around the world. This model has profound implications not only for the way we view the Internet's history; but more importantly for its continuing development, expansion, and evolution.

The Internet Model allows underlying technologies to continue to evolve – and to benefit from – the input of end users, network engineers, and businesses around the world. The success of the Internet has always been a result of its openness, transparency, and de-centralized nature.

Debate about the appropriate models for the management of Internet-related resources continues to be a feature of the policy landscape. Indeed, given the centrality of the Internet to modern life, such debates are unlikely to cease. The Internet Society believes that for the debate to be productive, it is important that those involved understand the structures that have evolved with the Internet, and have proven successful for its governance. The current structure is an ecosystem of many interrelated entities, each playing its own role in Internet governance, and bringing its own contribution to the table. Some of these entities are intergovernmental, some technical, and some come from the civil society, yet their interaction has created and continues to create the global success of the Internet.

Internet Society
Galerie Jean-Malbuisson, 15
CH-1204 Geneva
Switzerland
Tel: +41 22 807 1444
Fax: +41 22 807 1445
http://www.isoc.org
1775 Wiehle Ave.
Suite 201
Reston, VA 20190, USA
Tel: +1 703 439 2120
Fax: +1 703 326 9881
Email: info@isoc.org

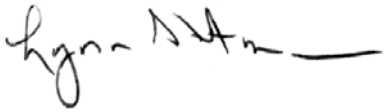
As the International Telecommunication Union begins its preparation for the fifth World Telecommunication Policy Forum (WTPF), the Internet Society respectfully submits this contribution with the goal of informing the process.

In the following annex, we have included three papers for consideration in preparing the initial WTPF 2013 report:

- The Internet Ecosystem
- The Internet Ecosystem Chart
- Preserving the User Centric Internet

The Internet Society looks forward to participating in the ITU Council informal group of experts preparing for the upcoming WTPF.

Sincerely,



Lynn St. Amour
President & CEO
Internet Society

ANNEX

The Internet Ecosystem

15 October 2010

Internet Society
InternetSociety.org
info@isoc.org

Galerie Jean-Malbuisson, 15
CH-1204 Geneva
Switzerland
Tel: +41 22 807 1444
Fax: +41 22 807 1445

1775 Wiehle Ave.
Suite 201
Reston, VA 20190, USA
Tel: +1 703 439 2120
Fax: +1 703 326 9881

Introduction

This paper offers a brief introduction to some of the Internet organizations and processes that shape naming and addressing, shared global services and operations, and open standards development in the Internet Ecosystem. It builds on the Internet Society's earlier well-received graphic: The Internet Ecosystem:

http://www.isoc.org/pubpolpillar/docs/internetmodel.pdf

This paper looks at some of the organizations and processes that shape Internet policy, with a focus on how any interested stakeholder can get involved in their work. It is not exhaustive; nor does it cover all aspects in detail. It is recommended that readers use this document as a starting point in their exploration of the Internet ecosystem, its players and policy processes.

As a discussion paper, "Exploring the Internet Ecosystem" will remain a work in progress. Readers who wish to suggest improvements are invited to send suggestions to the Internet Society at isoc@isoc.org.

The Importance of Participation

Ecosystem players have shaped the Internet and contribute to its future success. The Internet Society encourages stakeholders to become involved in the policy processes related to the evolution of the Internet and the management of Internet resources.

Within the ecosystem, Internet technical and management organizations have responsibilities for the protocols and standards that enable basic end-to-end communications (such as the Internet Protocol); the resources that direct these communications (such as IP addresses and the Domain Name System); the provision of reliable connectivity that ensures the communications reach their intended destinations, thus linking end-users (such as global telecommunication, satellite and cable system operators, Internet Exchange Points, etc.); and the policy and education necessary to ensure the Internet's openness, continuity and flexibility.

These technologies, resources and services are all highly interdependent and require a significant amount of coordination. The organizations responsible for coordination, administration and day-to-day management in the Internet sphere include ICANN, the IANA function, the RIRs, and many others that will be touched upon in this paper. Each organization has a specific role and provides fundamental value to the overall functioning of the Internet.

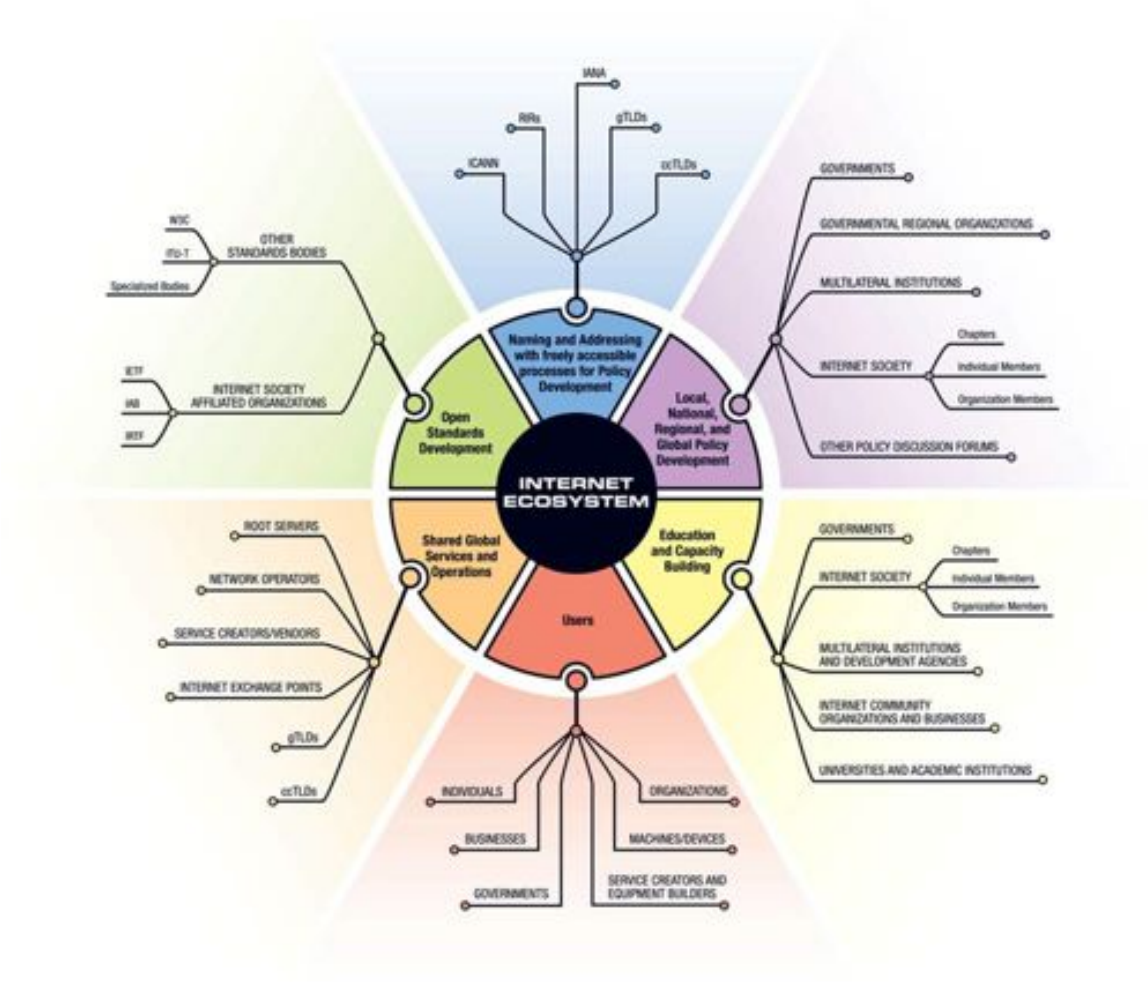
These organizations have a proven, long-standing relationship in coordinating the technical infrastructure of the Internet and have contributed to the incredible growth and stability of the Internet today. There are well-established mechanisms, including open, public meetings, mailing lists and bottom-up policy development processes that enable direct participation by any interested party. This ensures that policies are defined by those who require them for their operations, and also gives the system the flexibility to respond and adapt to the changing needs of the Internet community. It has resulted in a significant body of knowledge and experience in the successful administration and management of the technologies, resources and services that have made the Internet the success it is today.

The development, governance and coordination of the Internet result from discussions, debates and policy development processes in many specialized

forums. Active participation by end users, governments, business, civil society and technical experts (whether as individuals or organizational representatives) is essential to make the policies, approve the procedures and write the standards, etc., that make the Internet the efficient and effective system it is today.

The Internet Society is pleased to offer this guide to the players, policy processes and participation mechanisms related to naming and addressing, shared global services and operations and open standards development within the Internet Ecosystem. It is hoped that this paper helps encourage and facilitate participation in these important areas of Internet policy development.

The Internet Ecosystem



Internet Ecosystem is the term used to describe the organizations and communities that guide the operation and development of the technologies and infrastructure that comprise the global Internet. These organizations share common values for the open development of the Internet.

The Internet Ecosystem term implies that the rapid and continued development and adoption of Internet technologies can be attributed to the involvement of a broad range of actors; open, transparent, and collaborative processes; and the use of products and infrastructure with dispersed ownership and control.

Organizations that comprise the Internet Ecosystem include:

- Technical standards bodies such as the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C)
- Organizations that manage resources for global addressing capabilities such as the Internet Corporation for Assigned Names and Numbers (ICANN), including its operation of the Internet Assigned Numbers Authority (IANA)

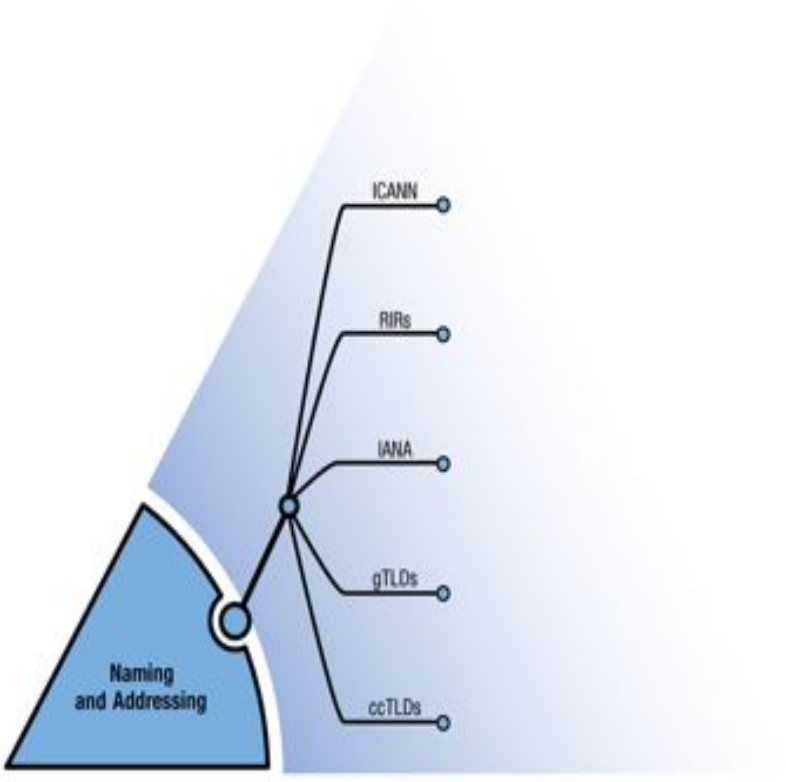
function, Regional Internet Registries (RIR), and Doman Name Registries and Registrars.

- Companies that provide network infrastructure services such as Domain Name Service (DNS) providers, network operators, and Internet Exchange Points (IXPs)

- Individuals and Organizations the use the Internet to communicate with each other and offer services

- Organizations that provide education and build capacity for developing and using Internet technologies, such as multilateral organizations, educational institutions, and governmental agencies

Naming and addressing



Focus areas:

1. Internet Protocol (IP) addresses
2. Generic Top Level Domains (gTLDs)

Internet Protocol addresses (IP addresses)

Background

Internet Protocol (IP) addresses are unique numeric identifiers that are needed by every device that connects to the global Internet. The numeric identifier is assigned to a device or end point that enables data to be accurately transported between origination and destination points within a network or networks. IP addresses are a shared common resource that must be managed carefully to ensure the continued growth and stability of the Internet.

Players

IANA

The Internet Assigned Numbers Authority (IANA) is responsible for the global coordination of the Internet Protocol addressing systems, as well as the Autonomous System Numbers used for routing Internet traffic and other technical parameters associated with Internet protocols. ICANN performs the IANA function under contract with the United States Department of Commerce.

http://www.iana.org/numbers/

ICANN

The Internet Corporation for Assigned Names and Numbers (ICANN) has responsibility for Internet Protocol (IP) address space allocation (through IANA), and the operation and evolution of the Domain Name System, along with the coordination of policy development reasonably and appropriately related to these technical functions.,.

http://www.icann.org/tr/english.html

ASO

The ICANN Address Supporting Organization (ASO) was established with a MoU between the RIRs and ICANN. Its purpose is to review and development of recommendations on Internet number resource policy and to advise the ICANN board.

http://aso.icann.org/

NRO

The NRO is composed of the 5 Regional Internet Registries (RIRs). The purpose of the Number Resource Organization (NRO) is to ensure global coherence of certain RIR activities, and to provide a single common interface to all the RIRs where this is necessary. The NRO also undertakes joint RIR activities, including technical projects and liaison activities.

http://www.nro.net/

RIR

The Regional Internet Registries (RIRs) are responsible, within their assigned regions, for allocating Internet number resources such as globally unique IP addresses (IPv4 and IPv6) and autonomous system numbers. These resources are required by Internet service providers and users to identify elements of the basic Internet infrastructure such as interfaces on routers, switches and computers.[1] RIRs hold open policy forums to discuss and establish regional policies for number allocation.

NIR

A National Internet Registry (NIR) primarily allocates address space obtained from the relevant RIR, consistent with RIR policies, to its members or constituents, which are typically LIRs/ISPs. A limited number of NIRs exist in the Asia and Latin American and Caribbean regions.[2]

LIR

A Local Internet Registry (LIR) is typically an Internet Service Provider (ISP) which assigns address space to users of its network services (who may be other ISPs, which then assign address space to their own customers).[3]

ISPs

Internet Service providers.[4]

IP address allocation process

The allocation of Internet Protocol addresses is undertaken by IANA, in accordance with the IP specification laid out by IETF specifications.

Requests for IP addresses are typically made by Internet Service Providers (ISP) either to the appropriate Regional Internet Registry (RIR), or, in limited cases, to the Local Internet Registry (LIR) or National Internet Registry (NIR) – if either one or the other exists in the particular jurisdiction. (The LIRs and NIRs also receive their allocations from the RIR in their particular region.) [5]

As an RIR completes allocations from the space it has been given from IANA, the RIR will request a new allocation from IANA. Once IANA has determined that the request meets various clearly defined conditions (agreed on in global policy), the allocation is made to the RIR. IANA does not make allocations directly to ISPs, LIRs and NIRs.

For an in-depth review of the RIRs and address allocation policy:

http://www.isoc.org/pubpolpillar/docs/address-allocation_200906.pdf

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[1] http://www.nro.net/about/internet-registries.html

[2] For a full list: http://en.wikipedia.org/wiki/National_Internet_registry

[3] ibid

[4] http://en.wikipedia.org/wiki/Internet_service_provider

[5] For more information on the operational relationships between NIRs and APNIC: http://www.apnic.net/policy/operational-policies-nirs/text

The allocation processes outlined above are clearly defined in policy documents agreed between the RIRs and ICANN (as the responsible party for IANA's operations). Whether an ISP requests addresses from an RIR or an RIR requests a new block of addresses from IANA, there must be a demonstrated need for the request to be granted. These documents are listed below.

Allocation of IP addresses to the RIRs:

http://www.icann.org/en/general/allocation-IPv4-rirs.html

Allocation of last IPv4 blocks to the RIRs:

http://www.icann.org/en/general/allocation-remaining-ipv4-space.htm

Allocation of IPv6 addresses to the RIRs:

http://www.icann.org/en/general/allocation-IPv6-rirs.htm

Additionally, certain protocol parameter-related technical aspects of IANA's work are governed by a MoU between the Internet Engineering Task force (IETF) and ICANN:

http://tools.ietf.org/html/rfc2860

IP address policy processes

As with the allocation process, the mechanism by which allocation policy is proposed and agreed is driven through bottom-up and open consultation.

In addition to the various parties outlined in the above, there are two important additional policy focused entities that are involved in policy development for IP addresses: the Number Resource Organization (NRO) and the ICANN Address Supporting Organization (ICANN ASO).

Regional IP address allocation policy development will typically start as a result of an input by an individual or organization to an RIR. While the RIR policy development processes may differ slightly across the regions, they are based upon the principles of openness, transparency and deliberation. Any individual or organization can participate.[6]

Policy proposals that may have global import will also typically be submitted through one of the RIR policy forums. For a policy to be declared global, it has to be one that affects all five RIRs and IANA.[7]

Global policy proposals are discussed within each of the RIRs and a common position is sought that can then be forwarded onto the ASO. The ASO then communicates the proposal to the ICANN Board and, once accepted, is announced as global policy and published on the NRO and ICANN websites.[8]

For both regional and global policy proposals the policy development processes (PDPs) are open and encourage participation by all interested parties and stakeholders. This is discussed further in the next section.

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[6] The policy development process at RIPE: http://www.ripe.net/ripe/docs/pdp.html

[7] See attachment A of the following document for a detailed description of the global policy process: http://aso.icann.org/documents/memorandum-of-understanding/

[8] The policy document outlining the process for ratification of a global policy by ICANN: http://www.icann.org/en/general/review-procedures-pgp.html

The following documents provide useful additional reading on the policy processes:

A document that compares and outlines the policy processes of the RIRs:

http://www.nro.net/documents/comp-pol.html

An overview of the RIR policy development processes:

http://www.nro.net/policy/index.html

How to participate in IP address allocation policy processes

Interested individuals and organizations can follow and participate in IP address allocation policy development through the RIRs' open meetings, policy development processes and forum mailing lists, ICANN's public meetings, and through the open ASO[9] mailing lists. Interested organizations (those that use large numbers of addresses or make assignments to other entities) could consider membership in of one of the RIRs.

Government representatives are encouraged to participate directly in the RIR policy process, and several do. In addition, they can also be informed of recent developments in IP address allocation discussions through the ICANN's Governmental Advisory Committee (GAC) via the NRO report:

http://gac.icann.org/

Additionally, government representatives can and do participate in the RIR and ICANN open meetings and subscribe to their open mailing lists. Some RIRs also hold specific roundtable meetings focused on issues of interest to governments and regulators.[10]

While participation in the IP address allocation policy is important, participation in the uptake and transition to IPv6 is equally so. Most of the Internet is currently addressed via IP version 4 (IPv4) addresses. IPv6 addresses are also increasingly used, but not yet to the same extent. IPv6 is a more recent protocol, offering a much larger address pool than IPv4. However, IPv6 is not intended as a direct replacement for IPv4. Rather, the two address protocols are able to be used together across the Internet.

This transition to IPv6 is becoming increasingly critical as the IPv4 address pool is running out and the time to implement IPv6 in networks is now. For more information on IPv6 and its importance to the future growth and continuity of the Internet see:

http://www.isoc.org/pubpolpillar/docs/ipv6-way-forward.pdf

[9] http://aso.icann.org/contact/aso-mailing-lists/

[10] 2010 RIPE meeting for governments and regulators: http://www.ripe.net/meetings/roundtable/feb2010/

Generic Top Level Domain Names

Background

A generic top-level domain (gTLD) is one of a number of different types of top-level domains (TLDs) maintained by the Internet Assigned Numbers Authority (IANA) for use in the Domain Name System of the Internet. These categories include, among others, generic top level domains (gTLD) and country code top level domains (ccTLD). A domain name is a way of making an Internet Protocol address (a series of numbers and dots) more comprehensible to users. Typical gTLDs that we are all familiar with include .com, .net, .org, etc.

Two recent developments that are touched upon in this paper that have been the product of extensive policy deliberation are the (eventual) introduction of new gTLDs and the introduction of internationalized ccTLDs.

Players

ICANN

GNSO

The Generic Names Supporting Organization (GNSO) is the main policy-making body of ICANN for gTLDs.

http://gnso.icann.org/

CBUC

The GNSO's Commercial and Business Users Constituency (CBUC) is the voice of commercial Internet users within ICANN.

http://www.bizconst.org/

ISPCP

The Internet Service Providers and Connectivity Providers (ISPCP) constituency within the GNSO.

http://www.ispcp.info/default.htm

NCUC

The Non-commercial Users Constituency in the GNSO is the home for civil society organizations and individuals within ICANN.

https://st.icann.org/ncsg-ec/index.cgi?membership_criteria#

gTLD Registries Stakeholder Group

The gTLD Registries constituency represents those organizations running gTLD registries within the GNSO.

http://www.gtldregistries.org/

Registrar Stakeholder Group

The registrar constituency represents companies that register domains for Internet users for a fee within the GNSO.

http://www.icannregistrars.org/

IPC

The Intellectual Property constituency (IPC) represents intellectual property interests to ICANN through the GNSO.

http://www.ipconstituency.org/

Structure of gTLD policy process

gTLD policy discussions are typically initiated by or within ICANN's Generic Names Supporting Organization (GNSO) following input from its six "stakeholder" communities: the CBUC (business constituency), the ISPCP (ISPs and connectivity providers), the NCUC (non-commercial/business, civil society constituency), gTLD Registries (those that manage the TLDs), the Registrars (those that provide domain names, etc.) and the IPC (the Intellectual Property constituency).

Each of these constituencies has its respective policy processes to allow positions to be submitted to the GNSO Council for review. For further details of memberships and policy processes it is recommended that the reader visit the relevant constituency website (see above). Each of these constituencies elects representatives to the GNSO Council.

The GNSO has a policy development process that is outlined in ICANN's bylaws.[11] The ICANN Board, the GNSO Council or an ICANN Advisory Committee (GAC, ALAC, SSAC, RSSAC)[12] may raise issues for consideration within the policy development process of the GNSO. Typically the GNSO will meet with the Advisory Committees, notably the GAC, during each ICANN meeting to inform and encourage discussion. Once the issue has satisfied the necessary requirements the policy development process (PDP) can begin.

Once a proposal has passed through the GNSO's PDP and has the recommendation of the GNSO Council it is submitted to the ICANN Board for approval.

[11] GNSO policy development process: http://www.icann.org/en/general/bylaws.htm#AnnexA

[12] ICANN Advisory Committees overview: http://www.icann.org/en/structure/

The new gTLD policy

In 2008, agreement was reached in ICANN for the introduction of new gTLDs. While significant progress has been made in defining the new gTLD processes, etc., some components are still under review. For example, at the time of writing, ICANN has indicated that it expects a new draft of the applicant guidebook to be available for public review prior to the next ICANN meeting in December 2010.

A full review of the new gTLD process:

http://www.icann.org/en/topics/new-gtlds/strategy-faq.htm

Draft of the applicant guidebook (May 2010):

http://www.icann.org/en/topics/new-gtlds/draft-rfp-clean-28may10-en.pdf

How to participate in gTLD policy processes

The gTLD landscape is changing and the introduction of new gTLDs and Internationalized Domain Names should encourage a greater number of stakeholders to participate in the relevant policy processes.

As an interested individual one can follow and participate in the policy discussions through ICANN's public comment webpage in which all the substantive pieces of work of a policy nature (and more) are listed and open to comment.[13]

For a more in-depth engagement, interested individuals can join the NCUC constituency:

https://st.icann.org/ncsg-ec/index.cgi?membership_criteria

Organizations have an opportunity to participate in the various ICANN supporting structures (through their respective constituencies) outlined above. This requires a greater level of engagement, but for those organizations that are involved in or have a material interest in the domain name space participation is important.

It should be noted that there are many representative organizations that participate in the ICANN processes. It is not absolutely essential, therefore, to participate directly, although this will of course depend upon the importance of ICANN deliberations to the organization in question. The International Chamber of Commerce in the GNSO's CBUC is an example of a representative association that participates in the ICANN GNSO and many other forums.[14]

As has been noted above many national, regional or international associations participate in ICANN processes, and these provide a useful first entry point for individuals and organizations that are new to the world of gTLD policy.

And, as with IP address allocation, governments will typically participate directly in ICANN gTLD deliberations through the GAC, although GAC representatives are free to participate directly in any ICANN constituency.

It is also essential that interested individuals and organizations monitor related policy initiatives or consultations in their home countries. Governments will issue updates or notices and consultations on Internet policy matters and it is important

[13] http://www.icann.org/en/public-comment/

[14] http://www.iccwbo.org/

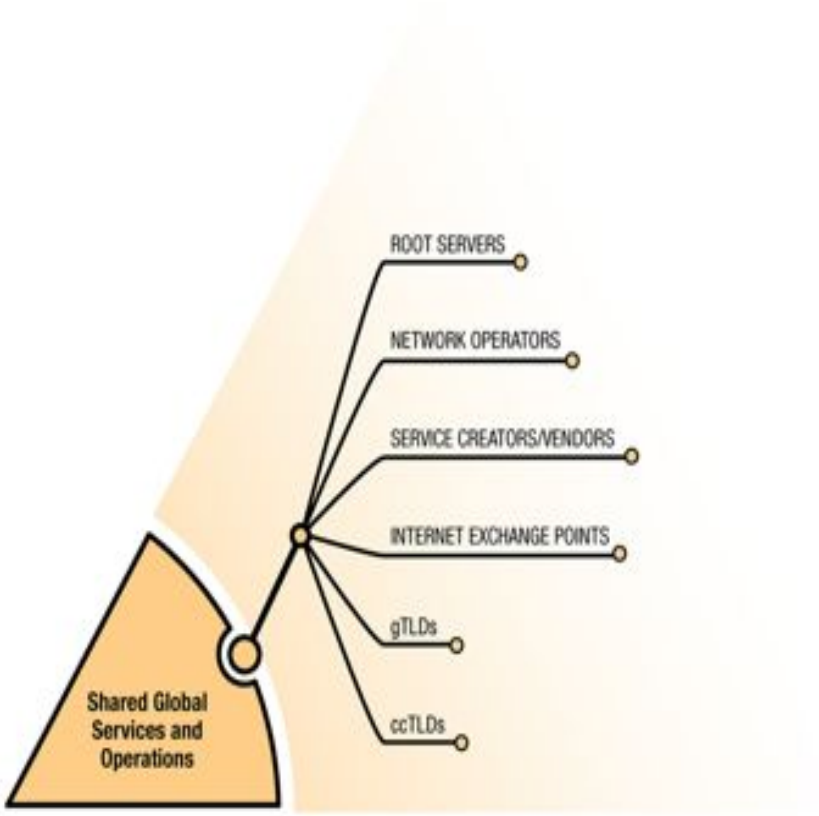
that interested parties contribute to those discussions at a national level.[15] Input and comments to national governments help shape the positions that their representatives will take in the GAC at ICANN.

For more on the ways in which individuals and organizations can participate in ICANN:

http://www.icann.org/en/participate/how-do-i-participate.html

[15] An example of an Australian notice on new gTLDs: http://www.dbcde.gov.au/__data/assets/pdf_file/0003/128433/ICANN-FACTSHEET-1700.pdf

Shared Global Services and Operations



Focus areas:

- Root servers
- ccTLDs

Root Servers

Background

The root zone file is at the apex of the Domain Name System (DNS) database. This database is used by almost all Internet applications to translate globally unique names like isoc.org into other identifiers; the web, e-mail and many other services make use of the DNS. Root servers contain the IP addresses of all the TLD registry name servers, including the gTLDs such as .com and the ccTLDs such as .de (Germany). Root servers "translate" names into next-level nameserver IP addresses and form a critical if somewhat "back-office" role in ensuring the continuity and therefore reliability of the Internet.[16]

Players

IANA

IANA is the global coordinator of the DNS root which is upper-most part of the DNS hierarchy.

http://www.iana.org/domains/

ICANN

In the context of root servers, ICANN is the responsible party for the operational management of IANA under contract with the United States Department of Commerce.[17]

Root Server Operators

For a full list of the root server operators: http://www.root-servers.org/

RSSAC

Root Server System Advisory Committee advises the ICANN Board on the operation of the root name servers of the domain name system.

http://www.icann.org/en/committees/dns-root/

Root Server Technical Operations Association

http://www.root-servers.org/

[16] http://www.isoc.org/briefings/020/

[17] http://www.ntia.doc.gov/ntiahome/domainname/iana/ianacontract_081406.pdf

Structure of Root Server related policy processes

The operation of the Root Servers is distinct from both IP address allocation and the DNS although it is a critical part of the operational whole that ensures that the Internet continues to function smoothly.

The root server operators are a group of independent and autonomous organizations that are responsible for the management and maintenance of the root servers. Each operator is responsible for the operation of its root letter for the way in which the service is operated. This diversity is one of the strengths of the system. Neither the IANA nor ICANN have any executive authority over the operation of root name servers; the primary root zone file is currently located on the A root server, which is operated by Verisign under a cooperative agreement with the U.S. Government.

However, Root Server operators cooperate and coordinate their activities. The Root Server operators meet at the IETF (and ICANN) meetings. They have formed the Root Server Technical Operations Association and are in frequent contact among themselves and with other bodies as appropriate.

Many of the root server operators also deploy copies or instances of their root server in different locations around the globe through "anycast" technology.[18] This allows for a more distributed and resilient Internet and provides for more efficient "local" access to the root servers around the world.[19] The importance of anycast can be understood when considering the impact of distributed denial of service (DDoS) attacks:

http://www.icann.org/en/announcements/factsheet-dns-attack-08mar07.pdf

There have been a number of policies in which the root server community and others have participated, including the recent implementation of DNNSEC (Domain Name System Security) into the root:

http://www.root-dnssec.org/

In terms of codifying institutional relationships, ISC, operator of the F root, has signed a Mutual Responsibilities Agreement (MRA) with ICANN:

http://www.isc.org/files/ICANN-ISC-MRA-26dec07.pdf

And importantly, while diverse and autonomous, the root server operators manage the root servers according to accepted guidelines developed through the open processes of the IETF:

http://tools.ietf.org/pdf/rfc2870.pdf

Participation in root server related policy activities:

It is recommended that interested parties explore the membership or participation opportunities with each of the root server operators directly. Some, such as RIPE NCC[20], operator of the K root, have clear policy processes given the nature of its

[18] http://en.wikipedia.org/wiki/Anycast

[19] Example of an F root anycast instance: http://www.isc.org/press-release/de-cix-supports-deployment-f-root-servers-frankfurt

[20] http://www.ripe.net/

overall responsibilities, as discussed earlier; other operators may not have such processes.

Given the important role that ICANN plays as the operational management of IANA, and given the role of the RSSAC in ICANN, participation in the supporting organizations and (as appropriate) advisory committees of ICANN is also recommended.

Country Code Top Level Domains (ccTLDs)

Background

A **country code top-level domain (ccTLD)** is an Internet top-level domain generally used by a country - .de (Germany), .fr (France) and .jp (Japan) – and typically designated according to the ISO two-letter country code standard.[21]

With the recent introduction in ICANN of a fast track for internationalized ccTLDs, 33 requests in 22 languages had been received as of 1 October 2010.[22]

The players

IANA
ICANN
ccNSO

The Country Code Names Supporting Organization (ccNSO) is the policy development body created for and by ccTLD managers for ccTLD issues within ICANN.

http://ccnso.icann.org/

ccTLD operators

See the list from the IANA website:

http://www.iana.org/domains/root/db/

Regional ccTLD associations

There are a number of regional ccTLD organizations:

APTLD for Asia Pacific http://www.aptld.org
AFTLD for Africa http://www.aftld.org
CENTR for Europe http://www.centr.org
NATLD for North America,
LACTLD for Latin America and the Caribbean http://www.lactld.org

[21] http://en.wikipedia.org/wiki/ISO_3166-1_alpha-2

[22] http://www.icann.org/en/topics/idn/fast-track/

Structure of ccTLD policy processes

Policies are set by the trustee/operator for the day to day management of the local ccTLD and by the ccTLD community, the regional ccTLD associations and the ccNSO within ICANN for policies relating to the operation of the ccTLDs as a whole.

A government agency typically acts as a trustee for the delegation of the ccTLD and/or as the operator of the ccTLD. As trustee and as the national government it is responsible for the ccTLD being administered in the public interest.

The US Department of Commerce is also involved when there are changes to ccTLD policy and when there are changes in the ccTLD operator or trustee, as these changes have to be entered into the root zone file which contains information about the TLDs and their administrators.

Policy that relates to the overall operation of the ccTLDs is set by the ccTLDs through ICANN. Any policy proposal would likely start through the individual ccNSO member (a ccTLD operator) or relevant association (CENTR for Europe, for example). New policy proposals for the community as a whole are typically made through the regional ccTLD associations or through the ccNSO, the ccTLD operator organization within the ICANN structure.

The policy development process of the ccNSO (see Annex B of linked document):

http://www.icann.org/en/general/bylaws.htm#IX

Policy changes can also be proposed by the GAC - the government advisory body to ICANN. Indeed the ccNSO and the GAC often cooperate within ICANN to propose policy changes – recently for the introduction of IDN (internationalized domain name) ccTLDs.

Proposals that will affect the operation of ccTLDs as a whole are presented to the ICANN Board for review and approval.

The recent introduction of “fast-track” Internationalized ccTLDs is a useful example of the ccNSO’s policy development process and can be found here:

http://ccnso.icann.org/policy/cctld-idn

For more information on the IDN ccTLDs fast track:

http://www.icann.org/en/topics/idn/fast-track/

How to participate in ccTLD policy processes

As an interested individual or organization participation is possible through a number of routes.

Some ccTLD operators have open policy processes and it is possible to participate in those processes online or through open meetings. For example, Nominet, the ccTLD operator for .uk, encourages engagement in its policy development processes:

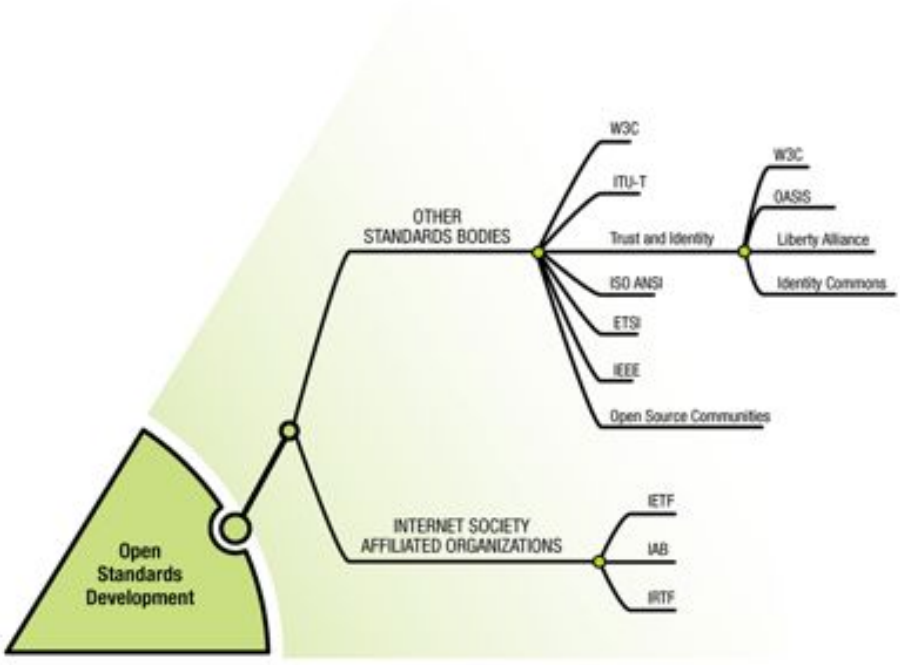
http://nominet.com/policy/process/

ICANN also has open consultations. To be more involved in ICANN interested individuals can participate in, for example, the ALAC (At-Large Community) that represents the interests of the individual users.

As a government representative or as an affiliated entity (registry, associated business, etc.) it is best to contact the appropriate ccTLD first to better understand how to engage in related national policy development. With some ccTLD operators it is possible to contribute to policy development without being a member, registrar or other associated entity. Mechanisms for participation will differ from ccTLD operator to ccTLD operator.

As of June 2010, only 41% of the ccTLD operators were members of the ccNSO. It is hoped that with the introduction of internationalized ccTLDs additional ccTLD operators will join the ccNSO.

Open Standards Development



Focus area:

Internet Society affiliated organizations and other relevant standards bodies

Open Standards Development

Background

The Internet is built on technical standards that allow devices, services, and applications to be interoperable across a wide and dispersed network of networks. By focusing on interoperability for passing traffic between networks, Internet standards describe the protocols without prescribing device characteristics, business models, or content.

The Internet depends on several types of technical standards, developed by a range of organizations. These include, among others: standards and protocols developed by the Internet Engineering Task Force (IETF), as well as telecommunications infrastructure standards developed by the International Telecommunications Union (ITU); hardware standards developed by bodies such as the Institute of Electrical and Electronics Engineers (IEEE); and application and software standards, such as those developed by the World Wide Web Consortium (W3C).

The players

ISOC

The Internet Society (ISOC) is the organizational home of the Internet Engineering Task Force (IETF), the Internet Architecture Board (IAB), the Internet Engineering Steering Group (IESG), and the Internet Research Task Force (IRTF)[23] — the standards setting and research arms of the Internet community.

http://www.isoc.org/

IETF

The Internet Engineering Task Force (IETF) is a large, open and international standardization community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. The IETF is responsible for the specifications of key Internet protocols such as IP (v4 and v6), as well as HTTP (the communication protocol for the World Wide Web)

http://www.ietf.org/

IAB

The IAB (Internet Architecture Board) is chartered as a committee of the IETF. Its responsibilities include architectural[24] oversight of IETF activities, Internet Standards Process oversight and appeal, and the appointment of the

[23] http://www.irtf.org/

[24] The IAB provides oversight of, and occasional commentary on, aspects of the architecture for the protocols and procedures used by the Internet.

RFC Editor. The IAB is also responsible for the management of the IETF protocol parameter registries.[25]

http://www.iab.org/

IESG

The IESG (Internet Engineering Steering Group) is responsible for the technical management of IETF activities and the Internet standards process. It is also responsible for the actions associated with entry into, and movement along, the Internet "standards track", including final approval of specifications as Internet Standards.

http://www.ietf.org/iesg/

W3C

The W3C (World Wide Web Consortium) develops interoperable technologies (specifications, guidelines, software, and tools) for the World Wide Web. The W3C is an international forum for information, commerce, communication, and collective understanding. One of the most important outcomes of the W3C is the standard specification of HTML, which is the publishing language of the World Wide Web.

http://www.w3.org/

IEEE

The IEEE (Institute of Electrical and Electronics Engineers) is an international organization that develops electrical and electronic technology standards. Many of the IEEE standards are integral to computing science and networking technologies. Some examples of key technologies include Ethernet, WiFi, Bluetooth, and Fiber optic connection standards.

http://www.ieee.org/index.html

ITU-T

The International Telecommunications Union (ITU) is a specialized agency of the United Nations dealing with **information and communication technology issues.** The ITU coordinates the shared global use of the radio spectrum, promotes international cooperation in assigning satellite orbits, works to improve telecommunication infrastructure in the developing world, and produces recommendations that foster the interconnection of communications systems. ITU-T (the telecommunications standardization sector of the ITU) produces global telecommunications recommendations. The recommendations produced by the ITU-T are not specific to the Internet, but because a portion of Internet traffic is carried over telecommunication networks, ITU-T is a part of the greater ecosystem.

http://www.itu.int/ITU-T/

[25] For more on the protocol parameter registries: http://tools.ietf.org/html/draft-iab-iana-05

Structure of Internet standards development

The following outlines, **in brief**, the standardization processes/structures of the IETF, the W3C and the IEEE-SA. These organizations work to ensure that the standards they develop contribute to and further the stability and continuity of the Internet. However, these organizations have differing approaches and processes, differing membership structures (or none at all in the case of he IETF), etc.

These organizations have responsibility for different, but complementary, areas of standardization. For example, the IETF does *not* standardize transmission hardware – that is the responsibility of organizations like the IEEE. Nor does it standardize specialized World Wide Web specifications such as HTML and XML, which are the responsibility of the W3C. The IETF *does* standardize all the protocol layers in between, from IP itself up to general applications like email and HTTP.

Whether infrastructure, hardware or software standards, each plays an important role in contributing to the Internet's success and increasing ubiquity. Ensuring that relevant standards organizations cooperate and actively work together to maximize effectiveness, and thereby avoid duplication, market confusion and resource inefficiencies, is essential in this increasingly converged Internet, computing and telecommunications world.

IETF:

> The Internet Engineering Task Force is a self-organized group of experts who contribute to the engineering and evolution of Internet technologies. It is the principal body engaged in the development of new Internet standard specifications. The IETF is unusual in that it exists as a collection of gatherings, but is not a corporation and has no board of directors, no members, and no dues.[26]
>
> The IETF's mission includes the following, among others: identifying, and proposing solutions to pressing operational and technical problems in the Internet; specifying the development or usage of protocols and the near-term architecture to solve such technical problems for the Internet; making recommendations regarding the standardization of protocols and protocol usage in the Internet; providing a forum for the exchange of information within the Internet community between vendors, users, researchers, agency contractors, and network managers. The IETF meets 3 times a year in locations around the world.[27] These face-to-face meetings are opportunities for engineers to share knowledge and expertise - whether long time participants, or newcomers.
>
> For an in-depth introductory document to the IETF:
>
> http://www.ietf.org/tao.html

[26] Much of the text for this section has been excerpted from the introductory document to the IETF: http://www.ietf.org/tao.html

[27] http://www.ietf.org/meeting/79/index.html

The Internet Standards developed by the open processes of the IETF and related organizations are published in the Request For Comments (RFC) document series:

http://en.wikipedia.org/wiki/Request_for_Comments

Every IETF standard is published as an RFC (a "Request for Comments), and every RFC starts out as an Internet-Draft (often called an "I-D"). An Internet Draft is the working document of the IETF, its work areas[28], and its Working Groups. Once the Internet Draft has received comments and is considered sufficiently agreed it is given to a work Area Director for presentation to the IESG. Further review of the Internet Draft by the wider IETF is also recommended. The IESG will then announce an IETF-wide Last Call which invites comment from the IETF community prior to further consideration by the IESG and possible approval. Once the Internet Draft is approved it is published as a Proposed Standard by the RFC Editor

An important aspect of the IETF's process is that decisions are taken on a "rough consensus" basis. This consensus does not require that all participants agree although this is, of course, preferred. In general, the dominant view of the working group prevails.[29]

The full standards development process can be found here:

http://tools.ietf.org/html/rfc2026

The IETF is focused in its activities and does not develop new activities when expertise is better represented elsewhere. The IETF is chiefly scoped to work on "protocols and practices for which secure and scalable implementations are expected to have wide deployment and interoperation on the Internet, or to form part of the infrastructure of the Internet." Adhering to this scope also allows the IETF to work in partnership with other standards organizations, where appropriate, on items of mutual interest:

http://www.ietf.org/liaison/managers.html

W3C

The World Wide Web Consortium (W3C) is an international consortium that develops Web standards and guidelines designed to ensure long-term growth for the Web. W3C is administered via a joint agreement among its host institutions: MIT in the USA, the European Research Consortium for Informatics and Mathematics (ERCIM) in France and Keio University in Japan.

[28] List of work areas and Working Groups: http://tools.ietf.org/area/

[29] http://tools.ietf.org/html/rfc2418

Sir Tim Berners-Lee, W3C Director and author of WWW and HTML, established the W3C in 1994 to ensure compatibility and agreement among industry members in the adoption of new WWW standards.[30] The W3C's mission is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web.[31]

Membership is open to all types of organizations (including commercial, educational and governmental entities) and individuals.[32]

At the W3C, standardization work items start as a Working Draft (not dissimilar to the Internet Draft at the IETF) which is subject to W3C and broader review, proceeds through a set of stages based largely on the maturity of the work in question, including candidate recommendation, proposed recommendation and finally W3C Recommendation (a standard reviewed and endorsed by W3C members and the Director).

For the complete W3C standardization process, see:

http://www.w3.org/2005/10/Process-20051014/

A list of all W3C Working Groups:

http://www.w3.org/Consortium/activities

IEEE-SA

The Institute for Electrical and Electronics Engineering (IEEE) undertakes its standardization work through the IEEE-SA or IEEE Standards Association. In addition to producing the 802 Standards for Local and Metropolitan Area Network Wireless, IEEE-SA also develops the standards for, among many others:

- Intelligent highway systems and vehicular technology
- Distributed generation renewable energy
- Voting Equipment Electronic Data Interchange
- Rechargeable Batteries for PCs
- Components Architecture for Encrypted Shared Media Organic Field Effect Technology[33]

The IEEE-SA has over 20,000 members from businesses, universities and governments as well as members who participate in an individual capacity.34 There are three levels of membership: individual, as well as basic and advanced corporate membership.

[30] The Internet is a vast network of networks, interconnected in many different physical ways, yet all speaking a common language, specified by standardized protocols. The Web is one - albeit, the most influential and well known - of many different applications which run over the Internet.

[31] http://www.w3.org/Consortium/mission#vision

[32] http://www.w3.org/Consortium/membership-faq

[33] http://standards.ieee.org/sa/sa-view.html

[34] IEEE-SA membership: http://standards.ieee.org/sa-mem/ind_overview.html

In brief, the following is required before the publication of a new IEEE standard: 1) sponsorship (support) for the proposed standard must be secured from one of the technical subgroups within IEEE; 2) approval of the sponsored work item by the IEEE-SA New Standards Committee; 3) the creation of a Working Group to draft the standard based on the approved work item; 4) a ballot of the membership (and other interested parties) to approve the draft standard; 5) review by the IEEE-SA Standards Review Committee; and 6) approval of the draft by the IEEE-SA Standards Board.[35]

For the full standards development process:

http://standards.ieee.org/guides/opman/sect5.html

http://standards.ieee.org/resources/development/initiate/index.html

A list of the IEEE-SA Working Group areas:

http://grouper.ieee.org/groups/index.html

How to participate in Internet-related standards development

IETF

The IETF is an open organization. There is no formal membership, no membership fee, and nothing to sign. By participating (joining a mailing list discussion or a meeting), one automatically accepts the IETF's rules, including rules about intellectual property (patents, copyrights and trademarks).[36]

There are a number of ways of participating in the IETF depending on one's level of interest. As much of the detailed technical work is done online, with the primary method being via email, joining the mailing lists for one or two Working Groups is a good way to get a feel for the work and processes. Proposals are made and discussed, issues are raised, and consensus is established online.

Another way to participate is to attend an IETF meeting. This allows for a more immediate feel for the IETF and also provides for an opportunity to participate in some introductory sessions. Following issues of interest through the mailing lists can be hugely beneficial prior to going to an IETF meeting.[37]

For more information on getting started at the IETF:

http://www.ietf.org/newcomers.html

[35] http://www.talkstandards.com/wp-content/uploads/2009/05/case-study-ieee-20090505.pdf

[36] http://www.ietf.org/newcomers.html

[37] http://www.itu.int/en/ITU-T/publications/Pages/recs.aspx

The Internet Society also offers fellowships to the IETF as a part of its Next Generation Leadership program:

http://www.isoc.org/educpillar/fellowship/index.php

W3C

Participation in the W3C standardization processes occurs largely through its membership, but there are opportunities for non-members and the pubic at large as well as opportunities for individual experts to participate.

The "W3C invites the public to participate in W3C via discussion lists, events, blogs, translations, and other means described below. Participation in W3C groups (Working, Interest, Incubator, Coordination, TAG, and Advisory Board) is open to W3C Members and other invited parties. W3C groups work with the public through specification reviews as well as contributions of use cases, tests, and implementation feedback."[38]

Non-members have opportunities to comment on draft standards and other work items once they have reached Working Draft status. This outlined here in section 7.4:

http://www.w3.org/2005/10/Process-20051014/tr.html#first-wd

Interested organizations should refer to the following:

http://www.w3.org/Consortium/join

IEEE-SA

Participation in the IEEE-SA standardization processes is limited to its individual and corporate membership although it does encourage public sector organizations to join. Working documents are only available to members.

Interested organizations should refer to the following:

http://standards.ieee.org/sa-mem/index.html

About the Internet Society

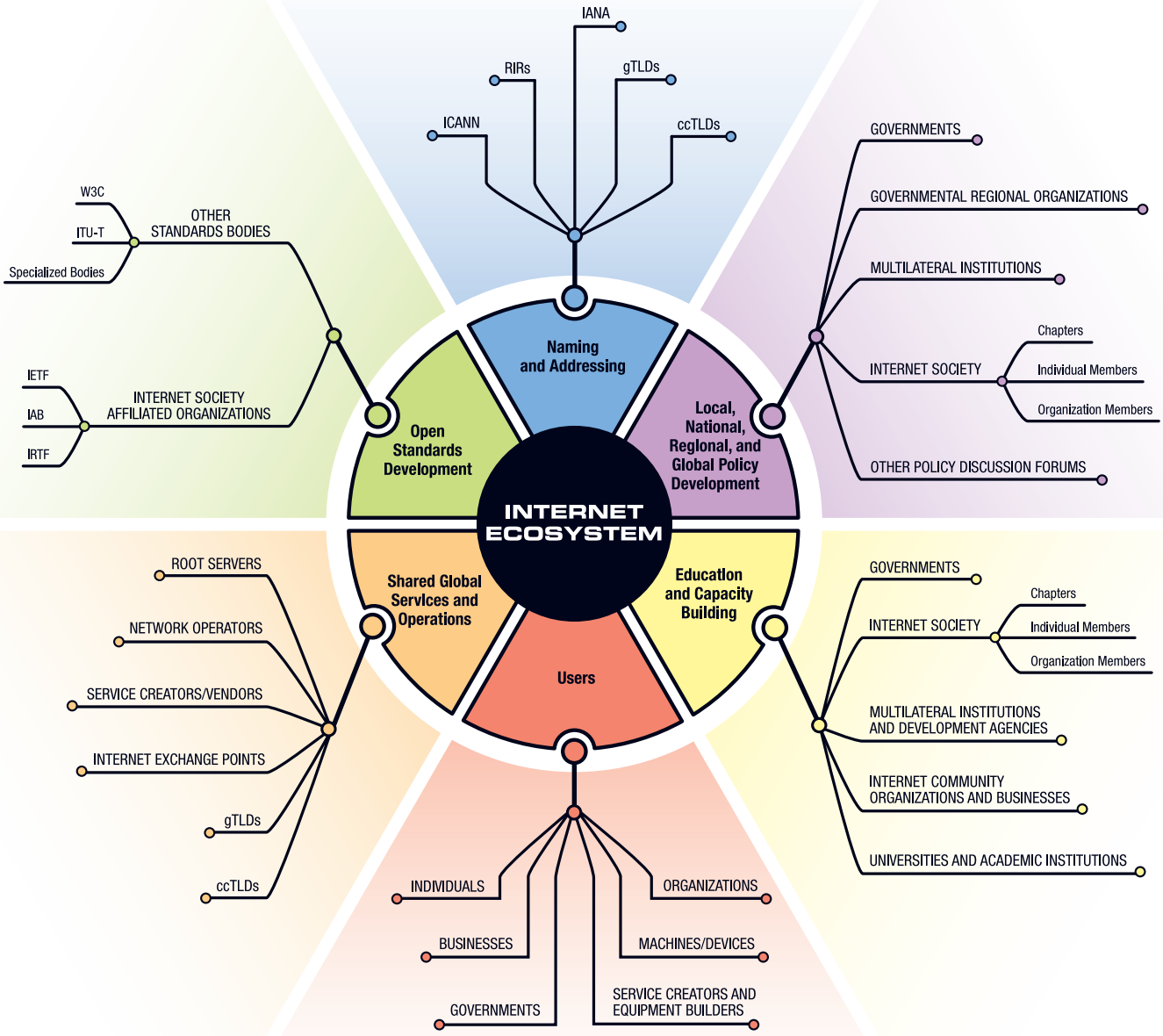
The Internet Society is a non-profit organization founded in 1992 to provide leadership in Internet related standards, education, and policy. With offices in Washington, D.C., and Geneva, Switzerland, it is dedicated to ensuring the open development, evolution, and use of the Internet for the benefit of people throughout the world. More information is available at: http://InternetSociety.org

[38] http://www.w3.org/participate/

The Internet Ecosystem

The Internet is successful in large part due to its unique model: shared global ownership, development based on open standards, and freely accessible processes for technology and policy development.

The Internet's unprecedented success continues to thrive because the Internet model is open, transparent, and collaborative. The model relies on processes and products that are local, bottom-up, and accessible to users around the world.



Internet Society

http://www.isoc.org

County-Code Top-Level Domains (ccTLDs) ccTLDs are operated according to local policies that are normally adapted to the country or territory involved. *http://www.iana.org/domains/root/db/*

Generic Top-Level Domains (gTLDs) gTLD registries operate sponsored and unsponsored generic Top-Level Domains according to ICANN policies. *http://www.iana.org/domains/root/db/#*

Governments Federal, state and local governments and their regulators have roles in setting policies on issues from Internet deployment to Internet usage.

Governmental Regional Organizations Governmental regional organizations include, but are not limited to, the African Union, the Asia-Pacific Economic Cooperation (APEC), the Asia-Pacific Telecommunity, the Caribbean Telecommunication Union (CTU), the Commonwealth of Nations, the European Union (EU), and the Inter-American Telecommunication Commission (CITEL). Governments sometimes like to coordinate policies related to the Internet for their regions.

Internet Architecture Board (IAB) The IAB is chartered as a committee of the Internet Engineering Task Force (IETF) and as an advisory body of the Internet Society (ISOC). Its responsibilities include architectural oversight of IETF activities, Internet Standards Process oversight and appeal, and the appointment of the RFC Editor. The IAB is also responsible for the management of the IETF protocol parameter registries. *http://www.iab.org/*

Internet Assigned Numbers Authority (IANA) IANA is responsible for the global coordination of the Domain Name System (DNS) Root, Internet Protocol (IP) addressing, and other Internet protocol resources. *http://www.iana.org/*

Internet Corporation for Assigned Names and Numbers (ICANN) ICANN is a not-for-profit public-benefit corporation that coordinates the system of unique names and numbers needed to keep the Internet secure, stable, and interoperable. It promotes competition and develops policy on the Internet's unique identifiers through its coordination role of the Internet's naming system. *http://www.icann.org/*

Internet Engineering Task Force (IETF) The IETF is a large, open, international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. *http://www.ietf.org/*

Internet Community Organizations and Businesses Many Internet organizations and businesses encourage, train, and invest in Internet education and capacity building. Organizations include, but are not limited to, the RIRs, regional and national network operators, and the Network Startup Resource Centre (NSRC), as well as vendors such as Afilias Limited, Alcatel-Lucent, Cisco, IBM, and Microsoft.

Internet Research Task Force (IRTF) The IRTF's mission is to promote research of importance to the evolution of the future Internet by creating focused, long-term, and small Research Groups working on topics related to Internet protocols, applications, architecture, and technology. *http://www.irtf.org/*

Internet Society (ISOC) ISOC promotes the evolution and growth of the global Internet. Through members, chapters, and partners, they are the hub of the largest international network of people and organizations that work with the Internet. *http://www.isoc.org*

ISOC Chapters ISOC Chapters localize ISOC's core values and promote the Internet for their local communities. *http://www.isoc.org/isoc/chapters/*

ISOC Individual Members ISOC Individual Members show commitment to ISOC's vision. *http://www.isoc.org/members/*

ISOC Organization Members ISOC Organization Members support and contribute to ISOC and understand the need to take action collectively to ensure the Internet remains open, accessible, trusted, and secure. *http://www.isoc.org/orgs/*

International Telecommunication Union Telecommunication Standarization Sector (ITU-T) The ITU-T regularly convenes specialists drawn from industry, the public sector, and R&D entities worldwide to develop technical specifications that ensure that each piece of communications systems can interoperate seamlessly with the myriad elements that make up today's complex ICT networks and services. *http://www.itu.int/ITU-T/*

Internet Exchange Points (IXP) Regional and national IXPs provide physical infrastructure that allows network operators to exchange Internet traffic between their networks by means of mutual peering agreements.

Multilateral Institutions and Development Agencies Multilateral institutions include organizations that have multiple countries working in concert on Internet issues for policy development, education and capacity building. Organizations include, but are not limited to, the International Telecommunication Union (ITU), the ITU's Development Sector (ITU-D), the United Nations' UNESCO, and the World Intellectual Property Organization (WIPO).

Network Operators Network Operators include companies that provide access to the Internet. Regional Network Operator Groups (NOGs) provide collaboration and consultative opportunities for local operators and among NOGs globally.

Other Policy Discussion Forums Organizations include, but are not limited to, the Internet Governance Forum (IGF) and the Organisation for Economic Co-operation and Development (OECD), as well as national consultative forums, industry associations, and civil society organizations.

Regional Internet Registries (RIRs) RIRs oversee the allocation and registration of Internet number resources within a particular region of the world. Each RIR is a member of the Number Resource Organization (NRO). RIRs include AfriNIC, the Asia Pacific Network Information Centre (APNIC), the American Registry for Internet Numbers (ARIN), the Latin American and Caribbean Internet Addresses Registry (LACNIC) and the RIPE Network Coordination Centre. *http://www.nro.net/*

Root Servers DNS root name servers reliably publish the contents of one small file called a root zone file to the Internet. This file is at the apex of a hierarchical distributed database called the Domain Name System (DNS), which is used by almost all Internet applications to translate worldwide unique names like www.isoc.org into other identifiers; the web, e-mail, and other services use the DNS. *http://www.root-servers.org/*

Service Creators/Vendors Service Creators and Vendors provide software applications and experiences that utilize the Internet.

Specialized Standards Bodies Many organizations focus on specialized standards; some play key roles in the Internet. These organizations include, but are not limited to, the European Telecommunications Standards Institute (ETSI), the Identity Commons, the IEEE Standards Association, the ISO ANSI, the Liberty Alliance Project, Open Source Communities, and the Organization for the Advancement of Structured Information Standards (OASIS).

Universities and Academic Institutions Historically and continuing today, academic institutions play a critical role in educating students and business people. They also prototype and demonstrate hardware and software solutions that benefit the Internet.

Users People and organizations that use the Internet or provide services to others via the Internet.

World Wide Web Consortium (W3C) W3C is an international consortium where Member organizations, a full-time staff, and the public work together to develop Web standards. *http://www.w3.org*

1775 Wiehle Avenue, Suite 201, Reston, VA 20190-5108, U.S.A.
+1 703 439 2120

Galerie Jean-Malbuisson 15, CH-1204 Genèva, Switzerland
+41 22 807 1444

03/24

Preserving the User Centric Internet

22 April 2009

About this paper

This paper, Preserving the User Centric Internet, was developed by the Internet Society in 2007. It is intended to clarify for readers the importance of the design values and fundamental principles that have underpinned the Internet's success. The Internet Society believes that principles such as openness, user choice and control, and edge based intelligence, among others, are central to a thriving Internet and, we believe, will be so for the foreseeable future. In focusing on "user-centricity", ISOC is seeking to ensure that the primacy of the user is not forgotten when it comes to new architectures, commercial offerings and policy making.

The Internet today faces a range of challenges that could impact the distributed, end-to-end and open nature that users have come to take for granted. Some of these challenges are service and architecture related, including but not limited to the Network Neutrality debate in the United States, initiatives on Next Generation Networks, and the discussion in Europe and elsewhere over the future of access regulation (unbundling) and competition. Other challenges relate to the impact changes in Internet usage patterns and the explosion of content consumption and creation are having on Internet architecture and business models.

These challenges are, in many ways, born of the Internet's success. This "network of networks" is enjoyed and shaped by an increasingly diverse range of players, from its users, to those who manage the networks that comprise it, to nations whose economic competitive advantage increasingly depends upon it. The Internet has shown itself to be supremely flexible and adaptable; yet these growing commercial and economic challenges apply pressures that could well change some of the principal elements underlying its success.

The Internet Society (ISOC) believes that the Internet's future depends on a renewed commitment to the principles that have made it so successful to date. For each of the various challenges listed, ISOC is concerned that there has been

Internet Society
Galerie Jean-Malbuisson 15
CH-1204 Genèva
Switzerland
Tel: +41 22 807 1444
Fax: +41 22 807 1445
http://www.isoc.org
1775 Wiehle Ave.
Suite 201
Reston, VA 20190, USA
Tel: +1 703 439 2120
Fax: +1 703 326 9881
Email: info@isoc.org

insufficient focus on the imperative of ensuring that the fundamental user-focused principles that the Internet is built upon are preserved. The National Academies voiced their concern in this regard in their 2001 publication "The Internet's Coming of Age":

> *The design values of the Internet have been reinforced by the environment in which the Internet was developed. In its early years as a cooperative research project, it was isolated from some of the stresses and strains associated with commercial marketplace interactions. …. Whether and how the traditional Internet design values will be maintained is an important issue for the future of the Internet.* [1]

The importance of maintaining these design values, and the fundamental principles that are based upon them, is at the heart of the Internet Society's **"User Centric Internet, an initiative that calls for a renewed focus on the openness, transparency, edge-based intelligence and, above all, user choice that are at the heart of the Internet today"**. [2]

I. The changing Internet

The success of the Internet has been due in large part to a common understanding or compact that the Internet and the fundamental benefits that arise from the Internet model are good for all. As Daniel Weitzner at MIT and W3C describes it:

> *The neutrality of the Internet arises out of a combination of basic architectural features of Internet and World Wide Web standards, and business practices on the retail and back-end of Internet service provider networks, all in a delicate balance with the competitive market forces that tie service providers, technology developers, and content providers together in a global, voluntary agreement to maintain these practices and standards. This agreement has been maintained out of an implicit but shared belief that cooperation to keep the Internet functioning as an open, interconnected and non-discriminatory platform serves the interests of the parties individually, as well as collectively*.[3]

However, this common benefit and "delicate balance" that has stood the test of time so well is now threatened by its very success.

The Internet is mainstream – it is no longer different or special. What is clear is that the ubiquity and indispensability of the Internet have made it an important means of reaching customers and building business opportunity. One of the consequences of the Internet's success is the desire to exploit it for business and competitive advantage. This in turn could have a significant impact on shaping the Internet's architecture, on the way commercial offerings are structured and on the way in which the Internet is used.

One of the characteristics of the Internet experience to date has been relatively unconstrained access for reasonable cost. Yet, the days of the Internet "all the bandwidth you can consume" buffet appear to be under threat. Some suggest

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[1] http://newton.nap.edu/html/coming_of_age/na_statement.html
[2] See also the National Academies' paper and http://www.ietf.org/rfc/rfc1958.txt
[3] http://dig.csail.mit.edu/2006/06/neutralnet.html

that the commoditization of Internet access has limited the ability of service providers to compete and invest in new networks, and is forcing them to find new business models and new ways of leveraging their assets. Content for example, may well become an increasing differentiation characteristic of service offerings, with providers creating new subscription packages that the Internet user can then choose to purchase or not (not dissimilar to the cable model). But, how will evolving subscription packages impact user choice? To what degree will they shape the users' Internet experience? The traditional content business is based upon proprietary product and premium content, much of which is increasingly tailored to particular groups of consumers. Will users who are already downloading movies, music, sharing video, and other multimedia pay more for the services they are already accessing? Undoubtedly there will be significant changes in commercial offerings that are based upon or tie into Internet access. Whether they be content focused, metered or Service Level Agreement based, innovation in commercial offerings should not be constrained. That said, at the same time it is important that there is adequate competition in service offerings and that there is a continuing ability for users to exercise choice in that regard. Further, while accessing content is an increasingly important part of a user's experience, they should also be able to "use" the Internet in ways in which they are accustomed. While it is a somewhat artificial distinction, it is important that future commercial offerings ensure that Internet is available as a tool (for use) as well as another medium for viewing content.

The future of the Internet is also being shaped by other factors, ranging from changing industry structure to questions related to the sustainability of the Internet given demands on the existing architecture. These factors also are having a direct impact on the user through affecting their ability to choose, inter alia, the service provider and the Internet service subscription of their choice.

Around the globe the traditional communications environment is changing with likely implications for the future of the Internet. In the United States, significant market restructuring is resulting in far greater consolidated local and backbone/transit footprints than before, lessening the dependencies on Weitzner's compact mentioned above. How this will impact the competitive landscape remains to be seen. In Europe, there is a considerable debate over the desirability of continued access regulation such as local loop unbundling, particularly with regards to new infrastructure investment. As the communications landscape changes around the globe, what is clear is that a user's ability to choose among providers is as important as, and has a direct bearing on, their ability to choose among subscription and service packages. User choice is dependent upon flourishing competition, so low barriers to market entry, not only in terms of infrastructure investment, but also content provisioning and user-driven innovation, is essential.

There are also wide-ranging discussions about the future viability of an Internet based on "best effort" delivery. One of the defining characteristics of the Internet is that it is a truly two-way, interactive medium driven by users (individual and community) innovation and creativity. This interactivity, and the ability of users to create content and applications, is driving an unprecedented explosion of user-created content and content sharing. This is not without its consequences, one of which is the suggestion that the networks underpinning the Internet are under increasing strain as more Internet users come on line and the availability and generation of content continues. Typical network based responses would include QoS management and/or bandwidth provisioning. One of the concerns

expressed in this regard is whether the user's Internet subscription will be increasingly determined by network management or by traffic type. For example, will services such as HDTV, DVD quality streaming and other high-bandwidth services become part of "premium content" packages that mirror some of the cable business offerings? And if services are broken out by particular characteristics, will those characterized by latency and jitter intolerance for example be priced higher to deliver?

Some look to architectural solutions, with next generation networks promising feature-rich triple or quadruple play converged services, in which quality-of-service (QoS) is ensured, security enhanced and application and service management made simpler. Concerns have been raised that such architectures could remove the control from the user and the intelligence from the edge, and place them once again into the core of the network. The focus in these multiple-play architectures is also largely on the consumption of content – but how will they facilitate and encourage its creation? Does the future of networking lie in the struggle between two different worlds, that of the Internet model, with its associated openness and freedom and user-centricity, on the one hand, and the closed network model, in which choice and control no longer sits with the user, on the other?

Whatever the future of commercial offerings and network architecture, how the Internet user will benefit and how user-centricity will be preserved should be the yardstick by which they are measured.

II. The importance of choice

Today's Internet is a user centric focused network of networks. It is, to paraphrase the Federal Communications Commission, the user who decides (largely) the content they wish to access, the applications they wish to use, the devices they wish to attach to the network and the service type or subscription package they wish to acquire.4 In each case the user makes choices and they have a set of options to choose from. This issue of choice (and the control that goes hand in hand with it) is fundamental to the user-centricity of the Internet.

Vint Cerf, Chief Internet Evangelist at Google, captured it well when he said:

> *The Internet's open, neutral architecture has proven to be an enormous engine for market innovation, economic growth, social discourse, and the free flow of ideas. The remarkable success of the Internet can be traced to a few simple network principles - end-to-end design, layered architecture, and open standards – which together give consumers choice and control over their online activities.*[5]

A central issue to the Internet Society's focus on the User Centric Internet is the degree to which today's Internet user will have the same "choice and control over their online activities" in the future.

The issue of choice was touched upon briefly above with regards to service offerings and access provision. Yet it is much broader in its importance: users

[4] Also see the Internet Society's principles http://www.isoc.org/pubpolpillar/principles.shtml
[5] http://commerce.senate.gov/pdf/cerf-020706.pdf

expect to be able to use the Internet as they wish, accessing the people, sites and content of their choice – recognizing that they might be limited by what is legal/illegal and what may not be accessible for technical reasons. At the moment that user experience is largely unconstrained.

One concern that has arisen is whether, with changing business models on the Internet, we are moving, or being moved, from users to consumers. And with that possible change does the Internet start to lose its user centricity and the users their control over this incredible tool? One of the unintended consequences of such a change could be a lessening of the innovation that is a result of not only the Internet's architecture but also its openness and accessibility. Innovation on the Internet has been driven by the user, by the individual, the entrepreneur, by the small business, by the corporation. The nature of the Internet, its ubiquity, openness and simplicity has enabled businesses to be built, communities to be formed, content to be created. How would these have been possible without the ability of the user to leverage the Internet as we know it today? How will the user's ability to wield this tool, for innovation for example, be different in the future?

This fundamental dynamic of choice is what has driven blogging, social networking, VoIP, and other innovations on the Internet. This user-centricity has unleashed innovation in communities, businesses, garage start-ups, and college dorm rooms. The ability to exploit the medium in an unfettered way has been a driver of its success. It is easy to forget that the Internet is more than a network of networks – rather it is a medium and tool that unleashes user creativity and innovation, and that builds communities and human and institutional networks around the globe, and drives commerce in unprecedented ways.

III. The future of the User Centric Internet

The Internet of today has been shaped by the fundamental principle that the user is in charge of their online activities: today's users choose and control where they wish to go on the Internet, who they wish to communicate with, the content and communities they wish to access, and the applications they wish to use. And most importantly, the intelligent edge and user centricity have driven innovation, the digital economy, the Information society, while measurably contributing to the wealth of nations. The Internet Society believes that these characteristics have made the Internet a unique tool, and a users' ability to wield this tool should not be fettered.

The Internet Society believes that the debate over issues such as network neutrality rules masks a more important discussion related to the future of the user centricity of the Internet and the preservation of the underlying principles that have made it the success that it is today. This is a discussion that merits much greater consideration as it has a direct bearing on the way the Internet will evolve. For example, the user-centricity of the future Internet depends on how we answer some fundamental yet complex questions, including:

- How do we maintain and improve upon the user-defined experience that has driven the overwhelming success of the Internet while encouraging investment and innovation, new services, new content, and other benefits yet unforeseen?

- As the Internet also becomes a significant medium for the provision and consumption of content, how can its fundamental interactivity be preserved so

that its use as a tool for human creativity remains as compelling as ever? How does the user remain a user as well as a consumer?

- Will the Internet of the future be accessible and open as a result of new investment, new networks and new business models or will the new networks be closed, tiered and exclusive, carrying only certain content to certain subscribers?

These are not easy issues to balance, but the Internet Society believes that the guiding principles for decision making must be the preservation of the Internet's user-centricity through its design values and its principles of openness, transparency, edge-based intelligence and, above all, user choice. Architectures, business models, and policies that fundamentally shift away from these design values are fundamentally shifting away from the Internet itself. Ensuring innovation, investment and commercial opportunity along with continued and enhanced user centricity will be essential to the Internet's future success.

IV. The Internet Society

The Internet Society (ISOC) is an independent international nonprofit organization with headquarters in Geneva, Switzerland and Reston, Virginia, USA. ISOC acts as a global clearinghouse for technically-sound, unbiased information about the Internet, as a provider of education, and also as a facilitator and coordinator of Internet-related initiatives around the world. It provides the organizational home for the IETF, IAB and IRTF.

ISOC was founded in 1992 to provide leadership in Internet related standards, education, and policy. It is supported by an active, global network of members who help promote and pursue the ISOC mission in all parts of the Internet community and all parts of the world. The Society has more than 80 organizational and more than 28,000 individual members in over 80 chapters who contribute to regionalizing the scope of ISOC technical, educational and policy initiatives.

ISOC is a Sector Member of ITU–T (Standards) and ITU-D (Development) since 1995. The website is: http://www.isoc.org.