# UNDERSTANDING THE INTERNET GOVERNANCE NETWORK

## A Prototype for Global Governance in the Networked Age

**Don Tapscott**
Executive Director
Global Solution Networks

*and*

**Lynn St. Amour**
President /CEO
Internet Society (ISOC)

*with*

**Steve Caswell**
Principal Researcher
Global Solution Networks

**One of the most extraordinary outcomes of the digital revolution is that multi-stakeholder networks, rather** than state based institutions, now govern important global resources. And one of the most important of these Governance Networks is the Internet itself, which is curated, orchestrated and otherwise governed by what at one time would have been an unthinkable collection of individuals, civil society organizations and corporations, with the tacit and, in some cases, active support of nation states. But no government, country, corporation or state-based institution controls it.

The Internet has achieved legitimacy, inclusiveness and consensus-oriented decision making. This report describes this complex ecosystem and what makes it tick. The story tells us much about how to govern a collective resource through a multi-stakeholder governance network.

GLOBAL
SOLUTION
NETWORKS

# Table of Contents

# Idea In Brief

One of the most extraordinary outcomes of the digital revolution is that multi-stakeholder networks, rather than state based institutions, now govern important global resources. These Governance Networks (one of the ten types defined in our taxonomy of Global Solution Networks) are beginning to address the coordination and even management of critical resources like forests and water. Some are more effective than others.

One of the most important is the Internet itself, which is curated, orchestrated and otherwise governed by what at one time would have been an unthinkable collection of individuals, civil society organizations and corporations, with the tacit and, in some cases, active support of nation states. But no government, country, corporation or state-based institution controls it.

Extraordinarily, it works and has become one of the most effective governance systems in the world. It has achieved legitimacy, inclusiveness and consensus-oriented decision making. This report describes this complex ecosystem and what makes it tick. The story tells us much about how to govern a collective resource through a multi-stakeholder governance network, rather than a state-based model.

Despite its remarkable job of addressing the operational and technical issues of the Internet, the Internet governance network faces stiff challenges ahead. There are many monumental issues for the Internet governance network to manage such as network reliability, security, privacy, access, intellectual property, appropriateness of content, neutrality, identity, fraud and spam—to name a few. While alluded to in this report, the policy challenges associated with the exploding global popularity of the Internet are discussed in more detail in the GSN companion paper—"Governing a Borderless Internet: Challenges Facing the Internet Governance Network."

# The "Showdown at Dubai" —December 2012

This was the chance to push for more control over the Internet. The last time that international telecommunications regulations (ITRs) had been updated was 1988. The International Telecommunications Union's (ITU) background brief on the World Conference on International Telecommunications 2012 (WCIT-12),[1] which was being held in Dubai from December 3-14, set the background about the ITRs as follows:

*The Internet... has changed the definition of management and governance as it has become governed by private sector and non-profit organizations that are open to anyone who wants to participate in its development and governance.*

Excerpt from the ITU background brief:

*The ITRs were agreed upon in 1988 at the World Administrative Telegraph and Telephone Conference in Melbourne, Australia, and came into force in 1990. They are one of the four treaties forming the foundation of ITU's mission, and 178 countries agreed to be bound to the ITRs.*

*Treaty-level provisions are required for worldwide networks and services...They comprise ten articles dealing with such matters as cooperation among national administrations; giving priority to emergency telecommunications, and how to calculate the charges for traffic exchanged between carriers in different countries. The ITRs laid the foundation for privatization, competition and deregulation that created the conditions for growth in ICTs—including the Internet—that we see today.*

*ADAPTING TO THE FUTURE*
*But the environment has altered dramatically since 1988. Back then the three pillars underpinning telecommunications were time, distance and location. These have all become significantly less important in terms of global services today. Governments have re-evaluated their policies and much of the sector has been privatized and liberalized.*

*There is consensus that the ITRs must be adapted to match our rapidly changing world. Differing proposals have been put forward on how best to do this, but all agree that there must be international cooperation. Governments and the private sector will play complementary but distinct roles. Governments establish sound regulatory frameworks, and the private sector provides the investment. Together this will ensure that infrastructure is built—to the benefit of consumers and the ICT sector as a whole.*

## New Kid on the Block

The most important word in the brief was "Internet," which *has* changed everything.[2] The Internet has collapsed the cost of international voice communications through voice over internet protocol (VoIP) telephony. Phone calls that once brought revenues by the minute into telecom coffers now travel for free.[3] The ITU expected the cost of international calls to decrease when undersea fiber optic cables dramatically increased capacity and they expected the lowered cost to drive an increase in traffic along with an increase in leased data lines, resulting in even greater revenues. They could not foresee that the Internet would end up carrying much of this traffic for flat rate monthly usage fees paid to local Internet service providers (ISPs).

The Internet, however, has done far more than collapse international telecommunications revenues. It has changed the definition of management and governance as it has become governed by private sector and non-profit organizations that are open to anyone who wants to participate in its development and governance. While governments are also able to participate, it is a real contrast to the more traditional international or UN organizations—which are controlled by governments.

## The Opportunity

WCIT-12 was the ITU's chance to reassert its dominance. It had started to push for more control at the World Summit on the Information Society (WSIS) in Geneva in 2003 and then again in Tunis in 2005.

Excerpt from WSIS Outcome Documents published December 2005:

*48. The Internet has evolved into a global facility available to the public and its governance should constitute a core issue of the Information Society agenda. The international management of the Internet should be multilateral, transparent and democratic, with the full involvement of governments, the private sector, civil society and international organizations. It should ensure an equitable distribution of resources, facilitate access for all and ensure a stable and secure functioning of the Internet, taking into account multilingualism.*

*49. The management of the Internet encompasses both technical and public policy issues and should involve all stakeholders and relevant intergovernmental and international organizations. In this respect, it is recognized that:*

> *a) Policy authority for Internet-related public policy issues is the sovereign right of States. They have rights and responsibilities for international Internet-related public policy issues.*

> *b) The private sector has had, and should continue to have, an important role in the development of the Internet, both in the technical and economic fields.*

> *c) Civil society has also played an important role on Internet matters, especially at the community level, and should continue to play such a role.*

> *d) Intergovernmental organizations have had, and should continue to have, a facilitating role in the coordination of Internet-related public policy issues.*

> *e) International organizations have also had, and should continue to have, an important role in the development of Internet-related technical standards and relevant policies.*

*50. International Internet governance issues should be addressed in a coordinated manner. We ask the Secretary-General of the United Nations to set up a working group on Internet governance, in an open and inclusive process that ensures a mechanism for the full and active participation of governments, the private sector and civil society from both developing and developed countries, involving relevant intergovernmental and international organizations and forums, to investigate and make proposals for action, as appropriate, on the governance of Internet by 2005.*

In Section 48 WSIS endorsed "multilateral, transparent and democratic" control of the Internet by "governments, the private sector, civil society and international organizations." Based on Section 50, furthermore, the WSIS established the Internet Governance Forum (IGF), whose stated purpose is "to support the United Nations Secretary-General in carrying out the mandate from the World Summit on the Information Society (WSIS) with regard to convening a new forum for multi-stakeholder policy dialog—the Internet Governance Forum (IGF)."[5]

Still, WSIS wrote in Section 49(a) that "Policy authority for Internet-related public policy issues is the sovereign right of States. They have rights and responsibilities for international Internet-related public policy issues."

So the Dubai conference was the opportunity for countries such as Russia, China, Saudi Arabia, Algeria, Bahrain, the United Arab Emirates and South Africa to reestablish the control that they believe comes from the "sovereign right of States" via international treaty. As such, they developed a proposal that would reestablish that control if adopted at the conference.

Excerpts from the proposal:[6]

*31B 3A.2 – Member States shall have equal rights to manage the Internet, including in regard to the allotment, assignment and reclamation of Internet numbering, naming, addressing and identification resources and to support for the operation and development of basic Internet infrastructure.*

*31C 3A.3 – Member States shall have the sovereign right to establish and implement public policy, including international policy, on matters of Internet governance, and to regulate the national Internet segment, as well as the activities within their territory of operating agencies providing Internet access or carrying Internet traffic.*

*31F 3B.1 – Member states have the right to manage all naming, numbering, addressing and identification resources used for international telecommunications/ICT services within their territories.*

## The Leak

On December 7, 2012 a draft of this proposal was leaked to the public by a website calling itself WCITLeaks.org (not to be confused with WikiLeaks, although the goals are very similar). The leaked document resulted in a firestorm of criticism, particularly from the United States and its allies, but also from many of the non-governmental stakeholders involved in Internet governance and from the American press.

> *US officials say placing the Internet under UN control would undermine the freewheeling nature of cyberspace, which promotes open commerce and free expression, and could give a green light for some countries to crack down on dissidents…*

According to a December 12, 2012 article by Amy Thompson in *Bloomberg*:[7]

> *The proposal faces opposition from countries such as Germany, the US, the Czech Republic, Sweden, Australia, Canada and the UK, which all had called for it to be struck off since they've agreed not to talk about regulating the Internet at the conference.*
>
> *The US White House said yesterday it would reject any measure that would move more control of the Internet to the International Telecommunication Union. The US delegation characterized the new proposal as an attempt to 'derail' the discussion.*

While the set of proposals was highly controversial, it was not unexpected. On October 12, 2012 Rob Lever wrote in an article in *Business Insider*:[8]

> *When delegates gather in Dubai in December for an obscure UN agency meeting, fighting is expected to be intense over proposals to rewrite global telecom rules to effectively give the United Nations control over the Internet.*
>
> *Russia, China and other countries back a move to place the Internet under the authority of the International Telecommunications Union, a UN agency that sets technical standards for global phone calls.*
>
> *US officials say placing the Internet under UN control would undermine the freewheeling nature of cyberspace, which promotes open commerce and free expression, and could give a green light for some countries to crack down on dissidents…*
>
> *"The most likely outcome is a tie, and if that happens there won't be any dramatic changes, although that could change if the developing countries make a big push," said James Lewis, director of the Technology and Public Policy Program at the Washington-based Center for Strategic and International Studies.*

## The Result

The article in *Business Insider* foreshadowed the result of the Dubai conference. While the delegations that wanted the ITU to establish more control over the Internet did not get what they wanted, they did manage to get enough changes in wording that the United States and its allies refused to sign the resulting Final Acts, which established a set of updated ITRs.

> **The Internet was developed in the United States, but has now grown into a worldwide phenomenon. Many governments are very concerned about that growth, and particularly that they have little control over its evolution within their borders.**

At the end of the Conference, only 89 of the members signed the Final Acts, while 55 opposed it. Russia, China, Saudi Arabia and their allies on the Internet governance issue all signed the ITR revisions, the United States, United Kingdom, Canada, Australia, Denmark, the Czech Republic and Sweden rejected signing the new ITRs outright, while Japan, India, Germany, France and Poland expressed reservations.

## What Does This All Mean?

Basically, Russia, China and their allies failed to move control of the Internet to the ITU because the United States, the United Kingdom, Canada and their allies refused to allow anything into the revised ITRs that could even remotely be construed as extending the ITU's province to the Internet.

The "Showdown at Dubai," however, is symptomatic of a greater debate about how the Internet should be governed. The Internet was developed in the United States, but has now grown into a worldwide phenomenon. Many governments are very concerned about that growth, and particularly that they have little control over its evolution within their borders. There is also a growing number of ways to view the debate. For example, it is very easy to view the "Showdown at Dubai" through the lens of democracy versus authoritarianism, especially since a number of countries pushing for more control by the ITU were considered authoritarian countries in comparison to the United States and its western, industrialized allies.

The recent revelations about the US National Security Agency's intercepting Internet and cell phone records, however, has completely altered the debate. It's very difficult to view the issue as one of democratic versus authoritarian governments when the leading "democratic" government is caught capturing massive amounts of Internet traffic for security purposes.

### The Economic View
While one can analyze the results using a democracy versus authoritarianism model, it's also possible to take a more economically driven view in which we say that the United States and its closest industrialized allies do not want anyone else to muscle in on their *de facto* control of the Internet and the economic benefits that accrue from it.

In a lengthy article in the *Huffington Post* entitled, "And Now the Second Battle of the Internet," Jean-Christophe Nothias, Editor in Chief of *The Global Journal* writes:[9]

*The rules in question, such as respect of personal information, net neutrality or digital public policies whether national, regional or international, are at the heart of an ongoing 15-year battle. During the last two years, this fight has taken a more aggressive turn, with the US government, American companies and their close allies pitted against those who demand more international and multilateral governance. The US government is clinging to its power via a so-called "multi-stakeholder" model, lumped together with the believers in an autonomously-ruled Internet, the so-called digital freedom fighters who reject all governmental regulation, the masked anonymous vigilantes who act as law enforcement, the kings of spam or porn, the Internet money makers, the rebel hackers or former hackers become intelligence officers.*

*Not a week goes by without an enlightened mind cursing governments or recounting the story of the Internet as a pure product of 1960s counterculture, born from LSD or the desire to live in a commune. According to such individuals, the founding fathers of the Internet offered the world this new space beyond the control of national powers. The reality of the Internet is actually more pragmatic, industrial and economic. And to be honest, the Internet has now become a very political battlefield.*

*As opposed to a phenomenon linked to a form of counterculture, the Verizon affair10 has shed new light on the reality of Internet control. Worldwide, every state plays, whether they like it or not, a role within their own borders, fortified by traditions, law and industrial heavyweights. One country in particular has the power to not only impose its Internet laws on its citizens, but also on 'foreign citizens'—that is the US. This is exactly what the Verizon affair has demonstrated. Indeed, it is further evidence that there is a need to redevelop and rebalance Internet governance. And this is the very thing the US officials and the big US digital corps have refused to discuss in Dubai, Geneva or elsewhere...*

*From the very beginning, the famous 13 servers forming the Internet's backbone (the DNS Root Servers) have been in American hands, or in the hands of close allies. The two not located in American territory are in London (LINX/RIPE) and Stockholm (NORDU). That is, the two capitals most vocal alongside Washington in favor of the status quo. The strongly anti United Nations campaign before and after the Dubai conference in December 2012 worried many who saw there a resurgence of the Cold War. Not quite so, I would say. The PRISM affair demonstrates the problem was not so much the danger represented by China or Russia in regards to our digital exchanges, accounts and personal information, but the fact of having a state and some of its digital juggernauts enjoying control of the Internet.*

*Yes, the economic issues are major, especially in terms of high-speed broadband, critical to accelerating the economic development of entire countries. Who should pay for this significant investment? Each single user by whatever means he has? Public or private national operators? The Internet Service Provider that benefits from the connection of these networks? The Internet Robber Barons such as Google and others? What are the two thirds of the world population to do who have no access to the Internet? For two years, Americans have pushed to defend the status quo, even inventing 'digital' human rights. Specialists of Stalinist propaganda have a nice topic to look after here. A more pragmatic and responsible approach is seen right by the southern border of the USA. Mexican President Peña Nieto is among those advocating for greater equality, working to enshrine a right to broadband access in his country's constitution. He has turned this into reality on June 10 when he signed the Constitutional Reform regarding Telecommunications and Economic Competition. A revolution in the backyard of the US.*

## What is the "Truth"?

Is the battle for control of the Internet all about democracy and freedom versus authoritarianism? Is it about the inherent right of states to control what goes on inside their borders? Is it part of an economic imperialism that pits the industrialized nations against the developing nations?

While the present battle for Internet control may seem to be influenced by all of these elements, we believe that the real issue has little to do with democracy versus authoritarianism or any kind of economic issues at all. The real issue is that the Internet allows a new form of human organization—multi-stakeholder governance—that does not require governments in order to be properly organized. This is a profound realization because it opens the door to new forms of management and organizational control of the Internet that will alter the role of governments in relationship to the people they govern on a global scale.

Specifically, multi-stakeholder governance changes the role of governance by allowing the governed to play a direct and much larger role in the governance process. Furthermore, it allows people to interact well beyond traditional borders. Over the short-term, these issues will become embroiled in the politics of the day simply because there is no other way for them to be viewed in relationship to practical day-to-day governance decisions. Hence, it's easy to couch debates about Internet governance in terms like democracy versus authoritarianism or economic imperialism.

From a longer-term perspective, however, we are watching the early stages of a new form of multi-stakeholder governance that will one day change the very concept of how human affairs should be governed. This change will take place through an evolution of our present governance systems, which we see reflected in the "Showdown at Dubai" and related efforts of many existing governments to exert more direct control over Internet governance.

Bertrand de La Chapelle, who served on the Board of Directors of the Internet Corporation for Assigned Names and Numbers (ICANN) from 2010-2013, and who is presently the director of the Internet & Jurisdiction project, said the multi-stakeholder model of Internet governance was "as radical a notion and as big a mental leap as when people said we will establish representative democracy or the notion of universal suffrage."

## The Internet's Dual Nature

While the Internet has clearly been a force for empowering individuals globally, as we have seen from the PRISM program, it also has given governments the ability to monitor those communications in an unprecedented manner. While one part of the US government may be pushing for Internet openness and freedom, for example, another part has "tapped" the Internet for what it deems security purposes. Basically, it has assembled a vast database of Internet usage so that it can identify users who may be part of a terrorist plot against US interests.

> *…the real issue has little to do with democracy versus authoritarianism or any kind of economic issues at all. The real issue is that the Internet allows a new form of human organization—multi-stakeholder governance—that does not require governments in order to be properly organized.*

This shows the Internet's dual nature. While the Internet puts unprecedented power into the hands of its users to find information and to collaborate on a global scale, it also puts unprecedented power into the hands of governments to monitor what those citizens are doing on the Internet. As we've seen, this duality illustrates the age-old conflict between privacy and security that is both national and international in scope. Finding the proper balance is something that has to be defined within every individual country as well as globally.

## The Internet's Governance Challenge

The Internet has demonstrated the power of the multi-stakeholder governance model by growing from a tiny number of users into the world's most powerful communications network largely without being controlled by governments. Nevertheless, it is now at a clear crossroads as governments worldwide struggle with how to strike a balance between their perceived mandate to control what happens within their own borders and the Internet's inherently borderless nature. From a longer-term perspective, these governments are merely adjusting to a new reality in which the "governed" are destined to play a more direct role in the governance process because of the nature of the Internet itself.

This poses a challenge for the Internet governance ecosystem the Internet evolves from its present size into a network that reaches into every nook and cranny of the globe. Some of the questions to be discussed in this report on Internet governance:

- What are the attributes of multi-stakeholder governance?
- What is the legitimacy of the Internet's multi-stakeholder governance network?
- What does the Internet add to the viability of multi-stakeholder governance?
- How does the Internet change the relationship between the players who are participating in a multi-stakeholder governance model?
- Where has the multi-stakeholder model been the most and least successful?
- How should governments interact with a network that is being controlled by its many stakeholders, not just by governments alone?
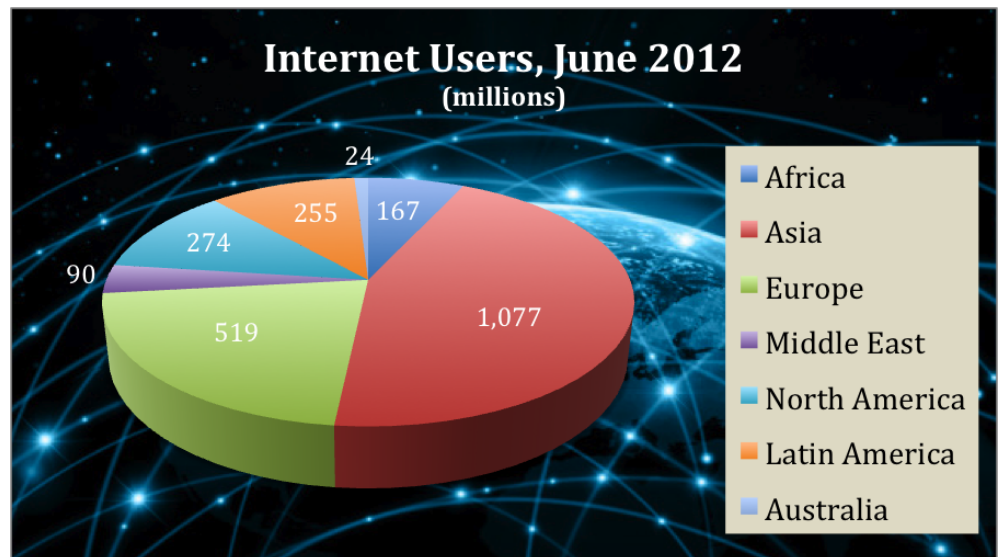
# The Internet's Multi-stakeholder Ecosystem

There are now several billion people worldwide who connect to the Internet in a growing variety of ways, including fixed desktop computers, mobile laptop computers, tablets and mobile smartphones. According to statistics gathered by NetNames.com, there were 233 million domain names registered worldwide at the end of September 2012. More than 100 million of these domains are registered as .com, while about 95 million domains are registered in more than 290 countries with two letter country codes.[11]

As of June 2012, InternetWorldStats.com estimated that there were 2.4 billion Internet users, which are broken down by region in the following table.[12]



**Internet Users, June 2012**
(millions)

24 — Africa (dark blue)
167 — Africa
255 — Latin America
274 — North America
90 — Middle East
519 — Europe
1,077 — Asia

- Africa
- Asia
- Europe
- Middle East
- North America
- Latin America
- Australia

## How Is the Internet Governed?

The Internet is tens of thousands of interconnected networks connecting about 2.5 billion people worldwide. So who runs it? Who governs this amazing network that, quite literally, is now central to mankind's destiny?

As hard as it is to believe, the Internet is "run" by its vast number of stakeholders who all participate in some way in how the Internet operates. Basically, it is managed in an open, distributed and collaborative manner that cannot be measured by traditional command and control management techniques. One must also separate developing the Internet's protocols and naming and addressing policies from implementing them. A relatively small

number of stakeholders is involved in developing the protocols and naming and addressing policies, while hundreds of thousands of stakeholders are involved in providing backbone services, connecting to the backbone as Internet service providers and serving as hosting companies that also offer domain name registration services. Finally, there are potentially millions of stakeholders who have websites or offer services associated with other Internet applications, although it is fair to say that only a tiny percentage of these have become prominent on a global or even regional scale.

According to Internet pioneer Vint Cerf,

> *"There are tens of thousands, hundreds of thousands of operators of pieces of the Internet—and I hope you have that well-fixed in your heads. This is not a few. There are hundreds of thousands. They're all independently operated. They make independent decisions about hardware and software. They decide who they connect to. Nobody…dictates the terms and conditions of interconnection. Every single one of them recognizes that it is total and full interconnection or full connectivity that makes the Internet what it is. And they all understand that and that's why they work to make sure everything stays connected."*

Readers should also keep in mind that the stakeholders who operate the Internet's backbone network, act as Internet service providers, provide website hosting and operate websites on the Internet have formed numerous nationwide, regional and global trade associations that work to develop policies that impact their own separate spheres of operation.

To cite just a few examples, there are the United States Internet Service Provider Association, the Wireless Internet Service Provider Association, the Federation of Internet Solution Providers of the Americas, the Internet Service Providers Association (United Kingdom), the Internet Service Providers Association of Pakistan, the Internet Infrastructure Coalition, the Association of Internet and Hosting Service Providers. It goes on and on worldwide and numbers in the hundreds, if not thousands.

Discussing the organizations and individuals involved in developing the Internet's standards, protocols and naming and addressing policies is itself a complex topic. There are from 120 to 150 working groups in the Internet Engineering Task Force (IETF) alone that use an innovative consensus process to determine the Internet's protocol standards. In addition to the IETF, there are several other major organizations, such as IEEE, and numerous smaller specialized organizations involved in developing Internet standards. In addition, a separate organization, the Internet Corporation for Assigned Names and Numbers (ICANN), has as its charter management of the complex process of developing policies associated with operating the Domain Name System (DNS) as well as coordinating the implementation of the so-called Critical Internet Resources (domain names, IP addresses and protocol parameters through the IANA function). Lastly, but importantly,

there are community-based Regional Internet Registries (RIRs) responsible for the IP address policies at the end-user level.

Finally, the Internet's technical and operational standards are just one part of the governance ecosystem. As the Internet has grown, so too have numerous issues associated with its usage, such as spam, cyberbullying, privacy, credit card fraud, identity theft, intellectual property rights and several other major issues. These issues pose a major challenge to the governance network because they don't have simple solutions and are related to legislating human behavior, which cuts across legal jurisdictions globally. Solving many of these issues will require technical, legislative and educational components, which is why they are so complex.

No government or group of governments controls the Internet or its standards, although several US government agencies once funded it. In the 1990s, however, they willingly and wisely shifted responsibility to its present-day multi-stakeholder governance network. The UN doesn't control it either, although many think it should. No corporation or group of corporations owns it, although there is now a growing number of Internet companies that have become rich and powerful and play a large role in its development and, ultimately, its governance. Everybody gets to participate in some manner in coordinating how the Internet runs, including governments, non-governmental organizations (NGOs), corporations, trade associations and any individuals who want to put in their own two cents.

But how did the multi-stakeholder model develop? The Internet, after all, was initially funded, and presumably controlled, by US government agencies. Why wouldn't they have kept that control? Isn't that what governments typically do? Vint Cerf provides the answer. He says,

> "It was never about control. It was about building something that could grow to a much larger scale… The funding was used to create an environment of collaboration and sharing— starting with the ARPANET and continuing with the Internet. This was always about facilitation, not about control… The program managers at DARPA [Defense Advanced Research Projects Agency] and NSF [National Science Foundation] were particularly focused on this process of fashioning a bottom-up, facilitative environment. The program managers, starting with Bob [Kahn] and me and going on to Stephen Wolff [at NSF], among others, guided the development community towards collaborative processes. As the Net and its institutions grew, the government agencies were able to shift responsibility to these multi-stakeholder, bottom-up processes. I think the story is more about the choice of the government program managers to facilitate this process rather than one of ceding control."

It is a remarkable and humbling perspective, especially in a world where a hierarchical command and control management structure has been at the heart of most organizations. Essentially, understanding the Internet's entire

> *It was never about control. It was about building something that could grow to a much larger scale...*

history requires a paradigm shift in how we think about typical models of control. This section explores the organizations that are at the heart of the Internet's protocol and naming and addressing policy development, and how they coordinate the Internet's multi-stakeholder model. It is important to keep in mind, however, that these organizations do not "govern" the Internet. It is a true commons controlled by all of its stakeholders. It's also important to keep in mind that there are literally hundreds of thousands of organizations involved in implementing the Internet worldwide.

## The Key Players

The key organizations charged with coordinating critical administrative or operating functions for the Internet do their work through hundreds and hundreds of separate committees and working groups, and also coordinate with numerous national and regional organizations with stakes in the Internet's governance.

The Internet Society (ISOC), the Internet Engineering Task Force (IETF), the Internet Corporation for Assigned Names and Numbers (ICANN), the Internet Assigned Numbers Authority (IANA), and the Regional Internet Registries (RIRs) are some of the most critical organizations at the heart of coordinating the Internet's standards and naming and addressing policies. ISOC was formed in 1992 as an international non-profit organization by several of the Internet's founders. It is the organizational home of the IETF and related bodies, plays a leading role in the many policy issues associated with the Internet and has a long history of ground breaking development programs focused on bringing the Internet and its benefits to everyone in the world.

The IETF and its associated bodies—the Internet Architecture Board (IAB) and Internet Research Task Force (IRTF)—have the mission to help the Internet work better. The first "IETF document" was published 44 years ago in 1969. The IETF is discussed later in this section and in the Appendix.

ICANN was formed in 1999 to coordinate the implementation of core Internet resources: domain names, IP addresses and protocol parameters worldwide. It is unique because it not only develops policy, but also establishes contracts associated with those policies. In contrast, ISOC provides education about the Internet and provides a forum to discuss key Internet-related issues, while the IETF establishes standards to be implemented. ICANN is also discussed later in this section. The Regional Internet Registries and the Number Resource Organization (NRO) are also discussed later in this section and in the Appendix.

## The Unique Role of the Internet Society

The Internet Society (ISOC) was formed as a charitable organization and was to be operated for international educational, charitable and scientific purposes, according to its 1992 founding document, *Announcing ISOC*.[13]

Its main initial function was to serve as the organizational home of the Internet Engineering Task Force. Basically, the National Science Foundation, which had funded the IETF in the 1980s, was winding down its support of the Internet as it became a commercial entity, so instead of setting up another government agency or transferring it to another agency, it shifted responsibility of the IETF to the Internet's original developers, who set up ISOC so that the multi-stakeholder network would continue to operate unimpeded.[14] It's an almost unheard of decision for a government agency to shift responsibility of a resource like the Internet to a non-profit, but still private, corporation.

It's even more remarkable that the Internet's key standards body, the IETF, wasn't even incorporated, especially since it consists of hundreds of working groups. As Vint Cerf says, ISOC was "intended to be the institutional home for standards-making because we believed that we were getting to the point where standards were becoming very important commercially and that there needed to be a legal entity that would house the IETF, which is still an unincorporated element."

Today, the IETF and its associated bodies are an "organized activity of the Internet Society" yet operate under their own management, governance structures and processes. Since its founding in 1992, ISOC has been the leading proponent of an open, global Internet developed and managed through open, collaborative processes—multi-stakeholder in nature. The Internet Society's mission is "to promote the open development, evolution and use of the Internet for the benefit of all people throughout the world."[15]

From its origins as a modest organization (Vint Cerf said at its founding he was "running around with a tin cup trying to get some funding to put ISOC on financially solid ground and also to help pay for the cost of the secretariat"), the Internet Society in 2012 had revenues of $35.1 million and assets of $17.2 million. A significant portion of its funds comes from a supporting entity called Public Interest Registry (PIR) that operates the .org top-level domain. Its surplus comes to ISOC to fund ISOC's charitable mission.

## Overall Internet Ecosystem

The Internet Society is one of the organizations at the heart of the Internet's growing multi-stakeholder ecosystem.[16] This is a true ecosystem, all parts evolving together in response to various stimuli. The following diagram is a model of the Internet Ecosystem published by the Internet Society that breaks the Internet down into six constituent areas:

- Open Standard Development

- Naming and Addressing

- Shared Global Services and Operations

- Local, National, Regional and Global Policy Development

- Education and Capacity Building

- Users

Within each area, the ecosystem has numerous branches that represent the stakeholders in each area. A summary of the ecosystem is provided in the Appendix.
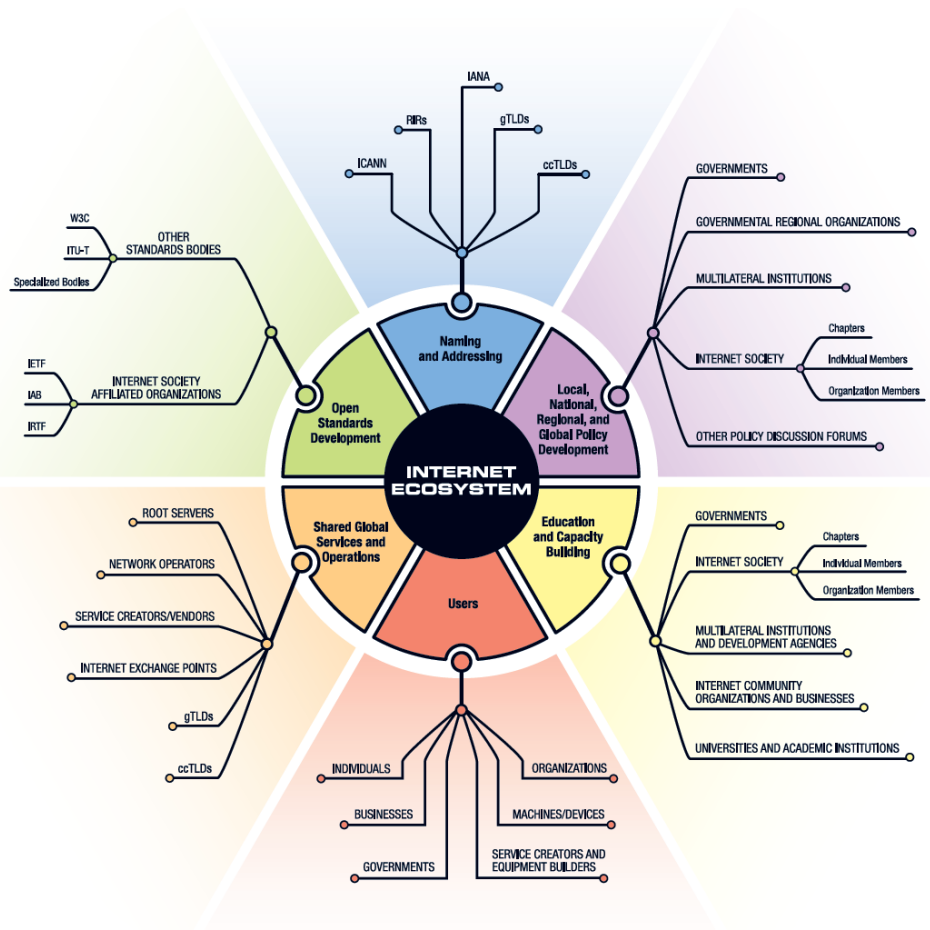
# How Does Network Global Governance Work?

The development and operation of the Internet are accomplished through an open, self-organizing, distributed, collaborative and transparent multi-stakeholder ecosystem. As we've seen, the ecosystem and its underlying governance model have made it possible for the Internet to scale beyond anyone's imagination. It has given us applications that have transformed virtually every part of our world. While there will always be difficult or thorny issues to resolve, the Internet governance model has thus far provided a robust avenue for addressing them.

So is the multi-stakeholder model a viable model for governance of the Internet or has it taken us as far as it can?

## Two Opposing Views

Setting aside the issue of whether or not states should govern the Internet, the "Showdown at Dubai" also reflects two opposing views of how to achieve efficacy—how to have the most effective governance model. In one view, one might say that the multi-stakeholder model is part of the Internet's fabric and, as an innovation-enabling platform, it is natural and intuitive for it to be governed in the same kind of open, collaborative way.

From another perspective, however, one would say that the Internet is just a communications medium that should be subject to more traditional models. As it grows and becomes more complex, it would be important to implement traditional organizational structures, hierarchies, systems and decision-making.

Which view is correct?

To analyze the multi-stakeholder model let's consider two aspects:

- *Modus Operandi*—What operating principles make it tick?
- How does it achieve legitimacy?

## *Modus Operandi*—What Makes it Tick?

The operating principles in traditional organizations are a well-understood element of management science. Traditional organizations (such as corporations, governments and global institutions) are organized hierarchically, where power and ultimate decision-making reside at the top.

In fact, structures of superiors and subordinates have been the primary source of wealth creation throughout history. At the top is the supreme governor, at the bottom the permanently governed and in the middle those who act alternatively as governors or governed.

Whether the ancient slave empires of Greece and Rome or the feudal kingdoms that later covered the planet or the capitalist corporation—hierarchies have been with us throughout human history. The management theories today that advocate empowerment, teams and enlightened management techniques even take as a basic premise the command *modus operandi* inherent in the traditional organization.

Because the Internet reduces transaction and collaboration costs, new structures of peer collaboration are emerging—both inside organizations, between organizations and outside the boundaries of traditional structures. Dismissed early-on as merely on-line communities and chat rooms, The Internet is now populated with individuals and entities that are producing goods and services of tangible value. In the mid-1990s thousands of volunteer programmers collaborating over the Internet produced a free computer operating system called Linux. In less than 20 years, Linux moved from a programming experiment to become the dominant operating system in the world. Linux, furthermore, is part of what is known as the LAMP open source web application software stack, including the Apache HTTP web server software, the MySQL relational database, and the perl/PHP/Python scripting languages that are used to link MySQL applications into HTML-based web applications.[17]

As Don Tapscott and Anthony D. Williams described in their 2006 book, *Wikinomics*:

> *Participants in peer production communities have many different motivations for jumping in, from fun and altruism to achieving something that is of direct value to them. Though egalitarianism is the general rule, most peer networks have an underlying structure, where some people have more authority and influence than others. But the basic rules of operation are about as different from a corporate command-and-control hierarchy as it was from the feudal craft shop of the pre-industrial economy.*

They argued that:

> *Peering succeeds because it leverages self-organization—a style of production that works more effectively than hierarchical management for certain tasks. Its greatest impact is in the production of information goods, and its initial effects are most visible in the production of software, media, entertainment and culture.[18]*

Today, companies of all types are turning to self-organization and peer collaboration models in order to reduce costs, speed time to market, neutralize competitors, capture customers and engage loyalty.

All state-based global institutions operate using five *modus operandi* for making decisions.

- They are relatively "closed." They are membership organizations in which one must be "inside" to participate and only members have decision-making authority. Most information is tightly controlled.

- Their internal operating structure is hierarchical.

- Power and influence are based on status in the hierarchy.

- They are limited democracies in which states have a vote. As such, they are peer communities, albeit in a limited sense.

- As in networks, participants in traditional institutions typically have a strong sense of social purpose and cause. They are paid employees operating in a hierarchy.

The Internet governance network is organized according to a set of implicit (and sometimes explicit) principles that are very different. As computer scientist David Clark said in 1992, the ecosystem governing the Internet was neither hierarchical not democratic. "We reject: kings, presidents and voting. We believe in: rough consensus and running code," he said.

While each of the organizations in the Internet governance network conducts its affairs under varying operating principles, there is great consistency. There are five principles that are common:

## 1. Boundaries and Process: Open versus Closed

The boundaries of the organizations that comprise the ecosystem are porous, with the extreme case being the IETF that has no "membership" *per se*. To reiterate the comment from Vint Cerf, "Just to give you one other little example. There is no way to join the IETF. There's no membership. You just show up. That's it."

The IETF process is open and any interested person can participate in the work, know what is being decided, and make his or her voice heard on the issue. The IETF also has a high degree of transparency, making all its documents, working group mailing lists, attendance lists, and meeting minutes publicly available on the Internet.

ICANN is also open to anyone who wishes to participate by joining its supporting organizations or advisory committees. In addition, its five Regional Internet Registries (RIRs), which dispense the IP addresses that are critical to the Internet's operation, are distributed worldwide. Finally, ICANN

is opening up domain names on a global scale so that it will be possible to not only register names in numerous languages, but to create one's own global domain extensions (gTLDs).

Former ICANN Board member Bertrand de La Chapelle says that ICANN is unique because in the Internet space, it is the only organization that is able to develop policy in a completely open manner with the participation of all the different stakeholders, and not only to develop policy, but also to establish contracts and enforce those contracts.

"Any governance mechanism deals with five layers," he says. "One is the agenda setting and issue framing, the next one is the drafting and development of recommendations, proposals or regimes, the third one is the actual validation and endorsement of those regimes, and then you get into implementation, and then the fifth one is enforcement."

He adds that ICANN has the characteristic of covering all the five dimensions. The IGF, in contrast, covers only the first one. The standards bodies, he says, do the first one and the second one, but the third one, validation, is just voluntary adoption by a certain number of other stakeholders. "It is a remarkable achievement that in 15 years of existence ICANN has established an organization that is non-governmental but that has the whole five dimensions of governance, and just that is an achievement," he says.

At the Internet Governance Forum (IGF), anyone can attend the meetings and speak and most of the organizations are open in this way. In the network there is no formal "representation" *per se* either. Participants need to be transparent about which organizations they work for, but they are not necessarily representing their employers in the forum. In this sense the Internet Governance ecosystem is, like many GSN's, "networks of the able and committed."

Openness—in the sense of transparency—is critical for success too. There is an expectation that parties will act with integrity and transparency. The expression "what are they hiding" shows the relationship between trust and transparency. Because the Internet's many planning processes are open, discussions, decisions and standards are scrutinized carefully. Research has shown that in transparent environments there are lower transaction costs, a faster metabolism of innovation, fewer errors and better value that comes to the fore. The ecosystem is naked and as such it needs to be buff.

## 2. Structure: Network versus Hierarchy

Human hierarchies are power structures that define rank, importance, status and accountability and, as such, have worked well as a way of directing the manner in which most organizations have operated over the centuries. But an increasingly complex and interdependent global economic environment is now exposing hierarchical institutions as being deeply limited and perhaps even posing a liability as we enter an era in which the upper bounds of human ingenuity will be tested.

> *The new [multi-stakeholder] model is tangled…but in a nice way…The new model has a greater variety of connections that are not just vertical but all over the place…*

The problem is that traditional command and control hierarchies divide the world into governors and the governed. The middle managers in-between acted, as business thinker Peter Drucker put it, as "relays—human boosters for the faint, unfocused signals that pass for information in the traditional, pre-information organization."[19] This was a hierarchy and the job was to move up, and fulfill the goals determined by the boss—or his boss, or his boss. Information was the source of power, and it was hoarded. Communications were vertical and restricted largely to organizational "silos."

Tim Berners-Lee explains how the ecosystem that governs the Internet is very different from the organization silos of the traditional enterprise. He describes it as a "multi-dimensional, interconnected system that allows a shorter path from problem to solution than a hierarchical model." Hierarchies require vertical paths that cause friction and are slow. In contrast, on the Internet, he says, it was possible to establish liaisons where they're needed. "When you need somebody to connect to somebody who's got, for example, a technical solution to a social problem," he said, "it's going to be fewer clicks to get there than a hierarchy. The diameter of the system is smaller as are the degrees of separation."

That's not to say that it's without structure, but the structure is a networked one that is fluid. Tim Berners-Lee says that the W3 Consortium (W3C), is a structure that has arisen to follow trends and solve problems. For example, he says, "People will self-organize to create a new working group to liaise between two other working groups or maybe create a common task force. Then it may begin to call itself a working group or it may be big enough to call itself an organization. All this continuous morphing allows one to relax tensions in a collaboration too. It gives a system that is more resilient, and more adaptable."

He uses a word that won't be found in management literature to describe this network—"tangled." "The new [multi-stakeholder] model is tangled" he says, "but in a nice way…The new model has a greater variety of connections that are not just vertical but all over the place…In a hierarchical model, you've only got one route between any two people…You go up the tree until you get to a common ancestor and then you come down the tree. In a multi-stakeholder model, however, there are many paths from one place to another. And the shortest path will be faster. This leads to better decisions…"

Overall, the experience suggests that new forms of collaborative networking now rival the hierarchical organization in its capacity to create standards, policies, services and even to solve the critical challenges facing the world. It shows that the collective knowledge, capability and resources embodied within broad horizontal networks of participants can accomplish much more than one organization can acting alone.

The network also has a great capacity to adapt to changing conditions or developments in technology or the global economy. The rapidity with which the ecosystem morphs and changes is astonishing. The tonic of global market forces is brought to bear real time on the network as shown in the case of the W3C's need to accelerate innovation about HTML5 or face loss of legitimacy.

### 3. Power and Influence: Based on Merit Not Status

Much has been written about the operations of the United Nations where, for example, employees are admonished regularly to follow the "chain of command."[20] It's understandable—states control the UN and are accountable to them, so hierarchical structures seem an effective way of ensuring that commitments are met and resources are mobilized to achieve goals.

In hierarchies, status, more than anything else, determines influence and power. But in the Internet ecosystem, the main driver of influence is merit. Vint Cerf describes the Internet ecosystem: "This is a meritocracy. It doesn't have anything to do with land grabs or anything else or declaration…If people like what you say, then your ideas get some purchase. If they don't, they won't…If your stuff works, you get legitimacy. If it doesn't you don't."

Overall, the marketplace of ideas and know-how drives the technical evolution of the Internet because decisions are based on merit. Among other things, a meritocracy minimizes the problem of political considerations being brought to bear on important decisions.

### 4. Decision Making: The Consensus Model

Instead of using some formal structure of reaching decisions (such as recorded votes), decisions are typically made by consensus.

A 1995 article by Paula Borsook in *Wired* elaborated on David Clark's famous 1992 aphorism about rough consensus: "In the IETF, we don't allow caucusing, lobbying and charismatic leaders to chart our path, but when something out on the Net really seems to work and makes sense to most of us, that's the path we'll adopt."[21]

When asked if the famous expression of David Clark from 1992 applies to the W3C, Tim Berners-Lee replied, "It depends." In fact in the W3C they strive for unanimity—but with a twist. "Unanimity can be very powerful but people are encouraged to document their exceptions through minority reports."

From our evaluating of the decision-making processes in these organizations, consensus appears to work better than voting because it mitigates the typical lobbying that occurs when many votes are taken. Points of view are less static and more fluid, as participants are free to change their minds based on the merits of the arguments at hand. Consensus appears to facilitate more robust discussions and more robust solutions than a traditional hierarchical model as participants are compelled to probe issues deeply and constantly be evaluating their own and the group's positions.

Consensus is viewed as an acceptable way of moving forward and has other advantages in this situation. The formality of traditional voting processes can slow down decision-making and action. There is also a need for synergy—combining of diverse opinions to reach a superior outcome, rather than polarizing people into voting camps. Consensus also encourages compromise on the part of individuals in the interest of the group as a whole.

## 5. Basis for Action: Voluntary Self Organization
## versus Orchestration and Coercion

In traditional governance models, nations participate to defend their national interests, but also in recognition that they have common interests with others. The individual participants who are employees have various motivations to be involved, ranging from belief in a cause to wanting to keep a good job or career.

The participants in the leadership of the Internet governance network are often volunteers. These organizations have relatively tiny staffs, compared to the monumental tasks at hand. And the groups, companies and others that participate self-organize to do so.

Self-organization has been around throughout human history. Language was a function of self-organization as was government, initially. But what used to take centuries can happen rapidly today. Ironically, the Internet is enabling people everywhere to self-organize in every nook and cranny of the global economy and society. Everywhere people are coming together to create businesses, solve problems, build communities and have fun. Of course there is a dark side where groups are self-organizing in new ways ranging from crime to terrorism.

GSN's are networks of the willing and committed and are typically self-organizing. The Internet governance network is no exception and the result has certainly worked judging by the Internet's growth. When people have the ability to publish, collaborate, create and access information that the Internet provides, and companies have opportunities to build new technologies and services, one can expect that some of them will want to be involved in how the platform they are using is governed.

Everyone who participates in the massive ecosystem (including the operators who run the Internet itself), do so on a voluntary basis, in part to defend their self-interest and in part realizing that they all have a common interest.

As explained earlier, traditional organizations are "controlled" from the top down, and they're "run" by a leader. Instead of thinking about who is in control, Internet ecosystem participants think about what they can contribute, what is the best course forward and then work within the multi-stakeholder process to develop solutions. This is important, as virtually all outputs in the Internet governance model are voluntary. They are not legislated or directed. Even the standards are voluntary.

In short, the Internet was built from the ground up with a multi-stakeholder model that is based on these five principles of openness, networking, merit, consensus and voluntary self-organization. It is a different way to think about development, management and governance. Nobody controls the Internet. No one group "runs" it. We all have a say in its future development and management—that is, in its governance.

# How Does it Achieve Legitimacy?

Critics can say what they like about the ITU, but it has a strong case that it is a legitimate organization and a legitimate candidate to govern the Internet.

There is a democratic process of elections in countries around the world and these countries select delegates to participate in the UN and its organizations and agencies. By contrast, no one elected the Internet governance ecosystem; it is entirely self-selected. Nobody was chosen or appointed to develop, manage or govern the Internet, and the governance ecosystem doesn't really answer to any sanctioned government agency.

In Don Tapscott's overview paper for the Global Solution Networks program, *Global Solution Networks: Understanding the New Multi-Stakeholder Models for Global Cooperation, Problem Solving and Governance*, he defines several criteria that stakeholders and observers may use to determine whether a global solution network is legitimate:

- Is there a clear definition of the mission?
- Is there a coordinating structure to ensure the network operates within the mission?
- Does it operate with openness, collaboration and transparency?
- Does it have a clear process for rule-making and decision-making?
- Does it meet contemporary moral and ethical standards?
- Does it have the "right" stakeholders to achieve legitimacy?
- Is it effective?

How well does the Internet governance ecosystem meet these criteria?

## Clear Definition of the Mission

While there are numerous organizations involved in the Internet's governance, they all have a remarkably consistent definition of their mission, which is perhaps best encapsulated in the ISOC's: To promote the open development, evolution and use of the Internet for the benefit of all people throughout the world.

## Coordinating Structure

The Internet has an elaborate coordinating structure. There are many players that all work together respecting the roles and missions of the other players. As an ecosystem, it shares the characteristic that players and roles evolve as the environment changes. The ecosystem adapts, and collaboration is key

to holding it all together. This immensely successful coordination is aided substantially by openness and transparency. Coordination is not so much a process as a slow and steadily building relationship.

## Openness, Collaboration and Transparency

The Internet governance network is, quite literally, open to anyone who wants to participate. Again, the IETF, which defines the bulk of the standards used throughout the Internet, does not have memberships. If someone wants to participate, they can just sign up on mailing lists or show up at meetings. Basically, the governance network was built on these attributes dating back to the Internet's founding in 1973. As Vint Cerf remembers, "It is individuals, representing what we believed to be the best interest of DARPA and the DOD [Department of Defense], who concluded that releasing the design of the Internet to the global public, without limitation, was necessary if this non-proprietary design was to have a chance of becoming an international standard. Moreover, we instituted practices that had served the ARPANET project well: openness, collaboration and cooperative work among a wide range of contributors."

## Clear Process for Rule and Decision Making

While there are hundreds of working groups associated with the Internet's standards processes and tens, even hundreds of thousands of organizations whose cooperation is required for the Internet to work, and equally thousands of policy forums, organizations, think tanks, etc., there is a clear process for advancing the work or policies based upon the concepts of collaboration and consensus.

Consensus, furthermore, does not mean total agreement. Instead, it means going through an iterative process of identifying all reasonable potential objections and adapting the decision to account for each of them.

## Meets Contemporary Moral and Ethical Standards

The governance network's policy of openness to all, satisfies the expectations of this qualification. Most participants receive no direct compensation from the network. The few staff personnel who are paid receive modest compensation—which is public information.

## The "Right" Stakeholders

Because of the Internet's openness, collaboration and consensus-oriented decision-making, it has had strong participation from technical organizations on a worldwide scale for the development of its standards and protocols, and for collaborating on its naming and addressing policies.

## Effectiveness

How can we measure whether the governance ecosystem is effective? Since it's a governance network, the best way is to measure how the Internet has

grown, and how stable it is. Growth has been explosive, both in numbers of users on the Internet and in an unparalleled richness of applications. Twenty years ago, there were probably fewer than 500,000 users and they were primarily in academic environments. Today, there are 2.5 billion users worldwide from every walk of life. As Vint Cerf put it, "It works…and they [the governance ecosystem operators] have done it for 20-plus years—30 years—and they've done it well."

## Is the Internet Governance Ecosystem Legitimate?

The Internet governance ecosystem meets every one of the above criteria. Still, there is something of a subjective quality associated with legitimacy. As Barbara Ridpath wrote in a paper for the Global Solution Networks project, "Legitimacy, like beauty, appears to be to a large extent in the eye of the beholder." As such, there is really no definitive way to "prove" whether the ecosystem is legitimate. Nevertheless, three of the above criteria stand out when evaluating whether the ecosystem is legitimate: rule-making, conferred legitimacy and effectiveness.

Bertrand de La Chapelle considers that "this is the core and the foundation of the legitimacy of the multi-stakeholder process, and it is very revolutionary. It is very audacious. Internet governance has worked from the onset with this notion that if you are a stakeholder, if you have a stake in an issue, you can participate, and this is a very, very far-reaching notion. To be frank, it breaks the current foundation of the international system, or at least it challenges the current foundation of the international system, which is based upon representation by governments."

Tim Berners-Lee agrees that efficacy is key to legitimacy, arguing that one reason the multi-stakeholder model currently governing the Internet is viewed as legitimate by its stakeholders is because the model enables extraordinary expertise to be brought to bear on problems, making it more effective. Stakeholders recognize that and grant it the status of being legitimate.

He tells an extraordinary story about how the W3C lost legitimacy in one area for a while. "W3C lost its legitimacy because it didn't move fast enough to HTML5 and stakeholders, in particular the browser manufacturers, thought it had become too stuffy." So the browser manufacturers started a competing consortium, perhaps as a cry for help and to emphasize their complaints that the current system wasn't working.

The W3C was able to get its legitimacy back by stepping up and being effective, convincing them that they had a better process to build the standards required for HTML5. Berners-Lee conceded that his personal reputation as inventor of the Web was probably important in winning back the legitimacy of his W3C, showing how legitimacy can be conferred from one party (Berners-Lee) to another (W3C).

*"While it is certainly understandable that many governments want to take more control over the Internet, it is equally understandable that this is not just infeasible, but also unwise."*

# Which View Is Correct?

Is multi-stakeholder governance an integral part of the Internet or should we be supporting more traditional governance models? Looking at the model's underlying structure, with its more effective decision-making, its historical connection to empowering users and its new model of management thinking, the answer is pretty clear.

The multi-stakeholder governance model works well and the evidence suggests it is just as much a part of the Internet as its technical foundations or its fundamental architectural principles. It not only has withstood the test of time, the demands of the operators, the explosive activity of users and the rapid evolution of technology, but it also likely represents what might be viewed as a new style of management by collaboration and consensus that could replace today's command and control style of management. If fact, it is hard to imagine how a traditional top-down approach would work in its stead, especially one in which governments have the ultimate control over the Internet. In today's ecosystem, governments participate along with its many other stakeholders, such as individuals, NGOs and the multitude of corporations that generate incomes from the Internet.

While it is certainly understandable that many governments want to take more control over the Internet, it is equally understandable that this is not just infeasible, but also unwise. First, the multi-stakeholder network would put up massive resistance to such an attempt. Second, the Western countries that fostered the multi-stakeholder approach have shown they will not go along with such an attempt. Third, the collective power and impact of the Internet have become so strong, that it's doubtful that governments can keep a lid either on the information flowing on the Net or the attitudes that develop because of it.

More than all the above factors, however, the Internet's nature of empowering its users is the single most important feature because it makes it possible for individual stakeholders to play an increased role in the governance process. Basically, the Internet alters the relationship between people and their governments. In the long run, there's about the same chance for today's governments to control the Internet's impact as there is for them to control hurricanes, tornadoes, earthquakes or tsunamis. The Internet will change governance and governments far more than vice versa.

This isn't to say that multi-stakeholder governance is perfect. There have been, and will continue to be, growing pains as the Internet continues to evolve and its stakeholders continue to change, particularly as the 5 billion people in the world who do not currently have access come online. Processes and solutions will all have to adapt to fully incorporate them, their needs and their ideas. However, multi-stakeholder governance is not an illusion. Multi-stakeholder networks must make sure that their decision-making processes remain as open and as fair as possible, and that the governance process evolves to meet the needs of the users; otherwise, the network's legitimacy will be compromised.

# Approaching the Multi-Stakeholder Ecosystem

One of the strange negatives about the Internet governance ecosystem is that it's a confusing process to many organizations and governments who want to participate. Many developing-country governments, for example, want to make sure that their concerns are properly adressed in the governance process, which is why many supported the movement to have Internet governance controlled within the ITU. The ITU's processes and procedures are familiar, while the Internet ecosystem's complex distributed processes can seem intimidating.

## Incorporating Third World Views

How do these third world organizations and governments approach the ecosystem to participate? Better yet, what can the ecosystem do to make sure that it is easy to participate?

One thing that it might do is to set up a group that would solicit governments that signed the ITU Final Acts to participate in the ecosystem. The group might try to identify key issues that these countries have and introduce them to the key working groups where these issues might have relevance or even foster the development of new working groups. The bottom line here is that neither the Internet ecosystem nor the countries that supported ITU control of the Internet are going away. It would be of great benefit for all Internet users if the ecosystem worked to understand user concerns and made sure those concerns were being addressed within the system's working groups.

As part of this process, the ecosystem needs to be very sensitive to socio-economic and political issues. Many developing countries feel that they are not part of the Internet governance process or even fear that the US refuses to give up control of the Internet as a form of economic and political control. The ecosystem must consider the concerns of these countries in its process. Since the process is open, it can only help everyone engaged in governing the Internet.

This, incidentally, is separate from outright control. If a country really just wants to control the Internet to make sure that it can monitor and censor what its citizens can see and do, then it really doesn't need to participate in the governance ecosystem. All it needs to do is to insert its control filters at points where traffic is carried across its borders and then monitor traffic and prevent access to specific domains and IP addresses. There is little doubt that a growing number of countries are already doing this to various degrees, including as we have seen, the US, whose National Security Agency (NSA) has enraged numerous allies when it was revealed that it has engaged in widespread monitoring of Internet traffic.

Brazilian president Dilma Rouseff recently gave a powerful speech at the UN General Assembly at which she first strongly denounced the NSA spying and then announced a multi-stakeholder global summit on Internet governance that will take place in April 2014 in Brazil.[22] Fadi Chehade, the president of

> *What started from a seed of collaboration and consensus undertaken by the Internet's founders has grown into a global network that is under continual scrutiny by governments and multi-stakeholder participants. At stake is the definition of how the multi-stakeholder network should evolve.*

ICANN, said about Rouseff that, "She spoke for all of us on that day. She expressed the world's interest to actually find out how we are going to all live together in this new digital age. The trust in the global Internet has been punctured and now it's time to restore this trust through leadership and institutions that can make that happen."[23]

### The Third World Is Not Alone

The third world governments are not alone in their concern about the NSA. The European Union is also searching to define its role in Internet governance. In September 2013, Neelie KROES, the vice president of the European Commission put out a call for submissions on "how the Internet should be governed and the role which Europe should play."[24]

The multi-stakeholder network itself is also far from static, especially when it comes to discussing Internet governance. For example, for several years, ICANN had a Strategy Panel on the Role of ICANN in the Future of Internet Governance that consisted of various leaders within the Internet's multi-stakeholder network who would meet to discuss ICANN's role in Internet governance. This group recently morphed into The Panel on Global Internet Cooperation and Governance Mechanisms and is holding a series of meetings worldwide on how the Internet's multi-stakeholder network model should be improved.[25]

The bottom line is that Internet governance is now a huge global issue, especially in light of the NSA revelations. What started from a seed of collaboration and consensus undertaken by the Internet's founders has grown into a global network that is under continual scrutiny by governments and multi-stakeholder participants. At stake is the definition of how the multi-stakeholder network should evolve.

# Summary

The Internet's multi-stakeholder model of governance wasn't added as the Internet went into operation and became successful. Instead, the Internet was conceived and developed based on an open collaboration model instead of a command and control model. From the beginning, the Internet's developers believed that an open, collaborative and transparent management model based on voluntary adoption—because sharing was its own reward—was *required* in order for it to become a global network.

Today, the Internet's multi-stakeholder governance network has developed enormous momentum because of the success and importance of the Internet. While many governments around the globe are rightfully concerned about Internet governance, especially in light of the recent revelations about the NSA's spying, there is virtually no likelihood that the multi-stakeholder network model of governance itself is being threatened as long as it reacts

> *From the beginning, the Internet's developers believed that an open, collaborative and transparent management model based on voluntary adoption—because sharing was its own reward—was required in order for it to become a global network.*

to the changing environment and continues to listen to its growing number of stakeholders.

To that end, there is a huge challenge ahead in dealing with the policy issues that are facing the Internet. Basically, one can talk about three types of Internet governance: governance of the Internet, governance on the Internet and governance using the Internet. This discussion has focused on governance of the Internet as well as governance on the Internet, which is focused on rules and regulations about how people conduct themselves on the Internet. Finally, there is governance using the Internet, which is the overall topic of the Global Solution Networks project. The Internet governance network, of course, is the first example of using the Internet to govern and it serves as the primary model for such governance.

# Conclusions

This document is part of an ongoing project to understand new models of global governance—one of several dozen projects that comprise the Global Solution Networks program.

The project has two goals:

1. Using the GSN framework, language and tools to conduct a more profound analysis of the ecosystem that governs the Internet than has been done to date. In doing so we seek to be helpful to those myriad players in the ecosystem and to provide knowledge to the broader global community that needs to understand how this network works, and why it is both effective and valid.

2. To develop insights for any groups or individuals who seek to govern another important global resource. The Internet governance network is rich with lessons for business, governments and civil society about how non-institutional models of governance might work for other challenges such as governing access to fresh water, addressing the causes of climate change or solving conflicts.

Along with the many factors analyzed in sister documents of the GSN program, the main lesson is that global Governance Networks are feasible and workable, and that those seeking to forge them should consider the principles, structure and *modus operandi* of the Internet ecosystem and its governance structures. To review:

**Create an Open Ecosystem**
The network is able to find and allocate resources from the vast talent pool of capability in the world. It is also inclusive, providing full opportunities for industry and other non-government players such as users, academia and the technical community, to participate actively in Internet governance decision-making processes. Because the ecosystem is open it is also dynamic with information flowing inside and outside its very porous boundaries.

Openness—in the sense of transparency—is critical for success.

**Build Networks not Hierarchies**
Experience suggests that new forms of collaborative networking now rival the hierarchical organization in their capacity to create policies, services and value to solve the critical challenges facing the world. It also shows that the collective knowledge, capability and resources embodied within broad horizontal networks of participants can accomplish much more than can one organization acting alone.

The network also has a great capacity to adapt to changing conditions or developments in technology or the global economy. The rapidity with which the ecosystem morphs and changes is astonishing. The influence of global market forces is brought to bear real time on the network.

**Power the Network on Merit**
The marketplace of ideas and know-how drives the evolution of the Internet because decisions are evaluated based on merit. Among other things, a meritocracy neatly avoids the problem of political considerations being brought to bear on important decisions. The upshot is that repressive governments have a reduced ability to censor, control or otherwise subdue the Internet as a tool for freedom.

**Consider Consensus for Decision Marking**
When it comes to the Internet governance network the consensus model (with its variants) works well. The participants are volunteers, not some general population. They are also not attending in an "official" way. They are not representing a state, organization or company for which they are being held accountable for a certain vote.

Consensus is viewed as an acceptable way of moving forward. Consensus has other advantages in this situation. The formality of traditional voting processes can slow down decision-making and action. There is also a need for synergy—combining of diverse opinions into a superior outcome, rather than polarizing people into voting camps. Consensus also encourages compromise on the part of individuals in the interest of the group as a whole.

**Encourage Volunteerism and Self-Organization**
GSN's are networks of the willing and committed and they are typically self-organizing. The Internet governance network is no exception and the result is a positive one.

In a sense, these networks are more like a movement than an institution. They also need to empower participants to self-organize and innovate—to configure or reconfigure the network in response to changing conditions.

This project also provides tools for those who believe the current model of governing the Internet is not only a good one but it is legitimate. It works, and has at its core a dynamic operating model that enables it to adapt and evolve as conditions require.

# Appendix—The Internet Governance Network

This appendix provides detailed descriptions of the key organizations that participate in the Internet's growing multi-stakeholder ecosystem. These organizations, as noted earlier, play a variety of roles in maintaining and governing the Internet, including:

- Naming and Addressing
- Open Standards Development
- Local, National, Regional and Global Policy Development
- Education and Capacity Building
- Shared Global Services and Operations
- Users

Several of the key roles and players are described below.

## The Internet Society

To achieve its mission, ISOC says that it:[26]

- Facilitates open development of standards, protocols, administration and the technical infrastructure of the Internet.
- Supports education in developing countries specifically and wherever the need exists.
- Promotes professional development and builds community to foster participation and leadership in areas important to the evolution of the Internet.
- Provides reliable information about the Internet.
- Provides forums for discussion of issues that affect Internet evolution, development and use in technical, commercial, societal and other contexts.
- Fosters an environment for international cooperation, community and a culture that enables self-governance to work.
- Serves as a focal point for cooperative efforts to promote the Internet as a positive tool to benefit all people throughout the world.

- Provides management and coordination for on-strategy initiatives and outreach efforts in humanitarian, educational, societal and other contexts.

To accomplish its tasks, ISOC works within an Internet ecosystem in an "open and collaborative approach." In its own words:

*In the Internet's short history, we have already witnessed attempts to shut down or limit discussions on key issues such as network neutrality, or to reframe the implications of policies, such as those that relate to cybersecurity. What we learn repeatedly is that the best and most lasting solutions are ones that we arrive at through cooperation and mutual respect, that are rooted in principle and that open the door to innovation.*

*The success of the Internet depends on more than the work of one, single organization—no matter how big, diverse, or influential it may be.*

*We operate collaboratively and inclusively, working with governments, national and international organizations, civil society, the private sector and other parties to reach decisions about the Internet that conform to the core values that gave rise to the Internet.*

*Through our collective efforts, we help strengthen the multi-stakeholder approach that is necessary for the Internet to continue to thrive.*

*We are uniquely positioned at the intersection of development-oriented (technical) groups, public policy and technology activities; and we serve as the hub of a global network of individuals and organizations that are collectively working toward the shared vision of an Internet that benefits everyone everywhere.*

Because it is at the intersection of policy, technology and development, a core part of ISOC's programs are associated with policy-related issues. Here is a list of the policy issues it covers:[27]

- Access
- Children and the Internet
- Human Rights
- Innovation
- Networks and Trust
- Online Identity
- Intellectual Property
- Internet Regulation
- Internet Governance
- Internet Security through Resilience and Stability
- Net Neutrality

- Privacy and Identity

- Spam

The ISOC website delves into each of these issues, along with the role that ISOC is playing in discussing and resolving them.

# Developing the Standards— Setting a New Paradigm

All the organizations in the Internet ecosystem depend on open, interoperable global standards. These standards are developed through an agreed upon set of principles that encourage the development of market driven standards. The OpenStand principles (see: open-stand.org) are based on the effective and efficient standardization processes that have made the Internet and the Web the premiere platforms for innovation and borderless commerce. The principles stress voluntary adoption and empower the economies of global markets—fueled by technological innovation—to drive global standards deployment. These principles are extendable to other technologies.

Three organizations coordinate the evolution of the main standards associated with moving information reliably through the Internet, which connects a growing number of independent networks:

- Internet Engineering Task Force (IETF)

- Internet Architecture Board (IAB)

- Internet Research Task Force (IRTF)

## Internet Engineering Task Force

The Internet Engineering Task Force develops and promotes Internet standards, but has as its main focus the TCP/IP protocol suite that controls how information flows over the Internet.

All IETF participants are volunteers and participate as individuals, not corporate representatives, although their employers or sponsors typically fund their participation. There is no "organizational" participation—corporate, academic or governmental—in the IETF, which was set up originally in 1986 and consisted of 21 researchers funded by the US government who met quarterly to discuss various issues.

Today, the IETF meets three times a year in face-to-face meetings and has upwards of 1,200 participants. In between meetings, work is conducted primarily online by approximately 120-150 working groups (WGs) that are divided to reflect the Internet's various protocols, with a major focus on TCP/IP. The IETF is funded in two ways: meeting fees and sponsorship, and support from ISOC. The key point about its funding is that no government or corporation provides money in such a way that it acquires

either direct or indirect control of the IETF's decisions. The IETF, incidentally, publishes its documents as Requests for Comments (RFCs), which is a system developed by Steve Crocker in 1969.[28] When an issue arises, it is assigned an RFC number. As comments are received, they are published under that number. If the comments morph into consensus on an issue, a standards specification document is created with the same RFC number, and the entire record remains as part of the RFC archive, which is published by the IETF as an open archive.[29]

*The goal of the IETF is to make the Internet work better.*

*The mission of the IETF is to produce high quality, relevant technical and engineering documents that influence the way people design, use and manage the Internet in such a way as to make the Internet work better. These documents include protocol standards, best current practices and informational documents of various kinds.*

*The IETF will pursue this mission in adherence to the following cardinal principles:*

**Open process –** *any interested person can participate in the work, know what is being decided and make his or her voice heard on the issue. Part of this principle is our commitment to making our documents, our WG mailing lists, our attendance lists and our meeting minutes publicly available on the Internet.*

**Technical competence –** *the issues on which the IETF produces its documents are issues where the IETF has the competence needed to speak to them, and that the IETF is willing to listen to technically competent input from any source. Technical competence also means that we expect IETF output to be designed to sound network engineering principles—this is also often referred to as "engineering quality".*

**Volunteer core –** *our participants and our leadership come to the IETF because they want to do work that furthers the IETF's mission of "making the Internet work better."*

**Rough consensus and running code –** *We make standards based on the combined engineering judgment of our participants and our real-world experience in implementing and deploying our specifications.*

**Protocol ownership –** *when the IETF takes ownership of a protocol or function, it accepts the responsibility for all aspects of the protocol, even though some aspects may rarely or never be seen on the Internet. Conversely, when the IETF is not responsible for a protocol or function, it does not attempt to exert control over it, even though it may at times touch or affect the Internet.*

## Internet Architecture Board

The Internet Architecture Board (IAB) has 13 members. Each year, six members are nominated for two-year terms on a rotating basis by a nominating committee drawn from the IETF.[31] The IAB has responsibilities as follows:[32]

**IESG Confirmation –** The IAB confirms the IETF Chair and IESG Area Directors from nominations provided by the IETF Nominating Committee.

**Architectural Oversight –** The IAB provides oversight of, and occasional commentary on, aspects of the architecture for the protocols and procedures used by the Internet.

**Standards Process Oversight and Appeal –** The IAB provides oversight of the process used to create Internet Standards. The IAB serves as an appeal board for complaints of improper execution of the standards process through acting as an appeal body with respect to an IESG standards decision.

**RFC Series and IANA –** The IAB is responsible for editorial management and publication of the Request for Comments (RFC) document series, and for administration of the assignment of IETF Protocol parameter values by the IETF Internet Assigned Numbers Authority (IANA).

**External Liaison –** The IAB acts as representative of the interests of the IETF in liaison relationships with other organizations concerned with standards and other technical and organizational issues relevant to the Internet.

**Advice to ISOC –** The IAB acts as a source of advice and guidance to the Board of Trustees and Officers of the Internet Society concerning technical, architectural, procedural and (where appropriate) policy matters pertaining to the Internet and its enabling technologies.

**IRTF Chair –** The IAB selects a chair of the Internet Research Task Force (IRTF) for a renewable two-year term.

## Internet Research Task Force

The IRTF defines itself, in its charter, as:

*The Internet Research Task Force (IRTF) focuses on longer term research issues related to the Internet while the parallel organization, the Internet Engineering Task Force (IETF), focuses on the shorter term issues of engineering and standards making.*

*The IRTF is a composed of a number of focused and long-term Research Groups. These groups work on topics related to Internet protocols, applications, architecture and technology. Research Groups have the stable long term membership needed to promote the development of research collaboration and teamwork in exploring research issues. Participation is by individual contributors, rather than by representatives of organizations.*[33]

## Other Standards Bodies

In order for the Internet to work properly, there are lower level standards required that connect various devices to the Internet. For example, personal computers typically are routed to the Internet via either a local area network (LAN) or Wi-Fi. The LAN and Wi-Fi standards are developed within the Institute of Electrical and Electronics Engineers (IEEE). In addition, telecommunication and cable companies typically provide broadband connections, such as DSL or a cable modem, while many people still use dial-up connections using traditional telephone lines and modems. These telecommunications standards are developed within the telecommunications industry and are defined within the ITU.

## Application Level Standards

Applications are the final level of Internet standardization, especially the World Wide Web, email and file transfer.

### *World Wide Web Consortium (W3C)*

Five years after Tim Berners-Lee developed the World Wide Web in 1989, he set up the World Wide Web Consortium (W3C) with the mission to "lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web" with the following design principles:[34]

**Web for All –** The social value of the Web is that it enables human communication, commerce and opportunities to share knowledge. One of W3C's primary goals is to make these benefits available to all people, whatever their hardware, software, network infrastructure, native language, culture, geographical location, or physical or mental ability.

**Web on Everything –** The number of different kinds of devices that can access the Web has grown immensely. Mobile phones, smart phones, personal digital assistants, interactive television systems, voice

response systems, kiosks and even certain domestic appliances can all access the Web.

**Vision –** W3C's vision for the Web involves participation, sharing knowledge and thereby building trust on a global scale.

**Web for Rich Interaction –** The Web was invented as a communications tool intended to allow anyone, anywhere to share information. For many years, the Web was a "read-only" tool for many. Blogs and wikis brought more authors to the Web, and social networking emerged from the flourishing market for content and personalized Web experiences. W3C standards have supported this evolution thanks to strong architecture and design principles.

**Web of Data and Services –** Some people view the Web as a giant repository of linked data while others see it as a giant set of services that exchange messages. The two views are complementary, and which to use often depends on the application.

**Web of Trust –** The Web has transformed the way we communicate with each other. In doing so, it has also modified the nature of our social relationships. People now "meet on the Web" and carry out commercial and personal relationships, in some cases without ever meeting in person. W3C recognizes that trust is a social phenomenon, but technology design can foster trust and confidence. As more activity moves on-line, it will become even more important to support complex interactions among parties around the globe.

Tim Berners Lee told us, "I wanted to try to standardize HTML, which is a mark-up language, and I went to the IETF. Unfortunately, people at the IETF… didn't know what the language is, mark-up languages…we had to make a new group, an HTML working group."[35] Basically, the IETF was populated with engineers experienced with the Internet's networking protocols, and he needed people with experience in working with mark-up languages and website programming. Thus, he started the W3C.

### Email and File Transfer Standards
The Internet's protocols for email and file transfer are Simple Mail Transport Protocol (SMTP) and File Transfer Protocol (FTP). Both protocols were developed by and are managed by the Internet Engineering Task Force, which was discussed in a previous section.

## Managing the Domain Name System (DNS) & IP Addresses

From its roots as the Advanced Research Projects Agency Network (ARPANET), the Internet has always had the problem of translating numbers

used in IP addresses and used by computers into names used by people. From its ARPANET days in the 1970s, one of the Internet's pioneers, Jon Postel, oversaw the naming and addressing function.[36]

In the 1970s and 1980s, Postel managed the process informally. In 1988, his employer, the Information Sciences Institute at the University of Southern California, formally contracted with Defense Advanced Research Projects Agency (DARPA) to manage the function. In 1990, it formally became known as the Internet Assigned Numbers Authority (IANA). In 1998, Postel passed away and sometime later control of IANA was transferred to the newly-formed Internet Corporation for Assigned Names and Numbers (ICANN), which is described in more detail below. ICANN is a non-profit corporation that, in its own words, "coordinates the Internet Assigned Numbers Authority (IANA) functions, which are key technical services critical to the continued operations of the Internet's underlying address book, the Domain Name System (DNS)."[37]

## The DNS Administration System

The overall DNS system is a complex process that operates on two fronts worldwide: registering domain names (ICANN) and tying those names to IP addresses assigned to Internet Service Providers and hosting companies (Regional Internet Registries or RIR's). ICANN has responsibility for coordinating the implementation of the IANA functions. To do so, it depends on guidance and standards set by the IETF and it works with several other organizations to perform its functions, including:

- Regional Internet Registries (RIR)

- Number Resource Organization (NRO)

- Generic Top Level Domain (gTLD) and Country Code Top Level Domain (ccTLD) Registries

- International Organization for Standardization, Maintenance Agency (ISO 3166 MA)

## ICANN's Charter

ICANN's mandate comes from the US Department of Commerce's National Telecommunications & Information Administration (NTIA), which inherited responsibility for the Internet in the early 1990s from DARPA. In essence, Jon Postel ran the Internet's (and predecessor ARPANET's) naming and addressing systems under sequential contracts to various government agencies for about 30 years. By 1996, he realized that his work needed to be institutionalized for long-term operation. An Internet ad hoc working group was established to consider how this might be done. A fractious debate ensued and when it was apparent that a likely proposal involved setting up an organization headquartered in Geneva, the White House stepped in.

Ira Magaziner, then a senior advisor to President Bill Clinton, led an effort that produced a "green paper" and then a "white paper" outlining a US-based private sector organization that could undertake this work.

Hence, the non-profit ICANN was established in 1998, and competed for the responsibility to undertake this work. Postel was to be its Chief Technology Officer, but he unexpectedly passed away in 1998 just as ICANN was forming. ICANN was selected to perform the naming and addressing functions that Postel had performed for many years and contracted with the NTIA for $0 to manage the functions. Nevertheless, this contract, which the NTIA continues to renew, raises the question of whether the US Department of Commerce somehow really controls naming and addressing, even though it plays a minor active role in ICANN.[38]

> As Vint Cerf says:
>
> *"From 1968 to the present, the US Government agencies involved in the predecessor network [ARPANET] and the Internet have shown their commitment to moving this entire ecosystem into the private sector and step-by-step have removed themselves from control deliberately. And the only remaining control, right now, is with NTIA, and it's a sore point with countries around the world because there is still a potential for NTIA to, for example, order ICANN to pull something out of the root zone. It's never done that.*
>
> *The problem is that it could do that. And, of course, you know the consequences of that would be an absolute catastrophe. I mean, it would be an uproar beyond all belief. It would destroy a lot of the ecosystem and people would, you know, move to other root zone managers, or something; I mean some bad thing would happen. So nobody in his right mind at NTIA would ever do that. The problem is that there are countries around the world that fear that that could happen...*
>
> *And I have to say, despite the fact that it has created huge tension and in some ways led to some of the schism in the World Conference on International Telecom, that NTIA has been vastly circumspect about intervening. And it speaks very, very articulately—especially Larry Strickling, the incumbent Assistant Secretary—about multi-stakeholder. At the last IGF, for example, in Azerbaijan, he was extraordinarily articulate on this point; insistent that Internet governance must be, will be, and, if the US has anything to say about it, shall be multi-stakeholder."*

ICANN's funding comes from "fees from domain name registrars and related accreditation activities plus contributions and grants," according to its audited financial statement on June 30, 1999. In its first year of operation in 1999, ICANN had a paltry $707,870 in revenues and assets of $84,677.[39] In its 2012, it had $72.4 million in revenues and net assets of $83.5 million.[40] In short, ICANN has become fully financially independent.

## ICANN's Multistakeholder Model

ICANN operates using what it describes as a "bottom-up, consensus-driven, multi-stakeholder model:

**Bottom up –** At ICANN, rather than the Board of Directors solely declaring what topics ICANN will address, members of sub-groups in

ICANN can raise issues at the grassroots level. Then, if the issue is worth addressing and falls within ICANN's remit, it can rise through various Advisory Committees and Supporting Organizations until eventually policy recommendations are passed to the Board for a vote.

**Consensus-driven –** Through its By-laws, processes and international meetings, ICANN provides the arena where all advocates can discuss Internet policy issues… Hearing all points of view, searching for mutual interests and working toward consensus take time, but the process resists capture by any single interest—an important consideration when managing a resource as vital as the global Internet.

**Multi-stakeholder model –** ICANN's inclusive approach treats the public sector, the private sector and technical experts as peers. In the ICANN community, you'll find registries, registrars, Internet Service Providers (ISPs), intellectual property advocates, commercial and business interests, non-commercial and non-profit interests, representation from more than 100 governments, and a global array of individual Internet users. All points of view receive consideration on their own merits. ICANN's fundamental belief is that all users of the Internet deserve a say in how it is run.

The following shows ICANN's Multi-stakeholder ecosystem:[41]
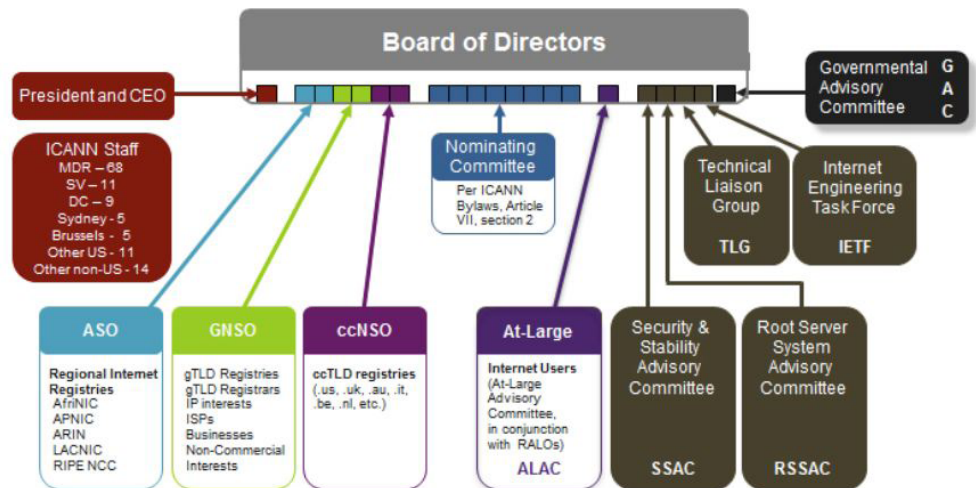


## Internet Assigned Numbers Authority (IANA)

IANA has a very similar relationship with ICANN as the IETF has with the ISOC. IANA's activities were performed by Jon Postel from the 1970s until he passed away in 1998. Its function is to "oversee global IP address allocation, autonomous system number allocation, root zone management in the Domain Name System (DNS), media types and other Internet Protocol-

related symbols and numbers."[42] In essence, IANA is the Internet's operational arm.

## Regional Internet Registries (RIRs)

The first step in ICANN's addressing coordination role starts with standards and guidance from the IETF. From there it goes from IANA to a series of Regional Internet Registries (RIRs) worldwide. IANA delegates Internet resources, essentially IP addresses and Autonomous System (AS) numbers, to the RIRs. The AS numbers are assigned to Internet Service Providers and are used for internal routing within the Internet. At present, there are five RIRs:[43]

1. African Network Information Centre for Africa

2. American Registry for Internet Numbers for the United States, Canada, several parts of the Caribbean region and Antarctica

3. Asia-Pacific Network Information Centre for Asia, Australia, New Zealand and neighboring countries

4. Latin America and Caribbean Network Information Centre for Latin America and parts of the Caribbean region

5. Réseaux IP Européens (RIPE) Network Coordination Centre for Europe, Russia, the Middle East and Central Asia

Essentially, the RIRs, through their multi-stakeholder communities and processes, decide all policy issues related to the use of IP addresses in their regions. It's important to understand that the RIRs play a much larger role in the naming and addressing process than we can possibly cover in the scope of this paper. They all work closely together and with the IETF and IANA in order to ensure the allocation of IP addresses globally is done as effectively as possible.

## Number Resource Organization (NRO)

The NRO is basically an association of the five RIRs that represents their collective interests primarily within ICANN. Its main goals are to:[44]

• Protect the unallocated Internet number resource pool.

• Promote and protect the bottom-up policy development process.

• Act as a focal point for Internet community input into the RIR system.

Again, the NRO plays a large role in the overall naming and addressing process, but it is beyond the scope of this paper to dive too deeply into its operations and its influence on the naming and addressing process.

## Top Level Domains (TLDs)

In addition to IP numbers, ICANN's province also includes domain names. The gTLDs are the Internet's generic top level domains, such as .com, .org, .info and .net, while the ccTLDs are the two-letter country code top level domains. All told, there are 22 gTLDs, although .com, .org, .net, .info and .biz are by far the best known.[45] ICANN contracts with an organization to manage each generic and country code domain. The gTLDs are typically managed by private organizations, while the country code domains are typically managed by an organization designated by the government of each country.

This is a highly complex process given that there are 22 separate companies managing the gTLDs and perhaps 200 countries that manage the ccTLDs, which are critical to how the Internet operates. Each of these entities has to manage its piece otherwise the overall Domain Name System will not operate properly.

In addition to the organizations that manage the domains there are also thousands of registrars, like GoDaddy, NetworkSolutions and Tucows, that handle the process of registering domain names for Internet users and inputting those names into the DNS. Finally, there are now tens of thousands of web hosting companies acting as retailers for the registrars, an increasing number of which function at the wholesale level. Tucows, in particular, through its OpenSRS subsidiary, is a wholesaler to more than 13,000 web hosting and other Internet service providers who resell domain name registration services.

## World Intellectual Property Organization (WIPO)

Trademark and the ownership of domain names is one of the major issues associated with registering domain names. WIPO works with the gTLDs and ccTLDs to help them negotiate these complex trademark issues. WIPO plays a much larger role in IPR issues than simply helping to resolve trademark issues.[46] WIPO is also heavily involved in the ongoing copyright issues associated with Internet usage and has worked closely with organizations within the Internet ecosystem to deal with these issues. This is covered in more detail in the sections on issues facing the Internet.

## International Organization for Standardization (ISO), Maintenance Agency (ISO 3166 MA)

The ISO 3166 MA is responsible for designating the specific two-digit country codes that are administered by the ccTLDs.[47] The ISO itself is the world's leading standards organization and gets it charter directly from governments worldwide.

### Key ICANN Issues: Opening Up the TLDs

ICANN is currently involved in a major expansion of the generic top level domains. In 2011, ICANN approved a plan to open up top level domains to organizations that can meet requirements agreed upon by the global Internet community. In all, there have been more than 1,900 applications with a wide range of names including names in multiple languages, particularly Chinese.[48] At present, the process is in the final stages of approving applications. While ICANN has not yet designated an official start date for the new domains, it expects that the first batch will go into operation in the near future.[49] The impact will be substantial and users will likely undergo naming shock. At present, we're used to .com, .org and .net. When the TLDs open up, we could have the domains .play, .dog, .party, .food, .career and on and on.

# Operationalizing the Internet

While it is beyond the scope of this paper to cover how the Internet is implemented in great detail, the basics of its implementation are important to understand. Essentially, the Internet is a network of networks and is structured with backbone networks that connect individual regional networks. All of these networks are private, in the sense that the Internet does not issue any charters for organizations to operate backbones or regional networks. Individual organizations working within the framework of the country in which they operate decide on their own if they wish to interconnect to the Internet and then they take the necessary steps to become a network operator. While all of these networks communicate via TCP/IP, that doesn't capture the relationships associated with how these network operators interconnect their traffic, which is done through separate interconnection agreements.

### The Border Gateway Protocol (BGP) and
### The Autonomous System (AS)

Each individual network is considered an autonomous system within the Internet and is given an Autonomous System Number (ASN), which functions as an internal routing code within the Internet. The actual routing of the information is controlled by the Border Gateway Protocol (BGP), which makes the core routing decisions.[50] The IETF, incidentally, defines the protocols associated with the routing process, while the ASN are assigned through ICANN and the many organizations with whom it works, such as the RIRs.

### Internet Exchange Points (IXP), Transit and Peering

While the BGP controls how the information is routed using ASN, the information itself travels between different networks at Internet Exchange Points (IXPs), which have both technical and legal components. Technically, the information is passed between routers operated by each separate network, which works effectively because of the Internet's loosely coupled protocol.

Legally, however, the network providers have to agree upon a commercial arrangement in order to interconnect. Basically, there are now two types of agreements: transit and peering. A transit agreement involves the exchange of money and typically takes place between larger and smaller ISPs. In a transit situation, the larger organization moves traffic between a smaller network and other networks on the Internet. Frequently, these larger organizations operate as backbone networks with revenue coming primarily from transit agreements with regional networks. These backbone networks then create peering arrangements with fellow backbone networks as information is routed nationally and globally.

Peering agreements are typically between similarly sized networks that are located closely enough to have a connection point. These arrangements are settlement-free, meaning that traffic is exchanged—essentially carried for free. Many peering arrangements are made between separate networks operating within a geographical region, such as cable companies, wireless service providers or landline telephone companies who operate separate networks within a metropolitan region. Other peering arrangements might be between large backbone networks that primarily route traffic throughout the Internet.[51]

This section is a very simplified description of the transit and peering structures associated with how information is exchanged through interconnecting networks. It is important for this document because of the enormous policy implications that are connected to why many international governments would like more control over the Internet. It is also directly connected to the issue of net neutrality.

## Tension Between Traditional Telephony and the Internet

One of the principles of international telecommunications has always been that the sender pays to have information delivered to the recipient. This has traditionally been implemented on a message-by-message basis, and the International Telecommunications Union (ITU) has defined the settlements system between telecom carriers to determine who receives what piece of the resulting revenue stream.

The Internet's information exchange practices completely upend the traditional telecoms' systems. It significantly reduces "net settlement rates" in nations across the world impacting both traditional telecom companies and governments. It also significantly impacts the ITU. There is no concept of the "sender" paying for a message. Instead Internet users pay to connect to the Internet. While one ISP might impose fees for the amount of information an individual transmits or receives, other ISPs might charge a flat monthly rate for customers to use the Internet as much as they choose. Backbone networks, which typically carry international traffic, also typically interconnect with a peering arrangement, which is antithetical to the traditional international tariff structures based upon settlements of individual messages.

If the Internet were to be transferred to the ITU, it is likely that there would be an effort to change the Internet's tariff structure so that governments might generate more revenues from Internet usage. In particular, efforts might be made to identify the type of traffic, such as video, data, or voice, so that different tariffs might be determined by information type.

## Handling the Policy Issues: the Policy Organizations

ISOC, ICANN and many other organizations deal with technical, operational and policy issues related to Internet usage. Because the Internet now impacts lives worldwide, however, there is a large and growing number of national, regional and international organizations that are focusing exclusively on these policy-related issues.

It is important to understand that since the Internet is worldwide, its impact is being explored globally by countless organizations at local, county, state, national, regional and international levels. Most of those organizations never interact with the Internet's governance ecosystem. Instead, they might look to how peers are dealing with similar issues. Take cyberbullying as an example—every school district in the world with students on the Internet has to deal with this issue. Yet, few of these organizations, if any, participate within the governance ecosystem. Instead they look at how other districts are handling the issue and, typically, react to any state laws that are passed.

Even national governments do not always participate as much as one might expect. However, regional organizations, such as the Organization of American States and the European Union, are typically becoming very active in the governance ecosystem. While these organizations are playing an increasingly important role, it is beyond the scope of this paper to explore these many organizations in any detail.

It is also important to understand that while many of these policy issues require legislative and educational activities, they will also require technical solutions that improve the privacy and security of Internet users. In short, resolving many of these policy issues can only be done at the intersection of policy, technology and development.

### Shifting Stakeholders and Limited Participation

The multi-stakeholder model shifts on an issue-by-issue basis in the policy arena. This is an enormously important issue. The stakeholders typically remain relatively static for technical and operational issues. While they may differ for various issues, in general most of the key stakeholders are involved in the process within each particular working group, which has resulted in enormous success in growing the Internet.

The opposite is true in the policy arena. Each issue has its own set of stakeholders and many of them do not or cannot participate in working to resolve the issues. Furthermore, many of these issues can only be resolved with the participation of the web of legal jurisdictions at local, state, national, regional and international levels, most of which do not participate in the Internet's multi-stakeholder network, making them a missing link in the process.

At a structural level, this is the reason why the multi-stakeholder governance model seems to be struggling in the policy arena. It's not that the model doesn't work. It's that it can be complex to involve the full set of required stakeholders and even more difficult to bring them to agreement.

## Internet Governance Forum (IGF)

Unlike ISOC and ICANN, which are independent, non-profit organizations, the Internet Governance Forum (IGF) is housed within the United Nations on a recommendation made by the World Summit on the Information Society (WSIS) in 2005, and is set up as "a multi-stakeholder forum for policy dialogue on issues of Internet governance. It brings together all stakeholders in the Internet governance debate, whether they represent governments, the private sector or civil society, including the technical and academic community, on an equal basis and through an open and inclusive process."[52]

If that sounds virtually identical to the way in which ISOC and ICANN see their roles, it is. The difference, of course, is that it's a UN organization. The IGF's mandate is to:[53]

- **Discuss public policy issues** related to key elements of Internet governance in order to foster the sustainability, robustness, security, stability and development of the Internet.

- **Facilitate discourse** between bodies dealing with different cross-cutting international public policies regarding the Internet and discuss issues that do not fall within the scope of any existing body.

- **Interface** with appropriate inter-governmental organizations and other institutions on matters under their purview.

- **Facilitate the exchange of information** and best practices, and in this regard make full use of the expertise of the academic, scientific and technical communities.

- **Advise all stakeholders** in proposing ways and means to accelerate the availability and affordability of the Internet in the developing world.

- **Strengthen and enhance the engagement** of stakeholders in existing and/or future Internet governance mechanisms, particularly those from

developing countries.

- **Identify emerging issues**, bring them to the attention of the relevant bodies and the general public and, where appropriate, make recommendations.

- **Contribute to capacity building** for Internet governance in developing countries, drawing fully on local sources of knowledge and expertise.

- **Promote and assess**, on an ongoing basis, the embodiment of WSIS principles in Internet governance processes.

- **Discuss**, inter alia, issues relating to critical Internet resources.

- **Help to find solutions** to the issues arising from the use and misuse of the Internet, of particular concern to everyday users.;

- **Publish** its proceedings.

## Independent Policy Organizations

As the Internet grows, there is a growing armada of organizations that either follows or participates in the Internet policy debates that is growing along with it. These organizations can be arms of other government organizations, non-governmental organizations (NGOs) or think tanks that might contribute as stakeholders within ISOC, ICANN, RIR's and/or IGF, or they might be organizations that follow the debates and produce reports for their constituents. Since there are so many of these organizations now in operation, there is no way to mention all of them. Here are just four examples of such organizations:

1. Global Internet Policy Observatory (GIPO)

2. Internet & Jurisdiction Project

3. United Nations Educational, Scientific and Cultural Organization (UNESCO)

4. Organization for Economic Cooperation and Development (OECD)

**GIPO** has just been formed by the European Commission. In its introductory press release, the Commission said:[54]

> The Global Internet Policy Observatory will act as a clearinghouse for monitoring Internet policy, regulatory and technological developments across the world.
>
> The objective of GIPO is to increase expertise and understanding among all actors, including countries, NGOs and interest groups which may have so far been marginalized in Internet debates and decisions. The Commission fears

*that the vast range of policy areas impacted by the Internet, combined with a highly complex institutional framework, may cause disengagement from these discussions, which must be truly inclusive in order to ensure a globally legitimate and sustainable governance framework for the Internet.*

**The Internet & Jurisdiction Project** is headquartered in Paris. Its project director is Bernard de la Chapelle, who also serves currently as an ICANN board member. It describes its mission as follows:[55]

*Internet & Jurisdiction seeks to establish a global, issue-based, multi-stakeholder dialogue process between states, International Organizations, companies, civil society and the technical community. The project provides a neutral platform to help framing the debate in a constructive manner and to facilitate the discussion on the future of the cross-border Internet and jurisdiction. Launched in 2012 and organized in partnership with the International Diplomatic Academy, the dialogue process explores two complementary issues that have been identified throughout the first year of activity: trans-border impacts of sovereignty and procedural interfaces.*

**UNESCO,** in its words, was created in 1945 "to respond to the firm belief of nations, forged by two world wars in less than a generation, that political and economic agreements are not enough to build a lasting peace. Peace must be established on the basis of humanity's moral and intellectual solidarity." As such, UNESCO has numerous programs worldwide designed to foster education and intercultural understanding.

One of UNESCO's developing themes is Building Knowledge Societies. It describes the theme as follows:

*Knowledge and information have significant impact on people's lives. The sharing of knowledge and information, particularly through Information and Communication Technologies (ICTs) has the power to transform economies and societies. UNESCO works to create inclusive knowledge societies and empower local communities by increasing access to and preservation and sharing of information and knowledge in all of UNESCO's domains. Knowledge societies must build on four pillars: freedom of expression; universal access to information and knowledge; respect for cultural and linguistic diversity; and quality education for all.*

The **OECD** is focused on global economic development. As such, it has a Working Party on the Information Economy that focuses on digital content, ICT diffusion to business, ICT-enabled offshoring and ICT skills and employment. Work is underway on ICTs and the environment and ICTs and the economic recovery. The Working Party has also prepared a

recommendation on public sector information.

This work contributes to development and understanding of policies to meet the opportunities and challenges of ICTs and the Internet economy, and to ensuring that benefits are widely shared. Results appear in the OECD Internet Economy Outlook, in OECD Digital Economy Papers and on the OECD website.

Many of the operational and policy challenges raised here, including the issue of net neutrality, are discussed in more detail in the GSN companion paper: "Governing a Borderless Internet: Challenges Facing the Internet Governance Network."

# Endnotes

Quotations in this paper: remarks in this paper were derived from a primary interview with the quoted person, unless otherwise identified by a footnote. The date of the interview is cited.

1   http://www.itu.int/en/wcit-12/Documents/WCIT-background-brief1.pdf.

2   Cellular telephony, which also has been a huge agent of telecom change, was only on the drawing boards of the world's telecommunications suppliers, in 1988. Cellular, however, is only peripherally part of the ITU's province, which is focused primarily on communications across borders.

3   In 1910 the cost of a three-minute long distance phone call in 1915 was $20.70. Today, the call is free, although there is a cost of about $30-$50 per month for broadband Internet connection, at least in North America. http://www.greatachievements.org/?id=3633.

4   http://www.itu.int/wsis/outcome/booklet.pdf.

5   http://www.intgovforum.org/cms/.

6   http://files.wcitleaks.org/public/Merged%20UAE%20081212.pdf.

7   http://www.bloomberg.com/news/2012-12-12/china-russia-resubmit-proposal-to-get-web-control.html.

8   http://www.businessinsider.com/theres-a-huge-plan-in-the-works-to-give-the-un-control-of-the-internet-2012-10.

9   http://www.huffingtonpost.com/jeanchristophe-nothias/internet-governance_b_3435812.html.

10  Nothias is referring to the PRISM program run by the US's National Security Agency in which major Internet telecom providers allow the NSA to gather overseas data from the Internet in search of national security threats. http://www.nytimes.com/2013/06/07/us/nsa-verizon-calls.html?pagewanted=all&_r=0.

11   http://www.netnames.com/resources/news-us/2012/more-233-million-domain-names-world.

12  http://www.internetworldstats.com/stats.htm.

13  http://en.wikipedia.org/wiki/Internet_Society.

14  http://en.wikipedia.org/wiki/Internet_Society.

15  http://www.internetsociety.org/who-we-are/mission.

16  http://www.internetsociety.org/sites/default/files/InternetEcoSystem.pdf.

17  http://en.wikipedia.org/wiki/LAMP_(software_bundle).

18  Don Tapscott and Anthony D. Williams, *Wikinomics: How Mass collaboration Changes Everything*, Portfolio, 2006.

19  Peter Drucker, *The New Realities*, Harper and Rowe, New York, 1989, P. 209.

20  Footnote required.

21  Paula Barsook, "How Anarchy Works," *Wired*, 1995. http://www.wired.com/wired/archive/3.10/ietf.html.

22  http://www.globalpost.com/dispatch/news/afp/131009/brazil-host-internet-governance-summit-next-year.

23  http://rt.com/news/brazil-internet-summit-fight-nsa-006/.

24  http://ec.europa.eu/commission_2010-2014/kroes/en/content/internet-governance-i-want-your-views.

25  http://www.prnewswire.com/news-releases/high-level-panel-on-global-internet-cooperation-and-governance-mechanisms-convenes-in-london-235789861.html.

26  Ibid.

27  http://www.internetsociety.org/what-we-do/internet-issues.

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

29  http://www.ietf.org/rfc.html.

30  http://www.ietf.org/rfc/rfc3935.txt.

31  http://www.iab.org/about/description/.

32  http://www.iab.org/about/iab-overview/.

33  http://irtf.org.

34  http://www.w3.org/Consortium/mission.

35  Interview between Tim Berners Lee and Don Tapscott, 21 August 2013.

36  http://en.wikipedia.org/wiki/Jon_Postel.

37  http://www.icann.org/en/about/welcome.

38  The above paragraphs on how ICANN was formed are based on ICANN's public documents as well as on the memory of some of the participants, particularly Vint Cerf.

39  http://www.icann.org/en/about/financials/financial-report-fye-30jun99-en.htm.

40  http://www.icann.org/en/about/annual-report.

41  http://www.icann.org/en/groups/chart.

42  http://en.wikipedia.org/wiki/Internet_Assigned_Numbers_Authority.

43  http://en.wikipedia.org/wiki/Regional_Internet_registry.

44  http://www.nro.net/about-the-nro/nro-faq.

45  http://en.wikipedia.org/wiki/List_of_Internet_top-level_domains.

46  http://www.wipo.int/amc/en/domains/cctld/.

47  https://en.wikipedia.org/wiki/ISO_3166.

48  http://newgtlds.icann.org/en.

49   http://newgtlds.icann.org/en/about/program.
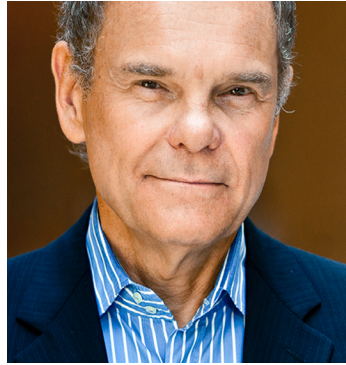
50   http://www.enterprisenetworkingplanet.com/netsp/article.php/3615896/
     Networking-101-Understanding-BGP-Routing.htm.

51   http://arstechnica.com/features/2008/09/peering-and-transit/.

52   http://en.wikipedia.org/wiki/Internet_Governance_Forum.

53   http://www.intgovforum.org/cms/aboutigf.

54   http://ec.europa.eu/digital-agenda/en/news/commission-plans-guide-
     through-global-internet-policy-labyrinth.

55   http://www.internetjurisdiction.net/about/mission/.

# About the Authors

Don Tapscott is Executive Director of the *Global Solution Networks* program. As one of the world's leading authorities on innovation, media and the economic and social impact of technology, he advises business and government leaders around the world. He is CEO of the think tank *The Tapscott Group* and has authored or co-authored 14 widely read books. In 2013, the Thinkers50 organization named him the 4th most important living business thinker. He is Adjunct Professor of Management for the Rotman School of Management and the Inaugural Fellow of the Martin Prosperity Institute, both at the University of Toronto.

Lynn St. Amour is President/CEO of the Internet Society (ISOC). She joined ISOC in 1998 as Executive Director of its Europe, Middle East and Africa (EMEA) division, and has been responsible for ISOC's international expansion. She became ISOC's global Executive Director and COO in 1999 and held that position until her appointment as President and CEO in February of 2001. She divides her time between ISOC's offices in Reston, Virginia, and Geneva, Switzerland.

Special thanks to principal researcher Steve Caswell. One of the early pioneers of the digital age, he was the founding editor of the *Electronic Mail and Message Systems* (EMMS) newsletter in 1977 and the author of the

seminal book *Email* in 1988. He also was a pioneer in ecommerce as one of the principal architects of the AutoSkill Parts Locating Network that has been used by auto dismantlers since the 1980s to buy and sell several billions of dollars of used auto parts. Today, he still follows the high tech industry very closely and teaches business and technology at Simi Valley High School in Simi Valley, CA.

## About Global Solution Networks

Global Solution Networks is a landmark study of the potential of global web-based and mobile networks for cooperation, problem solving and governance. This research project is a deliverable of the GSN program, offered through the Martin Prosperity Institute at the Rotman School of Management, University of Toronto.

## Program Management

Don Tapscott, Executive Director
Dr. Joan Bigham, Managing Director
Anthony Williams, Executive Editor

## GSN Program Membership

Membership in Global Solution Networks offers unlimited access to gsnetworks.org program deliverables including project plans, research publications and multi-media presentations, all posted for member use, review and feedback. Webinars on current research are held quarterly. Please visit our web site at www.gsnetworks.org or contact info@ gsnetworks.org for information on participation.

Ten Types of Global Solution Networks

MARTIN
Prosperity *Institute*

Rotman School of Management
UNIVERSITY OF TORONTO