**WTPF-IEG/3/11**

10 January 2013

**FOURTH DRAFT OF THE SECRETARY-GENERAL’S REPORT**

**for the   
Fifth World Telecommunication/Information and Communication Technology Policy Forum 2013**

**1. Preamble**

**1. 1 The Fifth World Telecommunication/ICT Policy Forum (WTPF) [[1]](#footnote-1)**

**1.1.1** Originally established by the 1994 Plenipotentiary Conference, the WTPF provides a forum where ITU Member States and Sector Members can discuss and exchange views and information on emerging telecommunication/ICT policy and regulatory matters, especially global and cross-sectoral issues (Resolution 2, Rev. Guadalajara, 2010).

**1.1.2** By Decision 562, the 2011 Session of ITU Council decided that WTPF-2013 would discuss all the issues raised in: Resolution 101: “Internet Protocol (IP)-based Networks” (Rev. Guadalajara, 2010); Resolution 102: “ITU’s role with regard to international public policy issues pertaining to the Internet and the management of Internet resources, including domain names and addresses” (Rev. Guadalajara, 2010); and Resolution 133: “Roles of administrations of Member States in the management of Internationalized (multilingual) domain names” (Rev. Guadalajara, 2010).

**1.1.3** The ITU Secretariat prepares annual reports to Council on ITU’s activities in relation to the implementation of Resolution 101 (Rev. Guadalajara, 2010), Resolution 102 (Rev. Guadalajara, 2010) and Resolution 133 (Rev. Guadalajara, 2010). Other relevant activities are also undertaken by ITU within the framework of its Strategic, Operational and Financial Plans.

**1.1.4** Building on the work of the Dedicated Group,the Council Working Group on International Internet-Related Public Policy Issues (CWG-Internet)[[2]](#footnote-2) was established by 2011 Council [Resolution 1336](http://www.itu.int/md/S11-CL-C-0099/en), in accordance with Resolutions 102 and 140 of the 2010 Plenipotentiary Conference. Its[terms of reference](http://www.itu.int/council/groups/CWG-internet/index.html) are to identify, study and develop matters related to international Internet-related public policy issues, including those issues identified in 2009 Council Resolution 1305. Participation in the CWG-Internet is limited to ITU Member States, with open consultation for all stakeholders[[3]](#footnote-3). Council 2012 Resolution 1344 further elaborated the modality of open consultation for the CWG-Internet to include online consultations for all stakeholders[[4]](#footnote-4).

**1.1.5** WTPF-2013 shall not produce prescriptive regulatory outcomes; however, it shall prepare reports and adopt non-binding opinions by consensus for consideration by Member States, Sector Members, and relevant ITU meetings, bearing in mind items 1.1.3 and 1.1.4, and the need to avoid contradiction between the themes and the discussions at WTPF and ongoing activities undertaken as part of ITU’s mandate under Plenipotentiary Resolutions (and other decisions of ITU Conferences and Assemblies) and the terms of reference of the ITU Council Working Group on International Internet-related Public Policy[[5]](#footnote-5).

**1.1.6** All information relating to WTPF-2013 is posted at: <http://www.itu.int/wtpf>.

# 1.2 Preparatory process for the Secretary-General’s Report

**1.2.1** Discussions at WTPF-2013 shall be based on a Report from the Secretary-General, incorporating the contributions of ITU Member States and Sector Members, which will serve as the sole working document of the Forum, and shall focus on key issues on which it would be desirable to reach conclusions (Council 2011 Decision 562). This draft Report outlines a potential scope for discussions and presents some of the Internet-related public policy issues under consideration among different stakeholder groups.

**1.2.2** According to Decision 562, the Secretary-General shall convene a balanced Informal Experts Group (IEG), each of whom is active in preparing for the Policy Forum. Membership of the IEG is now open to all stakeholders. At its 2012 Session, the Council agreed that all relevant stakeholders should participate in the work of the IEG of WTPF-13 to contribute their unique perspective to the preparatory process, based on their roles and responsibilities under Para. 35 of the *Tunis Agenda* (2005). Consequently, participation in the work of the IEG will be open to all relevant stakeholders in accordance with the 2011 and 2012 Council Decisions, and the need to maintain a balanced group of experts. Relevant stakeholders are invited to express their interest in participating in the IEG by registering at: <http://www.itu.int/wtpf>.

**1.2.3** A revised timetable, based on input received from membership and approved by Council 2012[[6]](#footnote-6), is given below.

**Table 1: Timetable for the elaboration of the Secretary-General’s Report**

|  |  |
| --- | --- |
| **9 March 2012** | Deadline for membership to submit materials considered relevant for the first draft of the Secretary-General’s report. |
| **13 April 2012** | Online posting and circulation to membership of the first draft of the Secretary-General’s report (drawn up on the basis of available material). |
| **15 May 2012** | Deadline for receipt of membership comments on the first draft and additional materials for the second draft. |
| **5 June 2012** | First meeting of the IEG.  Preliminary Second Draft of the Secretary-General’s report. |
| **25 June 2012** | Deadline for receipt of comments on the preliminary Second Draft. |
| **3 July  2012** | Online Posting of the Second Draft, incorporating comments received. |
| **1 August 2012** | Deadline for receipt of comments on the Second Draft and request for contributions to develop the Third Draft, including broad outlines for possible draft opinions. Invitation letter sent to all stakeholders to participate in the IEG. |
| **31 August 2012** | Online Posting of Third Draft and outlines for possible draft opinions. |
| **30 September 2012** | Deadline for receipt of comments on the Third Draft. |
| **10-12 October 2012** | Second meeting of the IEG. |
| **10 January  2013** | Online Posting of the Fourth Draft including draft opinions. |
| **6-8 February 2013** | Third meeting of the IEG. |
| **1 March 2013** | Finalization and publication of the Secretary-General’s report. |
| **13 May 2013** | WTPF Strategic Dialogue. |
| **14-16 May 2013 (in parallel with the WSIS Forum 2013)** | 5th WTPF on Internet-related public policy issues. |

# 

# 2. Themes for WTPF-2013

**2.1** By Decision 562, in accordance with Decision 2 (Rev. Guadalajara, 2012), the 2011 Session of Council decided that the fifth WTPF would discuss all the issues raised in Resolution 101 (Rev. Guadalajara, 2010), Resolution 102 (Rev. Guadalajara, 2010) and Resolution 133 (Rev. Guadalajara, 2010). Resolutions 101 (Rev. Guadalajara, 2010) and 102 (Rev. Guadalajara, 2010) were adopted in 1998 and amended most recently at PP-10.Resolution 133 (Rev. Guadalajara, 2010) was adopted in 2002 and amended most recently at PP-10.

**2.2** In accordance with Council 2011 Decision 562, the WTPF will discuss all the issues raised in Resolutions 101, 102 and 133 (Rev. Guadalajara, 2010). Below are suggested broad themes from IEG meetings[[7]](#footnote-7) under which these issues could be discussed:

* The multistakeholder model of the governance of the Internet;
* Global Principles for the governance and use of the Internet;
* Development and diffusion of ICTs and strategies for developing Internet connectivity globally;
* How to develop an enabling environment for encouraging growth, interoperability and development of the Internet;
* How can the Internet contribute to developing an enabling environment for encouraging growth [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0018/en)[[8]](#footnote-8)];
* Strategies for increasing affordable global connectivity: the critical role of IXPs [source: [ISOC](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en)[[9]](#footnote-9)].
* On the basis of reciprocity, to explore ways and means for greater collaboration and coordination between ITU and relevant organizations - including, but not limited to, the Internet Corporation for Assigned Names and Numbers (ICANN), the Regional Internet Registries (RIRs), the Internet Engineering Task Force (IETF), the Internet Society (ISOC) and the World Wide Web Consortium (W3C) - involved in the development of IP-based networks and the future internet, through cooperation agreements, as appropriate, in order to increase the role of ITU in Internet governance so as to ensure maximum benefits to the global community.

**2.3** For the purposes of this report, issues raised in Plenipotentiary Resolutions 101, 102 and 133 (bearing in mind item 1.1.5) are listed in the sections below.

**2.3.1 Development & Diffusion of ICTs Globally**

1. The Internet traces its origins[[10]](#footnote-10) to concepts developed in the United States of America more than 40 years ago, which made significant investments – financial, intellectual and human – in the development of early and later iterations of the Internet. Various technologies underpin the Internet (such as computing, digital communications and semiconductors). For example, in 1973, TCP/IP was first proposed and experimentally deployed a few years later to link packet-based networks. Thus was born the set of interconnected networks, computers and applications known as the Internet. In 1983, the Domain Name System (DNS) was introduced to allow the use of semantic names for host computers, which could be resolved to IP addresses, thus simplifying use of the Internet [source: [U.S.A./CNRI](http://www.itu.int/md/S12-WTPF13PREP-C-0019/en)[[11]](#footnote-11)]. Indeed, some of the key characteristics of the Internet today reflect the priorities and historical choices made during the course of its development (e.g., its architecture, the priority given to information-sharing and exchange, and the possibility of anonymity).
2. The Internet has evolved far beyond its initial experimental setting. Today’s information infrastructure encompasses a host of public and private IP-based and other networks with potentially global reach. It is estimated that more than 5,000 networks interconnect in the Internet [source: [U.S.A](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en).[[12]](#footnote-12)].
3. The significance of the Internet can be measured by a number of quantitative and qualitative metrics. Quantitative metrics measuring the size and growth of the Internet include, for example, its contribution to GDP[[13]](#footnote-13) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[14]](#footnote-14)], growth in infrastructure deployment[[15]](#footnote-15) (e.g., international Internet bandwidth, length of fibre deployed, the number of Internet servers), content (e.g., number of websites, volume of data traffic transmitted or stored[[16]](#footnote-16)) and Internet adoption (e.g., number of Internet subscriptions, number of fixed and wireless broadband subscriptions, number of Internet users[[17]](#footnote-17)) and diverse activities carried out via the Internet (e.g., integration of the Internet into existing business or citizen processes), *inter alia*. Qualitative metrics include measuring the impact of the Internet in transforming or inventing new business and citizen processes, for example. Various studies suggest that the Internet is transforming the global economy, as well as local economies. The Internet contributes to the global economy and creates opportunities for communities around the world.
4. The Internet has also become a vehicle for spam[[18]](#footnote-18), online child pornography and other abuses of children[[19]](#footnote-19), identity theft and cybercrime[[20]](#footnote-20), [[21]](#footnote-21), cyberterrorism, as well as use of Internet resources for purposes that are inconsistent with international peace, stability and security [source: [Russian Federation](http://www.itu.int/md/S12-WTPF13PREP-C-0032/en)[[22]](#footnote-22)]. Indeed, lack of security may limit even wider adoption of the Internet and its use for greater good; further, greater local language content is strongly associated with greater Internet use in many parts of the world[[23]](#footnote-23), so the lack of local language content may inhibit demand [source: [Saudi Arabia and Sudan](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) [[24]](#footnote-24)]. Considerable work has been done to mitigate these issues at ITU (e.g. various study groups within ITU, ITU-IMPACT) and in many forums, including, for example: the Council of Europe; the Organisation for Economic Cooperation and Development (OECD); the Asia-Pacific Economic Cooperation Forum (APEC); the Forum for Incident Response and Security Teams (FIRST); the Messaging Anti-Abuse Working Group (MAAWG); the Anti-Phishing Working Group, and the Government Group of Experts (GGE) in Committee 1 of the UN General Assembly, which are addressing issues related to cybercrime, fraud, and child pornography. There is a strong correlation between the development of local network infrastructure and the growth of local content. As a result of investments made around the world, local content is growing in volume. Further, local content composition is changing. Today, content is no longer dominated by developed countries but is more representative of the diversity of the many cultures, languages, and communities that exist across the globe [[25]](#footnote-25) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[26]](#footnote-26)].
5. In fact, the Internet is today available in nearly every country and supports applications that touch on virtually all aspects of society. The Internet has become a vital part of critical national information infrastructure, and a key driver of socio-economic growth and development, among other drivers. A 10% increase in broadband penetration has been estimated to yield a 1.21–1.38% increase in Gross Domestic Product (GDP) growth on average for high-income and low-/middle-income countries respectively (World Bank, 2009). Country case studies yield similar estimates for individual countries (e.g., for Panama, the Philippines and Turkey[[27]](#footnote-27)).
6. Total Internet users numbered some 2.3 billion worldwide by the end of 2011 (Figure 1, left). Total mobile broadband subscriptions amounted to 1.19 billion. English and Chinese are the languages most commonly used by Internet users, with English-speaking and Chinese-speaking Internet users amounting to some 565 million and 510 million or 27% and 24% of total Internet users worldwide respectively by May 2011 (Figure 1, right), with Spanish a distant third. If current growth rates continue[[28]](#footnote-28), the number of Internet users accessing the Internet predominantly in Chinese will overtake the number of Internet users accessing the Internet predominantly in English by 2015.
7. The strong and sustained growth of the Internet can be credited to the work of several generations of engineers, entrepreneurs, innovators, and investors across many parts of the globe. The path for their successful innovations and the growth of the Internet has been recently facilitated by market reforms from the 1980s and 1990s, which helped to replace the regime of state-owned, monopoly carriers with liberalized and competitive markets and private sector participation. Such reforms include market opening and competition[[29]](#footnote-29), billing arrangements for the transfer of international telecommunication traffic, market liberalization, and private sector participation in telecom markets, including privatization[[30]](#footnote-30). Indeed, worldwide, mobile markets have been subject to a greater degree of competition (compared to, for example, fixed line markets) and have enjoyed the highest and most sustained growth rates of any ICT sector[[31]](#footnote-31).
8. Advances in infrastructure have been made possible due in large part to investment by Governments, investors and particularly by network operators, who build and maintain the global information infrastructure. Recent studies indicate that while Internet traffic is increasing, the usage-based cost per subscriber of the fixed network is fairly constant[[32]](#footnote-32) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[33]](#footnote-33)].
9. Para. 50 of the *Tunis Agenda* recognizes the important role of local Internet Exchange Points (IXPs), with growing evidence for the significant cost and performance gains associated with IXP development in some emerging markets (for example, Kenya and Nigeria, where reductions in telecommunication traffic costs, reduced latency of local traffic, increased amounts of local content and greater usage of the Internet were observed to be associated with the establishment and activities of the IXPs in these countries[[34]](#footnote-34)).
10. The increased use of the Internet enhances the value of the network as a result of “network effects”[[35]](#footnote-35) and Metcalfe’s Law[[36]](#footnote-36). This enhanced value encourages the development of additional applications and services based on its architecture and the “end-to-end” principle e.g., the utilization of e-mail and text messaging, Voice over IP (VoIP), streaming and real time video, TV (IPTV) over the Internet, social networking, search capabilities, e-books, e-government, e-learning, e-health etc. By 2011, there were 135.4 million VoIP subscribers and 60 million IPTV subscribers worldwide[[37]](#footnote-37).

**Figure 1: Total Internet Users, by geographic region, and by language, 2011**

 

Source: ITU from <http://www.itu.int/ITU-D/ict/statistics/at_glance/KeyTelecom.html> (left); Internet World Statistics from <http://www.internetworldstats.com/stats7.htm> (right).

1. It may be observed that[[38]](#footnote-38):

i. Broadband and Internet penetration rates are markedly higher in developed countries than they are in developing countries, while the differences with respect to mobile cellular penetration are smaller.

ii. The growth of fixed (wired)-broadband subscriptions, Internet users and mobile cellular subscriptions during the period 2005-2011 has slowed mainly in developed countries, as these markets reach saturation. In the developing world, growth continues at double digit rates.

iii. In most of the developing world, 2.5G and 3G mobile has grown far faster than fixed Internet. Mobile broadband continues to be the ICT service displaying the sharpest growth rates. Between 2010 and 2011, growth continued at a rate of 40% globally, 23% in the developed world and 78% in developing countries. By end 2011, there were around 1.19 billion active mobile broadband subscriptions, up from 770 million a year earlier. Contrary to mobile-cellular penetration, no saturation point has yet been reached for mobile broadband penetration, and growth is expected to continue at double-digit rates over the next few years.

1. The Internet has fundamental value as a platform for business, innovation, democratic expression, access to information and scientific progress. In the growing digital economy, the Internet represents a portal for knowledge, education and entertainment which is becoming increasingly available to more of the world’s population, especially if growth in the use of mobile broadband can mirror the recent overall growth in mobile communications.
2. Today, the Internet is becoming “one of the basic commodities of life” and various studies have cited the information and knowledge provided over the Internet as examples of global public goods[[39]](#footnote-39). The Internet is comprised of many individual networks, although some networks (but not always the content) may be the property of distinct groups, companies or individuals [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[40]](#footnote-40)]. Applications such as the World Wide Web, E-mail, and Instant Messaging have changed the lives of ordinary people in some parts of the world. It is widely recognized that the utility and value of a network increases with the square of the growth in the number of nodes and users of that network.
3. One ideal is that the Internet, as a decentralized and open system, must be allowed to enable the world’s citizens to connect freely and express themselves consistent with fundamental principles of freedom of expression, as detailed in Article 19 of The Universal Declaration of Human Rights and recently reaffirmed by the UN Human Rights Council, while taking into consideration national security or of public order (ordre public), or of public health or morals[[41]](#footnote-41). Consistent with the nature of knowledge, information and forms of expression provided over the Internet as global public goods, ITU Member States may wish to consider policy measures to increase and promote the continued growth of the Internet and the markets and economies based thereon.
4. At the World Summit on Information Society (WSIS), world leaders and Heads of State adopted general principles on a multi-stakeholder governance model, which offer a fundamental framework on which to base such policy measures. Various initiatives have been undertaken at the national level to enunciate high-level governing principles for cyberspace (including, *inter alia*, the United States [International Strategy for Cyberspace](http://www.whitehouse.gov/sites/default/files/rss_viewer/international_strategy_for_cyberspace.pdf), and Brazil’s ten "[Principles for the Governance and Use of the Internet](http://cgi.br/)” and the concept of the Russian Federation Convention on International Information Security), and at the international level (such as the Report of the Group of Governmental Experts on Developments in the Field of Information and Telecommunication in the Context of International Security 65/201, International Code of Conduct for Information Security A/66/359, and the OECD Council Recommendation on Principles for Internet Policy-Making[[42]](#footnote-42)).
5. Advances in information infrastructure, including the development of IP-based networks and the Internet, taking into account the requirements, features and interoperability of next-generation networks (NGN) and future networks, are vitally important as a major engine for growth in the world economy in the twenty-first century.
6. The management of digital information has emerged in recent years as an important aspect of the Internet going forward. This will benefit many new efforts such as those involving current architectures – Cloud Computing, Big Data and the Internet of Things – and new architectures, such as the Digital Object Architecture (DOA), are being developed and deployed which support these initiatives [source: [U.S.A./CNRI](http://www.itu.int/md/S12-WTPF13PREP-C-0019/en) [[43]](#footnote-43)]. Major research and development activities are underway in the EU, the US, Rep. of Korea, Japan and elsewhere on new architectures and protocols for the future Internet, which aim, *inter alia*, to improve capacity, performance, stability and recognized weaknesses in security, and provide support for multilingualization.

**2.3.2 The Multi-stakeholder Model**

**2.3.2.1 The Multi-stakeholder Model has been recognized at WSIS as the global model for Internet governance; WSIS outcome documents provided a set of framework principles for the multistakeholder model**

a) Two key outcomes of WSIS were: (1) the clear enunciation of principles for the multi-stakeholder governance model of the Internet[[44]](#footnote-44) and (2) the recognition of this model as the way forward for the global governance of the Internet, as reflected throughout the WSIS outcome documents[[45]](#footnote-45), examples of which are included in paragraphs (b)-(e) of this subsection.

b) “A working definition” of Internet governance was developed by the Working Group on Internet Governance (WGIG, a group comprising all stakeholders[[46]](#footnote-46)) and later adopted by Summit and included in para. 34 of the *Tunis Agenda,* which states that Internet Governance is “the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet”. Para. 58 of the *Tunis Agenda* notes that Internet governance includes more than Internet naming and addressing; therefore it also includes other significant public policy issues such as, *inter alia*, critical Internet resources, the security and safety of the Internet, and developmental aspects and issues pertaining to the use of the Internet [source: [ISOC Bulgaria](http://www.itu.int/md/S12-WTPF13PREP-C-0037/en)[[47]](#footnote-47)].

c)   Para. 29 of the *Tunis Agenda* reaffirmed that 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.

d) The roles and responsibilities of each stakeholder group are specified in para. 35 of the *Tunis Agenda*, which states that:

“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:

1. 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, complemented by relevant legislation being enacted by appropriate law-making bodies (including Parliaments, etc.).
2. 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.
3. Civil society has also played an important role on Internet matters, especially at community level, and should continue to play such a role.
4. Intergovernmental organizations have had, and should continue to have, a facilitating role in the coordination of Internet-related public policy issues.
5. International organizations have also had and should continue to have an important role in the development of Internet-related technical standards and relevant policies”.

e) Under the broad framework of the multistakeholder governance model, the *Tunis Agenda* provides *guiding principles* for various aspects of the management of the Internet, including:

The relevant outcomes (§§ 29-82 of the Tunis Agenda) concerning Internet governance.

§§ 68-71 and 72-78 of the Tunis Agenda with regard to enhanced cooperation on Internet governance and the establishment of the Internet Governance Forum (IGF).

**2.3.2.2 Through its Plenipotentiary Resolutions, ITU membership recognizes the multi-stakeholder governance model based on WSIS principles as the framework for global Internet governance**

1. The recognition of WSIS principles, of the multistakeholder model of Internet governance and of the important role and responsibilities of each stakeholder group is emphasized in the various Plenipotentiary Resolutions, especially in Res. 102 (Rev. Guadalajara, 2010).
2. Many of the paragraphs from the *Tunis Agenda* on multistakeholder cooperation are included, *inter alia*, in Resolutions 101, 102 and 133. The need for multistakeholder cooperation is also apparent in paragraphs such as the ones below[[48]](#footnote-48) where the contribution from specific stakeholder groups towards the development of the Internet is acknowledged, while urging the involvement of all stakeholders in various aspects of its management:
3. The development of the Internet is today essentially market-led and has been driven by both private and government initiatives.
4. The private sector continues to play a very important role in the expansion and development of the Internet, for example through investments in infrastructures and services.
5. The management of the Internet is a subject of valid international interest and must flow from full international and multistakeholder cooperation on the basis of the WSIS outcomes.
6. As stated in the WSIS outcomes, all governments should have an equal role and responsibility for international Internet governance and for ensuring the stability, security and continuity of the existing Internet and its future development and of the future Internet, and that the need for development of public policy by governments in consultation with all stakeholders is also recognized.
7. WSIS recognized the need for enhanced cooperation in the future, to enable governments, on an equal footing, to carry out their roles and responsibilities, in international public policy issues pertaining to the Internet, but not in the day-to-day technical and operational matters that do not impact on international public policy issues [source: para. 69, *Tunis Agenda*[[49]](#footnote-49)].
8. Recalling the results of WSIS, there should be a commitment to working earnestly towards multilingualization of the Internet, as part of a multilateral, transparent and democratic process, involving governments and all stakeholders, in their respective roles [source: para. 53, *Tunis Agenda*[[50]](#footnote-50)].

**2.3.2.3 The implementation of the WSIS multistakeholder principles is under discussion. The issues raised in the Plenipotentiary Resolutions reflect the delicate interplay between the roles and responsibilities of different stakeholders in the management of the Internet**

1. The principle of multistakeholder governance of the Internet is broadly recognized. Discussions on Internet governance have been carried out from both a narrow and broad perspective. The narrow perspective focuses on Internet architecture and infrastructure (DNS, IP numbers, and root servers) – fields in which organizations such as the Internet Corporation for Assigned Names and Numbers (ICANN), the Regional Internet Registries (RIRs) play a significant role, with many stakeholders therein. A broader perspective on Internet governance goes beyond infrastructural points and address other legal, economic, developmental, and socio-cultural issues, such as the approach adopted by the WSIS [source: [Brazil](http://www.itu.int/md/S12-WTPF13PREP-C-0009/en)[[51]](#footnote-51)].
2. The WSIS outcome documents and ITU Plenipotentiary Resolutions, as well as many national and regional initiatives[[52]](#footnote-52), have endorsed the WSIS multistakeholder model for the management of the Internet that includes governments, private sector, international and intergovernmental organizations, civil society and academia.
3. A divergence in opinion is observed in the implementation of the WSIS multistakeholder model in the current Internet governance ecosystem:
4. One view is that the current governance of the Internet is sufficiently multistakeholder and inclusive in terms of involvement of all stakeholder groups[[53]](#footnote-53) [sources: [Cisco](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en), [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en), [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0007/en), [ISOC](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en)[[54]](#footnote-54)]. Those holding this view state that the current organizations, systems and processes have successfully met the needs of its stakeholders through “industry-led, bottom-up, voluntary, decentralized and consensus-based” processes. The current model has been cited has being “flexible, transparent and accountable”, “enabling a stable, open and innovative network of networks, the Internet today” [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en)[[55]](#footnote-55)]. These characteristics are credited with helping maximize flexibility and innovation and are cited as one reason why the Internet has been able to evolve and grow so quickly, both as a technological platform and as a means of expanding the free flow of commerce and ideas.

Another view is that further evolution is needed to keep pace with the spread of the Internet around the world, how the Internet is used today and that the various players need to work together to ensure its ongoing evolution[[56]](#footnote-56) [sources: [Saudi Arabia and Sudan](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en), [Algeria](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en)[[57]](#footnote-57)]. Those holding this view state that, with regards to international Internet-related public policy, the role of one stakeholder – Governments – has not been allowed to evolve according to WSIS principles. They consider this to be one reason for ongoing challenges in dealing with various issues (e.g., exploitation of children, security, cyber-crime and spam, etc). Those with this view identify and raise issues associated with the flexibility, transparency and accountability of the current management structure and issues concerning, for example, the adequacy of the role of governments in ICANN through bodies such as the GAC (see Section 2.3.6).

1. At the same time it is important to mention the view that the multistakeholder

model while

worked efficiently in ad hoc technical organizations , it requires a completely different effort to be successful when it is applied to global policy making.[[58]](#footnote-58) First of all , the open nature of the multistakeholder process does not guarantee by itself an effective participation of all stakeholders. Indeed, participation today has become the main principle of any form of Internet governance. This process, sometimes called “participatory evangelism”, offers people opportunities to get involve but not to really count in the decision making process. Indeed “ there is an important distinction between making your views known and making your views counts” .This is what quite often happens in the decision process of organizations such as ICANN. Analogous considerations can be made regarding the transparency of the multistakeholder process. Quite often information overload characterizes meetings and fora of the multistakeholder process creating real difficulties in identifying really important issues. Furthermore, different risks of capture by different groups ( “Internet evangelists” or rappresentative from developed countries in the IGF or in the GAC of ICANN, or the private sector ) have been suggested in the current process. Therefore, a stronger effort is required by all parties to improve and make more successful this process.

One additional view is to develop the current system of Internet governance from a multistakeholder to a **multi-istitutional model**.[[59]](#footnote-59) According to this approach forms of governance have to be linked to the type of governance challenge. Some problems, such as cybersecurity, will need a stronger government involvement, as a basis for international agreements. Others, such the development of technical standars should see the prevailance of self regulation among the key players. Finally, issues particularly relevant to civil society, such as the use of internet for the empowerment of disadvantages people, will be better addressed by bottom up processes, involving the interested communities.

1. Res. 102 (Rev. Guadalajara, 2010) recognized “§§ 71 and 78a) of the *Tunis Agenda* with regard to the establishment of enhanced cooperation on Internet governance and the establishment of the Internet Governance Forum (IGF), as two distinct processes”. The IGF brings stakeholders together annually to host a dialogue on international Internet-related public policy issues.

One topic of discussion[[60]](#footnote-60),[[61]](#footnote-61) concerning the implementation of the process of enhanced cooperation focuses on the role of different stakeholder groups. One view is that the “process towards enhanced co-operation involves all stakeholders in their respective roles, a recognition of the need for all stakeholders to recognize the ongoing roles of each stakeholder and for all to co-exist in an environment of mutual trusted co-operation” [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) [[62]](#footnote-62)]. Another view is that there is a specific role for governments, as defined clearly in Para. 69 of the *Tunis Agend*a: “enhanced cooperation is needed to enable governments, on an equal footing, to carry out their roles and responsibilities in international public policy issues pertaining to the Internet”, as well as in Para. 71: “the process towards enhanced cooperation will involve all stakeholders in their respective roles” [sources: [Saudi Arabia and Sudan](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en), [Algeria](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en)[[63]](#footnote-63)].

One view is that participation of different stakeholder groups (especially civil society) could be improved in ITU forums discussing Internet-related public policy issues [sources: [Cisco](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en), [ISOC](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en)[[64]](#footnote-64)]. This has been a topic of active discussion at recent ITU conferences, assemblies and meetings. Detailed discussions on this topic were held as recently as in Council 2012 in the context of the modalities for open consultations by the CWG-Internet[[65]](#footnote-65). Under the WSIS principles, ITU Plenipotentiary Resolutions 101, 102 and 133 resolve “to explore ways and means for greater collaboration and coordination between ITU and relevant organizations\* involved in the development of IP-based networks and the future Internet, through cooperation agreements, as appropriate, in order to increase the role of ITU in Internet governance so as to ensure maximum benefits to the global community” (\* including, but not limited to, ICANN, RIRs, Internet Engineering Task Force (IETF), the Internet Society (ISOC) and World Wide Web Consortium (W3C), on the basis of reciprocity)[[66]](#footnote-66).

1. ITU’s multistakeholder membership includes governments, regulators, industry, international organizations (intergovernmental and non-governmental), financial institutions and civil society[[67]](#footnote-67) — all participating in different capacities and in a wide range of ITU’s activities. ITU’s membership ranges from mobile and fixed phone operators to satellite companies, from equipment vendors to broadcasters and Internet Service Providers (ISPs). It also includes organizations focusing on access for people with disabilities, for example, or on emergency communications. ITU members also include various Internet-related organizations and academic institutions, including universities and research institutes focusing on ICTs. Indeed, non-profit institutions having an international character can request exemption from membership fees[[68]](#footnote-68).

Another view is that there is a lack of clarity on whether civil society is part of ITU membership and how such organizations can become members of the ITU. It should be noted that all civil society organizations of an international nature and which are working on issues related to ICTs are entitled and encouraged to join the ITU as members.

The ITU’s IPv6 Group, formed by ITU Council under the Directors of the ITU Development and Standardization Bureaux, is one example of inter-institutional collaboration and coordination. The WTPF IEG, which is open to all stakeholders outside ITU and is contributing to the preparation of this report in transparent and constructive manner, is another example of successful multistakeholder cooperation. In order to promote greater understanding of the involvement of all stakeholder groups within ITU fora, it could be beneficial for ITU to foster similar collaborative efforts between ITU and other relevant groups [source: [PayPal](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en)[[69]](#footnote-69)].

The World Conference on International Telecommunications (WCIT) Resolution 3, “To foster an enabling environment for the greater growth of the Internet”[[70]](#footnote-70), reinforces ITU’s support for the involvement of various stakeholder groups in its multistakeholder fora. The Resolution instructs the Secretary-General to continue to take the necessary steps for ITU to play an active and constructive role in the development of broadband and the multistakeholder model of the Internet as expressed in §35 of the Tunis Agenda. It therefore calls upon the Secretary-General to support the participation of Member States and all other stakeholders, as applicable, in the activities of ITU in this regard. It calls on Member States to engage with all their stakeholders to help them elaborate on their respective positions on international Internet-related technical, development and public-policy issues within the mandate of ITU at various ITU forums.

* + 1. **Internet Protocol (IP)-Based Networks and Management of Internet Resources**

1. Fixed and mobile broadband Internet are critical infrastructures in the growing global economy. As explained previously in section 2.3.1.j, the increased use of the Internet enhances the value of the network as a result of the “network effect” and Metcalfe’s Law and encourages additional development of applications, information services and content, due to the nature of the Internet and the ‘end-to-end principle’ siting intelligence at the edges allowing for the easy introduction of new applications [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[71]](#footnote-71)]. Internet services are today widely used, although challenges regarding quality of service (QoS), uncertainty of origin for some applications, and high costs of international Internet connectivity (IIC) persist for many developing countries. Today, many developing countries are looking at promoting the development of national infrastructure with the creation of national IXPs and improving the environment for the growth of local content and applications (e.g. Kenya and Nigeria) [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[72]](#footnote-72)]. Most carriers endeavor to provide a satisfactory level of service to end-users [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[73]](#footnote-73)].
2. Thanks to innovation and investment, the Internet has become a critical information infrastructure, a vital part of national and international infrastructures and an engine of growth in the twenty-first century. The Internet will continue to evolve and introduce new ways to acquire, produce, circulate and consume information. Encouraging competition, thereby providing high-speed Internet at low prices, will continue changing the way we produce and sell products and services for the benefit of all people [source: [ISOC Bulgaria](http://www.itu.int/md/S12-WTPF13PREP-C-0037/en)[[74]](#footnote-74)].
3. On the basis of such growth, demands are now growing on the existing Internet infrastructure. One view is that the underlying technical architecture of the present Internet may not have been designed for, and hence may not be sufficiently robust, to support some new classes of applications and services. Security, identity management and multilingualism are commonly cited examples[[75]](#footnote-75). Another view is that the current architecture has allowed astonishing levels of innovation and growth with, in particular, massive uptake of video traffic and multi-user applications [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en)[[76]](#footnote-76)]. Opinions differ as to how well current infrastructure may be able to continue to evolve and grow to cope with growth in demand.
4. However, the most recent literature acknowledges that the technological and economic environment of the Internet has dramatically changed since the mid‐1990s. [[77]](#footnote-77)In particular, four major changes have forced the networks to evolve since then:

1) **Increase in the number and diversity of end users**: from a small population of scientists and researchers to a user base much larger, more diverse and less technologically sophisticated;

2) **Increase in the diversity and intensity of applications**: from low intensity bandwidth applications such as email and web‐browsing to videoconferencing, to online gaming which is much more bandwidth ;

3) **Increase in the variety of technologies**: while in the mid‐90s access to the Internet was granted through dial‐up modems, now access is guaranteed through a variety of technologies such as cable modems, digital subscriber lines (DSL), fiber to the home and wireless solutions. These new technologies have different characteristics in terms of bandwidth, reliability and mobility, bringing a substantial degree of heterogeneity in the Internet world compared to the uniformity of the wireline solutions of the mid‐90s.

4) **The emergence of more complex business relationships.** In the mid‐90s, the topology of the Internet was characterized by a strict three‐level hierarchy: backbones, regional Internet service providers and last mile access providers. Now the Internet, as a network of networks, is characterized by a set of much more diverse business relationships such as, for instance, private peering and content delivery networks.

These technological and economic changes over the past fifteen‐plus years have placed increasing pressures on the Internet to develop new architectural principles and in, particular, are leading, among other characteristics, towards :

1)Changes in the optinal level of standardization to match the greater demand for heterogeneity ; 2)The shift towards more formal governance to manage the increase in the number and heterogeneity of end users

3)The migration of functions into the core of the network for a better management of security and congestion

4) the growing complexity of internet pricing to support the new business relations of today Internet.

1. The high costs of the circuits for IIC between Least Developed Countries (LDCs) and the Internet backbone networks remains a persistent problem for these countries[[78]](#footnote-78). An enabling and competitive environment must be in place to allow for availability of affordable bandwidth for cross-border and in-country interconnection, as well as to enable ISPs to make commercial arrangements for peering or transit [source: [Cisco](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en)[[79]](#footnote-79)]. Para. 50 of the *Tunis Agenda* (2005) acknowledged there are concerns, particularly amongst developing countries, that the charges for IIC should be better balanced to enhance access. It called for the development of strategies for increasing affordable global connectivity, thereby facilitating improved and equitable access for all, by:
2. Promoting Internet transit and interconnection costs that are commercially negotiated in a competitive environment and that should be oriented towards objective, transparent and non-discriminatory parameters, taking into account ongoing work on this subject.
3. Setting up regional high-speed Internet backbone networks and the creation of national, sub-regional and regional IXPs.[[80]](#footnote-80)
4. Recommending donor programmes and developmental financing mechanisms to consider the need to provide funding for initiatives that advance connectivity, IXPs and local content for developing countries.
5. Encouraging ITU and other relevant institutions to continue the study of the question of IIC as a matter of urgency, and to periodically provide outputs for consideration and possible implementation.
6. Promoting the development and growth of low-cost terminal equipment, such as individual and collective user devices, especially for use in developing countries.
7. Encouraging ISPs and other parties in the commercial negotiations to adopt practices towards attainment of fair and balanced interconnectivity costs.
8. Encouraging relevant parties to commercially negotiate reduced interconnection costs for LDCs, taking into account the special constraints of LDCs.
9. Rates for IIC have been studied in ITU-T Study Group 3 with several recommendations[[81]](#footnote-81) having been made on methods to reduce connectivity rates. WCIT Resolution 5[[82]](#footnote-82) - on “International telecommunication service traffic termination and exchange” - invites concerned Members States to collaborate so that their regulatory frameworks promote the establishment of commercial agreements between authorized operating agencies and the providers of international services in alignment with principles of fair competition and innovation. The Resolution also instruct the TSB Director to take necessary action in order that ITU-T Study Group 3 study recent developments and practices with regard to the termination and exchange of international telecommunication traffic under commercial agreements, so as to develop a Recommendation, if appropriate, and guidelines for concerned Member States, for the use of providers of international telecommunication services in regard to issues they consider relevant.
10. ITU Member States and the ITU may wish to consider which policy environments and strategies can facilitate the growth of networks and reduction in connectivity rates, including IXPs (both at a local and regional level). The need for IIC can be reduced through the development of local/ national/regional networks. Content hosted within a country rather than abroad, will reduce demand for international connectivity. Hosting local content closer to the users may also reduce latency, improve user experience, and increase demand for Internet connectivity [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en)[[83]](#footnote-83)].
11. With the move from traditional networks (based on dedicated service-channels and/or separate networks for each service) to integrated (transport) services on a single packet-based transport infrastructure, maintaining pre-defined transmission planning of Quality of Service (QoS)[[84]](#footnote-84) presents a challenge, since many IP-based networks might not provide for self-standing end-to-end QoS, but only transport classes, which enable QoS differentiation. Rather than relying on expensive, fault-tolerant equipment for reliability, engineers experimented with a larger number of inexpensive, less reliable nodes with a multiplicity of paths as another option to obtain reliability [source: [PayPal](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en)[[85]](#footnote-85)].
12. An IP-based network can support end-to-end QoS, if its routers support the appropriate mechanisms and the network is designed for QoS. Adding Quality of Service to a network can increase the complexity and the cost of the network depending on the mechanisms used and the service quality levels provided [source: Discussion of Ad Hoc Group, first IEG meeting[[86]](#footnote-86)].
13. Due to the dramatic increase in mobile communications (both in terms of the number of registered devices and of the volume and transmission of requested resources), some have cautioned that migration scenarios and hybrid connections with existing wireline and traditional networks and terminals may be neglected and it may become increasingly difficult for network operators to establish, implement or maintain certain QoS standards[[87]](#footnote-87).
14. One view is that the importance of standardization is such that the quality of service of telecommunications/ICTs should be in line with international standards. It is in the public interest that IP-based networks and other telecommunication networks be both interoperable and provide, at a minimum, the level of QoS provided by traditional networks[[88]](#footnote-88). Another view is that any attempt to mandate traditional QoS in a packet switching Internet will significantly increase costs; a likely consequence of this could be to price LDCs out of the Internet and to reduce participation rates in developed and developing countries [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en)[[89]](#footnote-89)]. IP-based networks can support end-to-end QoS if the routers in between support the mechanisms and the network is designed for QoS [source: Discussion of Ad Hoc Group at first IEG meeting[[90]](#footnote-90), [Saudi Arabia and Sudan](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en)[[91]](#footnote-91)].
15. One view is that the present situation of the wide penetration of Over The Top (OTT) services[[92]](#footnote-92) over operators’ networks and their impact on operators’ services, may require ITU to consider management of QoS for OTT services which are carried over the Internet [source: [Russia](http://www.itu.int/md/S12-WTPF13PREP-C-0010/en)[[93]](#footnote-93)]. Specifically on OTT, some have stated that OTT is outside the scope of the ITU and that management of QoS for applications that run over the Internet are the core mandate of other organizations, except where these organizations should work with the ITU-T for those areas within the ITU-T’s mandate [sources: [Cisco](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en), [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en)[[94]](#footnote-94)]. Another view is that “telecommunications services, whether or not carried over the Internet, are within the mandate of ITU” [sources: [Saudi Arabia and Sudan](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en)[[95]](#footnote-95)]. ITU’s mandate is defined by its membership and ITU-T’s standardization work is driven by membership contributions.
16. As a natural consequence of today’s environment, from a commercial perspective, there is a growing discrepancy between the growth in traffic (requiring corresponding significant growth in investment in telecommunication infrastructure) and trends in pricing and revenues (Figure 2). One view is that the mismatch between trends in traffic growth, pricing and revenues poses a challenge to network operators[[96]](#footnote-96). Another view is that investment in new capacity is keeping up the growth in traffic [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[97]](#footnote-97)].

**Figure 2: Trends in pricing and revenues[[98]](#footnote-98)**



1. Figure 2 does not show cost data. One view is that it is normal for prices to fall, if costs in falling, and indeed there is reason to believe that operating costs are falling (but data on operating costs are hard to obtain). Another view is that capital expenses (which contribute to overall costs) will rise significantly and that consequently the current billing paradigm for Internet services should be revisited[[99]](#footnote-99).
2. IP-based networks have evolved into a widely accessible and flexible medium used for commerce and communication. Resolution 101 (rev. Guadalajara, 2010) recognizes a need to identify the global activities related to IP-based networks with respect to, for example:
   * 1. infrastructure, interoperability and standardization;
     2. Internet naming and addressing;
     3. dissemination of information about IP-based networks and the implications of their development for ITU Member States, particularly among developing countries.

**2.3.3.1 Infrastructure, interoperability and standardization[[100]](#footnote-100)**

1. Internet-related applications are carried over both publicly and privately-owned telecommunication infrastructure (wired and/or wireless)[[101]](#footnote-101).
2. Convergence of ICT technology is making IP a key protocol for services provided over modern telecommunication networks[[102]](#footnote-102), and IP is also playing an increasing role in underpinning infrastructure.
3. There have been calls for bold new initiatives to continue to expand the flexibility and capabilities of the Internet beyond incremental improvements to its deployed capabilities[[103]](#footnote-103). Further research and development and innovation in the fundamental design of the Internet (including architecture, protocols, interfaces and services) is taking place (through both government-funded and private sector research) and may need to be encouraged further.
4. Given the depth to which the Internet is today embedded in the socio-economic fabric of many societies, any evolutionary approach to building the future Internet should strive to ensure full interoperability with the existing one to minimize disruption.
5. Research and standardization play an important role in ensuring this interoperability, while facilitating the continuous development of the Internet and its capabilities[[104]](#footnote-104). Significant work and research on IP-related issues and the future Internet is being conducted by many bodies at the national, regional and international levels. Some examples include: ITU; the Internet Engineering Task Force (IETF); US National Science Foundation (NSF) projects, including the Global Environment for Network Innovations (GENI) and Future Internet Design (FIND) projects; Japan’s NeW Generation Network (NWGN) research and development initiative, including the Akari project by Japan’s National Institute of ICT (NICT); and the European Union’s Future Internet Research & Experimentation (FIRE) initiative.

**2.3.3.2 Internet Naming and Addressing**

1. Every device connected to the Internet is identified by an IP address used to route data packets globally across the Internet. IP addresses are a finite resource. The current implementation, IP version 4 or ‘IPv4’, was deployed on 1 January 1983 and uses 32 bits to represent addresses, generating a theoretical total limit of 232 (4 billion addresses). It is still the most widely used today. While IPv4 limits unique IP addresses to approximately 4 billion devices, this does not establish the upper bound of devices that may connect to the Internet using IPv4. Rather, there is no static upper bound considering most devices connect to the Internet through private networks that assign IP addresses dynamically using protocols like DHCP[[105]](#footnote-105) [source: [PayPal](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en)[[106]](#footnote-106)].
2. The Internet Assigned Numbers Authority (IANA)[[107]](#footnote-107) is a set of technical functions that include the allocation of IP addresses from the global pool of unallocated addresses to the RIRs, according to their needs. Another key IANA role is the reservation of IP addresses for specific technical purposes, which is carried out following the direction of the IETF. Examples include Multicast assignments, transition tunnelling technologies and private use addresses.
3. The continued rapid growth of the number of devices connected to the Internet led to the exhaustion of the IANA managed global pool of IPv4 addresses. In anticipation of this exhaustion, in 1998 the IETF developed a new version - IPv6[[108]](#footnote-108) - which provides a greatly expanded address space since it uses 128 bits to represent addresses (generating a new limit of 2128 addresses, equivalent to some 340 undecillion). IANA began allocating blocks of IPv6 addresses in 1999[[109]](#footnote-109), [[110]](#footnote-110). In February 2011, IANA assigned the last five remaining free blocks of IPv4 addresses to the five RIRs and IANA’s global IPv4 pool was exhausted.
4. The smooth migration from IPv4 to IPv6 represents a key global issue, the fundamental crux of which is that IPv6 and IPv4 are not compatible at Layer 3. The same infrastructure, equipment, etc. can be used for IPv6, but a modified Layer 3 stack must be deployed that supports both protocols: IPv4 and IPv6 [source: Discussion of the Ad Hoc Group at first IEG meeting[[111]](#footnote-111)]. In addition, some applications (that use IP address literals) must be modified. IPv6 implementation has been picking up relatively significantly in recent years [sources: ARIN, [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0019/en)[[112]](#footnote-112)], [[113]](#footnote-113) , but absolute statistics show that IPv6 deployment is still low[[114]](#footnote-114) [source: [Algeria](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en)[[115]](#footnote-115)] and more could be done to encourage the deployment and smooth migration to IPv6. According to some, the deployment of IPv6 should become a clearly-stated priority objective for national policy-makers and all stakeholders to enhance the pace of IPv6 deployment[[116]](#footnote-116). The WTSA 2008, WTDC-2010, and Plenipotentiary 2010 resulted in Resolutions related to IP addressing that stressed the need for human capacity development and training with respect to IPv6 address deployment.
5. One view is that the approach that new IPv6 allocation policies could be similar to IPv4 policies, on a “first come, first serve” basis with ‘demonstrated’ need. However, another view is that this may represent a cause for concern[[117]](#footnote-117). One view is that this policy has led to the occupancy of a substantial amount of the finite IP addresses in the IPv4 address space and may work against late entrants, especially developing countries. Another view is that IPv6 address space is virtually inexhaustible, and that this quasi-inexhaustibility of the IPv6 space means that any past issues regarding imbalances [sources: ARIN, [Cisco](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en)[[118]](#footnote-118)] would be avoided in the future and therefore the current allocation policies of the RIRs are feasible for IPv6. Those with this view note that IPv6 address policies apply from the beginning, whilst IPv4 policies have developed retrospectively [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en)[[119]](#footnote-119)]. The [2005 report of WSIS-Working Group on Internet Governance (WGIG)](http://www.itu.int/wsis/wgig/docs/wgig-background-report.pdf) acknowledged that “the current numbering management is required to ensure equitable distribution of resources and access for all into the future”.
6. Furthermore, now that IANA and APNIC have exhausted their IPv4 free pools (in February and April 2011, respectively), for the current migration to IPv6, ISPs using IPv6 still need to use IPv4 in order to be able to access large amounts of content[[120]](#footnote-120) and users[[121]](#footnote-121) that are still IPv4-only (and might likely remain so for several years ahead). The availability (or lack thereof) of IPv4 addresses is a factor which therefore continues to be relevant today. Another view is that quantities of IPv4 space remain and inter-regional transfer policies will help mitigate potential shortages until a more complete transition to IPv6 can be accomplished [source: [PayPal](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en)[[122]](#footnote-122)]. Special policies have gone into effect to secure blocks of IPv4 addresses for the new networks over the long-term [sources: [Cisco](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en), [ISOC](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en), ARIN [[123]](#footnote-123)] to allow new networks to access both the IPv4 and IPv6 Internets, until IPv6 reaches its full deployment.
7. The exhaustion of IPv4 address and migration to IPv6 have led to suggestions that the governance structure of IP addresses needs to be reformed for improvement. One view is that any reform should come from within the existing structures and processes [source: UK [[124]](#footnote-124)][[125]](#footnote-125),[[126]](#footnote-126). Another view is that this might not be sufficient and that greater reforms may be needed [source: [Algeria](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en) [[127]](#footnote-127)][[128]](#footnote-128),[[129]](#footnote-129).
8. Specifically on the issue of IPv6 address allocation, the ITU’s IPv6 Group, formed by ITU Council under the Directors of the ITU Development and Standardization Bureaux, concluded “that current IPv6 allocation policies and processes met the needs of stakeholders”[[130]](#footnote-130). Some recommend organizing rational usages of IPv6 addresses in all regions within further ITU function of the IPv6 allocation [sources: [Russia](http://www.itu.int/md/S12-WTPF13PREP-C-0010/en), [Algeria](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en)[[131]](#footnote-131)], while another view is that present IPv6 allocation mechanisms and existing Regional Internet Registry processes are adequate and that the key objective should be identifying ways to spur IPv6 adoption by relevant stakeholders [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en)[[132]](#footnote-132)].
9. As the Internet evolves, the potential for abuse of Internet resources grows. In response to some routing failures and international calls for enhanced security, changes are underway in Internet routing and addressing policy to incorporate new measures for secure authentication. Resource Public Key Infrastructure (RPKI)[[133]](#footnote-133) is a security technology that would create a hierarchy of digital certificates which would be used to authenticate the information associated with allocated addresses[[134]](#footnote-134). These certificates could be used by ISPs to secure their route announcements in order to improve the security of the global routing system.
10. RPKI enables users of public networks, such as the Internet, to verify the authenticity of registration data of Internet Numbering Resources (INR) that has been digitally signed by the originator of the data. In other words, RPKI provides a secure means to certify the allocation of Internet number resources, particularly Autonomous System (AS) numbers and IP addresses. The certificate structure mirrors the way in which INR are distributed – resources are distributed by IANA to the RIRs, who allocate them to Local Internet Registries (LIRs), who then assign the resources to their customers. Each RIR has its RPKI guidelines and process posted on its website [source: ISOC[[135]](#footnote-135)].
11. One view is that such a rigid global hierarchy could converge on a single trust anchor and that “if RPKI is used there are concerns that could affect the growth, freedom and democratic process that the Internet currently enjoys” [sources: Nav6, University Sains Malaysia[[136]](#footnote-136)]. The Syracuse University-based Internet Governance Project states that[[137]](#footnote-137) :

*“The critical feature of the proposed RPKI solution is the attempt to link resource certificates to the authoritative sources of Internet resources, namely ICANN and the RIRs. This could fundamentally change their governance role”.*

1. Another view is that while RPKI is a good tool to provide others with authentication, it is optional for network operators to decide whether they wish to use it [sources: [ARIN](http://www.itu.int/md/S12-WTPF13PREP-C-0012/en), [ISOC](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en)[[138]](#footnote-138)].

**2.3.3.3 Dissemination of information about** **IP-based networks and the implications of their development for ITU Member States, particularly developing countries**

1. Providing open and equitable access to information about critical Internet resources by enabling the adaptation of adequate national and/or regional policy processes, specifically for IP-based networks – including the transition from IPv4 and migration to/deployment of IPv6, domain names and their internationalized versions – and ensuring that countries improve awareness of issues pertaining to Internet-related public policy, including Internet governance, are key issues for all stakeholders, including ITU Member States[[139]](#footnote-139).
2. With the ever-increasing migration to all-IP based networks and the evolution of the current Internet governance arrangements, many developing countries have realized the need to build national capacity and improve their contribution and involvement in the management and effective governance of the Internet[[140]](#footnote-140).
3. Resolutions from WTSA-08, WTDC-10 , and PP-10 all point to the importance of coordination and collaboration with respect to human capacity development and training with respect to the deployment of IPv6 addresses and the transition from IPv4 to IPv6.
4. Participants from developing countries and LDCs could be disadvantaged by the significant costs and human capacity requirements associated with participation in various global fora where Internet-related technical and public policy issues are discussed[[141]](#footnote-141). This has often been highlighted as a barrier to equitable access to participation in the open global decision-making process on Internet-related matters.
5. To enable participants from developing countries and LDCs to participate in various global fora where Internet-related technical and public policy issues are discussed, a range of capacity building programmes are being developed, including the use of remote participation, accommodative participatory policies, travel fellowships, and electronic working methods. These initiatives should be encouraged, regularly assessed and reviewed in order to facilitate equitable access to participation in the open global decision-making process on Internet-related matters.
6. Relevant international organizations recognize the importance of enabling wide stakeholder involvement in their processes [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[142]](#footnote-142)]. Examples of international organizations with initiatives to promote remote participation include ccNSO [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[143]](#footnote-143)], IETF and ISOC [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[144]](#footnote-144)] and ITU.

**2.3.4 International public policy issues and the management of Internet resources**

**2.3.4.1 generic Top-Level Domains (gTLDs) under the DNS**

1. The DNS specifies a hierarchical structure of the delegation authorities in domain naming. As read from right to left, the DNS hierarchy is divided into Top-Level Domains (TLDs), Second-Level Domains (SLDs), and so on. For example, in the ITU web address [www.itu.int](http://www.itu.int), the TLD is “.int” and the SLD is “itu”. TLDs are generally categorized in two different groups: namely, generic Top Level Domains (gTLDs) and country code Top Level Domains (ccTLDs)[[145]](#footnote-145).
2. Originally, there was one gTLD called .arpa, and seven more gTLDs (.com, .org, .net, .gov, .edu,

.mil and .int) were subsequently added. Following growth in the demand for more gTLDs, several gTLDs (i.e., .biz, .info, .aero, .coop, and .post) have been added to the DNS. Historically, a new gTLD was added to the DNS based on proposals solicited by ICANN during specific application periods, in 2000 and 2003[[146]](#footnote-146). Currently, there are 22 functional gTLDs[[147]](#footnote-147).

1. ENUM defines a method for entering Recommendation E.164 country codes into the Internet DNS. A specific zone under the .arpa gTLD, namely "e164.arpa", has been allocated for use with ENUM E.164 numbers. Res. 133 (Rev. Guadalajara, 2010) states that the existing role and sovereignty of ITU Member States is recognized with respect to allocation and management of their Country Code Numbering resources, as defined in Recommendation ITU-T E.164[[148]](#footnote-148).
2. In 2005, ICANN initiated a process to develop the policies and procedures necessary to introduce an unlimited number of new gTLDs. In June 2008, ICANN announced its new gTLD expansion policy, under which any public or private-sector entity could apply to create and operate a new gTLD. ICANN clarifies that applying for a new gTLD is not the same as buying a SLD on a “first-come, first-served” basis. Applicants for a new gTLD would operate a registry business for a new gTLD based on the applicant’s technical and business capability and a commitment to implement ICANN’s policies effectively. After more than three years of preparation and consultation, the ICANN Board of Directors approved the rules for the new gTLD program in June 2011 [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[149]](#footnote-149)], and ICANN initiated the first round of the new gTLDs application which opened on 12 January 2012 and closed on 30 May 2012. Each gTLD applied-for string requires an online application via ICANN’s online application system and an evaluation fee of US$ 185,000 per application to cover the cost of the evaluation process.
3. Expansion of the new gTLD space is expected to provide a platform for city, geographic, and internationalized domain names, among other possible top-level domain strings, and intended to allow new TLD operators to create and provide content in native languages and scripts, otherwise known as Internationalized Domain Name (IDNs), in addition to new gTLDs in ASCII or Latin scripts [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[150]](#footnote-150)]. Another view is that expansion of the domain name system could, for example, allow businesses to identify themselves by sector or by their community [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[151]](#footnote-151)].
4. Concerns have been raised about the magnitude and scale of gTLD expansion, transparency in the cost evaluation used in the determination of registry fees[[152]](#footnote-152), and risks to public interest, business and consumer protections[[153]](#footnote-153). According to the ICANN’s New gTLDs Applicant Guidebook, there is no upper limit on the number of applications for new gTLDs; however, ICANN has committed to no more than 1,000 new gTLDs being entered into the root per year in accordance with the results of root zone scaling feasibility studies[[154]](#footnote-154) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) [[155]](#footnote-155)].
5. There has also been discussion regarding new gTLDs impact on competition in the market for gTLDs. For example, one view is that there is a risk of creating a multitude of monopolies in the new gTLDs[[156]](#footnote-156), especially associated with the cross ownership issues for registries and registrars[[157]](#footnote-157), while another view is that the new gTLDs represent a substantial step toward increasing competition in the domain name market[[158]](#footnote-158). A further potential concern is that the current arrangement regarding the DNS might result in insufficient competition in the domain name marketplace in general [[159]](#footnote-159). ICANN conducted two studies prior to the launch of the new gTLD program, which noted that metrics associated with the first round of gTLDs will yield important information regarding competition and other economic factors[[160]](#footnote-160) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[161]](#footnote-161)].
6. There are also concerns about the impact of multiple new gTLDs on trademark holders or rights holders, especially those in developing countries, who might be compelled to assume high costs of addressing the possible proliferation of cyber-squatters inhabiting an unlimited number of new gTLDs[[162]](#footnote-162). For example, since the domain name is generally used in the URL for the website for a company or organization, there are more possibilities that trademark abusers could use new gTLDs with trademark protected names or look-alike names that may lead users/consumers to spoofed websites (“phishing”) or to rival company websites (“free riders”).It may thus be necessary for “www.A.com” registrant to register the same domain name in all other gTLDs, such as “A.info”, “A.biz”, “A.mobi”, and “A.(all other new gTLDs)” to protect the trademarked name of “A”. With the proposed simultaneous roll-out of multilingual (IDN) gTLDs, one view is that applicants may find themselves having to pay several multiples of the application fees for multiple domain names in different languages, which might result in a significant financial burden, especially for applicants from developing countries[[163]](#footnote-163).
7. ICANN’s Applicant Guidebook contains new rights protections mechanisms to address some of these concerns[[164]](#footnote-164) [source: U.S.[[165]](#footnote-165)], such as a trademark clearing house and a uniform rapid suspension system to resolve disputes as they arise. However, some contend that various policy challenges persist[[166]](#footnote-166). The protection against the possible misleading use of the names and acronyms of inter-governmental organizations (IGOs) has been cited as one example, with ongoing discussions about how to respond to this. Within ICANN, it has been acknowledged that the rights of governments or public authorities in relation to the rights of the sovereign state or territory which they represent cannot be limited or made conditional by any procedures that ICANN introduces for new gTLDs, and as such, ICANN should avoid country, territory or place names, and country, territory or regional language or people descriptions, unless in agreement with the relevant governments or public authorities[[167]](#footnote-167).
8. Acknowledging concerns relating to competition, consumer protection, security, and trademarks, following the first round of the new gTLD applications, ICANN has committed to organize a review that will examine the extent to which the introduction or expansion of gTLDs has promoted competition, consumer trust and consumer choice, as well as the effect of (a) the application and evaluation process, and (b) safeguards put in place to mitigate issues involved in the introduction or expansion[[168]](#footnote-168). ICANN plans to organize a further review of its execution of the above commitments two years after the first review, which will be performed by volunteer community members and the review team, whose composition will be agreed jointly by the GAC Chair and the CEO of ICANN[[169]](#footnote-169). These reviews could provide the international multi-stakeholder community, including governments, with an opportunity to comment on and make improvements to the new gTLD program[[170]](#footnote-170) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[171]](#footnote-171)].

**2.3.4.2 country code Top-Level Domains (ccTLDs) under the DNS**

1. The *WSIS* *Plan of Action* (2003) invites “Governments to manage or supervise, as appropriate, their respective country code top-level domain name”. Any such involvement should be based on appropriate national laws and policies. It is recommended that governments should work with their local stakeholders in deciding on how to work with the ccTLD Registry [source: [Ad Hoc Group, second IEG meeting](http://www.itu.int/md/S12-WTPF13PREP-C-0040/en)[[172]](#footnote-172)].
2. As stated in the GAC Principles and Guidelines for the Delegation and Administration of country code Top-Level Domains, ccTLD policy should be set locally, unless it can be shown that the issue has global impact and needs to be resolved in an international framework. Most of the ccTLD policy issues are local in nature and should therefore be addressed by the local stakeholder groups according to national law [source: [Ad Hoc Group, second IEG meeting](http://www.itu.int/md/S12-WTPF13PREP-C-0040/en)[[173]](#footnote-173)].
3. A ccTLD is generally used or reserved for a country, territory or area of geographical interest. Its subdivisions are identified in ISO 3166-1 standard[[174]](#footnote-174) and represented by two US-ASCII characters. The two letters chosen for each ccTLD are taken directly from the ISO 3166-1 list or the list of reserved Alpha-2 code elements defined by the ISO 3166 Maintenance Agency.
4. IANA is responsible for the delegation or re-delegation of an appropriate trustee for each ccTLD, but it has no responsibility over the entries on the ISO 3166-1 list. From the list of ccTLDs, the authority over each ccTLD is delegated to a trustee responsible for the policies and operation of the domain.
5. Since ccTLDs are based on a “territory” set, debates over ccTLD often focus on the relationship between a TLD string and a “territory” (per the ISO 3166-1 list). More specifically, questions could arise as to whether a TLD string exactly matches with the territory in the ISO 3166-1 list, whether the ccTLD easily represents the name of the territory, how many ccTLDs are possible for one listed territory, and so on[[175]](#footnote-175). For example, from the beginning the United Kingdom of Great Britain and Northern Ireland used the exceptionally reserved code “UK” from the ISO 3166-1 decoding table for its ccTLD, instead of the primary code “GB.” The UK government still holds the delegation for .gb, which cannot be allocated to any other country. Furthermore“.ax” for *Åland Islands* has been reserved on request of Finland and “.fx” for France, Metropolitan has been reserved on request of France[[176]](#footnote-176).
6. The delegation or re-delegation of a ccTLD is a process comprising several stages, with many different players involved in the process. It starts with[[177]](#footnote-177), [[178]](#footnote-178):
7. a proposed new operator who is an applicant for a name in a ccTLD; and
8. the existing operator who confirms the change is appropriate, in the case of a re-delegation request.
9. in many cases, a national Government associated with the ccTLD is asked to verify that the re-delegation is supported as the sponsoring organization.
10. those parties served by the ccTLD are asked to show that they support the request and that it meets the interests and needs of the local Internet community.
11. the IANA functions as the coordinator and analyzes the request, including investigating the details of the request, preparing a recommendation for the ICANN Board, and implementing the request if it is approved.
12. The ICANN Board of Directors considers the IANA recommendation and votes on whether the request should move forward.
13. Finally, the U.S. Government evaluates a report on the request prepared by IANA.
14. The socio-economic potential of a ccTLD has become more widely acknowledged. Meanwhile, a steady flow of ccTLD re-delegation requests has been observed [source: UK [[179]](#footnote-179)]. Some note that some issues have arisen with regard to the national authority to delegate and administer the ccTLDs[[180]](#footnote-180). In fact, some governments have sought assistance from the United Nations system to reclaim their own ccTLDs or tried to use national legislation to reclaim ccTLDs from incumbent ccTLD managers. As an example, the application for re-delegation of “.so” ccTLD was accepted by the ICANN Board in February 2009. The “.so” TLD is designated in the ISO 3166-1 standard for Somalia, but the initial delegation of the .so TLD was performed in 1997 to World Class Domains, which is a US-based company. The application for re-delegation of .so TLD was put forward by ITU, and the .so TLD was re-delegated to the Ministry of Posts and Telecommunications of the Transitional Federal Government of Somalia in 2009[[181]](#footnote-181).
15. As articulated in the *Tunis Agenda*, Member States represent the interests of the population of the country or territory for which a ccTLD has been delegated[[182]](#footnote-182). Para 63 of the *Tunis Agenda* states that countries should not be involved in decisions regarding another country’s ccTLD and that “their legitimate interests, as expressed and defined by each country, in diverse ways, regarding decisions affecting their ccTLDs, need to be respected, upheld and addressed via a flexible and improved framework and mechanisms”.

**2.3.4.3 Security of the DNS**

1. The DNS, the Internet's addressing system, was not originally designed with security in mind.  As a result, there are security flaws that make it vulnerable to threats such as, for example, man-in-the-middle attacks (a malicious third party could intercept a query, send a fake response and redirect the user to their own site) and cache poisoning (the introduction of fake DNS data into the cache stored in DNS name servers). These could be exploited to redirect internet traffic to fraudulent sites and unintended addresses, enabling identity theft and phishing, eavesdropping communications, providing misleading information or planting malicious software [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[183]](#footnote-183)]. Such attacks threaten users’ ‘trust’ of the Internet.
2. Some applications and services can be provided with only limited regard to security, while others require trust frameworks and security mechanisms not present in the basic Internet Protocols. A broad class of applications and services employ trusted certificates (ITU-T X.509) to establish their identities when communicating over secure channels such as Secure Sockets Layer (SSL)[[184]](#footnote-184) and Transport Layer Security (TLS)[[185]](#footnote-185), although some issues have arisen with the use of security certificates (source: [PayPal](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en)[[186]](#footnote-186)). There have been calls for better standards, best practices, and operating procedures in this regard. Trust in the certificate ecosystem requires trust in all part of the system with the strength of the trust limited to the weakest link in the chain. Given their central position in the security structure of the Internet, certificates, and in particular their issuance, require international collaboration and cooperation to ensure that those issuing them adhere to the highest standards and operate according to agreed principles and norms.
3. A set of Security Extensions to the DNS, known as DNSSEC, have been developed[[187]](#footnote-187) to provide origin authentication and validation of integrity of DNS data to DNS clients – a mechanism that provides an added layer of assurance that a responding entity (name server) really is what it purports to be.
4. DNSSEC facilitates the provision of cryptographic signatures which allow relying parties to verify that DNS responses are authentic. The resolution process ensures the “origin authentication of DNS data” by establishing an unbroken “chain of trust”. The key characteristic of this chain of trust is that each parent zone vouches for its child. If any part of the authentication chain breaks due to a response from an unrecognized entity, then the resolution of that address is not achieved.
5. For the “chain of trust” in DNSSEC to work, it needs a single origin of trust (at the root) i.e., a trust anchor that the users can have faith in and from where the trust chain can be built. This requires the creation, use, and management of cryptographic keys. The U.S. Department of Commerce has identified that the maintenance of the root cryptographic keys be split between the current root zone management partners, which are the IANA functions operator (ICANN) and the Root Zone Maintainer (VeriSign). Namely, ICANN is responsible for the management of the Key Signing Key (KSK) and VeriSign (a private organization) is responsible for the Zone Signing Key (ZSK). The KSK is the mainstay key that is required to periodically sign the ZSK that then signs the root zone. ICANN is also responsible for the publication of the trust anchor [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[188]](#footnote-188)].
6. While some are concerned about this arrangement supporting this critical function[[189]](#footnote-189),[[190]](#footnote-190),[[191]](#footnote-191), some others have expressed confidence in the arrangement and processes in place stating that the US National Telecommunications Industry Association (NTIA), ICANN and VeriSign have liaised with the naming and security communities to make the processes “transparent, independently audited and effective” [sources: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en), [ISOC](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en)[[192]](#footnote-192)]. Those with this view note that ICANN relies on direct global stakeholder involvement in KSK management, utilizing twenty one “Trusted Community Representatives” (TCRs). The TCRs are experts from 17 geographically dispersed countries who play a key role in the root key generation, back-up, and signing process to ensure neutrality, transparency, and security [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[193]](#footnote-193)].
7. Lack of security can actually limit the spread of the Internet and consequently limit the spread of related economic and social benefits. One of the main principles of information security is that security itself is like a chain: a system or a service is only as secure as the weakest link. Therefore, a strong and secure core network infrastructure can be attacked if the entire chain is not fully protected. The approach should be end-2-end, and the user side as well as the access structures need to be included in the general security framework.
8. The security of the routing and the DNS is only one side of the coin (although extremely important). True end-2-end security is actually what is needed in order to increase the trust in the networks and the Internet services in particular. The goal should be enabling a true identity management across organizations and single individuals. Today in the cyberspace it is possible to hide your real identity by misusing current authentication mechanisms used by Telco and ISP (in fact the TCP/IP protocol suite has not been designed with strong security requirements in mind). A “controlled” anonymity is a value, but it is also important to be able to prevent and block malicious behaviors that today pose at risk the entire Internet and its services. It is necessary to find the right trade-off between the freedom of the cyber-citizens and the need to identify and block cyber-criminals activities. This can be achieved by starting from a correct identification of the end users, in order to maintain a robust, secure and resilient network infrastructure. Open standards and trust mechanisms able to overcome the boundary between organizations and countries have to be defined in order to preserve and enhance the level of trust in the cyberspace. Finally, electronic identity management is a very sensitive topic, which has to be managed carefully as our “real” identity. A strong identity mechanism, coupled with a strong role management, could help not only to make secure the networks and services, but also to help to protect better people’s privacy

**2.3.5. Role of administrations of Member States in the management of internationalized (multilingual) domain names**[[194]](#footnote-194)

1. Resolution 133 (Rev. Guadalajara, 2010) recognized the following with respect to the management of internationalized (multilingual) domain names:
   1. The *Tunis Agenda for the Information Society* adopted by the WSIS made a commitment to advance the process for the introduction of multilingualism in a number of areas, including domain names, e-mail, Internet addresses and keyword look-up.
   2. There is a need to promote regional root servers (see section 2.3.5.2) and the use of internationalized domain names in order to overcome linguistic barriers to Internet access
   3. Considering the continuing progress towards the integration of telecommunications and the Internet, and the fact that that Internet users are generally more comfortable reading or browsing texts in their own language, for the Internet to become more widely available to a large number of users, it is necessary to make the Internet (DNS system) available in non-Latin based scripts, taking into account the progress recently made in this regard.
   4. Recalling the outcomes of WSIS, there should be a commitment to working earnestly towards multilingualization of the Internet, as part of a multilateral, transparent and democratic process, involving governments and all stakeholders, in their respective roles.
   5. The current domain name system does not fully reflect the diverse and growing language needs of all users.
   6. Internationalized Internet domain names, and more generally ICTs and the Internet, must be widely accessible to all citizens without regard to gender, race, religion, country of residence or language.
   7. Internet domain names should not privilege any country or region of the world to the detriment of others, and should take into account the global diversity of languages.
   8. Recalling the results of WSIS and the needs of linguistic groups, there is an urgent need to:
      * advance the process for the introduction of multilingualism in a number of areas, including domain names, e-mail addresses and keyword look-up.
      * implement programmes that allow for the presence of multilingual domain names and content on the Internet and the use of various software models in order to fight against the linguistic digital divide and to ensure that everyone can participate in the emerging new society.
      * strengthen cooperation between relevant bodies for the further development of technical standards and to foster their global deployment.
   9. There are a number of challenges with regard to intellectual property and the deployment of internationalized domain names, and adequate solutions should be explored.
   10. The roles played by the World Intellectual Property Organization (WIPO) (with regard to dispute resolution for domain names), and by the United Nations Educational, Scientific and Cultural Organization (UNESCO) (with regard to promoting cultural diversity and identity, linguistic diversity and local content) are recognized. It is also recognized that ITU enjoys close cooperation with both WIPO and UNESCO.
   11. It is paramount to maintain global interoperability as domain names expand to include non-Latin character sets.
2. While the need for and importance of a multilingual Internet is universally accepted, there is some divergence on the current status of the urgency of the need to advance the process towards multilingualism and to implement programmes in this regard. One view is that the introduction of Internationalized Domain Names (IDNs) under DNS (see section 2.3.5.1) has progressed considerably under the current process established by ICANN and therefore, the previously acknowledged urgency of need is being met by the current process [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) [[195]](#footnote-195)]. Another view is that although IDNs are possible, more work remains to be done with respect to keyword look-up. Those holding this view also point out that the current IDN implementation is “effectively a patch on an ASCII-based system and that the DNS will properly reflect multilingualism when support is native to the system” [sources: [Saudi Arabia and Sudan](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en), [Algeria](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en)[[196]](#footnote-196)].The IDN implementation embodied by RFCs 5890, 5891, 5892, 5893, 5894 and Informational RFCs 3743, 4185, 4690 that build on the Unicode (ISO/IEC 10646) series of standards is in essence a patch [[197]](#footnote-197). However, others contend that this is not a patch on the ASCII domain name system (just as IPv6 and DNSSEC are not patches), and that is not possible to have 'native' support for IDNs without confusing name servers, resolvers and clients, and that any script can be supported and can be encoded to fit in an ASCII domain name, as there are no real restrictions [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[198]](#footnote-198)].
3. Current efforts are focused on developing standards, technologies, and practices that enable the Internet to support interoperable IDNs without breaking or interrupting root servers and their mirrors, other DNS resolvers, and application-level services [source: [PayPal](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en)[[199]](#footnote-199)].
   * + 1. **Internationalized Domain Names (IDNs) under the DNS**
4. Historically, the DNS root zone was limited to a set of characters conforming to US-ASCII or the Latin alphabets. This changed with the introduction of IDNs, which introduced TLDs in different scripts (e.g., characters in Arabic, Chinese, Cyrillic or Korean), which enables Internet users to access domain names in their own languages.
5. The process to advance the introduction of multilingualism in the DNS through IDNs has progressed considerably since 2010. Approval of the IDN ccTLD Fast Track Process by the ICANN Board at its annual meeting in Seoul, South Korea in October 2009, enabled countries and territories to submit requests to ICANN for IDN ccTLDs representing their respective country or territory names in scripts other than US-ASCII characters.
6. Implementation of IDN in the new gTLDs programme and the implementation of IDN ccTLDs raise some complex issues – for example, defining policies for scripts that the registries can accept, agreement on the type and number of characters in the strings etc. [[200]](#footnote-200)
7. By June 2012, a total of 30 countries/territories requests have successfully passed through the String Evaluation. Of these, 21 countries/territories (represented by 31 IDN ccTLDs) are delegated in the DNS root zone; with the remainder either readying to apply, or actively applying for, delegation of the string[[201]](#footnote-201).

**2.3.5.2 Regional Root Servers**

1. The DNS associates IP addresses with semantically meaningful domain names assigned to computers. When a user types “www.itu.int”, the DNS resolves this address in a right-to-left order by first going to a root server (“.”), which provides a referral to the location of an “.int” name server, which in turn provides a referral to an “itu.int” name server. Here, a root name server is a DNS server that answers requests for the DNS root zone, and provides referrals for names within a particular TLD to that TLD’s name servers. There are currently 12 operators running 13 root servers specified with names in the form “letter.root-servers.net”, where the letter ranges from A to M. The A, C, E, F, G, I, J, K, L and M servers now exist in multiple locations on different continents to provide decentralized service[[202]](#footnote-202).

**Table 2: Operators and Root Servers**

|  |  |  |  |
| --- | --- | --- | --- |
| Server | Operator | Locations | Number of Instances |
| A | VeriSign, Inc. | Distributed using anycast | 6 |
| B | Information Sciences Institute | Marina Del Rey, California, US | 1 |
| C | Cogent Communications | Distributed using anycast | 6 |
| D | University of Maryland | College Park, Maryland, US | 1 |
| E | NASA Ames Research Center | Distributed using anycast | 12 |
| F | Internet Systems Consortium, Inc. | Distributed using anycast | 49 |
| G | U.S.[A.] DOD Network Information Center | Distributed using anycast | 6 |
| H | U.S.[A.] Army Research Lab | Distributed using anycast within the US | 2 |
| I | Netnod (formerly Autonomica) | Distributed using anycast | 43 |
| J | VeriSign, Inc. | Distributed using anycast | 70 |
| K | RIPE NCC | Distributed using anycast | 18 |
| L | ICANN | Distributed using anycast | 121 |
| M | WIDE Project | Distributed using anycast | 6 |

1. The 12 operators manage the system used to publish the root zone that is administered through the IANA functions process and cryptographically-signed and distributed by VeriSign as the Root Zone Maintainer.
2. In the geographical sense, only three root server operators have administrative headquarters outside the U.S.A. (the Netherlands, Sweden and Japan); however, the majority of root server operators have deployed mirror copies of existing root servers throughout the world, such that there are now 341 instances of root servers and mirrors. For instance, while ICANN has headquarters in California in the U.S.A., service for L ROOT-SERVERS.NET is provided using mirror copies (instances) located in 112 locations in 49 countries.

d) One view is that there is an uneven geographical distribution of the DNS root servers (and mirrors) [[203]](#footnote-203). Figure 3 highlights the disparity between the geographical distribution of root servers and the global distribution of Internet users, while Figure 4 shows their location. In Res. 133 (Rev. Guadalajara, 2010), ITU membership has highlighted the need to promote regional root servers. However, another view is that the ratio of the “number of users per root server” is not necessarily meaningful. Due to the nature of networking and concepts of peering, routing and DNS server selection, it is simply not possible to guarantee that, for example, Internet users in Australia will necessarily use root-servers physically located in Australia [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[204]](#footnote-204)]. The root-servers provide the top of the delegation chain, which is cached for on average around two days. A user will use their ISP's caching server, which should be close (in terms of network topology), while pre-emptive caching also helps reduce the likelihood of long latencies. The set of root servers continues to grow all the time [source: [Nominet](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en)[[205]](#footnote-205)]. e) Those holding this view note that that the existing system has demonstrated it is capable of facilitating wider distribution of root servers, and that it is not necessary to modify the administrative structure of the root server system by reassigning responsibility for existing root servers or adding new ones in order to achieve this goal [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) [[206]](#footnote-206)].

**Figure 3: Geographical distribution of DNS root server sites and Internet users, 2011**[[207]](#footnote-207)

Geographical distribution of DNS root server sites (left chart) and Internet users (right chart).



**Figure 4: Geographical distribution of DNS root servers and mirrors[[208]](#footnote-208)**

****

**2.3.6** Governments play a role in ICANN’s structure through the Governmental Advisory Group (GAC), which provides advice to ICANN on issues of public policy, especially where there may be an interaction between ICANN’s activities or policies and national laws or international agreements[[209]](#footnote-209).

* 1. According to ICANN Bylaws, the advice of the GAC on public policy matters shall be duly taken into account, both in the formulation and adoption of policies by the ICANN Board. In the event that the ICANN Board determines to take an action that is not consistent with the GAC advice, it shall so inform the GAC and state the reasons why it decided not to follow that advice[[210]](#footnote-210). The GAC Chair serves as a non-voting liaison on ICANN’s Board [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[211]](#footnote-211)].
  2. Membership of the GAC is open to all national governments and distinct economies as recognised by international fora, and multinational governmental organizations and treaty organizations may join the GAC as observers [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en)[[212]](#footnote-212)]. Currently, the GAC is composed of 114 Country Members and 27 Observers[[213]](#footnote-213).
  3. One view is that the GAC is limited by its role as an advisory body only. In addition, some have noted that further integrating the GAC into multistakeholder policy development has several obstacles, including misunderstandings about the GAC as an organization of nation state representatives [source: [UK](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en)[[214]](#footnote-214)]. Another view is that broadening the exchanges between the GAC, the ICANN Board and other members of the ICANN community could overcome these misunderstandings [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[215]](#footnote-215)].
  4. There are some occasions where the ICANN Board has not requested GAC’s opinions or rejected GAC’s advice, despite public policy implications relating to the issues under discussion[[216]](#footnote-216) . There have been joint efforts between the ICANN Board and GAC to address the concern of integrating the GAC more effectively into ICANN’s structure[[217]](#footnote-217), which were further advanced by the Accountability and Transparency Review Team (ATRT)[[218]](#footnote-218) [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)[[219]](#footnote-219), [[220]](#footnote-220)]. The report issued by the Joint Working Group (JWG) of the ICANN Board and the GAC in 2011 contains several recommendations.

**3. Conclusion**

This draft report of the Secretary-General to the WTPF-2013 aims to provide a basis for discussion at the Policy Forum, incorporating the contributions of ITU Member States and Sector Members, and serving as the sole working document of the Forum focusing on key issues on which it would be desirable to reach conclusions (Council 2011 Decision 562).

**Annex A: List of Draft Opinions**

To date, six draft opinions have been received, which have been discussed briefly at the Second IEG Meeting, and shall be discussed further at the Third IEG Meeting:

* Draft Opinion [1] from the Kingdom of Saudi Arabia on “[Supporting Full Multi-stakeholderism in Internet Governance](http://www.itu.int/md/S12-WTPF13PREP-C-0027/en)”, received on 1 October 2012, available from: [www.itu.int/md/S12-WTPF13PREP-C-0027/en](http://www.itu.int/md/S12-WTPF13PREP-C-0027/en);
* Draft Opinion [2] from the Kingdom of Saudi Arabia and the United Arab Emirates on “[Support of the Adoption of IPv6 and of Careful Management of the Transition from IPv4](http://www.itu.int/md/S12-WTPF13PREP-C-0028/en)”, received on 1 October 2012, available from: www.itu.int/md/S12-WTPF13PREP-C-0028/en;
* Draft Opinion [3] from the Kingdom of Saudi Arabia on “[Supporting Operationalizing the Enhanced Cooperation Process](http://www.itu.int/md/S12-WTPF13PREP-C-0029/en)”, received on 1 October 2012, available from: [www.itu.int/md/S12-WTPF13PREP-C-0029/en](http://www.itu.int/md/S12-WTPF13PREP-C-0029/en);
* Draft Opinion [4] from the United Kingdom of Great Britain and Northern Ireland on “[Supporting Capacity Building for the deployment of IPv6](http://www.itu.int/md/S12-WTPF13PREP-C-0034/en)”, received on 5 October 2012, available from: [www.itu.int/md/S12-WTPF13PREP-C-0034/en](http://www.itu.int/md/S12-WTPF13PREP-C-0034/en);
* Draft Opinion [5] from the United Kingdom of Great Britain and Northern Ireland on “[Promoting Internet Exchange Points (IXPs) as a long-term solution to advance connectivity](http://www.itu.int/md/S12-WTPF13PREP-C-0035/en)”, received on 5 October 2012, available from: [www.itu.int/md/S12-WTPF13PREP-C-0035/en](http://www.itu.int/md/S12-WTPF13PREP-C-0035/en);
* Draft Opinion [6] from the United Kingdom of Great Britain and Northern Ireland on “[Supporting the inclusivity of communications for all​](http://www.itu.int/md/S12-WTPF13PREP-C-0036/en)”, received on 5 October 2012, available from: [www.itu.int/md/S12-WTPF13PREP-C-0035/en](http://www.itu.int/md/S12-WTPF13PREP-C-0035/en).

**Annex B: List of Acronyms**

AP-CERT Asia-Pacific Computer Emergency Response Team

APEC Asia-Pacific Economic Cooperation Forum

APNIC The Asia Pacific Network Information Centre

ARIN The American Registry for Internet Numbers

ARPANET The Advanced Research Projects Agency Network

AS Autonomous System

BGRD Board-GAC Recommendation Implementation Working Group

ccTLD country code Top-Level Domain

CWG ITU Council Working Group

CWG-Internet The Council Working Group on International Internet-Related Public Policy Issues

DoD U.S. Department of Defense

DNS Domain Name System

DNSSEC Domain Name System Security Extensions

FIND Future Internet Design project

FIRE European Union’s Future Internet Research & Experimentation

FIRST Forum for Incident Response and Security Teams

GAC Governmental Advisory Committee

GDP Gross Domestic Product

GENI Global Environment for Network Innovations

GGE Government Group of Experts of the UN General Assembly

gTLD generic Top-Level Domain

IANA Internet Assigned Numbers Authority

ICANN Internet Corporation for Assigned Names and Numbers

ICT Information & Communication Technology

ICTs Information & Communication Technologies

IDN Internationalized Domain Name

IEG Informal Experts Group

IETF Internet Engineering Task Force

IGF Internet Governance Forum

IGOs Inter-governmental Organizations

IIC International Internet Connectivity

INR Internet Numbering Resources

IP Internet Protocol

IPv4 Internet Protocol version 4

IPv6 Internet Protocol version 6

IPTV Internet Protocol Television

ISOC Internet Society

ISPs Internet Service Providers  
ITU International Telecommunication Union

ITU-T ITU Telecommunication Standardization Sector

IXPs Internet Exchange Points

JWG ICANN’s Joint Working Group

KSK Key Signing Key

LDCs Least Developed Countries

MAAWG Messaging Anti-Abuse Working Group

NASA U.S. National Aeronautics and Space Administration

NGN Next-Generation Network

NICT Japan’s National Institute of ICT

NSF U.S. National Science Foundation

NTIA U.S. National Telecommunication Industry Association

NWGN Japan’s NeW Generation Network (NWGN) research and development initiative

OECD Organisation for Economic Cooperation and Development

OTT Over The Top

QoS Quality of Service

RIPE Réseaux IP Européens/European IP Networks

RIR Regional Internet Registry

RPKI Resource Public Key Infrastructure

SLD Second-Level Domains

SME Small- and Medium-sized Enterprise

TCP/IP Transmission Control Protocol/Internet Protocol

TLD Top-Level Domain

UNESCO United Nations Educational, Scientific and Cultural Organization

VoIP Voice over Internet Protocol  
WIDE Widely Integrated Distributed Environment project

WGIG Working Group on Internet Governance

WIPO The World Intellectual Property Organization

WSIS World Summit on the Information Society

W3C World Wide Web Consortium

WTPF World Telecommunication/ICT Policy Forum

WTSA World Telecommunication Standardization Assembly

WTDC World Telecommunication Development Conference

ZSK Zone Signing Key

1. Note: the title of WTPF-2013 is specified in Res. 2 (Rev. Guadalajara, 2010), Council 2011 Decision 562, and Council 2012 Decision 572. [↑](#footnote-ref-1)
2. CWG-Internet, available at: <http://www.itu.int/council/groups/CWG-Internet/index.html>. [↑](#footnote-ref-2)
3. Quoting *instructs the Council 1* of Res. 102 (Rev. Guadalajara 2010). [↑](#footnote-ref-3)
4. Council 2012 Res. 1344 (available at: <http://www.itu.int/md/S12-CL-C-0086/en>). [↑](#footnote-ref-4)
5. Please note that para 1.1.5 was included in Council Document [C12/27 (Rev. 2](http://www.itu.int/md/S12-CL-C-0027/en)) which was endorsed by Council 2012. [↑](#footnote-ref-5)
6. Council 2012 Document C12/27, “Preparations for the Fifth WTPF”, at: <http://www.itu.int/md/S12-CL-C-0027/en>. [↑](#footnote-ref-6)
7. For further detail, please see the Chairman’s Reports of the 1st and 2nd IEG meetings. [↑](#footnote-ref-7)
8. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0018/en) (1 August 2012). [↑](#footnote-ref-8)
9. [ISOC Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en) (26 June 2012). [↑](#footnote-ref-9)
10. “*Brief History of the Internet”,* by Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert E. Kahn, Leonard Kleinrock, Daniel C. Lynch, Jon Postel, Larry G. Roberts, and Stephen Wolff, available at: <http://www.internetsociety.org/internet/internet-51/history-internet/brief-history-internet/>. [↑](#footnote-ref-10)
11. See [US/CNRI contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0019/en) (1 August 2012) for a more detailed timeline of major technological milestones. [↑](#footnote-ref-11)
12. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-12)
13. A 2012 McKinsey report found that in “Aspiring Countries”, or countries with the economic size and dynamism to be significant players on the global stage in the near future, the Internet contributed on average around 1.9% to GDP. The Internet’s contribution to countries’ GDP is likely to grow considerably in the future, given rapid growth in Internet penetration. The Internet creates net job growth in SMEs. Specifically, the McKinsey report found that the Internet created an average of 3.2 jobs for every job it eliminated in Aspiring Countries. [↑](#footnote-ref-13)
14. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-14)
15. Minges (2000), “Counting the Net: Internet Access Indicators”: [www.isoc.org/inet2000/cdproceedings/8e/8e\_1.htm](http://www.isoc.org/inet2000/cdproceedings/8e/8e_1.htm) [↑](#footnote-ref-15)
16. See for example, the IDC report on the Size of the Data Universe. [↑](#footnote-ref-16)
17. ITU World Telecommunication/ICT Database. [↑](#footnote-ref-17)
18. 2011 MessageLabs Intelligence Report: [www.symantec.com/about/news/release/article.jsp?prid=20110524\_02](http://www.symantec.com/about/news/release/article.jsp?prid=20110524_02). [↑](#footnote-ref-18)
19. <http://www.itu.int/osg/csd/cybersecurity/gca/cop/>; see also for example M. Taylor and E. Quayle, Child Pornography: an Internet Crime (2003, London: Routledge) at 159-163; Y. Akdeniz, International Child Pornography and the Law: National and International Responses (2008, Aldershot: Ashgate) at 7; the Convention on the Rights of the Child and its optional protocol on the sexual exploitation of children; the 2009 G-8 Ministers’ Declaration (<http://www.justice.gov/criminal/ceos/downloads/G8MinistersDeclaration20090530.pdf>); all cited in Alisdair A. Gillespie, Jurisdictional issues concerning online child pornography, International Journal of Law and Information Technology, (Oxford University Press), vol. 20, no. 3, Autumn 2012. [↑](#footnote-ref-19)
20. See for example, monitoring and intelligence from Symantec, available at: <http://www.symanteccloud.com/en/us/globalthreats/> or the growing sophistication of cyber-risks for enterprises from the Cisco Annual Security Report 2011, available at: <http://www.cisco.com/en/US/prod/collateral/vpndevc/security_annual_report_2011.pdf>. [↑](#footnote-ref-20)
21. Estimates for adult entertainment content vary between 4-30%, depending on whether websites, web searches or Internet traffic are measured. See: <http://www.extremetech.com/computing/123929-just-how-big-are-porn-sites> and <http://www.forbes.com/sites/julieruvolo/2011/09/07/how-much-of-the-internet-is-actually-for-porn/>. [↑](#footnote-ref-21)
22. [Contribution of the Russian Federation](http://www.itu.int/md/S12-WTPF13PREP-C-0032/en) (4 October 2012). [↑](#footnote-ref-22)
23. OECD, UNESCO and Internet Society Report (2012): “The Relationship Between Local Content, Internet Development and Access Prices”, available at: <http://www.internetsociety.org/localcontent/>. [↑](#footnote-ref-23)
24. [Saudi Arabia and Sudan contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) (1 August 2012). [↑](#footnote-ref-24)
25. OECD, UNESCO and Internet Society Report (2012): “The Relationship Between Local Content, Internet Development and Access Prices”, available at: <http://www.internetsociety.org/localcontent/>. [↑](#footnote-ref-25)
26. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-26)
27. See the series of country case studies for broadband, available at: [www.itu.int/broadband/](http://www.itu.int/broadband/). [↑](#footnote-ref-27)
28. Broadband Commission Report, “The State of Broadband 2012: Achieving Digital Inclusion for All”. [↑](#footnote-ref-28)
29. ITU World Telecommunication Development Report 1996/7: Trade in Telecommunications, available at: [www.itu.int/newsarchive/press/WTPF98/TradeInTelecomsExSum.html](http://www.itu.int/newsarchive/press/WTPF98/TradeInTelecomsExSum.html). [↑](#footnote-ref-29)
30. ITU “WTDR 2002: Reinventing Telecoms”, available at: <http://www.itu.int/ITU-D/ict/publications/wtdr_02/>. [↑](#footnote-ref-30)
31. See, for example, ITU “World Telecommunication Development Report 2002: Reinventing Telecoms”, available at: <http://www.itu.int/ITU-D/ict/publications/wtdr_02/> and ITU Trends in Telecommunication Reform Report 2007: The Road to NGN”, available at: <http://www.itu.int/ITU-D/treg/publications/trends07.html>. [↑](#footnote-ref-31)
32. Network Operators and Content Providers: Who Bears the Cost?, J. Scott Marcus, Wissenschaftliches Institut fur Infrastruktur und Kommunikationdienste (2011) at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1926768>. [↑](#footnote-ref-32)
33. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-33)
34. Kende (2012): “Assessment of the impact of IXPs – empirical study of Kenya and Nigeria”, Internet Society, available at: <http://www.internetsociety.org/ixpimpact>. [↑](#footnote-ref-34)
35. <http://en.wikipedia.org/wiki/Network_effect>. [↑](#footnote-ref-35)
36. <http://en.wikipedia.org/wiki/Metcalfe%27s_law>. [↑](#footnote-ref-36)
37. Point Topic statistics (2012), available at: <http://point-topic.com/dslanalysis.php>. [↑](#footnote-ref-37)
38. ITU *Measuring the Information Society 2012* Report, see: <http://www.itu.int/ITU-D/ict/publications/idi/index.html>. [↑](#footnote-ref-38)
39. “Knowledge as a Global Public Good”, Joseph Stiglitz, available at: <http://cgt.columbia.edu/files/papers/1999_Knowledge_as_Global_Public_Good_stiglitz.pdf>. A chapter in Providing Global Public Goods: Managing Globalization argues that telecommunications and the Internet are themselves global public goods; however, most observers agree that it is the knowledge and information provided over the Internet which are non-rivalrous and non-excludable, rather than the networks (which may be rivalrous and excludable). See also the ICT For Development Report (World Bank, 2009) and “Confronting the Crisis: ICT Stimulus Plans for Economic Growth” (ITU, 2009). [↑](#footnote-ref-39)
40. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-40)
41. Article 19, International Covenant on Civil and Political Rights (1966); Article 34 of the ITU Constitution. [↑](#footnote-ref-41)
42. <http://www.oecd.org/dataoecd/11/58/49258588.pdf>. [↑](#footnote-ref-42)
43. [U.S.A./CNRI contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0019/en) (1 August 2012). [↑](#footnote-ref-43)
44. §§ 29-82 of the Tunis Agenda, as described in para 2.3.2.1(d). [↑](#footnote-ref-44)
45. Tunis Agenda for the Information Society (2005), available at: <http://www.itu.int/wsis/docs2/tunis/off/6rev1.html>. [↑](#footnote-ref-45)
46. A Group open to all stakeholders, see: <http://www.wgig.org/members.html>. [↑](#footnote-ref-46)
47. [Contribution from ISOC Bulgaria](http://www.itu.int/md/S12-WTPF13PREP-C-0037/en) (9 October 2012). [↑](#footnote-ref-47)
48. Paras 1-5 are from Res. 102 (Rev. Guadalajara, 2010); Para 6 is from Res. 133 (Rev. Guadalajara, 2010). [↑](#footnote-ref-48)
49. Paragraph 69 of the Tunis Agenda. [↑](#footnote-ref-49)
50. Paragraph 53 of the Tunis Agenda. [↑](#footnote-ref-50)
51. [Brazilian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0009/en) (18 May 2012). [↑](#footnote-ref-51)
52. United States [International Strategy for Cyberspace](http://www.whitehouse.gov/sites/default/files/rss_viewer/international_strategy_for_cyberspace.pdf), the OECD Council Recommendation on Principles for Internet Policy-Making, Brazil’s ten "[Principles for the Governance and Use of the Internet](http://cgi.br/)”. [↑](#footnote-ref-52)
53. <http://www.circleid.com/posts/us_european_union_to_support_icann_but_demand_reform/>. [↑](#footnote-ref-53)
54. [Cisco contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en) (25 June 2012), [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012), [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0007/en) (18 May 2012), [ISOC contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en) (26 June 2012). [↑](#footnote-ref-54)
55. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012) and [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en) (30 September 2012). [↑](#footnote-ref-55)
56. <http://articles.timesofindia.indiatimes.com/2012-07-30/edit-page/32924041_1_internet-governance-internet-corporation-root-servers>. [↑](#footnote-ref-56)
57. [Saudi Arabian/Sudan contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) (1 August 2012), [Algerian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en) (2 August 2012). [↑](#footnote-ref-57)
58. See on this, Bertrand de la Chapelle (2011), Internet Policy Making, MIND . Furthermore see IGP (2009)”ICANN, Inc: Accountability and participation in the governance of critical Internet Resources “ [↑](#footnote-ref-58)
59. See on this Johannes Bauer (2011), “Panarchy:the futire of Internet Governance”, Kiel Global Economic Symposium [↑](#footnote-ref-59)
60. CSTD (<http://unctad.org/en/Pages/MeetingDetails.aspx?meetingid=61>), UN General Assembly. (<http://unctad.org/meetings/en/SessionalDocuments/a66d77_en.pdf>). [↑](#footnote-ref-60)
61. [Open consultations on enhanced cooperation on international public policy issues pertaining to the Internet - written contributions](http://www.unpan.org/DPADM/EGovernment/WSISImplementationMechanism/CommentsonWSISFollowup/tabid/1448/language/en-US/Default.aspx). [↑](#footnote-ref-61)
62. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-62)
63. [Saudi Arabia, Sudan contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) (1 August 2012), [Algerian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en) (2 August 2012). [↑](#footnote-ref-63)
64. [Cisco contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en) (25 June 2012), [ISOC contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en) (26 June 2012). [↑](#footnote-ref-64)
65. [Council 2012: Provisional Summary Record of the fourth Plenary Meeting](http://www.itu.int/md/S12-CL-C-0106/en). [↑](#footnote-ref-65)
66. Resolutions 101, 102, 133, (Rev. Guadalajara, 2010), Resolution 180 (Guadalajara, 2010). [↑](#footnote-ref-66)
67. <http://www.itu.int/en/membership/Pages/default.aspx>. [↑](#footnote-ref-67)
68. <http://www.itu.int/en/membership/Pages/default.aspx>. [↑](#footnote-ref-68)
69. [PayPal contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en) (October 2012). [↑](#footnote-ref-69)
70. Available from: <http://www.itu.int/en/wcit-12/Documents/final-acts-wcit-12.pdf>. [↑](#footnote-ref-70)
71. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-71)
72. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-72)
73. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-73)
74. [Contribution by ISOC Bulgaria](http://www.itu.int/md/S12-WTPF13PREP-C-0037/en) (10 October 2012). [↑](#footnote-ref-74)
75. “[The Future Internet”, ITU-T Technology Watch Report, April 2009](http://www.itu.int/dms_pub/itu-t/oth/23/01/T230100000A0001PDFE.pdf); David Talbot (2005), “*The Internet is broken”,* MIT Technology Review; WG-WSIS-18/05: ‘The 'future Internet'’ (V.3): <http://www.itu.int/md/S11-RDG5-C-0004/en>;   
    H. Kobayashi, Princeton University: <http://files.hisashikobayashi.com/articles/20080623_Kenynote_NICT_slide.pdf>. [↑](#footnote-ref-75)
76. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-76)
77. See on this Christopher Yoo(2012), “The Dynamic Internet:How technologies, Users and Businesses Are Transforming the Network”, AEI . [↑](#footnote-ref-77)
78. [www.itu.int/ITU-T/worksem/apportionment/201201/index.html](http://www.itu.int/ITU-T/worksem/apportionment/201201/index.html). [↑](#footnote-ref-78)
79. [Cisco contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0031/en) (30 September 2012). [↑](#footnote-ref-79)
80. For instance, Euro-IX has run a successful twinning programme for some years which sees engineers from LDCs visit engineers at IXPs in developed countries for training, and engineers in developed countries visit LDCs to provide on-the-ground assistance. [↑](#footnote-ref-80)
81. See, for example: [www.itu.int/ITU-T/worksem/apportionment/201201/index.html](http://www.itu.int/ITU-T/worksem/apportionment/201201/index.html). [↑](#footnote-ref-81)
82. <http://www.itu.int/en/wcit-12/Documents/final-acts-wcit-12.pdf>. [↑](#footnote-ref-82)
83. [UK Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en) (21 September 2012). [↑](#footnote-ref-83)
84. As defined by ITU Recommendation E800. [↑](#footnote-ref-84)
85. [PayPal contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en) (October 2012). [↑](#footnote-ref-85)
86. Discussion of the Ad Hoc Group at first IEG meeting (June 2012). [↑](#footnote-ref-86)
87. <http://www.internetsociety.org/qos-emperors-wardrobe-geoff-huston-isp-column>. [↑](#footnote-ref-87)
88. See Overview of QoS, Information Doc 5, CWG-WCIT, Feb 2012: [www.itu.int/md/T09-CWG.WCIT12-INF-0005/en](http://www.itu.int/md/T09-CWG.WCIT12-INF-0005/en). [↑](#footnote-ref-88)
89. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-89)
90. Discussion of Ad Hoc Group at first IEG meeting (June 2012). [↑](#footnote-ref-90)
91. [Saudi Arabia and Sudan contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) (1 August, 2012). [↑](#footnote-ref-91)
92. The term OTT is used to refer to applications and services accessible over the Internet and carried over operators’ networks offering Internet access services e.g., social networks, search engines, amateur video aggregation sites, etc. [↑](#footnote-ref-92)
93. [Russian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0010/en) (15 May 2012). [↑](#footnote-ref-93)
94. [Cisco contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en) (25 June 2012); [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en)  (25 June 2012). [↑](#footnote-ref-94)
95. [Saudi Arabia, Sudan contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) (1 August 2012). [↑](#footnote-ref-95)
96. Report by Arthur D Little, “Telco Operators: Let’s Face It”, March 2012. [↑](#footnote-ref-96)
97. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (September 2012), citing <http://blog.telegeography.com/post/32390008437>. [↑](#footnote-ref-97)
98. Source: TeleGeography ([www.telegeography.com](http://www.telegeography.com)). [↑](#footnote-ref-98)
99. “A Viable Future Model for the Internet”, AT Kearney (2010), available at: <http://www.atkearney.com/index.php/Publications/a-viable-future-model-for-the-internet.html>. [↑](#footnote-ref-99)
100. WG-WSIS-18/05\*: ‘The 'future Internet' (Version 3.0), available at: <http://www.itu.int/md/S11-RDG5-C-0004/en>. [↑](#footnote-ref-100)
101. WTDC-02 Programme 2. [↑](#footnote-ref-101)
102. In addition to older protocols such as SS7. In terms of number of users, SS7 is at present the most widely-used connectionless packet-switched network (because it supports mobile networks), and it is also is the most widely-used messaging system (because it supports SMS). [↑](#footnote-ref-102)
103. “David Talbot (2005), “*The Internet is broken”,* MIT Technology Review; WG-WSIS-18/05\*: ‘The 'future Internet'’ (V.3), at: <http://www.itu.int/md/S11-RDG5-C-0004/en>; H. Kobayashi, Princeton University: <http://kccc.nict.go.jp/keihanna-lab/document/20080623_kobayasi2.pdf>. [↑](#footnote-ref-103)
104. Note: The IANA contract references certain standards that must be followed or that must be considered, such as certain IETF RFCs and ISO Standards; by reference to PKI, it implicitly references Recommendation ITU-T X.509. See: <http://www.ntia.doc.gov/files/ntia/publications/sf_26_pg_1-2-final_award_and_sacs.pdf>. [↑](#footnote-ref-104)
105. RFC 2131. [↑](#footnote-ref-105)
106. [PayPal contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en) (October 2012). [↑](#footnote-ref-106)
107. The IANA is a set of technical functions related to the operations of the Internet. The IANA functions include: (1) the coordination of the assignment of technical IP parameters; (2) the administration of certain responsibilities associated with the Internet DNS root zone management; (3) the allocation of Internet numbering resources; and (4) other services related to the management of the ARPA and INT top-level domains (TLDs). Since February 2000, the IANA functions have been performed by ICANN under the contract with the US Department of Commerce (DoC). The current IANA contract expired on 30 September 2012, and ICANN will continue to perform the IANA function for the new IANA contract dates from 1 October 2012 to 30 September 2015, with two separate two-year option periods for a total contract period of seven years” (source: IANA Functions Contract, NTIA, the US Department of Commerce (DoC), Available at <http://www.ntia.doc.gov/page/iana-functions-purchase-order>). [↑](#footnote-ref-107)
108. IETF RFC 2460, available at: <http://tools.ietf.org/html/rfc2460>. [↑](#footnote-ref-108)
109. Number Resources, IANA, <http://www.iana.org/numbers>. [↑](#footnote-ref-109)
110. Initial IANA Delegation of IPv6 address space, <https://www.iana.org/reports/1999/ipv6-announcement.html>. [↑](#footnote-ref-110)
111. Ad Hoc Group discussion in first IEG meeting (June 2012). [↑](#footnote-ref-111)
112. [ARIN contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0012/en) (22 June 2012), [US contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0019/en) (1 August 2012). [↑](#footnote-ref-112)
113. <http://bgp.potaroo.net/v6/as2.0/>. [↑](#footnote-ref-113)
114. <http://labs.apnic.net/dists/v6dcc.html>. [↑](#footnote-ref-114)
115. The reasons stated range from technical issues to challenges faced by developing countries ([Algerian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en), 2 August 2012) and other assertions, such as market failure. [↑](#footnote-ref-115)
116. ITU’s related capacity-building efforts can be found at: <http://www.itu.int/ITU-D/cyb/ip/index.html>. One example of current initiatives to promote deployment of IPv6 is the [World IPv6 Launch Day](http://www.worldipv6launch.org/). [↑](#footnote-ref-116)
117. “Internet Protocol version 6”, Contribution from the Syrian Arab Republic to the IPv6 Group, available at: <http://www.itu.int/md/T09-IPV6-C-0019/en>. [↑](#footnote-ref-117)
118. Some point out that that most of the legacy address allocations were allocated before the current address allocation system was in place. See [ARIN contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0012/en) (22 June 2012) and [Cisco contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en) (25 June 2012). [↑](#footnote-ref-118)
119. [UK Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en) (21 September 2012). [↑](#footnote-ref-119)
120. Note: According to an analysis by RIPE-NCC (Available at <https://labs.ripe.net/Members/emileaben/world-ipv6-launch-lasting-effect-on-content>), less than 10% of top 1 million websites (as compiled by Alexa) are IPv6-enabled. Many Content Delivery Networks (CDNs) enabled their networks for IPv6 before 6 June 2012 (World IPv6 Launch Day). [↑](#footnote-ref-120)
121. <http://labs.apnic.net/dists/v6dcc.html> shows on 29 August 2012, 0.14% of Internet users are IPv6 users worldwide. [↑](#footnote-ref-121)
122. [PayPal contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en) (October 2012). [↑](#footnote-ref-122)
123. [Cisco contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0014/en) (25 June 2012), [ISOC contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en) (26 June 2012), [ARIN contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0012/en) (22 June 2012). [↑](#footnote-ref-123)
124. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-124)
125. ICANN contribution on the effectiveness of bottom-up policy making in IP address management. ITU IPv6 Expert Group, June 2012. [↑](#footnote-ref-125)
126. [Co-chairs' report on the APNIC 29 Community Consultation: “IPv6 Address Management and ITU: Is an ‘additional parallel structure’ required](http://www.itu.int/md/T09-IPV6-C-0005/en)?” [↑](#footnote-ref-126)
127. [Algerian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en) (2 August, 2012). [↑](#footnote-ref-127)
128. [Stewardship and the Management of the Internet Protocol Addresses](http://internetgovernance.org/pdf/CyberDialogue2012_Mueller.pdf), Milton Mueller, available at: <http://internetgovernance.org/pdf/CyberDialogue2012_Mueller.pdf>. [↑](#footnote-ref-128)
129. [The Country Internet Registry (CIR) model](http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=5423069&contentType=Conference+Publications): An alternative approach for the allocation and distribution of IPv6 Addresses. Murugesan et al. HONET'09, Proceedings of the 6th international conference on high-capacity optical networks and enabling technologies, Pages 216-220, 2009. [↑](#footnote-ref-129)
130. [Report of the 4th meeting](http://www.itu.int/md/T09-IPV6-120612-R/en) of the IPv6 Group, Geneva, 12 June 2012; Council 2012 document [C12/62](http://www.itu.int/md/S12-CL-C-0062/en) on the Report on the closure of the IPv6 Group. [↑](#footnote-ref-130)
131. [Russian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0010/en) (15 May 2012). [Algerian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en) (2 August 2012). [↑](#footnote-ref-131)
132. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012) and [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en) (21 September 2012). [↑](#footnote-ref-132)
133. <http://www.apnic.net/services/services-apnic-provides/resource-certification/RPKI>. [↑](#footnote-ref-133)
134. ISOC RPKI White Paper: <https://www.internetsociety.org/doc/technopolicy-primer-resource-public-key-infrastructure-rpki-0> [↑](#footnote-ref-134)
135. ISOC contribution (November 2012). [↑](#footnote-ref-135)
136. Details included in [contribution from Nav6, University Sains Malaysia](http://www.itu.int/md/S12-WTPF13PREP-C-0016/en), “Resource Public Key Infrastructure (RPKI): A tradeoff between security and freedom”. [↑](#footnote-ref-136)
137. Ruling the Root part II: RPKI and the IP address space, available at: <http://blog.internetgovernance.org/blog/_archives/2010/3/13/4479658.html>. [↑](#footnote-ref-137)
138. [ARIN Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0012/en) (22 June 2012); [ISOC contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en) (26 June 2012). [↑](#footnote-ref-138)
139. WTDC-10 Programme 2. [↑](#footnote-ref-139)
140. Para 3.2., WTDC-10 Programme 2. [↑](#footnote-ref-140)
141. See, for example, the [IGF workshop](http://wsms1.intgovforum.org/content/no69-teaching-internet-governance-developing-countries) on “Why do developing countries have a low participation in the Internet Governance Process?”. [↑](#footnote-ref-141)
142. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-142)
143. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-143)
144. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-144)
145. For example, ccTLD is a TLD with two characters for countries and territories based on the ISP 3166 list (i.e., “.ch” for Switzerland) and so a gTLD is a TLD which is not a ccTLD, such as “.com” or “.int”. [↑](#footnote-ref-145)
146. About gTLDs, ICANN, available at <http://www.icann.org/en/resources/registries/about>. [↑](#footnote-ref-146)
147. TLDs, Version 2012082101, last updated on August 22 07:07:02 2012 UTC, <http://data.iana.org/TLD/tlds-alpha-by-domain.txt>. [↑](#footnote-ref-147)
148. See <http://www.itu.int/en/ITU-T/inr/enum>. [↑](#footnote-ref-148)
149. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-149)
150. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). In addition, according to the NTIA, this type of change to the DNS is expected to enhance consumer trust and choice, and reinforce the global nature of the Internet: Testimony of Fiona M. Alexander, Associate Administrator, NTIA, US Department of Commerce (DoC), Hearing on ICANN’s Expansion of Top Level Domains, 4 December 8, 2011; <http://www.ntia.doc.gov/speechtestimony/2011/testimony-associate-administrator-alexander-icann-s-expansion-top-level-domains>. [↑](#footnote-ref-150)
151. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-151)
152. [Daniel L. Jaffe, Vice President, Association of National Advertisers (ANA), The US House Energy and Commerce Committee, December 14, 2011](http://www.ana.net/getfile/17073); Jon Leibowitz, The US Federal Trade Commission (FTC), Hearing before the House Judiciary Subcommittee on Intellectual Property, Competition and the Internet, 7 December 2011. [↑](#footnote-ref-152)
153. [Consumer Protection Concerns Regarding New gTLDs, the US Federal Trade Commission, December 16, 2011](http://www.ftc.gov/os/closings/publicltrs/111216letter-to-icann.pdf); [Concerns about the new gTLD Expansion, Congress of the United States, 7 August 2012](http://www.icann.org/en/news/correspondence/leahy-et-al-to-atallah-07aug12-en). [↑](#footnote-ref-153)
154. During the root scaling discussion, it was agreed that ICANN would not delegate TLDs at a rate greater than 1,000 per year. <http://newgtlds.icann.org/en/announcements-and-media/announcement-29jul12-en>. [↑](#footnote-ref-154)
155. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012).ICANN staffs haves also stated that they believe the delegation rate will result in fewer than 1000 new gTLDs in the root per year; [GAC-ICANN Board Meeting, ICANN 42, October 25, 2011](http://dakar42.icann.org/node/26925); [GAC-ICANN Board Consultation, Root Zone Scaling, February 21, 2011](http://archive.icann.org/en/topics/new-gtlds/gac-board-root-zone-scaling-21feb11-en.pdf); [“Scaling the Root Report on the Impact on the DNS Root System of Increasing the Size and Volatility of the Root Zone”, 31 August 2009](http://www.icann.org/en/committees/security/sac046.pdf); and [Summary of Impact of Root Zone Scaling, October 2010](http://archive.icann.org/en/topics/new-gtlds/summary-of-impact-root-zone-scaling-06oct10-en.pdf). [↑](#footnote-ref-155)
156. New gTLDs: Competition or Concentration? Innovation or Domination?, Phil Corwin, 6 June 2012, available at: [www.domainnamenews.com/new-gtlds/new-gtlds-competition-or-concentration-innovation-or-domination/11833](http://www.domainnamenews.com/new-gtlds/new-gtlds-competition-or-concentration-innovation-or-domination/11833). [↑](#footnote-ref-156)
157. Cross Ownership Issues, Letter from Lawrence Strickling (the US DoC, NTIA) to ICANN, 16 June 2011, available at: <http://www.icann.org/en/correspondence/strickling-to-dengate-thrush-16jun11-en.pdf>. [↑](#footnote-ref-157)
158. Rationale for Board Decision on Economics Studies Associated with the New gTLD Program, ICANN, 21 March 2011, available at: <http://www.icann.org/en/groups/board/documents/rationale-economic-studies-21mar11-en>. [↑](#footnote-ref-158)
159. ICANN’s Escape from Antitrust Liability, Justin T. Lepp, 89 Wash. U. L. Rev. 931 (2012), available at: <http://lawreview.wustl.edu/in-print/icanns-escape-from-antitrust-liability/>. [↑](#footnote-ref-159)
160. [Economic Framework for the Analysis of the Expansion of Generic Top-Level Domain Names](http://www.icann.org/en/topics/new-gtlds/economic-analysis-of-new-gtlds-16jun10-en.pdf) (June 2010); [Economic Considerations in the Expansion of Generic Top-Level Domain Names, Phase II Report: Case Studies (Phase II Report)](http://www.icann.org/en/topics/new-gtlds/phase-two-economic-considerations-03dec10-en.pdf); and also see [Rationale for Board Decision on Economic Studies Associated with the New gTLD Program, 21 March, 2011](http://www.icann.org/en/groups/board/documents/rationale-economic-studies-21mar11-en); ICANN has now committed to further study of the impacts of the new gTLD program [source: [U.S](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en).]. [↑](#footnote-ref-160)
161. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-161)
162. [Defensive Registrations for New gTLDS, ANA, 7 May 2012](http://www.icann.org/en/news/correspondence/jaffe-to-beckstrom-07may12-en.pdf); [Mallory Duncan, Vice President, National Retail Federation, 21 October 2011](http://www.ana.net/getfile/16997). [↑](#footnote-ref-162)
163. Why The New gTLD Program Remains of Concern to Business, Intellectual Property Owners Association (Appendix), [www.bakerlaw.com/files/Uploads/Documents/News/Articles/INTELLECTUAL%20PROPERTY/2011/IPO\_Comments\_Einhorn-3-2011.pdf](http://www.bakerlaw.com/files/Uploads/Documents/News/Articles/INTELLECTUAL%20PROPERTY/2011/IPO_Comments_Einhorn-3-2011.pdf); New gTLD and IDNs for development: Importance and Obstacles, IGF 2010 (Session 61), [www.intgovforum.org/cms/component/content/article/102-transcripts2010/634-61](http://www.intgovforum.org/cms/component/content/article/102-transcripts2010/634-61); WIPO Arbitration & Mediation Center observations on ICANN’s April 2011 Discussion Draft of New gTLD Applicant Guidebook, Erik Wilbers, Director, WIPO Arbitration & Mediation Center: [www.icann.org/en/correspondence/wilbers-to-beckstrom-13may11-en.pdf](http://www.icann.org/en/correspondence/wilbers-to-beckstrom-13may11-en.pdf). [↑](#footnote-ref-163)
164. Applicant Guidebook, <http://newgtlds.icann.org/en/applicants/agb>. [↑](#footnote-ref-164)
165. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-165)
166. [Concerns about the new gTLD Expansion, Congress of the United States, August 7, 2012](http://www.icann.org/en/news/correspondence/leahy-et-al-to-atallah-07aug12-en); [Why the New gTLD Program Remains of Concern to Businesses, Intellectual Property Owners Association (Appendix)](http://www.bakerlaw.com/files/Uploads/Documents/News/Articles/INTELLECTUAL%20PROPERTY/2011/IPO_Comments_Einhorn-3-2011.pdf). [↑](#footnote-ref-166)
167. [Protection Against the Misleading Use of the Names and Acronyms of International Intergovernmental Organizations in the DNS, Legal Counsels of Public International Intergovernmental Organizations, December 13, 2011](http://www.icann.org/en/news/correspondence/igo-counsels-to-beckstrom-et-al-13dec11-en.pdf); [Letter from T. Stelzer (Secretary of CEB) to Akram Atallah, United Nations, July 11, 2012](http://www.icann.org/en/news/correspondence/stelzer-to-atallah-11jul12-en); [GAC Principles regarding new gTLDs (28 March 2007)](http://archive.icann.org/en/topics/new-gtlds/gac-principles-regarding-new-gtlds-28mar07-en.pdf). [↑](#footnote-ref-167)
168. Affirmation of Commitments (AoC) by the U.S. Department of Commerce and ICANN, 30 September 2009, available at: <http://www.ntia.doc.gov/files/ntia/publications/affirmation_of_commitments_2009.pdf>. [↑](#footnote-ref-168)
169. Ibid. [↑](#footnote-ref-169)
170. Affirmation of Commitments by the U.S. Department of Commerce and ICANN, 30 September 2009, available at: <http://www.ntia.doc.gov/files/ntia/publications/affirmation_of_commitments_2009.pdf>. [↑](#footnote-ref-170)
171. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-171)
172. The [Ad Hoc Group convened by Verizon and ARIN](http://www.itu.int/md/S12-WTPF13PREP-C-0040/en), Second IEG meeting, October 2012. [↑](#footnote-ref-172)
173. The [Ad Hoc Group convened by Verizon and ARIN](http://www.itu.int/md/S12-WTPF13PREP-C-0040/en), Second IEG meeting, October 2012. [↑](#footnote-ref-173)
174. RFC1591 Domain Name System Structure and Delegation (March, 1999) introduce the ccTLD operating List by using the ISO 3166 List. “The selection of the ISO 3166 list as a basis for country code top-level domain names was made with the knowledge that ISO has a procedure for determining which entities should be and should not be on that list.” <http://www.ietf.org/rfc/rfc1591.txt>; [US Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (4 October 2012). [↑](#footnote-ref-174)
175. Issue Paper Selection of IDN ccTLDs associated with THE iso 3166-1 two letter codes, ICANN, 9 July 2007, at: [http://www.icann.org/en/resources/idn/ccnso-gac-idn-issues-report-09jul07-en.pdf](http://www.google.ch/url?q=http://www.icann.org/en/resources/idn/ccnso-gac-idn-issues-report-09jul07-en.pdf&ei=iVkuUIqvLMbSsgaP3YHICw&sa=X&oi=unauthorizedredirect&ct=targetlink&ust=1345216657728943&usg=AFQjCNHiiu2iAC48cetGlMbgBdxqDiJ_YA). [↑](#footnote-ref-175)
176. Exceptionally reserved code elements, ISO 3166-1 decoding table, <http://www.iso.org/iso/country_codes>. [↑](#footnote-ref-176)
177. Understanding the ccTLD Delegation and Redelegation Procedure, IANA: [www.iana.org/domains/root/delegation-guide/](http://www.iana.org/domains/root/delegation-guide/). [↑](#footnote-ref-177)
178. Under the new IANA contract (July 2012), the IANA contractor (currently ICANN) shall apply existing policy frameworks in processing requests related to the delegation and redelegation of a ccTLD, such as RFC 1591, the GAC Principles And Guidelines For The Delegation And Administration Of Country Code Top-Level Domains, and any further clarification of these policies by interested and affected parties: [www.ntia.doc.gov/files/ntia/publications/sf\_26\_pg\_1-2-final\_award\_and\_sacs.pdf](http://www.ntia.doc.gov/files/ntia/publications/sf_26_pg_1-2-final_award_and_sacs.pdf). [↑](#footnote-ref-178)
179. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-179)
180. Sovereign Domains: A Declaration of Independence of ccTLDs from Foreign Control, Kim G. von Arx and Gregory R. Hagen, 9 RICH. J.L. & TECH. 4 (Fall 2002) at <http://jolt.richmond.edu/v9i1/article4.html#_edn87>; The National ccTLD Disputes: Between State actors and non-state actors, Y. J. Park, International Journal of Communications Law & Policy, Winter 2009, <http://ijclp.net/files/ijclp_web-doc_10-13-2009.pdf>. [↑](#footnote-ref-180)
181. IANA Report on the Redelegation of the .SO Top-Level Domain, <http://www.iana.org/reports/2009/so-report-03feb2009.html>. [↑](#footnote-ref-181)
182. Resolution 102 (Rev. Guadalajara, 2010). [↑](#footnote-ref-182)
183. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-183)
184. RFC 6101. [↑](#footnote-ref-184)
185. RFC 6176. [↑](#footnote-ref-185)
186. [PayPal contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en) (October 2012). [↑](#footnote-ref-186)
187. DNSSEC Protocol RFC (IETF): RFC 4033, RFC 4034, and RFC 4035. [↑](#footnote-ref-187)
188. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (2 October 2012). [↑](#footnote-ref-188)
189. See more, <http://www.zoomerang.com/Shared/SharedResultsSurveyResultsPage.aspx?ID=L23VTKJEXCE9>. [↑](#footnote-ref-189)
190. <http://www.internetgovernance.org/2008/02/15/eeny-meeny-miny-moe-will-verisign-control-the-root/>. [↑](#footnote-ref-190)
191. <http://www.internetgovernance.org/2009/06/12/former-principal-scientist-at-verisign-blasts-us-control-of-dnssec-root-signing/>. [↑](#footnote-ref-191)
192. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012), [ISOC contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0015/en) (26 June 2012). [↑](#footnote-ref-192)
193. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (2 October 2012). [↑](#footnote-ref-193)
194. Resolution 133 (Rev. Guadalajara, 2010). [↑](#footnote-ref-194)
195. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-195)
196. [Saudi Arabia and Sudan contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0017/en) (1 August 2012), [Algerian contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0021/en) (2 August 2012). [↑](#footnote-ref-196)
197. Version 1.0 of the Unicode Standard was published in October 1991, but the first data files simplifying implementation and enhancing interoperability did not appear until Version 2.0 in July 1996. By this time, the Internet was more than well-established and the World Wide Web was recognized as an important technological development. [↑](#footnote-ref-197)
198. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-198)
199. [PayPal contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0039/en) (October 2012). [↑](#footnote-ref-199)
200. IDN Variant TLD program , ICANN, (4 May, 2012),  <http://www.icann.org/en/news/public-comment/idn-variant-tld-revised-program-plan-04may12-en.htm>.  [↑](#footnote-ref-200)
201. Information on the status of IDN ccTLD implementations in different scripts can be found at: <http://www.icann.org/en/resources/idn/announcements>.   [↑](#footnote-ref-201)
202. Details of root server deployment can be found at <http://www.root-servers.org/>. [↑](#footnote-ref-202)
203. For more information on the uneven distribution of DNS root servers on the Internet, see: <http://royal.pingdom.com/2012/05/07/the-very-uneven-distribution-of-dns-root-servers-on-the-internet/>. [↑](#footnote-ref-203)
204. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-204)
205. [Nominet contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0024/en) (30 September 2012). [↑](#footnote-ref-205)
206. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0013/en) (25 June 2012). [↑](#footnote-ref-206)
207. <http://royal.pingdom.com/2012/05/07/the-very-uneven-distribution-of-dns-root-servers-on-the-internet/>. [↑](#footnote-ref-207)
208. <http://root-servers.org/>. [↑](#footnote-ref-208)
209. “About the GAC”, available at: <https://gacweb.icann.org/display/gacweb/About+The+GAC>. [↑](#footnote-ref-209)
210. ICANN Bylaws (March 2012) - Article XI: Advisory Committees, [www.icann.org/en/about/governance/bylaws](http://www.icann.org/en/about/governance/bylaws). [↑](#footnote-ref-210)
211. [U.S.A. Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (4 October 2012). [↑](#footnote-ref-211)
212. [UK contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en) (21 September 2012). [↑](#footnote-ref-212)
213. GAC Members (as of 12 December, 2012), see: <https://gacweb.icann.org/display/gacweb/GAC+Members>. [↑](#footnote-ref-213)
214. [UK Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0023/en) (21 September, 2012). [↑](#footnote-ref-214)
215. [U.S.A. Contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (4 October, 2012). [↑](#footnote-ref-215)
216. “ICANN has rejected the GAC’s advice that the definition of “Community-based” strings be expanded to include strings that purport to represent a particular group of people or interests based on historical, cultural, or social components of identity, such as nationality, race or ethnicity, religion, culture, etc., or particular sectors, on the grounds that doing so would be extremely difficult to implement”, GAC comments on the Applicant Guidebook (15 April 2011 version). [↑](#footnote-ref-216)
217. Report issued by the Joint Working Group (JWG) of the ICANN Board and the GAC, June 2011. Available at: <http://archive.icann.org/en/committees/board-gac-2009/board-gac-jwg-final-report-19jun11-en.pdf>. [↑](#footnote-ref-217)
218. <http://archive.icann.org/en/committees/board-gac-2009/board-gac-jwg-final-report-19jun11-en.pdf>. [↑](#footnote-ref-218)
219. [U.S.A. contribution](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en) (2 October 2012). [↑](#footnote-ref-219)
220. Five out of 27 ATRT Recommendations relate to the role of the GAC within ICANN, and the Board-GAC Recommendation Implementation Working Group (BGRI) has completed work on three of the five recommendations. The BGRI is presently advancing proposals to complete the remaining two recommendations, which focus specifically on the early engagement of the GAC in ICANN’s policy development processes [source: [U.S.A.](http://www.itu.int/md/S12-WTPF13PREP-C-0033/en)]. [↑](#footnote-ref-220)