1 June 2012

**PRELIMINARY SECOND DRAFT OF THE SECRETARY-GENERAL’S REPORT**

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

 **1. Preamble**

**1. 1 The fifth World Telecommunication/ICT Policy Forum (WTPF)**

**1.1.1** Originally established by the 1994 Plenipotentiary Conference, the World Telecommunication/ICT Policy Forum (WTPF) aims to provide a forum where ITU Member States and Sector Members can discuss and exchange views and information on emerging telecommunication and ICT policy and regulatory matters, especially global and cross-sectoral issues (Resolution 2, 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 related 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) was established as a separate group 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. CWG-Internet is limited to Member States, with open consultation among all stakeholders. The[terms of reference for CWG-Internet](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.

**1.1.5** WTPF-2013 shall prepare reports and adopt opinions by consensus for consideration by ITU membership and relevant ITU meetings, bearing in mind items 1.1.3 and1.1.4, and the need to avoid contradiction between the debates 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 CWG-Internet.

**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 (2011 Council Decision 562). This draft Report outlines a potential scope for discussions and presents some of the Internet-related public policy issues under consideration in different stakeholder groups.

**1.2.2** According to Decision 562, the Secretary-General shall convene a balanced, informal group of experts, each of whom is active in preparing for the Policy Forum, to assist in this process.

**1.2.3** [A circular letter (DM12-1003)](http://www.itu.int/en/membership/Pages/letters.aspx) outlining the preparatory process of the fifth WTPF was sent to ITU membership on 1 February 2012 (<http://www.itu.int/en/membership/Pages/letters.aspx>). The proposed timetable, included in the letter, is given below:

**Table 1: Proposed Timetable for 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.  |
| **15 May 2012** | Deadline for receipt of membership comments on the first draft and additional materials for the second draft. Deadline for nominations for the informal expert group (IEG) to advise the Secretary-General. |
| **5 June 2012** | First meeting of the group of experts. Preliminary second draft of the Secretary-General’s Report. |
| **31 July 2012** | Online posting and circulation of second draft (incorporating comments and broad outlines for possible draft opinions). |
| **30 September 2012** | Deadline for receipt of comments on the second draft. |
| **Jan-Feb 2013** | Second meeting of the informal group of experts. |
| **1 March 2013** | Finalization of the Report of the Secretary-General, and deadline for its publication. |
| **13 May 2013** | Proposed date for a high-level Strategic Dialogue. |
| **13-17 May 2013 (coincides with WSIS Forum 2013)** | Proposed dates for 5th WTPF on Internet-related public policy issues. |

# 2. Themes for WTPF-2013

**2.1** By Decision 562, 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 recently at PP-10.

**2.2** Issues raised in Plenipotentiary Resolutions 101, 102 and 133 that are under consideration for the purposes of this report (bearing in mind item 1.1.5) have been extracted from the aforementioned Plenipotentiary Resolutions and are listed in the sections below.

**2.3.1 Development & Diffusion of Information and Communication Technologies Globally**

1. The Internet traces its origins[[1]](#footnote-1) to concepts developed in the United States more than 40 years ago, which made significant investments – financial, intellectual and human – in the development of early and later iterations of the Internet. Indeed, some of the key characteristics of the Internet today reflect priorities and historical choices made during the course of its development (e.g., its architecture, the fundamental importance of information-sharing and exchange, and the possibility of anonymity).

**Box 1: Key Stages in the Development of the Internet**

**1969 — ARPANET** (US Department of Defense)

**1972 — CYCLADES** (The French government developed its own computer network, named CYCLADES, designed by Louis Pouzin in 1972)

**1975 — TCP/IP (**allowing not only computers to be networked, but also *networks* to communicate with each other. It was designed by Robert E. Kahn and Vint Cerf working at ARPA)

**1983 — The Domain Name System** (DNS)

1. **— The World Wide Web** (invented by Tim Berners-Lee at CERN)
2. The Internet has evolved far beyond its initial experimental setting. Today’s global information infrastructure encompasses a host of public and private Internet Protocol (IP)-based and other networks.
3. The Internet is today global in scale and supports applications that touch on virtually all aspects of society. The Internet has become a critical national resource for governments, a vital part of national infrastructure, and a key driver of socio-economic growth and development, among other drivers.
4. Total global Internet users numbered some 2.4 billion by the start of 2012, among which, total mobile broadband subscribers amounted to 1.192 billion. The increased use of the Internet enables additional applications based on its highly advanced technology and end-to-end architecture, e.g. the utilization of e-mail and text messaging, applications that utilize many forms of Voice over IP (VoIP), streaming and real-time video, social networking, e-government, e-banking, search capabilities, e-books and TV (IPTV) over the Internet. By the end of 2011, there were some 135.4 million VoIP subscribers and 60 million IPTV subscribers worldwide (Point Topic, 2012[[2]](#footnote-2)).

**Table 2: Summary Statistics for High-Speed Connectivity[[3]](#footnote-3)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Total, 2011** | **High-speed, 2011** | **% Global Totalhigh-speed, 2011** |
| **Fixed Internet subscriptions** | 659 million (2010) | 527 million (2010) | 80% (2010) |
| **Mobile subscriptions** | 5.981 billion | 1.192 billion | 19.9% |
| **Handset shipments** | 1.5452 billion | 491.4 million | 31.8% |

**Figure 1: Global Internet Users, by geographic region, 2011**



1. Advances in the global information infrastructure, including the development of IP-based networks and especially the Internet, and future IP developments, are an engine of growth and socio-economic development in the world economy in the twenty-first century. A ten per cent 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 – [www.itu.int/broadband/](http://www.itu.int/broadband/)).
2. The Internet has fundamental value as a platform for 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.
3. Today, the information and knowledge provided over the Internet are often cited as examples of global public goods. It is widely recognized that the utility and value of a network increases with growth in the number of nodes and users of that network.
4. The Internet, as a decentralized and open system, must be permitted to enable the world’s citizens to freely connect and express themselves consistent with fundamental principles of freedom of expression, while taking into consideration national security or of public order (ordre public), or of public health or morals[[4]](#footnote-4). 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 enable the continued growth of the Internet and the markets and economies based thereon.
5. 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/)”.
6. Advances in global 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.

**2.3.2 The Multi-stakeholder Model**

1. The development of the Internet is today essentially market-led and has been driven by both private and government initiatives. The Internet grew within an environment facilitated by voluntary, decentralized and consensus-based processes. The private sector continues to play an important role in the expansion of the Internet - for example, through investments in infrastructure and services and through the bottom-up, consensus based voluntary standards and policy development processes of, for example, the IETF and Regional Internet Registries respectively.
2. The management of the Internet is a subject of international interest with the current organizations, systems and processes successfully meeting the needs of its stakeholders via its industry-led, bottom-up, consensus-based processes.
3. While this report refers to the *Tunis Agenda* extensively, it is recognized that the process used to approve the *Tunis Agenda* did not follow an open, multistakeholder, consensus-based process. It used a process that reserved all decision-making ability to the governments and where the private sector, civil society and non-governmental organizations (NGOs) had no status in the decision-making process.
4. In addition, it should also be noted that the subject of this WTPF, Resolutions 101, 102 and 133, were developed in an ITU Plenipotentiary meeting where the private sector, civil society and NGOs had no status in the decision making process. Also the decision to hold this WTPF and its the terms of reference were developed at ITU Council at which, again, most of the stakeholders mentioned herein had no status in the decision-making process and had very limited ability to participate even as Observers.
5. The *Tunis Agenda for the Information Society* (para 34) provides “a working definition” of Internet governance as “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”.
6. The WSIS and the Tunis Agenda provide the framework for discussions on Internet-related public policy issues including a broad framework for establishing governing principles for the management of the Internet. Endorsed by world leaders in 2005, it touches on public policy issues related to the Internet and the multi-stakeholder governance model:
7. §§ 69, 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).
8. The relevant outcomes (§§ 29-82 Tunis Agenda) concerning Internet governance.
9. The management of the Internet encompasses technical and public policy issues and should involve all stakeholders and relevant intergovernmental and international organizations in accordance with §§ 35 a)-e) Tunis Agenda which state:
10. 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.
11. 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.
12. Civil society has also played an important role on Internet matters, especially at community level, and should continue to play such a role.
13. Intergovernmental organizations have had, and should continue to have, a facilitating role in the coordination of Internet-related public policy issues.
14. International organizations have also had and should continue to have an important role in the development of Internet-related technical standards and relevant policies.
15. 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. The need for development of public policy by governments in consultation with all stakeholders is also recognized[[5]](#footnote-5) understanding that “consultation with all stakeholders” is not the same as a multi-stakeholder process.
16. ITU membership has been discussing Internet governance for many years, from both a narrow and broad perspective. The narrow approach focuses on Internet architecture and infrastructure (DNS, IP numbers, and root servers), a field in which the Internet Corporation for Assigned Names and Numbers (ICANN) plays a significant role. According to the broad approach, Internet governance negotiations should go beyond infrastructural points and address other legal, economic, developmental, and socio-cultural issues, as adopted by the World Summit on the Information Society (WSIS).
17. While most are satisfied with the current state of Internet governance whose bodies have evolved based on a bottom-up, community-led, consensus-based process and enabled the growth of the Internet as described in Section 2.3.1, others have expressed dissatisfaction, expressing that further evolution is needed to keep pace with the global spread of the Internet, how the Internet is used today and the roles of the various players who need to work together to ensure its ongoing evolution. Those dissatisfied point out that the current governance of Internet could be improved in accordance with the WSIS outcomes (especially on the roles and responsibilities of different stakeholder groups as outlined in § 35 of the Tunis Agenda – with some citing, for example, that governments currently have a limited decision-making role in formulating international public policy) and call for all governments to have an equal role and responsibility in an inclusive global management framework of the Internet. Some others call for more balanced representation of all stakeholder groups. Those that are satisfied with the current Internet governance model point out:
* the massive growth in connectivity, new services and markets as described in Section 2.3.1 that have been enabled by the current model,
* that the bottom-up, community-based decision processes are open to all (including government representatives on an equal role) and have allowed the evolution of policies to meet new challenges,
* that all decision-making in the WSIS and Tunis processes and in ITU’s Plenipotentiary meetings and Conferences (e.g., WTSA, WRC, WCIT) are closed to Governments only (or inter-governmental organizations) so that the private sector, civil society and NGOs have **no** decision-making capability in those organizations and that ITU Resolutions 101, 102 and 133 were decided on by Member States only at ITU Plenipotentiary 2010 where all other stakeholders had no status in the decision-making process.
* Under the framework of the WSIS principles, ITU 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, 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 World Wide Web Consortium (W3C), on the basis of reciprocity” [Brazilian and ARIN contributions to WTPF; see Documents 9 and 8 at: <http://www.itu.int/md/S12-WTPF13PREP-C-0009/en> and ARIN <http://www.itu.int/md/S12-WTPF13PREP-C-0008/en>].

**2.3.3 Internet Protocol (IP)-Based Networks and Management of Internet Resources**

1. Advances in global information infrastructure, including the development of the Internet, and future IP developments, are an engine of growth in the twenty-first century. Broadband Internet is today a critical infrastructure in the growing global economy. The increased use of the Internet enables additional applications and information services, e.g. the utilization of e-mail and text messaging, VoIP-based applications, streaming video and real-time video-conferencing, social networking, e-government, e-banking, mapping, search capabilities, e-books, and IPTV over the Internet. These services have become commonplace, although challenges regarding quality of service and uncertainty of origin for some applications, and high costs of international connectivity persist for some countries.
2. The Internet, and IP-based networks more broadly, are today critical information infrastructure for governments and a vital part of national infrastructure. Current and future IP-based networks and future IP developments will continue to introduce dramatic changes in the way we acquire, produce, circulate and consume information.
3. On the basis of such growth, demands are now growing on the existing Internet design and infrastructure. New applications, services and functionality are needed. Some experts have suggested 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, with security, identity management and multilingualization as commonly cited examples. Other experts point out that the open, community-driven, consensus-based processes used by the IETF and other organizations (e.g., the Network Operators Groups) for managing the evolution of the technical architecture of the Internet have dealt with such challenges over the last 20+ years successfully enough to have enabled the massive growth in connectivity and new applications as described in Section 2.3.1. These organizations continue to identify new needs and develop solutions to enable further growth and development.
4. The high costs of the circuits used for Internet connectivity within and between least developed countries and to the Internet Transit Providers as well as regulatory restrictions that in some countries still constrain the ability for Internet Providers in those countries from concluding commercial agreements with Internet Providers in other countries and with Internet Transit Providers remains a serious problem for these countries. Paragraph 50 of the Tunis Agenda (2005) acknowledged significant concerns and calls for the charges for international Internet connectivity to be better balanced to enhance access, particularly from developing countries. It therefore called for the development of strategies for increasing affordable global connectivity, thereby facilitating improved and equitable access for all, by:
5. 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.
6. Setting up regional high-speed Internet backbone networks and the creation of national, sub-regional and regional Internet Exchange Points (IXPs).
7. 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.
8. Encouraging ITU and other relevant institutions to continue the study of the question of International Internet Connectivity (IIC) as a matter of urgency, and to periodically provide outputs for consideration and possible implementation.
9. Promoting the development and growth of low-cost terminal equipment, such as individual and collective user devices, especially for use in developing countries.
10. Encouraging Internet Service Providers (ISPs) and other parties in the commercial negotiations to adopt practices towards attainment of fair and balanced interconnectivity costs.
11. Encouraging relevant parties to commercially negotiate reduced interconnection costs for Least Developed Countries (LDCs), taking into account the special constraints of LDCs.
12. Given the above and given the goal of enabling future growth of the Internet and the economy, the WTPF should consider options to reduce the regulatory restrictions that keep Internet providers from developing commercial agreements for interconnection both within their home country and with Internet providers in other countries. The WTPF should also consider how to reduce barriers to ISPs from one country showing up at and connecting to an IXP in a separate country and establishing peering agreements with ISPs in that country.
13. Rates for International Internet Connectivity (IIC) have been studied in ITU-T Study Group 3 with several recommendations[[6]](#footnote-8) having been made on methods to reduce connectivity rates.
14. 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, pre-defined transmission planning of Quality of Service (QoS)[[7]](#footnote-9) has become a major challenge, since many IP-based networks might not provide for self-standing end-to-end QoS, but only transport classes, which enable QoS differentiation.
15. 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, many experts have cautioned that migration scenarios and hybrid connections with existing wire-bound and traditional networks and terminals may be neglected and it may become increasingly difficult for network operators to establish or enforce appropriate quality of service standards.
16. Some commentators have stressed the importance of standardization so that the quality of service of telecommunications is consistent with international standards. They opine that it is in the public interest that [IP-based networks and other] telecommunication networks should be both interoperable and provide, at a minimum, the level of quality of service provided by traditional networks.
17. According to some, the present situation of the wide penetration of applications and services accessible over the Internet and carried over networks of operators that offer Internet access service and their impact on operators’ services, may require ITU to consider management of quality of service of services which are carried over the Internet and not offered by the operator itself [Russian contribution – see Document 10 at <http://www.itu.int/md/S12-WTPF13PREP-C-0010/en>]. Others consider that applications that run over the Internet are outside the scope of the ITU and that management of quality of service for applications that run over the Internet are the core mandate of other open, community-driven, consensus-based organizations except where these organizations should work with the ITU-T for those areas within the ITU-T’s mandate.
18. As a natural consequence of today’s competitive 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). This poses a significant challenge to network operators offering services in this competitive market.

**Figure 2: Trends in pricing and revenues[[8]](#footnote-10)** 

**2.3.3.1 Infrastructure, interoperability and standardization[[9]](#footnote-11)**

1. There have been calls for bold new initiatives to expand the capabilities of the Internet well beyond incremental improvements to its deployed capabilities. In order to provide additional flexibility to accommodate current and new and unforeseen innovations, further research and development and innovation in the fundamental design of the Internet (including architecture, protocols, interfaces and services) may need to be encouraged.
2. Given the depth to which the Internet is today embedded in the socio-economic fabric of society, any evolutionary approach to building the future Internet should ensure full interoperability with the existing one.
3. Standardization would play an important role in ensuring this interoperability, while promoting the continuous development of Internet. 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 National Institute for ICT (NICT) Akari project; and the European Union’s Future Internet Research & Experimentation (FIRE) initiative.

**2.3.3.2 Internet Addressing**

1. Every device connected to the Internet is identified by an IP address or unique numerical label used to route data packets globally across the Internet. IP addresses are a finite resource. The first 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.
2. The Internet Assigned Numbers Authority (IANA) is responsible for globally coordinating the IP addressing systems and its role is to allocate IP addresses from the pools of unallocated addresses to the Regional Internet Registries (RIRs) according to their needs.
3. The continued rapid growth of the number of devices connected to the Internet is leading to the exhaustion of IPv4 addresses. 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. In anticipation of this exhaustion, the IETF developed a new version (IPv6), which provides a greatly expanded address space since it uses 128 bits to represent addresses (generating a new limit of 2128 addresses is equivalent to some 340 trillion). IANA began allocating blocks of IPv6 addresses in 1999.[[10]](#footnote-12)
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.  Lower layers and upper layers are fine. 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. In addition, some applications (that use IP address literals) must be modified. . While IPv6 deployment started slowly it is starting to pick up [provide numbers].. In June 2012, the Internet Society (ISOC) organized a World IPv6 Launch Day in which many companies committed to turning on and keeping on IPv6 support in their networks. According to some, deployment of IPv6 should become a clearly-stated priority objective for national policy-makers.
5. Some observers suggest that the current IPv6 allocation policies may represent a cause for concern. These observers caution 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. It has been pointed out many times that most of the legacy address allocations about which they complain were allocated before the current address allocation system was in place. On the other hand, many argue that the current allocation policies have enabled the massive growth of connectivity and new applications described in Section 2.3.1. Many also argue that the IPv6 address space is virtually inexhaustible and therefore the allocation policies of the Regional Internet Registries (RIRs) are feasible for IPv6. The [background report of WSIS-Working Group on Internet Governance (WGIG)](http://www.itu.int/wsis/wgig/docs/wgig-background-report.pdf) in 2005 has acknowledged that “the current numbering management is required to ensure equitable distribution of resources and access for all into the future”.
6. Furthermore, Internet Service Providers (ISPs) using IPv6 still need to use IPv4 in order to be able to access most of the existing content, so the availability (or lack thereof) of IPv4 addresses is a factor which continues to be relevant today in the context of migrating to IPv6, after IANA and APNIC exhausted their IPv4 free pools in January and April 2011 respectively. The term “exhausted” in the context of the RIR allocation policies does not mean that there are no IPv4 addresses left. It means that special policies have gone into effect to allocate the remaining IPv4 addresses. The exhaustion of IPv4 address and migration to IPv6 has led to suggestions that the governance structure of IP address needs reform for improvement[[11]](#footnote-13). These same suggestions included developing a free market in IPv4 addresses which was rejected by some Member States at the ITU IPv6 Group meeting at which it was presented.
7. According to some, the present situation of the deficit of the IPv4 addresses for Internet connections and expansions of Internet resources requires to recommend organize rational usages the IPv6 addresses in all regions within further ITU function of the IPv6 allocation [Russian contribution – see Document 10 at <http://www.itu.int/md/S12-WTPF13PREP-C-0010/en>].
8. After studying the above issues, the ITU’s IPv6 Group, formed by ITU Council under the BDT Director and TSB Director concluded “that current IPv6 allocation policies and processes met the needs of stakeholders.”[[12]](#footnote-14) The WTPF should take the results of the ITU’s IPv6 Group into account.

As the Internet evolves, major changes are underway in Internet routing and addressing policy. Resource Public Key Infrastructure (RPKI)[[13]](#footnote-15) is a security enhancement to the current IP address registration system that implements a digital cryptographic "right of use" certificate. The RPKI system is based on ITU-T Recommendation X.509 and follows the current IP address allocation system. The main use case for the RPKI infrastructure is to improve routing security.

1.

Observers note with caution that such a rigid global hierarchy could converge on a single trust anchor. The Syracuse University-based Internet Governance Project states that[[14]](#footnote-16) :

*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.*

(Note: Issues related to Internet Naming are addressed in section 2.3.4).

**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. Some observers note that participants from developing and Least Developed Countries are disadvantaged by the significant costs and human capacity requirement associated with participation in various global fora where Internet-related technical and public policy issues are discussed. This has often been highlighted as a barrier to equitable access to participation in the open global decision-making process on Internet-related matters. Others point out that these fora generally do a lot of their work via email lists and provide remote participation, thus enabling participation by people from Developing and Least Developed Countries. Unfortunately, many telecom-related policy for a are closed to Member States so that not even non-government people from developed countries can participate and they tend not to do their work via email making it even more difficult to participate.

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

**2.3.4.1 Inclusion of new generic Top Level Domains (gTLDs) under the Domain Name System**

1. The Domain Name System (DNS) specifies a hierarchical structure of the delegation authorities in domain naming. The DNS hierarchy is divided into top-level domains (TLDs), second-level domains (SLDs), etc. TLDs are generally categorized in two different groups: namely, generic Top Level Domains (gTLDs) and country code Top Level Domains (ccTLDs).[[15]](#footnote-18)
2. Originally, there were only seven gTLDs (.com, .org, .net, .gov, .edu, .mil and .int). Following growth in the demand for more gTLDs, several gTLDs (i.e., .biz, .info, .aero, .coop) 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. Currently, there are 22 functional gTLDs.
3. In June 2008, ICANN announced its new gTLD expansion policy, under which any public or private-sector entity can apply to create and operate a new gTLD. ICANN clarifies that applying for a new gTLD is not the same as buying a domain name on a “first come, first served” basis, but will be operating 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, ICANN finally initiated the first round of the new gTLDs application opening on 12 January 2012 for three months. Each gTLD applied-for string requires an online application via ICANN’s online application system and an evaluation fee (currently set at US$ 185,000 per requested application).
4. Some observers have raised concerns about the magnitude and scale of gTLD expansion and transparency in the cost evaluation used in the determination of registry fees. There is no upper limit on the number of applications for new gTLDs. Many observers are concerned about competition in the market for gTLDs, and the risk of creating a multitude of monopolies, rather than increasing competition in the gTLD market.
5. Some stakeholders remain concerned about the impact of multiple new gTLDs on trademark holders or right holders, especially those in developing countries, who would be compelled to assume high costs of addressing the possible proliferation of cyber-squatters inhabiting an unlimited number of new gTLDs. For example, since a domain name navigates to a website for a certain 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, observers point out that applicants may find themselves having to pay several multiples of the application fees for multiple domain names in different languages. This could result in a significant financial burden for applicants from developing countries. Trademark and other Intellectual Property related issues are normally managed by WIPO.
6. While ICANN has put in place some dispute resolution procedures to resolve disputes as they arise, some observers note that various policy challenges persist. The protection against the misleading use of the names and acronyms of inter-governmental organizations (IGOs) has been cited as one example. 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[[16]](#footnote-19).

**2.3.4.2 country code Top Level Domains (ccTLDs) under the Domain Name System**

1. 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 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.
2. IANA is responsible for the determination, 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.
3. 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 can 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.
4. The current delegation or re-delegation of a ccTLDs is a process comprising several stages, with many different players involved in the process. It starts with:[[17]](#footnote-20)
5. a proposed new operator who is an applicant for a name in a ccTLD; and
6. the existing operator who confirms the change is appropriate in the case of a re-delegation request.
7. In many cases, a national government associated with the ccTLD is asked to verify that the re-delegation is supported.
8. IANA then manages 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.
9. the ICANN Board of Directors considers the IANA recommendation and votes on whether the request should move forward.
10. Finally, the U.S. government evaluates a report on the request prepared by IANA.
11. As the socio-economic potential of a ccTLD has become more widely acknowledged, the number of requests for ccTLD re-delegations is growing.
12. Observers note that some serious issues have also arisen with regard to the authority to delegate and administer the ccTLDs. In fact, some governments have sought assistance from the ITU to reclaim their own ccTLDs or tried to use national legislation to reclaim ccTLDs from incumbent ccTLD managers.[[18]](#footnote-21) The Tunis Agenda (2005) acknowledges that Member States represent the interests of the population of the country or territory for which a ccTLD has been delegated. It goes on to state that countries should not be involved in decisions regarding another country's ccTLD.
13. The existing role and sovereignty of ITU Member States is recognized with respect to allocation and management of their telephony country code numbering resources as defined in Recommendation ITU-T E.164.

**2.3.4.3 Security of the Domain Name System**

1. The DNS resolution mechanism has critical security flaws that malicious entities have taken advantage of in order to launch attacks such as ‘man-in-the-middle’ attacks (a malicious third party can 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 types of attacks are the source of the majority of identity theft incidents and pose a great threat to the users’ “trust” of the Internet. To counter these threats, a set of Security Extensions to the DNS, known as DNSSEC, have been developed to provide origin authentication of DNS data to DNS clients – a mechanism that provides an added layer of assurance that a responding entity (name server) really is who it purports to be.
2. The resolution process ensures the “origin authentication of DNS data” by establishing an unbroken “chain of trust” between zones – right from the root, through the TLDs, to the domain server – that is resolved. 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.
3. For the “chain of trust” in DNSSEC to work, it would need 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 entity would be responsible for creating and maintaining the key that signs the root. The U.S. Department of Commerce and ICANN have identified a private organization, VeriSign, as the entity to manage and have operational responsibility for the Zone Signing Key. ICANN will manage the Key Signing Key process. ICANN will work closely with VeriSign regarding the operational and cryptographic issues involved. Some observers are concerned about this arrangement supporting this critical function[[19]](#footnote-22).

**2.3.5 Role of administrations of Member States in the management of internationalized (multilingual) domain names[[20]](#footnote-23)**

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. Note that Internet addresses are numbers, so multi-lingualism is irrelevant to IP addresses.
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 language (Resolution 133, Rev. Guadalajara, 2010).
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 (Resolution 133, Rev. Guadalajara, 2010).
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 (Resolution 133, Rev. Guadalajara, 2010).
8. Recalling the results of WSIS and the needs of linguistic groups, there is an urgent need to:
	1. advance the process for the introduction of multilingualism in a number of areas, including domain names, e-mail addresses and keyword look-up.
	2. 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.
	3. 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 Organisation (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.

**2.3.5.1 Internationalized Domain Names (IDNs) under the Domain Name System**

1. 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 Internationalized Domain Names (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.
2. Implementation of IDN in the new gTLDs program 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. [[21]](#footnote-24)

**2.3.5.2 Regional Root Server Instances**

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 the root server (“.”), which gives it the location of the “.int” name server, which in turn provides the location of the “itu.int” name server. Here, the root name server is a DNS server that answers requests for the DNS root zone, and re-directs requests for a particular top-level domain (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. Instances of the C, F, I, J, K, L and M servers now exist in multiple locations on different continents to provide decentralized service.

**Table 3: List of Operators Involved in the Root Zone Management System**

|  |  |  |
| --- | --- | --- |
| Server | Operator | Locations |
| A | VeriSign, Inc. | Dulles, Virginia, US |
| B | Information Sciences Institute  | Marina Del Rey, California, US |
| C | Cogent Communications | Distributed using anycast |
| D | University of Maryland | College Park, Maryland, US |
| E | NASA Ames Research Center | Mountain View, California, US |
| F | Internet Systems Consortium, Inc. | Distributed using anycast |
| G | U.S. DOD Network Information Center | Columbus, Ohio, US  |
| H | U.S. Army Research Lab | Aberdeen Providing Ground, Maryland, US |
| I | Netnod (formerly Autonomica) | Distributed using anycast |
| J | VeriSign, Inc. | Distributed using anycast |
| K | RIPE NCC | Distributed using anycast |
| L | ICANN | Distributed using anycast |
| M | WIDE Project | Distributed using anycast |

Source: [www.root-servers.org](http://www.root-servers.org)

1. The 12 operators manage the system used to publish the root zone file that is administered through the IANA functions process.
2. In the geographical sense, only 3 root severs are located outside of the US (the United Kingdom, Sweden and Japan); however, some of the root server operators have deployed mirror copies of existing root servers throughout the world. For instance, while ICANN’s L.root-servers.net is based in California in the United States, mirror copies (instances) of ICANN’s L root server are located in more than 90 places in different regions of the world.
3. Many observers have noted the uneven geographical distribution of the DNS root servers (and mirrors) [[22]](#footnote-25). Figure 3 highlights the disparity between this geographical distribution and the global distribution of Internet users. In Resolution 133 (Rev. Guadalajara, 2010), ITU membership has highlighted the need to promote regional (instances of) root servers.

**Figure 3: Geographical distribution of DNS root server sites and Internet users, 2011[[23]](#footnote-26)**

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



 **2.3.6** It is to be noted that the Government Advisory Committee (GAC), a non-decision making advisory body within the ICANN structure, discusses intensively public policy issues related to the topics highlighted above and many others[[24]](#footnote-27) related to the stability, security and continuity of the Internet domain name system. Many observers have noted that GAC, currently composed of 114 Country Members and 17 Observers, despite its earnest efforts, is however limited by its role as an advisory body only. There are some occasions where the ICANN Board has not requested GAC’s opinions or rejected GAC’s advice[[25]](#footnote-28) despite potentially serious public policy implications relating to the issues under discussion.

**3. Conclusion**

This draft report of the Secretary-General to the WTPF-2013 aims to provide a basis for discussion at the World Telecommunication 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 (2011 Council Decision 562).

1. <http://www.computerhistory.org/internet_history/> [↑](#footnote-ref-1)
2. <http://point-topic.com/dslanalysis.php> [↑](#footnote-ref-2)
3. Source: ITU (<http://www.itu.int/ITU-D/ict/statistics/at_glance/KeyTelecom.html>). Smartphone shipment statistics from IDC 2012, quoted at: <http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats#phone-shipments>. [↑](#footnote-ref-3)
4. Article 19, International Covenant on Civil and Political Rights (1966); Article 34 of the ITU Constitution [↑](#footnote-ref-4)
5. Resolution 102 (Rev. Guadalajara, 2012), §68 of the Tunis Agenda (2005) [↑](#footnote-ref-5)
6. 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-8)
7. As defined by ITU Recommendation E800. [↑](#footnote-ref-9)
8. TeleGeography (www.telegeography.com) [↑](#footnote-ref-10)
9. WG-WSIS-18/05\*: ‘The 'future Internet' (Version 3.0), available at: <http://www.itu.int/md/S11-RDG5-C-0004/en>. [↑](#footnote-ref-11)
10. Number Resources, IANA, <http://www.iana.org/numbers> [↑](#footnote-ref-12)
11. [Stewardship and the Management of the Internet Protocol Addresses](http://internetgovernance.org/pdf/CyberDialogue2012_Mueller.pdf%22%20%5Ct%20%22_blank), Milton Muller, available at: <http://internetgovernance.org/pdf/CyberDialogue2012_Mueller.pdf> [↑](#footnote-ref-13)
12. **IPV6 Group - R 4 Rev.1,**  [↑](#footnote-ref-14)
13. <http://www.apnic.net/services/services-apnic-provides/resource-certification/RPKI> [↑](#footnote-ref-15)
14. 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-16)
15. 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 “.net”. [↑](#footnote-ref-18)
16. GAC Principles regarding new gTLDs, available at: <http://archive.icann.org/en/topics/new-gtlds/gac-principles-regarding-new-gtlds-28mar07-en.pdf> [↑](#footnote-ref-19)
17. Understanding the ccTLD Delegation and Redelegation Procedure, IANA, available at: <http://www.iana.org/domains/root/delegation-guide/> [↑](#footnote-ref-20)
18. IANA Report on the Redelegation of the .SO Top-Level Domain, <http://www.iana.org/reports/2009/so-report-03feb2009.html> [↑](#footnote-ref-21)
19. See more, <http://www.zoomerang.com/Shared/SharedResultsSurveyResultsPage.aspx?ID=L23VTKJEXCE9> [↑](#footnote-ref-22)
20. Resolution 133 (Rev. Guadalajara, 2012) [↑](#footnote-ref-23)
21. 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-24)
22. The (very) uneven distribution of DNS root servers on the Internet: <http://royal.pingdom.com/2012/05/07/the-very-uneven-distribution-of-dns-root-servers-on-the-internet/> [↑](#footnote-ref-25)
23. <http://royal.pingdom.com/2012/05/07/the-very-uneven-distribution-of-dns-root-servers-on-the-internet/> [↑](#footnote-ref-26)
24. GAC Communiqué, 43, (16 March, 2012), available at: [https://gacweb.icann.org/display/gacweb/GAC+Recent+Meetings](https://gacweb.icann.org/display/gacweb/GAC%2BRecent%2BMeetings) [↑](#footnote-ref-27)
25. “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 (April 15th, 2011 version). [↑](#footnote-ref-28)