PREAMBLE

i. The ITU World Telecommunication Policy Forum (WTPF) was established by the 1994 Kyoto Plenipotentiary Conference and is covered by the provisions of Resolution 2 of the 2002 Marrakesh Plenipotentiary Conference. The purpose of the Forum is to provide a venue for exchanging views and information and thereby creating a shared vision among policy makers worldwide on the issues arising from the emergence of new telecommunications services and technologies, and to consider any other policy issues in telecommunications which would benefit from a global exchange of views. Although the WTPF shall not produce prescriptive regulatory outcomes or outputs with binding force, it shall prepare reports and, where appropriate, opinions for consideration by Members States, Sector Members and relevant ITU meetings.

ii. By Decision 9, the 2006 Antalya Plenipotentiary Conference decided to convene the fourth World Telecommunication Policy Forum in Geneva, in the first quarter of 2009, in order to discuss and exchange views on a number of the themes, noting the following:

- that convergence, including Internet-related public policy matters, is one of the topics of high current interest to ITU Member States and Sector Members;

- that the continued development of convergence, next-generation networks, and Internet also has significant implications for several domains, particularly for capacity building, especially in developing countries;

- that a study of emerging telecommunications policy and regulatory issues is also amongst the topics of high current interest to ITU Member States and Sector Members;

- that a study of new and emerging issues as referred to in Resolution 146 (Antalya, 2006) is also among the topics of high current interest to ITU Member States and Sector Members.
iii. Decision 9 of the Antalya Plenipotentiary Conference states that arrangements for the fourth WTPF shall be in accordance with applicable Council decisions. In accordance with Decision 498 of the 2000 session of the ITU Council, discussions at the World Telecommunication Policy Forum shall be based on a report from the Secretary-General, incorporating and referencing 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.

iv. The main objective of this first draft of the Secretary General’s report is to encourage contributions from ITU Member States, Sector Members, on any of the themes relevant to the Forum.

v. To give the Membership as much opportunity as possible for contributing to the preparations for this important event, and in line with previous Council decisions on this matter and Decision 9 of the Antalya Plenipotentiary Conference, the Report of the Secretary-General shall be prepared according to the following timetable:

<table>
<thead>
<tr>
<th>Date</th>
<th>Eventdescription</th>
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<tbody>
<tr>
<td>30 September 2007</td>
<td>Online posting and circulation to membership of the first draft of the Secretary General’s report (drawn up on the basis of available material).</td>
</tr>
<tr>
<td>15 December 2007</td>
<td>Deadline for receipt of membership comments on the first draft and additional materials for the second draft. Deadline for nominations for a balanced group of experts, to advise the Secretary-General on the further elaboration of the report and of draft opinions associated with it.</td>
</tr>
<tr>
<td>Spring 2008</td>
<td>First meeting of the group of experts.</td>
</tr>
<tr>
<td>30 June 2008</td>
<td>Online posting and circulation of second draft (incorporating comments and broad outlines for possible draft opinions).</td>
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<tr>
<td>4 July 2008</td>
<td>New deadline for submitting additional comments on the second draft of the SG’s Report</td>
</tr>
<tr>
<td>15 July 2008</td>
<td>ITU SG publishes new version of the 2nd draft of SG’s Report.</td>
</tr>
<tr>
<td>30 September 2008</td>
<td>Deadline for receipt of comments on second draft.</td>
</tr>
<tr>
<td>Autumn 2008</td>
<td>Second meeting of the group of experts.</td>
</tr>
<tr>
<td>15 December 2008</td>
<td>Finalizing the Report of the Secretary General, and deadline for its publication.</td>
</tr>
<tr>
<td>End of January 2008</td>
<td>Third meeting of the group of experts</td>
</tr>
<tr>
<td>20 April 2009</td>
<td>Proposed date for Information Session</td>
</tr>
<tr>
<td>21-24 April 2009</td>
<td>Proposed dates for 4th WTPF on Convergence and emerging policy issues</td>
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vi. In accordance with decisions by Council, the Secretary General shall convene a balanced, informal group of experts from Member States and Sector Members- who are active in
preparing for the Forum in their own country - to assist in the successive stages of the preparatory process. It is proposed that this group would meet twice during the consultation process. The first meeting of that group is scheduled for Spring 2008 in Geneva and a second meeting is tentatively planned for Autumn 2008. Invitations to participate in the informal group of experts will be sent out by the Secretary-General to those who contribute to the consultation process plus others who he feels can make significant contributions and can assist in achieving the desired balance. In order to strengthen this iterative process, we would welcome the designation of a focal point in your office to follow up this matter.

vii. If the 2009 WTPF is to prove a success, it will be because the final report submitted reflects the opinions and contributions of the ITU membership as a whole. For that reason, the membership is encouraged to submit comments and contributions by 15 December 2007, to the following address:

International Telecommunication Union  
Corporate Strategy Division  
M. 209  
Place des Nations  
CH-1211 Geneva 20  
Switzerland

Alternatively, comments and contributions can also be submitted by fax (to +41 22 730 6453) or by email (to wtpf2009@itu.int). This report, together with other background information relating to the themes of the 2009 WTPF on convergence and emerging policy issues will be posted on the ITU website, at: http://www.itu.int/wtpf.

1. **INTRODUCTION**

1.1. The overall environment for global communications has changed dramatically during the past 30 years, in particular because of technological innovation, privatization and liberalization. Incumbents are now being joined in the telecommunication marketplace by other types of service providers and new players. This may lead to continuing pressure in national markets both from direct competitors and from new global players who provide indirect competition (for example, advertising revenue being shifted to global search engines, E-Mail replacing older messaging media, mobile telephony replacing fixed telephony, third-party carriage of international traffic, etc.). It is also difficult for the new entrants to gain market share.

1.2. More recently, the phenomenon of convergence, combined with the evolution to all-IP and next-generation networks, provides tremendous opportunities for the telecommunication industry, but also represents significant new challenges.

1.3. The "Next-Generation Networks" or NGNs will represent a fundamental change in telecommunication core and access networks over the next decade, separating different service-related functions from transport-related technologies. NGNs are intended to provide consistent, ubiquitous and reliable information and communication services to users. NGNs are seen as the key future trend in networks. But there is still significant uncertainty as to the regulatory mechanisms that would ensure its smooth and secure deployment.
1.4. At the same time, the effects of convergence are being felt at many levels. On a technical level, different devices are converging (e.g. cameras and MP3s on mobiles, mobile and Internet access devices). There is convergence at the network level, e.g. fixed-mobile convergence, and also at the applications level, e.g. VoIP (voice over Internet protocol). In addition to technological convergence, institutions (e.g. regulators) and corporations are also facing convergence in a larger sense, as are entire industries (e.g. computing, broadcasting and telecommunications). Convergence underpins many of the fast-paced changes in the communications industry today.

1.5. Access to content and services anytime and anywhere is the foundation of future services, and is made possible by the growth of IP-based networks. IP-based networks are expected to drive costs down and enable new services. They are not only increasingly being used as alternatives to the public switched telephone network (PSTN), but also as alternatives for the delivery of multimedia content, e.g. Internet TV and IPTV. As voice and video are increasingly carried outside the PSTN (that is, the traditional, circuit-switched telephone network), they fall outside traditional structures, and require a reconsideration of rules and regulations. In many countries, these services threaten revenue streams and traditional universal access/service mechanisms that, for developing countries, serve to bridge the gap between served and underserved areas. On the other hand, they may play a role in improving Internet access and increasing penetration rates.

1.6. Governments as well as consumers are benefiting from the provision of commercial broadband services. Government entities at all levels, especially local public safety entities, are benefiting more and more from the increased availability of access to the Internet and other secured databases in times of emergency (increased interoperability) and on a routine basis (increased efficiency).

1.7. The growing availability of wireless as well as wireline broadband networks has had a very significant enabling effect in this respect. Broadband availability has been provided by different methods in different countries, the primary methods being implementation of ADSL and related technologies over the existing PSTN infrastructure, use of cable TV infrastructure, and roll-out of new infrastructure specifically designed for high-speed access (for example, direct fiber-optic connections). It should also be noted that networks in different existing radiocommunication terrestrial or space services are also converging to provide similar types of applications using broadband wireless access.

1.8. Implementation of broadband has raised a number of policy and regulatory issues in some countries, for example: whether or not to unbundled the local loop; whether regulations should be similar or identical for technologies such as ADSL, FTTH, HSDPA, WIMAX, etc and/or cable providers; whether a provider of new infrastructure would be exempt from certain regulations for a certain period of time, whether and/or how to apply universal access/service provisions, etc.

1.9. There are many success stories regarding broadband implementation and its use to enable new or improved applications, and several can be found at: http://www.itu.int/osg/spu/wsis-themes/ict_stories/

1.10. NGN networks are expanding the potential of developing countries to participate in the global economy. In order to stimulate investment in an era of convergence, governments
should foster an enabling, pro-competitive and transparent regulatory environment for the development of new services.

1.11. Challenges for the future include:

a) Issues affecting networks, such as network facilities and investment incentives, local loop unbundling, spectrum access, universal access/service, interoperability, strengthening trust and security, access to addressing resources etc.

b) Issues affecting content, such as copyrights, digital rights management, global and regional protection against piracy, the impact of differing cultural standards, etc. It should be noted that ITU does not at present have a significant role with respect to such issues.

c) Issues relating to the user’s experiences, such as total quality of service (going beyond simple network performance and including factors such ease of handset use, etc.).

d) The institutional challenges and benefits, or otherwise, of converged and independent regulations, and their interaction with more generic competition authorities.

e) Specificities for developing countries, which face the same challenges as developed countries, but may face additional challenges. Further, the impact of appropriate policy and regulatory responses might be different because of less fully developed networks, lower penetration of the fixed telecommunication infrastructure and of personal computers and data communication networks, potentially limited access to capital as well as instability or deficiency of power supply. Capacity-building and standardization are also additional challenges for developing countries (see also 2.8 below).

f) Identity management will be essential with the converged network.

1.12. This report of the Secretary General is structured as follows: Part 2 considers the overall phenomenon of convergence in today’s fast-paced digital age. Part 3 focuses on the core vision of NGNs and their larger implications. Part 4 examines some of the Internet-related public policy issues. Part 5 raises a number of emerging telecommunication policy and regulatory issues. Finally, part 6 discusses matters related to the ITRs.

2. AN ERA OF CONVERGENCE

2.1. As per ITU-T Recommendation Q. 176, 3.1 Convergence is defined as the coordinated evolution of formerly discrete network towards uniformity in support of services and applications. Convergence coupled with the increase in communication traffic is the main driving force behind changes in the information and communications landscape today. The spread of broadband and transition to IP network have resulted in different forms of convergence which lead to a vertical as well as horizontal integration of the market.
Also, the distinction between network infrastructure and the services and applications that it delivers is being increasingly blurred. Today’s services, such as voice services, do not necessarily match a specific type of network or end-user equipment. Innovation, in particular in Internet Protocol networks, has stimulated a wide array of ICT services and devices.

2.2. One of the most important forms of convergence is network convergence. Traditionally, audio, video, data or voice services were made available through distinct network infrastructure and distinct terminal equipment, e.g. personal computers connected to the Internet, televisions connected to cable networks. In the ongoing shift to Next-Generation...
Networks, networks and services are no longer associated. Network convergence refers to the increasing integration of networks and their use of Internet Protocol (IP).

2.3. Fixed-mobile convergence (FMC) was the first form of network convergence, with some services starting as early as 1997. For ITU, FMC refers to the seamless integration between fixed line and mobile markets over a single network, and services accessible from a range of converging devices.

2.4. Terminal equipment has also been subject to the phenomenon of convergence. Mobile handsets can now be used to access the Internet, and personal computers to view video programming which can be broadcasted on demand or not. Audio (MP3) players are mobile phones, mobile phones are digital cameras, and gaming consoles are Internet-access devices. Not only are services becoming independent of networks, but independent of devices, too, through developments such as “place-shifting” (i.e. where roaming users can access content on their home computers or servers).

2.5. As networks and technologies converge, so do the channels for the delivery of content. The business of blockbuster films is no longer only about making them available in theatres, but involves publishing content on official websites, blogs, chatrooms, social networking spaces, and in some cases the launch of new video games. Talk shows and game shows now typically have active web campaigns and interactivity via SMS or email comments and/or voting. This increase of Consumer Generated Content, the spread of Machine to Machine Software as a Service and grid computing will cause future traffic surges. This will also raise network neutrality issues.

2.6. In addition to networks, content and devices, convergence is also having an impact on the corporate landscape. Facing increased competition, service providers and network operators are diversifying their service portfolios to keep in line with technical convergence. In part, this is being achieved through mergers and acquisitions, but also through “multiple play” strategies that combine billing for different services (e.g. broadband, mobile, television, etc…). While regulators and policy makers are exploring a range of sharing strategies, including infrastructure sharing, spectrum sharing and end-user sharing, to foster affordable access to converged services by end users.

2.7. Convergence can be expected to have an impact on E-Government, because converged communication facilities could be used to disseminate information more quickly and efficiently.

2.8. E-Government is a term used to refer to the increasing use by governments of electronic means to facilitate communication with citizens, both from the citizen to the government (for example, electronic filing of forms) and from the government to the citizen (for example, web sites containing information).

1 For reference see ITU-T Recommendation Q. 1761.3.6 that defines FMC.
2 More information on a range of sharing strategies may be found in the ten 2008 ITU Global Symposium for Regulators Discussion Papers on Six Degrees of Sharing at http://www.itu.int/ITU-D/Regulators/GSR08/papers.html.
3. NEXT-GENERATION NETWORKS (NGNs)

3.1. There are many views of what constitutes next-generation networks (NGNs), and a variety of NGN migration paths. The ITU defines a Next-Generation Network as “a packet-based network able to provide Telecommunication Services to users and able to make use of multiple broadband, Quality of Service (QoS)-enabled transport technologies and in which service-related functions are independent of the underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.” NGN differs from the Internet. Internet is another IP-based network, but it is an open network developed through interconnection of networks; it has not guarantee of QoS and it depends on applications for security and authentication. NGN and the Internet have different philosophies concerning construction and operation of networks. It is necessary to realize a network environment in which the high reliability and integrity of NGNs and the autonomy of the Internet can coexist.

3.2. NGNs can be viewed as network operator-managed broadband networks that integrate provision to the end-user over all IP layers of transport, connection and, from upper levels, data, voice and video services. Operators are making NGNs upgrades both to the Core (transport or backbone network) and the Access NGN (or the local loop).

3.3. Whatever the definition or migration path, it would appear that most new networks currently being established are IP-based, and it is widely expected that IP-based networks will ultimately replace traditional circuit switched telecommunications networks. These trends mean that the type of variety of services that may be delivered over NGNs will generally be broader than those delivered over legacy service specific networks. This has implications for end users, operators and service providers alike, especially with regard to competition and pricing, and raises various public policy issues including security and safety, as well as a range of regulatory issues, many of which were addressed in the 2007 ITU Global Symposium for Regulators (GSR), the 2007 GSR Discussion Papers on NGN, and the 2007 GSR Best practice Guidelines for Next-Generation Migration. This presents many opportunities, challenges, innovative options and alternatives for the global ICT sector.

3.4. For operators and investors, NGNs are expected to offer increased revenue streams and profitability. This arises from the ability to provide a full range of service offerings as PSTN voice revenue declines and competition increases. In addition to an increase in revenues, NGNs operators are expected to gain greater productivity and associated cost savings: this is due to the anticipated economies of scale arising from the integration of existing networks and the reduction in operational costs, as local exchanges are eliminated or withdrawn. Network operators see NGNs investments as a rational choice when legacy networks reach the end of their life cycle, requiring equipment to be replaced. Indeed, investment in NGNs is

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1 ITU-T Recommendation Y.2001 (Study Group 13)
2 All resources for the 2007 GSR are available at http://www.itu.int/ITU-D/hrd/index.asp
3 ITU-T Recommendation Y.2001 (Study Group 13)
4 All resources for the 2007 GSR are available at http://www.itu.int/ITU-D/hrd/index.asp
expected to boost the equipment manufacturing market considerably, including the customer premises equipment (CPE) market.

3.5. For customers, NGNs are expected to respond to demands for bandwidth-hungry services and applications, guaranteed quality of service for certain IP-based applications and services (like IPTV and VoIP7), seamless high-performance service provision, secure voice, data and multimedia services. They also may enable service delivery at work, home or on the go, together with the possibility for attractive pricing bundles for combined voice, data and video needs, across both fixed and mobile networks.

3.6. For developing countries, NGNs in offering the possibility of wireless as well as wireline broadband connectivity may also play a role in improving Internet access and increasing penetration rates. Developing countries could leapfrog directly to NGNs for the provision of voice, data and multimedia services. In addition, triple play offerings may have the potential to open up television as a delivery platform for a far wider range of multimedia services, thereby overcoming, to some extent, the lack of installed, Internet-connected computers in developing countries.

3.7. The deployment of NGNs comes with a number of challenges, including the need for significant investment in core and access networks; inter-operability between existing and next-generation networks and the market forces driving terminal equipment to be interoperable across access networks. This may require increased coordination amongst standards development organizations, conformance and interoperability testing as well as associated certification. In the migration phase, competitive operators are likely to face technical challenges as current points of interconnection are withdrawn.

3.8. While there may be better spectrum utilization where mobile phones used indoors are able to use fixed line networks, there may be increasing demands placed on spectrum by wireless NGNs access providers, especially those offering bandwidth intensive services. Similarly, the rise of end-user created web-content could mean the need for greater bandwidth and spectrum for uploading content. The growing numbers of Internet users and IP-based devices will also increase the demand for numbering and naming resources. There will also be a need to improve cybersecurity and data protection measures.

4. INTERNET-RELATED PUBLIC POLICY MATTERS

4.1. The rapid expansion of the Internet has raised a wide array of public policy issues. The ITU has a role as stated in Resolution 102 (Rev. Antalya 2006) and as further indicated in Council Resolution 1282. The question of how to handle, and in which forum to handle, certain public policy issues has been controversial.

4.2. Some Member States have input contributions on this topic to various ITU groups, in particular the Council Working Group on WSIS8.

4.2.1. Some of the key policy questions that have been identified in the Handbook on Internet Protocol (IP) –Based Networks and Related Topics and Issues are:

7 IPTV refers to the use of IP-based networks to transmit television programs; VoIP refers to the use of IP-based networks to transmit voice communications.

8 For more information on this Working Group, see [webwww.itu.int/council/wsisc/Working_Group_on_WSIS-Feb-2006/wsisc_WSIS-previous_events.html](http://webwww.itu.int/council/wsisc/Working_Group_on_WSIS-Feb-2006/wsisc_WSIS-previous_events.html)

9 This list is drawn from the 2005 ITU publication “A Handbook on Internet Protocol (IP)-Based Networks and Related Topics and Issues”, which was written to inform Member States, especially developing countries, about issues related to Internet Protocol (IP)-based networks, including the management of Internet domain names and related issues. It provides background information, but also identifies some key policy questions associated with the general use of IP-based networks (that is, of the Internet). See [http://www.itu.int/ITU-T/special-projects/ip-policy/final/index.html](http://www.itu.int/ITU-T/special-projects/ip-policy/final/index.html)
4.2.2. Plenipotentiary Resolution 102 (Rev. Antalya, 2006) references issues such as:
investment in infrastructure and services, IPv6, ENUM, IDNs, Multilingualism and
Capacity-building and technical assistance.

4.2.3. Council Resolution 1282 references (through C07/21) issues such as:

a) Communication infrastructure (WSIS Action Line C2), including quality of service,
reliability and telecommunication protocols;

b) Building confidence and security in the use of ICTs (WSIS Action Line C5),
including countering Spam and Cybersecurity;

c) Naming numbering and addressing including ENUM, and internationalized domain
names;

d) Capacity-building and technical assistance.

e) IPV6

f) Internet exchange point

g) International Internet Connectivity

4.3. Most of those issues are national matters, to be dealt with by national authorities. However,
some of the issues may have international aspects. This is further discussed below.

4.4. The World Summit on the Information Society agreed the following documents:
Geneva Declaration of principles; Geneva Plan of Action, Tunis Commitment and Tunis Agenda for
the Information Society.

4.5. Those documents contain paragraphs related to Internet Governance and in particular called
for the creation of an Internet Governance Forum to further discuss certain issues.

13 See http://www.itu.int/ITU-T/studygroups/com03/iic/index.html
4.6. In 2006, the United Nations Secretary General convened the first Internet Governance Forum (IGF). The second IGF was hosted in Rio de Janeiro, Brazil in November 2007. The overall cross-cutting theme for the IGF is capacity-building and development. Critical Internet resources; Access, Diversity, Openness and Security were also discussed in Rio de Janeiro.

4.7. Building upon areas of agreement, discussions should continue on a variety of Internet-related public policy issues, as appropriate. Nevertheless some topics require further studies such as the management of Internet resources, the international Internet interconnection, the multilingual Internet and the diversity of participation in the Internet.

4.7.1. Management of Internet resources

4.7.1.1. There is consensus that the management of the Internet encompasses both technical and public policy issues and should involve all stakeholders and relevant intergovernmental and international organizations (see paragraph 35 of the Tunis Agenda). However, there is lack of consensus on certain specific issues, for example, what exactly the role of ITU and/or Member States should be with respect to administration of the root zone files and system, allocation of domain names, and IP addressing. There are a number of countries that believe that at least some aspects of these issues are public policy matters that are in principle, within the purview of governments, even if only as a “backstop” in case private sector governance mechanisms fail to meet national or internationally agreed goals. A balanced representation of the international community views on these issues can be found in the cited WSIS outputs and in ITU documents such as the “ITU Handbook on IP-based Networks and Related Topics and Issues”. The WTPF may wish to consider which, if any, of these issues to address, and what, if any, opinions to issue with respect to these matters.

4.7.2. International Internet Interconnection

4.7.2.1. ITU-T Study Group 3 has been studying the matter of international Internet interconnection for a number of years. However, no consensus has been reached regarding the various matters being studied. There are three main lines of thought: some hold that market mechanisms are working well and that market forces account for the observed prices for international Internet interconnections. Others hold that abuse of dominant power by incumbent, former monopoly, operators in developing countries results in artificially high costs, in some cases, for international Internet interconnections in some developing countries. Others hold that abuse of dominant power by major multi-national telecommunications operators (based in developed countries) results in artificially high costs, in some cases, for international interconnections in most developing countries. Further studies should be conducted in ITU-D and ITU-T, regarding how implementation of regional or national IXPs and the introduction of competition at the gateway can encourage infrastructure growth and development in order to reduce costs.

4.7.3. The Multilingual Internet

[14] ITU-D and IDRC prepared a joint report on the role of IXPs in Africa in 2004. This report, Via Africa: creating local and regional IXPs to save money and bandwidth, available at www.itu.int/ITU-D/treg/publications/index.html may be considered by WTPF-09. The 2008 edition of Trends in Telecommunication Reform will also include a chapter on open access to international gateways.
4.7.3.1. The Internet, and its key protocols, were initially developed in the United States and meant for communications in English and thus initially relied on a 7-bit character encoding that supports only a limited character set. As the Internet has expanded and come to be used around the world, the protocols have been adapted to cater to a wide diversity of scripts and character sets. Work is now taking place to implement a diversity of scripts in the domain name system, this work is referred to as Internationalized Domain Names (IDN) which is not only technical but also raised public policy issues. Deployment of IDN top-level domain names could contribute to the further development of cultural diversity and identity, linguistic diversity and local content.

4.7.3.2. As requested in PP06 Resolution 133, the ITU Secretary-General brought this Resolution to the attention of the Directors General of WIPO and UNESCO and also requested the creation of an interagency Working Group, to address issues related to the various aspects of Internationalized Domain Names (IDN) within the mandates of ITU, WIPO and UNESCO. In addition, at the November 2008 Internet Governance Forum, ITU, ICANN and UNESCO announced collaborative efforts to forge universal standards towards building a multilingual cyberspace. ICANN is presently conducting independent IDN trials.

4.7.3.3. Work is ongoing with respect to certain matters related to IDN top-level domain names especially focused on the policy-related issues related to their deployment. In accordance with its mandate, ITU will liaise and cooperate with appropriate entities in this respect.

4.7.4. Diversity of participation in the Internet

4.7.4.1. It has been stated that participation in the Internet, whether as users, or providers of content, or developers of standards, or providers of hardware and software, is more prevalent in developed than in developing countries.

4.7.4.2. In terms of users, this is no longer the case since very rapid growth of Internet usage in China has resulted in its providing the single largest number of Internet users in absolute terms. It remains the case, however, that the penetration rate of Internet users in developed countries is far higher than the penetration rate in most developing countries (where mobile telephony continues to have penetration rates 10 or more times that of Internet, and is typically growing faster than the Internet).

4.7.4.3. Various reasons have been advanced to explain this phenomenon. There is general agreement that historical factors are important: the Internet was first developed in the United States, so naturally it was first used in that country and only later expanded to the rest of the world.

4.7.4.4. However, questions remain regarding whether the structure of Internet governance mechanisms, the Internet standardization bodies, and the market for interconnection, hardware, and software is such that barriers arise that discourage participation by developing countries. Some hold that market mechanisms are working properly and that the current participation rates simply reflect optimal distribution of resources, in accordance with efficient markets. Others hold that, at
least in some cases, dominant players influence markets, with the effect (often unintended) of discouraging developing country participation. Some hold that those dominant players, if they exist, are developed-country early-adopters of Internet technologies, others hold that they are developing-country incumbent traditional telecommunications operators and related organizations.

4.7.4.5. There is general consensus that an enabling environment is crucial to the development of Internet infrastructure and services. Education, training, and development of both people and organizations in developing countries could assist with increasing meaningful and diverse participation in Internet-related matters. There are numerous specific projects at the national level that result in increased access to Internet in developing countries.

5. EMERGING TELECOMMUNICATION POLICY AND REGULATORY ISSUES

5.1. The increasingly pervasive use of information and communication technologies combined with the growth of always-on IP-based networks and services is giving rise to a number of emerging ICT policy issues, ranging from freedom of expression to data protection, which governments, service providers and users alike are struggling to address. In particular, means should be found to encourage willingness to invest in new infrastructure and competence building, especially in developing countries.

5.2. Regulatory and policy issues raised by NGNs

5.2.1. In response to the technical phenomenon of convergence, government and regulatory agencies are exploring ways in which to address the regulation of traditionally separate areas and to promote technological neutrality. A number of national regulatory authorities around the world have combined institutional frameworks for infrastructure and content (e.g. United Kingdom, Switzerland) and/or are considering multi-sector utility regulation (telecommunications, power, water, etc…). A shift away from sector-specific regulation to general principles of competition policy is being increasingly favored.

5.2.2. For regulators and policy makers, NGNs present an opportunity to analyze the impact that current regulatory frameworks have on innovation, investment and affordable access in order to design regulatory frameworks for NGNs that realize the goal of the global Information Society. In particular, the aspects of universal access/service should be considered. NGN may also improve radio spectrum utilization for some services (e.g. when inside buildings, mobile calls, which currently utilize spectrum, can be put through fixed-line networks, thereby freeing up spectrum). And harmonization of naming, numbering, and addressing schemes needs to be considered.

5.2.3. In general, regulatory frameworks which were initially designed for a traditional circuit switched environment may not be equipped to address an IP-based environment where multiple services can be offered over a single platform. As services converge in the NGN environment, market and service definitions used for authorization or licensing and market analysis purposes, will have to be revisited. In addition, new dominance-determination reviews may have to address the development of horizontal and vertical market integration, for example where fixed-mobile convergence (FMC) offers the possibility of dominant fixed and dominant mobile carriers uniting to
exercise market dominance, or where vertical integration enables market dominance not only in the physical network and telecom service layers but also in the platform and content/application layers. Public policies (including security and safety) designed for traditional circuit-switched networks may present technical challenges when applied to converged IP networks. Likewise, universal access/services practices may have to be updated and address the co-existence of PSTN, IP network and NGNs, the organizational structure of regulatory bodies reconsidered, and dispute settlement provided for new kinds of disputes, for example, between carriers and platform and content and application layer players.

5.2.4. The Internet has traditionally been lightly regulated, while the telecom world has faced heavier regulation (and this because, historically, telecoms consisted of incumbent dominant operators which were relatively heavily regulated to protect consumers and encourage competition). Since NGNs represent the confluence of the Internet and telecom worlds, many regulators and policy makers are exploring whether an NGN regulatory framework should be regarded as a choice between two different regulatory approaches, a hybrid system, or an entirely new model. This is especially important when considering NGN interconnection and access issues such as access to network and service interfaces, access between layers in a network, access to platform features, application features and terminal layers as well as frameworks for calculating interconnection charges. Because the traditional circuit-switched telephone networks, mobile networks, IP and NGNs are likely to co-exist, it is important that regulators work to achieve competitive neutrality in order to minimize or eliminate opportunities for regulatory arbitrage. While regulators strive to develop frameworks that promote investment and innovation, especially in competitive and diversified access infrastructure, some fear that without regulatory intervention, NGNs could create new competitive bottlenecks or lead to vertically integrated monopolies. Thus, the need for particular regulation of NGNs needs to be evaluated in light of the costs and benefits of those regulations in particular circumstances.

5.2.5. There are emerging regulatory issues associated with areas such as cybersecurity, data protection, Internet numbering and naming resources, conformance and interoperability testing and associated certification, creating good conditions for investments and sound competition as well as soundness of the infrastructure. As a result, regulators will consider whether and how to ensure certain features inherent in traditional telecommunication networks, like emergency services, secure communication, and lawful interception, continue to be available in the migration to NGNs.

5.2.6. The many changes brought about by the shift to NGNs gives rise to the need for capacity-building at all levels (users, operators, regulators and policy makers), especially in developing countries, so that their citizens can experience fully all the benefits of the global information society. In addition, as services go beyond national boundaries, it may be necessary to ensure the consistency of competition rules through international coordination.

5.3. Strengthening trust and security

5.3.1. Protection of minors

5.3.1.1. The protection of minors, in particular, has become a pressing concern. The abuse of children, child pornography, is the most alarming problem. Inappropriate
content that can be delivered to minors include, *inter alia*, pornography, online games, video or audio material that are violent or sexually explicit, gambling content, spam containing adult content and so on. Although the distribution of illegal content remains the responsibility of individual member states, the cross-border nature of IP-based networks calls for measures to reinforce co-operation.

It should be noted that the ITU does not at present have any significant role with respect to such issues.

5.3.2. Personal privacy and the protection of data

5.3.2.1. The pervasive nature of networks and information poses a threat to the protection of data. It will take a concerted global effort required to foster trust in the network, in the form of technical, market, and organizational mechanisms.

5.3.2.2. Strategies and mechanisms for the protection of data and privacy in a networked world are wide-ranging and typically ad-hoc, i.e. they are put into place after networks and services have been deployed. Calls are being made to build these priorities into the very process of technology design.

5.3.2.3. Digital identity management solutions can provide the capability to manage and protect user data as well as offer user consent and choice consistent with the specific context. Other important principles include transparency, notification, accountability and data minimization.

5.3.2.4. With the progress of IT in assisting socio-economic activity, the growth and expansion of the Internet, the expansion of the market size of ASP, and the diversification of use-transmitting network application, the social structure increasingly depends on the networks. In such circumstances, it is becoming impossible to expect users themselves to do everything necessary to protect their privacy and personal data. There is a need for a secure and safe communication environment that everyone can use with ease.

5.3.3. Digital rights

5.3.3.1. The proliferation of digital networks and storage make the replicating of data and content fast, easy and inexpensive. Effective digital rights management tools are required to tackle the explosion in online content, in order to address the need for rewarding content creators while fostering fair content distribution in the public interest.

5.3.3.2. Enabling the seamless distribution of digital content regardless of the type of transmission configurations is important in terms of competition policy and the development of digital content. It is necessary to consider rules that can maintain a balance between appropriate compensation for creators and the interests of consumers.

5.3.4. Cybersecurity
5.3.4.1. Building security in the use of ICTs is a highly significant topic. Cybersecurity requests a dynamic and flexible response to continuously changing threats. At the national level it involved the development of national frameworks for the application of available technical, legal and regulatory tools by end users, industry and Government as well as a continuous effort of capacity building, awareness raising and prevention. At the international level, Cybersecurity calls for strengthened cooperation and coordination between the different actors, as well as support for information sharing and capacity building to developing countries. In that aim the WTPF could provide an opportunity to define a common view on what are the principal areas of threat; to consider how to establish a mechanism to share best practices; and to develop common initiatives such as the preparation of guidelines for government and private sector cooperation in the prevention, detection and response to the misuse of ICTs.

5.3.4.2. The WTPF should reach a consensus in major areas concerning security threats. During this process, it is necessary to make assumptions about the future ICT usage environment and consider threats to various networks such as NGNs, as well as to review specific threats of today’s world. For example, with the transition to IP-based networks and the migration to IPv6, devices that can be connected to the network will diversify. To ensure security for these devices, more sophisticated and easy-to-use encryption and authentification methods will be required.

5.3.4.3. The WTPF should agree an opinion on these matters, taking into account current work in ITU on the topic, in the Sectors and in the General Secretariat and the instrumental mechanisms which ITU as a UN special agency could provide.

5.3.5. Cybercrime

5.3.5.1. Cybercrime can be informally defined as an activity in which computers or networks are either a tool, a target or a place of criminal activity. An alternative definition is computer-mediated activities which are either illegal or considered illicit by certain parties and which can be conducted through global electronic networks.

5.3.5.2. In order to facilitate prevention, repression and cooperation on Cybercrime, a number of countries have reviewed their legislative environment related to the goals and actions identified in UN General Assembly Resolution 55/63 (2000) on “Combating the criminal misuse of information technologies” and have undertaken a number of regional and multilateral initiatives such as the Council of Europe’s Convention on Cybercrime15 (2001). Both can assist in an examination of national policy and institutional arrangements necessary for the implementation of Cybercrime laws and policies. As nations may adopt different approaches to legislating Cybercrime offences (e.g., creating specific new legislation or amending existing legislation), a major challenge is to find common approaches that will ensure the interoperability of existing legal frameworks and facilitate international cooperation in the fight against Cybercrime.

15 See the full text of this Convention at http://conventions.coe.int/Treaty/en/Treaties/Html/185.htm
6. MATTERS RELATING TO THE INTERNATIONAL TELECOMMUNICATION REGULATIONS

6.1. The International Telecommunication Regulations (ITRs)\textsuperscript{16} are a treaty level instrument of the ITU. The ITRs establish general principles relating to the provision and operation of international telecommunication. They facilitate global interconnection and interoperability of telecommunication infrastructure, underpin the harmonious development and efficient operation of technical facilities, and promote the efficiency and availability of international telecommunication services.

6.2. The current instrument is the successor of a long series of instruments, dating back to the original creation of the ITU in 1865. The immediate predecessor of the current instrument consisted of two separate treaties, the Telegraph Regulations (1973) and the Telephone Regulations (1973).

6.3. History of review of the ITRs

6.3.1. The ITRs have remained unchanged since coming into force on 1 July 1990. Since then, there has been rapid and far-reaching technological change and the widespread liberalization of telecommunication markets through privatization and competition. In many countries the role of government has evolved from operator of analog voice telephony services to regulator of digital convergent multimedia services. Although the pace of change has varied between countries, the liberalization of telecommunication markets has been a common trend in both developed and developing countries worldwide.

6.3.2. Issues concerning the need for and scope of review of the ITRs were considered by the ITU at its Plenipotentiary Conferences held in Minneapolis (1998) and Marrakech (2002), but consensus to establish, scope and implement a review has been difficult to achieve due to the variety of perspectives on the ITRs held by ITU Member States\textsuperscript{17}.

6.3.3. The Plenipotentiary Conference 2006 (PP-06) made substantial progress, embodied in Resolution 146 (Antalya, 2006) Review of the International Telecommunication Regulations, by reaching consensus on a review process that respects the divergent opinion among Member States regarding the future treatment of the ITRs.

6.3.4. Resolution 146 implicitly recognizes that the ITRs remain valid and relevant for international telecommunication networks and services, and that non-treaty level discussions must take place to achieve broad consensus before treaty level negotiations can commence. Explicitly, Resolution 146 states that:

\begin{quote}
there is a need to build broad consensus on what could appropriately be covered in the ITU treaty framework, within its standardization activities, and within its development activities;
\end{quote}

\begin{quote}
it is important to ensure that the ITRs are reviewed and, if deemed appropriate, revised and updated in a timely manner in order to facilitate cooperation and coordination among Member States and to reflect accurately the relations
\end{quote}

\textsuperscript{16} See the full text of the ITRs at \url{http://www.itu.int/ITU-T/itr/files/ITR-e.doc}
\textsuperscript{17} Information on various discussions that have taken place prior to the 2006 Plenipotentiary Conference can be found at: \url{http://www.itu.int/ITU-T/itr/index.html}
between Member States, Sector Members, administrations and recognized operating agencies; and

the World Telecommunication Policy Forum (WTPF) has historically provided an appropriate venue for discussing global and cross-sectoral issues of high concern to the ITU membership.

6.3.5. Resolution 146, recognizing the extent and complexity of discussions on the ITRs since 1998, resolves that the ITRs should be reviewed and, inter alia, that:

the ITU-T should review the existing provisions of the ITRs, engaging with other sectors as appropriate with ITU-T as a focal point;

the fourth WTPF should consider emerging policy and regulatory issues with respect to international telecommunication networks and services for the purpose of understanding them and possibly developing opinions as appropriate; and

WTPF should prepare reports and, where appropriate, opinions for consideration by Member States, Sector Members, relevant ITU meetings and Council;

a World Conference on International Telecommunications (WCIT) be convened in 2012 at ITU on the basis of recommendations arising from this separate process of review.

6.3.6. Thus Resolution 146 envisages a process, building on previous discussions where applicable, of two separate and distinct reviews to deal with existing ITR provisions and new and emerging international telecommunication issues, respectively.

6.3.7. The ITU-T review is currently being carried out by an expert group, in accordance with TSB Circular 146\(^{18}\).

6.4. **New challenges for the ITRs**

6.4.1. A number of Member States contributed to the work of the 2004-2005 Council Working Group on the ITRs\(^{19}\). Some of those contributions identified potential new issues for discussion in the context of the review of the ITRs. However, there was no consensus on which, if any, of the issues should be retained for further discussion. The WTPF should consider new and emerging policy and regulatory issues, which may be relevant to a review of the ITRs.

6.4.2. The issues identified are summarized in Annex 3 of the Report of the Council Working Group on the ITRs, which is found in Council document C05/EP11. That list is reproduced in Annex X if this report.

6.4.3. In addition to the above, some Member States may wish to consider additional items that have arisen more recently in other forums. For example, ITU-T Study Group 3 is currently studying “hubbing”, tentatively defined as follows: “the routing of traffic in hubbing mode consists in routing traffic to final destinations via a transit centre (hub), with payment being made, solely to the latter, of the termination (in case of reverse

\(^{18}\) See http://www.itu.int/md/T05-TSB-CIR-0146/en
\(^{19}\) See http://www.itu.int/ITU-T/itr/files/ITR-e.doc
charged traffic: the origination) prices indicated in its hubbing offer. ITU Study Group 3 has also considered the issue of network externalities, a concept which is referenced in Plenipotentiary Resolution 22 (Revised, Antalya, 2006).

6.4.4. Certain contributions which have been submitted to the Expert Group to Review the ITRs (ITR-EG) raise matters which might be considered to new, and thus outside the scope of ITR-EG. The WTPF may wish to consider some of those matters, which may include security, misuse of facilities, misuse of numbering resources, fraud and dispute resolution.

6.4.4.1. The term fraud is used in various ways and in various contexts. What is intended here is not the term as used in certain countries to refer to certain types of criminal activities. In the context of telecommunications network with the intention of avoiding payment, without correct payment, with no payment at all, or by making someone else pay.

6.4.4.2. The term misuse, in connection with numbering resources, occurs where the use of that numbering resource does not conform to the relevant ITU-T Recommendations(s) assignment criteria for which it was assigned or when an unassigned numbering resource is used in the provision of a telecommunication service.

6.4.4.3. Misuse and fraud related to numbering resources can be distinguished, although some types of misuse are related to fraud. Misuse arises when numbering resources are used for a purpose other than that for which they were allocated. Fraud arises when numbering resources are used for the purpose for which they were allocated and for the purpose of generating cash at the expense of the customer and/or operator.

6.4.5. Further, a contribution from Cameroon to ITU-T Study Group 3 and the ITR-EG appears to raise a potential new issue: whether, as a general principle, operators providing transit or termination services should receive a cost-oriented payment for such services. This would tend to exclude sender-keeps-all billing arrangements.

6.4.6. It is proposed that the WTPF consider the items above and give its opinion regarding which, if any, should be subject to further study in the context of preparations for the WCIT called for in Plenipotentiary Resolution 146.

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20 See TD 11 (WP 3/3)
21 See TD 8 (WP 3/3); and GR TAF – C 4 and GR TAF – C 7
22 http://www.itu.int/ITU-D/finance/work-cost-tariffs/events/tariff-seminars/djibouti-08/Peter%20Hoath-4-EN.PDF
23 See 4 of ITU-T Recommendation E.156.
24 See 3 of Supplement 1 to ITU-T Recommendation E.156.
25 See COM 3 – C 42, which is the same as ITR-EG – C 9.