New ITU-D Question: Policy, regulatory and technical aspects of the migration from existing networks to broadband networks in developing countries, including Next Generation Networks, “OTT” services and the implementation of IPv6

# 1 Statement of the situation or problem

Increased access to broadband is widely credited with improving development outcomes, fostering economic growth, and increasing competitiveness. Broadband is a key input to achieving a people-centred, inclusive, and development-oriented information society.

Despite impressive gains in access to telecommunications/ICTs infrastructure, services, and applications, many developing countries, particularly least developed countries (LDCs) still lack sufficient access to broadband connectivity. ITU data estimates that 31 percent of the population and 28 percent of households in developing countries have access to the Internet, and in the world’s 49 LDCs, less than 10 percent have Internet access. The gender gap is also more pronounced, as 16 percent fewer women than men use the Internet. Of the more than one billion people who have a disability that affects their access to modern communications, 80 percent are in the developing world.Penetration rates for mobile broadband subscriptions in developing countries stood at 20 percent in 2013, with fixed broadband penetration at 6.1 percent. Further**,** the cost of access to broadband service remains prohibitively high in many developing countries due to a variety of factors, including a lack of infrastructure investment and the need to develop, implement, and enforce enabling policies and regulations, in particular those that would promote effective competition.

The Development Sector, with active participation from Member States and Sector Members, should endeavour to increase the availability of affordable broadband services during 2014-2018 by carefully analysing the policy and technical issues related to broadband deployment, adoption, and use. In particular, ITU Members and the Telecommunication Development Bureau (BDT) must identify, elevate, and address the stated needs of the LDCs and others in improving broadband deployment and use. Members will benefit from analysing the technical issues involved in deploying broadband access technologies, including integration of access network solutions with existing or future network infrastructure.

Broadband access policies, implementation, and applications should be studied together so that developing countries can better evaluate their best possible options for broadband deployment. Combining these topics will eliminate fragmentation of these related issues and more accurately provide a clear roadmap of options for developing countries to close the existing gap in broadband service.

The proposed Study Question and expected outputs reflect elements from Study Questions from 2010 - 201419-2/1 “Implementation of IP telecommunication services in developing countries,” and 26/2 “Migration from existing networks to next generation networks for developing countries: technical, regulatory, and policy aspects”.

 (USA Document WTDC14/22 Add 19)

During the 2010-2014 study period for Question 19-2/1, the rapporteur group within Study Group 1 studied the implementation of IP telecommunication services in developing countries. A study report was drafted containing relevant information and data that will be of use to Member States, and particularly the developing countries.

Global implementation of IPv6 remains a challenge for all countries and which will be achieved in stages. Studies are therefore proposed on transitioning from IPv4 to IPv6 and its impacts.

The Internet Engineering Task Force (IETF) develops Internet Protocols including IPv4 and IPv6.

Many countries and international organizations are interested in this question. WTSA-08 adopted Resolution 64, on IP address allocation and facilitating the transition to and deployment of IPv6, which was revised by WTSA-12. The ITU Council at its 2012 session, in Decision 572, decided that WTPF-13 (World Telecommunication/ICT Policy Forum 2013) would address the issue of IP-based networks. The forum was held from 14 to 16 May 2013 in Geneva (the previous WTPF had been held from 21 to 24 April 2009 in Portugal, and had discussed convergence, Internet and the ITRs). WTPF is organized by ITU and aims to encourage discussion and seek consensus among the different stakeholders in the form of “opinions” reflecting a common vision which serves to guide policy in the ICT sector as well as regulatory and standardization activities throughout the world. WTPF-13 issued six opinions (Document WTPF‑13/16), as follows:

– **Opinion 1**: Promoting Internet exchange points (IXPs) as a long-term solution to advance connectivity

– **Opinion 2**: Fostering an enabling environment for the greater growth and development of broadband connectivity

– **Opinion 3**: Supporting capacity building for the deployment of IPv6

– **Opinion 4**: In support of IPv6 adoption and transition from IPv4

– **Opinion 5**: Supporting multistakeholderism in Internet governance

– **Opinion 6**: On supporting operationalizing the enhanced cooperation process.

Many countries are also now discussing at the highest policy level the adoption of laws and regulations on “net neutrality”. This subject involves all the stakeholders, including political leaders, regulators, operators and providers, Given the complexity of the matter and the different market conditions in each country, there is no “one size fits all” approach to this issue.

In 2005, the Federal Communications Commission (FCC) published an Internet Policy Statement in which it made clear its support to preserve and promote the open and interconnected nature of the public Internet and has recognized the role of appropriate network management. In Europe, the EU, citing Article 1, paragraph 8*(*g), of Directive 2009/140/EC, published a Communication on the open Internet and net neutrality in Europe (COM(2011)0222). The Body of European Regulators for Electronic Communications (BEREC/ORECE) in December 2011 published its Guidelines on transparency in the scope of net neutrality and a framework for work on quality of service. In France, the *Conseil National du Numérique* in its report of 12 March 2013 calls for recognition of the principle of net neutrality as a fundamental principle of a constitutional character.

On 18 April 2013, ITU published a report on regulation, *Trends in Telecommunication Reform 2013: Transnational aspects of regulation in a networked society.* Chapter 2 of this report is devoted to the issue of net neutrality. As the report shows, the debate on net neutrality continues to be obscured by the lack of a generally agreed definition of the term among regulators themselves.

# (ATU Document WTDC14/42 Add 12)

# 2 Question for study

2.1 Policy and Regulation

a) Policies and regulations that promote affordable broadband networks, services, and applications, including ways to optimize spectrum use

b) Effective and efficient ways to fund increased broadband access to the unserved and underserved

c) The regulatory and market conditions necessary to promote deployment of broadband networks, services including organizational options for national regulatory authorities and coordination with related ministries and regulators

d) Success stories and lessons learned.

e) Ways to remove practical barriers to broadband infrastructure deployment.

(USA Document WTDC14/22 Add 19)

f) Considering the fact that meeting demand for content requires improved access to broadband services, study the following:

* Pattern and trends in broadband deployment;
* Access supporting applications primarily used for development viz. e-government, education, health etc.

g) Commercial impact of new investments required to meet the growing demands for access to the Internet generally and on delivering affordable broadband services to meet the development needs.

 APT Document WTDC 37 Add 15

h) Impacts of the provisioning of IP-based applications and services.by content providers to users over an broadband Internet connection, independent of the telecommunications network operator providing the Internet connection, often referred to as “over the top (OTT)” services, including impacts on regulation, competition, network infrastructure and business models

(Arab States WTDC14 43 Add. 16)**b)Transition and Implementation**

2.1 Methods to implement broadband service, including the transition from narrowband networks, including interconnection and interoperability features.

2.2 Operational and technical issues associated with deploying broadband networks, services and applications, including the transition from narrowband to broadband networks .

2.3 Ways to remove practical barriers to broadband infrastructure deployment (

2.4 Success stories and lessons learned.

(USA Document WTDC14/22 Add 19)

2.5 To pursue study of issues relating to facilitating access to IP networks, thereby enabling access to IP services and associated applications, as identified in §2 of the wording of Question 19-2/1 for the 2010-2013 study period.

2.6 To study the policy and technological aspects of (a) the migration of IPv4 to IPv6, and separately (b) ways to manage access to networks balancing network performance, competition and consumer benefits.

(ATU Document WTDC14/42 Add 12)

# 3 Expected output

Reports, best practice guidelines, case studies and recommendations as appropriate that take into account the issues for study and the following expected outputs:

1. **Broadband Policy and Regulation**
2. Policies promoting incentives for broadband deployment through effective competition, private investment, inter platform competition, and private-public partnerships;
3. Best practices to develop technology and service neutral policies;
4. Methods to open markets to effective competition through transparent regulatory and taxation reforms;
5. Policies to encourage efficient and innovative mobile broadband practices for new market entrants and consumers including by allocating and assigning spectrum
6. Best practices for infrastructure sharing and access to networks to promote market entry, where appropriate.
7. Studies to examine new and innovative pricing methodologies for broadband services;Assessment of the current demand for broadband at global and regional level;
8. Best practices for stimulating investment in broadband that allow the delivery of services for development in an affordable manner.

APT Document WTDC 37 Add 15

1. Identification of policy tools to facilitate and encourage successful and competitive IP based services and applications (so called “Over the Top” Services (OTT) services), availability to consumers at the local and national levels;

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1. Identify the range of alternative successful business arrangements that have been used to meet growing demand and other changes in the market
2. Identification of the best practices and policies that create incentives for investment in IP based services and applications .

(Arab States WTDC14 43 Add. 16)

1. **Broadband Transition and Implementation**
2. Best practices to finance broadband access to underserved and unserved communities including universal service funds, coverage requirements, and alternative means of financing broadband access;
3. Guidelines for making the transition from narrowband to broadband networks taking into account in particular the potential challenges, benefits and opportunities that developing countries may encounter when implementing broadband networks, services and associated applications.

(USA Document WTDC14/22 Add 19)

**c) Transition from IPv4 to IPv6**

i. compilation of the questiones raised by and requirements of developing countries in their transition to IPv6;

ii. consolidation and coordination of efforts to ensure the transition to IPv6;

iii. Survey of procedures, methods and time-frames for the effective transition to IPv6, having regard to the experience of ITU Member States.

The final report should also contain best practices on transition to IPv6 which may address but not be restricted to the following questions:

1) Transition to IPv6 for telecommunication operators

1.1) Stages in the transition

1.2) Transition for network backbones

1.3) Transition for access networks

1.4)

1.7) Network service

1.8) Quality of Service issues

1.9)

2) Combined use of IPv6 and IPv4

3) 4) Participation required of the regulator

RCC Document WTDC14/23 Add 19)

# 4 Timing

 Annual progress reports. This study is expected to last four years.

Within two years, a draft report on the subjects should be submitted to Study Group 1.

A final report and Guidelines or Recommendation(s) are to be submitted to Study Group 1 within four years.

The Rapporteurs Group will work in collaboration with BDT to implement the lessons learned from study of the Question through training seminars.

The activities of the Rapporteurs Group will end within four years.

# 5 Proposers

ATU, APT, Brazil, RCC and United States of America.

# 6 Sources of input

The major source of input will be the experiences of those Member States and sector members that have deployed broadband networks and that have begun implementation of IPv6. Contributions from Member States and Sector Members will be essential to the successful study of the issue.

Interviews, existing reports and surveys should also be used to gather data and information for finalization of a comprehensive set of best practice guidelines.

Material from regional telecommunication organizations, telecommunication research centres and manufacturers and working groups should also be used, in order to avoid duplication of work.

Close cooperation with ITU‑T study groups, in particular SG 13 and the Global Standards Initiative (GSI‑NGN), other standards groups involved in the activities discussed in the study questions, and other activities within ITU‑D, will also be essential.

(RCC Document WTDC14/23 Add 19)

Contributions are expected from Member States, Sector Members and Associates, and from relevant ITU‑R, ITU‑T and ITU‑D study groups, and other stakeholders.

(ATU Document WTDC/42 Add 12)

# 7 Target audience

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| --- | --- | --- | --- |
| **Target audience** | **Developed countries** | **Developing countries** | **Least developed countries (LDCs)** |
| **Telecom policy-makers** | Yes | Yes | Yes |
| **Telecom regulators** | Yes | Yes | Yes |
| **Service providers/operators** | Yes | Yes | Yes |
| **Manufacturers** | Yes | Yes | Yes |
| **Consumers/end-users** | Yes | Yes | Yes |
| **Standards Development Organizations, including Consortia** | Yes | Yes | Yes |

## a) Target audience

All national telecom policy‑makers, regulators, service providers and operators, especially those in developing countries as well as manufacturers of broadband technologies.

(ATU WTDC14/42 Add. 12)

## b) Proposed methods for the implementation of the results

The results of the Question are to be distributed through ITU‑D interim and final reports. This will provide a means for the audience to have periodic updates of the work carried out and a means for the audience to provide input and/or seek clarification/more information from ITU-D Study Group (To Be Determined) should they need it.

# 8 Proposed Methods of Handling the Question or Issue

The Question will be addressed within a study group over a four-year study period (with submission of interim results), and will be managed by a Rapporteur and Vice-Rapporteurs. This will enable Member States and Sector Members to contribute their experiences and lessons they have learned with respect to policy, regulatory and technical aspects of the migration from existent networks to broadband networks.

# 9. Coordination

9.1 The ITU‑D Study Group dealing with this Question will need to coordinate with:

* Relevant ITU‑T Study Groups, particularly Study Group 13
* Relevant focal points in BDT and ITU Regional Offices
* Coordinators of relevant project activities in BDT
* Standards development organizations (SDOs)
* Experts in this field

# 10. BDT programme link

* WTDC Resolution [result from merger of 20, 50 and 72] (Dubai, 2014)

Links to BDT programmes designed at fostering the development of telecommunication/ICT networks as well as relevant applications and services, including bridging the standardization gap.

# 11. Other relevant information

As may become apparent within the life of this Question.