**MOD** ONAT/35/1

QUESTION 1/1

Policy, regulatory and technical aspects of the migration from existing networks  
to broadband networks in developing countries, including next-generation networks, m-services, over-the-top (OTT) services and  
the implementation of IPv6

# 1 Statement of the situation or problem

In September 2015, UN Member States and the UN General Assembly formally agreed on the Sustainable Development Goals (SDGs) and set out a global agenda for development based on economic prosperity, social inclusion and environmental sustainability, known as the ‘2030 Agenda for Sustainable Development’.

Broadband and ICTs have a unique potential to support countries to meet the SDGs by 2030. However, in order for this to happen, key framework conditions need to be met. According to the latest ITU estimates, there will be 3.5 billion people online by the end of 2016, but more than half the world’s population (some 3.9 billion people) will still be offline, and unable to connect regularly, if at all. But in the 48 UN-designated Least Developed Countries (LDCs), still only around one in seven people is online. Pushing basic connectivity out beyond major urban centres to more remote areas continues to prove a major challenge. Even where people have access to the Internet, access has to be accompanied by a range of relevant services and content to help improve individuals’ personal awareness, education and hygiene, as well as development outcomes in health and education at the national level.

ITU‑D, with active participation from Member States and Sector Members, should endeavour to increase the availability of affordable broadband services by carefully analysing the policy and technical issues related to broadband deployment, adoption and use. In particular, ITU members and 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.

Seeking to provide a collaborative study of broadband access policies, implementation and applications the World Telecommunication Development Conference (WTDC-2014) in Dubai (United Arab Emirates) resolved to begin studing new study Question 1/1 “Policy, regulatory and technical aspects of the migration from existing networks to broadband networks in developing countries, including next-generation networks, m-services, over-the-top (OTT) services and the implementation of IPv6”. During 2014-2017 study period Rapporteur Group on Question 1/1 prepared Report that can be found at [ITU website](https://www.itu.int/net4/ITU-D/CDS/sg/index.asp?lg=1&sp=2014). The Report includes country experiences, best practice guidelines to promote affordable broadband networks, services, and applications including those that stimulate demand for broadband such as e-education, m-banking, m-commerce, mobile money transfer, and over-the-top services (OTT). The report also includes ways to promote broadband deployment through effective competition, public and private investment, inter-platform competition, broadband stimulus, and universal service funds. Examples of experiences and policies facilitating the transition from narrowband to broadband networks including from IPv4 to and through deployment of IPv6 are also featured.

The surveys highlighted the Members’ satisfaction with the work conducted to date and propose some alternative ways forward. Regarding the future of Question 1/1, the results of the surveys carried out by the ITU-D Study Groups on the current work and the future of the Q1/1 indicate that this Question should continue.

# 2 Question or issue for study

**Transition to broadband networks**

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 for the unserved and underserved.

c) Ways to remove practical barriers to broadband infrastructure deployment, and best practices for improving cross-border connectivity and small island developing states' connectivity challenges.

d) Pattern and trends in broadband services in regard to, inter alia, broadband deployment, international traffic and applications, etc.

e) Commercial impact of new investments required to meet the growing demand for access to the Internet generally, and bandwidth and infrastructure requirements for delivering affordable broadband services to meet development needs.

f)

g)

h)

i) Factors influencing the effective deployment of wireline and wireless, including satellite, broadband access technologies and their applications.

j) Methodologies for migration planning and implementation of broadband technologies, taking into account existing networks, as appropriate.

k) Trends in the various broadband access technologies, deployments, services offered and regulatory considerations.

l) National digital policies, strategies and plans which seek to ensure that broadband and IP technologies are available to as wide a community of users as possible.

m) Flexible, transparent approaches to promoting robust competition in the provision of network access and end-user digital services.

n) Co-investment and the co-location and shared use of infrastructure, including through active infrastructure sharing.

o) Innovative licensing regimes and incentivizing new business models for covering remote and rural areas that more effectively integrate the use of terrestrial, satellite, and submarine telecommunication infrastructure.

p) Holistic universal access and service strategies and financing mechanisms for both network expansion, connectivity for public institutions and the community as well as demandstimulation measures, such as end-user subsidies.

q) Regulatory and policy incentives for investment in high-speed and high-capacity broadband networks.

r) New policy formulas to address affordable access to digital services for the various target groups and communities and implement strategies for universal access irrespective of the demographics and location of users.

s) Regulatory challenges and policies to leverage on the rise of new technologies in the digital economy and society.**Development and deployment of m-services**

a) Methods of development and deployment of cross-cutting services such as e-commerce, e-finance and e-governance, including money transfer, m-banking and m-commerce.

b) Facilitating availability, access, and use of mobile services and apps.

c) Promote enabling environment among ICT stakeholders for development and deployment of m-services.

d) Promising technological avenues in the field of mobile payments.

**Development and deployment of IP-based services and applications (Over-The-Top ) services**

a) Impacts of the provisioning of IP-based applications and services offered by content providers to users over a broadband Internet connection, independent of the telecommunication 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.

b) Policy tools to facilitate the availability to consumers at the local and national levels of competitive IP-based services and applications.

c) Best practices and policies that create incentives for investment in IP-based.

d) Success stories and lessons learned.

e) Continued study of issues relating to facilitating access to IP networks, thereby enabling access to IP services and applications.

f) Best practices and guidelines regarding legal frameworks of development and deployment of IP-based services and applications.

g) Relationship between telecom operators and OTT service providers.

a) Policy and technological aspects of the transition from IPv4 to IPv6.

b) Ways to manage access to networks, balancing network performance, competition and consumer benefits.

c) Available procedures, methods, and timeframes for the effective transition to IPv6.

d) Methods of consolidating and coordinating efforts to facilitate the transition to IPv6.

# 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:

a) Policies and regulations that promote affordable broadband networks, services and applications, including effective and efficient ways to fund increased broadband access for the unversed and undeserved.

b) Methods of broadband infrastructure deployment, and best practices for improving cross-border connectivity and small island developing state connectivity.

c) Overview of current trends in broadband services in regard to, inter alia, broadband deployment, international traffic and applications.

d) Methods of commercial impact of new investments in broadband that allows the delivery of services for development in an affordable manner.

e) Guidelines for making the transition from narrow-band to broadband networks, taking into account interconnection and interoperability features.

f) Case studies associated with operational and technical issues of deploying broadband networks, services and applications, including the transition from narrowband to broadband networks.

g) Examples of removing practical barriers to broadband infrastructure deployment.

h) Analysis of the factors influencing the effective deployment of of wireline and wireless access technologies.

i) Examination of trends in the various broadband access technologies, deployments, services offered and regulatory considerations.

j) Overview of national digital policies, strategies and plans which seek to ensure that broadband and IP technologies are available to as wide a community of users as possible.

k) Methods of promoting robust competition in the provision of network access and end-user digital services.

l) Best practices for co-investment, co-location and infrastructure sharing to promote market entry, where appropriate.

m) Regulatory and policy incentives for investment in high-speed and high-capacity broadband networks, including innovative licensing regimes and incentivizing new business models, holistic universal access and service strategies.

n) Regulatory challenges and policies to leverage on the rise of new technologies in the digital economy and society, including universal service funds, coverage requirements and alternative means of financing broadband access.

o) Methods of facilitating availability, access, and use of mobile services and apps such as m-commerce, m-finance and m-governance, including money transfer, m-banking and m-commerce.

p) Policy tools to facilitate the availability to consumers at local and national levels of competitive IP-based services and applications, so called "over-the-top" (OTT) services.

q) Best practices and guidelines regarding legal frameworks that create incentives for investment in IP-based services and applications.

r) Overview of trends in the transition from IPv4 to IPv6.

s) Methods of consolidating and coordinating efforts to facilitate the transition to IPv6.

# 4 Timing

Annual progress reports.

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

# 5 Proposers/sponsors

There was consensus at the WTDC-17, held in Buenos Aires, that issues related to broadband deployment is of extreme importance to all countries, particularly developing countries, and needs to be continued as a revised Question in the next study period 2018-2021.

# 6 Sources of input

1) Results of related technical progress in relevant ITU‑R and ITU‑T study groups.

2) Contributions from Member States, Sector Members and Associates, and from relevant ITU‑R and ITU‑T study groups, and other stakeholders.

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

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

5) ITU publications, reports and recommendations on broadband access technologies.

6) Relevant output and information from study Questions related to ICT applications.

7) Relevant inputs and information from BDT programmes related to broadband and the different broadband access technologies.

# 7 Target audience

| Target audience | Developed countries | Developing countries[[1]](#footnote-1)1 |
| --- | --- | --- |
| Telecom policy-makers | Yes | Yes |
| Telecom regulators | Yes | Yes |
| Service providers/operators | Yes | Yes |
| Manufacturers | Yes | Yes |
| Consumers/end users | Yes | Yes |
| Standards-development organizations, including consortia | 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.

b) Proposed methods for 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 to provide input and/or seek clarification/more information from ITU‑D Study Group 1 should they need it.

# 8 Proposed methods of handling the Question or issue

a) How?

1) Within a study group:

– Question (over a multi-year study period) ☑

2) Within regular BDT activity (indicate which programmes, activities,   
projects, etc., will be involved in the work of the Study Question):

– Programmes ☑

– Projects ☑

– Expert consultants ☑

– Regional offices ☑

3) In other ways – describe (e.g. regional, within other organizations   
with expertise, jointly with other organizations, etc.) □

b) Why?

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 group. This will enable Member States and Sector Members to contribute their experiences and lessons learned with respect to policy, regulatory and technical aspects of the migration from existing networks to broadband networks.

# 9 Coordination and collaboration

The ITU‑D study group dealing with this Question will need to coordinate with:

– Relevant ITU-R and ITU‑T study groups;

– the relevant outputs from ITU‑D Questions;

– Relevant focal points in BDT and ITU regional offices;

– Coordinators of relevant project activities in BDT;

– Standards-development organizations (SDOs);

– Experts and experienced organizations in this field.

# 10 BDT programme link

Links to BDT programmes aimed 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 the Question.

1. 1These include the least developed countries, small island developing states, landlocked developing countries and countries with economies in transition. [↑](#footnote-ref-1)