

ITU Workshop on “Apportionment of revenues and international Internet connectivity”

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INTERNATIONAL INTERNET CONNECTIVITY

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1- Brief historical overview of international Internet regulation

Three important phases in the evolution of international Internet regulation, punctuated by the World Summit on the Information Society (WSIS):

- pre-WSIS
- WSIS
- Post-WSIS

1- Brief historical overview of international Internet regulation

- 21 December 2001: Approval by United Nations General Assembly of a resolution to hold a WSIS in two phases
- First phase: 10-12 December 2003, in Geneva
- Second phase: 16-18 November 2005, in Tunis.

1- Brief historical overview of international Internet regulation

- Geneva phase culminated in the adoption of a Declaration of Principles and Plan of Action
- Two issues remained pending:
 - ➔ Financing policies to combat the digital divide
 - ➔ Internet governance.

1- Brief historical overview of international Internet regulation

- Tunis phase culminated essentially in the establishment of a multistakeholder consultative forum for Internet governance – Internet Governance Forum (IGF)
- IGF is a global meeting where all interested parties can exchange views on any subject whatsoever associated with Internet governance
- IGF is mandated to address public policy issues related to Internet governance
- This mandate is set forth in § 72 of the Tunis Agenda for the Information Society.

2- Analysis of international Internet connectivity

2.1 Technical aspects of interconnection

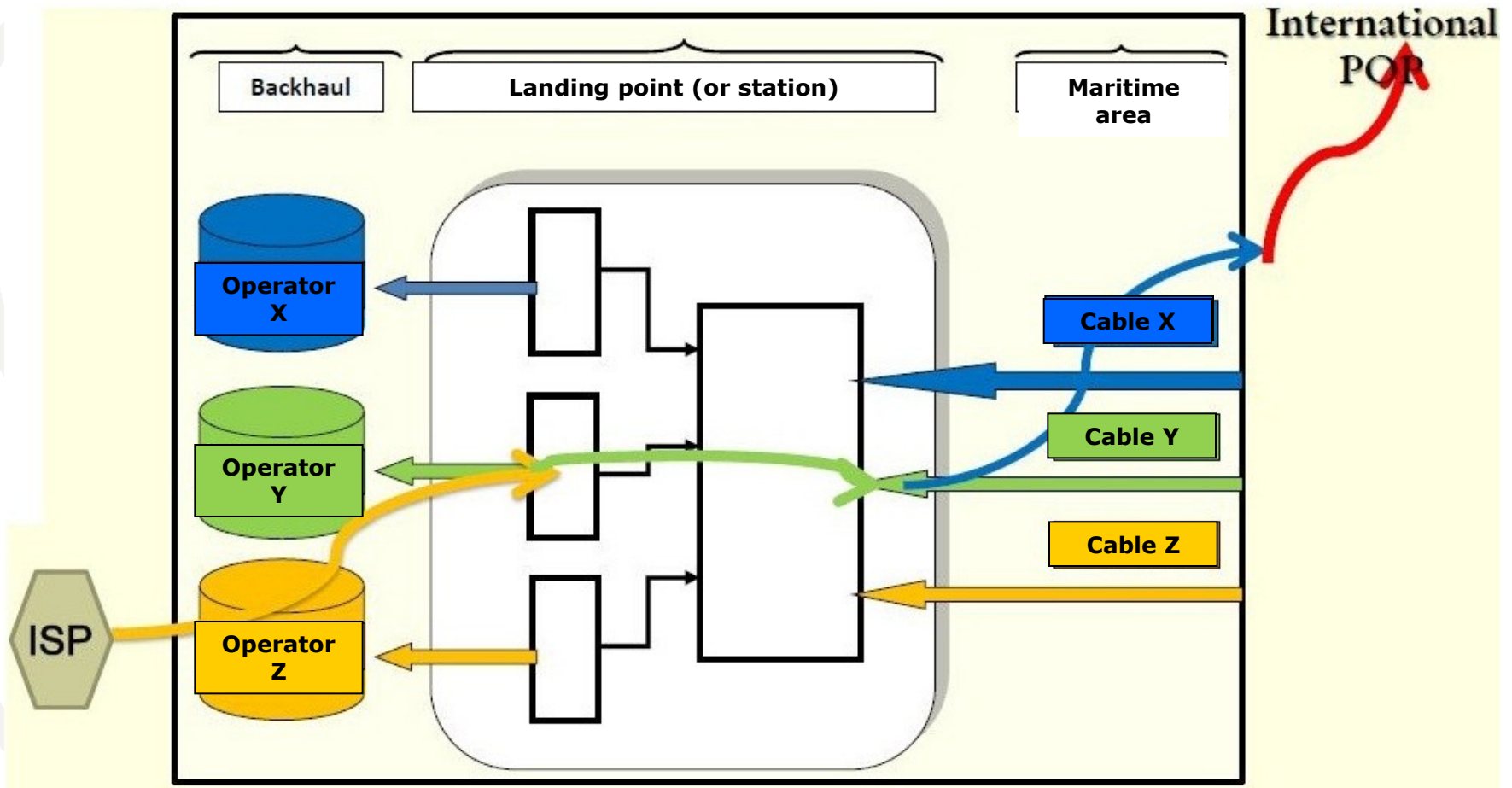
2.2 Interconnection agreements and regulatory aspects thereof

2.3 Economic aspects and tariff mechanisms

2.1 Technical aspects of interconnection

- **International bandwidth** is the maximum quantity or the rate of transmission of data from one country to the rest of the world
 - Deployed by satellite or by fibre-optic cable (land or submarine)
 - Effective if connected to an international backbone provider (IBP)

2.1 Technical aspects of interconnection



2.2 Regulatory aspects of interconnection agreements

- Internet access providers (ISPs) need to conclude national or international interconnection agreements in order to access the Internet resource. There are two types of such agreement:
 - Peering agreements
 - Transit agreements

2.2 Regulatory aspects of interconnection agreements

Regulatory aspects can be seen at the national and international levels:

- National level: Regulators frame the technical and tariff conditions for access to backhaul, landing point, circuit leasing and teleport
- International level: Free market, although some observers believe it is dominated by a few IBPs which hold sway

2.2 Regulatory aspects of interconnection agreements

At the national level, one could contemplate:

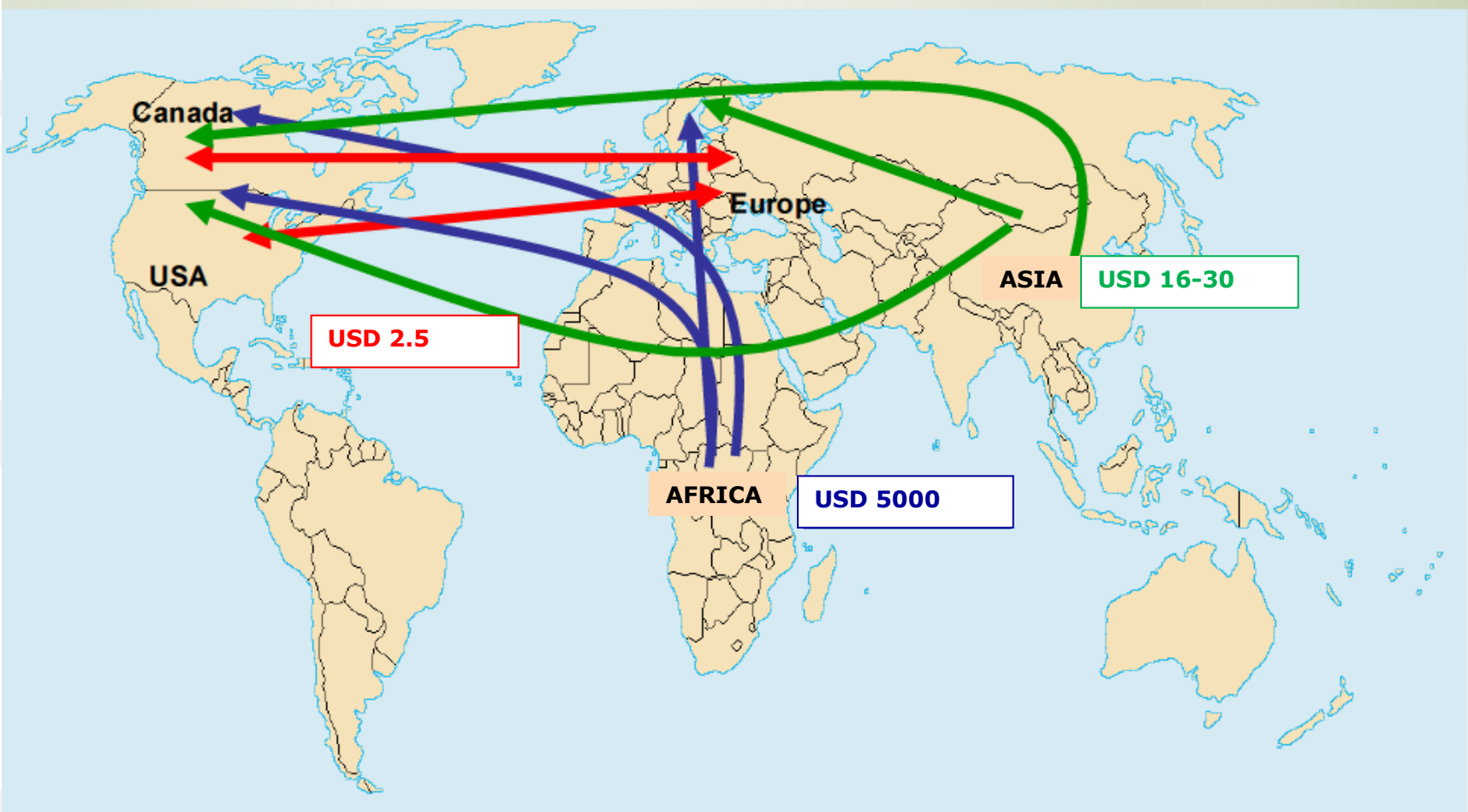
- Establishing Internet exchange points (IXP)
- Building the capacity of ISPs to establish and operate IXPs
- Opening up to competition the international gateway, which remains under monopoly in some countries
- Measures to develop broadband infrastructure and promote the development of local content

2.2 Regulatory aspects of interconnection agreements

At the international level, one could contemplate:

- Harmonizing regional regulations, in order to facilitate cross-border connectivity between countries
- The need to take international actions, either through WTO or within the framework of revision of the ITRs, to facilitate cost-oriented access of developing-country ISPs to IBPs
- Applying Recommendation ITU-T D.50 by introducing a principle of transit with cost-sharing

2.3 Economic aspects and tariff mechanisms



2.3 Economic aspects and tariff mechanisms

2.3.1- Economic issues

- The tariff differential observed on the map is explained to a large extent by the tariff system for international Internet, based on the so-called "full-circuit" model
 - In this model, small ISPs located in developing countries bear the whole cost of transit, which they pass on to the end customer
 - To access the international Internet resource, small ISPs sign transit agreements with large-scale global ISPs (Tier 1 and 2 ISPs) in which they agree to pay for sending or receiving Internet traffic

2.3 Economic aspects and tariff mechanisms

2.3.1- Economic issues

International Internet bandwidth and access to the international point of presence (PoP) account for around 80% of costs for Internet access providers (IAPs) in African countries, whereas their traffic accounts for only 20% of the volume exchanged over the corresponding international infrastructure

In the United States, Internet services are classed as information services and interconnection between ISPs is thus not regulated

2.3 Economic aspects and tariff mechanisms

2.3.1- Economic issues

- The European Union's regulatory framework defines 18 market segments for end-users and interconnection products
- In each of these market segments, the degree of competition has to be measured and players with a dominant position identified
- The regulator intervenes where necessary. As in the United States, the Internet market segment in Europe is not one of these 18 market segments

2.3 Economic aspects and tariff mechanisms

2.3.2- Discussion of IIC in SG3

- The question of IIC first appeared on the agenda of SG3 during the 1997-2000 study period. The terms of reference may be summarized as follows:
 - Determine which components of the international infrastructure play a part in the Internet and fall within the framework of GII
 - Identify cost issues and, if appropriate, propose a set of equitable remuneration principles for application among international circuit providers

2.3 Economic aspects and tariff mechanisms

2.3.2- Discussion of IIC in SG3

- WTSA-2000: Adoption of Recommendation ITU-T D.50
- June 2004: First amendment – Insertion of an Appendix 1 to Recommendation D.50 on "General considerations for charging criteria and options for IIC"
- WTSA-08: further amendment to Recommendation D.50 – Inclusion of the option to possibly take account of network externalities as one of the compensation components

2.3 Economic aspects and tariff mechanisms

2.3.2- Discussion of IIC in SG3

- 2005-2008 : SG3, acting on a proposal by China, entrusted a new mandate to the rapporteur group consisting in the study of methodologies for measuring traffic flow on the Internet, for use within the framework of commercial arrangements. The discussions on this question have continued during the current study period 2009-2012. There are diverging views as to the adoption or otherwise of a Recommendation on the measurement of Internet traffic flow
- 2010 : Through the revision of Resolution 101 (Rev. Guadalajara, 2010), the Plenipotentiary Conference called in particular on SG3, which has responsibility for Recommendation ITU-T D.50, to complete as soon as possible its studies, which have been ongoing since WTSA-2000

2.3 Economic aspects and tariff mechanisms

2.3.2- Discussion of IIC in SG3

- 2011:
 - Adoption of a supplement to Recommendation D.50, on general considerations for traffic measurement and options for IIC.
 - Approval of an Amendment 2 to Appendix 1 of Recommendation D.50. SG3 undertook however to pursue its studies on the issue of IIC
- 2010 (WTDC-10): Establishment of a framework for cooperation between ITU-T and ITU-D

2.3 Economic aspects and tariff mechanisms

2.3.2- Discussion of IIC in SG3

- This framework enables the two Sectors to organize and coordinate activities that promote:
 - Information sharing among regulators on the relationship between charging arrangements for international Internet connection
 - The affordability of international Internet infrastructure development in developing and least developed countries

3- Reasons for the high cost of international Internet connectivity in developing countries

- Lack of regulation of the Internet, coupled with no or little competition in the Internet access value chain, which results in powerful developed-country ISPs holding sway over the market
- Limited bargaining power of developing-country ISPs
- Highly concentrated international bandwidth market, implying less competition and strong downward price rigidity

3- Reasons for the high cost of international Internet connectivity in developing countries

- Low level of development of telecommunication infrastructure at the regional and local levels, visible in particular in the low level of cross-border connectivity of fibre-optic cables between national IXPs
- Lack of national and transnational strategies for the deployment of broadband telecommunication infrastructure
- Absence of genuine competition with respect to infrastructure
- Structural problems associated with the low level of demand in LDCs and SIDS
- Small (but growing) number of national and regional IXPs

4- International Internet connectivity in some African countries

- In recent years, Africa has seen major investment in the construction of new submarine cables that will make for a 4 000% increase in international capacity
- Africa has highly promising fibre-optic cable development projects at the national and transnational levels, one example in central Africa being the "Central African Backbone" (CAB) project
- Internet infrastructure development in Africa is also reflected in an increasing number of IXPs

4- International Internet connectivity in some African countries

■ Case of Cameroon

- Bandwidth on SAT3 of 10Gbit/s
- Monopoly on this market segment managed by the incumbent operator
- Average price of Internet access for a household with a shared 256 kbit/s connection around USD 100 per month
- Businesses subscribing to a transmission capacity of 512 kbit/s and reception capacity of 2 Mbit/s pay their ISP around USD 2 000 per month
- By comparison, in the USA, a dedicated transmission and reception capacity of 30 Mbit/s costs around USD 500 per month

4- International Internet connectivity in some African countries

■ Case of Cameroon

- Recurrent expenses for the lease of bandwidth account for the major portion of the costs of a national ISP in Cameroon, i.e. on average over 60%
- This cost includes, *inter alia*, expenses for upkeep and maintenance of the SAT3 fibre-optic infrastructure, and **expenses in respect of transit agreements signed with Tier 1 ISPs.**

4- International Internet connectivity in some African countries

■ Case of Sierra Leone

- ▶ There being no optical fibre, Internet users are obliged to use the sole available bandwidth provided by the satellite Airtel, an Indian mobile-telephone company
- ▶ Those wishing to have access to a better connection can employ VSAT technology, but this costs over EUR 5 500 per month for a capacity of 2 Mbit/s
- ▶ By comparison, in developed countries such as France, broadband connections are available which are 20 times faster but ... 250 times cheaper

4- International Internet connectivity in some African countries

■ Case of Côte d'Ivoire

- ➔ Access to the SAT3 submarine cable infrastructure.
- ➔ Infrastructure managed under a monopoly by the incumbent operator, Côte d'Ivoire Telecoms. The country's international bandwidth is estimated at 3 Gbit/s. The bandwidth used for incoming traffic is estimated at 70%, as against only 30% for outgoing traffic
- ➔ Annual price of leasing an STM-1 (155 Mbit/s) is estimated at USD 888 667 per year

5- CONCLUSION

The cost of transit agreements constitutes a significant bottleneck for Internet development in the developing countries.



Thank you for your attention

Questions?