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SERIES D: TARIFF AND ACCOUNTING PRINCIPLES AND INTERNATIONAL TELECOMMUNICATION/ICT ECONOMIC AND POLICY ISSUES

ITU-T D.52 – Implementation guidelines for Recommendation ITU-T D.52 focusing on operationalization of regional Internet exchange points

ITU-T D-series Recommendations – Supplement 5

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Supplement 5 to ITU-T D-series Recommendations

ITU-T D.52 – Implementation guidelines for Recommendation ITU-T D.52 focusing on operationalization of regional Internet exchange points

Summary

Supplement 5 to ITU-T D-series Recommendations is focused on addressing the challenges related to the operationalization of regional Internet exchange points and identifying the most cost-effective mechanisms for interconnecting regional Internet exchange points.

History

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* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Introduction

With the increased use of the Internet as a primary means of communication, affordability of Internet services has become a key policy priority for the International Telecommunication Union (ITU) Member States and Sector Members, particularly developing countries. Recommendation ITU-T D.52 encourages regional collaboration to establish central hubs or Internet exchange points (IXPs) that enable local Internet traffic to be routed locally, saving international bandwidth and reducing the costs of international Internet connectivity. More details are required in the form of guidelines on the regional interconnection of IXPs, particularly, operationalization of regional Internet exchange points and identifying the most cost-effective mechanisms for interconnecting regional Internet exchange points.

Supplement 5 to ITU-T D-series Recommendations

ITU-T D.52 – Implementation guidelines for Recommendation ITU-T D.52 focusing on operationalization of regional Internet exchange points

1 Scope

This Supplement proposes guidelines for the implementation of [ITU-T D.52] with a focus on operationalization of regional Internet exchange points (RIXPs).

2 References

[ITU-T D.52] Recommendation ITU-T D.52 (2016), *Establishing and connecting regional Internet exchange points to reduce costs of international Internet connectivity*.

3 Definitions

3.1 Terms defined elsewhere

This Supplement uses the following term defined elsewhere:

3.1.1 Internet exchange point (IXP) [ITU-T D.52]: A single physical network infrastructure operated by a single entity with the purpose to facilitate the exchange of Internet traffic. It acts as a centralized hub enabling local traffic to be routed locally and save international bandwidth which has the effect to reduce the overall costs of international Internet connectivity.

3.2 Terms defined in this Supplement

None.

4 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

ISP Internet Service Provider

IXP Internet Exchange Point

NRA National Regulatory Authority

RIXP Regional Internet Exchange Point

5 Conventions

None.

6 Overview of regional Internet exchange points

A regional Internet exchange point (RIXP) is a physical network infrastructure that facilitates the exchange of Internet traffic in different countries. The primary role is to keep regional traffic regional and save international bandwidth, which reduces the costs of exchange traffic between local Internet service providers (ISPs). By locating internal traffic and avoiding international links, regional operators and consumers can realize significant savings, provide substantial local bandwidth and significantly increase the local performance of the Internet. Local links are often faster, because of the reduced waiting time for traffic.

7 Approaches to establishing regional Internet exchange points

There are three (3) main approaches to establishing RIXPs:

i) Interconnecting existing IXPs to create an RIXP

This model assumes that at least some or all countries in the region have an operational IXP and that there is cross-border terrestrial infrastructure in place. Interconnection of existing IXPs have high recurrent costs implications. Successful interconnection would require increased commitments from the existing IXPs. Where interconnection has been successful, the IXPs had already been well established. Interconnection is largely dependent on having an enabling policy and a regulatory environment for competition on cross-border interconnection.

ii) Building a regional IXP

To build an RIXP several considerations such as location viability, infrastructure investment requirements, policy and regulatory frameworks, ownership and cost apportionment, amongst other issues, should be considered. Policy and regulatory issues include the licence requirements to set up an IXP, cross-border interconnection policy, peering requirements, transit requirements, critical infrastructure protection and taxation amongst other issues.

iii) Evolving national/local IXPs into regional IXPs.

The evolution of a national IXP requires an enabling environment to support its growth. The IXPs compete to attract membership from within and beyond their geographical location. An ISP is capable of peering in more than one IXP in different cities or countries in the region based on the value derived from each IXP. There can also be more than one regional IXP in the region.

8 Institutional and operational models

The three common organizational models for operating regional IXPs are 'not-for-profit', 'for profit' and 'government subsided'. The 'not-for-profit model' is usually based on cost recovery i.e., one-off joining fees and operation fees based on port speed or traffic volume. The 'for profit' model normally involves a commercial neutral operator. An RIXP can also be established and financed from subsidies and grants.

9 Implementation and management of RIXPs

Implementation considerations include location, licences and permissions, budget, deployment model, amount of traffic and number of peering operators, amongst other issues. There is no one right fit-for-all management model for RIXPs, but the structure should assist the RIXP to be self-determining, remain within legal and regulatory constraints, maintain neutrality and establish financial sustainability. Whether commercial or not it is recommended that ownership and management of the IXP should always remain neutral and uncompromised. Capacity building for the RIXP membership is encouraged for the successful operationalization of the RIXP.

10 Policy and governance framework

Governing policies should be consensually developed by members of the RIXP; these include operational, technical and RIXP membership policies amongst others. It is also recommended that regulators reduce regulatory constraints and create an enabling environment for the IXPs. The existing regulatory regime and its policies may hinder the growth of the IXP. For instance, policies that inhibit competition on broadband terrestrial infrastructure may limit the options available for local interconnection. Content regulation constraints should also be addressed and the promotion of local content policy is encouraged to boost local traffic for the RIXP.

11 Regional peering, interconnection and settlement policy considerations

It is encouraged that an open peering policy is to be developed and implemented in order to encourage non-traditional members such as the academia and banks for peering. A regional interconnection policy is also recommended to foster harmonization and encourage members to exploit cross-border interconnection opportunities by negotiating fair contracts with infrastructure operators and international bandwidth providers.

The ability to attract carriers and transit providers at an IXP is important to grow the value and traffic at an IXP, hence a transit policy should be in place. This policy would be subject to national regulations on Internet transit. Policy and regulatory transparency are pertinent for encouraging regional and international entities to participate in the local interconnection and peering environment. National regulatory authorities (NRAs) are encouraged to foster competitive access to wired and wireless connections, which will help lower the costs associated with connecting to an IXP.

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