

Brazil

CONTRIBUTION TO THE SIXTH MEETING OF CWG-INTERNET

I Introduction

Following recent decisions of the ITU Plenipotentiary Conference 2014 and the ITU Council 2015, the Council Working Group on international Internet-related public policy issues (CWG-Internet) decided that an Open Consultation would be convened in 2015 on the following issue:

"With a view to discussing the establishment of Internet Exchange Points (IXPs) to advance connectivity, improve service quality and increase network stability and resilience, fostering competition and reducing interconnection costs, as proposed by Opinion 1 of WTPF-13 and consistent with PP-14 Resolutions 101 and 102, stakeholders are invited to **elaborate and exemplify on the challenges faced and identify widely accepted best practices for the design, installation and operation of IXPs.**"

Furthermore, it was decided that relevant inputs from the open online consultation will form the basis of discussion at the physical open consultation meeting and all relevant responses will be submitted to the CWG-Internet for consideration during its next meeting.

The Open Consultation attracted more than twenty substantive contributions to the discussion on IXPs. Several of the contributions indicated a wish to further collaborate with the work of the ITU on the issue of IXPs, while recognizing the need for more affordable infrastructure to support international Internet connectivity. It is also interesting to note that some of the contributions, particularly among those coming from developing countries, identified challenges related to public policies to stimulate the deployment of IXPs, with an aim to allow all countries to have access to at least one IXP. It is precisely in these areas that public policies can provide the means to stimulate competition and effectively create an enabling environment for the deployment of IXPs, while also stimulating the development of local content and applications.

II Background

The International telecommunications Union has contributed significantly to policy discussions related IXPs since the early work of Recommendation ITU-T D.50, and later with its

supplements. More recently, the significant provisions of article 3.7 of the new International Telecommunication Regulations (ITRs) were followed by Opinion 1 at the Fifth World Telecommunication/ICT Policy Forum and a further update to ITU-T D.50 in Supplement 2: Guidelines for reducing the costs of international Internet connectivity. All this previous work culminated with the recent revision of Resolutions 101 and 102 at the ITU 2014 Plenipotentiary Conference. The following provisions are of relevance to the work of CWG-Internet that follows the Open Consultation:

- **World Conference on International Telecommunications (WCIT-2012).**

International Telecommunication Regulations (ITRs)

3.7 Member States should create an enabling environment for the implementation of regional telecommunication traffic exchange points, with a view to improving quality, increasing the connectivity and resilience of networks, fostering competition and reducing the costs of international telecommunication interconnections.

- **ITU Fifth World Telecommunication/ICT Policy Forum (WTPF-2013)**

Opinion 1 - Promoting Internet Exchange Points (IXPs) as a long term solution to advance connectivity

is of the view:

a) that establishment of local, national, sub-regional, and regional IXPs is a priority to address connectivity issues, improve quality of service and reduce interconnection costs;

b) that enabling the interconnection of international, national and regional networks through IXPs may be an effective way to improve international internet connectivity and to reduce the costs of such connectivity, with regulation only when necessary to promote competition;

c) that donor programmes and developmental financing mechanisms should consider the need to provide funding for initiatives that advance connectivity, IXPs and local content for developing countries;

d) that the creation of IXPs enables a virtuous cycle: as the IXP attracts more ISPs, it will also begin to attract local, national and international content providers, along with business, academic, and governmental users, which in turn attracts more ISPs;

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- **Recommendation ITU-T D.50 – Supplement 2: Guidelines for reducing the costs of international Internet connectivity (2013)**

3 Ways and means to reduce the cost of international Internet connectivity

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3.1 Establishment of Internet exchange points (IXPs)

Internet exchange points (IXPs) have been established successfully in some countries. These allow exchanges of local Internet traffic between two Internet service providers within the same country, thereby saving on the use of international bandwidth. IXPs should also be created and efforts should be made to promote traffic exchange at the regional level, ...

Regional interconnection of infrastructure must be encouraged in order to facilitate the exchange of Internet traffic locally without using international bandwidth.

3.2 Development of local services including local hosting and local applications

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Policy makers could examine the development of domestic content hosting services and look for ways to promote the development of a local content hosting as a way to reduce international transit costs and increase the speed of content storage and delivery.

3.3 Access to landing points for submarine cables and related issues

Lack of access to submarine cable stations by both national and regional operators can hinder competition.

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3.4 Mirror sites and caches

As more caches arise across countries and regions, they allow traffic exchange to be localized, and reduce the need to rely on longer-distance backhaul, including notably expensive transcontinental submarine cable capacity. Content delivery networks (CDNs) leverage IXPs to help manage the flow of content.

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- **ITU 2014 Plenipotentiary Conference**

- Resolution 101 - Internet Protocol-based networks**

resolves

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5 to continue the study of international Internet connectivity as an urgent matter, as called for in § 50 d) of the Tunis Agenda (2005), and to call upon ITU-T, in particular Study Group 3, which has responsibility for Recommendation ITU-T D.50 and which has compiled an initial set of guidelines in Supplement 2 to Recommendation ITU-T D.50 (05/2013), to complete as soon as possible its studies that have been ongoing since WTSA-2000;

- **ITU 2014 Plenipotentiary Conference**

- Resolution 102 - ITU's role with regard to international public policy issues pertaining to the Internet and the management of Internet resources, including domain names and addresses**

instructs the Director of the Telecommunication Development Bureau

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4 to liaise with the Telecommunication Standardization Bureau and to collaborate with other relevant organizations involved in the development and deployment of IP-based networks and the growth of the Internet, aiming to make available to Member States widely accepted best practices for the design, installation and operation of Internet exchange points (IXPs),

III Discussion

Internet Exchange Points (IXPs) have increasingly been recognized as a key element to improve the quality and ensure the resilience of Internet infrastructure. Over the last few years many countries have put forth national broadband plans, some of which include the rollout of extensive broadband networks to reach unserved and underserved areas. These networks must be able to exchange traffic with existing IP backbones, in order to establish local peering arrangements and negotiate transit capacity.

In this context, partnerships that establish open and neutral IXPs have recently been disseminated. The deployment of IXPs carries the positive externalities of distribution of content closer to the end users, along with improvement in topology and routing efficiency, increased connectivity, reduced connection latency, and economic benefits of stimulating competition in the wholesale IP transit market.

Additionally, IXPs can be efficient locations from which to offer other system services. In this regard, two very relevant areas for creating synergies in an IXP “ecosystem” are co-location with submarine cable landing stations and on-site datacenters (e.g., hosting CDN content servers).

The effectiveness of an IXP resides, to a great extent, in the fact that a significant number of autonomous systems (AS) of networks and content providers are present at that particular IXP. The deployment of an IXP should result that all conditions for such arrangements are offered. The success of an IXP can be measured by the number of AS participating.

Content Delivery Networks (CDNs) aggregate and distribute content globally over the Internet. By locating servers at datacenters, relatively close to Internet users, a CDN is able to optimize content distribution based on technical criteria of route, availability, location and interconnection conditions. Given the growth projections of Internet video content over the next several years, it is interesting to note that in many countries just two CDN-hosted video services together currently account for over 40% of total download Internet traffic, and well above that mark during peak traffic hours¹.

Although typically a CDN utilizes third party network connections, it is usually structured around its own unique autonomous system (AS). The dissemination of IXPs worldwide will foster the location of CDNs closer to the end users, reducing the demand for transit services. Hosting local servers at IXPs is one possible solution to mitigate the potential that CDNs have to generate great IP international traffic imbalances, while at the same time reducing international transit costs.

Domestically generated content can also benefit from being conveniently hosted at IXPs, as a way to increase the speed of content storage and delivery, particularly in the case of large volume of video content (e.g., content generated at major international sporting events).

IV Proposals

Brazil thus proposes to establish priority on the following Internet-related initiatives within ITU, on which CWG-Internet should periodically report to Council:

- Advance ITU's role in capacity building on the issue of IXPs, in line with Plenipotentiary Resolution 102 (Busan, 2014) which instructs the Telecommunication Development Bureau and the Telecommunication Standardization Bureau, in collaboration with other relevant organizations in this area of expertise, to make available to Member States best practices for the design, installation and operation of Internet exchange points. This can be achieved through initiatives such as publishing guidelines, workshops and training programs. The compilation of concepts and definitions used by the different stakeholders, as a means to improve a better understanding of all aspects related to the Internet, should be promoted as part of the initiative to discuss and understand problems and propose solutions.
- Actively promote the continuation of the study of international Internet connectivity as an urgent matter, in line with Plenipotentiary Resolution 101 (Busan, 2014). In this regard, that ITU-T, in particular Study Group 3, which has responsibility for Recommendation ITU-T D.50 and which has compiled an initial set of guidelines in Supplement 2 to Recommendation ITU-T D.50 (05/2013), completes as soon as possible its studies that have been ongoing since WTSA-2000.
- Identify and compile public policies that Member States adopt, in line with article 3.7 of the International Telecommunication Regulations, in order to create an enabling environment for Regional IXPs with global connectivity, as a means to enhance the distributed nature of the

¹ www.sandvine.com/trends/global-internet-phenomena/

Internet, improve quality of service and reduce interconnection costs, and especially the costs to end users.

- Ensure that the CWG-Internet continues to identify other Internet-related public policy issues to promote the development of the Internet worldwide for all, in particular those issues that can benefit from enhanced cooperation among Member States.
