



Creating an Enabling Environment for the Internet: Role of IXPs

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Global Presence



NORTH AMERICA

EUROPE

AFRICA

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ASIA

100

Chapters
Worldwide

65,000

Members and
Supporters

145

Organization
Members

6

Regional
Bureaus

18

Countries with
ISOC Offices

Our Mission

To promote the open development, evolution, and use of the Internet for the benefit of all people throughout the world.

Openness a Core Principle of the Internet

*Protocol
Standards, Global
Interoperability*

Technology

Economy

*Permissionless
Innovation, New
Business Models*

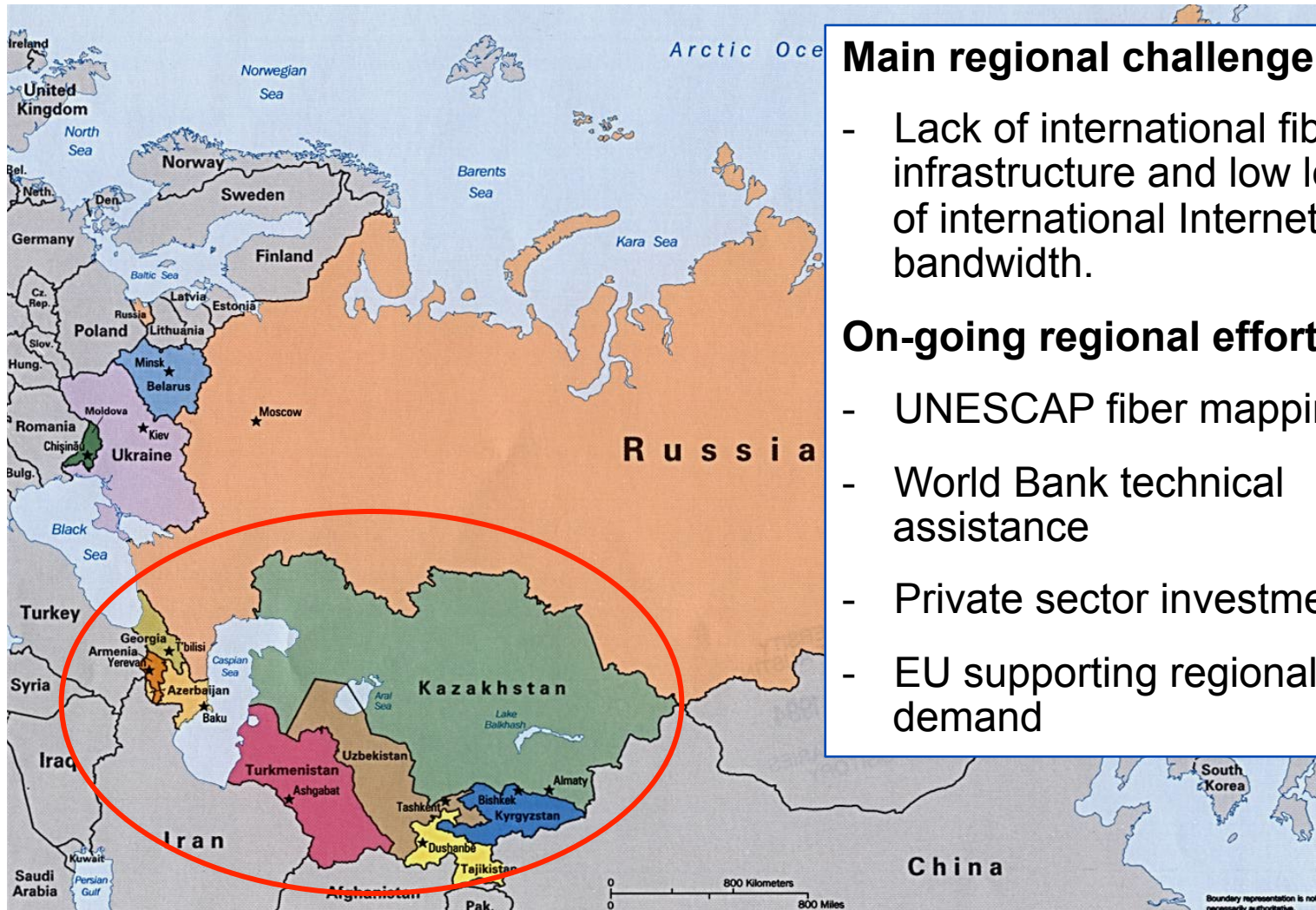
*Openness
Possible with
Many Different
Policy Regimes*

Politics

Society

*Social Medium for
Users*

Trans-Eurasian Connectivity Snapshot



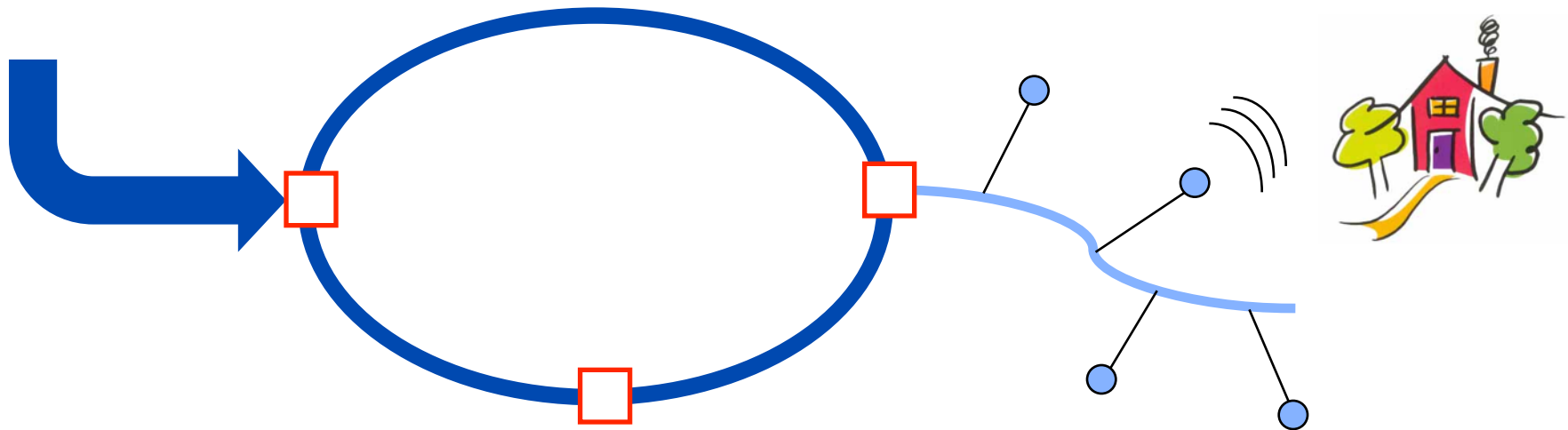
Main regional challenge:

- Lack of international fiber infrastructure and low levels of international Internet bandwidth.

On-going regional efforts:

- UNESCAP fiber mapping
- World Bank technical assistance
- Private sector investment
- EU supporting regional demand

Internet Access Value Chain



Role of Internet Exchange Points (IXPs)

Internet Exchange Points (IXPs) are now well recognised as a **vital part of the Internet ecosystem** and essential for facilitating a robust domestic ICT sector*.

A primary role of an IXP is to:

- Keep local Internet traffic within local infrastructure and to **reduce costs** associated with traffic exchange between networks.
- **Improve the quality of Internet services** and **drive demand** in by reducing delay and improving end-user experience.
- **Create a convenient hub for attracting key Internet infrastructures** within countries.
- Act as a **catalyst** for overall Internet development including commercial, governmental and academic stakeholders.

* See for example, the OECD's recent report on Internet Traffic Exchange:
http://www.oecd-ilibrary.org/science-and-technology/internet-trafficexchange_5k918gpt130q-en

IXPs around the World



Source: TeleGeography World IX Map, <http://www.internetexchangemap.com/>

Measuring Benefits of IXPs: Kenya Example

Benefit	Before	After KIXP	Summary
Latency	200-600 ms	2-10 ms	Significant increase in performance
Local traffic exchange	Negligible	1 Gbit/s	Estimated total saving of \$1,440,000 per year on international transit
Content	All content was accessed through international links, almost all content hosted abroad	Google network present locally. Rehoming of content hosted abroad	Increased revenues up to \$ 6 millions per 100 Mbit/s of new mobile data traffic
E-government	KRA collected taxes manually	Revenues collected online	Significant reliance on KIXP to clear customs and raise revenues
Domain names	.com was predominant domain, registered overseas	.ke is the predominant domain, registered and based locally	KENIC uses KIXP to help increase service delivery for .ke
Regional routes	All regional traffic tromboned internationally	An increasing amount of regional traffic exchanged at KIXP	KIXP more attractive to content providers and backbones able to access regional users

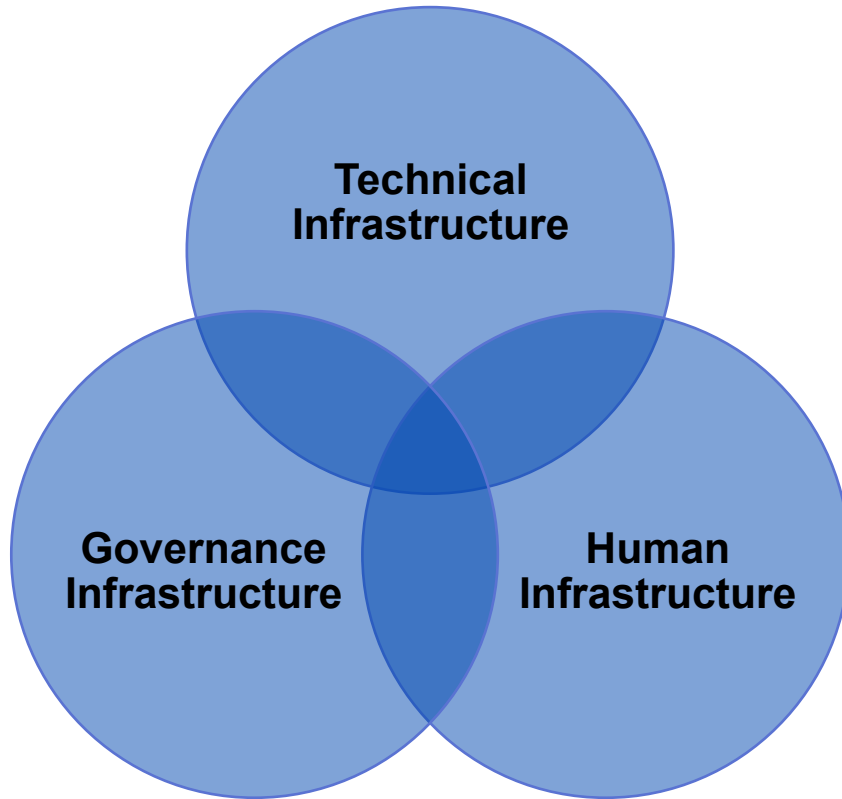
Source: Analysys Mason, 2012



Formula for IXP Development

IXP 80/20: “80% Social Engineering, 20% Technical Engineering”

The Internet Society works on **3 types of “IXP infrastructure”**:



1. **Technical:** Need not be expensive to be effective.
2. **Governance:** Typically not-for-profit, neutral and transparent member-driven model.
3. **Human:** Local skills and capacity building are key drivers of success and sustainability.

IXP Development in Practice: Georgia

- **Workshop partners:** RIPE NCC and EUR-IX, supported by the Regulator (GNCC) and Ministry of Economy.
- **Attendees:** main telecoms operators, other ISPs, data center providers, NREN.
- Summary of **issues raised**:
 - IXPs and competition in telecoms market;
 - Private peering vs. public peering;
 - IXP neutrality;
 - Value add of IXPs;
 - Role of government in IXP development.



The screenshot displays the Internet Society website. The top navigation bar includes links for Home, Connect Login, Become a Member, Find a Chapter, Blog, and News. Below this, a secondary navigation bar features Who We Are, What We Do, Events (highlighted), Publications, The Internet, and Get Involved. The main content area is titled 'IXP Workshops' and features the Internet Society logo and the text 'IXP Workshop'. It describes the organization's mission to foster robust, efficient, and cost-effective interconnection and traffic exchange environments, including assisting the development of IXPs. It also mentions a series of IXP Workshops created for IXP Managers and Operators, Internet Service Providers, Network Operators, and National Research and Education Networks. A link is provided for the next workshop: 'IXP Workshop - Belgrade, Serbia, December 4-5'. At the bottom, there is a link for more details on Internet Exchange Points (IXPs).

Creating an Enabling Environment for the Internet

- **Competition, non-discriminatory tariff frameworks and open access** particularly at the levels of international bandwidth, IP transit, interconnection, and backhaul.
- **Local-loop unbundling**, as well as **infrastructure sharing**, to ensure competitive service offerings to end-users.
- **Internet Exchange Points** can be a catalyst of a robust domestic Internet environment and market.
- Promotion of **private sector investment** and **providing regulatory certainty**.



References:

ISOC IXP Toolkit: <http://www.ixptoolkit.org>

ISOC Paper on the Open Internet:

<http://www.internetsociety.org/doc/open-internet-what-it-and-how-avoid-mistaking-it-something-else>

UNESCAP fiber mapping:

<http://www.unescap.org/resources/background-document-telecommunication-connectivity-central-asia>

Get Involved

There are so many ways to support the Internet. Explore how you can make an impact.

- Become a Member
- Join a Chapter
- Attend an Event



**This is your Internet.
Join it!**

www.internetociety.org

For any questions, please contact me at: palovirta@isoc.org