

# *Supporting Development of Critical Caribbean Infrastructure*

# *Caribbean IXP Proliferation*

*Junior Mc Intyre  
Project Co-ordinator  
Caribbean Telecommunications Union (CTU)*

# Brief History



Caribbean  
Telecommunications  
Union

- 1989: Established by CARICOM to be the inter-governmental telecommunications policy instrument for the Caribbean
- 2003: Defined a new strategic direction to address issues of information and communications technologies (ICT)
- 2004: Expanded Membership to include Private sector organisations
- 2013: Inaugurated Caribbean Regional Infrastructure Programme (CARCIP)

# CTU Members



Caribbean  
Telecommunications  
Union



ARIN

Bureau Telecommunicatie en Post (Curacao)

Digicel (Trinidad & Tobago)

Eastern Caribbean Telecommunications Authority

LIME (Barbados)

International Amateur Radio Union (Region2)

Telecommunications Authority of Trinidad and Tobago

## CTU Mission

- To create an environment in partnership with members to optimize returns from ICT resources for the benefit of stakeholders.

## Connected Caribbean Initiative (CCI)

- Connected Caribbean is a strategic initiative of the Caribbean Telecommunications Union (CTU) to facilitate functional Caribbean integration.
- A significant element of the CCI is the establishment of Internet Exchange Points in the Caribbean.

# Emerging Caribbean Epiphany

- Much greater focus has to be put on increasing *education and awareness*, facilitating *collaboration* (inter-agency and inter-country), *building capacity*, improving *policy* and legislative environment and strengthening physical *infrastructure*

# Understanding the Internet Economy

- These services must be anchored in someone's economy:
  - This is why countries with the highest concentration of Internet **infrastructure**, Internet **content** and Internet **connectivity** are the ones seeing the greatest economic benefit.

# Understanding the Internet Economy

- There is a distinction between
- developing services that *run on the Internet*
- and
- building a domestic economy that is *based on the Internet.*

# Understanding the Internet Economy

- **FACT**

- The absence of IXPs compromises a country's ability to build a robust domestic internet ecosystem and economy



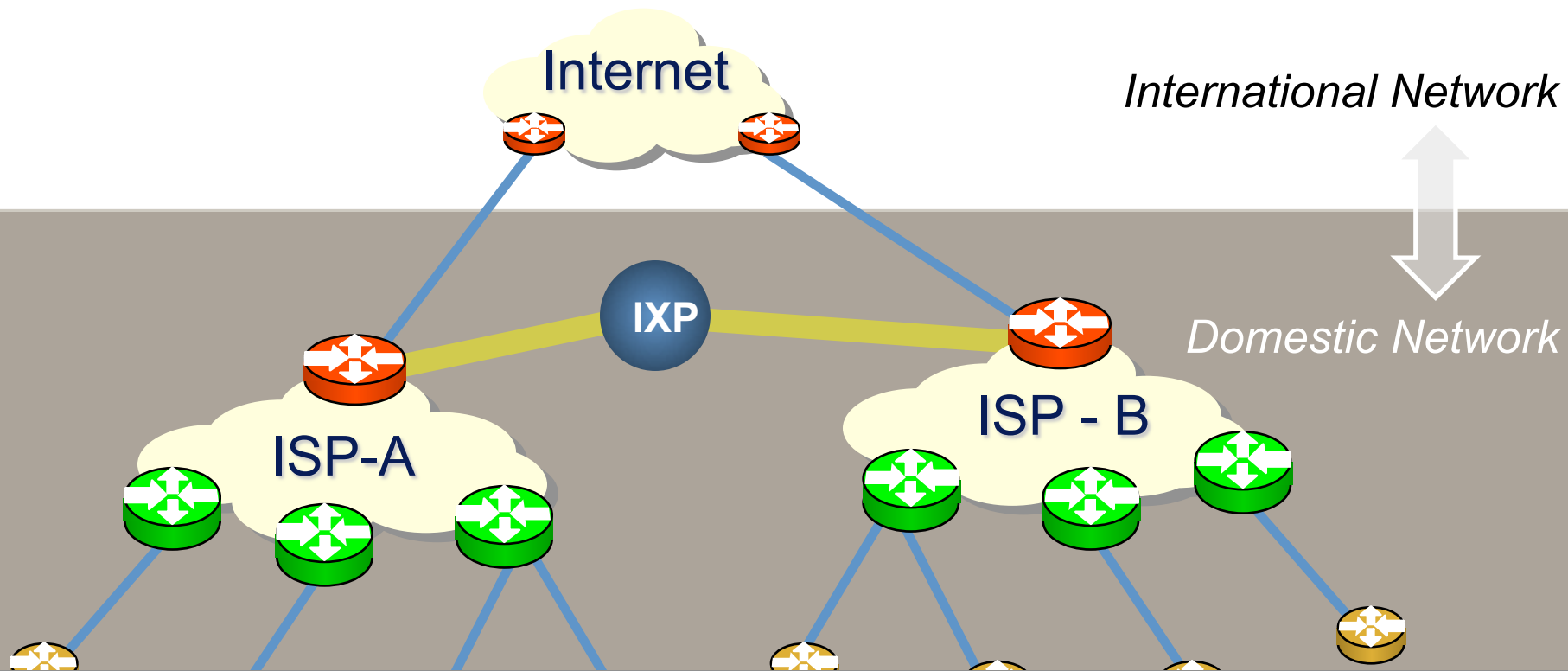
# Understanding the Internet Economy

- The domestic Internet economy develops when users **shift from merely consuming content** hosted outside of a country, **to producing local content** and facilitating local transactions, all run on local networks

*These local networks are in turn, connected to the global Internet.*

# What is an IXP: Quick Definition

- Domestic vs International Interconnection



An **Internet exchange point (IX or IXP)** is a physical infrastructure that allows different Internet Service Providers (ISPs) to **exchange Internet traffic** between their networks **without cost**.

# Traffic Exchange - Economic Choices

- Any country whose ISPs do not PEER with each other relies exclusively on TRANSIT
- This is
  - Expensive for the ISP
  - Inefficient Routing of Traffic
  - Poor QoS to Customers
  - Needless export of capital from the economy

# Traffic Exchange via Domestic Peering

- Participants gain a significant advantage over any competitors who fail to participate in the IXP
- This advantage grows even greater with time

# Domestic Traffic Exchange Benefits

- Any country whose ISPs PEER with each other derive **TECHNICAL benefits**.
  - Reduce the portion of traffic that must be delivered via out-of-country transit providers
  - Frees capacity on international pipes
  - Lowers the latency of domestic traffic
  - Provides more efficient route and improves fault tolerance for domestic traffic

# Domestic Traffic Exchange Benefits

- Any country whose ISPs PEER with each other derive **ECONOMIC benefits**.
  - Reduces the Average Per Bit Delivery Costs (APBDC) for domestic traffic
  - Allows ISPs to maintain higher levels of profitability, reduce costs, or increase reinvestment
  - Provides incentives for the creation of new domestic services

# IXP Benefits: Privacy and Security

- By keeping local traffic local, sensitive data is not subject to unintended foreign interrogation
  - *Sending sensitive data across national borders presents a privacy risk to governments and corporations.*



# IXP Benefits: Network Applications



- IXPs enable high-bandwidth, low latency applications



## IXP Benefits: Coordination of Resources



- Enables co-ordination of security, infrastructure protection, abuse response activities

## IXP Benefits: Coordination of Resources



- Facilitates co-ordination of security, infrastructure protection, abuse-response activities

# Caribbean Context

- Inefficient and expensive traffic routes
- Caribbean ISPs pay exorbitant transit costs to commercial IXs in the US.
  - Costs passed on to consumers
  - Providers offer reduced services to keep costs down
  - Low speeds and latency problems on local loops

# Caribbean Context

- Large ISPs own primary transit routes and have little incentive to peer within the region
  - LIME and Flow dominate in traffic and infrastructure
- Transit model discriminates against development of regional content
  - Favors consumption of US content;
  - ISPs argue that customers prefer international content

# Beyond IXPs

*Accelerating regional development of critical Internet resources*



# What are We Really After

- Caribbean IXP proliferation is about
  - Caribbean Innovation and Entrepreneurship,
  - Community Empowerment
  - Local Content Generation
  - Economic Growth
  - Capacity Building and ultimately...

**REGIONAL DEVELOPMENT**



# Building the Caribbean Internet Economy and Information Society

## LOCAL CONTENT

E-Services, Web and Mobile  
Apps, Online Repositories, etc

## SUPPORT SERVICES

Legislation, Investment,  
Education, Policy, etc

IXPs

## LOCAL INFRASTRUCTURE

DNS, DNSSEC, Cyber Security,

## HR DEVELOPMENT

Technical and Non-Technical  
Skills

# What's Being Done



Caribbean  
Telecommunications  
Union



## Education and Awareness

- Caribbean ICT Roadshow
- National Initiatives
- Other Stakeholder Activity



## Collaboration and Capacity Building

- Caribbean Network Operators Group
- Promoting CERTs
- Building / Facilitating Regional Relationships



## Policy Frameworks

- Working with Regulators and Governments



## Infrastructure Strengthening

- Internet Exchange Point Proliferation
- DNSSEC Implementation
- Promote and support IPv6 implementation

**Regional, Sub-regional and National Initiatives**



## CCI - The IXP Proliferation Projects

- The CTU's IXP Proliferation project had its genesis in 2006, with a request for IXP support from a CTU Member Government.
- In 2007, having researched the requirements for the establishment of IXPs, the CTU began advocating IXP proliferation.

# Milestones and Targets

- **August, 2007:** The need for Caribbean IXPs as critical Internet Infrastructure was explained at the CTU's 3<sup>rd</sup> Caribbean Internet Governance Forum in Curacao.
- Subsequent interventions by the CTU and Packet Clearing House, IXPs were established in Curacao and later St. Maarten.

# Milestones and Targets

- **July 2009 to present:** The CTU began partnering with PCH to actively promote IXP establishment as part of its 20-country Caribbean ICT Roadshow.
- Fifteen (15) workshops/symposia have been conducted in 12 Caribbean countries to educate stakeholders on the principles, value proposition and benefits of establishing IXPs in each country.

# Milestones and Targets

**March 2010:** ICT Ministers, Regulators and Operators participating in the CTU's 7<sup>th</sup> Ministerial Strategic Seminar in Washington D.C. committed to promote and support the establishment of IXPs in their countries.



# Milestones and Targets

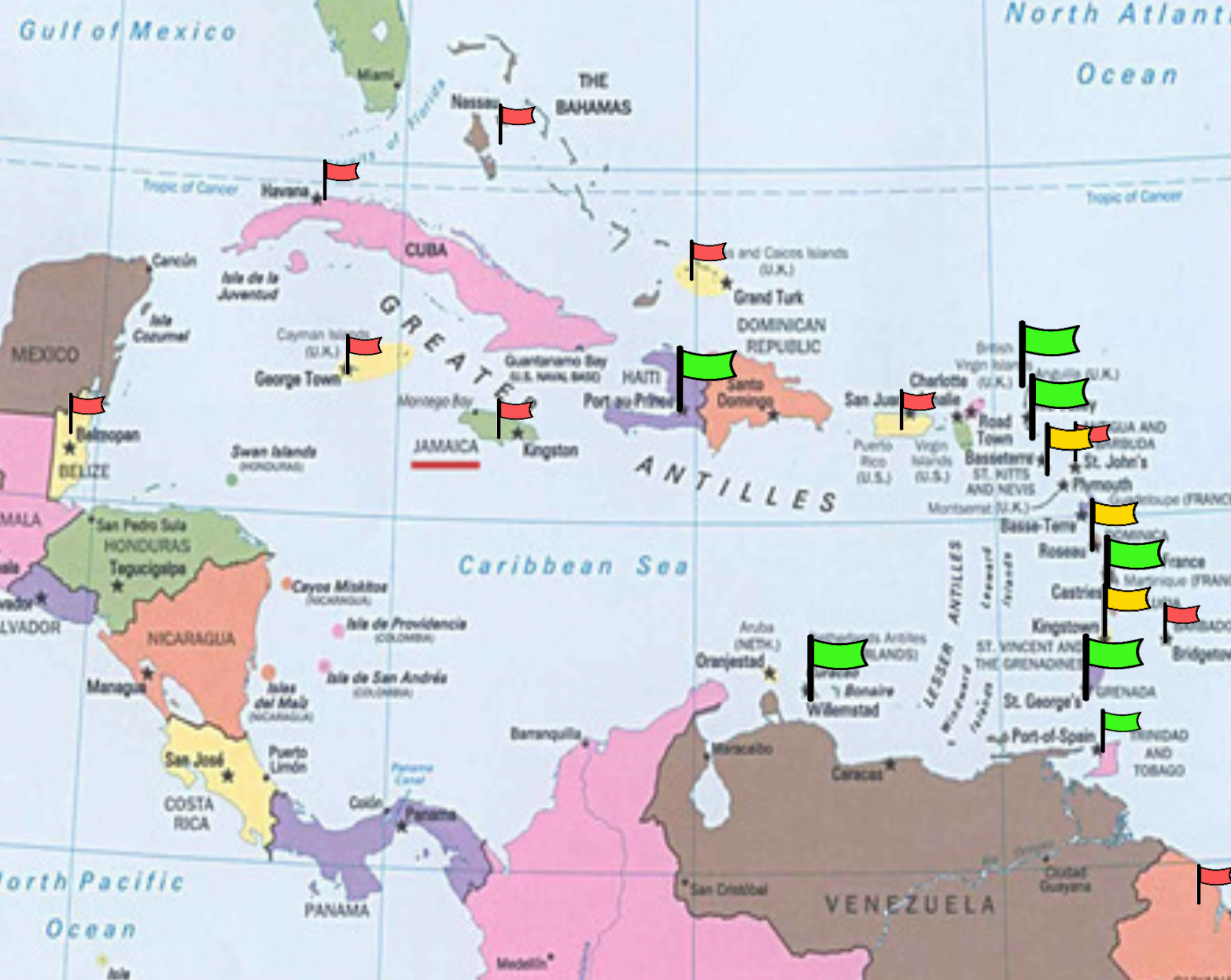
**May 2011:** Grenada launched the first IXP in the Anglo Caribbean (GREX).

**June 2011:** The British Virgin Islands launched BVIX.

# Milestones and Targets

**September 2013:** CARCIP IXP Symposia / Workshops were held in St. Lucia and St. Vincent and the Grenadines this resulted in,

- the launch of St. Lucia IXP (SLiX) in **February 2014**
- the anticipated launch of St. Vincent and the Grenadines IXP is February 2015.



- ACTIVE IXPs
  - Curacao
  - Haiti
  - St Maarten
  - Grenada
  - BVI
  - St Lucia
  - Trinidad & Tobago
- IN PROGRESS
  - Dominica
  - St Kitts
  - St Vincent
- THINKING ABOUT IT
  - Barbados
  - Jamaica
- MAYBE ONE DAY
  - Everyone Else

# Internet Exchange Points in the Caribbean

**Thank you**



**Junior Mc Intyre**

*Project Co-ordinator*

**Caribbean Telecommunications Union (CTU)**