



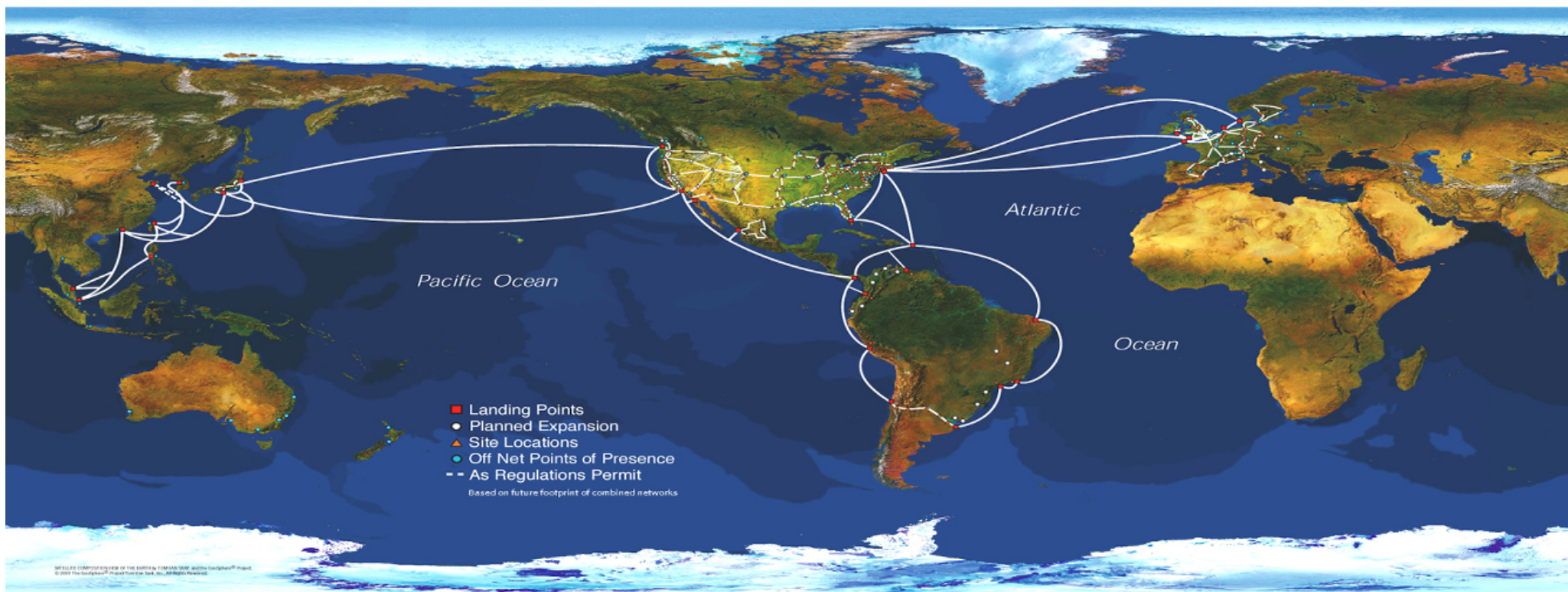
# Optical Networking for Research and Education Communities in Latin America and the Caribbean



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**Dale Miller  
Managing Director,  
Latin America & Caribbean**

[www.globalcrossing.com](http://www.globalcrossing.com)



## The Global Crossing Network – Completed and Fully Functional

- » 200 + On-Net Cities
- » 27 On-Net Countries
- » 101,000 route miles
- » Tripled IP network traffic from 10 to 30 Gbs in 2002
- » 250 POPS
- » 1.5 million fiber miles
- » Self-Healing Ring Architecture
- » Increased VoIP traffic in 2002, with more than 8.2 bln minutes



## GC Latin America & Caribbean at a Glance

- Over \$2b invested in region and over \$700 million total sales since inception in late 2000
- Carrier revenues grew 70% and Enterprise revenues grew 815% in 2002
- Sold 100% of initial capacity within 18 months of service launch
- 163 employees (Miami/In-region)
- Counts 9 of top 10 leading carriers in region as customers
- Network covers 85% of traffic in region, with over 37,000 route kilometers (Network combines redundant rings via 4 seamlessly connected sub sea systems – South American Crossing, Pan American Crossing, Mid-Atlantic Crossing and Mexico Crossing).
- Anchor tenant in the TECOTA facility (NAP of the Americas)



# South American Crossing

## Legend

- Landing Points
- Cities Connected (Backhaul)
- Terrestrial Cities Connected
- Connecting Systems










# Trans-Andean Crossing (TAC)



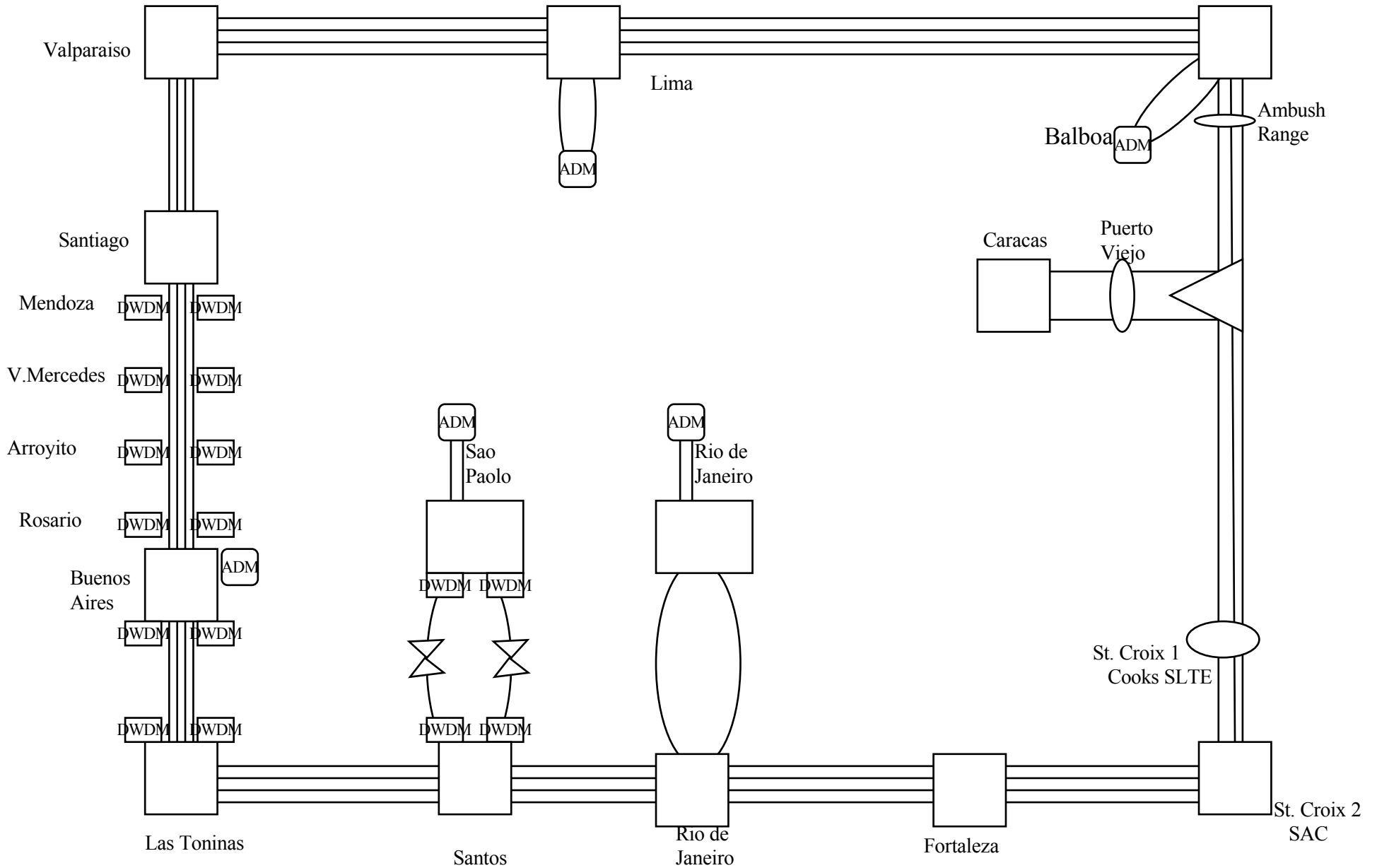
## Legend

-  Landing Points
-  Cities Connected
-  Backhaul Cities
-  Cities with Repeater Sites
-  Connecting Systems

## SAC Overview

- **20,312 Km, including TAC**
- **Landing Stations: St. Croix, USVI; Fortaleza, Brazil; Rio de Janeiro, Brazil; Santos, Brazil; Las Toninas, Argentina; Valparaiso, Chile; Lurin, Peru; Fort Amador, Panama (shared with PAC); Puerto Viejo, Venezuela (shared with PAC)**
- **Subsea Ring Nodes/Service Points: Buenos Aires, Argentina and Santiago, Chile, along TAC route**
- **10G System**
- **4 Fiber Pairs**
- **297 Repeaters**





## Transmission Overview

- **Ultimate Design Capacity:**
  - ✓ **4 Fiber Pairs x 32λ @ 10G = 1.28Tbps per segment**
  - ✓ **Current System Usage:**
    - Fiber Pair #2 – Use of 6 Wavelengths @ 10G**
    - + Fiber Pair #3 – Use of 4 Wavelengths @ 10G**
    - 5 Bi-directional Line Switched Rings (BLSR)**

## SDH Ring Configurations

- **5 MS-SPRing**

## Capacity

- **Ultimate Design Capacity: 1.28T**
- **Total SDH Capacity: 100G per segment**



Global Crossing Last Mile Service Providers



## Which applications have been the driving impetus for optical networking thus far?

- The Internet has been the biggest driver for optical networking so far with bandwidth intensive applications (e.g. music downloading) as key factors
- Significant IP & Data Services (Frame Relay/ATM) growth
- Other significant factors:
  1. Privatization/Liberalization of Telecom Markets with significant investments
  2. Globalization of Modern Business

## How can end-to-end infrastructure be a deciding factor in optical networking effectiveness?

- Standard engineering design and ownership of end-to-end infrastructure directly impacts network performance
- Supply contracts for last mile access with standard SLAs impacts network performance
- There is ample international TDM or Optical Transport capacity from region. However, existing last mile options are largely for lower speed circuitry only. The bandwidth required by Research and Educational communities may justify constructing "layer1" facilities between the end location and the nearest splice point of Global Crossing to create an optical local loop.

## What could happen to prevent optical networking?

- Restrictive regulatory environment and unfriendly public policies
- Absence of competitive alternatives
- Regional and national macroeconomic conditions



The ability to reach the world.  
The capacity to change it.

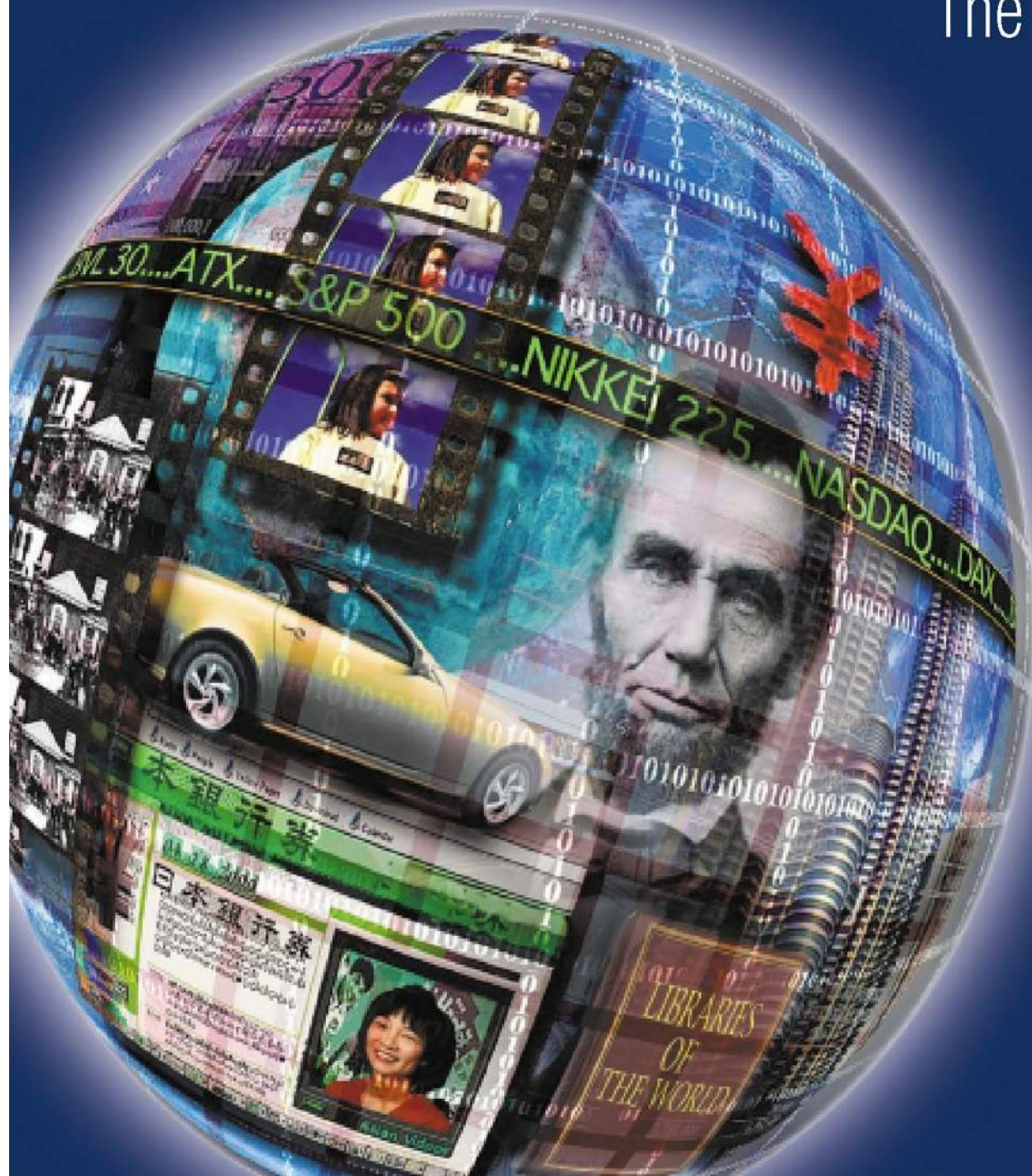
# Thank You

Global Crossing. It's what happens when the most advanced network on earth meets the world's richest content to take your business anywhere on the planet.

- A fast, secure, seamless global network.
- A full range of IP services that meld network and applications to enable an array of rich content.
- GlobalCenter's unique infrastructure, applications and Web hosting for complex online enterprises.

 **Global Crossing™**

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**BACKUP**

# Research & Educations Programs



Since 1999 interconnecting the Research and Education (R&E) networks in South and Central America, the Caribbean and Mexico to US and non-US R&E networks Global Crossing donated 10 DS-3 (45 Mbps) for 3 years.

Currently, there are four National Research Networks (NRNs) connected to AMPATH and one State Research Network. They are REUNA, Chile, RETINA, Argentina, RNP2 and ANSP, Brazil, using donated DS3 circuits on the Global Crossing network. Both Panama's SENACYT and Venezuela's REACCIUN/CNTI are expected to connect in 2003.

## **Future Opportunity:**

- **FIU, Express Route Service Miami-Chicago.**
- **DIA upgrade in Miami (GigE port). The South Florida GigaPOP (National Science Foundation ,the University of Miami and Florida Atlantic University )**



Global Crossing is providing FAPESP, the largest academic research institution in Brazil, with an ExpressRoute IP VPN™ solution between Brazil and the United States

**Future Opportunity: DIA in Sao Paulo, STM-1 full port, STM-4 IPL**

# Research & Educations Programs



Global Crossing is providing RNP, one of the largest academic research institutions in Brazil, with a DS-3 donation between Brazil and the United States

**Future Opportunity: RFP STM-1 plus DIA OC-3port Rio de Janeiro – Miami (Awarded Dec 12, 2002 to Global Crossing)**



Global Crossing is commissioning a multi-gigabit Internet Protocol (IP) Transit Service for DANTE - the organization responsible for managing the world's largest academic and research network, GÉANT

**Future Opportunity: RFP for Connectivity within the region and Europe (IPL)**



Global Crossing is working closely with Internet 2 as an alternative of their Abilene network in the US providing connectivity at the Lambda level

**Future Opportunity: IPL/Waves Backup links of their Abilene network**

**Starting conversations for potential testing of IPv6 technology**



# Research & Educations Programs

## Clara

Cooperacion Latinoamericana de redes Avanzadas. Latin American networks are organizing themselves in order to promote regional integration. The first Clara - Latin American Cooperation on Advanced Networks - meeting was held in Rio de Janeiro. Representatives from Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela participated in this initiative. Supported by @LIS Alliance for the Information Society

**Future Opportunity: Intra regional connectivity (IPL)**



Global Crossing is working closely with FIU to develop a bundle offer to NREN and/or Universities in the region to provide:

Commercial Internet Access to Internet 2



Access to Federal Networks (DOE/NASA) ESnet: Energy Sciences Network – USA DOE , connects 100+ networks

**Future Opportunity: CUDI (Mexico) connectivity to Miami**