RedCLARA: regional network in Latin America

I2MM Spring 2009

Michael Stanton
michael@rnp.br
Chair, CLARA Technical Committee
CLARA and CKLN /C@ribnet

- CLARA is the regional association of NRENs in Latin America (LA)
- CLARA operates the LA regional R&E network – RedCLARA – which joins together NRENs from several countries bordering on the Caribbean
- Many of our international links cross the Caribbean
- We would like to offer our support for R&E networking initiatives in the Caribbean
The LA experience in advanced R&E networking

• After the establishment of Internet2 in 1996, “advanced networks” became a new paradigm to be pursued by the Research and Education (R&E) community.

• The first steps in LA were taken by Mexico, with cross-border connections to the US, and by the AMPATH project at FIU, Miami, which began linking South American networks to the US.
Internet2 Connectivity in Latin America by 2002

AMPATH

- used new submarine cable
- connected Argentina, Brazil (2), Chile, Venezuela
- 45 Mbps
- all connections are point to point from Miami, and thence to Abilene

Mexico

- cross-border connections to USA (Texas and California)
Established education and research networks:

- With dedicated Internet2 connections: Argentina, Brazil, Chile, Mexico, Venezuela
- Some with dedicated int’l connectivity: Cuba, Uruguay

Education and research networks were being re-established (present nat’l/int’l connectivity through commercial ISPs)

- Bolivia, Colombia, Costa Rica, Ecuador, Guatemala, Panama, Peru, Paraguay, El Salvador

No education/research network (most connected to Internet via commercial ISPs):
Nicaragua, Honduras
Europe and the @LIS initiative

- Through GÉANT, the European R&E community enjoyed high bandwidth connectivity with N. America
- Initiatives had already been taken to improve connectivity to Asian-Pacific, Mediterranean and Latin American regions, with support from the European Commission
- Next was Latin America:
  - @LIS: Alliance for the Information Society (2003-2005)
    - targeted at 18 LA countries
    - 62.5 M€ for EU-LA on Information Society Issues
    - 10 M€ for Interconnecting Europe & Latin American Researchers
CAESAR project

European initiative to prepare for the @LIS program

- Promote EU-LA connectivity through regional connectivity within LA plus a large pipe to Europe
- Participants: DANTE, NRENs of Spain and Portugal
- CAESAR Workshop 2002 in Toledo, Spain, with representatives from 12 LA countries, became the starting point for CLARA (*Toledo Declaration*)
  - create an cooperative organisation for advanced networking in LA
  - build a regional network:
Cooperación LatinoAmericana de Redes Avanzadas

• Association of NRENs in LA open to all LA Countries
  – constituted in Uruguay (like LACNIC)
• Principal objectives:
  – Build an “advanced” regional network in LA
  – Connect LA to the rest of the world
• CLARA created in 2003 and registered in Uruguay as a non-profit international organisation
CLARA Members
(also @LIS target countries)

- Argentina
- Brazil
- Bolivia
- Chile
- Colombia
- Costa Rica
- Cuba
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama
- Paraguay
- Peru
- Uruguay
- Venezuela
ALICE project:
May 2003 to April 2008

ALICE - América Latina Interconectada Con Europa

- Funded by @LIS
- Coordinated by DANTE, with participation of NRENs from Italy, France, Spain, Portugal and the CLARA countries, and CLARA itself (once formally incorporated)
- 12.5 M€ budget (20% LA NRENs, 80% EC)
- Main objective: Build the RedCLARA network
  - Interconnect LA NREN (and new initiatives) and link the resulting network to GEANT
  - September 2004: first links operational
RedCLARA development to 2008

- Initial network deployed in 2004
  - 155 Mbps backbone (PoPs in 5 countries: Brasil, Argentine, Chile, Panama, Mexico)
  - 622 Mbps link to GEANT in Madrid (Spain)
  - Spur links to other countries (maximum 9, currently 7)
- Linked to US from 2005 through IRNC project WHREN-LILA:
  - 2x1G fibre link from Tijuana (MX) to San Diego
    - later extended to Pacific Wave
  - submarine link from S. Paulo (BR) to Miami, shared with RNP and ANSP from Brazil (1.2G)
    - later extended to Atlantic Wave and upgraded to 2.5G
    - soon to be further upgraded to 2x10G
    - 6th RedCLARA PoP in Miami for simpler connectivity
RedCLARA development (fases 1 & 2)
Latin American NREN development to 2008

- New NRENs created:
  - InnovaRed (Argentina) in place of RETINA
  - RAAP (Peru)
  - CEDIA (Ecuador)
  - RENATA (Colombia)
  - REDCYT (Panama)
  - RAICES (El Salvador)
  - RAGIE (Guatemala)

- Expansion of existing NRENs in Brazil, Chile, México, Uruguay, Venezuela
2008: waiting for ALICE2

- The ALICE project (financed by the EC) terminated in March, 2008.
- The EC was persuaded that a second project would be needed, before RedCLARA could become sustainable with regional funding
  - A new 4 year project (ALICE2) was approved by the EC and began in November, 2008
- RedCLARA has been maintained solely by LA-NREN funding during this interval
- A third topology was adopted in April 2007.
Red CLARA (fase 3)

- First wholly terrestrial links: Colombia – Ecuador – Peru

- AR-CL is part of GX “ring”
ALICE2 and the future of RedCLARA

- ALICE2 is a 18M€ project of the @LIS2 programme of the EC
  - 1/3 comes from LA NRENs, 2/3 from EC
  - coordinated by CLARA
- Objective is to build a new network (RedCLARA2) which will be sustainable at project end, by lowering Opex through non-use of leased circuits
  - seek terrestrial infrastructure to share between NRENs and RedCLARA
  - first steps in Argentina, with agreement with Silica Networks for sharing fibre between Buenos Aires and Santiago
  - CLARA + NRENs pay for DWDM; capacity divided with Silica
  - Possible model for future opportunities
Published in 2009, to be opened May 4th
Both facilities (IRUs) and leased circuits requested
The new network will be built by a mixture of both kinds of links
The topology should be similar to the fase 3 topology, with some new terrestrial links between Colombia, Venezuela and Panama
In future, we seek a terrestrial backbone from Brazil to Mexico, built on an infrastructure shared with the NRENs in each country crossed.
Starting in 2004, in Rio de Janeiro, one of the main activities of CLARA has been the twice yearly technical meetings. These involve technical representatives of CLARA and LA NRENs, as well as invited specialists from elsewhere. The meetings organised by the CLARA Technical Committee, with representatives of 7 NRENs. Meeting agenda normally includes:

- updates on RedCLARA and NREN networks
- reports on Working Group activities
- invited presentations on selected topics (services or applications)
- technical training in selected areas
CLARA-TEC WGs

- Working groups are composed of technical representatives and other interested persons
  - explore a specific theme and bring proposals for action within the CLARA community
  - original themes included:
    VoIP, Videoconferencing, Advanced Routing, Multicast, Measurements, IPv6, Security, Training
  - in 2009 reformed to include:
    VoIP, Videoconferencing, Measurements, IPv6, Security, Training, Eduroam, IPTV, Hybrid Networking
Since 2005, technical training has been provided on the following themes (typically 2 to 3 days):

- VoIP
- Videoconferencing
- Network management
- IPv6
- Network security
- Advanced routing
- Optical networks
- NOC tools
CLARA-TEC Futures

- Next meeting in Tegucigalpa, Honduras June 29th – July 3rd
- Agenda is not so far defined
- We would welcome participation from CKLN /C@ribnet members
Thank you!

Michael Stanton: michael@rnp.br

CLARA: www.redclara.net