IPv6 in CUDI and CLARA

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Mexican IPv6 Forum
IPv6 Working Groups in Internet2 (CUDI/CLARA)
Universidad Nacional Autónoma de México (UNAM)

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1. Introduction

CONTENTS

1. **Introduction**.
   - IPv6 in Latin America
   - Testbeds and Production

2. IPv6 in CUDI Network

IPv6 IN LATIN AMERICA
Testbed Networks (Within 6Bone Project)

- **55** Nodes (1480 worldwide, i.e. 3.72%).
  - 11 in Argentina (14)
  - 13 in Brazil
  - 3 in Chile
  - 6 in Colombia
  - 1 in Cuba
  - 3 in Dominican Republic
  - 16 in Mexico
  - 2 in Peru
  - 0 in Uruguay (1)

IPv6 IN LATIN AMERICA
Test Prefixes (Within 6Bone Project)

- **8** pTLA (117 worldwide (26 Returned), i.e. 6.84%)
  - Rede Nacional de Pesquisa, RNP, Brazil
  - Fibertel, Argentina
  - UNAM, Mexico
  - ITESM, Mexico
  - Compendium, Argentina
  - UDG, Mexico
  - UACH, Chile
  - RETINA, Argentina

IPv6 IN LATIN AMERICA Production Networks

- **23** sTLA's (1234 worldwide, i.e. 1.86%)
  - UNAM, Mexico
  - AVANTEL, Mexico
  - ITESM, Mexico
  - RNP, Brazil
  - AXTEL, Mexico
  - PROTEL, Mexico (Returned)
  - UNINET, Mexico (Returned)
  - Brazil / Dominican R.
  - Chile / Argentina
  - Uruguay / Paraguay
  - Venezuela / Costa Rica

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IPv6
in CUDI Network

IPv6 Working Group

- The IPv6 Working Group started in April 2000.
- It is coordinated by the UNAM.

BACKGROUND

- April 2001, First native connection (CUDI).
- December 2001, native IPv6 in the backbone.
- June 2002, First native connection between the networks of Abilene and CUDI.

BACKGROUND

- 2003, Bigger IPv6 prefix.
- February 2004, IPv6 Virtual Day.
- ..

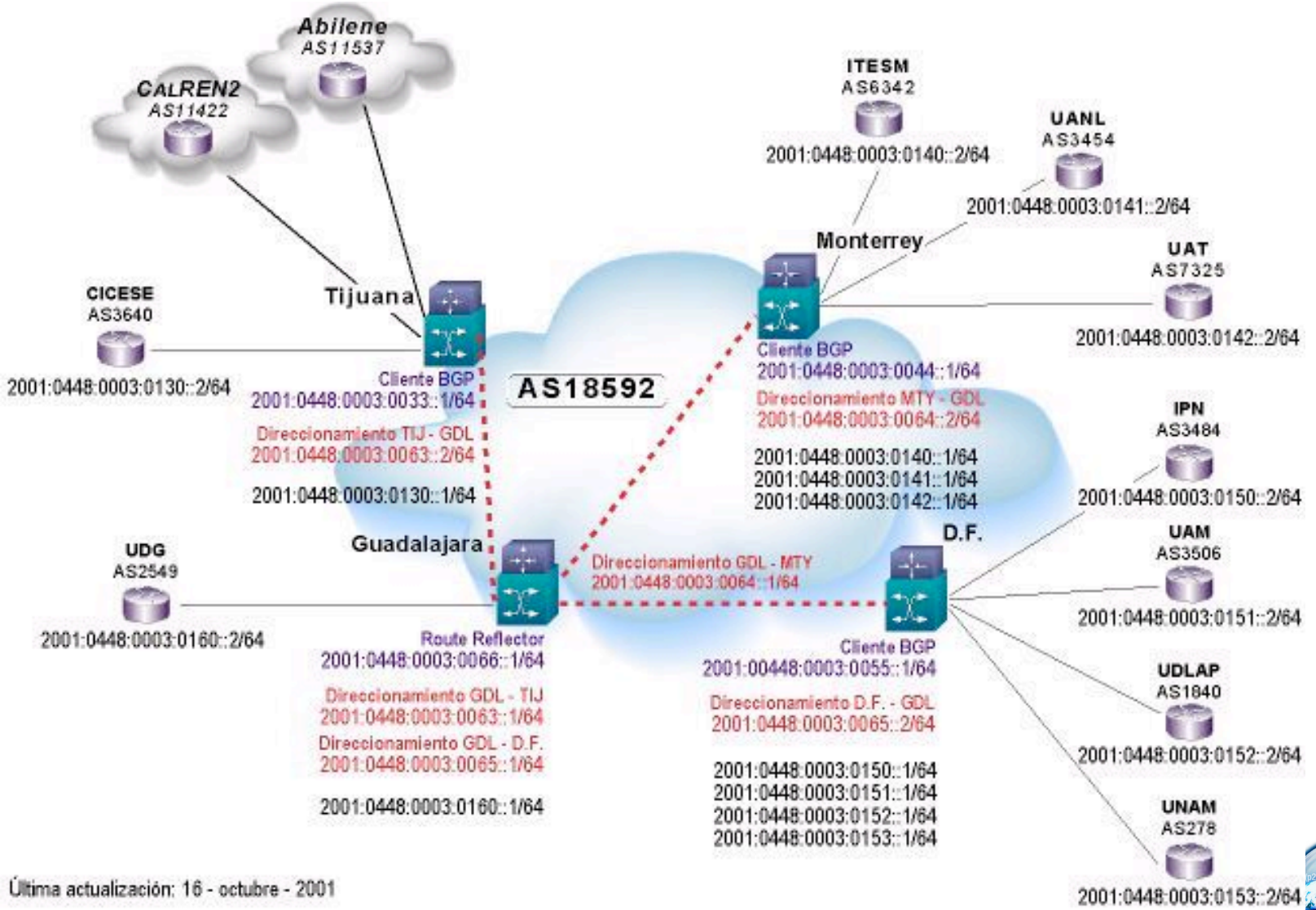
GOALS

- Implementing IPv6 in the “Internet2” network of Mexico.
- Delegate IPv6 address space.
- Use and develop IPv6 applications.

GOALS

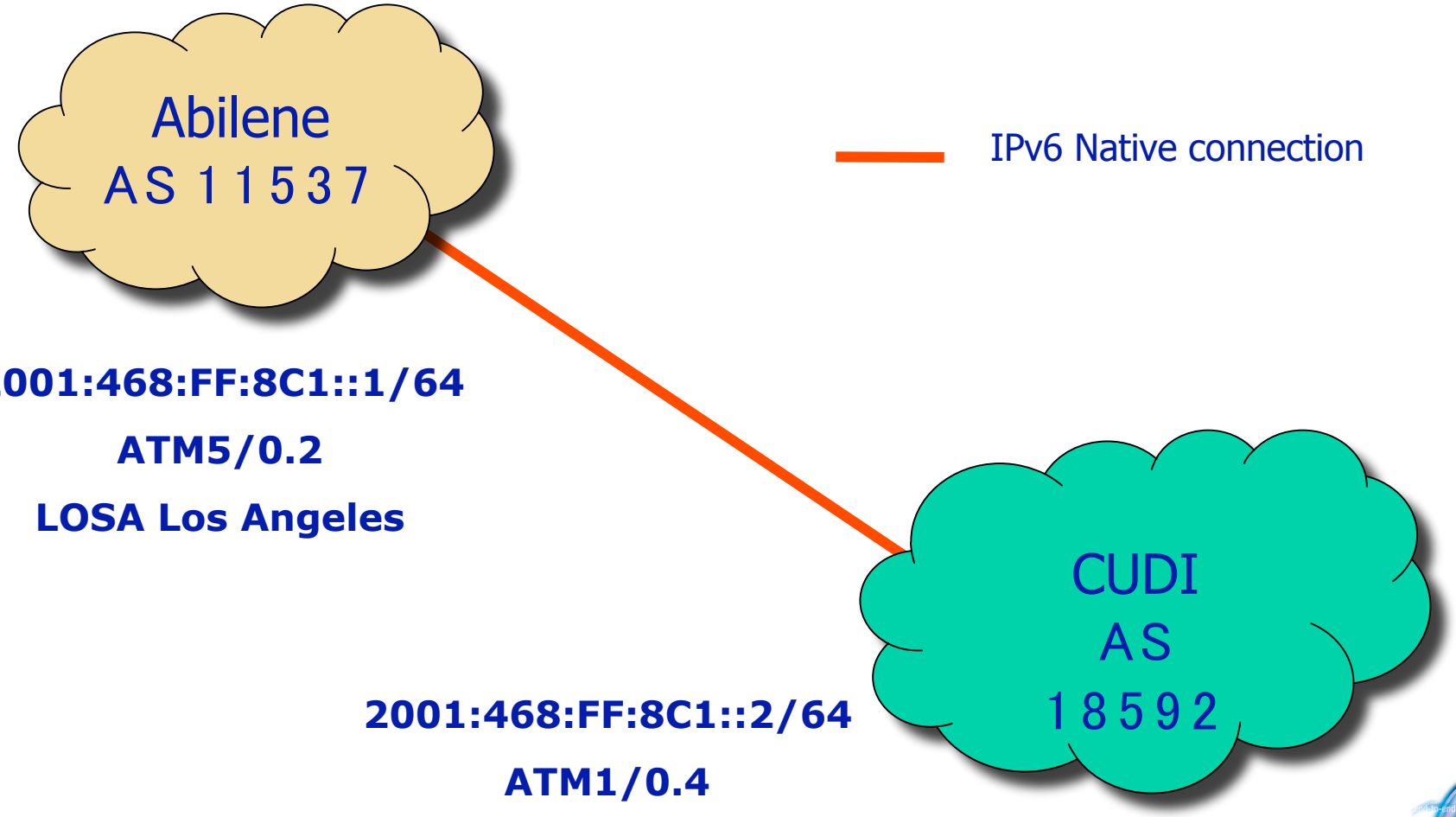
- Work together with Academic Associates (Universities).
- Work with Internet2-IPv6 Groups around the world.

Mexican Internet2 backBone with IPv6

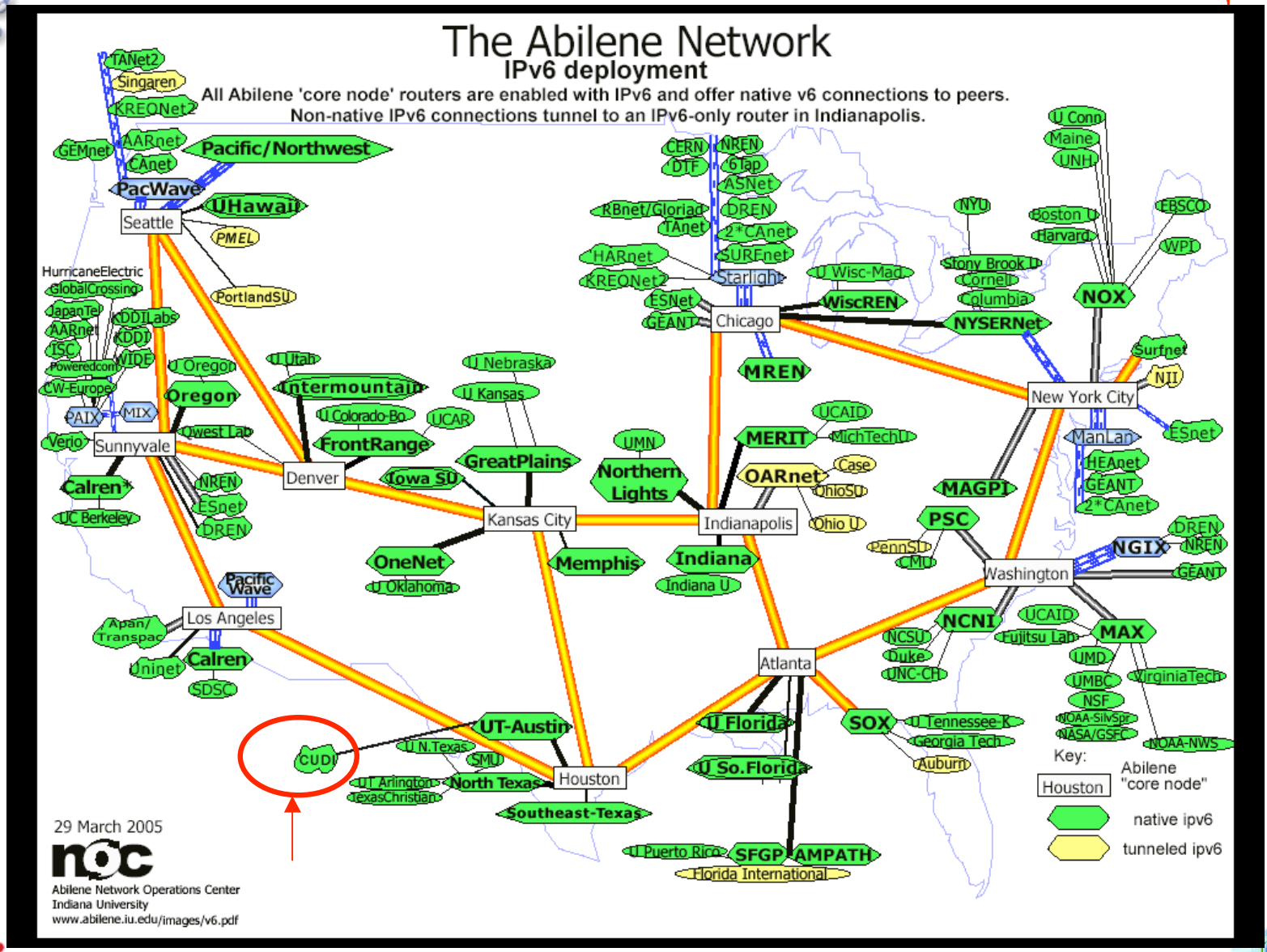


Última actualización: 16 - octubre - 2001

IPv6 CONNECTION
CUDI - ABILENE



IPv6 CONNECTION with Abilene

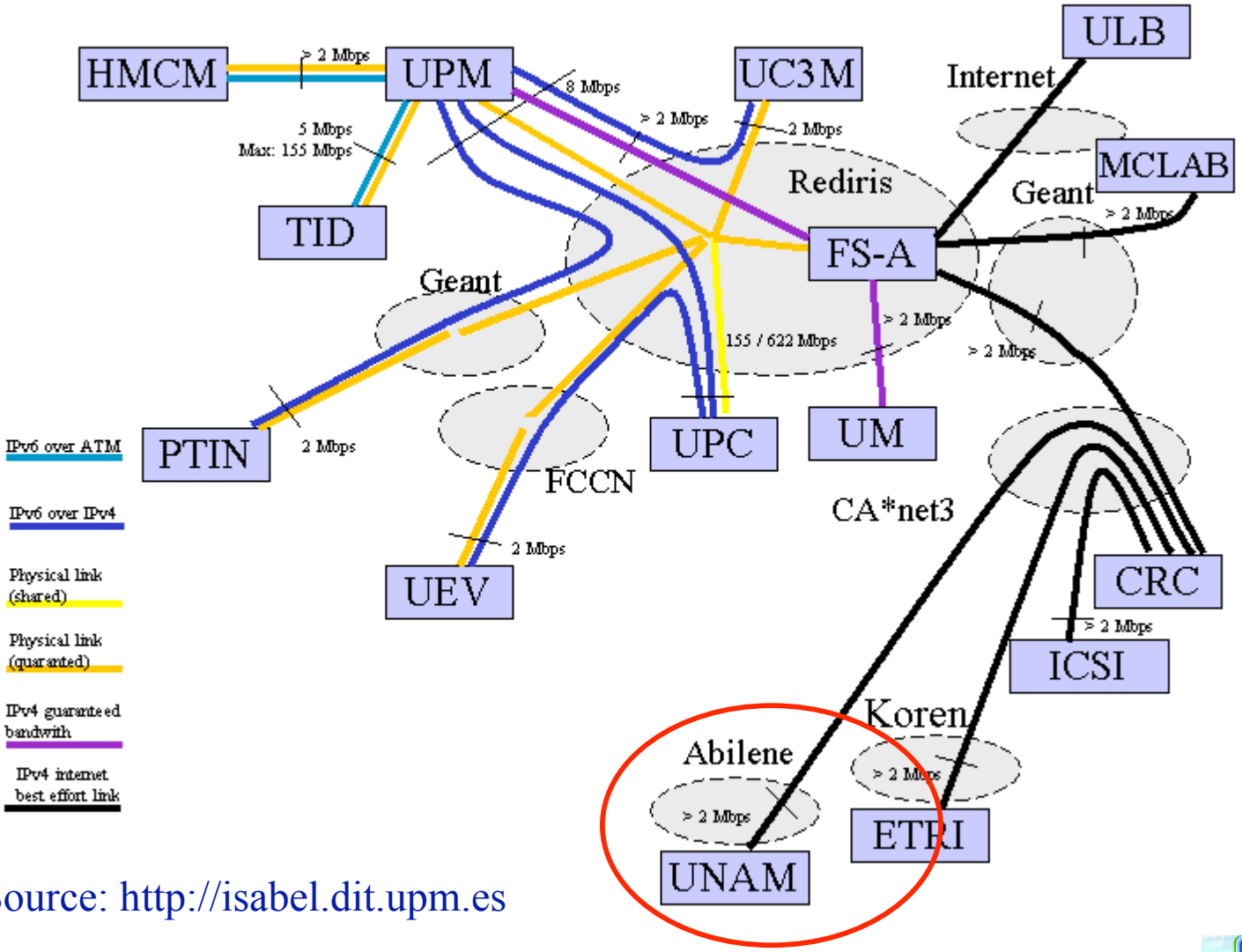


IPv6 in CUDI Network

TESTS

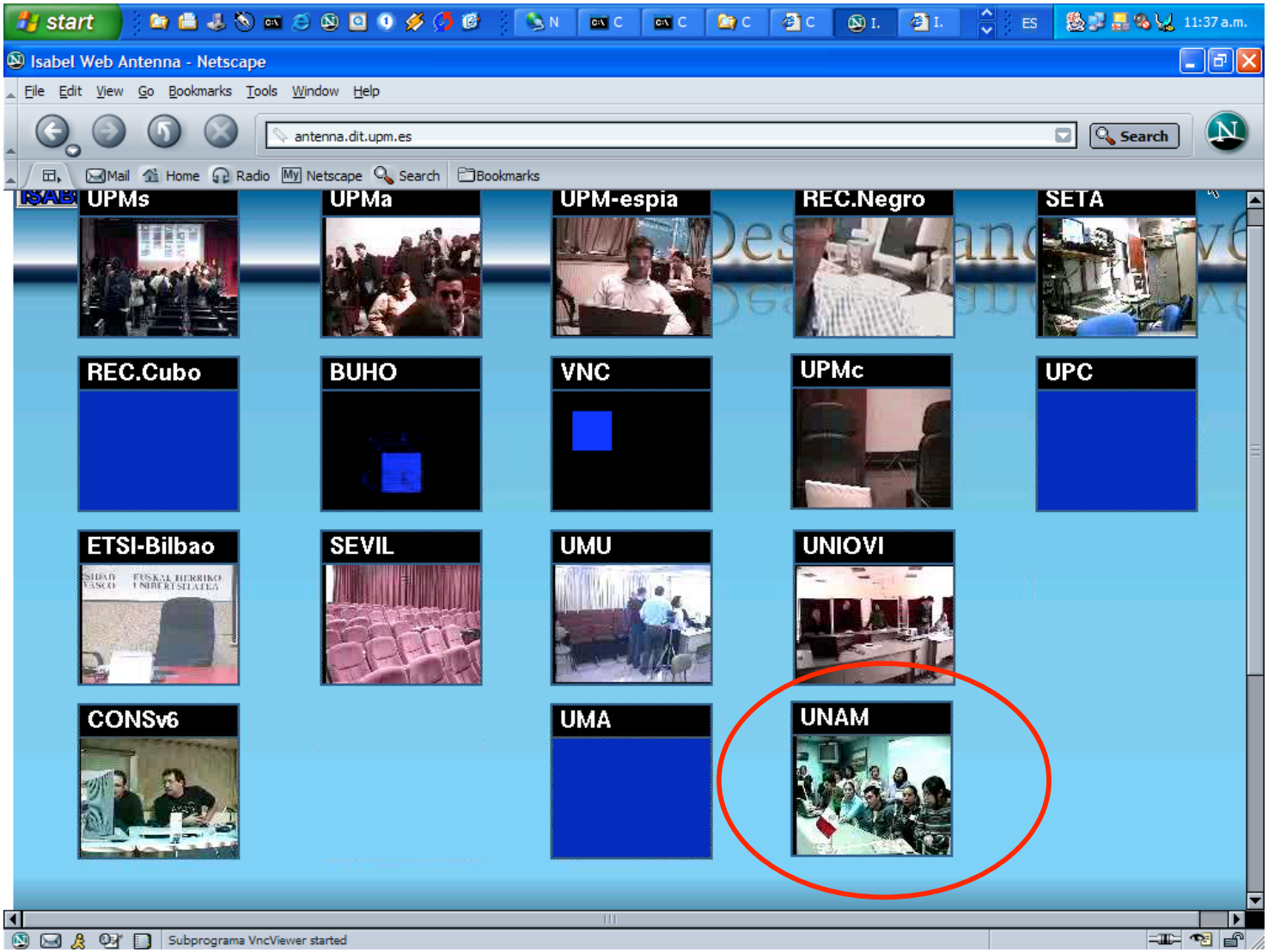
- Videoconference applications with IPv6 support (Gnome meeting, Isabel,etc.).
- Security tools and IPSecv6.
- IPv6 support (web, DNS, etc.).
- Performance.
- Some multicast IPv6 tests (vic, rat, etc).

Madrid 2002 Summit



Source: http://isabel.dit.upm.es

Participation using ISABEL



APPLICATIONS

- Astronomy
- Digital Libraries
- Distance Education
- Earth Sciences
- Life Sciences
- Collaborative
- Remote Laboratory
- Robotics
- Supercomputing
- Telemedicine and Health
- Visualization

PROJECTS

Work together with research groups to support and use IPv6 in:

- GRID Computing
- Remote Control of telescopes, microscopes, microprobes, etc.
- Volcanic Monitoring
- Parallel Processing
- VoIPv6, etc.

PROJECTS

- Native IPv6 Network Latin America (CLARA)
- Opera Oberta with Multicast IPv6 (Starting)

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IPv6
in CLARA Network

CLARA Network Overview

- **The CLARA organization (Latin American Cooperation of Advanced Networks)** responsible for the implementation and management of the network that interconnect the National Academic Networks of several Latin American countries, and for the coordination of their efforts and promotion of scientific development.

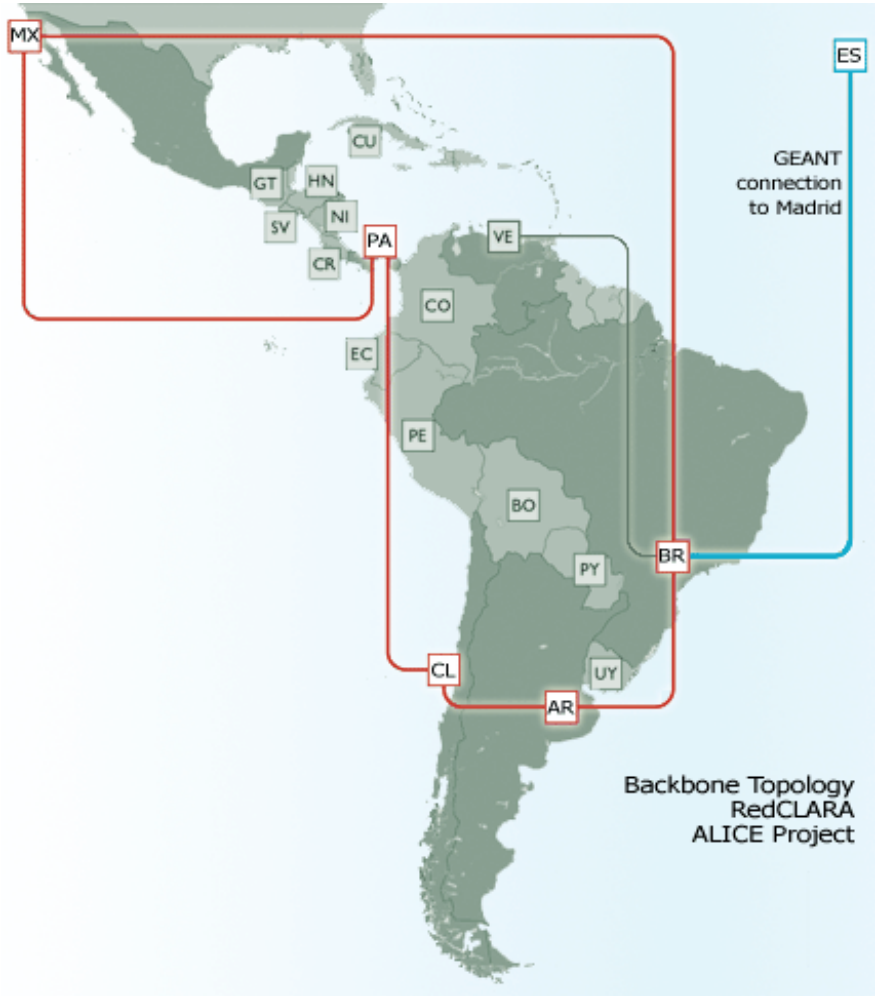
ALICE Project

- "América Latina Interconectada con Europa"
- Started – June 2003
- Coordinator – DANTE
- Partners – FCCN, RedIris, Renater, GARR and 18 LA-NRENs
- Total budget – 12.5 M Euros (20% LA, 80% EU)

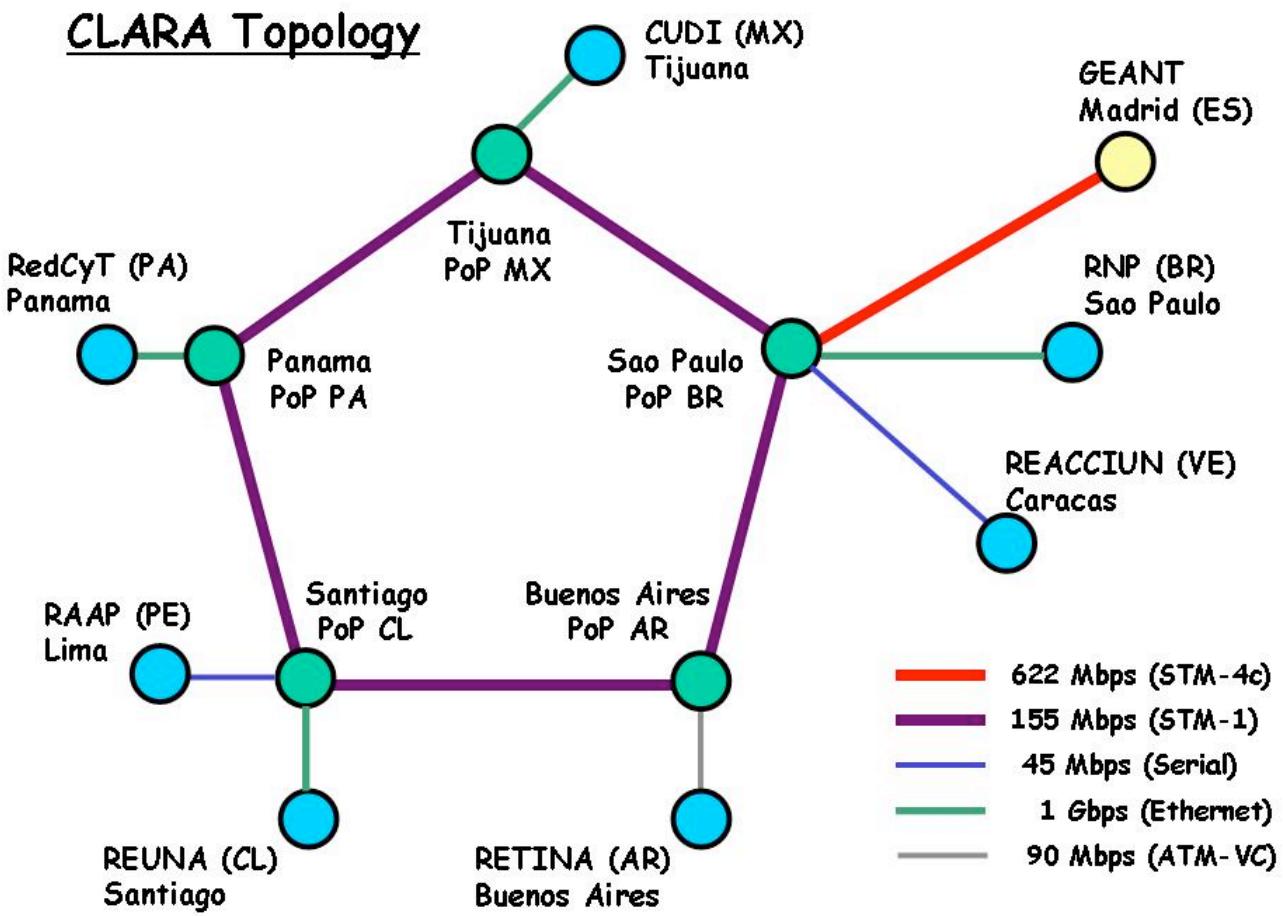
ALICE
America Latina Interconectada Con Europa

Goal Network

Backbone Topology



Network Backbone



BACKGROUND

- Preliminary addressing plan by the NEG.
- The IPv6 Working Group started in April 2005.
- Allocation of the IPv6 prefix.
- Some addressing and routing plans discussions.

BACKGROUND

- **April 19th, 2005:**
  Allocation of the IPv6 prefix

ownerid:	UY-CLAR-LACNIC
owner:	Cooperación Latino Americana de Redes Avanzadas
inetnum:	2001:1348::/32
status:	allocated
created:	20050419
changed:	20050419

GTv6 GOALS

- Implementing native IPv6 support in CLARA network.
- Help in the implementation of IPv6 in the LA-NREN's Backbones.
- Delegate address space from the IPv6 production prefix, ***sTLA 2001:1348 ::/32***.
- Use and develop IPv6 applications.

GTv6 GOALS

- Work together with Academic Associates (Universities).
- Work with Internet2-IPv6 Groups around the world.

NRENs using IPv6 (Ampath) (5)

- RETINA (Argentina)
- RNP (Brazil)
- REUNA (Chile)
- CUDI (Mexico)
- RAU (Uruguay)

NREN´s

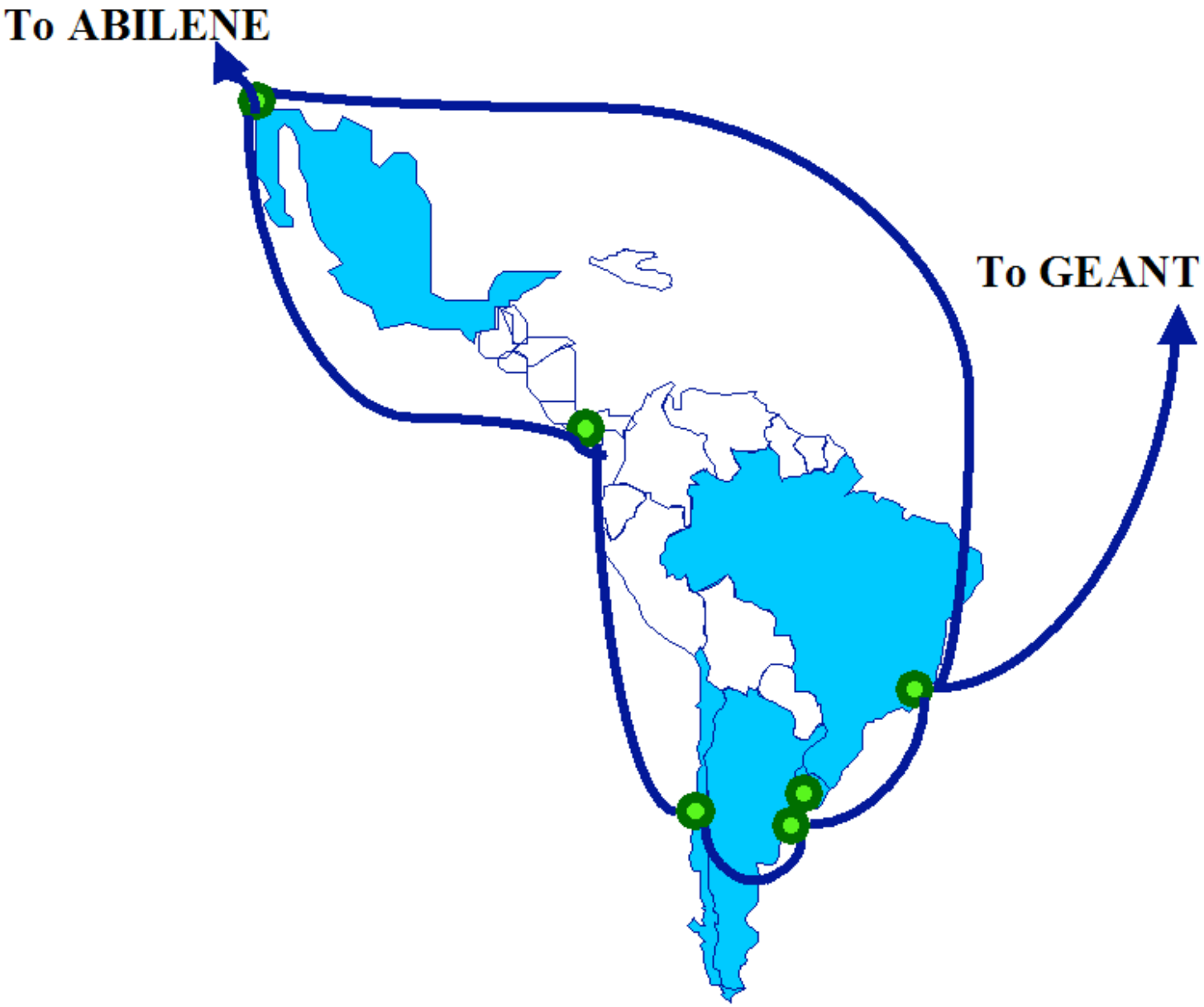
NRENs with IPv6 Plans (5)

- CEDIA (Ecuador)
- RAICES (El Salvador)
- RENIA (Nicaragua) (IPv6 only)
- RAAP (Peru)
- REACCIUN (Venezuela)

Other NRENs with future IPv6 use (8)

- ADSIB (Bolivia)
- RAC (Colombia)
- CRnet (Costa Rica)
- RedUniv (Cuba)
- RAGIE (Guatemala)
- UNITEC (Honduras)
- RedCyT (Panama)
- Arandu (Paraguay)

Initial IPv6 Deployment



Deployment GOAL

IPv6 Prefix of CLARA (1)

sTLA

Prefix: **2001:1348::/32**

sNLA for the NRENs:

2001:1348:1XX3::/48

IPv6 Prefix of CLARA (2)

sTLA

Prefix: **2001:1348::/32**

sNLA for the NRENs:

2001:1348:1XX3::/40

Native IPv6 support

- Using native IPv6 conections over SDH/SONET (POS) in the Backbone.

RFC 3572: IPv6 over MAPOS

Routing Protocols

- EGP protocol: BGP4+

- IGP protocol: IS-IS for IPv6, not OSPFv3 (No RIPng)

PROJECTS

- IPv6 Applications development:
  - VoIPv6 or SIP with IPv6
  - Videoconference.
  - QoS.
  - Firewalls.
- Multicast IPv6 (Opera Oberta).

4. References

REFERENCES

- www.cudi.edu.mx
- www.redclara.net
- www.ipv6.unam.mx/Internet2/
- www.ipv6.unam.mx
- www.ipv6forum.com.mx

Thanks for your attention !

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G R A C I A S

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