Laboratories Over Next Generation Networks.

Collaboration & Exhibit at
Madrid 2002 Global IPv6 Summit

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I - LONG in the Madrid 2002 Global IPv6 Summit
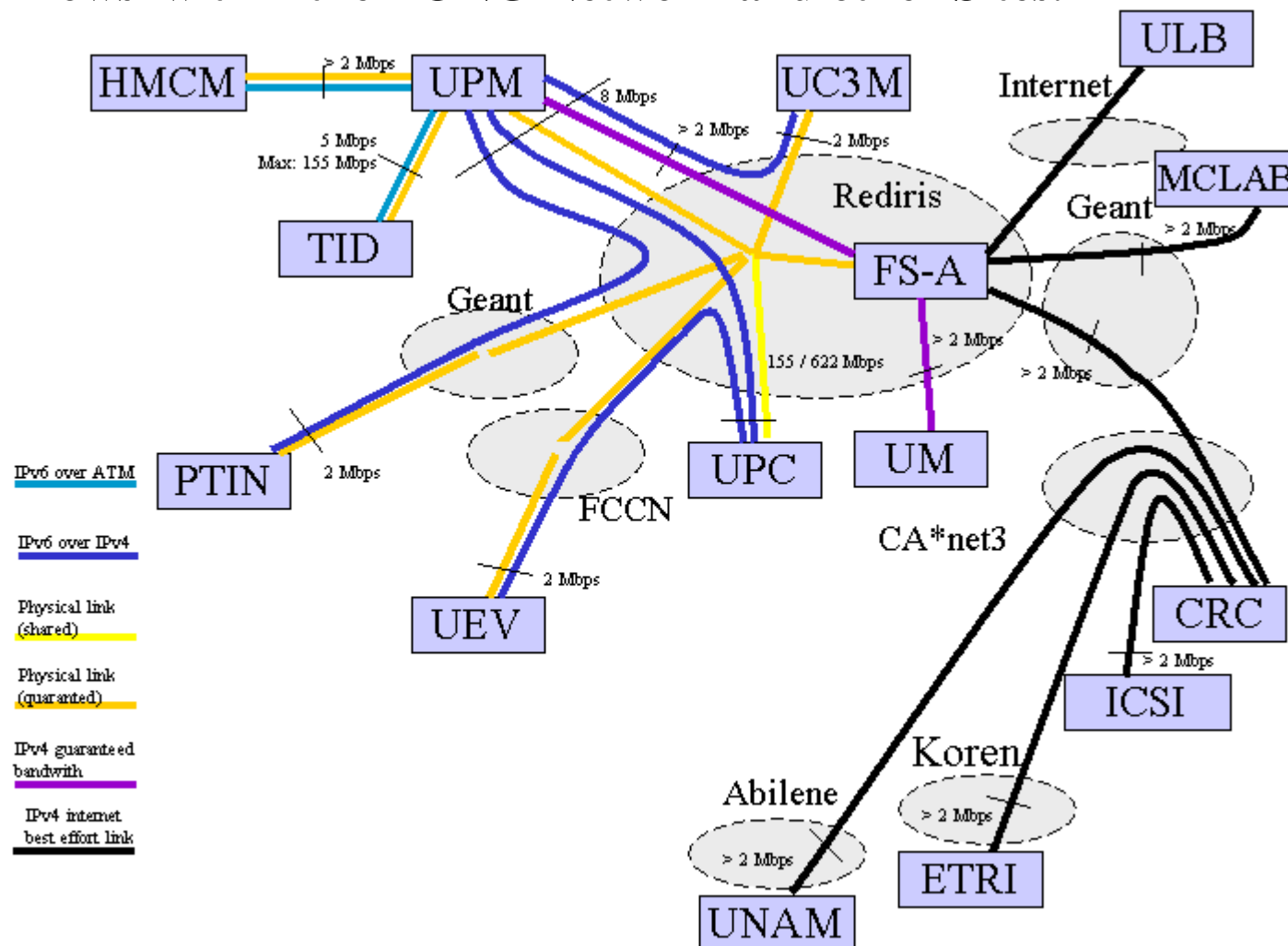
LONG Collaboration in the Summit

- **LONG collaboration in the Madrid 2002 IPv6 Global Summit Event:**

- LONG organizes and contributes with speakers in the "IPv6 tutorial".

- Distribute the meeting to remote interactive IPv4 and IPv6 sites:
  - **IPv4 Sites:** CRC-Ottawa (Canada), PTIN-Aveiro (Portugal), UNAM-Mexico (Mexico), ETRI-Korea (Korea), MCLab-Basel (Switzerland), ULB-Bruxelles (Belgium).
  - **IPv6 Sites:** UEV-Evora (Portugal), UC3M-Madrid, TID-Madrid, UPC-Barcelona, UPM-Madrid, Hotel Melía Castilla-Madrid.

- LONG Fixed Exhibit at "El Jardín" room at Meliá Castilla Hotel.

- LONG Distributed Exhibit: Some LONG services could be used in the main conference room using the WLAN (installed by the event organization to provide Internet and some WEB/FTP access).
  - IPv6 enabled laptops will be able to access some unrestricted LONG services.
  - Win2000 Laptops could download a package to install IPv6 support.

LONG Conferences. IPv6 Tutorial

- **Wednesday, 13th March - IPv6 Tutorial**
  - "Addressing and Routing" - David Fernández (UPM).
  - "Security" - Victor Villagrá (UPM).
  - "Quality of Service" - Alberto López (UPM).
  - "Mobility" - Pedro Ruiz (UPM).
  - "ICMPv6 & Neighbor Discovery" - Tomás de Miguel (UPM)
  - "Porting Applications & DNS issues" - Eva Castro (UPM)
- **Transition and Coexistence IPv4-IPv6**
  - "Transition Mechanisms Overview" - David Fernández (UPM)
  - "6to4" - Tomás de Miguel (UPM).
  - "6over4" - Alberto López (UPM).
  - "SIIT & NAT-PT" - Alberto García (UC3M).
  - "DSTM" - Pedro Ruiz (UPM)
  - "BIA, TRT, SOCKS" - David Fernández (UPM)
  - "IPv64" - Arturo Azcorra (UC3M)
  - "Case Studies and Conclusions" - Francisco Fontes (PTIN)

LONG: Connecting the World with ISABEL

• **ISABEL Flows within the LONG Network and other Sites.**

More Details: http://isabel.dit.upm.es/events/IPv6Global02/plan/index.html

General LONG Infrastructure in the Summit

MELIÁ CASTILLA HOTEL

Main Conference Room

IPv4 Client   IPv6 Client

ISABEL

WLAN 802.11b

IPv4 Server   **IPv6 Server**

LONG DISTRIB. DEMO

Exhibits Room

FIXED LONG DEMO

LONG

GR-2000

IPv4 & IPv6, 100 Mbps

IPv6, 100 Mbps

IPv4, 100 Mbps

GIGACOM (ATM PVCs CBR SERVICE)

IPv4
PVC 4 Mbps

IPv4
PVC 8 Mbps

IPv6
PVC 2Mbps

TID.LONG Network

INTERNET REDIRIS

UPM.LONG (ISABEL)

ISABELv6-TID
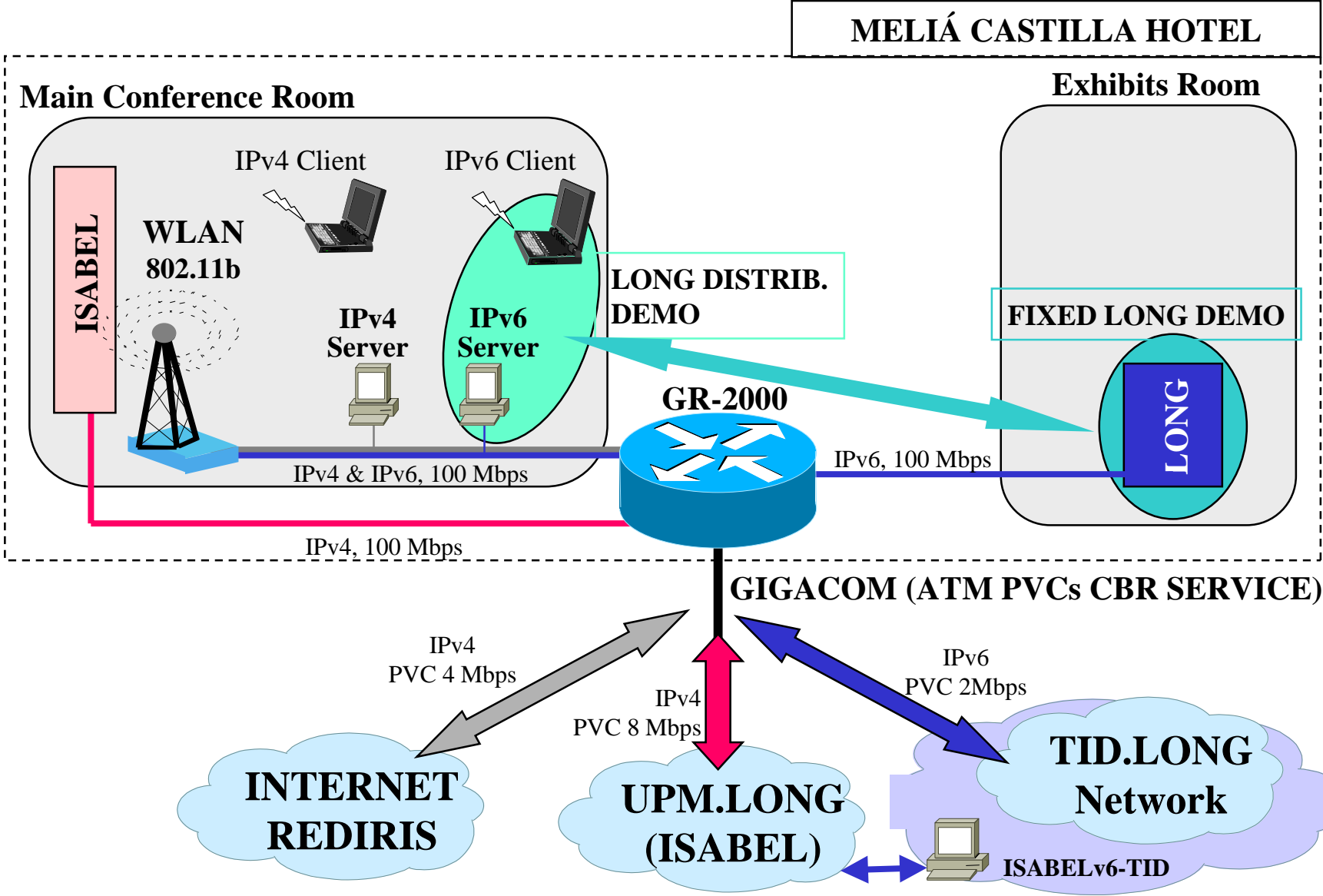
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LONG

LONG Fixed & Distributed Exhibit

- **Demonstrations in the Fixed demonstrator:**

  - IPv6 Mobile Exhibit.

  - Video Streaming Exhibit.

  - ISABEL IPv6 application.

  - Take a Picture and send it to an Internet mailbox using our IPv6 mail server.

    - The IPv6 address of our server will appear in the mail header.

  - LONG News server (connected to the Internet News service).

  - LONG IRC IPv6 Server (Connected to other IRC server in the Internet).

- **Accesible Services in the Distributed Exhibit**

  - Access to the LONG common services:

    - LONG IPv6 WEB and FTP.

    - 6-Bone WEBs.

    - IRC chat rooms.

    - E-mail to the Internet through an IPv6 server.

- **Details of the Exhibits (Graphics & Diagrams):**

  - http://long.ccaba.upc.es/events/IPv6SummitMadrid2002/index.html

Laboratories Over Next Generation Networks.

II - LONG Brief Project Description

LONG Description

- **LONG: Laboratories Over Next Generation Networks (IST-1999-20393).**

- **Date of Start:** 1/12/2000. Duration: 24 Months.

  - **Participants:**
    - Portugal Telecom Inovaçao (PTIN): WP2 Leader (Network Design & Deploy.)
    - Telefónica I+D (TID): Project Coordination and WP1 Leader (Management).
    - Universidad Carlos III de Madrid (UC3M): WP4 Leader (Trials & Events).
    - Universidad de Evora (UEV).
    - Universitat Politecnica Catalunya (UPC): WP5 Leader (Dissemination)
    - Universidad Politécnica Madrid (UPM): WP3 Leader (Collaborative Environ.)
    - Nortel Networks (NOR) (New partner of LONG).

- **Main Objectives of LONG**
  - Deploy an IPv6 test-bed network to connect all partners.
  - Study, Test and Deploy in the LONG IPv6 Network:
    - **Access and Transport Technologies.**
    - **Network Services:** Basic and Advanced.
    - **IPv4-IPv6 Transition Mechanisms.**
   - **User Services.**

LONG. Contact People and WEB

- **Contact people:**
  - **Mailing-List:**   **long-committee@ac.upc.es**

  - Francisco Fontes   (PTIN, WP2 Leader)   Fontes@ptinovacao.pt
  - Juan Quemada   (UPM, WP3 Leader)   quemada@dit.upm.es
  - Arturo Azcorra   (UC3M, WP4 Leader)   azcorra@it.uc3m.es
  - Jordi Domingo   (UPC, WP5 Leader)   jordi.domingo@ac.upc.es
  - Joaquim Godinho   (UEV)   jjg@uevora.pt
  - Rafael Bonet   (Nortel Networks)   Rafael.Bonet@nortelnetworks.com
  - Carlos Ralli Ucendo   (TID, Project Coordinator):   ralli@tid.es

- **LONG public WEB Server:** http://long.ccaba.upc.es/

- **Possible Synergies and Collaboration with:**
  - "Next generation networks" development teams.
  - Advanced IPv6 Applications development groups.
  - Collaborative Work Applicationes development groups.

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III - LONG Results

LONG Network Global View

- **Global view of the Network.**

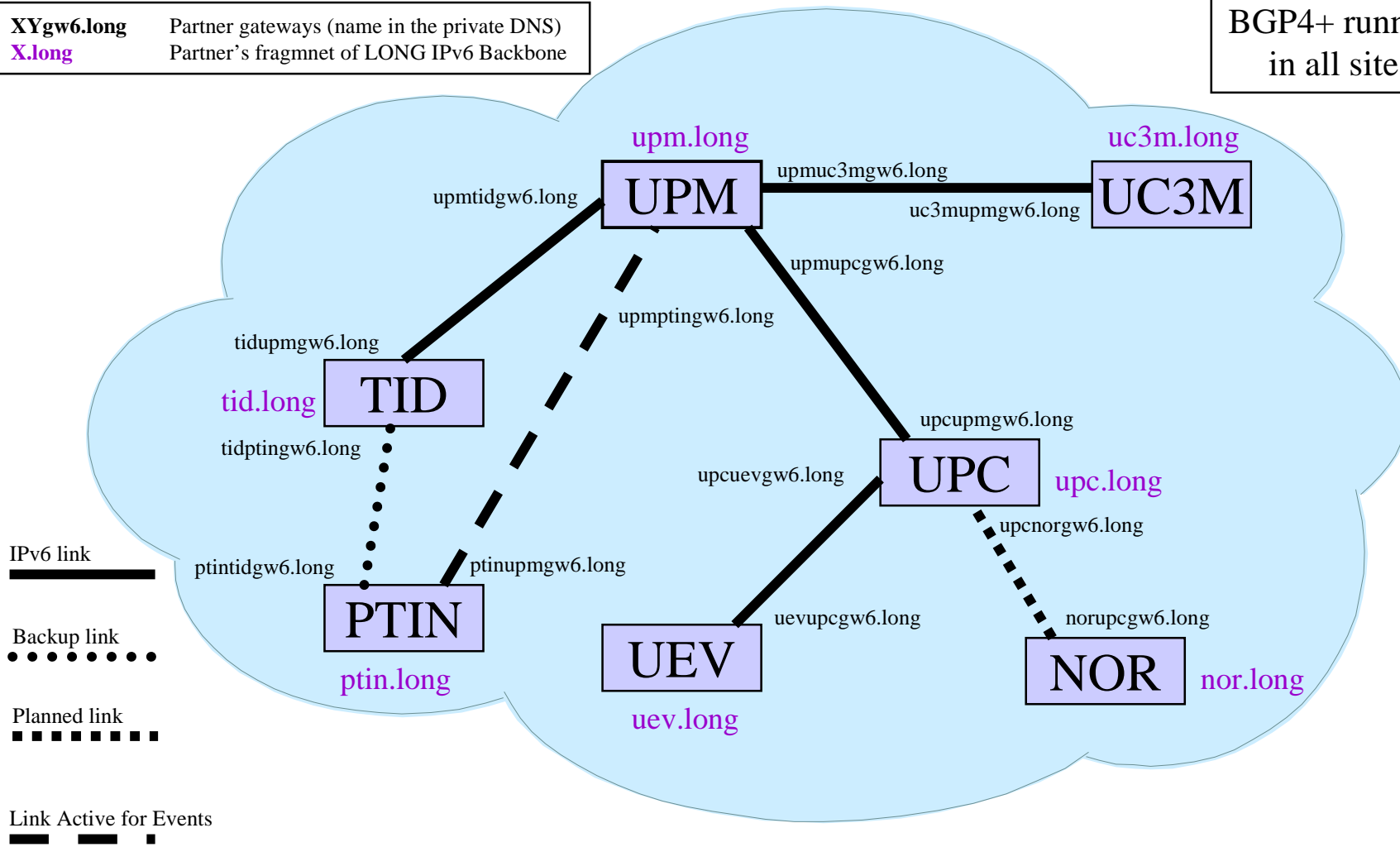LONG: Laboratories Over Next Generation Networks.
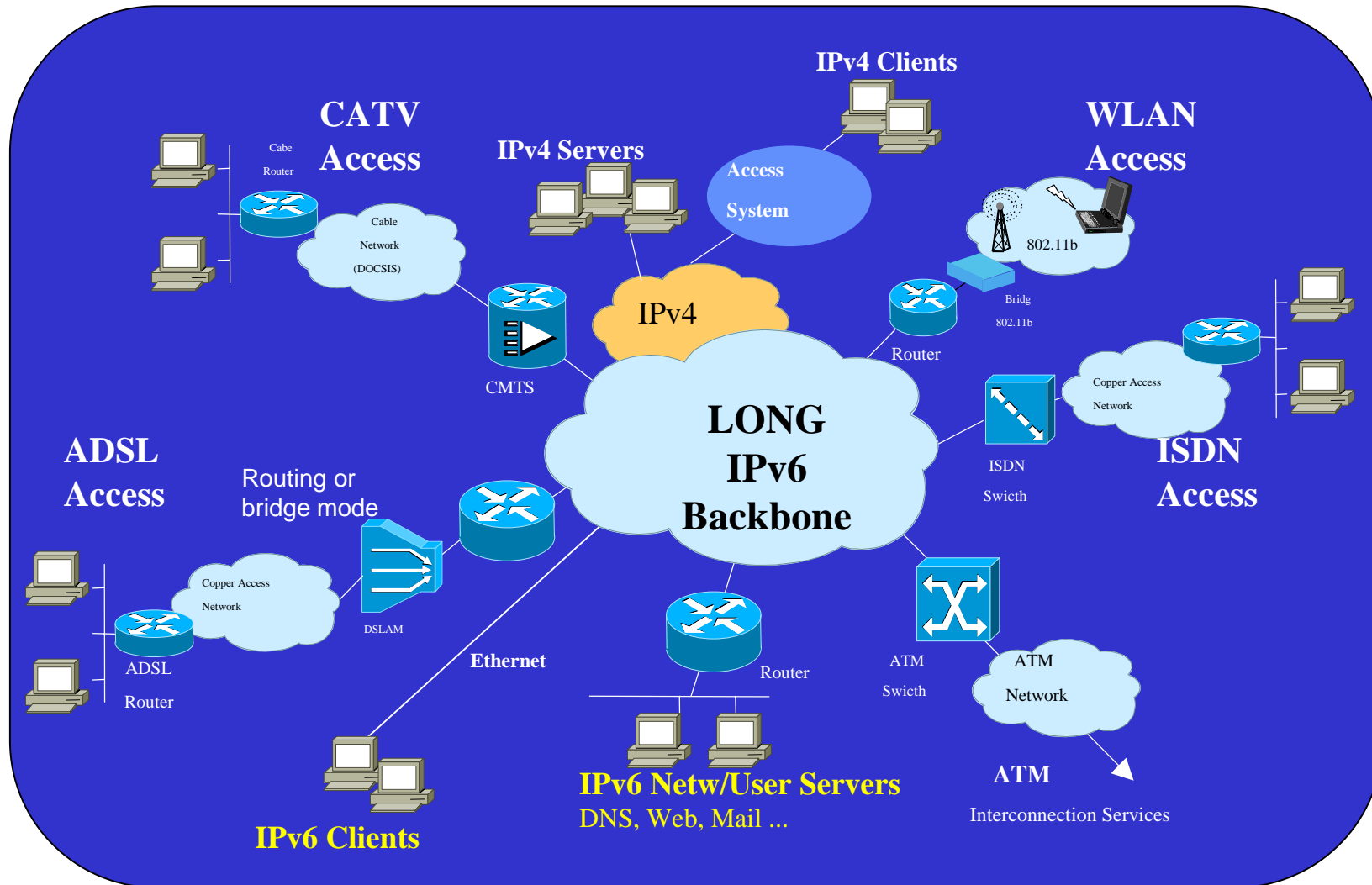
LONG IPv6 Backbone Network Details

- **LONG IPv6 Backbone.**

XYgw6.long Partner gateways (name in the private DNS)
X.long Partner's fragmnet of LONG IPv6 Backbone

BGP4+ running
in all sites

upm.long

uc3m.long

upmtidgw6.long

UPM — upmuc3mgw6.long — **UC3M**

uc3mupmgw6.long

upmupcgw6.long

upmptingw6.long

tidupmgw6.long

tid.long **TID**

tidptingw6.long

upcupmgw6.long

upcuevgw6.long **UPC** upc.long

upcnorgw6.long

ptintidgw6.long ptinupmgw6.long

PTIN

IPv6 link

Backup link

Planned link

Link Active for Events

uevupcgw6.long norupcgw6.long

UEV **NOR** nor.long

uev.long

LONG

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LONG Main Results

- **LONG Central ("Backbone") Network**
  - Each partner has deployed an IPv6 local network.
  - All these networks are linked building a single LONG IPv6 backbone.
  - These partner's networks are mainly connected using IPv6 over IPv4 configured tunnels. One of these links (UPM-TID) is a native IPv6 over ATM link.
  - BGP4+ is used as the routing protocol in the backbone.
  - A Performance measurement tool (MGENv6) has been adapted to IPv6 by UC3M.
- **Access Systems deployed in the LONg network:**
  - ADSL (TID), CTAV (PTIN), WLAN (UPM), ISDN (UEV).
- **Transport/Network Technologies tested:**
  - ATM, POS, Ethernet, FastEthernet, GbE.
- **Basic Network Services:**
  - **DNS:** A DNS system has been deployed in the network.
    - **A Queries:** Names to IPv4 addresses.
    - **AAAA Queries:** Names to IPv6 addresses.
    - Able to process DNS Queries over **UDP/IPv4** and **UDP/IPv6**.
    - **Private Domains:** .long (backbone); ptin.long, uc3m.long, tid.long ... (partners).
    - **Public Domain:** "ist-long.com" has been purchased.

LONG Main Results (II)

- **Routing Protocols:**
  - **Backbone:** BGP4+ is used.
  - **Partners:** Static routes / RIPng.
    - iBGP will be used in each partner premises.
- **Advanced Network Services:**
  - **Mobility**, **Security**, **Multicast**, **QoS** and **Multihoming**.
    - Standards and implementations basic tests done.
    - Functionality and performance tests proposed. Being done nowadays.
    - Future Plans: Introduce some of these services in the LONG stable network.
- **IPv4-IPv6 Transition Mechanisms (TM):**
  - Tunneling TM: Configured, 6to4, Automatic Tunnels, 6over4, DSTM.
  - Translation TM: NAT-PT, SOCKS64, TRT, BIS.
  - All have been studied and tested (functionality and performance).
  - The TM will be applied in the LONG stable network ONLY when needed by network/user services in order to connect IPv4/IPv6 Clients/Servers.
  - The easiest solution will be used in most situations. When some options are available the easiest from the user side will be used.

LONG Main Results (III)

- **User Services:**
  - Centralised: WEB, FTP, Video Streaming.
    - Video Streaming: Video Client/Server adapted to IPv6 by TID.

  - Distributed: E-mail, IRC, LDAP, Collaborative Work.
    - **E-mail:** Dual stack server.
      - LONG partners can use IPv6 to send /receive E-mails.
      - Public E-mail Server (Internet): "mail.ist-long.com"
      - Able to send/receive e-mails form the Internet E-mail service.

    - **IRC:** IPv4 and IPv6 IRC servers communicate TRT Transition Mechanism.
      - Service can be accessed by IPv4 (Internet included) and IPv6 Clients (LONG Network). All users see the same chat rooms.

    - **Collaborative Work:** UPM has migrated ISABEL CSCW Application to IPv6.
      - ISABEL is an CSCW SW deployed by UPM and largely used to distribute public events.
      - IPv4 and IPv6 remote nodes can be simultaneusly connected.
      - Project Technical meetings are in fact tele-meetings using ISABEL software. In the last meeting some partners joined it using IPv6.

LONG Technical Documentation

- **Main LONG Technical Documents issued:**

  - **WP 2:**
    - "D2.1 - Description of IPv4/IPv6 available transition strategies".
    - "D2.2 - Access Technologies in LONG project".
    - "D2.3 - Advanced Network Services: description and support in LONG network".

  - **WP 3:**
    - "D3.1 - Requirements and guidelines for distributed laboratories application migration".
    - "D3.2 - Guidelines for migration of collaborative work (CSCW) applications".

  - **WP 4:**
    - "D4.1 - First Phase trials scenario specifications".
    - "D4.2 - Report on first phase trials and evaluation".
    - "D4.3 - Second phase trials specification".

- Download Technical DOC (deliverables) from: http://long.ccaba.upc.es/

LONG: Laboratories Over Next Generation Networks.