IPv6 Services in LONG Network

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Overview

IPv6 Distributed Labs

LONG: Building a distributed IPv6 Lab.

- LONG Backbone
- LONG Global View
- LONG IPv6 Services
- Examples of IPv4-IPv6 Interaction

LONG Advanced Network Services

- Planned Experiments

Conclusions

Contact & More Info

IPv6 Distributed Labs

Why IPv6 Distributed Labs?

- "Stable" R&D testing platforms are needed to:
  - Adapt current network and final-user services to v6.
  - Deploy new network and user services in v6 Networks.
  - Ensure IPv4-IPv6 interaction at Service level.

- Several Scenarios => Join partner's Labs (distributed topology)

Objectives

- Propose solutions for IP network & services evolution.
- Feedback to standarization bodies and developers.

It happened before: Current Internet services came from IPv4 R&D stable Labs linked together.

IPv6 Distributed Labs (II)

IPv6 Distributed Lab = v6 Nodes + IPv6 Backbone (links, routing)

Alternatives for the backbone Links Deployment

- Public L2 Networks: Guaranteed BW, expensive for R&D purposes.
- Research networks: Still Based today in IPv4: Tunneling needed. Deploying QoS scheemes at IPv4 level.
  - NRENs: within a single country.
  - GEANT: connections over 2 or more NRENs.
- Tunnels over Internet: Straight solution, best effort, low BW.

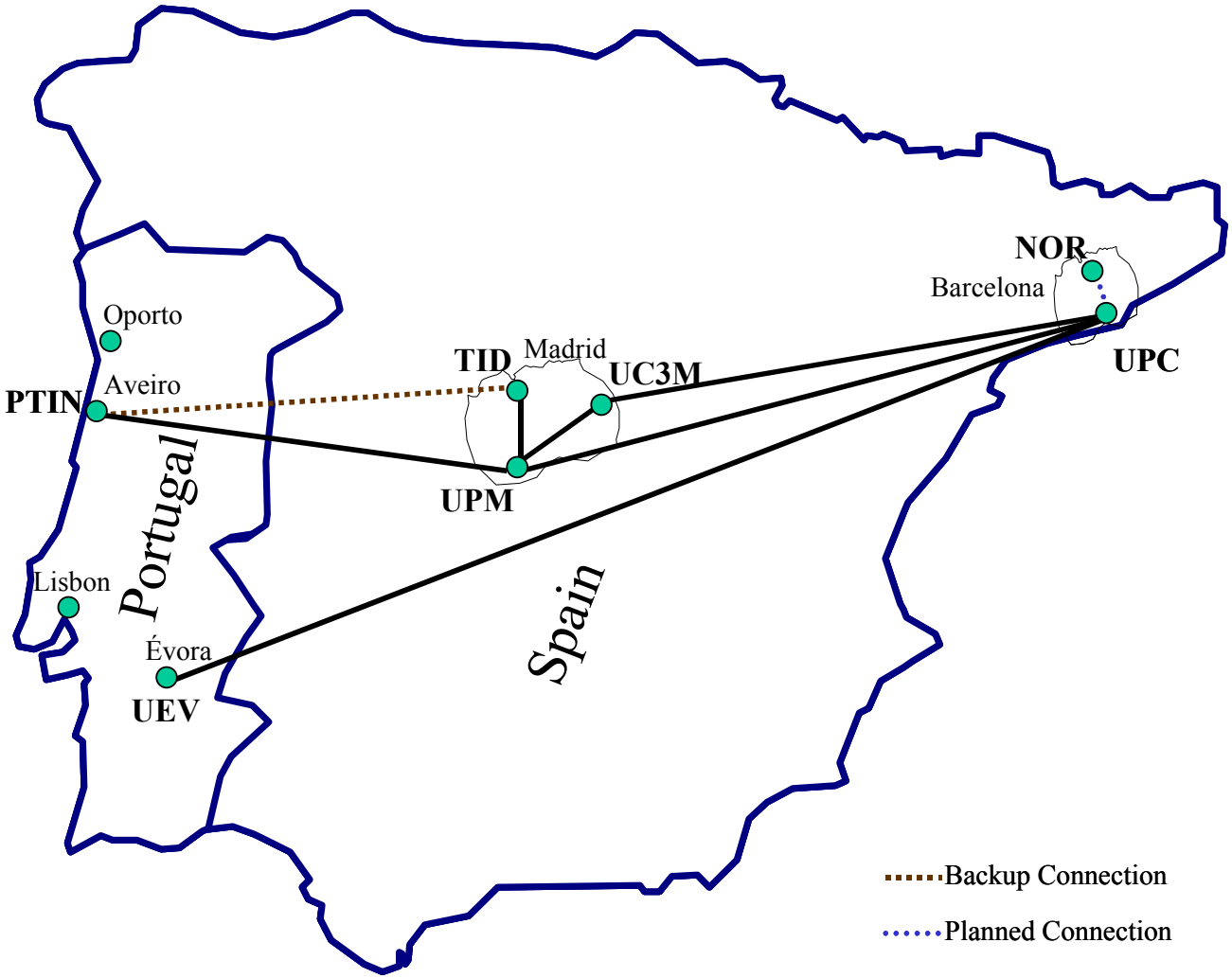
New Alternative: Large IPv6 projects: Euro6IX / 6NET.

BW Considerations

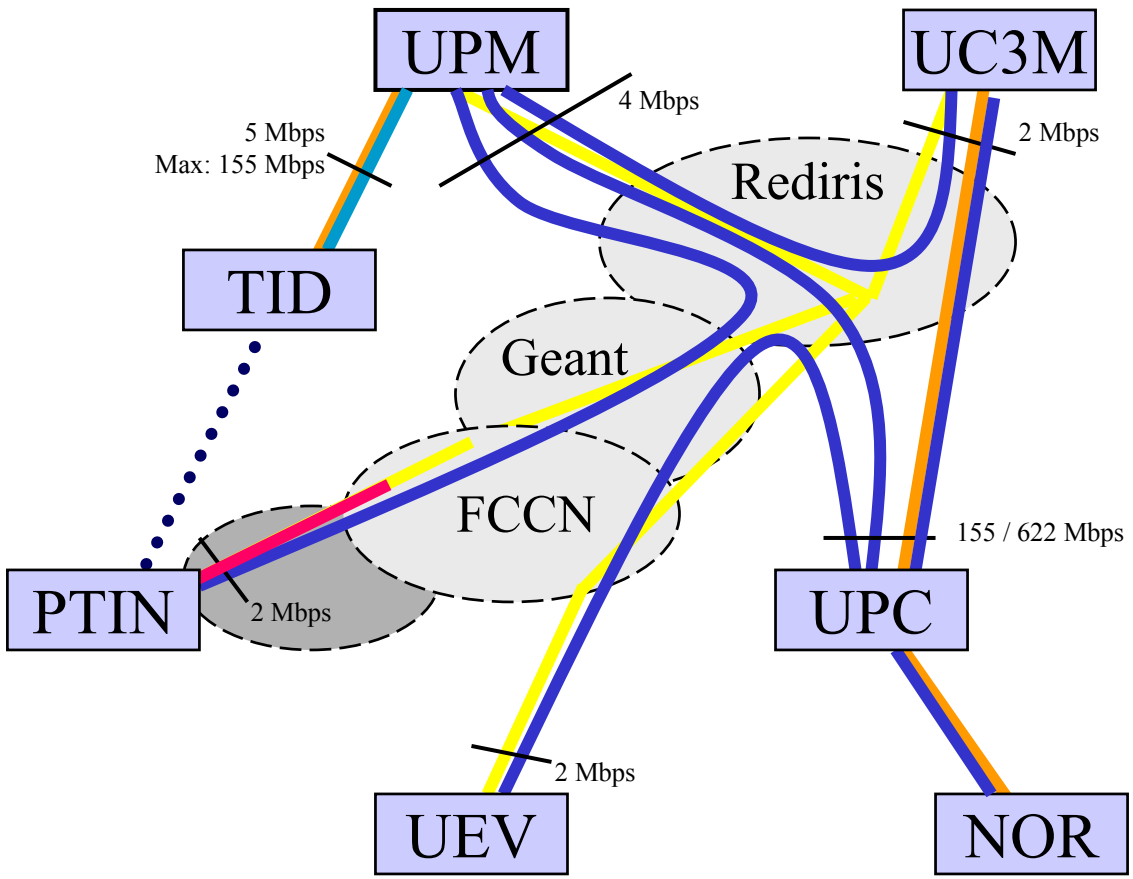
- Best effort & Low BW enough in most functionality/basic services experiments.
- Guaranteed High BW is needed in some user services experiments.

LONG Backbone: Logical Links

LONG: IST 5th FP – Project Funded by EC.



LONG Backbone: Physical Links



IPv6 over ATM
(Public Network)

IPv6 over IPv4

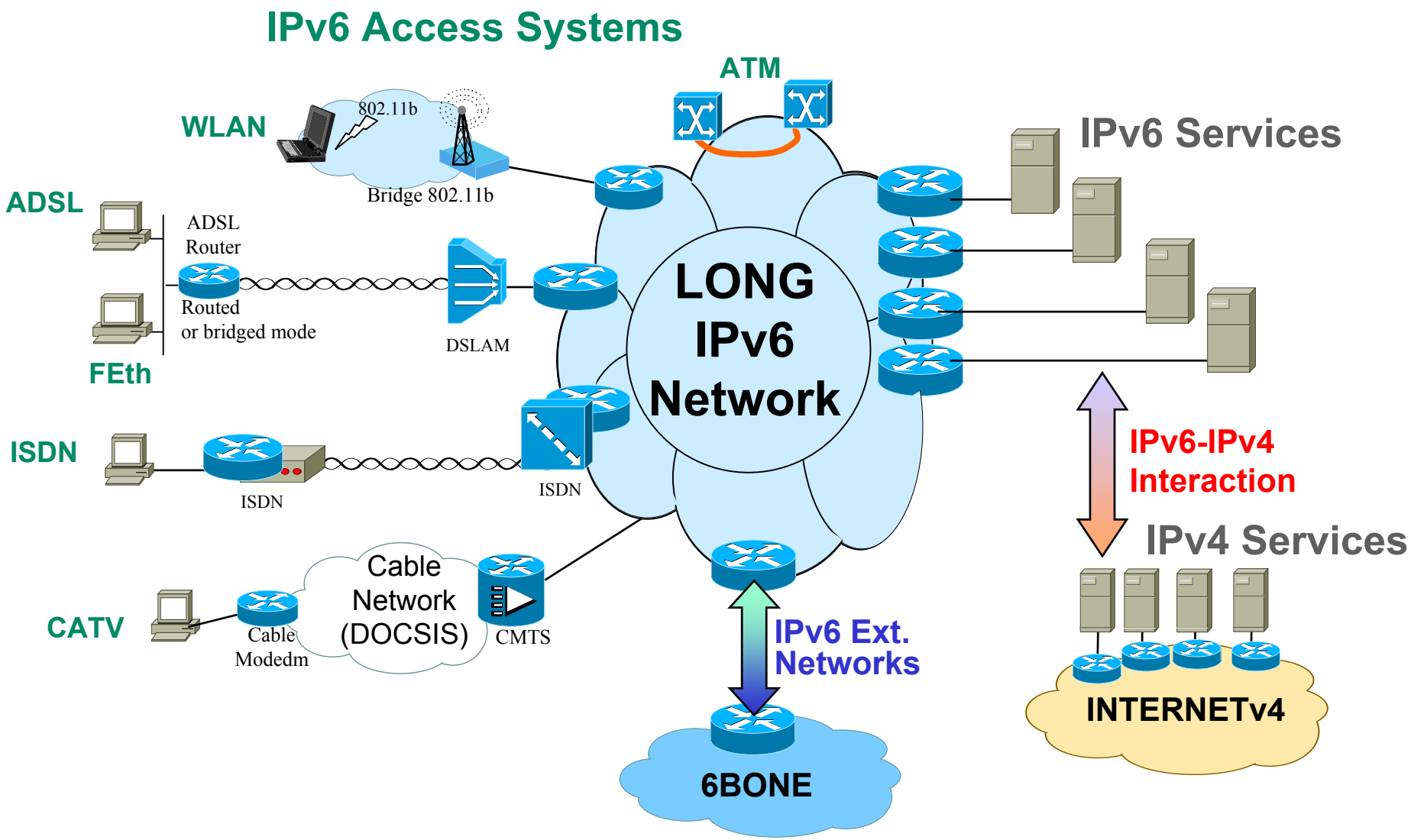
Backup over Internet

Physical link
(shared BW)

Physical link
(quaranted BW)

Physical link
(EVENTS ONLY)

LONG Distributed Lab (Global View)



LONG: IPv6 Services

BASIC NETWORK SERVICES
- DNS
- NETWORK STATISTICS

USER SERVICES
- Web, FTP, News
- Mail
- IRC
- LDAP
- Games
- Video Streaming: High BW req.
- ISABELv6: High BW req.

IPv4-IPv6 Service Integration

ADVANCED NETWORK SERVICES
- IPv6 Mobile
- Multicast
- QoS Experiments

IPv6 ONLY Experiments

LONG: DNS Service

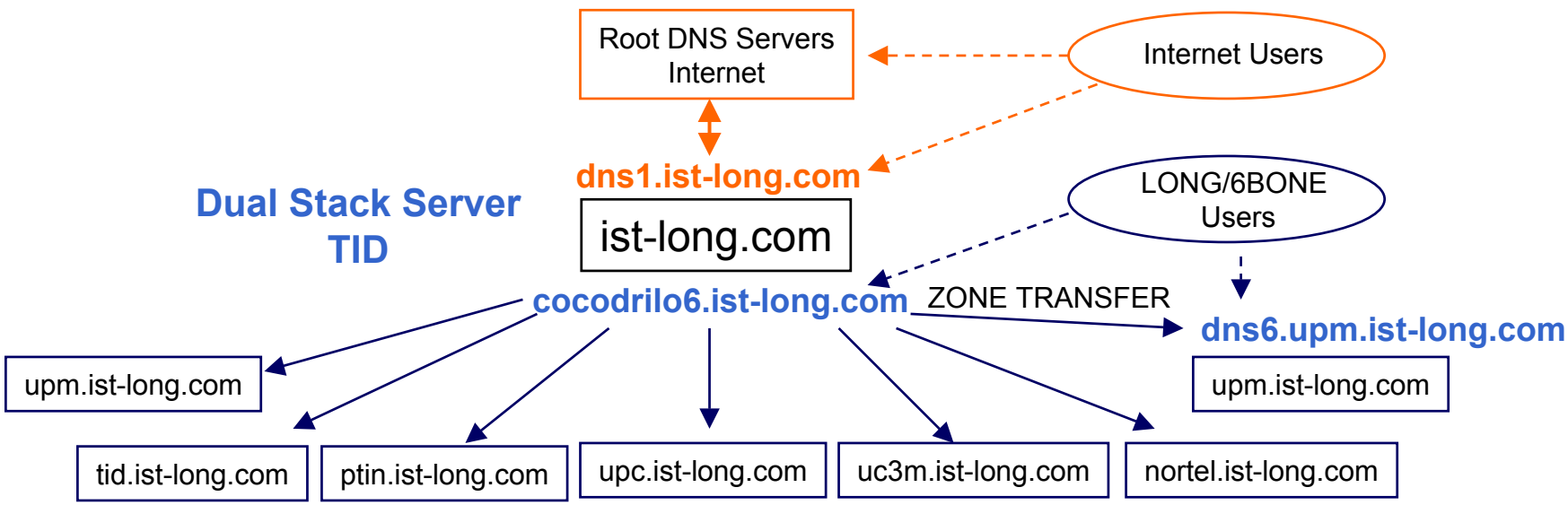
Based in BIND9 on Linux boxes

- Supports queries over IPv4 & IPv6.
- Supports A queries (v4 addressing) and AAAA queries (v6 addressing)

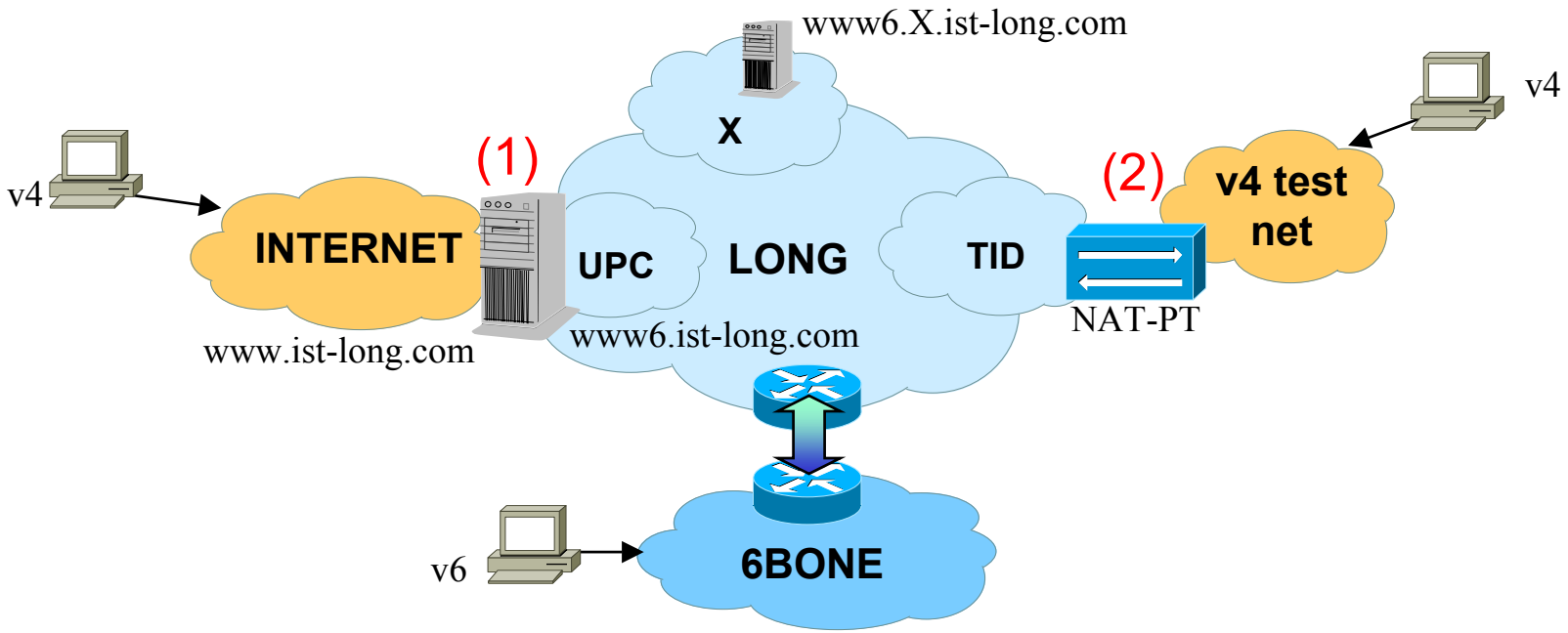
Convention in LONG:

- “name” / “name4” for IPv4 addressing or v4VA.
- “name6” for IPv6 addressing or v6VA.

Public Domain: “ist-long.com” available for the project.



LONG: WEB Services



IPv4-IPv6 Interaction

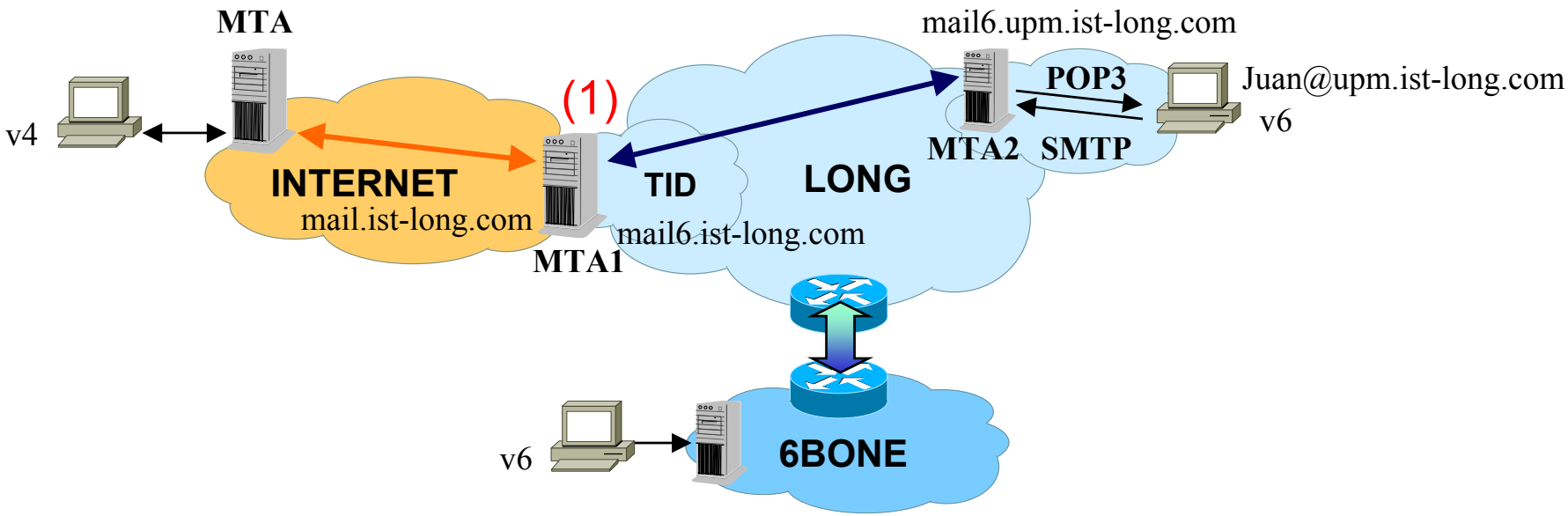
(1) Dual Stack Server at UPC (Oficial WEB Page)

- Internet Clients – v4 Server (www.ist-long.com)
- LONG/6BONE Clients – v6 Server (www6.ist-long.com)

(2) NAT-PT & v4-VAs at TID

- v4 Clients - NAT-PT: www4.ist-long.com

LONG: Mail Service

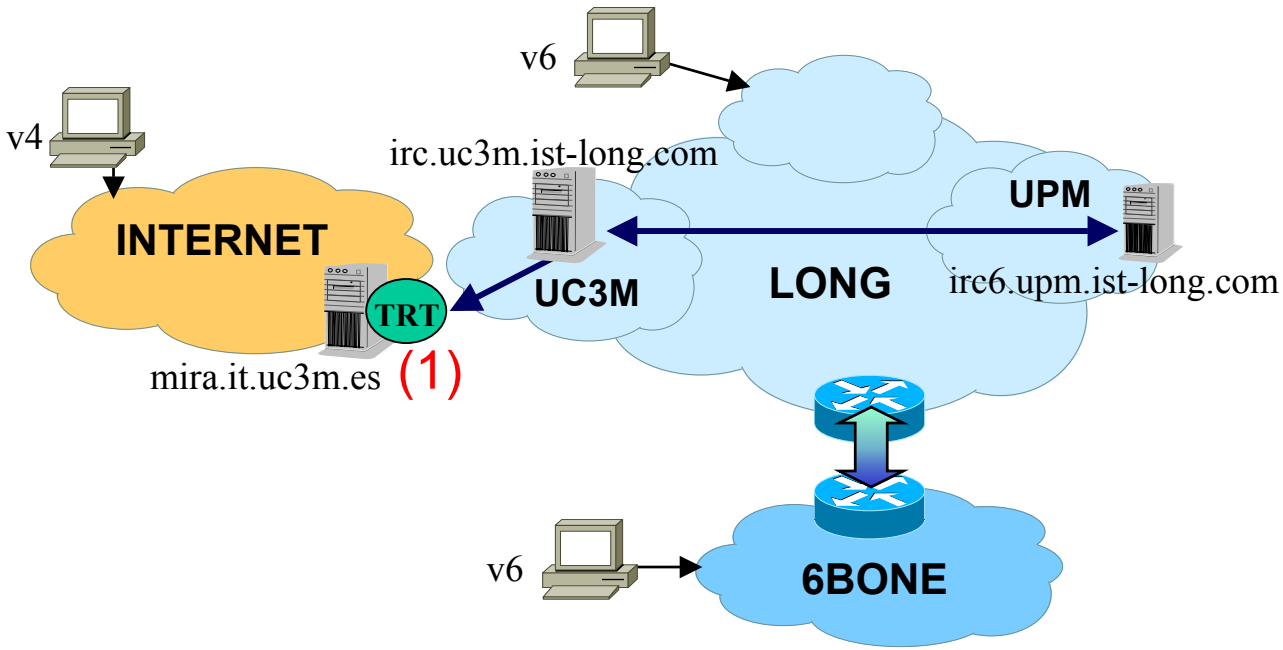


IPv6 MTAs deployed by each partner.

IPv4-IPv6 Interaction (1) Dual stack Mail server at TID.

- DNS:
  - MX for “X.ist-long.com” is mail.ist-long.com (194.179.25.37).
- Inside “ist-long.com” Domain:
  - MTA1 is aware of all MTAs.
  - Outgoing mails in MTA2 are sent to mail6.ist-long.com.

LONG: IRC Service

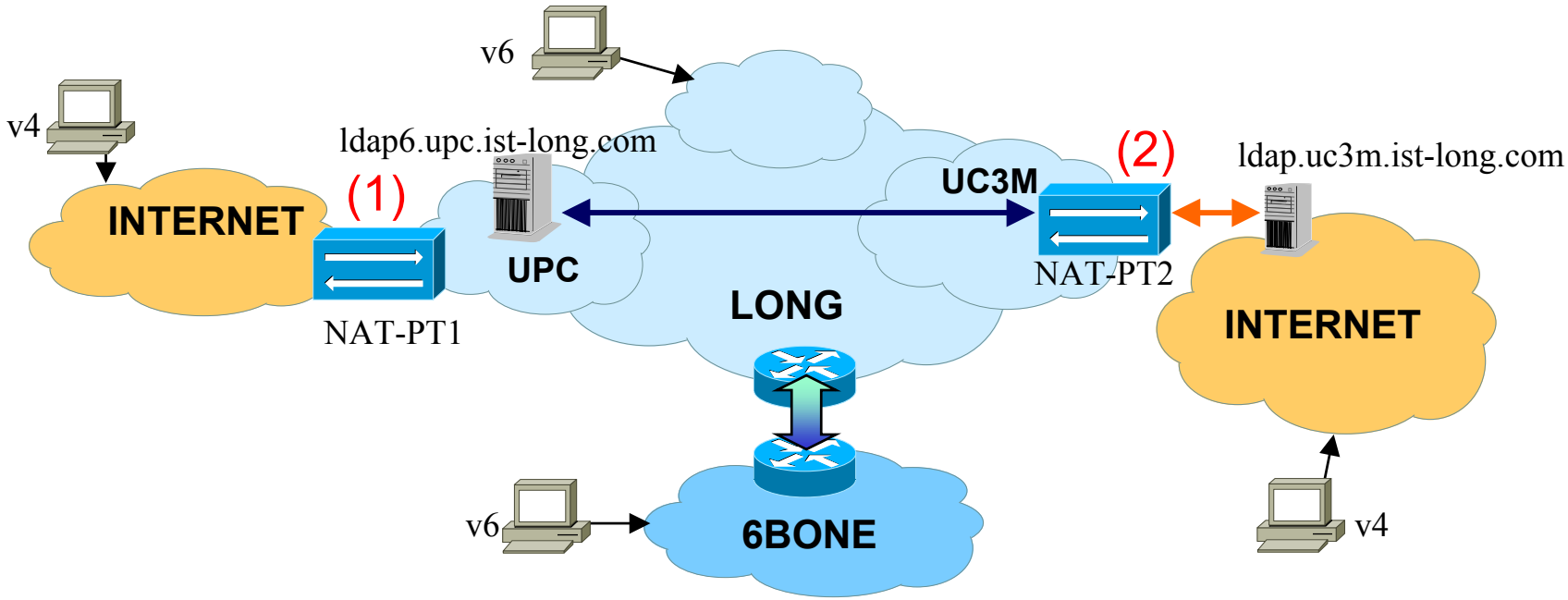


IPv4-IPv6 Interaction

(1) TRT: IPv6 IRC server initiates server's connection.

- Internet Clients - v4 Server (mira.it.uc3m.es)
- LONG/6BONE Clients - v6 Servers (IRCv6 Network: irc6.uc3m.ist-long.com...)

LONG: LDAP Service



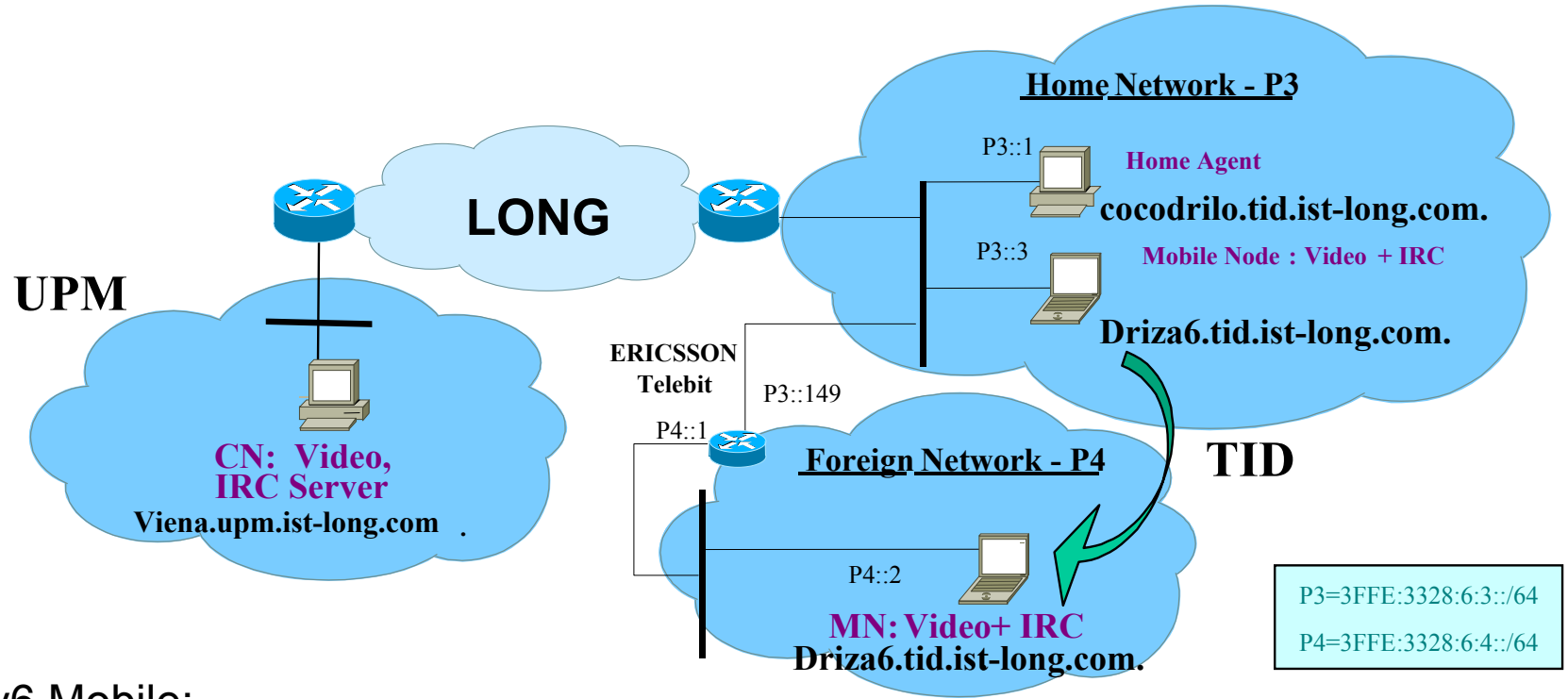
IPv4-IPv6 Interaction

(1) UPC: IPv6 Server in LONG. NAT-PT & v4-VA (Internet).

(2) UC3M: IPv4 Server in Internet. NAT-PT & v6-VA (LONG).

LONG/6BONE Clients:	Directly:	ldap6.upc.ist-long.com.
	NAT-PT2:	ldap.uc3m.ist-long.com
Internet Clients:	Directly:	ldap.uc3m.ist-long.com.
	NAT-PT1:	ldap6.upc.ist-long.com
Servers Comm:	NAT-PT2	

LONG: IPv6 Mobile



IPv6 Mobile:

- Linux platform
- MIPL implementation from HUT: http://www.mipl.mediapoli.com

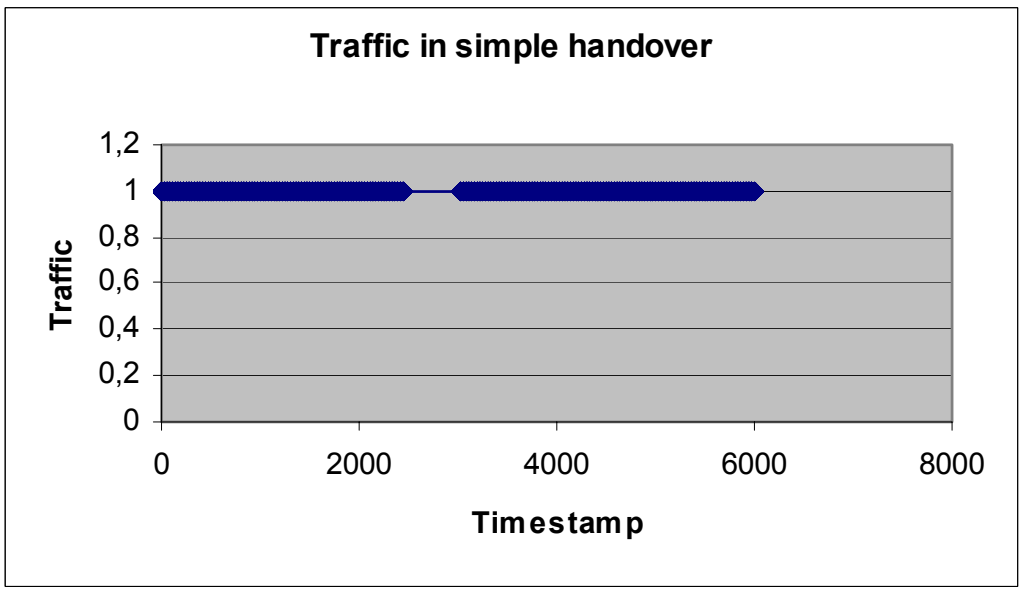
DEMO

- A Laptop changes from one IPv6 net to another.
- IRC service and Videostreaming clients running.
- In 3-5 s both services are recovered.

LONG: IPv6 Mobile (II)

IPv6 Mobile Handover:

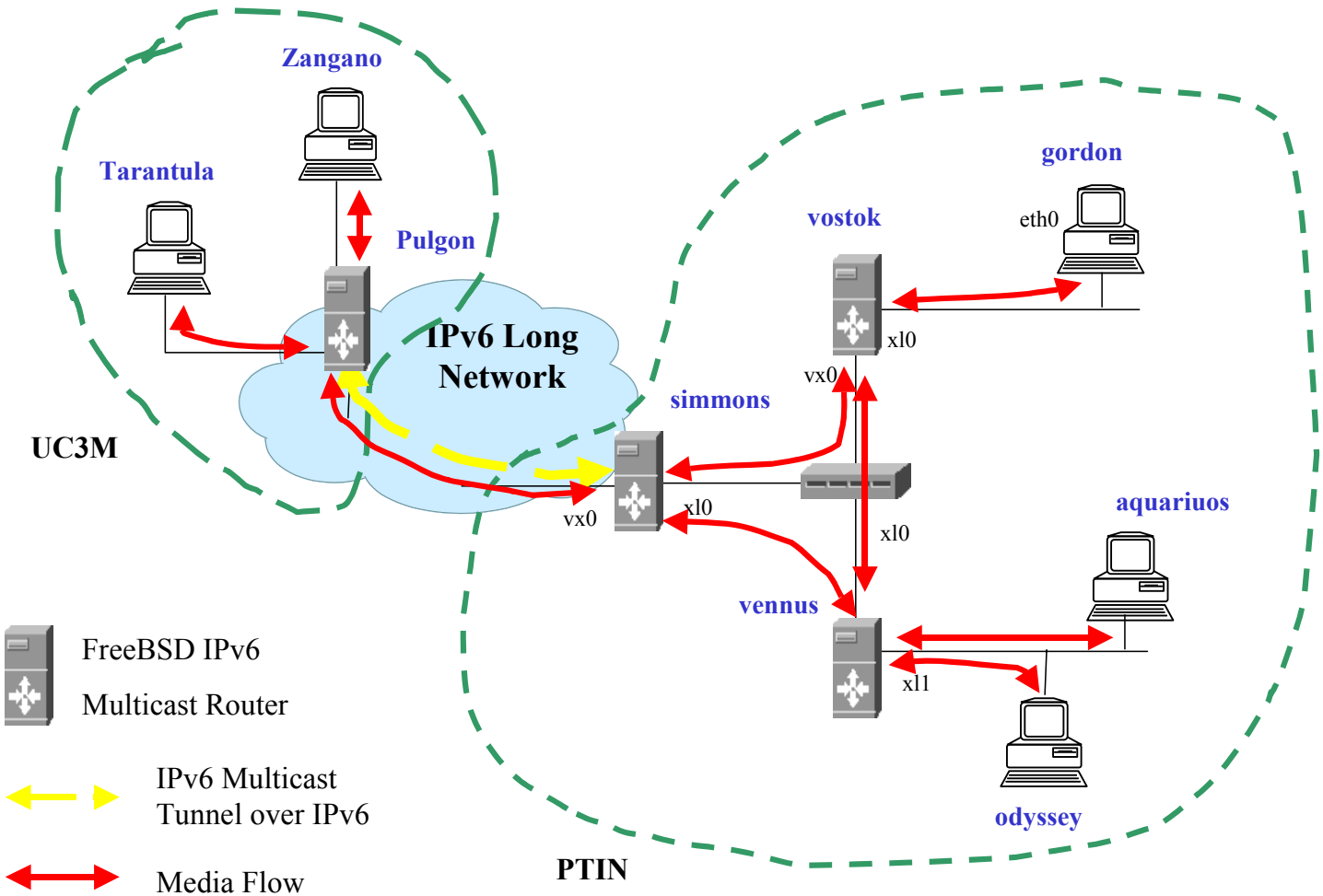
- Traffic measurement in the IPv6 Streaming Video Server:



LONG: IPv6 Multicast

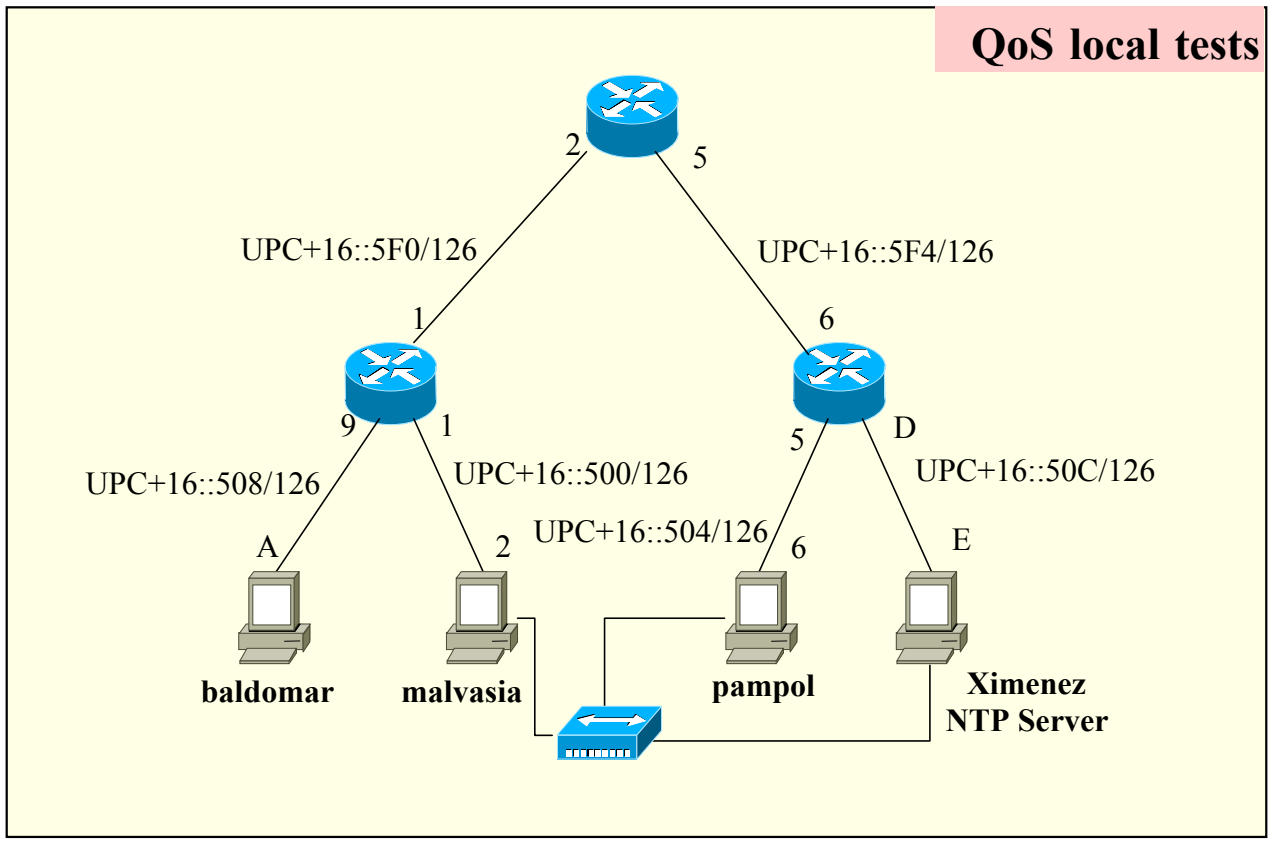
LONG: Planned Multicast tests (FreeBSD)

Tests with IPv6 Video Streaming & ISABELv6



LONG: IPv6 QoS

LONG: Planned local IPv6 QoS tests at UPC



Conclusions

Built an “stable” IPv6 Distributed Lab with SERVICES.

REAL USE of these services:

- ISABEL for most project meetings (14,315 E saved in travel costs).
- IRC used to set up & operation event platforms (v6 & v4 accesses used).
- Planned: IPv6 Mailboxes in v6 MTAs (To send if v4 MTAs fail ...)
  - Redirected to current mailboxes (do not want 2 mailboxes).

  ralli@tid.ist-long.com =>ralli@tid.es

WEB Tools: Internet users may access from http://www.ist-long.com:

- IPv6 tools: ping, traceroute, AS path tool.
- IPv6 services: LDAP, mail, network statistics.

Transition Mechanisms

Today:	NOT testing ALL combinations. TM ONLY used when needed to provide one IPv6 LONG service to the v4 Internet.
Next Step:	Use other TM to provide v4 Internet services within our v6 net.

More Info /Contact

Public Documents and Developments: http://www.ist-long.com/

Contact, do you want to join our experiments?

- Carlos Ralli: ralli@tid.es

Thanks!

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