

IPv6 Services in LONG Network

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LONG: Laboratories Over Next Generation Networks.



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

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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.

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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 schemes 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

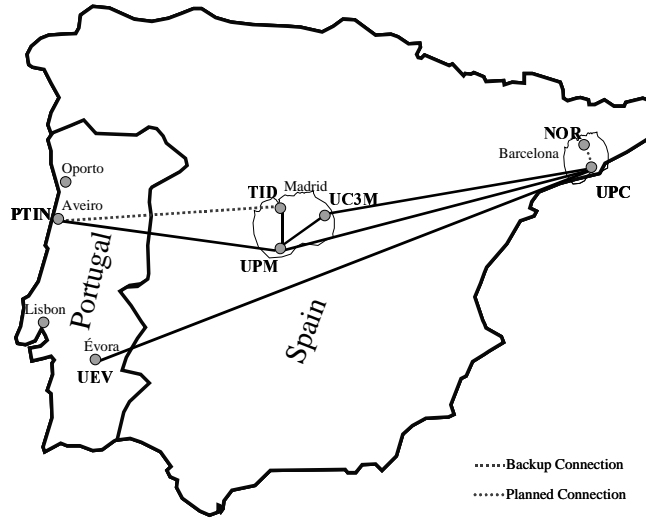
- Best effort & Low BW enough in most functionality/basic services experiments.
- Guaranteed High BW is needed in some user services experiments.

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LONG Backbone: Logical Links

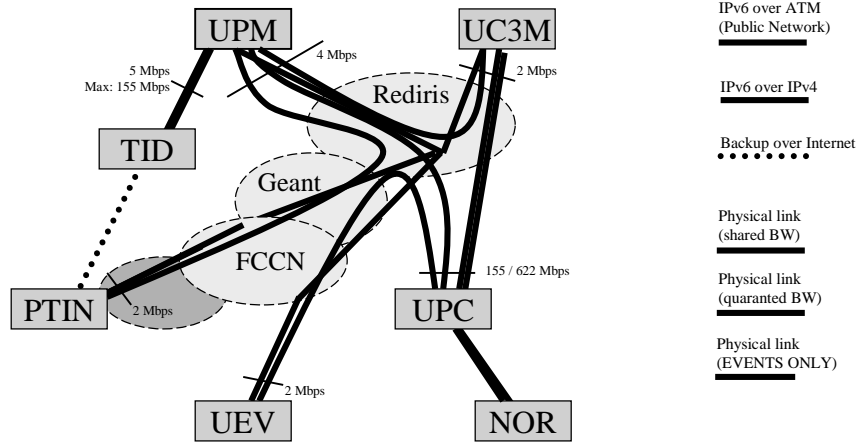
LONG: IST 5th FP – Project Funded by EC.



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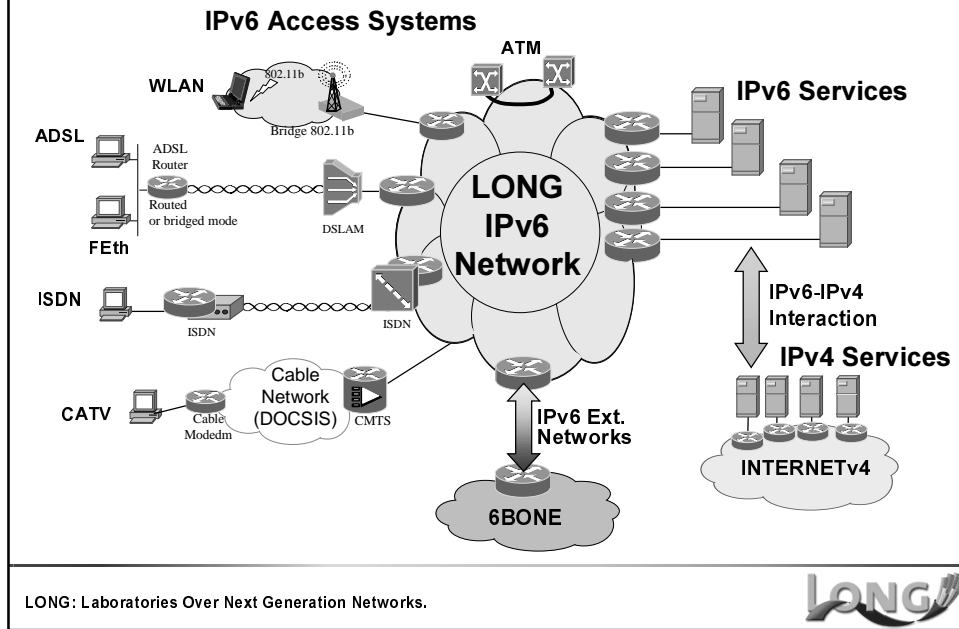
LONG Backbone: Physical Links



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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

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LONG: DNS Service

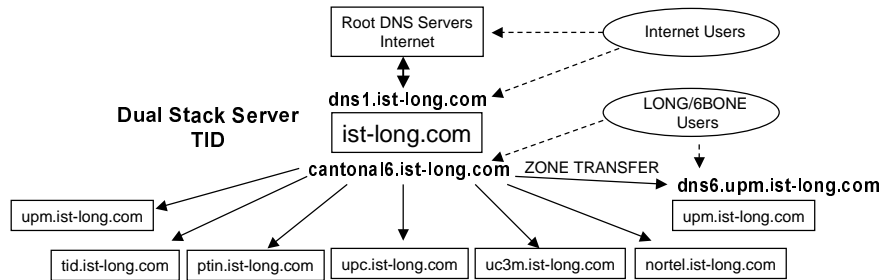
Based in BIND9 on Linux boxes

- 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.

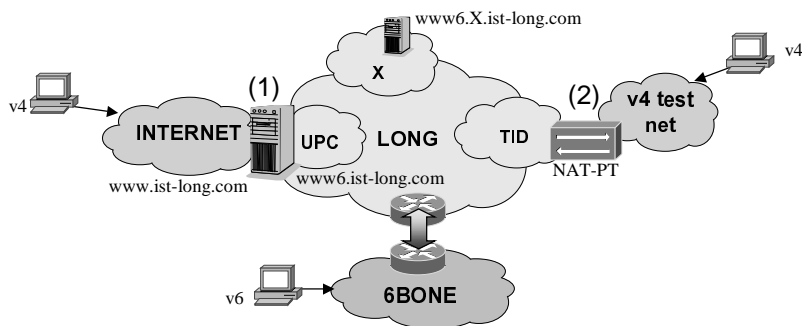
Public Domain: "ist-long.com" available for the project.



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LONG: WEB Services



IPv4-IPv6 Interaction

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

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

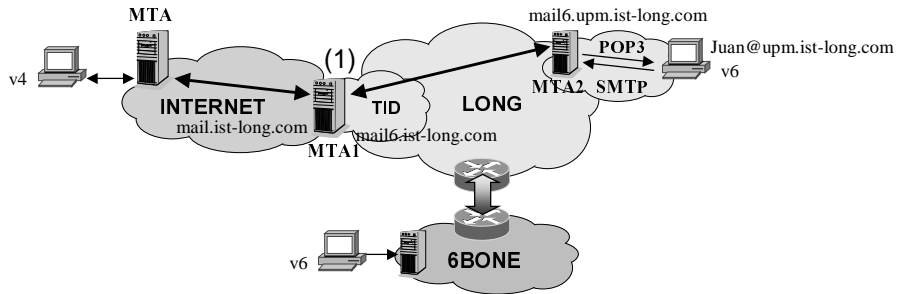
(2) NAT-PT & v4-VAs at TID

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

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LONG: Mail Service



IPv6 MTAs deployed by each partner.

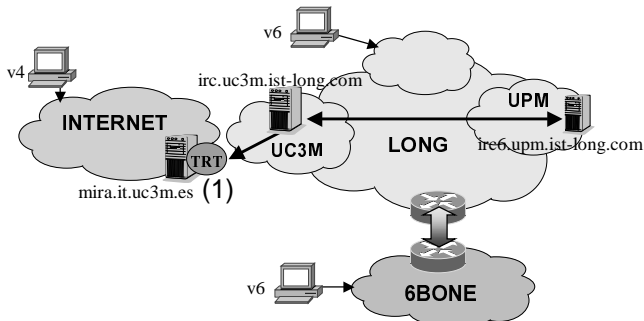
IPv4-IPv6 Interaction (1) Dual stack Mail server at TID.

- 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.

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LONG: IRC Service



IPv4-IPv6 Interaction

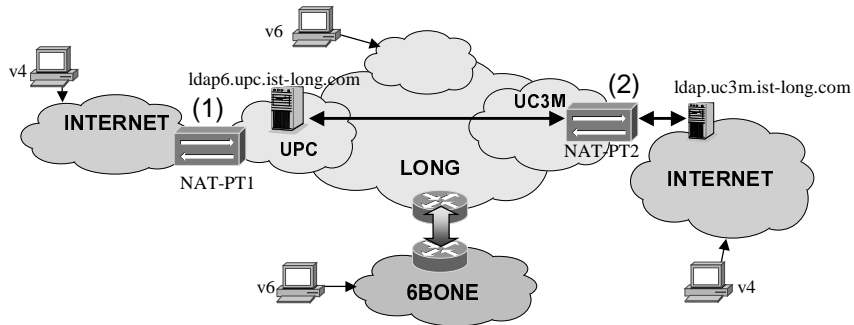
(1) TRT: IPv6 IRC server initiates server's connection.

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

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LONG: LDAP Service



IPv4-IPv6 Interaction

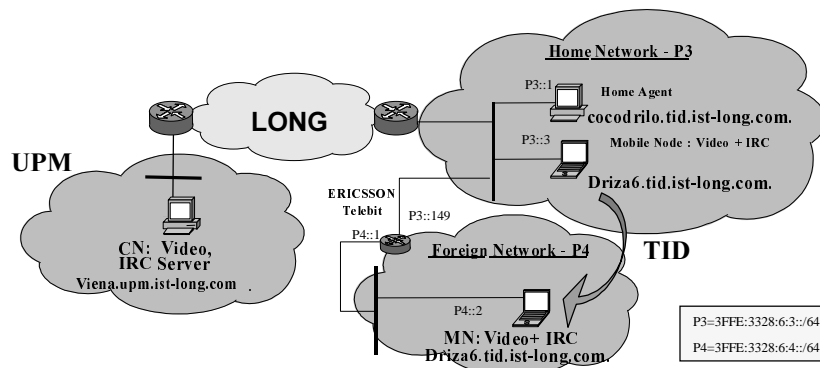
- (1) UPC: IPv6 Server in LONG. NAT-PT & v4-VA (Internet).
- (2) UC3M: IPv4 Server in Internet. NAT-PT & v6-VA (LONG).

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	

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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.

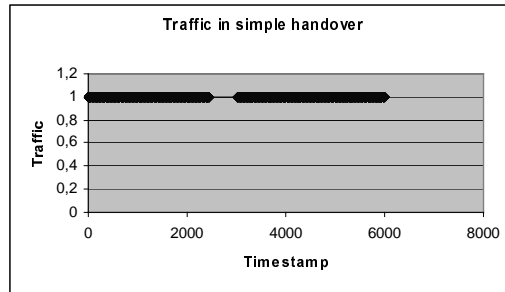
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LONG: IPv6 Mobile (II)

IPv6 Mobile Handover:

- Traffic measurement in the IPv6 Streaming Video Server:



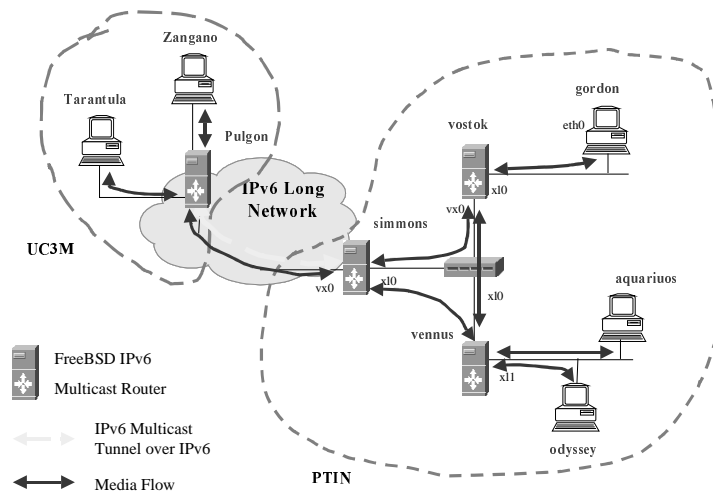
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LONG: IPv6 Multicast

LONG: Planned Multicast tests (FreeBSD)

Tests with IPv6 Video Streaming & ISABELv6

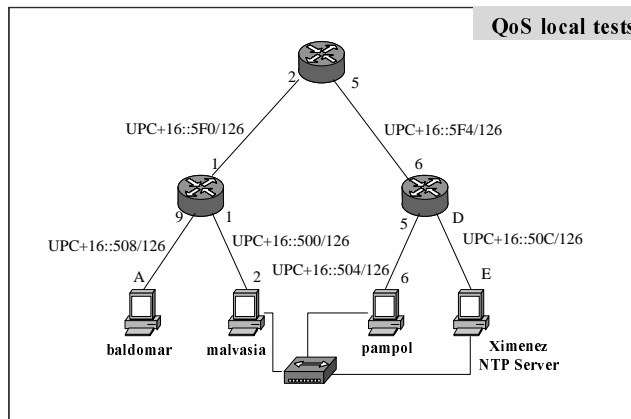


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LONG: IPv6 QoS

LONG: Planned local IPv6 QoS tests at UPC



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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.

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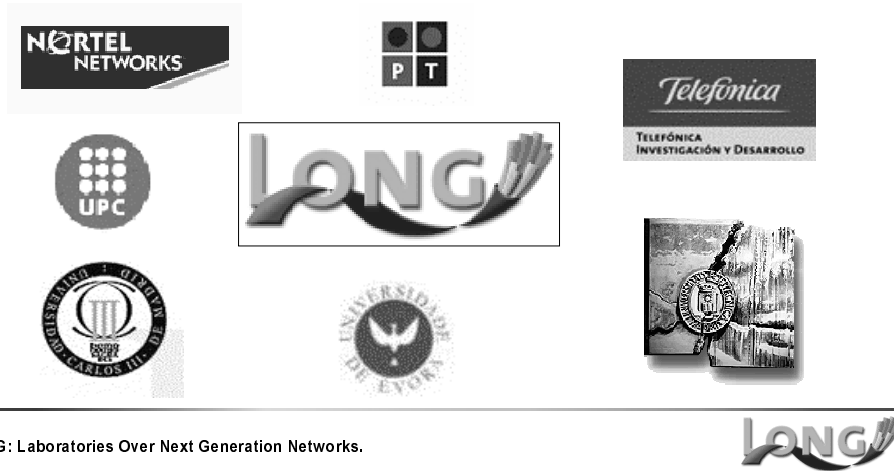


More Info /Contact

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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