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| <b>Abstract:</b>     | This deliverable reports a description of the preliminary plans for dissemination of the IST project LONG. The report includes a brief summary of the main objectives of the project and focuses on the expected plans for dissemination. |
| <b>Keyword List:</b> | LONG, IPv6, Next Generation Networks, Advanced Network Services, Advanced Network Platforms, Guidelines for IPv6 – IPv4 Transition Mechanisms, Dissemination Activities.  |

## **Executive Summary**

This report states the planned activities to be carried out by the project LONG within the workpackage 5 about dissemination and implementation. This document is delivered at month 6 since the beginning of the project. It includes the first dissemination activities performed during this period of time and a plan of the ongoing and planned activities for the rest of the duration of the project.

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## 1. Introduction

The main goal of the project is to foresee and solve problems related to the design, configuration and deployment of Next Generation telecommunication networks especially when new services and applications are carried out across them. LONG will provide the scientific community, vendors and operators with the necessary capacity to cope with the problems that the design of Next Generation networks will pose to them. The new version of the IP protocol, IPv6, will become an integral part of these Next Generation networks, because of its bigger address space and the advanced services that can be provided along with it.

The main focus of the LONG project is the production of guidelines for the design, configuration and deployment of Next Generation networks so that new services and applications can be supported across them. The standards for these Next Generation networks are in many cases still emerging and its adoption by manufacturers and users is not so widespread as it would be desirable if we think of their benefits in terms of advanced services, management and operational costs. LONG will address the design and deployment of IPv4/IPv6 transition scenarios and will validate the integration of IPv6 with advanced services such as QoS techniques, mobility mechanisms, multicast support and security procedures. LONG aims to gain an in-depth knowledge of the operational issues regarding heterogeneous access and transport internetworking.

LONG will produce guidelines for extending the framework of relevant Next Generation applications so that these can take into account the services provided by the Next Generation networks. The lack of IPv6 applications is one of the factors behind its limited deployment up to now. Therefore, the elaboration of guidelines on the porting of applications to a mixed IPv4/IPv6 environment will help to accelerate the adoption of IPv6 by the European companies. On the other hand, the adaptation of this kind of applications to heterogeneous access and transport scenarios will promote the use of the high bandwidth networks.

In summary, the objectives of the project, as stated in the technical annex, are the following:

1. To deploy a Next Generation testbed.
2. To port and validate relevant Next Generation applications to IPv4/IPv6 and heterogeneous access scenarios.
3. The production of guidelines on IPv4/IPv6 transition.
4. The validation of IPv6 and advanced services integration.
5. The production of recommendations on the operational internetworking of heterogeneous network access scenarios.
6. The production of guidelines on the porting of applications to IPv6 and heterogeneous access scenarios
7. To disseminate the results.
8. Exploitation of the results
9. To guarantee the quality of the work.

As it may be noted in the previous list, many of the objectives are directly related to dissemination activities. At this stage, when in a short period of time the new IP protocol will be deployed, it is very important to define a set of guidelines and recommendations for IPv4/IPv6 transition, both in corporate and wide area networks. These guidelines and recommendations must be supported by an extensive evaluation of the different scenarios. Also, the migration of applications to IPv6 and the corresponding guidelines obtained from experiences and testing will be a valuable contribution of the project.

The plans for dissemination are divided in the following areas:

- i. Set up and maintenance of a public web server for the project.
- ii. Participation in the Standardization Fora.
- iii. Participation in conferences, workshops and journals.
- iv. Organization of dissemination activities.
- v. Relations with other projects.

The rest of the document presents the activities done in each of these areas and the planned ones for the next 18 months.

## 2. Dissemination through the LONG public web server

The participants in the project make use of the IT widely. There have been defined several mailing lists for the project, an internal web server is set up and a public web server for dissemination is set up also.

### 2.1 Mailing Lists

A set of mailing lists have been set up, one for each workpackage and a global one for all the participants in the project. These lists allow a fluent means of communication among the different groups. Many discussions and join work is done using the electronic mail and the distribution lists. The mailing lists are maintained by UPC.

The lists are the following:

- General list including all participants in the project [long@ac.upc.es](mailto:long@ac.upc.es)
- Management committee list (WP1) [long-committee@ac.upc.es](mailto:long-committee@ac.upc.es)
- WP2 activities (network design and deployment) [long-wp2@ac.upc.es](mailto:long-wp2@ac.upc.es)
- WP3 activities (collaborative work environment) [long-wp3@ac.upc.es](mailto:long-wp3@ac.upc.es)
- WP4 activities (system exploitation, trials and evaluation) [long-wp4@ac.upc.es](mailto:long-wp4@ac.upc.es)
- WP5 activities (dissemination and implementation) [long-wp5@ac.upc.es](mailto:long-wp5@ac.upc.es)

### 2.2 Internal Web Server

An internal web server has been set up at UPM, which is accessible only to the members of the project (<http://www.dit.upm.es/long>). The server will contain internal documents, drafts, presentations, experiment description, preliminary results, and so on. The site is maintained by UPM.

### 2.3 Public Web Server

The public web server is maintained by UPC (<http://long.ccaba.upc.es/>). As stated in the technical annex a preliminary version is available in month 6 (May 2001). The web server is also available via the 6Bone (<http://long-ipv6.ccaba.upc.es/>) in order to increase the visibility of the project within the IPv6 research community.

This web site is intended to be a repository of documents related to IPv6 activities, including references to well known web sites, sites containing tools for IPv6 transition mechanisms and traffic measurement, standardization bodies, and white papers, tutorials, presentations, projects and relevant papers.

During the development of the project technical documents, public reports, the guidelines and recommendations will be made available to the research community.

A list of activities where LONG participates will be maintained including the participation at international conferences, publication of papers in well known journals, contributions to standardization bodies and fora, etc.

the guidelines and recommendations developed in the project will be published at the web site as well as software tools and applications for IPv6 environments.

### **2.3.1 Software tool distribution**

At Carlos III University of Madrid (UC3M), in LONG project framework, they have migrated MGEN application to IPv6 so that it can generate and receive all kind of IPv6 packets (including Hop by Hop options, routing header and destination options).

The tool may be found at <http://long.ccaba.upc.es/>.

### 3. Participation in Standardization Bodies and other Fora

At present, the most significant activities related to the deployment of IPv6 are gathered round the IPv6 Forum and the working groups of IETF (ipngwg, ngtrans, multi6). Other working groups are IPv6 (<http://www.ipv6.org/>), the 6Bone (<http://www.6Bone.net>), IPv6 Taskforce (<http://www.ipv6-taskforce.org/>), and ETSI Bake-Off (<http://www.etsi.org/bake-off/>).

#### 3.1 IPv6 Forum

A world-wide consortium of leading Internet vendors, research & education networks are shaping the IPv6 Forum, with a clear mission to promote IPv6 by dramatically improving the market and user awareness of IPv6, creating a quality and secure Next Generation Internet and allowing world-wide equitable access to knowledge and technology, embracing a moral responsibility to the world.

To this end the IPv6 Forum will establish an open, international forum of IPv6 expertise, share IPv6 knowledge and experience among members, promote new IPv6-based applications and global solutions, promote interoperable implementations of IPv6 standards, co-operate to achieve end-to-end quality of service, resolve issues that create barriers to IPv6 deployment. The IPv6 Forum will not develop protocol standards.

The site of the IPv6 Forum is located at: <http://www.ipv6forum.com/>. The calendar of IPv6 Forum conferences and global summit events may be found here.

Telefónica and Ericsson/Telebit are founding members of the IPv6 Forum. So TID and TED may provide updated information of the main topics of interest for the project. UPC intends to participate in IPv6 Forum meetings and discussions in the near future.

#### 3.2 IETF

The Internet Engineering Task Force has sole authority for IPv6 protocol standards. Regular meetings are held. Not all the meetings include all the working groups. For LONG project the working groups of interest are briefly described later. The calendar for planned meetings may be found at <http://www.ietf.cnri.reston.va.us/meetings/meetings.html>.

Currently there are four meetings scheduled:

- Summer 2001 – 51<sup>st</sup> IETF. August 5-10, 2001. London, UK.
- Fall 2001 - 52<sup>nd</sup> IETF. December 9-14, 2001. Salt Lake City, Utah. Host: Novell.
- Spring 2002 - 53<sup>rd</sup> IETF. March 17-22, 2002. Minneapolis, MN. Host: TBD.
- Summer 2002 - 54<sup>th</sup> IETF. July 14-19, 2002. Yokohama, Japan. Host: WIDE project. Sponsor: Fujitsu.

The program for the 51<sup>st</sup> IETF meeting in London on August 5-10, 2001 includes sessions on IPv6 (IPng) and IPv6 transition (ngtrans). People from both UPM and UC3M plan to attend the meeting and report the main interesting topics for the project.

Another expected result of the project research is the generation of drafts for the IETF community, a first step to become Internet standards.



### **3.2.1 IP New Generation (ipngwg)**

The next generation of the Internet Protocol (IPv6) is intended to support Internet traffic for many years into the future by providing enhancements over the capabilities of the existing IPv4 service. This working group will produce specifications for the core functionality of that service.

The site is located at: <http://www.ietf.cnri.reston.va.us/html.charters/ipngwg-charter.html> and <http://playground.sun.com/pub/ipng/html/ipng-main.html>

### **3.2.2 New Generation Transition (ngtrans)**

The goals of the ngtrans working group are: to specify the tools and mechanisms that might be used for transition to IPv6; to write documents outlining how the various transition tools and mechanisms might apply to various scenarios for a transition to IPv6; to coordinate with the IPv6 6Bone testbed, operating under the IPv6 Testing Address Allocation allocated in Experimental RFC 2471; to foster the development, testing, and deployment of IPv6; and to coordinate appropriately with other IPv6 related IETF activities and activities in other organizations.

The site is located at: <http://www.ietf.org/html.charters/ngtrans-charter.html>

### **3.2.3 Site Multihoming in IPv6 (multi6)**

A multihomed site is a site that has more than one connection to the public Internet with those connections through either the same or different ISPs. Sites choose to multihome for several reasons, especially to improve fault tolerance, perform load balancing, etc. Multihoming today is largely done by obtaining a block of address space for the site and then advertising a route for that prefix through each of its ISP connections. The address block may be from the so-called provider independent space, or may be a sub-allocation from one of its ISPs. A site's ISPs in turn advertise the prefix to some or all of their upstream connections and the route for the prefix may propagate to all of the routers connected to the default-free zone (DFZ). As the number of sites multihoming in this manner increase, the number of routes propagated throughout the DFZ increases and overall routing stability decreases because of the burden on convergence time. This WG will explore alternative approaches with better scaling properties. Specifically, the WG will prefer multi-homing solutions that tend to minimize adverse impacts on the end-to-end routing system and limit the number of prefixes that need to be advertised in the Default-Free Zone (DFZ).

The site is located at: <http://www.ietf.org/html.charters/multi6-charter.html>

## 4. Participation in Conferences, Workshops and Journals

During these six months of activity several presentations of the ongoing work in the project have been made. It is foreseen a significant participation in conferences and workshops during the activity of the project.

### 4.1 List of events where LONG was present

- Global IPv6 Forum Summit. Madrid, January 29<sup>th</sup>-February 2<sup>nd</sup>, 2001. Several presentations of people working in the project were given. The complete program may be found at the web site of the event:

<http://www.consulintel.es/Html/ForoIPv6/madridgishomeeng.htm>

- LONG: IPv6 Trials and Test-Beds, Carlos Ralli (TID).
- IPv4 to IPv6 Transition, Carlos Ralli (TID).
- Mobility in IPv6, Tomás de Miguel (UPM).
- QoS provision for mobile access networks using IPv6, Alberto López (UPM).
- Active Networking for IPv6, Arturo Azcorra (UC3M).
- Porting Applications into IPv6, Eva Castro (UPM).
- Multicast in IPv6, David Larrabeiti (UC3M).
- QoS in IPv6, Alberto López (UPM).

### 4.2 List of Conferences where LONG may submit a paper

- iDMS 2001. 8<sup>th</sup> International Workshop on Interactive Distributed Multimedia Systems. Garstang Country Hotel, Lancaster, UK. September 4-7, 2001.
- COMPUTER NETWORKS: The International Journal Of Computer And Telecommunications Networking. Call For Papers. Special Issue On The New Internet Architecture. Submission deadline: September 30<sup>th</sup>, 2001.
- PROMS 2001. 6<sup>th</sup> International Conference on Protocols for Multimedia Systems (). Enschede, The Netherlands. October 17-19.
- Eurescom Summit: 3G Technologies and Applications. Heidelberg. November 13-15, 2001.
- "XI Jornadas Telecom I+D". Madrid, Barcelona, Valencia. November 21–22, 2001.

## 5. Dissemination Activities

### 5.1 Past Events

Just at the beginning of the project, LONG was deeply involved in the Global IPv6 Summit 2001, held in El Escorial (Madrid) from January 29<sup>th</sup> to February 1<sup>st</sup>. This was a very important event related to IPv6 where several presentations were given by members of the project (<http://www.consulintel.es/Html/ForoIPv6/madridgishomeeng.htm>). The event was distributed, as indicated in the related press release, through ISABEL and MBone (thanks to RedIRIS). A short report of the details of the MBone distribution may be found at <http://www.rediris.es/rediris/boletin/>, (Boletín n. 56).

All the sessions were distributed using ISABEL platform from El Escorial to UPM, TID and UPC (Barcelona). UPM is the technical coordinator for events and demonstrations and they were in charge of the technical organization of the event.

### 5.2 Planned Activities

As part of the dissemination activities of the project, it is intended to participate in some significant events (about two per year) related to IPv6 deployment and technical discussions. As mentioned before, one of these events was the Global IPv6 Summit. It is expected that LONG will participate also in the next edition of the Global IPv6 Summit 2002 that will be held in Spain in the first quarter of 2002. Two goals are in mind for this event: to use IPv6 for the network infrastructure and to have ready the migration to IPv6 of the ISABEL platform. Perhaps both goals may not be achieved at that time, but they are expected for the end of the project.

A follow up of the events that will be held, mainly in Europe, related to IPv6 Forum activities and other IST projects will be made. Once an event is identified as a target for a LONG dissemination activity, we will contact the organizers in order to confirm the feasibility and to define how the collaboration will take place.

Two types of activities have been identified: the participation in experimental and demonstration IPv6 infrastructure, and the use of the migrated version of the ISABEL environment. This latter action is coordinated by the UPM team as the developers of the platform.

Finally, it is envisaged to organize a LONG workshop at the end of the project to present some of the experiences performed with IPv6 islands interconnected with mixed IPv6 and IPv4 access networks using the transition mechanisms evaluated within the project. The availability of the ISABEL environment migrated to IPv6 and the evaluation of the overall platform are one of the main results to be presented. Another foreseen possibility is to collaborate in the organization of a big conference or workshop instead of organizing one more event. This latter alternative may be interesting in order to not contribute to the proliferation of workshops with a reduced audience. Of course, the possibility of using ISABEL to distribute the sessions and gain a much larger audience will be considered.

### **5.3 Technology Transfer**

Technical information exchange with people in our near environment is sought as an important outcome of the project. All partners have some contacts with companies that may benefit from the know how developed in the project. As a tentative list we plan to approach the following ones: Nortel, Xfera (new 3G mobile service provider), Ericsson Spain, Nokia Spain, Cisco, Retevision, Menta, Airtel.

## 6. Relations with other Projects

### 6.1 IST Concertation Meetings

On March 13<sup>th</sup> 2001, Carlos Ralli, as coordinator of the LONG project, attended the "Concertation meeting about IPv6 deployment in Europe". In this meeting, coordinators of several IST projects together with equipment providers (like Cisco, Ericsson-Telebit) and representatives of IPv6 Forum and UMTS Forum, discussed about the way to promote the deployment of IPv6 throughout Europe.

### 6.2 IST Projects

A first dissemination action about the LONG project was made in the Wireless IP Workshop (Brussels, March 12<sup>th</sup>, 2001). Carlos Ralli (TID) attended the workshop. Talks about mobile and wireless systems were the main contents but IPv6 was present in most of the presentations and discussions. A leaflet with the list of the ongoing projects related to IPv6 was distributed among the attendants.

The following paragraphs compile a list of projects that have some work related to LONG and therefore some kind of liaison should be encouraged or projects where one or more LONG partners participate in.

**6INIT.** The IPv6 INternet IniTiative project is a Fifth Framework EU funded project, under the Information Society Technologies (IST) programme (IST-1999-12383). It features 11 principal partners and international sponsorship from both NTT (Japan) and Viagenie (Canada). The objective of the 6INIT project ([www.6init.org](http://www.6init.org)) is to promote the introduction of IPv6 multimedia and security services in Europe. The 6INIT project will provide guidelines on how to set up an operational platform providing end-users with native IPv6 access points and native IPv6 services. TED is one of the partners and may act as contact between both projects.

**6WINIT.** The IPv6 Wireless INternet IniTiative project will validate the introduction of the new mobile wireless Internet in Europe. It will investigate and validate the set up of one of the first European operational IPv6-3G mobile Internet initiatives, providing the 6WINIT project customers with native IPv6 access points and native IPv6 services in a 3G environment. It will concentrate on the problems raised by the mobile dimension; it will build on the existence of an experimental fixed IPv6 environment from other initiatives, and will link into such existing infrastructures. The project will provide a number of testbeds including one in a particular applications environment, namely healthcare (<http://www.cs.ucl.ac.uk/research/6winit/>). TED is one of the partners and may act as contact between both projects.

**MOBY DICK** (IST-2000-25394). Mobility and Differentiated Services in a Future IP Network (<http://www-int.berkom.de/~mobydick/>) is an IST project with participants from telecom companies (including PTIN), manufacturers, and research institutes and universities (including UC3M) that aims to develop, implement and test end-to-end communication components based on IPv6 involving mobile systems. Vertical and horizontal hand-over, QoS and AAAA DNS query mechanisms are key points in their project. PTIN and UC3M are partners and may explore the possibilities for collaboration.

**GCAP** (IST-10504). Global Communication Architecture and Protocol for new QoS services over IP networks (<http://www.laas.fr/~berthou/Public/gcap.html>). GCAP is an IST project

with the participation of UC3M, devoted to define and develop new QoS protocol architectures over IPv6, with special emphasis on multicast, by means of active networking technology. Experiments will be carried out using European academic and research networks. UC3M may act as liaison with this project.

Other IST projects that may be interesting to have some kind of contacts are the following ones:

**AQUILA.** Adaptive resource control for QoS Using an IP-based Layered Architecture.

**SEQUIN.** Service Quality across Independently managed Networks.

**NETGATE.** Advanced Network Adapter for the new Generation of mobile and IP based Networks.

**DriVE.** Dynamic Radio for IP-services in Vehicular Environments.

**WINE GLASS.** Wireless IP Network as a Generic platform for Location Aware Service Support.

**BRAIN.** Broadband Radio Access for IP based Networks.

**SUITED.** Multi-segment System for broadband Ubiquitous access to Internet services and Demonstrator.

### 6.3 EURESCOM Projects

**SALTAMONTES (P1115).** Selected Quality of Services Provision in an Multi Protocol Label Switching/Differentiated Services Internet. The goal of the SALTAMONTES project will be to study and evaluate issues related to QoS, implemented by the Differentiated Services approach and Multi Protocol Label Switching (MPLS), whereby the project will focused on the migration concept of IP networks towards the use of MPLS, MPLS based enhanced IP services, and MPLS interoperability. The starting point of the project will be the results of the EURESCOM project P1006: "Differentiated Services – Network Configuration and Management (DISCMAN)". The outcome of DISCMAN will be the bases that will enable SALTAMONTES to obtain a solid experience in the above mentioned topics. The project is starting in April 2001. More information may be found in:

<http://www.eurescom.de/>

**AMPIIPv6.** Advanced Multi-Provider IPv6 project (P1113). The basic features of IPv6 have been tested and deployed in various experimental/trial networks. Some specific aspects, such as transition, peering and always-on, have been tested in the P1009 project. There is however little experience of some of the newer features of IPv6 that are still being standardized. This project will investigate via practically deploying an IPv6 network among the project partners with a selection of these new features (Addressing, DNS, mobile IP, network security etc.) and will help to answer the development issues that arrive when deploying IPv6 in a multi provider environment. The project reuses results from EURESCOM project Armstrong (P1009). The project is planned to start in spring 2001. More information may be found in: <http://www.eurescom.de/>.

## 6.4 COST Actions

**COST 263** Action on " Quality of Future Internet Services (QoIS)". (1998 -2002). The web site is located at: <http://www.fokus.gmd.de/research/cc/glone/projects/cost263/>. UPC and UC3M are participating actively in COST 263.

The motivation for this action states that coordination of activities in the area of quality of Internet services is needed at the European level for researchers, engineers, governments, standardization bodies, Telecoms, businesses and organizations because all of them are using the Internet and are going to use it at much larger scale. Despite the differences in usage scenarios they all need reliable, secure, fairly charged Internet services with guaranteed quality. Currently, there is no structured coordination effort in Europe in this area, while the need for such coordination is well recognized and stressed in such non-European initiatives as Next Generation Internet, Internet2, etc.

The main objectives of the Action are:

- 1) To coordinate, from a European perspective, concerted actions among involved European participating organizations and research groups being active in the field of the quality of Internet services. The COST sponsorship will be also used for existing events, to give them the appropriate focus.
- 2) To establish and maintain the technical programme in the area of QoIS aiming at research, technical and engineering improvements of the quality of existing and emerging Internet services, and providing dynamic output for the European internetworking community.
- 3) To enable coordinated contributions of European participants to the Internet-related standards made by organizations, mainly IETF. This coordination is intended to improve the quality of contributions, e.g. to enable and coordinate independent interoperable implementations of proposed Internet protocols, to help in dissemination of results among interested parties.

## 6.5 Other Research Projects

**SABA-2.** New Services for the Broadband Academic Network – 2.

The Spanish research project SABA-2 (CICYT TEL99-1117-C03) may collaborate with LONG until its termination in December 2001. SABA-2 has set up a platform connecting a significant number of Spanish universities which can be used for the dissemination of the LONG results. SABA-2 performs regularly distributed workshops, meetings and courses (over RedIris). UPM, UPC, UC3M and TID are participating in SABA-2.

**i2CAT.** Internet 2 in Catalunya. The i2CAT project is building an experimental and precompetitive advanced Internet platform with the aim of promoting both the development of broadband Internet applications and services and the deployment of a broadband information infrastructure. The members of the project include the main telecommunications operators in Catalunya (Telefónica, Retevisión, Menta, Al-pi, Airtel, Tradia), communications equipment providers (Alcatel, Ericsson, Cisco, Nortel), private services companies (CCRTV-TV3, Localret, Mediapark, Prous) and public entities (FCR-CESCA, DURSI, UPC and all the rest of the universities in Catalunya). The project is coordinated by the team at the UPC. The core of the network, named GigaCAT, is located at the Advanced Broadband Communications Center (CCABA) at the UPC. CCABA is in charge of the GigaCAT which objectives are: testing the new generation of Internet protocols (IPv6, IPv4-IPv6 migration, IP mobile, IP

multicast, MBGP, Differentiated Services, MPLS); setting up an optical network using WDM technologies; evaluating different network access technologies (xDSL, modem cable, FFTH with Gigabit Ethernet, LMDS, GPRS, UMTS); and analysis of IP traffic and measurements of QoS. More information may be found in

[http://www.ccaba.upc.es/projects/i2cat/index\\_english.htm](http://www.ccaba.upc.es/projects/i2cat/index_english.htm).

In summary, an straightforward collaboration through the UPC may be established and many synergy may result from it.