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Abstract: <p>This deliverable reflects the initial plans of dissemination and related activities of 6POWER project.</p> <p>Addresses the dissemination within IST Clusters and Concertation meetings, conferences, workshops, publications, standardization Fora and standards groups (IETF, ETSI, etc.), other related organizations or entities (IPv6 Forum, IPv6 Task Force, PLC Forum, etc.), liaison to national activities and user groups, and partner related activities.</p> <p>The project also has plans to interact at international level with sponsors and other supporting organizations, mainly for trials, but also considering public events.</p>

Keywords: Concertation, Conferences, Dissemination, Events, Exploitation, IPv6 Cluster, IST, NGN-I, Optimist, Publications, Users.
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Executive Summary

Within this document, the initial project dissemination plans are provided.

Identifies project and IST level communication, events to be organized by the project, participation in standards activities, presentation of project results in workshops and conferences as well as publication initiatives and on-line dissemination, via the web site mainly.

Early exploitation plans of the project partners and their associated companies and user groups are also detailed, as identified in the early beginning of the project.

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1. INTRODUCTION

The main goal of the project is to contribute to ensuring affordable broadband access and the deployment of IPv6 in Europe, as stated in the conclusion of the Presidency from the Barcelona European Summit.

In order to achieve this goal, the project will research the native support and deployment of IPv6, QoS and other advanced services over Power Line Communication networks.

In order to achieve this goal, the project has defined the following objectives:

- Research native IPv6/IPv4 and related protocols or advanced network services (QoS, security, multicast, mobility and so on) support over broadband Power Line, in several platforms/devices, including the necessary standardization activities mainly on the IETF, but not limited to.
- Adaptation of several next generation applications and services required for a correct evaluation of this technology and the actual support of the advanced network services, including VoIP, multi-conferencing and audio/video streaming.
- Field Trial and Evaluation of several devices, services and network prototypes, interconnected with other major IPv6 network trials, like Euro6IX and 6NET.

Other key features of this project with respect to other projects that may be related in any way to PLC, IPv6 or QoS (among other advanced services) are:

- For the first time, a large-scale deployment of very high speed broadband PLC will be performed in Europe. Currently deployed technologies in Germany and other European countries only provide data rates up to 2 Mbps and do not have QoS support. The PLC technology deployed in this project will provide up to 45 Mbps and will support QoS features to the upper layers (IPv6) through well-defined and standardized interfaces.
- The project will provide the support for emerging technologies and will make possible their actual evaluation and assessment. These technologies, like VoIPv6, and advanced “next generation” digital set-top-boxes, will have the right scenario to benchmark the next generation services as high-speed interactive TV, secure e-commerce, virtual shopping, infotainment and related applications.
- The project will be active in dissemination and linkage activities, with other related Foras and Projects, including IPv6 Forum, 6Link, IPv6 Cluster, and other events related to IPv6, PLC, and related technologies, in order to publicize the project results.

In the context of this document, the most important concept is the last one above indicated: The project dissemination and linkage activities, together with the standardization activity, if needed.

2. DISSEMINATION STRATEGY

The deployment of a pan-European IPv6 networking infrastructure supporting co-operative Research and Development across Europe belongs to the key strategic objectives of the 5th Framework Programme of the EC.

At the Barcelona Council in March 2002, it was clearly indicated as a priority, the further development of broadband and IPv6. This was followed in June, by a call on Member States from the Telecommunications Council to take further steps towards the deployment of broadband and IPv6, as part of the e-Europe 2005 plan.

Given the relevance of the issues addressed in the project, a comprehensive approach must be adopted towards the appropriate:

- Visibility of project achievements.
- Establishment of synergetic cooperation with other related projects and working groups.
- Accomplishment of wide dissemination to industry and scientific communities.
- Exploitation of the research results by project partners.

Towards this end, the strategy for creating maximum awareness will comprise, at a minimum, the following tasks:

- Identification of main target groups of project results.
- Production of documentation and material for the targeted groups, tailored to their specific information requirements.
- Identification of distribution channels, multipliers and key events for dissemination opportunities.

In addition to producing information content and making it accessible through the 6POWER website, the project will adopt an active role in disseminating its outcomes by organizing, co-organizing or participating in workshop, events, symposiums and conferences, when appropriate, where project results will be presented and discussed with a wide audience.

3. TARGET GROUPS

The activities and results produced by this project are of interests to various communities.

A few target groups for the dissemination of results are already identified.

The major dissemination groups comprise:

- Researchers and Developers from other IPv6 projects, performing experimentation of broadband, IPv6, QoS and multicast.
- Application developers where QoS and multicast could be relevant.
- Vendors and implementers of networking equipment and software.
- Electricity providers.
- Telcos, ISPs and infrastructure providers, building networks that require usage of power and data in distribute locations (3G Base Stations and WLAN Access Points, for example).

In the starting phase of the project special emphasis of dissemination activities will lie on the setting up of liaisons with other research groups and projects to plan for common experimentation activities and test-beds, including testing new applications.

The next group to be addressed will include vendors that could be interested by developing and implementing PLC hardware and the required firmware on new products that could also be trailed by the project.

Then new electricity providers will be approached in order to extend the test-beds to other countries and demonstrate the feasibility of the PLC business case.

Finally, actual Telcos, ISPs and other infrastructure providers will have the opportunity to take advantage of the PLC technology to quickly deploy networks that require distribution of data and power to selected points, where its viable to use the power line technology to avoid a specific cabling for the data.

4. CLUSTERING, LINKAGE AND LIAISON ACTIVITIES

The project has early established very good contacts, even before the start of the project with different actors around the world, in part because existing relations of the partners, but also because very early dissemination activities, and contacts with interested sponsors.

These liaisons will be used for exchange of information, organization of events, contribution towards standards and common specifications.

4.1 IST IPv6 Cluster

A cluster of projects developing IPv6 related technologies has been set up within the IST programme.

For the transition process towards native IPv6 networks to gain momentum, it is necessary to bring together a critical mass of networking infrastructure and to demonstrate the efficiency and maturity of the supporting technology required for the operation of the next generation networks. Project results from 6POWER will constitute valuable contributions for the realisation of such an advanced infrastructure that helps to put Europe in a position to play a leading role in defining the next generation of networking and application technologies.

4.2 IST Projects

European Commission Information Society Technologies Programme, is funding a number of projects with a focus on IPv6 research and development activities, broadband, and very few related to PLC and similar technologies.

Several project partners are also partners of a few of these projects, but in general they actively participate in Concertation and Clustering activities, that provide very good occasions for increasing the project awareness and linkage.

A large set of projects is addressing different technical aspects related to IPv6 (e.g. IPv4 to IPv6 transition, Quality of Service, etc.). It includes IPv6 Projects that have a particular emphasis on IPv6, with the main goal being the research and development related to the protocol itself and projects than can be called IPv6 Related Projects, which are employing IPv6 as part of their broader goals.

4.2.1 Supporting projects

Three special projects were started in March, July and October 2002, respectively, as accompanying measures to the research and development projects.

- The 6LINK project was designed in order to support the IPv6 Cluster activities, via consensus building, dissemination on consensus agreements and exploitation of the consensus.
- Eurov6 (the European IPv6 Showcase) has as principal objective to show the usage of IPv6 products and services and their impact to anyone, at anytime, by the means of fixed and nomadic showrooms.

- IPv6 TF-SC's (IPv6 Task Force Steering Committee) main goals are to discover and fill gaps, provide strategic guidance with the assistance of a number of industry and academic players, to quickly propose measures to the appropriate bodies, to involve the European Commission and to verify sustained activities and implementation of proposed measures, towards the global deployment of IPv6.

Both Eurov6 and the IPv6 TF-SC include special liaison with similar international initiatives, in order to raise political and industrial awareness related to IPv6 on a global scale.

6LINK, on behalf of the IPv6 Cluster, has issued the booklet 'IPv6 Research and Development in Europe' that provides information and references to over 30 projects participants of the IPv6 cluster. 6POWER is part of this guide, and is actively participating among the various activities at the level of an IPv6 Cluster, especially considering that Consulintel is the main editor of this work and also part of 6LINK, Eurov6 and the IPv6 Task Force Steering Committee.

4.2.2 6NET & Euro6IX

Two large very scale experimentation platforms are investigating the real deployment of IPv6. 6NET and Euro6IX, started in January 2002, are building dedicated, native, IPv6 networks, involving National Research and Education Networks, telcos and ISPs, in a complementary approach, and considering other aspects like applications and Internet Exchanges.

6NET is a three-year European project aims to help European research and industry play a leading role in defining and developing the next generation of networking technologies. The project builds a native IPv6-based network with both static and mobile components in order to gain experience of IPv6 deployment and migration from existing IPv4-based networks. This will be used to extensively test a variety of new IPv6 services and applications, as well as interoperability with legacy applications.

Euro6IX project will research, design and deploy a native pan-European IPv6 network, called the Euro6IX test-bed. It will include the most advanced services obtainable from present technology and will follow the architecture of the current Internet (based on IPv4). It will consider all the levels needed for the worldwide deployment of the next generation Internet.

Several partners of 6POWER participate in Euro6IX project, and we expect a number of collaboration activities carried out between all these projects. Euro6IX and 6NET have cooperation activities, and the networks are interconnected in London and Torino.

4.2.3 Projects where IPv6 is the main focus

Starting in January 2000, 6INIT was one of the first attempts to validate the introduction of IPv6 technology in Europe.

GCAP studied multicast and QoS based on IPv6 and DiffServ in relation to active networks technology.

The goal of the WINE project was to build fully IPv6-based globally optimized wireless Internet environments with QoS awareness.

In December 2000, LONG was initiated with the aims to foresee and solve problems related to the design, configuration and deployment of IPv6, especially when new services and applications are involved.

6WINIT continues the work done in 6INIT, but with an emphasis on wireless access and IP mobility, combining IPv6, GPRS, and 3GPP/UMTS.

6NET and Euro6IX, started in January 2002, as major projects for the broad deployment of IPv6 in Europe, building dedicated, native, IPv6 networks, involving National Research and Education Networks, telcos and ISPs, in a complementary approach, and considering other aspects like applications and Internet Exchanges.

In March 2002, the SATIP6 project started to examine the technical issues facing satellite broadband access in the coming years, including adaptation of DVB-RCS for IP and IPv6 introduction.

OverDRiVE is aimed at UMTS enhancements and the coordination of existing radio networks into a hybrid network to ensure spectrum efficient provision of mobile multimedia services, based on the IPv6 architecture.

6QM will develop a comprehensive approach towards IPv6 QoS measurement.

6HOP studies how multi-hop heterogeneous wireless IPv6 networks can support mobility of users, packet routing and adaptation to varying link conditions.

4.2.4 IPv6-related Projects

The following projects aren't specially focused on IPv6, but have some related activities, rely on IPv6 networks or will run with IPv6, sooner or later.

In April 2000 DRiVE started, aiming at enabling spectrum-efficient high-quality wireless IP in a heterogeneous multi-radio environment to deliver in-vehicle multimedia services, including the design of an IPv6-based mobile infrastructure that ensures the inter-working of different radio systems.

HARMONICS proposes a common dynamically reconfigurable fibre infrastructure, deploying flexible wavelength routing integrated with flexible time slot allocation in a new Medium Access Control protocol.

ANDROID is an Active Networks project, started in June 2000, whose aim is to design a means of managing active services through the use of policies. Several IPv6 application layer software modules are being developed.

The overall aim of the CRUMPET project is to implement, validate, and trial tourism-related value-added services for nomadic users (across mobile and fixed networks).

GÉANT was started on November 2000, in order to provide pan-European IPv4 interconnection between National Research and Education Networks (NRENs) in Europe at gigabit speeds, based on direct access to optical connectivity, migrating finally to IPv6.

NGNi's prime mission is to establish an appropriate infrastructure to operate the first European open environment for research organizations and industry to investigate a broad range of topics and issues covering NGN evolution, and create opportunities for strategic discussions on a global scale.

NGN-LAB establishes a platform for the development of advanced Internet technologies, by provisioning the required system infrastructure and interactive applications, to realise Next Generation Network related experiments.

Moby Dick, started on January 2001, develops, implements, and evaluates an IPv6-based mobility-enabled network architecture with Authentication, Authorisation, Accounting and Charging (AAAC) services and support for Quality of Service (QoS), in order to continue the evolution of the 3rd generation mobile and wireless infrastructures towards the Internet.

TORRENT is building a test-bed for multi-service residential access networks that will allow the project to demonstrate the benefit of intelligent control, both for the customer and for the network operators and service providers, with applications based on IPv6.

MIND takes as starting point the concept of an IP core, accessed by a variety of technologies. Research is conducted in the areas of services and applications, the access network architecture and the air interface. The project investigates new business models for 'systems beyond 3G', mapping the value chain into the functional entities.

@HOM, started on September 2001, is dedicated to the promotion of broadband home networks and the proof of concept of an open, end-to-end and seamless network architecture, with the objective to provide citizens with the emerging IP-based broadband services. Will include an IPv6 testbed demonstrator.

The FUTURE HOME project will create a solid, secure, user friendly home networking concept with open, wireless networking specifications and will introduce usage of IPv6 and Mobile IP protocols in the wireless home network

In April 2002, INTERMON was started, in order to enhance the inter-domain QoS analysis in large-scale, multi-domain Internet (IPv4, IPv6) infrastructures.

WirelessCabin project is developing wireless access technologies for aircraft cabins.

xMOTION will specify and test requirements emerging from the nature of safety and security providing organisations operating in varying degrees of emergency (in particular communication and information needs).

SEEREN, started in October 2002, is aiming at easing the "digital divide" that still separates most of the South Eastern European countries from the developed world, expanding GÉANT reach.

MESCAL will start in November 2002, and aims to propose and validate scalable, incremental solutions that enable the flexible deployment and delivery of inter-domain Quality of Service (QoS) across the Internet, applicable for both, IPv4 and IPv6.

4.3 European IPv6 Task Force

The European Commission initiated an IPv6 Task Force driven by major and key European and worldwide players, to develop a comprehensive action plan by the end of 2001 aiming at ensuring the timely availability of IPv6.

The conclusions and recommendations of the Task Force were successfully submitted to the European Council Spring Meeting of 2002, under the Spanish presidency (Barcelona), and in the context of this document, a series of recommendations pertaining to the implementation of IPv6 by all relevant ICT sectors were proposed by the Commission.

As a result, the Heads of State resolution was to prioritize the widespread availability and use of broadband networks throughout the Union by 2005 and the deployment of the new Internet protocol, IPv6, as part of the e-Europe 2005 initiative.

One of the main achievements was a Communication from the Commission to the Council and the European Parliament called, 'Next Generation Internet - priorities for action in migrating to the new Internet protocol IPv6'.

As a complementary action, the European Commission called for the renewal of the mandate of the IPv6 Task Force as a platform for debate on critical issues concerning the deployment of IPv6.

As a consequence, the nature of the IPv6 TF-SC project is to be the main strategic instrument fostering the deployment of IPv6 technology in Europe. In addition, the project will collaborate with other regional groups and initiatives deploying IPv6.

The European Commission has called for the renewal of the mandate of the IPv6 Task Force as a platform for debate on critical issues concerning the deployment of IPv6. The mandate includes ensuring a working liaison with standards and Internet governance bodies, provisioning of a regularly updated review and plan of action (the European IPv6 Roadmap) on the development and future perspectives of IPv6 to co-ordinate European efforts, and establishing collaboration arrangements and working relationships with similar initiatives launched in other world regions.

As a first result, several European countries had already initiated national IPv6 Task Forces (Consulintel started the Spanish one in May 2002, followed by France, UK, Switzerland, France, and Germany). Several project partners are actively participating on this global effort.

The North America and Asia Pacific Task Forces had already initiated their activities, with the collaboration with the European Task Force, and Consulintel is also participating on these.

4.4 IPv6 Promotion Council

The IPv6 Promotion council is a Japanese initiative involving about 300 corporate members, for furthering widespread and upgrade of IPv6. It was formed in response to the e-Japan Priority Policy Program established in March 2001, which has the target to realize an Internet environment equipped with IPv6 by 2005.

Aims of the Council include showing international leadership within the field of Internet development, to develop human resources for an advanced information and telecommunications network society and to create and support new business related to hardware, software and its service associated with networks and terminals.

On 19th September 2002 the European Commission initiated IPv6 Task Force and the IPv6 promotion council of Japan announced to have approved a cooperation agreement to foster promotion and deployment and garner support for the new generation IPv6.

The Eurov6 project has also signed a specific cooperation agreement with the IPv6 Promotion Council.

One of the 6POWER partners, Consulintel, is already working with the Japanese partners as an opportunity to demonstrate such cooperation in practice, including common standardization and trials.

4.5 Industry Fora

We have identified already the IPv6 Forum, the PLC Forum and the HomePlug Alliance.

IPv6 Forum

The IPv6 Forum is mainly a marketing body compound by over 150 members, dedicated to the promotion and awareness of IPv6. This is a world-wide consortium of leading Internet vendors, Research & Education Networks, 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.

The IPv6 Forum is organizing and participating in many events worldwide. IPv6 Forum sponsored events include the Global IPv6 Summits all over the world, which provide an introduction to IPv6 to professionals specially in fields like: Internet Service Providers, e-commerce, Telco's, Utilities, Defense, Security, Finance, Public Administration, Education, and in general any kind of Telecom Professionals.

6POWER is already working very closely with the IPv6 Forum for awareness creation among the actors responsible for developing next generation networks, as indeed one of the project participants (Consulintel) is the chair of the Education, Awareness, Promotion and Public Relations Working Group.

A major event is being co-organized by Consulintel with 6POWER, in Madrid, 12-14th of May 2003.

PLC Forum

DS2 is a founder member of the PLC forum (Power Line Communications Forum) that brings together the main electricity utilities in the world with several PLC vendors (including ASCOM, DS2 and MAIN.NET). Its objective is to agree on standards and actions to enable rapid market growth in the power line telecommunications sector. DS2 has a seat on the Board of this organization and one of DS2's employees is chairman of the technical and regulatory working group. DS2 will use this position to further promote the results of the project within the world of electricity utilities during the open door days for PLC Forum members.

HomePlug

HomePlug Power Line Alliance is an industry Alliance comprised of industry leaders at each level of the value chain – from Technology to Services & Content. The Alliance members bring necessary capabilities and a financial commitment to the successful launch of the technology. The Alliance's mission is to enable and promote rapid availability, adoption and implementation of cost effective, interoperable and standards-based home power line networks and products. DS2 is a HomePlug's members from its beginning, working on the development of the Power Line Communications in-Home.

4.6 Standardization Bodies

The project will work very closely with IETF, ETSI, CENELEC and CISPR.

The IETF is the Internet and related protocols standardization body, and several project partners are heavily involved in their process. Expected contributions could be related to the IPv6 Working Groups, the autoconfiguration related works (zero router autoconfiguration WG), and others related to QoS (NSIS) and Multicast (MAGMA).

DS2 is among the leading Powerline Communication companies in the Standard making bodies. DS2 is a member of CENELEC, in particular SC 205, WG 10, and also of ETSI – PLT (Power Line Telecommunications) projects, playing leading roles as Vice-chairman in ETSI-PLT projects and reporters of documents about radiation, measurements and co-existence between in-home and access PLT networks in CENELEC and ETSI.

DS2 is also member of the International Standardization Organism, CISPR, and Chairman of the PLC Working Group. All these points allow the member play an important role on the definition of standards concerning PLC.

Consulintel is heavily involved in the ETSI Plugtest (for IPv6, IPSEC and QoS) and the new IPv6 Enable/Ready programs. Together with DS2 is working with ETSI in order to start a Plugtest program specific for PLC, that could be easily related with the others.

A major plugtest event is expected in parallel with the Madrid 2002 Global IPv6 Summit, and will be followed by a new one, involving IPv6, IPsec, QoS and PLC in 2004.

5. NATIONAL ACTIVITIES

There are number of national activities which will be followed by the project through partners in respective countries.

These activities are potential awareness and dissemination tools for the project results, in addition to potential users for trials and public demonstrations.

Some of these activities are related in the next sections.

5.1 France

The G6 gets together French academic and industrial people involved in IPv6, since the very beginning of the 6Bone. Some members of the G6 are part of entities directly involved in the 6NET project (i.e. Renater).

Within the French initiative called RNRT (Réseau National de Recherche en Télécommunications), led by the Ministry of Industry, several projects related to the deployment of IPv6 networks are going to be launched in Q4/2002 and Q1/2003. After a first phase during which the main focus was on network technology, these new projects will be mainly devoted to IPv6 applications, as:

EVERYWARE:

The goal of this project is to demonstrate new applications taking benefits from a network architecture based on both 2,5-3G and WLAN technologies using IPv6 mobility and authentication services. Fleet management applications for business applications will be the main target for this project.

INFRADIO:

This project is devoted to the deployment of IPv6/WLAN-based networks in a campus to provide the users (students, professors, guest professors, ...) with multimedia services. Security mechanisms will be deployed to allow these different users to access to the different applications within the campus and on the Internet. QoS over wireless links will be studied and deployed.

EPIS:

The goal of this project is to study how secure IPv6 networks can be deployed to fulfill the stringent requirements of banking applications. Using IPsec together with a new generation of smart cards will be studied.

5.2 Spain

SABA-DOS (New services for broadband academic network – 2):

SABA-DOS is a project, which addresses the design, experimentation and evaluation of tele-meeting, tele-education/learning and tele-conference over a next generation Internet. It supports broadband communications, multicast, quality of service control facilities and protocols like RSVP, IPv6, RTP-RTCP and other protocols which are considered to play an important role in the future Internet.

This project is devoted to the experimentation and evaluation of tele-meeting, tele-education/learning and tele-conference over a broadband communication network of second generation Internet type, with multicast, quality of service control facilities and protocols like RSVP, IPv6, RTP-RTCP as a key elements of the future Internet

PREAMBULO Project (Prototipo de red multiservicio de muy altas prestaciones basada en IPv4/IPv6 sobre multiplexación por longitud de onda):

PREAMBULO project is centered on IP over DWDM technologies and is aimed to create a high performance network that will interconnect three important research institutions in Madrid. Primary study issues will be the management functions of the optical network: traffic control, failure recovery and QoS. Advanced experiences will also be carried out to analyze the system behavior under QoS, multicast and IPv6 traffic.

MIRA (Metodologías para la Inspección de tráfico en Redes Avanzadas):

MIRA project has developed tools and applications to analyze and characterize the traffic of the Spanish National R&D Network RedIRIS.

ISAÍAS (INFRAESTRUCTURA SOFTWARE PARA UNA ARQUITECTURA INTELIGENTE EN APLICACIONES SINCRONAS DE INTERNET 2):

ISAIAS is a project funded by the Spanish Ministry of Science and Technologies that is related to the development of middleware to support synchronous applications in the Internet, considering different aspects like QoS, Security and specially the integration of several services as complementary to facilitate the deployment of audio and video applications.

CROWN (Components for Application Reaction on Wireless Networks):

CROWN is a project funded by the Spanish Ministry of Science and Technologies under PROFIT projects and its main goals are the evaluation of Adaptive applications mainly for audio and video in the context of no QoS services networks like the ones under the 2.5 and 3GPP perspective. The main topics that will be investigated are the mechanism for application adaptability and its integration in audio and video applications standards.

PISCIS (PROYECTO PILOTO DE UNA INFRAESTRUCTURA DE SEGURIDAD PARA EL COMERCIO INTELIGENTE DE SERVICIOS PISCIS):

PISCIS was a project developed under the FEDER initiative where a complete Security Framework was developed and applied to the secure e-commerce environment. A prototype of a PKI and a Audio_Music-Server were designed and several applications and protocols that extensively use smart-cards and security communications were considered.

5.3 Switzerland

National research network (SWITCH) has s-TLA for IPv6 and are involved in testing various IPv6 features across several interconnected networks such as CERN, ETHZ, EPFL etc. Swisscom also has already started some studies in IPv6.

Several technical schools are also experimenting with IPv6, but no commercial networks and applications are available in the country.

MCLAB is active in several IPv6 related projects have the IPv6 laboratory facilities available in their premises. The MCLAB network is interconnected to GEANT network, so that many experiments can be carried over with connectivity across Europe.

5.4 U.K.

Bermuda 2 Project:

The Bermuda 2 project (<http://www.ipv6.ac.uk/bermuda2/>) conducted trials of IPv6 on UK academic networks; UoS led the project, which also featured Lancaster and UCL. Bermuda 2 included studies in WLAN and Mobile IPv6.

Nor.Web:

UK was the pioneer country in the development of broadband PLC. Nor.Web, a joint venture formed by Nortel Networks and United Utilities, developed the first version of the digital power line modem with speeds around 1 Mbps.

Nor.Web demonstrated the feasibility of power line communications and triggered a large interest amongst utilities worldwide. The Nor.Web project was cancelled in 1999 due to unclear reasons, which probably included the strong opposition from radio amateurs in UK, who complained about the interference problems that they experienced during field trials with Nor.Web technology.

Even if the Nor.Web project was cancelled, it had a tremendous impact on the PLC industry, which took advantage of the momentum created by the project, and that learned from the experience gained in their field trials, specially in the area of radio interference. Second and third generation PLC technologies now use a variety of modulation techniques (spread spectrum, OFDM) that reduce the transmitted power spectral density, avoiding the interference problems found with Nor.Web technology.

Currently, PLC activities in UK are not progressing as fast as in other countries in Europe (probably because radio amateur associations still remember their bad experiences with first generation power line and have a hostile positions against PLC) but some activities are being carried out anyway:

Specifically, Scottish and Southern Electric (SSE, <http://www.scottish-southern.co.uk/>) has started pilot projects with several PLC technology vendors for providing broadband communications through power lines in rural areas in Scotland. There is a large expectation in this project, as it will be the opportunity to show radio agencies and amateur associations that current PLC technology is capable of providing multi-megabit speeds while keeping emission levels very low.

6. DISSEMINATION ACTIVITIES

The dissemination activities will have the responsibility of awareness creation of IPv6 deployment related issues among all the involved groups.

6.1 Press releases

The project web site will be used for publicizing related press releases and events.

Several partners will use also their web sites for publishing 6POWER press releases.

Several mailing lists related to broadband, PLC, IPv6, Next Generation Networks, standardization and projects will also be used for this purpose.

6.2 Project Website

The main dissemination tool of the project is the project website.

The domain names 6power.org and .net have already been registered and point to the same web site. These domains had been widely publicized thru most of the important search engines and portals, in order to facilitate the information search.

The project web site is continuously updated with the documents, press information, presentations and other information related to the project.

The site has both public and private space. All these public information is available on this site so that visitors can download those that are of their interest, by registering as users. All these users profiles will be maintained in the users group and whenever major changes are made with news, deliverables, events, etc. all these users will be notified via a short email.

The project partners will use the private web space and FTP server mainly for exchange of documents and mail archive.

6.3 IPv6 Cluster and IST Events

IPv6 Cluster workshops will be and opportunity for the project to disseminate the achievements and further realize collaboration with other related projects and initiatives.

IST events, and other events organized by other projects will be also targeted as a key dissemination tool of the project.

The project has already participated in the IST2002 event.

6.4 IPv6 and PLC Forum's events

The events of these Forums will be heavily used to disseminate the project results, as there are targeted to key user groups for the project.

The project already committed to participate in the next Madrid Global IPv6 Forum Event.

6.5 Conferences and Publications

The project will be actively participating in as many related events as possible, and submitting papers to those publications that are read by the target groups.

The project has already participated in several conferences, including the IST Broadband event.

6.6 Demonstration of IPv6 Applications

Several of the previously indicated events will offer the possibility to realize demonstrations of the project.

The project will be also a key and pro-active area of the Eurov6 project showcases.

7. USAGE PLANS

The project has plans to liaise with several Utilities, which will be invited to participate as project sponsors.

That will facilitate the internal, public and international trials, and also the dissemination and awareness of the project achievements.

7.1 Partner's Exploitation Plans

7.1.1 Network Operators/ISPs

Endesa, as a customer of PLC technology, wish the further development of this technology and that all troubles that may arise in the telecom operator network roll-out are properly overcome: that is, to achieve a proper service quality management and to avoid that the number of connected devices may over-complicate the network's design and operation.

PLC technology provides utilities with the possibility of offering telecommunication services through the electricity grid, opening new business opportunities.

From the telecom market perspective, PLC can promote further competition through a new "local loop" access to customers: the electricity grid "illuminated" with PLC.

One of the PLC network characteristics is its capillarity. The electricity cables can be found in every building and in every room within those buildings. This capillarity implies that a PLC network allows for the connection of many devices permanent and simultaneously.

The electric cable, used for telecommunication services, is a shared media for all the devices that attach to a single Transformation Center or PLC Head-End. In order to guarantee the services over a shared media to a number of devices is clearly useful to take advantage of the improvements introduced by IPv6, particularly by integrating the proprietary QoS qualities developed by DS2 over PLC with IPv6 standards.

Endesa hopes that the improvements introduced by IPv6, together with a good integration with the PLC Quality of Service management, may facilitate and simplify the design very much, as well as the roll out and operation of future PLC networks.

7.1.2 Manufacturers

6WIND:

6WIND commercializes solutions for enabling a smooth transition to the new mobile-multimedia-everywhere Internet based on IPv6. These solutions rely on two different equipments:

- A Customer Premises Equipment called 6WINDGate including all the features to provide the user with enhanced IPv4/IPv6 services (QoS, IPsec, IP filtering, multicast, mobility) and all the mechanisms for the IPv4/IPv6 coexistence and transition.
- A Point of Presence Equipment called 6WINDEdge able to provide a solution to deploy IPv6 services over a broadband network architecture (DSL in a first phase) whatever the

existing broadband architecture and the kind of service (IPv6-only, IPv4 and IPv6, IPv6 in IPv4) might be.

Thanks to its extended address format and to enhanced features, such as auto-configuration, mechanisms or anycast addressing, IPv6 is a solution for providing Internet access everywhere. Technologies such as ADSL, WLAN and PLC are key ones to leverage IPv6 deployment for home network and business applications.

6WIND will use the results of the project to define efficient IP architecture over PLC, to integrate the PLC technology in its low-end equipment range (6WINDGate) such as residential gateways and to study how the 6WINDEdge equipment can be adapted to PLC architecture.

The results will also be used to set partnerships with companies involved in the home equipment development to integrate the IPv6 technology in a large set of devices and appliances.

DS2:

All the technical activities described in this project are in line with DS2's long-term strategic plans and fit perfectly with our current line of products.

One of the main assets of DS2 is its complete portfolio of patents regarding Power Line Communications architecture and implementation issues. The results of this project, specially regarding QoS provisioning for PLC devices, will increase the value of DS2's Intellectual Property Rights portfolio.

Other intangible benefits of the project for DS2 will be related with the availability of an open IPv6-to-PLC standard interface. This open standard will favor the growth of both PLC and IPv6 technologies, and will put DS2 in an advantageous position due to its early delivery of a reference implementation of the IPv6-to-PLC standard interface. All the results achieved during the life of the project will be quickly integrated into the development and production processes of the enterprise and will be an important part of the DS2 technology.

PACE:

Pace is a commercial organization involved in the design, development and sale of Set Top Box products for domestic and SOHO requirements mainly for multimedia applications. The IPTV division of Pace specializes in these Set Top Box products for use on IP networks.

As a commercial organization, Pace plans to utilize the work done on IPv6 to promote Pace products and so the IPv6 versions as well. This will be done in various ways as:

- Working through the Pace partner programme.

The Pace partner programme involves a number of commercial organizations all of whom co-operate to provide end to end multimedia delivery systems. The programme includes Server manufacturers, Encoder manufacturers and others involved in head-end equipment and services supply. Also included are network equipment providers (including Alcatel, Nokia, Innovia among others) content providers, middleware vendors and the like. We would expect to work with partners to promote Ipv6 around the World together with those partners who were already able to work with this technology.

In fact Pace is working directly with a server supplier so as to ensure a demonstrable product within the 6POWER project.

We believe the influence of Pace within the Partner programme will be the most important route through which Pace promotes IPv6 networks and technology.

More information on the Programme can be found at:
<http://www.pace.co.uk/paceproducts/section.asp?section=IP>

- Exhibitions and Conferences:

Pace presents its products regularly around the world at exhibitions such as Supercom, ITU Asia, Streaming Media Europe and International Broadcast Equipment Exhibition. Pace will naturally promote IPv6 within the broadband service arena at these exhibitions once we have, with the 6POWER project, a demonstrable product and system.

- International Standards Committees:

Pace is a member of a number of International Standards bodies as: DVB (Digital Video Broadcast), DTG (Digital Television Group); member of industry standards bodies (DVB/DAVIC Interoperability Consortium, ATSC, ATVEF, EHSA - European Home System Association, DECT Forum, SCTE - Society of Cable Television Engineers, TV Linux Alliance); and active participant in CableLabs - CableModem, OpenCable, PacketCable, Cable Home, tComLabs, EuroPacketCable.

Once we are able to promote actively our IPv6 solution then the Pace representation on these bodies will of course include active promotion of IPv6 technology.

Clearly to date Pace is active in promoting use of IPv4 networks for distribution of multimedia services. Following the timescales in this project, PACE should be very effective in promotion of IPv6 technology from around mid of 2003.

7.1.3 Consultants, System Integrators and Application Developers

ASSA:

Our previous experience on internetworking multimedia over the Internet, has demonstrated us the importance of an integrated QoS management at all every layer for the provision of a good end-to-end quality sensation to the user. This project is a good opportunity for Agora Systems to test the benefits of this approach before incorporating such end-to-end QoS mechanisms in our products. In addition, PLC technologies seem to play an important role in next generation networks and home environments, and we also think that this project can help us very much to identify possible extensions that could be needed to accommodate our products in the PLC market.

In addition, we also plan to publish some research papers describing the results of this experiences and eventually standardize some of the proposed mechanisms in international fora, so that the research community can benefit from our results.

Consulintel:

6POWER will help maintain Consulintel's leverage on the Spanish market with IPv6 networks, consultancy, system integration, and training, as has been recognized during last 3 years.

Consulintel considers 6POWER as a key project as the PLC technology will provide new business opportunities, reinforcing the growth of the company and its investment in research, development, and marketing, increasing the experience and the number of full time dedicated employees.

Consulintel plan is to increase the number of IPv6 related innovative and advanced services, offering and applications, creating a more secure new Internet that would offer security warranties and QoS.

Consulintel already completed several papers and articles related to IPv6, and provided talks about the project in several events.

MCL:

Participation in the IST Programme is in-line with the lab's intention to provide a practical basis for collaborative research efforts (e.g. in photonic networks, next generation IP, service configuration protocols or mobile broadband services). It therefore supports the early availability of the most advanced infrastructures of all types, which will in turn allow for early experiments with advanced applications (e.g. remote high-volume data visualization, meta-computing or networked immersive virtual reality) requiring very high bandwidth or new services. It will also enable Europe to play a leading role in defining, standardizing and validating the next generations of network protocols (including those for the Internet) and other emerging broadband services. It will contribute to the long-term interoperability and seamless of advanced network infrastructures, services and applications.

7.1.4 Universities

This project will help to improve the knowledge and expertise in IPv6 and QoS management of the university present in the consortium. It will be mainly done thanks to the possibility of taking their current research activities to a real IPv6 over PLC network. Thus, it will be well placed for exploiting the general project results and increase the ability to support the European Internet industry, from its active R&D work and the coordination of the project trials.

It will also produce some research papers in national and international conferences and scientific journals from their activities in the project; furthermore, the direct cooperation with some industrial partners will help to increase and disseminate their knowledge and experience.

7.2 Users

The project already started considering several target user groups, that will participate in some of the trials.

7.3 Enrolment of Sponsors

The Consortium has the intention of entering into agreement with Sponsors interested in the evaluation of new products and services regarding IPv6 over Power Line Technology.

Some of the possible Sponsors are European Utilities, which will participate in the project, on the Field Trials and Evaluation of Prototypes and Services.

The Sponsors will provide the technical and personnel resources needed to develop pilot test-beds and small trials.

Those Sponsorships will bring the opportunity to test the prototypes in different network types and also disseminating the results of the new IPv6 products and services.

7.4 Joint Trials with other IST projects

Several trials are being planned that will involve the participation of other IPv6 related test-beds, and probably some other broadband project network, including optical networks. All these will be mainly used to interconnect different PLC test-beds across the world.

The project will be also involved in QoS measurement trials, most probably with 6QM.

8. SUMMARY AND CONCLUSIONS

The project participants had initiated early dissemination and awareness activities (presentations and papers in events and conferences), that provide a very good tool for gathering new “users” and “sponsors” for the research, development and trial activities of the project.

The dissemination is key for the correct awareness of the project results and achievements, and all the partners are heavily implicated towards this task.

This include liaison with IST Clusters and participation in Concertation meetings, conferences, workshops, publications. Also collaboration with standardization Fora, standards groups (IETF, ETSI, CENELEC, CISPR, etc.), and other related organizations or entities (IPv6 Forum, IPv6 Task Force, PLC Forum, etc.) is envisaged.

Furthermore liaison to national activities, user groups, and partner related activities would be properly considered.

The project also has plans to interact at international level with sponsors and other supporting organizations, mainly for trials, but also considering public events.