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Abstract:

The document introduces the approach followed by the project towards liaisons with other IST projects or clusters and cooperation with international bodies and foras.

The technology developed within the project will provide key components to support the transition towards IPv6 technologies in Europe, and improve the possibilities of the PLC broadband technology deployment.

It is important to coordinate and align with related groups for a fast uptake of the project results.

Keywords:

Business Plans, IPv6, PLC, Project Liaisons.

Revision History

The following table describes the main changes done in this document since its creation.

Revision	Date	Description	Author (Organization)
v1.0	30/05/2003	Document Creation	Jordi Palet (Consulintel)
v1.1	16/06/2003	Add section on IETF activities	Jean-Mickael Guerin (6WIND)
v1.2	17/06/2003	Added PLC FORUM and HomePlug	Chano Gómez (DS2)
v1.3	30/06/2003	Final review	Jordi Palet (Consulintel)

Executive Summary

This document describes liaison activities already started by the project and provides a roadmap for the future inter-project cooperation.

It extends on the approaches outlined in the Dissemination and Use Plan, which identified other IST projects and activities for potential cooperation.

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1. INTRODUCTION

The “Dissemination and Use Plan” deliverable detailed the opportunities considered by the project, in order to disseminate achievements from the project. It identified potential partners for cooperation within IST project clusters, industrial fora and standardization bodies working on issues addressed by the project, where it is expected that it can contribute with substantial input.

This document extends on the approaches outlined in the above-mentioned document, investigating how the project results can be used to support the work of those groups and how to promote the deployment of broadband PLC and IPv6. Describes also liaison activities that have already been started by the project and provides a roadmap for future inter-project cooperation.

High emphasis is put on forming synergies and cooperation with other IST activities and the dissemination of project results into the broad integrated initiatives for IPv6 technologies funded by the European Commission. Project groups of interests for cooperation with the project can be associated mainly with the existing related clusters of IST projects, mainly around the topics of IPv6 and QoS.

There is a lack for a PLC Cluster, but considering new projects funded in FP6, it will be possible to contribute to that activity. In any case, broadband activities can also be considered.

The project partner’s are actively participating in events organized by these clusters and even have contributed to their newsletters and other publications.

In addition there is a strong cooperation with other related projects, like 6LINK, 6NET, 6QM, Euro6IX, IPv6 TF-SC, because common partners and/or common activities undergoing.

Regarding to standardization bodies, members of the project are particularly active within IETF, where they are regular participants and contributors/authors to a number of working group drafts currently under preparation.

2. CLUSTER ACTIVITIES AND COOPERATION WITH IST PROJECTS

The Framework Programme considers clustering activities as a means to group and collectively build on their individual results and encourages to actively contributing to the work of specific clusters.

A number of projects within the IST framework can be identified, for which there exist an overlap of common interests with the work in this project and where there is a potential for mutual synergies.

In the case of 6POWER there can be identified target project groups for cooperation, starting with the large IPv6 Cluster, working on different aspects important for a fast Europe-wide deployment of IPv6.

Other clusters that are especially important for this project include projects with focus on QoS issues, broadband and PLC (not actually available).

Of particular mention are the IPv6 infrastructure projects of 6NET and Euro6IX and development groups within TF-NGN/GÉANT.

2.1 IPv6 Cluster

The European Commission Information Society Technologies Programme is funding a considerable number of projects focusing on IPv6 research. This represents an investment over than 180 M€, half funded by the EC.

Those projects are addressing different technical aspects related to IPv6 (including IPv4 to IPv6 transition, deployment, mobility, Quality of Service, etc.). The IPv6 Cluster provides an important coordination forum for IST Projects that have a strict emphasis on IPv6, with the main goal being the research and development related to the protocol itself, and IPv6 Related Projects, which are employing IPv6 as part of their broader goals.

The project is actively contributing to IPv6 Cluster activities, including an on-going publication ‘Moving to IPv6 in Europe’, specially considering that one of the partners is also participant of 6LINK, the project that supports the IPv6 Cluster activities.

Part of the IPv6 Cluster is also the IPv6 Task Force Steering Committee, which is coordinating at a global scale, the international and national/regional IPv6 Task Force or equivalent groups.

2.2 QoS Project Cluster Activities

There are several IST projects addressing various QoS aspects. The three projects AQUILA, CADENUS and TEQUILA acted here as focal point for activities related to IP QoS and Premium IP Service, and their common workshops helped to create a forum for information exchange between IST projects working in this area. Of these however, AQUILA and TEQUILA have already terminated and CADENUS is now ending. Thus there is currently seen a transition phase in the cluster activities to follow-up projects working on QoS topics.

MESCAL project is somehow the successor of TEQUILA.

Also, 6QM (IPv6 QoS Measurement) is joining in when those initiatives are resumed which is expected to gain more momentum with the start of the first round of 6th Framework projects.

One of the 6POWER partners is also partner in 6QM, so this provides a good liaison between both projects.

2.3 Monitoring and Measurement Cluster Activities

The IST MoMe Project Cluster coordinates activities between projects active in the area of monitoring and measurement.

Nevertheless this project isn't focused in monitoring and measuring activities, it will be useful to have some inputs, and even use the tools produced by those projects, to facilitate the 6POWER project evaluation.

This is the case for 6QM, INTERMON and SCAMPI.

INTERMON is concentrating on inter-domain aspects. It is developing a scalable inter-domain QoS architecture with integrated monitoring, topological and geographical structure mapping, modeling, simulation, optimization and visual data mining.

SCAMPI is developing a scaleable monitoring platform for the Internet. It addressing core backbone links at 10 Gbps speed and investigates further the technical challenges of developing monitoring systems for 100 Gbps speeds and beyond.

Efforts have been made by the projects, including 6POWER, to organize a Monitoring and Measurement session at 10th Concertation Meeting IST Communication & Network Technologies in Brussels, 10-12 March. However the date clashed with the Intermon technical audit and also representatives from SCAMPI were not available on this date. Coordination is under way to set up such an inter-project session in the next future.

2.4 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. Several partners of 6POWER participate in Euro6IX and have a very close relation with 6NET.

Is expected a number of collaboration activities carried out between all these projects, that already started because 6POWER is using these networks as backbone to connect several partners, trials and to interconnect to other IPv6 networks or projects.

6NET builds a native IPv6-based network with both static and mobile components in order to gain experience of IPv6 deployment and transition 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.

The cooperation will concentrate specifically on WP6 of 6NET as well as WP4 and WP5. WP6 is meant for *Network Management Architecture and Tools* considers configuration, performance, fault, security and availability management issues. It will also develop and test appropriate management tools. It has published Deliverable D6.3.1, the first version of the 'IPv6 Network Management Cookbook', which features, recommendations and tools that may be used to manage and monitor a wide area IPv6 network. The part on measurement tools is still rudimentary.

WP4, "Application and Service Support", identifies and implements applications and services that support network mobility and quality-of-service (QoS). *WP5, IPv6 Middleware and User Application,* will trial diverse IPv6-enabled middleware and user applications including real-time videoconference and media streaming applications, online gaming, relational databases, transaction processing systems, and portal services. 6POWER will cooperate in some of these trials providing necessary measurement support to validate the use of QoS sensitive IPv6 based applications.

Euro6IX project is researching, designing and deploying 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.

WP4 in Euro6IX is researching several IPv6 QoS aspects that will provide and received feedback with 6QM. The same is true with WP2 (network design) and WP3 (network deployment). Actually there are already some works carried out between both projects.

2.5 TF-NGN Performance Monitoring and PERT Initiative

The Task Force on Next Generation Networks TF-NGN is a collaborative effort of European national research and education networks (NRENs) and associated research organizations, coordinated by TERENA and DANTE, performing early trials and studying performance and deployment issues. As the development part of the IST project GN1, it complements the infrastructure building effort of the GÉANT network, the pan-European backbone with core network capacity at 2.5-10 Gbit/s. GÉANT interconnects about 30 NRENs (national and regional research and education networks) in Europe and provides connectivity to other research networks worldwide.

TF-NGN explores technologies viewed as strategically important for the NRENs and GÉANT. Two related subgroups within TF-NGN are of particular importance to the work of the project, namely *Performance Monitoring* and *PERT*, which are activities that have been newly included in the GÉANT technology roadmap for 2003.

Performance Monitoring explores monitoring and measurement tools for the research networks. It has the goal of devising an international inter-domain monitoring infrastructure that can serve for Service Level Agreement (SLA) verification as well as for other research and operational purposes.

Intra- and Inter-domain monitoring infrastructure aims to monitor "performance" metrics (such as one-way delay, jitter, packet loss, available bandwidth, etc) inside a domain and across several domains. The aim is to provide to different groups of users (NOCs, GRIDs, etc) an "across domains" view. In its first phase, focus lies on identifying the subset of metrics, which should be monitored, the interactions between the domains and to provide recommendations on how the metric should be monitored. Measurements need to be performed for IPv4, IPv6 and different Types of Service. An embryonic system of the inter-domain monitoring infrastructure is planned to be setup by Q3/2003.

The *Pilot PERT Initiative* addresses the end-to-end performance problem. The performance experienced by network users is the result of a complex interaction of many components: application software, operation systems, network adapters, and networks belonging to separately administered domains (campus, regional and national backbone, international backbones). In order to address the end-to-end performance appropriately it is necessary to go beyond a purely network-centered view of QoS mechanisms. What is needed, are cross-disciplinary experts that help locate problematic area(s) before relevant area-specific experts can take over. Such generalists need to understand the totality of factors contributing to the end-to-end performance equation, as well as their interplay. The term PERT refers to such a cross-disciplinary group with the task of looking at performance issues in an integrated way, where “PERT” stands for “Performance Enhancement and Response Team”.

The PERT focalizes vertical expertise. For their task, the PERT team depends on access to measurements and monitoring data from various points in the network, including participating host systems and applications in order to identify domains, which need to react. They propose possible remedies, and provide the “logistics” function to bring multi-disciplinary experts together to jointly solve the problem.

Another important contribution of the PERT is to make available tools for the diagnosis of difficult end-to-end performance problems, along with guidance on when and how to use them. Where such tools may require measurement and monitoring infrastructures, these infrastructures should be made as openly available as possible, so that it can be deployed on additional networks, and used by more people at the "edges" of those networks.

Through actual involvement of project partners there are already close links into this community. Given the overlapping interests of the research topics addressed by the TF-NGN working group and the project objectives of 6POWER, towards the provision of evaluation tools, participation in TF-NGN meeting is used for mutual information exchange and planning for common experimentations with partner NRENs working in the relevant research areas.

3. LIAISONS WITH INDUSTRY ASSOCIATIONS

IPv6 Forum

6POWER is working, since the early beginning very closely with the IPv6 Forum for awareness and dissemination 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 first result was the participation of 6POWER in a major event co-organized with Consulintel, in Madrid, 12-14th of May 2003, but also the participation with presentations of 6POWER work in several IPv6 Forum events.

There are several plans for continuation of this close cooperation, and even increase the direct cooperation among the IPv6 Forum and PLC related associations or foras.

ISOC

6POWER has succeeded to publish a "members briefing", "Addressing the Digital Divide with IPv6-enabled Broadband Power Line Communications" (http://www.isoc.org/briefings/013/), being a key milestone for PLC and IPv6 technologies.

This document is now being processed for presentation on higher-level statements related to worldwide development.

PLC Forum

DS2 is a member of the board of PLC Forum and holds the chair of the Technical and Regulatory Working Group. During the last months, the agenda of the PLC Forum has been more dominated by discussions about regulatory issues (mainly emission limits for Power Line networks), and less about "higher layer" issues like communication protocols.

The main activities carried out by the consortium partners in the PLC Forum has been monitoring activities and make sure that any decision that could affect the 6POWER areas (like anything that could have an effect on QoS on Power Line) is in line with the project.

Once the discussions on regulatory issues are over and the PLC Forum starts working on developing industry standards, we will try to influence the process in order to be in line with 6POWER results.

HomePlug

DS2 is member of HomePlug since its creation, more than 3 years ago. Until now, HomePlug has been focused on developing standards for the medium-speed, home-networking market via power lines.

Some months ago, HomePlug announced the objective of creating a new standard for transmission of very high speed (100 Mbps class) multimedia over power lines. The main target of this effort (called HomePlug AV – for Audio/Video) is fixing the lack of high-speed capabilities in the original standard, and adding support for HDTV streaming.

DS2 is involved in this process, with a special focus on the Working Group responsible for the MRD (Marketing Requirements Document) and the EPWG (Evaluation Plan Working Group). The EPWG defines the test procedure for selecting the new AV technology, and includes detailed tests for validating the QoS capabilities of the AV Power Line standard.

DS2 participates in the weekly EPWG conference calls and contributes frequently to the deliverables of the EPWG group.

4. LIAISONS WITH STANDARDIZATION BODIES

The project is working very closely with IETF, ETSI, CENELEC and CISPR.

4.1 IETF Standardization

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 and zero configuration WGs), DHCP WG and others related to QoS (NSIS) and Multicast (MAGMA).

DNSEXT Working Group

Among other topics, the DNSEXT working group is dealing with the adjustments to the DNS required by IPv6 addressing. This working group is in charge of the advancement of RFC 1886 to Draft Standard status. RFC 1886 "DNS Extensions to support IP version 6" defines the changes that need to be made to the Domain Name System to support hosts running IPv6. Since 1995, RFC 1886 has been updated by RFC 3152, which deprecates the use of IP6.INT and replaces it by IP6.ARPA.

Currently, RFC 1886 is at the Proposed Standard status and some interop tests are required to pass it to the Draft Standard status. During the Minneapolis IETF, the ngtrans and dnsext chairs asked 6WIND to carry these interop tests. These tests were made successfully in July 2002 with the help of AFNIC and of the G6 (French IPv6 association).

The results are available online at http://www.ietf.org/IESG/Implementations/RFC1886-Implementation/rfc1886-Implementation.html.

They also were presented at the Yokohama IETF meeting; see http://www.ietf.org/proceedings/02jul/slides/dnsext-1/index.html.

During the meeting, the consensus was that it was better to merge RFC 1886 and RFC 3152 before to move them to Draft standard status. 6WIND then volunteered with AFNIC to do this work and a dnsext draft co-authored by V. Ksinant was issued in September 2002. The document is available at http://www.ietf.org/internet-drafts/draft-ietf-dnsext-rfc1886bis-00.txt.

This draft was presented at Atlanta's IETF meeting; see the proceedings at http://www.ietf.org/proceedings/02nov/slides/dnsext-3/index.html.

Working group last call was then issued, followed by IESG last call. The current draft is available at http://www.ietf.org/internet-drafts/draft-ietf-dnsext-rfc1886bis-03.txt.

IESG last call will expired on June 17th 2003.

The second contribution deals with interop tests for RFC2845 (TSIG). These tests are still in preparation. The goal is to be ready for the next Vienna IETF meeting.

V6OPS Working Group

v6ops is a recent working group. It aims at developing guidelines for the operation of a shared IPv4/IPv6 Internet and at providing guidance for network operators on how to deploy IPv6 into existing IPv4-only networks, as well as into new network installations.

Several design teams have been set in order to describe some transition scenarios dedicated to some representative environments.

One of these design teams deals with ISP environment. 6WIND and Consulintel are part of this design team. A first draft co-authored by V. Ksinant has been issued and presented at the v6ops interim meeting in September 2002, available at http://www.ietf.org/internet-drafts/draft-mickles-v6ops-isp-cases-01.txt.

The slides presented during the meeting can be found at http://6bone.net/v6ops/minutes/IETF-55-Sunnyvale-Interim/isp-cases.pdf.

This draft is now in its 5th edition, available at http://www.ietf.org/internet-drafts/draft-mickles-v6ops-isp-cases-05.txt.

After some changes in the design team, it has been decided to issue a new draft with less detailed description. The document, and the new design team web sites, hosted by Consulintel, are available at http://www.v6ops.euro6ix.org/isp.php?numero=2.

Project partner's can claim here outstanding IETF participation especially when taking into consideration the low representation of European representatives at IETF, which is far below 20% of the attendance. Project partners are listed currently as authors/coauthors for working group drafts.

4.2 ETSI

4.2.1 IPv6 Testing Activities

ETSI's Plugtests™ Service organizes the IPv6 (Internet Protocol Version 6) interoperability testing event which provides a commercially secure environment in which engineers can meet together to share experiences, to check their implementations with others and to ensure interoperability of their products and prototypes.

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 Plugtests program specific for PLC, that could be easily related with the others.

A major Plugtests event has been co-organized by ETSI and Consulintel in parallel with the Madrid 2003 Global IPv6 Summit, and will be followed by a new one, involving IPv6, IPsec, QoS and PLC in 2004.

ETSI TC MTS (Methods for Testing and Specification) have recently set up a new group dedicated to testing IP-based technologies. MTS-IPT will be dedicated to all aspects of testing IP-based technologies, and will cover conformance (compliance), performance and interoperability testing.

ETSI test specifications are usually developed by groups of experts, better known as Specialist Task Forces (STF), recruited from the ETSI membership and run by the ETSI Protocol and Testing Competence Centre (PTCC). Experts from the relevant Technical Bodies, manufacturers, test system developers and other interested parties are all closely involved in the development of the test specifications.

A scoping project (STF 236) under the leadership of the PTCC has been setup to define priority areas of activity of IPT in IPv6 (e.g., security, mobility, QoS). STF will provide a strategy and work-plan for the group. STF 236 worked from January 27th to the end of March 2003. Consulintel, has actively participated in this initiative.

4.2.2 PLC Activities

Several partners are working with ETSI in PLC activities, including planning the organization of PLC Plugtests.

The work is still preliminary at this stage.

5. LIAISONS ROADMAP

The project consortium has already started the process of coordinating its activities with other projects. Those activities will become enhanced as the project matures and further results become available. In this section we outline the liaison roadmap taken by the consortium so far and next steps planned.

5.1 Role of Liaison Projects

There are different forms of cooperation depending on the character and role played by the partner project. We can categorize them as:

- Providers of IPv6 Infrastructure.

  The project makes use of these infrastructures in order to set up experiments, demonstrators and to interconnect partners via IPv6 connectivity to build a distributed test-bed. These roles will be played mainly by 6NET, Euro6IX, GÉANT and NRENs connecting the partners.
- Developers of related and complementary technologies.

  For those projects it is necessary to set up mutually awareness and coordination from early on. Duplicate parallel developments should be avoided and complementary approaches should be sought. Agreements on common interfaces and protocols can help to integrate the tools. A common position will bring together critical mass and will create momentum in the development of standards.
- Developers of IPv6 based services and applications.

  Those projects will primarily act as “suppliers” for the project, as they can provide new applications to be trialed.

6. SUMMARY AND CONCLUSIONS

Liaison objectives during the first phase were the creation of awareness for the project and the initial establishment to relevant groups.

A further milestone has been achieved through the "live" demonstrator of the project at the Madrid 2003 Global IPv6 Summit from 12 to 14th of May. The demonstration provided advertisement for the project work and acted as reference point for the planning of common experimentation with other projects, already initiated during the first trial in the IST2002 event.

Emphasis for liaison activities in the current project phase lies on the coordination with other groups and projects working on QoS, and possible broadband and PLC related groups.

The next significant milestone is targeted for November 2003 with a new large-scale public demonstration.