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Abstract:
This deliverable is a public description of the project in terms of main goals, key issues, technical approach and expected achievements. It is intended for publication on the Websites of the Commission and the project. It will be complemented with a short slide-set to introduce the project in a non-technical way.

Keywords:
IPv6, Governments, project goals, technical approach, expected achievements.

Revision History

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

Revision	Date	Description	Author (Organization)
v1.0	21/02/2012	Document creation	Jordi Palet (Consulintel)
v1.1	28/02/2012	QS	Uwe Kaiser (FhG FOKUS)
v1.2	28/02/2012	Final review	Jordi Palet (Consulintel)
v1.3	29/02/2012	Small typos	Jordi Palet (Consulintel)

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Executive Summary

GEN6 shares the view that a democratic European society, with a strong and productive economy, requires service-oriented, secure, reliable and innovative government, at all levels independently of size and location used by all groups of citizens (elder, handicapped, youngsters, immigrants). Successful implementation of eGovernment can improve services, strengthen our societies, increase productivity and welfare, and reinforce democracy. This success will only be achieved by pursuing a long-term vision, with clear and sustainable objectives, with constancy and persistence, and with participation of all stakeholders: government, citizens and industry. GEN6 will contribute to these objectives in the area of communication and how to transition to IPv6 in the government area.

Looking at the propagation of IPv6 networks and services upon these networks, we can state that we are looking at islands. Narrowing the view to eGovernment, these islands are getting even smaller. As indicated in the call "ICT PSP call 2011 (Pilot Type B, objective 4.3), Piloting IPv6 upgrade for eGovernment services in Europe": "With a depletion of IPv4 addresses expected soon, public administrations and other stakeholders must prepare for IPv6 deployment in order to ensure continuity of their services." IPv4 addresses are not available anymore. So, actions have to be taken to pave the way for administrations to IPv6: "The aim is hence to stimulate the upgrade of eGovernment infrastructures, and services of public interest to IPv6."

This goal will be achieved by evaluation of available guidelines from research and administrative institutions (US NIST Profiles and documents from RIPE) to develop assistance targeting at European administrations. In parallel, GEN6 will execute a number of different pilots based on existing and running services and infrastructures to set up practical hands-on guidelines with checklists and evaluation charts. Due to the different characteristics of the pilots, those guides will encompass network equipment, middleware, portal technologies and up to dedicated government applications of different Member & Associated States. Pan European requirements will be identified within two cross-border scenarios.

Table of Contents

Figure Index

1. PROJECT PROFILE

Information on the proposed service/solution

Description of the issue and proposed service/solution

The exhaustion of the central IANA IPv4 address pool has happened on the 3rd of February, 2011 while the upgrade and deployment of IPv6 in Europe has not progressed as anticipated, putting thereby Europe at risk of discontinuity of the Internet growth and business sustainability. This is essentially true for the Public Administrations and eGovernment services, a critical driving force in this multi-stakeholder value chain.

The GEN6 project has an ambitious mission in addressing this fundamental issue by setting up complementary and interoperable national and cross-border pilots across different EU States, in order to validate and catalyse the deployment of IPv6 in the existing EU government infrastructures, services and applications. Expertise, guidelines, best practices and impact studies will be established for forceful dissemination and exploitation at different stages and levels, contributing thereby to a swifter uptake of IPv6 also in the rest of the EU Member States and Associated States.

The selected consortium partners have been carefully chosen to test and validate different and complementary IPv6 transition and coexistence strategies in order to provide a rich platform allowing aggregation of practical and hands-on results in a comprehensive upgrade and deployment recommendations roadmap.

Target users and their needs

Each country is targeting different user-groups, ranging from citizens, enterprises, to government agencies and employees. A specific Workpackge will set up those groups for each of the experiments, however and since this is an upgrade exercise, it is expected and desirable that it will be a broad public, actually the same as the existing services today with IPv4.

Usage

The target is that users should not see or even realise any difference at this stage when using IPv6. Indeed this is one of the first key success factors. The IPv6 transition and coexistence should be transparent to end-users. However, actual measurements already indicate a 0.02% failure rate, due to different implementations of dual-stack and applications in different operating systems. This might sound not relevant, but in the scale of the Internet, it could still touch millions of users as the current IPv6 users are expected to be educated to resolve their own issues. This is not the case for the remaining billions of users. There is a serious need to demonstrate in the project results if and under what conditions, new services or enhancements of existing ones, are useful and usable when supporting IPv6.

Technology

The project requires upgrading layer-3 hardware (routers) to IPv6, but other hardware will be impacted, such as firewalls, IDS, other security boxes, load-balancers, among others. The security

parity between IPv4 and IPv6 will be one of the key issues to investigate.

Server and client operating systems will also need to support IPv6. However this is already common, even if sometimes (especially in servers), not enabled by default.

Applications may need to be updated in order to support or to be agnostic to IP (IPv6) and this is the bigger cost of the project, in terms of developers resources, in addition to the required testing an evaluation.

Cross-border interoperability will have a strong focus especially in the security area.

Content

In principle, the project doesn't require specific contents, however, the dissemination activities, will provide contents, such as guidelines, as a project result.

Sustainability

The cost of the transition is a one-time cost, which means that once the hardware, operating systems and applications are updated to support IPv6, the natural maintenance cycle, being existing services and infrastructures, pay for the recurrent costs. An early requirement for IPv6 in the procurement policies will make any investment future-proof. This would need the definition of the IPv6 profile for products, applications and services to be used in the procurement process. GEN6 will define this profile and to be promoted to organisations such as RIPE and ETSI.

Ownership

The participants in the project or entities for which the project is working for, so the same entities will retain the project outcomes, own each of the pilots. However all the deliverables will be made public, ensuring that no confidential data is provided.

Other

The innovative approach of this project is that it has opted for a rich approach in the different EU states making it possible to enable IPv6 not only in a few services, but potentially in dozens of them with the same costs, streamlining and maximizing the community contribution.

Information on the project phase and impact

Number of users

The ambition of GEN6 is that all the actual users of the existing services will have the capability to be a "project user". This means that in some cases, it may be the citizens of a small town, while in others it may be millions of the country inhabitants. However the evaluation Workpackage will set up more concrete targets in order to provide realistic measurements, as it may depend on what ISPs on that country already provide as IPv6 services to end-users.

Location

The eGoverment services being upgraded to IPv6 are in Germany, Netherlands, Luxembourg, Spain, Slovenia, Greece, and Turkey. However it is expected that residents in other EU States (for example students, government employees, European Commission staff) will have access and can test the services.

Information on what already exists	
A technically tested prototype of the service exists?	YES
A business plan has been developed already for the service?	YES
A service already exists?	YES
Further localization work is needed?	NO
Further integration work is needed?	YES

If running service exists:	
Location(s):	Germany, Netherlands, Luxembourg, Spain, Slovenia, Greece and Turkey
Number of users:	From thousands to millions, depending on each of the services/countries
Ownership:	Each of the participants/countries
Sustaining the service:	Existing eGoverment services

2. LIST OF PARTICIPANTS & CONTACTS

Role	P. Nr.	Participant name	P. short name	Country
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P	3	TÜBİTAK Ulusal Akademik Ağ ve Bilgi Merkezi	TÜBİTAK ULAKBİM	TR
P	4	Universidad de Murcia	UMU	ES
P	5	Universite du Luxembourg	UL	LU
P	6	Ministerio de Política Territorial y Administración Pública	MPTYAP	ES
P	7	Univerza v Ljubljani	ULFE	SI
P	8	Nederlandse Organizatie Voor Toegepast Natuurwetenschappelijk Onderzoek - TNO	TNO	NL
P	9	KDVZ Citkomm	Citkomm	DE
P	10	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.	Fraunhofer	DE
P	11	Ministerio de Industria, Turismo y Comercio	MITYC	ES
P	12	Turksat Satellite Communication Cable TV and Operation AS	TURKSAT	TR
P	13	Greek Research and Technology S.A.	GRNET	GR
P	14	Computer Technology Institute & Press "Diophantus"	CTI	GR
P	15	Intelen Services Limited	INTELEN	CY
P	16	Gemeente Alkmaar	Gemeente Alkmaar	NL
P	17	Ministerstvo vnitra	MVČR	CZ
P	18	Ministry of Industry and Trade	MoIT	CZ
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3. PROJECT OBJECTIVES AND EU DIMENSION

3.1 Project objectives

The project match exactly the objectives, general and in detail, as stated in the call. GEN6 has taken measures to achieve the requirements of those objectives, as listed in the following table.

General Objectives
3 to 5 complementary experiments upgrading to IPv6 a set of representative eGovernment infrastructures and services of public interest.

GEN6 will have 4 different national pilots, some of them replicated in a complementary way in different countries, considering different existing approaches with IPv4:
    1. IPv6 upgrade of eGoverment Network Infrastructures, e-Identification, Services and Applications (Germany, Spain, Netherlands and Turkey).
    2. IPv6 upgrade of Secure Cloud Services (Luxembourg).
    3. IPv6 upgrade of Energy Efficiency in School Networks (Greece).
    4. IPv6 upgrade of Emergency Response Environments (Slovenia).
 	
Replicating many aspects of the pilots across different existing infrastructures in different countries, that have different approaches, allows more alternatives to be tested in real scenarios, providing a broader view for the replication of the project results across Europe, while actually the project approach reduces the cost, because of the parallel learning and knowledge exchange among partners, and maximizes the impact of the resources involved in the project.

The experiments shall be used as showcases to derive best practices, guidelines, methodologies and toolkits for the migration from IPv4 to IPv6. In the validation of each experiment, it is expected to address issues like cost-efficiency and cost-benefit analysis, experience with incentive measures, success factors, partnership, methodologies, immediate and long term benefits, viable transition paths, etc.

GEN6 will provide general guidelines for planning and transition steps.
    • IPv6 networks topologies and addressing types
    • IPv6 addressing technologies and addressing plans for Governments
    • IPv6 transition technologies and support
    • IPv6 deployment support
 	
The outcome of the national pilots will contribute to these guidelines and will provide additional documentation based on transition experience in the fields of:
    • network equipment (switches, router, firewalls, load balancers, …)
    • network provider access points (CPE, fibre, xDSL, …)
    • middleware and technologies like webservers, portals, databases
 	
Besides the technical documentation, the national pilots will document their efforts and costs for the transition and estimate possible benefits from the IPv6 upgrade.

A targeted Europe-wide dissemination campaign shall finally aim at further stimulating the EU-wide take-up of IPv6 in public administrations and by other relevant stakeholders.

The communication activities and road shows of GEN6 will make sure that the achievements of the project are well disseminated during the project and especially in the last 12 months of the project, which are aimed to a targeted European-wide dissemination campaign aimed to the stimulation of the IPv6 uptake in public administrations and other relevant stakeholders (targeted to experts and public authorities).

As a practical way to further stress this dissemination, an event will be organized in Brussels together with the EC, and a book with the project results will be delivered.

Beside this, all classical way to promote GEN6 results are used, such as publications, Internet presence (web service, Facebook, twitter) and presentations with special focus on eGovernment events, as well as clustering activities.

Special Objectives

The proposed set of experiments within the pilot should provide complementary experiences, in view of facilitating replication of approaches for upgrading to IPv6.

The national pilots in GEN6 are well balanced and will handle the whole stack from basic network infrastructure to government services for citizens. They provide complementary experiences because different approaches need to be taken some times in the same country, but definitively in different countries, considering actual different IPv4 implementations even for similar services.

The results from network and 'all-purpose'-applications (web services, portals, eID and PKI Services) can more easily be reproduced and adopted in other environments, whereas the results of special government applications will be generalized as much as possible, to maximise the impact and knowledge reuse in similar environments and other countries.

At least one of the experiments shall have a strong cross-border and interoperability dimension, e.g. in terms of services offered in several Member States and Associated Countries.

GEN6 has planned two cross-border pilots.

One pilot is targeted at the interconnection of national government backbones and European networks like sTESTA, in order to ensure a wider IPv6 readiness and interoperation for European cross-border services. This will be possible because most of the partners are connected to those backbones. This is of importance for cross-border connectivity and services and as already discussed with DIGIT, responsible for the sTESTA operation, it may be feasible to use, in the worst case, IPv6 in IPv4 tunnels, or even better, depending on the sTESTA transition plans, native IPv6 connectivity. It will also allow DIGIT to participate in the project as observers, or even contribute if they wish so, probably generating an additional added value from the project, by contributing directly to the

sTESTA and DIGIT services transition to IPv6. In this pilot, cross-borders demonstrations will be possible at a minimum between Spain, Germany and Luxembourg.

The second pilot aims for a service of high cross-border interest: Public Safety Networks and the greater benefits brought in to this critical sector by IPv6 features (such as "on the fly networking"). The pilot will be demonstrated between Slovenia, Luxembourg and Spain.

All the aspects depicted above for the national pilots apply also to the cross-border ones.

Different experiments should ideally be led by stakeholders from different Member States or Associated States.

One national partner will lead each national pilot, so each one is definitively led by different Member or Associated States. In addition to that, the national pilots and cross-border ones are grouped in different Work Packages, led by partners from different countries. This allows for a greater integration of all pilots and consortium partners, creating a traversal approach and eliminating any isolated approach.

All experiments should start from an existing baseline, e.g. an existing eGovernment infrastructure or service of public interest. Work should focus on enabling them to work with IPv6 using proven methodologies and technologies. Development of new infrastructures is beyond the scope of this initiative

All the pilots will start from existing infrastructures. The transition will be based on existing technologies available on the market. Main focus will be on documentation of the transition process. Necessary modifications during the transition will be in the duty of the associated stakeholders, like network providers and application developers who have given their consent to contribute to the project.

In each experiment, all relevant stakeholders of the value chain (e.g. public administrations, public authorities, public agencies, ISPs, content and service providers Internet organizations, research institutes, end users, vendors) should participate at the level necessary to successfully carry out the upgrade and evaluate the experiment.

All national partners have set up their pilot with the express confirmation of the participation of the persons, industries and/or organizations to ensure the fulfilment of the upgrade and the evaluation.

Proposers shall derive a transition plan for moving from IPv4 to IPv6, e.g. based on running in parallel integrated IPv4 and IPv6 implementations allowing that the constituency can gradually move to IPv6.

Transition technology and support will be provided by a specific Work Package, which acts as a transversal activity among all the pilots.

For some national pilots a dual-stack environment will be the result because not all of the running applications may be transitioned to an IPv6-only setup at this stage.

The national pilots will generate documentation on transition strategies and the parallel operation of IPv4 and IPv6. It will also provide recommendations on how to maintain IPv4-only islands, which will decrease when all applications support IPv6.

A joint working group should be set up for exploiting synergies and sharing best practices across the experiments of the pilot, and for broadly disseminating the experiences to relevant stakeholders across Europe.

This Working Group has been setup by a specific Work Package, contributed by all the partners, with already defines a set of transversal activities across all the pilots, in order to avoid duplication of work and act as a "think tank" for common aspects that typically need to be considered in every transition scenario.

Proposals should include specific and realistic quantified indicators to monitor progress at different stages in the project life.

Every national and cross-border pilot has provided a detailed project plan with a breakdown of activities, resources and a time schedule, which allowed to properly dimensioning the time scale of the overall project.

In addition to that, a specific Work Package takes care of the evaluation and monitoring of each of the pilots and on top of that, the management Work Package ensures the overall project timing and risk assessment.

Dissemination and communication activities should constitute an integral part of the proposed work, addressing not only experts, but also public authorities and relevant stakeholders who could play a role for the future deployment or replication of the envisaged solution/service, as well as the public at large.

Within GEN6 every pilot will do dissemination on the national level, under the scope of the Dissemination Work Package. The results will be made available to all stakeholders of the pilot but also to national interest groups for government services, equipment and network providers, by means of common dissemination activities, the road show, the project results book and the event organized jointly with the EC.

The project itself will spread the findings and results on the European and international level to make the initial starting points visible and to encourage other administrations to start national transition projects or to help interested authorities to get the first step done. Since transition in this case is less of a technical than a mental question, the documentation will stress the benefits of IPv6 on the one side and give technical advice on the other side.

3.2   EU dimension

The IPv4 address space is depleted and the need for the transition to IPv6 is an urgent issue. Not adopting IPv6 immediately across the EU will imply the loss of competitiveness and Internet leadership, due to the possible degradation of current Internet services (moving to NATs and CGNs) and decline in the ICT area and simultaneously in the connection of new users, including the impossibility to extend the eGoverment services.

The importance of IPv6 is mentioned in following EU documents:

- Digital Agenda for Europe (COM(2010)245).

- European Action Plan for eGovernment 2011-2015 (COM(2010)743).

- Council Conclusions on the European eGovernment Action Plan 2011- 2015 adopted on 27th May 2011.

The fact that the IPv6 upgrade is being discussed at EU level can be seen from the Communication from the Commission "Next Generation Internet – priorities for action in migrating to the new Internet protocol IPv6" (COM(2002)96). Therefore, the project EU dimension is supported by several member states involved in the project as well as several stakeholders, including academia and private companies.

The European dimension of the project will be further developed in the communication and dissemination activities. Foremost through the ePractice.eu portal and also in European campaigns which will give an opportunity to connect/link to the project by stakeholders and member states that are not involved in the project as partners.

This project is settled within Theme 4 of ICT PSP work programme 2011 focusing on 'ICT for Innovative Government and Public Services' The reasoning for this call was to support "the 'Digital Agenda for Europe' by innovating and making government services more effective and fully interoperable. It is in line with the eGovernment Action Plan and the "Malmö Ministerial Declaration on eGovernment" that includes provisions on improving organisational processes and promoting innovation in services."

In Europe, the provision of public services is still often rather fragmented and people have to go from one 'counter' to another (whether physical or on the web). Companies and citizens would much benefit from public services that are provided seamlessly online that is, the service is provided without any "break points" regardless of the number of different administrative systems or administrative bodies involved, and for which they do not need to know the different departments involved.

Most Member States are already addressing this challenge by adopting national 'eGovernment interoperability frameworks'. This is being complemented at European level by the development of the European Interoperability Framework, and at policy level by the Commission staff working paper 'Linking up Europe: the importance of interoperability for eGovernment services'[1].

Other Governments have already adopted concrete plans for the National IPv6 Transition, and

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[1] http://www.epractice.eu/en/library/281278

this is for example the case of the Spanish one, which published the plan 29th April 2011[2]. This will be of further help, not only for the rest of the partners of this project, but also for the rest of Member and Associated States, as the project will allow the Spanish government to further contribute to the project itself with the Spanish experiences and facilitate a wider dissemination of the Spanish Government initiative and results.

With the transition to IPv6, the network dimension is coming back to the interoperability level and has to be addressed to ensure the future execution of available and upcoming cross-border services in Europe at least for a transition and coexistence phase.

A lot of projects have been established during the last years focusing on eGovernment cross-border aspects such as STORK, SPOCS, SEMIRAMIS, eMayor, among others, and with more frequency, we see directives like the EU Services Directive to boost eGovernment services across Europe. Making IPv6 readiness a requirement for all EU funded Projects will ensure a smooth transition, as the underlying network protocol becomes IPv6.

Looking at the current call, the objectives 4.1, 4.2 and 5.1 in theme 4 and 5 will in future be based on IPv6 networks. From this, it is very obvious that GEN6 is not only oriented to transition of existing services but will also be a milestone and a reference project: a source for guidelines, checklists and operational procedures of new and future projects.

3.3   Maturity of the technical solution

GEN6 is building over existing infrastructures, services and applications, so from that perspective, the technical solution is mature regarding IPv4. IPv6 has been standardised for many years and the manufacturers are already providing stable equipment and operating systems, so integrating IPv6 in existing eGovernment services is a complex task, because many interoperability and security requirements, however, we are relaying in mature technical solutions. In many cases, several possible transition technologies are available, and one of the key aspects of the project is ensuring that a correct analysis of them, in each possible scenario, is correctly approached to determine indicators such as costs, easiness of implementation, advantages, etc., in order to provide guidelines that can be extended to the rest of the public and private services across Member and Associated States.

One more key innovative aspect of GEN6, is the fact that, in several of the participating countries, even if the solutions could be targeted to a few eGovernment services, the project approach is able to provide IPv6 transition to many, if not all, the country eGovernment services in a single shot, and again this is done with a technical solution (load balancers and routing configurations), which is technically mature and scalable.

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[2] http://www.ipv6.es/es-ES/transicion/Documents/Version_en_ingles_de_la_Orden_PRE17162011.pdf

4.   IMPACT

4.1   Target outcomes and expected impact

"Stimulating IPv6 upgrades of public networks and eGovernment services"

The pilot is critical for the successful implementation of "The European eGovernment Action Plan 2011-2015" in the forthcoming years. The implementation of the Plan is going to happen when at the same time Member States Public Administrations are deploying their own IPv6 transition strategies. Hence, ensuring interoperability between the National infrastructures regarding the state of the IPv6 transition in each Member State it is highly needed.

The introduction of IPv6 influences the network layer with switches, routers and access gateways and any middleware used. Security systems like firewalls and public key infrastructures and also the numerous government applications grown over the last years with only IPv4 in mind have also to be evaluated for their readiness. All these areas will be addressed by the national pilots on different levels from the transition of a core data centre infrastructure to government services. For each pilot the starting situation will be described, the transition documented and guidelines and checklist developed. The results will be consolidated by GEN6 and made publically available.

Two cross-border pilots will be set up in order to raise the awareness of ensuring interoperability between Member and Associated States and provide them a useful set of tools to plan their own strategy to evolve their connections. One shows a transition path on national secure government backbones and the other will focus on the Public Safety Communication. Emergency services authorities and organizations are coming under increasing pressure to upgrade their existing capabilities with modern information society standards and technologies. It is increasingly evident that this is a critical area. However, the technical architecture of most existing emergency access systems was designed more than 20 years ago. The GEN6 project will be an advocate worldwide for Interoperability Cooperation on Public Safety, Emergency & Disaster Management based on IPv6.

"Stimulating the development of new innovative IPv6 enabled content and services benefitting from new IPv6 functionalities"

A basic IPv6 Readiness will lead to new services, which can easier be implemented as before. Examples of such kind of services are Multicast Services such as conferencing or multimedia content distribution because features like IPsec for secure transmission and IP Multicast are inherent part of the protocol definition. Other areas will be in the mobile device sector where multi-homing and unique global addresses for device will introduce new services. Mobile IP will also belong to those topics, which will gain new awareness when IPv6 is basically rolled out.

Although many companies seem to approach the cloud-computing paradigm at a faster pace, the government sector still remains an exception. Deploying cloud computing to government specific services seems problematic. The sector is known for its reluctance to give up control over operations. GEN6 will contribute to the discussion about Cloud Services and eGovernment by taking a deep look on the communication and security requirements to ensure the integrity of transferred data.

"Contributing to the prevention of a secondary IPv4 market and a to quality drop in online public services caused by a depletion of the IPv4 address space"

The exhaustion of IPv4, in case IPv6 is not widely deployed, could create a grey market for IPv4 addresses, which creates several problems, such as the loss of competitiveness, the difficulty to connect new users to Internet, and increases the complexity of the development of applications that need to work through several levels of NAT, increasing their development costs and disallowing innovation and new services.

The project pilots, with different approaches, the documents and the expertise acquired for each transition scenario, will provide enough public knowledge to lower the hurdles of the new transition projects, because trust in real projects is higher than in theories. With the pilots, GEN6 can show that IPv4 addresses are not needed anymore and that IPv6 provides the path to innovation, lowering development costs of applications and services, and consequently increase the region competitiveness and making possible the extension of eGovernment services.

In order to support the achievement of the impact goals set by the EC a specific Work Package will monitor the outcomes and impacts of the pilots, best practices and dissemination during the course of project.

4.2 Long term viability

GEN6 will provide guidelines on transition and step-by-step procedures to evaluate connection interoperability between applications and services in a most economical and effective way, without the need to consider restructuring the legacy systems. It aims to simplify the use of basic technologies in IPv6 networks (e.g. addressing schemes, IPsec, renumbering, autoconfiguration) in order to show the basics for an IPv6 network and it finally provides a set of profiles to set up network equipment and services between the public organizations so electronic Government services can be accessed by all European public organizations based on the IPv6 protocol.

GEN6 will demonstrate interconnection in a cross-border scenario between at least two

member states. These will be chosen so that the conclusions that can be drawn will be usable across a wide range of other countries throughout the EU.

Setting up a large number of complementary national pilots will offer each country the possibility to use this transition for additional projects based on the experience of their own trial and to benefit from the results of the partners of the project. The results could be reused not only in administration environments but also spread to network providers, equipment manufactures as well as to the government application level.

Within the cross-border pilots GEN6 will establish a pan-European test environment driven by research and by government institutions which can be used in future to evaluate interconnection technologies from network to the application level and which can in parts be used as education and training environments.

IPv6 is being massively deployed in the next 2 years, so the project timing is perfectly adequate and enough for the required time coverage.

4.2.1 Member State Activities and Strategies with respect to IPv6

Furthermore, the long term survival and scale-up of the project work is guaranteed because the direct link with the transition strategies of Member and Associated States, as well as the rest of the world. There is no way to continue growing Internet services and applications, including eGovernment, than by means of IPv6, and the message as already gone thru all the European leaders and there are several examples of that, including the recent Spanish Government IPv6 transition plan, which will be synchronized with GEN6 and therefore the activities developed in the project will not be a waste of resource, but the other way around, a required complement.

All the participant governmental bodies have confirmed their support, for example as introduced already, the Spanish Government has recently approved a national transition plan. Follows specific support inputs provided by other countries:

Germany:

ICT Strategy for Germany "Digital Germany 2015". The strategy was approved by the Federal Cabinet (10/11/2010). It states, that for federal, state and local governments, the introduction of IPv6 (Internet Protocol version 6) represents a significant contribution to the introduction of new Internet technologies in modern, secure communications infrastructures".

Decision of the IT Planning Committee (Committee consisting of high level representatives of the federal states and the central government), 3rd March 2011, approving the IPv6 address policy framework and the key points of the organizational implementation described in the report "IPv6 for the public administration of Germany - address concept and key points of the

organization". The reports states in its introduction: "The migration to a new Internet Protocol version 6 (IPv6) is necessary… . With the introduction of IPv6 not only the limitation of the address space will be solved but also key policy goals are supported….". As further result of this activity a reference book for the technical IPv6-implementation will be developed. Therefore a research project has been started and will be finalized until March 2012. It will work out guidelines and technical compatibility references for use scenarios that are common in public government.

Allocation of a common IPv6 address space for the German public administration. Already in September 2009 the KoopA (former committee coordinating common IT strategies of the German public administration) decided that the federal government as a central authority requests an IPv6 address space for the entire public administration in Germany. Accordingly, in 2009 a /26 address space was allocated to the Ministry of the Interior by RIPE NCC.

Netherlands:

The Digital AgendaNL for 2011-2015 reflects Dutch Government's Commitment. It contains the target that Dutch governments' websites and email should be reachable via IPv6 by the end of 2013, as latest. IPv6 has also been adopted on the comply-or-explain-list of open standards for Dutch (semi-) governmental organisations (e.g. ministries, municipalities, institutes) regarding ICT-procurements. A showcase of leading-by-example is the main website of the Dutch Government[3], which has been reachable over both IPv4 and IPv6 since the first half of 2010. The Dutch government also funds the Dutch IPv6 Task Force[4] and financially supports national IPv6 monitoring activities.

Both the Digital AgendaNL and comply-or-explain-list documents are too long, and only in Dutch, so not attached here.

Luxembourg:

The Luxembourg government has already endorsed their IPv6 Roadmap[5]. It was debated recently in the parliament and Latif Ladid, one of the project participants, was asked to comment.

Slovenia:

In the coming period, it has been already stated publicly that they will work on two levels for

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[3] http://www.rijksoverheid.nl

[4] http://www.ipv6-taskforce.nl

[5] http://www.ipv6council.lu/RoadMapPH.html

implementing IPv6[6]:

- General direction of the implementation of IPv6.

- Encouraging its introduction in public administration.

Among specific support measures, we will give priority to carrying out:

- Raising awareness of the significance of IPv6,

- Motivating network managers to introduce the new protocol,

- Creation of standards for the introduction of IPv6 in state administration,

- Active involvement in initiatives in this field,

- Elaboration of a training plan for IPv6 (e-material IPv6),

- Preparation of IPv6 specifications for communications equipment,

- Encouraging providers of content to make the transition.

Some of the tasks are already implemented; others must be started as soon as possible. We must be aware, namely, that slow introduction of IPv6 could cause a technological lag and, in the long term, isolation from developed information environments. It would be sensible to make use of Slovenia's present progressive position in the introduction of IPv6 and further fast development, for greater recognition in the international environment, since Slovenia is still not generally recognised as a technologically advanced state."

Greece:

There is no national plan approved by the Government for deployment IPv6 services in the public sector or commercial industries today. However, multiple administrative and technical groups are active in the deployment of IPv6 services in public sector organisations.

The Greek Research & Technology Network (GRNET) provides IPv6 interconnection services to all the local universities and research institutes in the country. The most prominent universities, such as the National Technical University of Athens (NTUA) and the Aristotle University of Thessaliniki (AUTh), have already enabled IPv6 interconnection to all their intranets and provide IPv6 services to their students, such as web hosting, DNS, electronic mail, network management & monitoring, etc. However, many universities still have to upgrade their intranets. In addition, the GRNET provides cloud-computing services using IPv6, such as the

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[6] http://www.mvzt.gov.si/nc/en/splosno/cns/news/article/94/6867/

"Pithos" (pithos.grnet.gr - online storage up to 30 GB per user) and "Okeanos" (okeanos.grnet.gr – middleware for the automatic provision of virtual machines to students). In addition, the Greek School Network (GSN) supports IPv6 interconnection services using various access technologies such as xDSL, wireless, satellite, etc. and other basic services, such as school web portals, mailing lists, e-learning platforms, etc. Such services are gradually extended in the intranets within schools in approximately 15.000 sites, under the responsibility of the local school communities.

There multiple public authority organisations in Greece either partially or not connected to the Internet. The national public backbone network, called SYZEYXIS[7], interconnects today more than 4.500 sites, providing Internet connectivity, telephony, videoconferencing, and other services. However, SYZEYXIS does not support IPv6 interconnection services.

The eGovernment Group is one of the first public sector Technical Groups that has committed (since the World IPv6 Day – June 2011) to upgrade key services in order to support IPv6, such as opengov.gr (portal targeting to citizens, focusing on open consultation of governmental policies) and diavgeia.gov.gr (portal targeting to citizens, publishing public sector decisions and governmental laws). GEN6 will cooperate with eGovernment Group and it is expect that IPv6 services this will be realised within the first year of the project. In addition, the Greek Government plans to extend the national public backbone network public network, called SYZEXIS-II, which will interconnect the vast majority of the public organisations, approximately 18.000 sites. The current planning (e.g. tender dossier under consultation) has explicit reference for the support/usage of IPv6 protocols but there is no explicit roadmap for enabling IPv6 services in the following years. Finally, the Governmental Agencies providing cloud services have already initiated a Technical Committee that also explores the benefits/challenges for the deployment of IPv6.

GEN6 partners, in close cooperation with the Hellenic Task Force[8] will provide technical know-how and support in order to achieve an acceleration of the IPv6 deployment in the country.

Turkey:

The government already concreted a transition plan for the public sector on 8th December 2010 "Turkey's Plan for Public Sector's Transition to IPv6":

Phase 1 (January 1st, 2011 – August 31st, 2012):

1.1. Governmental agencies shall perform an inventory analysis to assess IPv6 support of their hardware and software.

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[7] http://www.syzefxis.gov.gr

[8] http://www.ipv6-taskforce.gr

1.2. Considering the lifecycles of the software and hardware which are not IPv6- compatible, a plan shall be prepared to renew these items and the costs shall be considered in the annual budget studies.

1.3. Governmental agencies shall get IPv6 addresses and IPv6 connections until August 31st, 2012 at latest.

1.4. No investment for network software and hardware, which is not IPv6-compatible shall be made after August 31st, 2012.

1.5. Governmental agencies shall assess their staff's training needs on IPv6 transition and IPv6-enabled services. Necessary training shall be completed until March 1st, 2012 at latest.

1.6. Governmental agencies can get their trainings from "IPv6 Transition Training Centre" which will be formed under Turkish Academic and Technological Research Council of Turkey - Turkish Academic Network and Information Centre (ULAKBIM). The scope of the training program will be determined and announced by ULAKBIM.

1.7. This training could be provided from another entity which is a "personnel licensing institute" accredited according to standards TS EN ISO/IEC 17024 or ISO/IEC 17024.

Phase 2 (September 1st, 2012 – December 31st, 2012):

2.1. Governmental agencies shall make at least one of their Internet-based services IPv6-compatible as a pilot application until December 31st, 2012 at latest.

Phase 3 (January 1st, 2013 – August 31st, 2013):

3.1. Governmental agencies shall make their all Internet-based services open to public access IPv6-compatible until August 31st, 2013 at latest.

Turkish Academic Network and Information Centre (ULAKBIM) manage the Turkish Academic Network (ULAKNET) and connect more than 2.5 million users to global research networks. ULAKNET was connected the global IPv6 backbone in 2003 and it has been IPv6 enabled since that time. At the same year, ULAKBIM Internet services (such as DNS, FTP, SMTP etc.) were made available over IPv6 as well. ULAKBIM also set up ULAK6NET backbone to which IPv6 capable universities and research institutions are connected. In order to promote the IPv6 usage in ULAKNET, ULAK6NET IPv6 task force was established by ULAKBIM.

Czech Republic:

The Government of the Czech Republic set the plan for IPv6 transition in the Government Resolution No. 727 on the Report on the transition to Internet Protocol version 6 (IPv6). In the

resolution the Government empowers the ministers and heads of other central state administration bodies (and encourages municipalities and the Mayor of the Prague) to ensure that:

- After 30th June 2009 all the renewal of the network elements have to be comply with IPv6.

- Before 31st December 2010 the access to websites of Public Administration and the services of eGovernment be accessible through IPv4 and IPv6.

Unfortunately, according to our survey and random testing, a lot of services still run on IPv4 and the gap is significant in the group of self-government bodies, especially small and middle villages and cities and their electronic services.

4.2.2 Member State Commitments

To express their commitment to a European transition strategy to IPv6 some member states are directly involved in GEN6 by being project partners. These countries are:

- Spain: Ministerio de Política Territorial y Administración Pública and Ministerio de Industria, Turismo y Comercio

- Netherlands: Gemeente Alkmaar

- Czech Republic: Ministry of Interior, Ministry of Industry and Trade

The same or other countries participate indirectly by their owned institutions (data centres) or organisations with a closed relationship to the public sector and research as e.g. universities. Those countries are:

- Spain: Universidad de Murcia

- Luxembourg: Université du Luxembourg

- Germany: KDVZ Citkomm and Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.

- Slovenia: Univerza V Ljubljani

- Netherlands: Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek (TNO)

- Greece: Computer Technology Institute & Press "Diophantus", Greek Research and Technology S.A.

- Turkey: TÜBİTAK Ulusal Akademik Ağ Ve Bilgi Merkezi TÜBİTAK ULAKBİM.

And other partners have a long relationship to national governments as technology consultants, service provider and are experts in the area of network technology:

- Germany: Devoteam Danet GmbH

- Spain: Consultores Integrales en Telecomunicaciones "Consulintel", S.L.

- Turkey: Turksat Satellite Communication Cable TV and Operation AS

- Cyprus: Intelen Services Limited

- Czech Republic: CZ.NIC

5. CHOSEN APPROACH

The project has been structured in order to meet as closely as possible the call objectives, dividing the work in one coordination/management work package, one dissemination-communications work package, and 3 technical work packages (responsible for the common IPv4-IPv6 transition support and issues, the national pilots and the cross-border ones). In addition to that, an evaluation work package is responsible for the overall project evaluation.
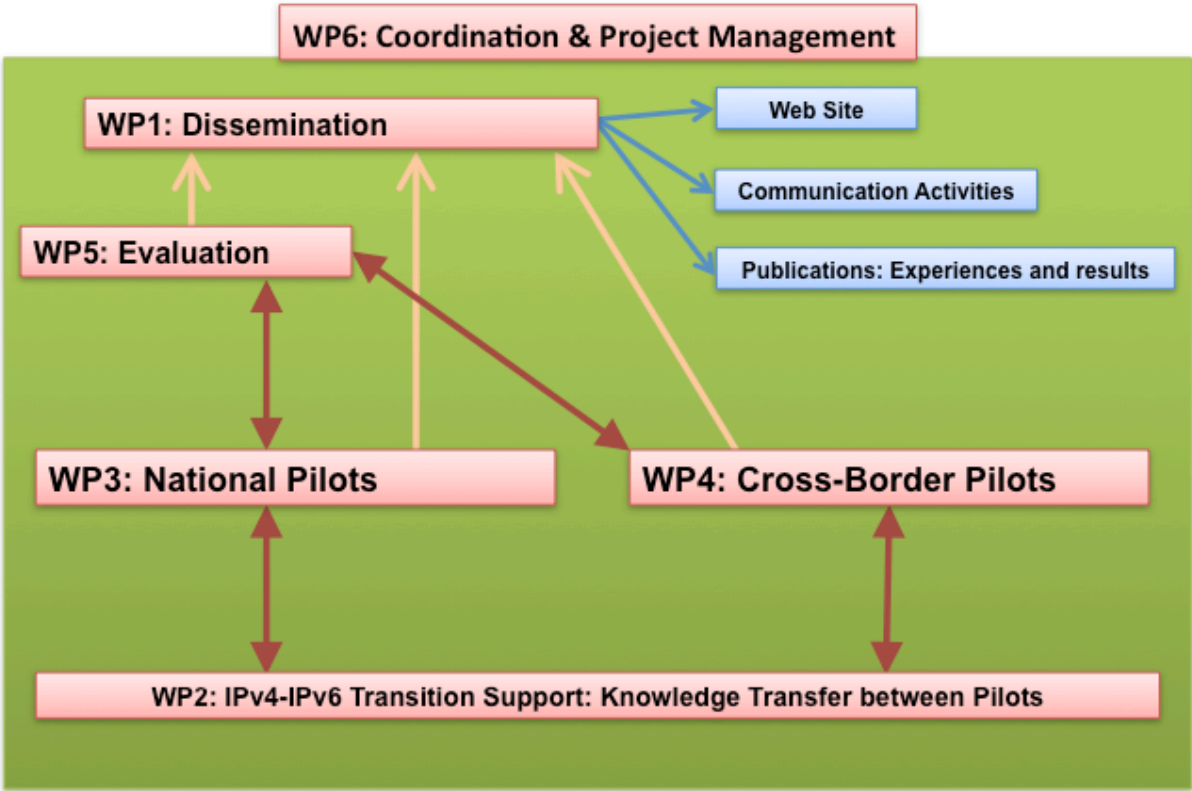

Figure 5-1: PERT Diagram