Pan-European Laboratory for Next Generation Networks and Services

(Definition – 31st January 2007)

Background

Celtic\(^1\), as a pre-competitive R&D programme in the telecommunication sector puts an emphasis on co-operative testing. It is the intention of the initiative to form a mechanism that enables early-phase testing and cross-operability trials as widely and deeply through the layers and players of telecommunications, as possible. Furthermore, the European Commission underlined the testing issues in its both framework programmes FP6\(^2\) (2001-2006) and FP7\(^3\) (2007-2013).

This emphasis on testing is necessary in order to strengthen European positioning in the global market and in order to utilise the possibilities offered by the European telecommunication sector’s technical and economical achievements during the past decades. However, Japan, China and Korea have made their impressive moves, not forgetting the economical strength of North America, therefore the competition is hard, but the potential and challenges lie in the ability of joining forces in Europe. Despite the fragmented political and regulatory environment European telecommunications have been successful in showing a unified front. Joining forces without prejudices, allowing compromises and holding to high moral principles in co-operation, are necessary to achieve collaborative far-reaching results.

In order to boost European testing, testbed development and usability for the good of telecommunications market the resources have to be aggregated, managed and further refined. This is the motivation for the pan-European laboratory for networks and services.

Concept of the Pan-European Laboratory

The Pan-European laboratory is based on the concept of federation of distributed test laboratories and testbeds that are interconnected and provide access to required platforms, networks and services for broad interoperability testing (Figure 1).

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\(^1\) http://www.celtic-initiative.org
\(^2\) http://cordis.europa.eu/fp6
\(^3\) http://cordis.europa.eu/fp7
The Pan-European laboratory is a concept that is being introduced to enable the trial and evaluation of service concepts, technologies, system solutions and business models to the point, where the risks associated with launching them as commercial products will be minimised. The accomplishment of this objective, which will assist many different European collaborative projects, is an important step towards the establishment of a truly pan-European collaboration network. The long-term vision for the ICT industry and landscape imposes additional requirements for end-to-end testing. Due to the increasing complexity of systems and services, different testing approaches and models are required.

The Pan-European laboratory is not a static organisation, but rather dynamic and adaptive. It will be extended, adjusted and improved by any new available platform, service and system that can be offered by the connected laboratories or new laboratories joining the federation. The entire mechanism, the rules and procedures of how to achieve the effective testing collaboration, will be developed in the Panlab project.

**The Panlab Project**

The Panlab project is a Specific Support Action (SSA) supported by the European Commission, which enables and facilitates the vision for a Pan-European laboratory. Panlab needs to build trust and respect in order to form a functioning forum for the vital work of drafting the Pan-European laboratory for networks and services. The objective of Panlab is to define a framework for the interconnection of independent testbeds and laboratories. The workgroup needs to combine both innovative and realistic views in the field. It needs to combine a wide variety of different technologies, saving the margin for newcomers. A successful Panlab leaves a self-sustainable, long-living, and well-functioning legacy of guidelines, principles and rules allowing the implementation of the Pan-European telecommunication test laboratory.

![Figure 2: Relation between Panlab and the Pan-European laboratory](image)

Pan-European laboratory assures the visibility of the virtual network of laboratories, which means that the testing sites and testbeds become known and accessible for the potential customers. On the other hand, individual testing facilities and groups gain valuable publicity by joining the Pan-European laboratory. Panlab is not restricted to the existing test activities, but seeks also insight to the future testing facilities presenting mechanisms for linking these together. The federative approach to distributed testing has the benefit of flexibility, but at the cost of the management of the distributed environment. The issues addressed by Panlab range from logistics, availability of qualified personnel, remote access and management of systems to the legal, economic and operational matters.
The results enable the implementation of a physical infrastructure (interconnecting facilities, remote access and management capabilities, collaboration tools, etc.), aiming at establishing integration, testing, validation/verification, and possibly certification services for specific technologies and services as well as global solution prototypes developed by European collaborative projects. The ultimate goal of Panlab is the establishment of the grounds for a future operational and long term self-sustainable Pan-European laboratory. This includes a business model on the continuation of Panlab as an independent entity, targeting customers, such as European or national collaborative projects and the industry, during its pre-competitive research and development phase.

All the relevant information and metrics collected from the independent test sites are standardised in order to allow meaningful comparison of the sites. The result of such a standardisation is a transparent classification and rating of the sites, which improves the overall quality of the offered services. By bringing the individual test sites on the same line, a competitive situation is induced between the sites. This alone is an incentive for the sites to stay up-to-date in their offering, and to strive for improving their services. Panlab realises a web brokering service for the test facilities that makes recommendations for projects needing testing, based on the search criteria executed against the standard metrics database of available test facilities and their capabilities.

Important aspects about test sites are for example:

1. **Definition of resources**: technical advancement, capabilities, capacity, equipment, labour resources, lead-time
   
   It is necessary to know what type of tests and with what type of capacity tests can be carried out.

2. **Descriptions**
   
   The test processes should be described related to the first item as well.

3. **Possibility for roadmap testing**
   
   In order to shorten time-to-market it would be feasible to make pre-competitive conceptual tests of services / contents / products.

4. **Availability, publicity**
   
   If there are restrictions in the access to a certain site for certain parties it should be stated. A booking calendar can be maintained.

5. **Linkage**
   
   Possible connections to other test sites or telecommunication stakeholders. Availability of ad-hoc or permanent connections and their types.

6. **Marketing**
   
   Test sites should make themselves well-known. A peer recommendation system needs to be considered. User experiences need to be solicited and stored in the web service.

7. **Offer, pricing, cost calculations**
   
   The whole procedure ranging from offer request practice to cost calculations, fee setting and pricing should be transparent.

8. **Booking**
   
   How to book and how the commitment of the test site for the booking is guaranteed.

Panlab could lay a basis for a ‘Testbed Google’. Pan-European Laboratory would exist as a web service maintained orderly by e.g. a Panlab consortium member/members. It is very important to bear in mind in Panlab that the mechanism to be created needs to operate on ad-hoc principle to be successful. Heavy, bureaucratic and static structures will not survive. The test sites need to ‘loadable up’ when needed and any unnecessary manning or idle costs the laboratory system can not be afforded.

Panlab could create a tradition of arranging testing events and opportunities, e.g., ‘Interoperability Weeks’, during which different products or even concepts could be tested. A question remains how far manufacturers, operators and service providers are willing to go, without fearing to lose critical information into competitor’s hands. Much is also dependant on the credibility and trustworthiness of the trials. How to control and guarantee independent test sites?
Panlab validates also the needs and requirements for offering concurrent design services. In concurrent design several virtually connected parties from many sites or organisations may jointly work on a common project. This is aided by facilitating a central service consisting of, e.g., joint libraries for software, system, architecture, pattern and form design, open source software components, version management systems, software build trees, software license leasing, repositories, storage, messaging, discussion fora, messaging of both instant and pervasive kind, and others. All these would be offered in a secure way with the necessary authentication and authorisation means.

**Panlab Community**

One of the targets aimed by the Panlab project is creation of so-called Panlab Community. Besides members of the Panlab project consortium members, the Community participants will be potential partners and customers of the Pan-European Laboratory as well as all other companies, organisations, and individuals interested in various Panlab activities. In this way, the Panlab Community can achieve its purpose to:

- Build up a serious basis of potential providers of testbeds, which will be included in the Pan-European Laboratory as service/testing providers,
- Establish a reasonable market for the Pan-European Laboratory by involving its potential customers,
- Promote the idea of the Pan-European Laboratory, and
- Gather requirements from the Community members in order to include it in the framework of the Panlab project.

Thus, the Panlab Community will ensure a basic membership of the future Pan-European Laboratory. However, the members of the Pan-European Community do not ultimately have to be members of the Panlab Community and vice versa.

**Figure 3: Panlab Community**

Different from the Panlab project consortium, which is governed by a consortium agreement, the Panlab Community will be governed by loose rules. On the other hand, the Pan-European Laboratory, as a new organisation, will be clearly governed by the legal, operational, administrative, and economic rules, which will be specified in the Panlab project.