

# TORGA.net: The »Trans Portugal-Galicia« Communication Network

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## Introduction

The Trans Portugal Galicia Network Project, TORGA.net, was a proposal to the Program Interregional IIIA, Galicia – North of Portugal sub-program with the following partners: University of Minho, University of Vigo, Centro de Supercomputación de Galicia and the Centro de Computação Gráfica in Guimarães. It has as its main objective the creation of infrastructures and the organization and development of the space beyond borders.

The project proposes to establish a broadband communication network with reduced operational costs that links the campuses of the Universities of Vigo and Minho, as well as their associated Technological Centers, which are the Supercomputación de Galicia and the Centro de Computação Gráfica in Guimarães.

Using this telecommunications infrastructure, Access Centers will be installed in a Technology Access Grid, which will allow distance work sessions such as seminars, lessons, or discussion meetings.

## The Project

The general objective is to improve the indispensable tele-communication networks to enable the development of suitable access conditions for several applications of the information society. By using this communication infrastructure, it is intended to achieve the following specific objectives:

- The development of an R&D pilot project to be executed in the network as an eLearning platform,
- the promotion of common activities such as:
  - Initial training and post-graduation courses,
  - works related to the completion of careers including graduate and licentiate theses,



- access to specialized jobs,
- joint projects,
- scientific and technological meetings with companies,
- meetings of researchers from similar investigative areas, and
- access to cross-border job offers.

## Technical Description of the Network

TORGA.net intends to adopt a communication network system with circuits of interconnection of great capacity and with IP (Internet Protocol) support and reduced operational costs.

## German Abstract

Momentan arbeiten die Bildungs-, Forschungs- und Entwicklungseinrichtungen von Galicien und dem Norden von Portugal nur gelegentlich und auf einzelne Projekte beschränkt zusammen, obwohl sich längst herausgestellt hat, welche Synergien aus dieser Kooperation entstehen. Auf Grund dessen sieht das Torga.net Projekt die Implementierung einer Breitband-Kommunikations-Infrastruktur vor. Diese wird die Problematik, die durch die geringe Zusammenarbeit beider Regionen entsteht, reduzieren und den Zugang und das Teilen von Wissen erleichtern. Aufbauend auf dieser Kommunikationsplattform sind Lösungen der kooperativen Arbeit vorgesehen. Videokonferenzen und E-Learning dienen dabei als Unterstützung für die Zusammenarbeit zwischen den Institutionen beiderseits der Grenzen.

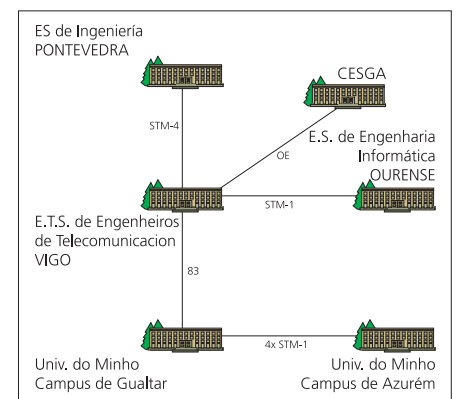


Figure 1: Example of the network with several lines of communication

The infrastructure of the broadband network will allow an international link between the University of Minho in Braga, and the University of Vigo, which operates initially at 155 Mbps and with an available Gigabit Ethernet (1000 Mbit) interface, which will allow for the growth of capacity of this link, as the needs of Torga.net develop.

The network interconnection, which enters the University of the Minho Campuses at Gualtar and Azurém, is carried by an optical fiber with Gigabit Ethernet interface and, initially, will operate at 150 Mbps.

All the other interconnections of TORGA.net, which include Vigo-Orense, Vigo-Pontevedra and Vigo-Santiago, are also carried through an optical fiber with an interface that is never inferior to one Gigabit and with speeds of 155Mbps. The »TORGA.net« network is being established to support the development of a set of important co-operative activities beyond national borders.

### Description of the Access Centers

The essential aspect of the Access Grid is that it is a system for capture and multimedia projections of large format and of high quality that simultaneously allow the visualization of presentations and videoconference in a number of rooms. The capacities of these rooms include:

- High quality video and multi-channel audio,
- a large format visualization screen,
- integrated presentation technologies,
- recording of sessions for a post-session reproduction,
- integration with »Globus« middleware for access to other Grid services such as directories, security, network management, etc.,
- accomplishment of multiple sessions.

The TORGA.net project plans the set up, management, and exploration of seven Access Grid Centers – two being located in the University of Minho and the other five being sited in Galicia.

All of these Access Grid Centers allow real-time multimedia communication between groups of dispersed users at a variety of locations.

### Description of the eLearning pilot project

Based on the proposed infrastructure to be created and in order that the implementation of courses is possible and practical actions undertaken at a distance within areas that normally are contemplated for new kinds of eLearning, such as moulds and graphical computation with the inclusion of music, a network will be needed with a large bandwidth, as well as some specific equipment and platforms (videoconference system, specific eLearning platforms, etc.).

With this project, it is on the one hand intended to create new practical forms of education based upon web technology and, on the other hand, to develop contents scientifically evaluated by specialists in the proposed areas. This way, courses could be facilitated of high quality with permanent teachers operating in a digital environment from whence it would be possible to teach to or from any point in both regions.

### Technological platform

In order to enable everyone to benefit from the easy access to the new practical forms of education through the use of the designated rooms, it will be necessary to make use of a



Figure 3: Example of an e-learning teaching and training room

common platform that works with the Internet and takes account of the technologies of the World Wide Web, as well as facilitating a common point of access to didactic and pedagogical contents.

The following practical areas of education will be included within the process of developing didactic contents to be used on the eLearning platform:

- The processes of moulds and polymers,
- Experimental Music,
- Graphical Computation.

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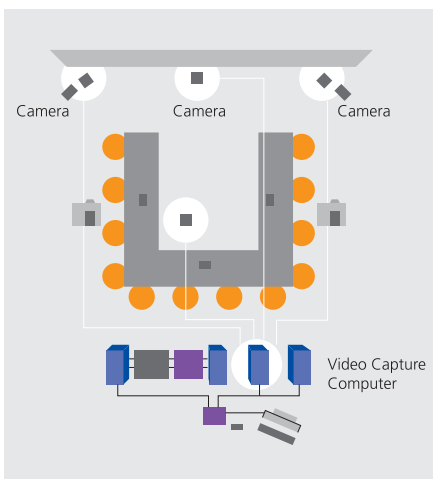


Figure 2: Example of the configuration of a room with the Access Grid system