



GÉANT2 Report on the Country Needs Assessment concerning research and education networking in Albania

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* The publication of this report has been authorised by the director of INIMA, the Institute for Informatics and Applied Mathematics of the Academy of Sciences of Albania, who collaborated in the Country Needs Assessment. This public version does not differ from the original version, which was distributed to the European Commission and national stakeholders of the Albanian NREN.

Executive Summary

GÉANT2 is the network backbone connecting the National Research and Education Networks (NRENs) of Europe. GÉANT2 is co-funded by the European Union's 6th Framework Programme through a project, which also includes a Networking Activity, NA4, to provide support to the development of research and education networks in the less-advanced countries in and around Europe.

During April and May 2005 TERENA has undertaken a study on behalf of the GÉANT2 Networking Activity NA4 about the status of research and education networking in Albania. The work included a desk study, detailed information gathering and a visit of a team of experts from GÉANT2 member NRENs, which was carried out on 26-27 May.

The members of the GÉANT2 team of experts identified two main recommendations to all the parties responsible for planning and supporting research and education in Albania and one major action to be implemented by the GÉANT2 NA4.

Recommendation 1. *Decision makers of research and education institutions and the government officials responsible for research and education policies in Albania must collaborate towards the creation of one single entity representing the totality of the research and education community, which should eventually become the Albanian NREN.*

This single entity does not need to be a separate legal entity from the beginning, but requires stability of funding to support adequate dedicated resources at the managerial organisational and operational level.

Such an entity is essential for representation of Albania at the international level and its future participation in regional or pan-European networking projects.

Recommendation 2. *Decision makers of research and education institutions, the government officials responsible for research and education policies in Albania and the (future) NREN need to work towards interconnecting all research and education institutions in the country via a single network, managed and operated by the NREN.*

A number of options may be available and need further investigation, though the following is recommended:

Follow examples of neighbouring countries and facilitate the acquisition of (dark) fibre for usage by the (future) NREN, either from the telecom operator or from alternative fibre suppliers.

Action. *NA4 to organise a user/policy workshop in Albania before mid November 2005, gathering all relevant actors, university directors, politicians, advanced research users and telecom operators in an international event aimed at consensus building and fostering the establishment of the NREN.*

Introduction

GÉANT2 is the seventh generation of pan-European research and education network, successor to the pan-European multi-gigabit research network GÉANT. The project within which the network is funded began officially on 1 September 2004, and will run for four years. GÉANT2 is co-funded by the European Commission and Europe's national research and education networks, and is managed by DANTE.

TERENA, the Trans European Research and Education Networking Association, is the leader of the GÉANT2 Networking Activity NA4, to support the development of research and education networks in the less-advanced countries in and around Europe.

One of the major challenges facing European research and education networking is the disparity between developments in different countries and regions. Narrowing this Digital Divide between the networking services available to researchers, teachers and students in some countries, is of the utmost importance for achieving the European Union's political objective of equal opportunities for researchers throughout the European Research Area.

The goal of the GÉANT2 Networking Activity NA4 is to contribute to reducing the divide by means of specific support actions targeted to important issues in the development of research and education networking in a specific country, which are identified in the process of a Country Needs Assessment. The findings of the assessments are meant to provide an overall picture about the status of research and education in the country concerned and to point out the way to specific forms of support that can be successfully undertaken to address the most important and/or urgent problems.

The GÉANT2 Networking Activity NA4 takes care of the Country Needs Assessment and the implementation of the specific support actions. However, the responsibility for any significant development of research and education networking lies with the national stakeholders. They need to take initiatives and ensure that the necessary policies at the different levels are in place and that sufficient resources will be available. A very important objective of the GÉANT2 Networking Activity NA4 is therefore to provide recommendations to these national stakeholders – government authorities, funding bodies, research and education institutions, and networking organisations – on the policies that they should develop and the actions that they should take to narrow the Digital Divide in research networking between their country and the rest of Europe.

The working method of a Country Needs Assessment, which is described in detail in a GÉANT2 deliverable¹, starts from creating a team of experts from the GÉANT2 community, who have specific knowledge about the country or have faced issues similar to those currently faced by the NREN in the country concerned and, finally, have an understanding of the country's political and economic environment. For the Country

¹ GÉANT2 Deliverable D.4.0.2 Terms of Reference for Country Needs Assessment
http://www.geant2.net/upload/pdf/GN2-05-002v7_20050127144241.pdf

Needs Assessment of Albania TERENA staff members were supported by Vasilis Maglaris, Chairman of the NREN Policy Committee and GÉANT2 Consortium and by Enzo Valente, Director of GARR, the National Research and Education Network of Italy.

During the Country Needs Assessment the GÉANT2 team carries out a desk study based on various information sources, including the NREN Compendium. An important source of information is the NREN in the country concerned. The GÉANT2 team liaises with the NREN about the acquisition of additional information and discusses the goals and the priorities for the study. As a part of the process the team may visit the country for a few days in order to understand what the difficulties and inhibitors are for the NREN and for the organisations responsible for research and education networking at a local level; to discuss possible solutions with key actors and to explore in-depth the areas that are identified as possible targets for assistance, and to discuss these options with the stakeholders in the country. At the end of the process the team assesses the information, analyses the findings and writes the report with recommendations to the stakeholders in the country concerned and to the European Commission.

The Country Needs Assessment of Albania started in April 2005 with the study of the NREN compendium, the SEEREN and SEE-GRID market analysis and other publicly available reports about the status of ICT in Albania. The objectives of the work and the priorities were discussed with members of INIMA, the Institute for Informatics and Applied Mathematics of the Academy of Sciences of Albania. A questionnaire was filled out by INIMA staff in May 2005, who, among other pieces of information, provided the GÉANT2 team with details about the universities and other higher education institutions in the in the country, their location and the student population; the computer networking facilities; the counterparts of the NREN in the government; the situation of the internal telecommunication market in Albania and the status of ISPs; the most important national and international projects (existing or planned) in key scientific disciplines in the country. The work was concluded by a visit of the GÉANT2 team to Tirana on 26 and 27 May. The agenda of the visit and contact details of people met during the visit are provided in Appendix B of this report.

This report is the outcome of the analysis of the findings of the Country Needs Assessment of Albania, which identified two major recommendations for stakeholders of NRENs and one main specific support action for the GÉANT2 Networking Activity NA4. In the following of this document the two recommendations and the action are discussed in detail. Appendix A summarises the main findings concerning the major research and education institutions in Albania and reports about their support for creating the NREN; details of the computer networking facilities in these institutions, and the options for interconnection of universities in Albania.

Recommendation 1. Creation of the Albanian NREN

Decision makers of research and education institutions and the government officials responsible for research and education policies in Albania must collaborate towards the creation of one single entity representing the totality of the research and education community, which should eventually become the Albanian NREN.

This single entity does not need to be a separate legal entity from the beginning, but requires stability of funding to support adequate dedicated resources at the managerial organisational and operational level.

Such an entity is essential for representation of Albania at the international level and its future participation in regional or pan-European networking projects.

The position of Albania with respect to European research and education networking

The European model of research and education networking has a federated structure, in which university campuses and institutions are interconnected via a single national research and education network, which in turn is connected to the pan-European network backbone. In practice, in some countries universities get access to the national network via smaller regional networks or metropolitan area networks.

This federated model has proved to be very effective in making sure that all academic institutions in one country can effectively collaborate with peer institutions, both nationally and abroad, by making use of high capacity networks, providing them with a high standard of service and security.

A condition for this model to be implemented across Europe is that each country has one single entity, responsible for managing the national research and education network (the NREN) and connecting to the pan-European backbone. In Albania there is an official government mandate giving the Academy of Science authority to run a backbone, but there is no funding allocated for this.

INIMA, the Institute of Informatics and Applied Mathematics of the Academy of Sciences of Albania, is formally in charge of operating the “state network”, but such a network does not exist currently in Albania. The Government is working right now to create its own network, while a national research and education network, as part of "national public network" does not exist. Universities are connected to the Internet via separate Internet Service Providers (ISPs). INIMA in practice provides only some network capacity to the institute itself and, via a wireless link, to a nearby building hosting the main office of the Academy of Sciences, the Centre for Geographical Studies and the Office for Accreditation of Higher Education.

INIMA is currently a reference partner for international networking activities. In recent years INIMA, has been involved in several European Union funded projects, including

SEEREN, SEE-GRID, and SEEFIRE. The organisation has been also involved in the SEEREN2 project proposal, which is entering into contractual negotiations with the European Commission at the time of writing this report, and which will likely start procuring international connectivity to the southeast European region before the end of 2005.

The need to create the Albanian NREN

About two years ago, by joint decision of the Ministry of Education and Science and the Academy of Sciences, a management board and a technical board were appointed with the mandate to create the Academic Network of Albania (ANA), the organisation that would be in charge of the national research and education network. These boards have met a few times in the past but there has been no activity in the last two year and some of their members have left their position without being replaced.

More recently, the Academy of Sciences has had discussions with the Ministry of Education and Science, as well as with other relevant ministries, in order to "revive" the issue of creating the NREN. These negotiations were pending at the time of the study because of parliamentary elections scheduled at the beginning of July 2005.

Internationally there is not a common standard concerning the legal status of an NREN. The status of European NRENs varies from that of associations to not-for profit companies and many other forms. Some European NRENs have no separate legal status but are legally part of a University. Many NRENs were created through an initial project stage with the task of providing the inter-university computer network, and only later became established as a separate legal organisation. In all cases though, a firm, official mandate, stable funding and adequate personnel resources from the very beginning were the conditions for the good functioning of these initiatives and their transformation into the established NRENs of the present days.

In connection with the enlargement process, moving the borders of the European Union farther east and south, the Union's policies towards neighbouring countries are changing and giving higher priority than before to countries in southeast Europe and in the Balkans in particular. To ensure that Albania becomes an integral member of the European research and education community, the country's institutions should continue and intensify their involvement in international networking activities. Albania is not yet eligible to become part of the GÉANT2 consortium, as is the case for Bulgaria, Romania and Croatia. Participation is defined by the rules of the Framework Programme and it is not clear at the moment what these will be for the period after 2007. However, if Albania has an ambition to become part of GÉANT2 one day, the existence of a single NREN is a mandatory condition.

Recommendation 2, Interconnection of research and education institutions.

Decision makers of research and education institutions, the government officials responsible for research and education policies in Albania and the (future) NREN need to work towards interconnecting all research and education institutions in the country via a single network, managed and operated by the NREN.

A number of options may be available and need further investigation, though the following is recommended:

Follow examples of neighbouring countries and facilitate the acquisition of (dark) fibre for usage by the (future) NREN, either from the telecom operator or from alternative fibre suppliers.

Research networks can dramatically improve the quality of education by providing access to a worldwide repository of knowledge and enabling the research and education community to generate new citizens who are trained in the latest and most advanced applications of Information and Communication Technologies (ICT). This role of research networking as a driver in building the Information Society and achieving the objectives of eEurope was well recognised by all the actors whom the GÉANT2 team of experts met during their visit to Albania.

The essential role of the NREN is to operate the national network interconnecting all research and academic institutions, providing them with international access and working as a laboratory for advanced network services required by those institutions. However, all the pre-conditions for this to happen are missing in Albania. There are no dedicated resources to support the operation of network services and there is no national network backbone. Research and education institutes have poor computer and network facilities, if any. Some university departments, research institutes and education institutions, including schools have expensive, low-bandwidth, connectivity to the Internet via Internet Service Providers. A few institutions in Tirana have Ethernet based LANs at 10-100Mbit/s.

For scientists to participate in research projects and collaborate with their peers in other countries a service quality comparable to other European NRENs, and this service level is not available today in Albania. It is clear that the universities and other research institutes do not have an adequate infrastructure and resources for providing such a quality of service. In fact, the SEEREN international link was providing 2Mbit/s connectivity to INIMA, but the lack of interconnection between academic institutions in Albania did not allow any research and education institutes in the country to share that facility.

The commercial sector is charging high prices for connectivity in Albania. Research and education networking in Albania will not be able to progress if left to the market forces and will consequently not be able to participate and compete internationally. Progress will be possible only by a focused effort of the government and the key decision makers to make a serious plan for creating an NREN providing the interconnection of all research and education institutions in the country and the provision of innovative network services.

Existing or potential international initiatives may help creating the opportunity for this. In particular, projects like SEEFIRE, SEELight and SEEREN2 may favour the acquisition of (dark) fibre by the future NREN of Albania. The government of Albania should build on the existing efforts from international programmes and invest significant resources into creating an appropriate national infrastructure connecting all universities and research institutions.

The SERENATE study² has identified a clear correlation between the liberalization of the market for data communication and the prices of telecom services. The higher the competition is in a country the lower the prices are for network connectivity. The lack of competition is one of the major components of the digital divide between different regions in Europe; this is dramatically the case in Albania. The solution for many NRENs in Europe and other world region has been obtaining access to optical fibres. A very special case occurred in neighbouring Serbia, where thanks to the pressure of the government the incumbent telecom operator has recognised the special status of research and education networks and has provided optical fibre for free to exclusive use of the NREN.

ALBTELECOM is the only operator of fixed telephony in Albania. A licence is expected to be granted to a second operator soon. There are a few competitors in the mobile telephony sector. But competition in the market of Internet Service Providers is quite developed.

The GÉANT2 team of experts did not speak to anybody from ALBTELECOM during the visit, but it does not seem very likely that the company would be willing to offer (dark or lit) fibre to the academic community. During the meeting with the regulatory authority it became clear that if the telecom operator wants to give lower prices to universities they can do so. As far as services are provided for the usage by not-for-profit organisations the price is not subject to regulation. However, these services cannot be offered for a price which is lower than the cost.

ALBTELECOM has been privatised by the Albanian Government. Even though there were disagreements from the opposition party about the fairness of the procedure, the privatisation is irrevocable. Because the government does not own the majority of the

² The SERENATE project carried out a study into the evolution of European Research and Education Networking. The project findings and recommendations are reported in "Networks for Knowledge and Innovation": <http://www.serenate.org/publications/d21-serenate.pdf>

company shares, a similar solution to the Serbian NREN does not seem a feasible option in Albania.

Alternative options for the acquisition of dark fibre by the research and education community in Albania are being investigated in the SEEFIRE (South East Europe Fibre Infrastructure for Research and Education) project. Although a few of these options have been identified, and fibre owners have been located it is still very hard to obtain documentation about fibre in Albania.

Action for GÉANT2 NA4

NA4 to organise a user/policy workshop in Albania before mid November 2005, gathering all relevant actors, university directors, politicians, advanced research users and telecom operators in an international event aimed at consensus building and fostering the establishment of the NREN.

The GÉANT2 team of experts understood that the lack of progress in the creation of the ANA in the past years was also related to internal difficulties and conflicting interests/priorities among different institutions, but that the situation had recently changed and potential conflicts between the Academy of Sciences and University institutes were apparently solved. This was confirmed by all actors met during the visits. Everybody supported the goal of creating a single entity in charge of managing the network and representing the whole research and education community. The rector of the University of Tirana confirmed that the Conference of Rectors of the Universities of Albania (CRUA) could also play a role in supporting the creation of the NREN in Albania.

The **action** that emerged from the talks was to organise a user workshop inviting all directors of universities and research institutes to Tirana for a two-day event to be held before the second half of November 2005. The objective of the workshop, where representatives of the new government of Albania and other potential stakeholders of the NREN should be invited, will be to transfer knowledge, establish a dialogue and exchange ideas at all relevant levels concerning the support for the NREN, raise awareness among stakeholders about the importance and need for the NREN in the country, and contribute to taking the necessary steps at the national level for achieving the objective of the GÉANT2 recommendations.

APPENDIX A

Major research and education institutions in Albania

There are 11 universities in Albania, with the major ones, the University of Tirana and the Polytechnic University of Tirana counting about 20,000 students, roughly half of the country's entire student population.

The GN2 NA4 team met the rectors of both universities. During the meetings the rectors emphasised their well established computing centres, the importance of the integration in the Bologna process, and the issues of relatively poor/old computer networking and laboratory facilities, as well as the need to obtain more support for research.

The Academy of Sciences was created in 1973, as an autonomous institution funded by the State budget. The Academy has 14 research institutes and centers, of which one, the Institute for Informatics and Applied Mathematics (INIMA) is specialised in computer sciences. The institutes of the Academy are grouped in two Sections, the Natural and Technical Section and the Section of Albanology. Together with the Ministry of Education and Science (MES), the Academy of Sciences is one of the main organisations coordinating and funding research in the country. There are at least three funding streams for research: one is dedicated to the Academy, one is dedicated to universities and other institutions (MES and other ministries), and a national programme for research and development "for all".

Besides the Academy and Universities there are about 40 R&D institutions that belong to various ministries and ministry departments, a partial list was provided to the GÉANT2 team by personnel of INIMA, but many of them are not well known.

The University of Tirana has several faculties and institutes in Tirana, located at a number of different sites, some of which are campus-like sites aggregating several institutes; occasionally several institutes are hosted in the same building. The whole university counts more than 15,000 students and 1,000 teachers. Two departments at the University of Tirana have ICT facilities and related expertise: the Department of Informatics of the Faculty of Economy and the Computer Sciences department of the Faculty of Natural Sciences

Besides INIMA and the University of Tirana, the other institute with a major Computer Sciences department in Albania is the Faculty of Electrical Engineering of the Polytechnic University of Tirana.

Because of their expertise, INIMA, the Faculty of Natural Sciences of the University of Tirana, and the Faculty of Electrical Engineering of the Polytechnic University of Tirana

represent the excellence in Albania concerning ICT and networking and should be the main focus for running the academic network.

There is no academic network in Albania and there is also no network interconnecting the buildings of the University of Tirana. All institutions have separate, generally low-bandwidth, connections to the Internet via several ISPs.

In practice universities do very little or no research at all, because of lack of facilities, but also because institutes can generate additional revenues by providing services to third parties. Moreover, it is not unusual for academic staff members to take unrelated commitments in business/management activities outside of the university.

INIMA

INIMA, the Institute of Informatics and Applied Mathematics of the Academy of Sciences of Albania, is formally in charge of operating the national network, but in practice provides only some network capacity to the institute itself and, via wireless link to the Academy of Sciences, Centre for Geographical Studies and Office for Accreditation of Higher Education (all sharing the same building). INIMA and the main building of the Academy of Sciences are located in nearby buildings.

Besides providing SMTP and HTTP services for the institute itself and for the Academy of Sciences, INIMA provides the DNS service for secondary-level domains of the .al country-code top-level domain.

Until the end of 2004, INIMA was hosting the SEEREN PoP, but this was discontinued after the end of the project. The institute has still a cable connection to a commercial ISP (1Mbit/s), and an international link to Bari, Italy (1Mbit/s). The international connection is currently paid by an Italian data company.

INIMA has a number of PC rooms with more than 100 UTP connected PCs. In addition there are two small server rooms and a PC lab for teaching with 20 connected PCs. Some of the facilities were currently in use for a data-entry service outsourced by an Italian firm.

Computer networking facilities at the major universities

University of Tirana, Faculty of Economics

The Faculty of Economics of the University of Tirana provides courses in informatics and MBAs with specialisations such as marketing/tourism. The Faculty participates in programmes for the exchange of staff and students and has some international collaboration with Nebraska and German Universities, as well as with the UK, Greece and Italy. Only a small number of the faculty PCs, mainly used for the administration, are connected by a LAN. The Faculty has two computer labs, but these are fully occupied all day long. They are too small for their needs. We visited two PC labs. One has 25 machines plus server, the other 20 machines not connected, but the room contains a

DELL Power connect 2016/2024.

The Faculty is connected to the Internet via a wireless link to an ISP at download speed of 512k and upload speed of 128k. The price paid for this connection is about 500 euro per 3 months. The same access point is shared by 6 departments in the building. A new library in a second building connected to the Faculty has three PCs, one of which is connected via the same 512k link.

University of Tirana, Faculty of Natural Sciences

The Faculty of Natural Sciences of the University of Tirana has about 3000 students. The Faculty provides three-year and five-year degrees in such disciplines as Biology, Physics, Mathematics and Chemistry. The faculty provides also Computer Science courses to about 70 students. All three buildings of the Faculty of Natural Sciences are connected via a LAN with about 100 PCs and connected to the Internet via a leased line from a commercial ISP for a price of approximately 300 euro/month.

Polytechnic University of Tirana, Faculty of Electrical Engineering

The Faculty of Electrical Engineering of the Polytechnic University of Tirana is a major centre of expertise in informatics and computer sciences. However, labs and computer networking facilities are very poor. There had been talks about six months ago about building a LAN infrastructure, but this was not available yet. The Robotics Lab and the Telecommunication lab have some PCs without network connections. We visited the Multimedia Library, where we saw a few notebooks and one desktop for the administration, connected via 1Mbps wireless link.

The options for interconnection of universities

All the people met during the visit agreed that interconnecting universities in Albania is one of the highest priorities. The rector of the University of Tirana mentioned two projects related to the development of interconnection facilities. The first project was linked to a fund of 2Meuro, which was earmarked from the Italian government for academic institutions in Albania two years ago and had not been utilised. The Conference of Rectors of Universities of Albania (CRUA) had agreed to channel this money into a project for the creation of the academic network of Albania, interconnecting all universities in the country. The project would also provide the infrastructure and the services for an information system supporting the integration of curricula, administrative information etc. to speed up the implementation of the Bologna process in Albania. The idea had been discussed with the relevant minister, who in principle agreed with the project. All details still needed to be defined. The second project was a feasibility study with participation from Greece to interconnect institutes in Tirana. This project would make use of funding available from the Greek Foreign Office.

From the information obtained it was not clear how much chance of succeeding these projects will have, but it is worth to monitor the progress closely. If any of these projects will succeed, some consultancy/expertise might be needed in the design of the network and GÉANT2 might provide some support.

APPENDIX B - Meeting agenda and contact details

26 May 2005

10:00 Meeting with Prof. Dr. Shezai Rrokaj, Rector of the University of Tirana

12:00 Meeting with Prof. Përparim Hoxha, Rector of the Polytechnic University of Tirana and

13.00 Meeting with Ylli Popa, Chairman of the Academy of Sciences and the Vice Chairman Farudin Hoxha

14.00 Meeting with Dule Dervishi, Executive Director of the Albanian Telecommunications Regulatory Authority

27 May 2005

10.00 Meeting with the Deputy Dean of the Faculty of Economy of the University of Tirana, Fatmir Mema and Bashkim Ruseti, Head of department of informatics and faculty of economy

13.00 Meeting with Llukan Puka, Dean of Faculty of Natural Sciences and Gezim Karapici, Dean of Faculty of Electric Engineering

14.00 Meeting with technical board of ANA:

- Gudar Beqirai, INIMA
- Neki Frasheri, INIMA
- Prof. Betim Cico, Head of Computer Engineering Section of the Polytechnic University of Tirana, Faculty of Electrical Engineering
- Prof. Eqerem Arkaxhiu, Head of Computer Sciences Dept. University of Tirana, Faculty of Natural Sciences

16.00 Closing meeting with INIMA staff