

The SEEREN Initiative: seeking sustainability for SE European NRENs

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1. Introduction

The telecommunications sector in SE Europe is improving steadily, but it still trails behind the rest of the continent. The move toward privatization and liberalization is alive and well and national telecommunications monopolies are becoming fewer and fewer in number. Although developing countries in the SE European region are currently expanding the services available over telecommunications networks, the pace at which infrastructure is being set in place varies from country to country.

The “digital” divide that separates most of the SE European countries from the rest of the continent originates from the fact that those countries have a relatively poor technical infrastructure, due to the lack or shortage of the necessary funds needed to keep them always updated.

As a result of the above, the Research and Educational community of the aforementioned countries are somehow secluded both from the rest of the continent and the other regional and neighboring countries. A factor that keeps them “outsiders” from the current and future European technological upgrades, hindering also the co-operation and the exchange of know-how amongst those scientific communities.

The South-Eastern European Research and Education Networking initiative (SEEREN) will oversee the establishment or upgrade of the international connectivity of the National Research and Education Networks (NRENs) of Albania, Bosnia-Herzegovina, Bulgaria, the Former Yugoslav Republic of Macedonia, and Serbia-Montenegro (beneficiary NRENs) into the regional points of presence of the pan-European Gigabit Academic Network (GEANT). In accordance with the SEEREN plans, the physical links for these

connections are procured by applying an open tendering process, while the GEANT access capacities are offered by the contractor NRENs from their subscribed capacities.

The importance of the SEEREN project is emphasized also by the fact that SE Europe was up to recently a source of political, social and economic instability. Hence, by facilitating co-operation, the project will promote regional relations in the area and provide stability and piece. Additionally, it will provide a platform for dissemination and development of the next generation of Internet technologies in those states that are on course to joining the EU.

The implementation of the SEEREN project started on December 2002 and will last 18 months. However, a long-term objective of the project is to preserve and assist the aforementioned countries to keep pace with all the future technological upgrades.

2. Long-term objectives

Countries in SE Europe have a wealthy cultural heritage that dates from several hundred years ago. Indeed, up to now the existing common as well as diverse cultural elements of the fairly small and closed local societies, could hardly be considered as being integral parts of the cultural fabric of the region. The SEEREN infrastructure would promote common cultural ties through applications that could enable publishing, access and sharing of cultural assets among users and possibly educate the various social and even ethnic communities.

The project will have a positive effect in the area of “brain-drain” prevention making the right information and knowledge resources accessible to the scholars both locally and globally. We are acutely alert by the daily mental hemorrhaging in SE European countries with so many young and

educated people leaving. While this is part of a more general phenomenon that also happens in developed countries, it is of great concern in the developing ones, particularly in academic environments.

SEEREN will bring together the research & academic communities of SE Europe enabling them to cooperate towards achieving their common scientific endeavors. This is clearly a positive development, taking into consideration the recent history of the region, where social unrest and political conflicts had affected the intra country cooperation and put the local academic and research communities into practical isolation.

On completion of SEEREN, the academic and research community of SE Europe will acquire the

eScience applications. SEREN will raise awareness for advanced services, thus laying the grounds to follow-up projects that will aim at funding internal, regional an international networking. The know-how transfer concerning project management and implementation will be achieved by means of direct or electronic interaction in the region, complemented by relevant workshops and task force participation.

Last but not least the SEEREN project has recognized the infrastructural divide of most of the NRENs and is supporting/coordinating other funding opportunities (e.g., NATO, UNDP, INTERREG, bilateral programmes, etc) to maximize the regional impact. The figure below depicts some of the SEEREN NRENs essential status indicators.

	.al	.ba	.bg	.gr	.hu	.mk	.ro	.yu	Source	Year
Geography indicators										
Area (sq km x1000)	28,75	51,13	110,91	131,94	93,03	25,33	237,50	102,17	World Fact Book	2001
Population (millions)	3,44	4,06	8,12	10,58	10,19	2,04	22,40	10,64	WorldBank	2001
Inhabitants per sq km	119,69	79,41	73,25	80,15	109,51	80,67	94,30	104,18		
Economic indicators										
GDP (billion USD)	4,11	4,77	12,71	116,35	52,36	3,44	39,71	10,88	WorldBank	2001
GDP per capita (x1000 USD)	1,20	1,17	1,57	11,00	5,14	1,69	1,77	1,02	WorldBank	2001
GDP growth (annual %)	6,00	6,00	5,00	4,00	4,00	-4,00	5,00	5,00	WorldBank	2001
Inflation rate	3,00	5,00	4,80	3,40	9,20	5,30	34,50	40,00	World Fact Book	2001
Unemployment (%)	30,00	40,00	17,50	11,00	6,50	39,00	9,10	30,00	World Fact Book	2001
VAT	20,00	20,00	20,00	18,00	25,00	25,00	19,00	-	Questionnaire	2003
Telecom indicators										
Literacy (%)	93,00	-	98,00	97,00	99,00	89,10	97,00	93,00	World Fact Book	2001
Internet users (x1000)	3,50	20,00	430,00	1000,00	1480,00	50,00	800,00	400,00	WorldBank	2001
% Internet users	0,10	0,49	5,29	9,46	14,53	2,45	3,57	3,76		
% computers	0,60	-	4,40	7,00	8,50	-	3,20	2,30	WorldBank	2001
% fixed phones	6,70	-	37,00	56,00	48,00	25,00	14,43	24,00	Questionnaire	2002
% cell phones	16,70	-	28,80	64,00	60,00	18,00	20,73	23,00	Questionnaire	2002
Data services market	liberalized	-	liberalized	liberalized	liberalized	monopoly	liberalized	partly lib.	Questionnaire	2003
Fixed phone services market	partly lib.	-	liberalized	liberalized	liberalized	monopoly	liberalized	monopoly	Questionnaire	2003
Cell phone services market	partly lib.	-	liberalized	liberalized	liberalized	partly lib.	liberalized	partly lib.	Questionnaire	2003
NREN indicators										
Separate legal entity	NO	YES	YES	YES	YES	NO	YES	NO	Questionnaire	2003
Operational (2002)	NO	NO	YES	YES	YES	YES	YES	YES	Questionnaire	2003
GEANT PoP	NO	NO	NO	YES	YES	NO	YES	NO	Questionnaire	2003
No. of persons employed (full)	0	3	4	30	26	16	30	19	Questionnaire	2003
Tot. expenditure '02 (EUR x1000)	NA	NA	NA	5320,00	6000,00	51,50	3160,00	470,00	Questionnaire	2003
Proj. funding '03 (EUR x1000)	NA	NA	300,00	7000,00	6000,00	266,00	2600,00	1000,00	Questionnaire	2003
Universities connected	0	0	26	21	123	2	38	7	Questionnaire	2003
of	11	7	42	21	123	3	-	-	Questionnaire	2003
Research institutes connected	0	0	76	16	50	0	37	27	Questionnaire	2003
of	45	30	100	16	50	0	-	-	Questionnaire	2003
Schools connected	0	0	10	6551	98	0	350	2	Questionnaire	2003
of	2170	1802	3200	9779	3200	1142	-	-	Questionnaire	2003
Other	0	0	6	11	409	10	96	13	Questionnaire	2003
End users - Academics (x1000)	45,45	63,00	98,00	265,00	340,00	61,00	200,00	80,00	Questionnaire	2003
End users - Researchers (x1000)	0,80	0,00	5,50	20,00	80,00	0,00	50,00	8,00	Questionnaire	2003
End users - Schools (x1000)	0,00	0,00	0,40	400,00	100,00	0,00	50,00	1,00	Questionnaire	2003
End users - Other (x1000)	0,00	0,00	0,40	3,00	80,00	9,00	8,00	1,00	Questionnaire	2003
End users - Total (x1000)	46,25	63,00	104,30	688,00	600,00	70,00	308,00	90,00	Questionnaire	2003
Tot. traffic through net '02 (TB)	-	-	-	2040,00	1000,00	6,36	-	1,11	Questionnaire	2003
Intern'l incoming traffic '02 (TB)	-	-	-	440,00	600,00	-	150,00	-	Questionnaire	2003
% to commercial internet	-	-	-	79,00	-	94,00	67,00	98,00	Questionnaire	2003
Intern'l outgoing traffic '02 (TB)	-	-	-	580,00	400,00	-	90,00	-	Questionnaire	2003
% to commercial internet	-	-	-	78,00	-	94,00	67,00	98,00	Questionnaire	2003
Intern'l link capacity (Mb)	-	-	6	1240	2500	1	155	8	Questionnaire	2003
Inten'l link congestion level (1-5)	-	-	5	1	1	5	5	5	Questionnaire	2003
Backbone congestion level (1-5)	-	-	-	3	2	5	4	1	Questionnaire	2003
NOC	NO	NO	YES	YES	YES	YES	YES	YES	Questionnaire	2003
NOC availability on weekly basis	-	-	12x6	12x7	24x7	9x5	24x7	24x7	Questionnaire	2003

means to assist in its integration into the European and international digital developments of the new generation state-of-the-art internet networks, as well as into the corresponding research-academic applications of the Information Society, such as tele-education, distributed super-computer processing in high energy physics, applications in meteorology and seismological research, etc.

The SEEREN project will be a pilot for a "next generation" networking environment that will operate at gigabit speeds and support advanced

3. Sustainability

Although the SEEREN plans are covering just the period ending September 2004, and also the SEEREN budget foreseeable covers the associated line costs of about one year, it is the intention of the consortium, and eminent interest of the beneficiary NRENs that the connectivity remains available beyond that time-span. In other words, the SEEREN project not only establishes the GEANT connectivity of the beneficiary NRENs but also provides support to these NRENs to keep the connections sustainable.

Moreover, by taking into account the continuous development and the organisational background of the European research and education network, sustainability of the connections available for the SEE NRENs is supposed to involve not only keeping a stable connectivity/access to GEANT but also the following gradual enhancements:

- achieving full NREN Consortium membership and subscription to GEANT services as soon as possible, by their integration into the GEANT community as GEANT partners (which means that all SEE NRENs are enjoying the same benefits as any European NRENs, by taking their proper part of the cost sharing scheme applied among the Consortium members, and also they are involved into the activities of the NREN Consortium, as well as, with full rights and duties, of the NREN Policy Committee);

- gradually increasing the access capacities of the SEE NRENs in a way resulting in a step by step elimination of the gap between their international access bandwidths and the average access bandwidths of the entire European NREN community;

- continuously developing their internal (domestic) R&E networking infrastructure so that the speed and coverage of the internal connectivity within the SEE NRENs keep pace with the gradual upgrading of their international access capacities, by providing internal connections making possible a continuously improving speed and service quality, well matching the increasing speed of their GEANT access; and

- step by step introducing advanced services and applications so that the network capacities are well utilised in order to support the evolving needs of their academic and research communities in the fields of domestic and international data communications, information access, as well as network based information exchange and co-operation.

Sustainability of the networking infrastructure (especially the international connectivity) of the SEE NRENs can only be achieved if a number of conditions are fully or at least partly met. The rest of this section deals with these conditions, by listing them. The main categories of the conditions for the attained sustainability are as follows:

A. Advantageous, supportive political and legal environment.

B. Enabling technical and infrastructural background.

C. Availability of financial resources.

D. Stable NREN organisation and operation.

E. Availability of technical expertise within and/or behind the SEE NRENs.

The listed conditions are to be considered as elements of the sustainability model of the SEEREN NRENs (although the validity of the model is much wider than just the SEEREN coverage).

Obviously the above, annotated list summarises the ideal conditions. Especially in the early phases of network development and operation some of the listed conditions are just partly met, or remain temporarily lacking. In case of a number of the listed conditions due activities within the SEEREN project may provide considerable contribution. TERENA is an extremely useful partner in these cases, but also the potential role of DANTE and the contractor NRENs must not be underestimated.

4. Conclusions

SEEREN is expected to upgrade and integrate the Internet services and infrastructure of the National Research and Education Networks of SE Europe, in an attempt to ease the "digital divide" that still separates most of the SEE countries from the rest of the continent. However SEEREN will do more. SEEREN will provide support to the beneficiary NRENs to keep the connections sustainable.

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