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Paving the Highway
by PHARE

István Tétényi

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Abstract

When the author first came across the imposition of bureaucratic rules on computer networking, he thought that the approach was nonsensical. Time passed and it became obvious that the management of a project requires a necessary formal framework otherwise the project is doomed to fail. While I took part as a technical consultant to DANTE in a PHARE project I had the opportunity to watch both the technical and organizational aspects of a large scale project. The paper gives a summary of both and presents the most important results.

1. Introduction

Computer networking activities become very important in the new democracies. The Internet networking technology became available to solve most of the technical problems. It was clear from the beginning that the availability of a suitable technology was only one of the necessary factors; *others* became more important as time passed.

DANTE is managing the multicountry EC PHARE 1994 R&D Networking Programme[1] in eleven countries for two years. The countries are Albania, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia. The project was launched with a 4MECU budget to help the improvement of the networking infrastructure in the region.

Background

External help has become available for the eleven PHARE countries from many governments and organizations since 1990. Although this help was appreciated by the countries themselves it was thought that an overall approach could speed up the development.

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PHARE(91)

The PHARE(91) project covering Bulgaria, Czech Republic, Hungary, Poland, Slovakia, Romania only was the predecessor of the PHARE(94) one. In the PHARE(91) project the aim was to *establish* international interconnectivity. The result of the PHARE(91) project was that Romania, Hungary and Czech Republic were connected to EMPB[2] by 1993. The project was successful as these countries enjoyed the service till October 1995.

At that time the Central and Eastern European countries were connected to the Internet through three service providers EBONE, Europanet and NORDUnet. Ebone and NORDUnet connections were funded by national or other (non-PHARE) funds.

2. Organizational model

The PHARE(94) project uses a simple organizational structure. The countries involved have national representatives. A Programme Advisory Committee (PAC) was formed of the national representatives, with DANTE and the PHARE project Officer from the EC. The PAC has regular six monthly meetings. External parties are also invited to the meetings as observers. The CEENet association and other non-beneficiary countries often send observers to the PAC meetings. The PAC meetings are held in parallel with the CEEnet association ones. It gives the parties enough time to discuss regional issues.

The PAC made the final decisions or proposals for:

- cost distribution principles
- technical issues
- future planning

3. Projects

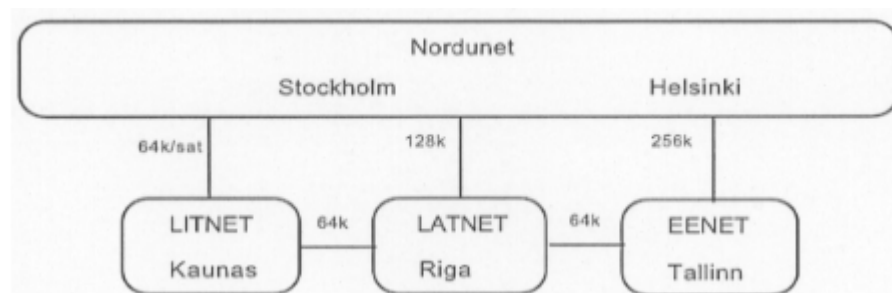The PHARE(94) project is divided into two subprojects:

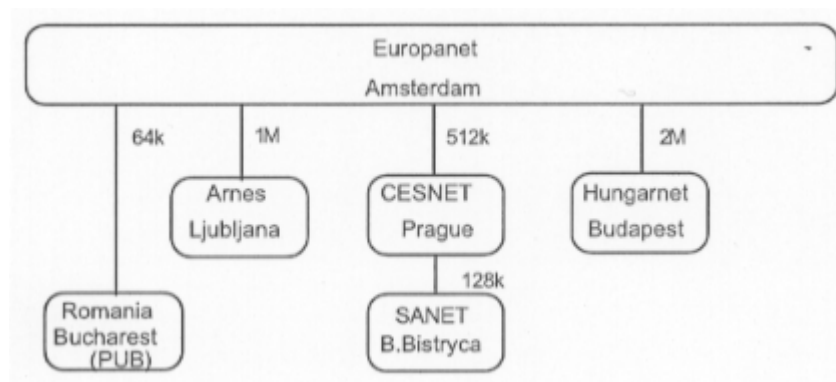*Figure 1: the Baltic connectivity as of 15 March 1996*

Figure 2: the Europanet connectivity as of 15 March 1996

- National supply
- International network service

National supply

In the national part of the PHARE(94) project the aim was to deploy a set of basic hardware and software components that was required by the countries. Routers, modems, workstations, network management software was needed by the research networks. Only five of the eleven countries took part in the national supply procedures as the other six had received equivalent funding under the PHARE(91) programme. The five countries planned to use the funds to improve their national infrastructure. The equipment was tendered according to the EC rules. The countries made proposals for the equipment and DANTE compiled the tender dossier. The countries were involved in the evaluation of the tenders.

The international network service provision

The model that was developed to formalize the relationship between the beneficiary country and the service provider consists of the following parts:

- international network service provider (ISP)
- international router (IR)
- international circuit(s)
- research network organization (RNO)

Applying the model there are two arrangements concerning service provision:

- the ISP provides the service, the circuit and the router for the RNO
- the ISP provides access for the service only and the RNO operates the IR and manages the service locally

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The first solution is closer to the EMPB type service provision and the second one resembles the EBONE model. This formal approach was required to define clearly the boundaries and responsibilities for the service provision. This model was used to justify the costs of network management. The model was the basis of the contract between DANTE and the beneficiary country.

Plan of the upgraded network

Figure 1 and 2 shows some of the connections.

Technical requirements

A document was prepared to help the operation of the international router and to make sure that a defined level of technical requirements were met. The document specifies different requirements regarding the:

- equipment provision
- facility management
- technical support
- operational support
- statistical reporting

4. Typical problems

Lack of research network organization

Many of the eleven countries have already a very effective research network organization. In some countries however, the organization has not yet been established or not effective and in some cases it made the progress slower. In the case of Albania specific advice was given to help the formation of a research network organization. An academic community without a research network organization is much less effective. The exercise of computer networking inherently requires a high level of organization hence the existence of the research network organization is vital.

Lack of cooperation within the country

Before a national network organization is established, it is common for different groups of enthusiasts or institutions to compete to create a dominant "national" service. This phenomenon has been observed in some of the PHARE countries, as elsewhere.

Who represents a country ?

DANTE was obliged by its contract with the EC to adopt a very formal approach to facilitate the nomination of the country representative in the PHARE(94) project. It was always the country who selected the representative. However, one country has demonstrated that unresolved internal conflicts can be carried through in the selection process.

Mixed interests of commercial and academic activities

Research network organizations are providing IP service for their community. Quite often service is provided not only for academic institutions. The research network organizations should emphasize their non-profit nature. Otherwise, a fully commercial IP service provider may feel that there is unfair competition and especially if the EC funds are used to keep service prices lower than that of the commercial rate.

Harmonizing external supports

In the case of Albania and the three Baltic States especial care was taken to harmonize the external support. To achieve cooperation instead of competition was the leading principle.

Lack of infrastructure

This is a well-known general problem of the central and eastern European countries. However, international digital terrestrial links are becoming available. Apart from Albania, Lithuania and Bulgaria digital circuits could be used in the PHARE(94) project.

Planning with too much redundancy

Many countries in the PHARE(94) project are having a second or backup circuit to a separate international service provider. Although this seems to be a good practice it is not cost effective and usually it is in practice *not* resilient. Many countries in Central and Eastern Europe are connected to the rest of the world with only *one* fiber optic cable. If there is *any* problem with that cable the resilience is lost. A second circuit can only be justified if it uses a separate circuit service provider. A truly resilient solution is applied in the Baltic countries and in Poland. An overview of the set of connections is given at Figure 3.

The peering problem

The proliferation of Internet services has created many Internet Service Providers. It is both a technical and a financial requirement that a national neutral interconnection of the service providers should be setup. Such National-IX was created during the life span of the PHARE(94) project in Estonia and Hungary.
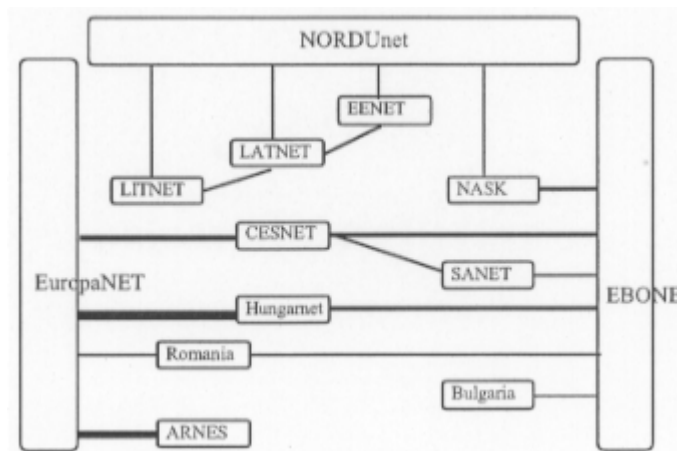
Figure 3: Research Networks and ISPs

The PHARE burden

The author has had experience with three PHARE projects in five years. In each case, the management of the PHARE projects in Brussels has proceeded more slowly than was expected in the beneficiary state or states.

Although the PHARE bureaucracy is very active in PR operations and produces glossy documents describing the success of PHARE projects, much less attention seems to be given to the actual benefits - and to the burdens that are imposed on the beneficiaries.

Problems arise because the EC management is procedure-oriented and not project-oriented. Timely achievement of goals is given little priority and programme objectives are sacrificed in the interest of conforming to bureaucratic procedures.

Some examples:

• The terribly slow process for issuing tenders and selecting equipment (for example, PCs) means that equipment is obsolete or no longer cost effective by the time it is actually delivered.
• The refusal to fund the purchase of equipment which is non-European in origin means that devices which are de facto standards in the Internet cannot be purchased; the objective of bringing CEE networks into line with their

Western European counterparts is overridden by the quite distinct objective of supporting European industry.
• Late payment of invoices by the EC imposes heavy costs on the beneficiaries and their suppliers.

Long and unpredictable implementation delays not only mean that funds which the EC has made available are not put to immediate use but also that national funds may be tied up unnecessarily.

5. Results

The supply tender was evaluated by the end of February 1996. Contracting work has started in March 1996. It is very possible that the equipment will arrive to beneficiaries within two months.

International network service

At the time of writing partial results can be given. More progress is expected in Albania, Bulgaria and Romania. Table 1 summarises the status of the funded network.

6. Future plans, present problems

Funding model in a monopolistic environment

There is a crucial economic problem in the Central and Eastern European countries regarding computer networking.

Country	connection	capacity	type	status
Albania	Tirana-Amsterdam	64kb/s	satellite	planned
Bulgaria	Sofia-Amsterdam	64kb/s	terrestrial	planned
Czech Republic	Prague-Amsterdam	512kb/s	terrestrial	operational
Czech Republic	Prague-Banska Bystrica	128kb/s*	terrestrial	operational
Estonia	Tallin-Helsinki	256kb/s*	terrestrial	operational
Estonia	Tallin-Riga	64kb/s*	terrestrial	operational
Hungary	Budapest-Amsterdam	2Mb/s	terrestrial	operational
Latvia	Riga-Tallin	64kb/s*	terrestrial	operational
Latvia	Riga-Stockholm	128kb/s	terrestrial	operational
Lithuania	Kaunas-Stockholm	64kb/s	satellite	operational
Lithuania	Vilnius-Riga	64kb/s	terrestrial	planned
Poland	Warsaw-Vienna	256kb/s*	terrestrial	operational
Romania	Bucharest-Amsterdam	64kb/s*	satellite	operational
Romania	Bucharest-Budapest	64kb/s	terrestrial	planned
Romania	Bucharest-Vienna	64kb/s*	satellite	operational
Slovakia	Prague-Banska Bystrica	128kb/s*	terrestrial	operational
Slovenia	Ljubljana-Amsterdam	1Mb/s	terrestrial	operational

Table 1: Overview of circuits[3]

How can an exponentially growing system be financed?

The most common answers are the following:

- introduce subscription fees
- become an internet service provider
- cooperate with your national PTT
- increase user coverage
- widen the sectoral structure

Whichever option(s) is chosen it should secure IP networking in the country.

A feasible solution today is getting obsolete in a year time

IP networking is changing very rapidly around the World. It is difficult to apply the everyday planning practice under such circumstances. Even the most careful planning is getting obsolete within a year time. Research networks are expected to make optimal choices.

It is very difficult as no one can predict the:

- circuit price drops in a year time
- international internet service provision price changes
- the effects of different mergers in the industry around the World

PHARE(97)

The possible continuation and extension of the PHARE(94) project was discussed in Bratislava, 1995 at the PAC95(03) meeting. The idea was generally accepted. It is unclear if the EC plans to continue this type of activity in the next years.

TEN-34

It is the general opinion that the future of European networking depends on the establishment of a 34 Mbit/s Trans European Network. Some of the PHARE(94) countries have already joined the TEN-34 consortium and involved in high-speed networking activities nationally and internationally. The most obvious problem here is financial. The countries in the PHARE(94) project are not members of the EC hence funding for this activity will be scarce from the Commission. The monopolistic and often privatized PTT environment in the PHARE countries will block the countries to participate and benefit directly from the TEN-34 network.

7. Conclusion

The primary aim of the PHARE projects is to help bridging the gap between East and West. One of the lessons to be learned from the project is that the EC/PHARE bureaucracy should keep this *aim* in mind and not be side-tracked by concentrating too much on procedural matters. In spite of this the PHARE(94) activities were successful

in the region as they helped to keep up the rate of development in the beneficiary countries. The PHARE(94) project made the gap disappear in some cases or in the case of the less developed countries the differences have become much smaller. The PHARE(94) programme helped to develop the technical awareness in the countries involved and supported the enrichment of collaboration of different groups of people.

Author Information

István Tétényi has been working for the Computer and Automation Institute in Budapest since 1977. During his career he took part in several computer networking related projects. His work include consulting for national and international projects. Recently he helped to design the networks of Hungarian Social Security Offices and the Hungarian Prime Minister's Office. He produced the background material for an OECD study assessing the Hungarian Information Infrastructure. He helped the preparation of the EuroCAIRN study at DANTE in 1994. In the PHARE(94) project he was one of the technical consultants. Since 1990 he is a member of the Technical Committee of the National Information Infrastructure Programme in Hungary.

Notes

[1] PHARE 1994 R&D Networking Programme - ZZ9416
[2] European Multi Protocol Backbone
[3] Circuits marked with (*) were established in a separate project, but funded or upgraded from PHARE(94) budget.