# Coordinating Networks in Central and Eastern Europe: CEENet

Peter Rastl <rastl@cc.univie.ac.at>

## Abstract

*This paper outlines the development of international connectivity with research networks in Central and Eastern Europe. While in most countries the need for better connectivity initially favored individual networking solutions which were immediately available, the requirement of efficient and cost-effective connectivity to the Internet stimulated coordination efforts among the countries of this region. Recently their national research network organizations founded the „Central and Eastern European Networking Association (CEENet)" in order to promote a consistent and optimized network infrastructure for Central and Eastern Europe.*

## I. Introduction

After the remarkable political changes in 1989 the term „Central and Eastern Europe" became more than a mere geographical denomination of some region on earth, it began standing collectively (although not exclusively) for the former communist countries who were well on their westward way. The Iron Curtain has been opaque to most kinds of information exchange in the past, and not only computer technology was shielded effectively from this region. Today we are meeting at INET'94 in Prague to discuss advanced topics of networking on a global scale, doesn't that illustrate best the enormous changes which have been accomplished? Meanwhile even trade limitations are dissolving – CEE economy may take slightly longer to recover, however.

But at all times CEE countries were provided with highly qualified scientists and technicians. They were able to develop regional networks for their research institutions even under the most restricted circumstances, building upon X.25 or UUCP and relying to a large extent on their own ingenuity. International connectivity was a most precious resource, available only through makeshift communication trails rather than on communication highways. Only after Poland was connected to EARN in 1990, soon followed by Hungary and Czechoslovakia, international networking became more widely accessible, to the effect of further stimulating the development [1].

The two latter countries (and others to follow) established their EARN connections via Austria. It may be appropriate (being an Austrian) to drop a few comments on Austria's part in Central and Eastern Europe: Austria always was Western Europe's outpost to the east (it may not be self-evident that Vienna is situated east of Prague), many international organizations operate their branch offices for Eastern Europe in Vienna. Austria also has traditional cultural ties to the CEE countries, dating back to the Habsburg Empire, and it was an obvious intention of Austrian foreign policy to establish close relations with the new democracies in our neighbourhood.

## II. Early Initiatives

The precarious economic situation in most CEE countries and the urgent need for better connectivity left any immediate improvement of the computing and networking infrastructure to support programs from the West. Computer manufacturers offered donations, notably IBM's Academic Initiative and DEC's programs. The Commission of the EC went ahead with a plan under the PHARE programme to provide international connectivity to IXI, the COSINE X.25 infrastructure. Some specific network development projects received funding support from the USA or from individual European countries, notably from Scandinavia who offered support to the Baltic Republics, and from Germany (who however were quite busy with extending their own research network to the former German Democratic Republic). The Austrian government allocated financial support for leased lines to the neighbouring countries in order to offer them immediate connectivity to the Internet via the Austrian Academic Computer Network (ACOnet), and provided (jointly with IBM and DEC) technical training to several hundred specialists from CEE countries.

This diversity of support initiatives from different sources caught the CEE countries on the horns of a dilemma: On one hand support was not always unselfish and free of conditions which guided the further development into a certain direction, on the other hand it did not seem wise to refuse support from influential sponsors, especially in a situation where external funding was urgently needed. For example the PHARE project originally required the CEE countries to establish their international connectivity using IXI while they would rather connect directly to the Internet. The experience of this kind of pressure and the need to join forces for greater efficiency stimulated coordination efforts among the countries.

The first coordination meeting was convened in Prague on February 14, 1992, by Milan Sterba (who is well known for his regularly updated report on East and Central European networking activities [2], [3]). This meeting gathered networking organizations

from Bulgaria (UNICOM), Czechoslovakia (FESNET), Hungary (HUNGARNET) and Poland (NASK) with representatives from NSF, RIPE, ACOnet and DFN participating. A Memorandum on Cooperation in R&D Networking was signed which declared the willingness to cooperate in

- network strategies,
- international connectivity,
- network education and training programs,
- network management and administration,
- user services.

It was considered appropriate to explicitly state that connectivity to the Internet was the highest priority.

A subsequent meeting took place in Vienna on December 10/11, 1992, to further elaborate this cooperation, which drew an even wider participation from a total of nine countries: Austria (ACOnet), Bulgaria (UNICOM), Croatia (CARNet), Czechoslovakia (CESNET and SANET), Hungary (HUNGARNET), Lithuania (Netlitera), Poland (NASK), Romania (ICI) and Slovenia (ARNES). A joint CEE Network Project Group was set up

- to constitute an association of national R&D network organizations in CEE countries,
- to coordinate R&D networking in Central and Eastern Europe,
- to cooperate by providing common services and mutual assistance,
- and to elaborate a common position towards international service providers.

In particular ACOnet was mandated to negotiate an EBONE membership of the CEE countries, which gave rise to leased line connections from six of the countries to Vienna, where an Ebone Boundary System (EBS) was established. Various network services (file server, netnews distribution, archie) for the CEE region have been implemented by ACOnet.

## III. Further Development

Research networks in the CEE countries were expanding rapidly and required bandwidth upgrades on their international links. In particular, the Polish Research and Academic Computer Network (NASK) put a 2 Mbps connection to NORDUnet into operation and was able to offer Internet connectivity to the countries of the former Soviet Union: Ukraine, Russia, Belarus and Lithuania started to establish leased line connections to Warsaw.

The Commission of the EC agreed to extend the PHARE project to utilize also the IP capability of EMPB, the successor of IXI. However, the progress of this project, which was planned to provide access to the EMPB backbone in Bucharest, Budapest, Prague, Sofia, Warsaw and eventually in Slovakia, was slower than expected, and the CEE countries decided to upgrade their EBONE connections concurrently.

In order to assist the CEE countries in implementing a sound research networking strategy which avoids the inefficiencies of parallel efforts, RARE in conjunction with the Hungarian Academy of Sciences, and with support from NATO, organized an advanced workshop on „Research Networking in Central and Eastern Europe", which took place on October 20/21, 1993, in Budapest [4],[5]. There were indications that the Commission of the European Union would continue the PHARE funding for network infrastructure into 1994 and extend the support to Albania, the three Baltic Republics and Slovenia. Again, there was a definite need for better coordination of the various support activities.

## IV. CEENet

At a meeting of the CEE Network Project Group which was held in Warsaw on January 14/15, 1994, the participants concluded that it is indespensable to enhance the framework of mutual collaboration in order to ensure the most effective way of using available national and international resources. Consequently it was decided to create the international „Central and Eastern European Networking Association – CEENet". CEENet's role is to coordinate international aspects of academic and research networking in the region of Central and Eastern Europe.

It was agreed upon the principle that the member organizations of CEENet should be appointed by their official national authorities and be authorized to represent national interests in regards to academic and research networking. In recognition of RARE's role as the umbrella body of research networking in Europe, CEENet immediately applied for RARE membership and was admitted as International Member by the RARE Council of Administration in February 1994.

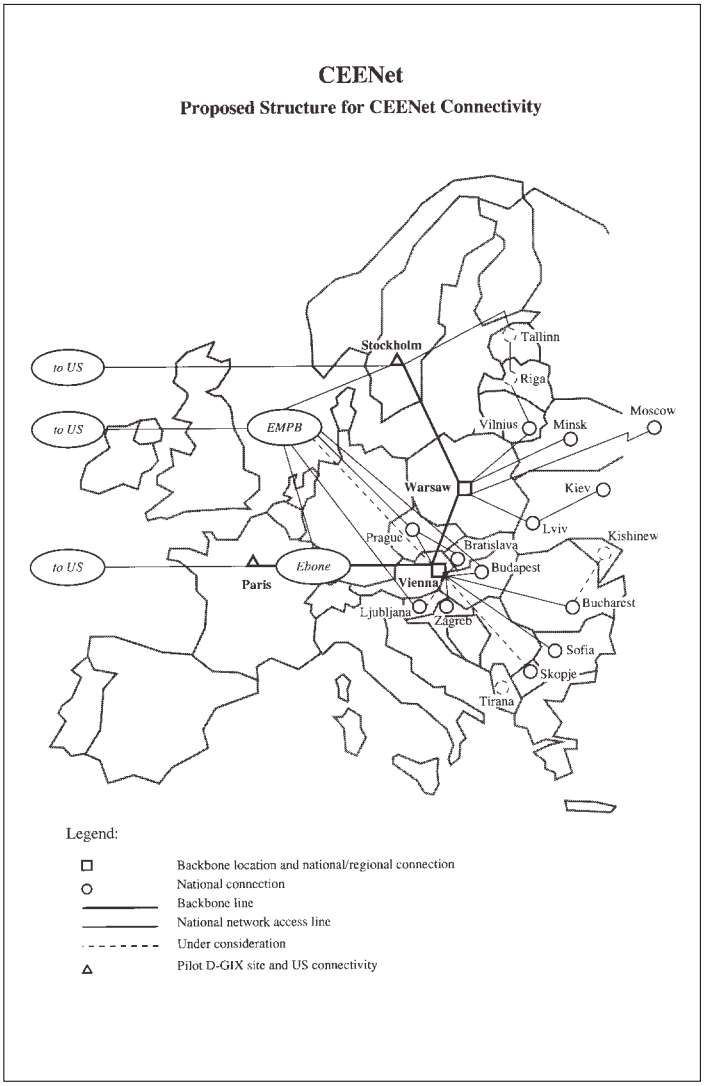
The first meeting of the CEENet General Assembly was held in Vienna on February 25/26, 1994. CEENet's member organizations currently represent 13 countries:

- Austria: ACOnet
- Belarus: UNIBEL
- Bulgaria: UNICOM
- Croatia: CARNet
- Czech Rep.: CESNET
- Hungary: HUNGARNET
- Macedonia: MARNET
- Poland: NASK
- Romania: Romanian Research Network
- Russia: FREEnet
- Slovakia: SANET
- Slovenia: ARNES
- Ukraine: UARNET project

In addition, LITNET (Lithuania) has already applied for CEENet membership, and the remaining countries of the region are also expected to join soon.

At this meeting the CEENet General Assembly passed the CEENet Constitution and installed the organizational bodies. The CEENet Management Committee has been elected and has been entrusted with the management and administration of the association. Tomasz Hofmokl of NASK is the first CEENet Chairman.

The CEENet General Assembly also approved „Basic Principles of CEENet Networking" as the fundamentals of a joint proposal with RARE and DANTE for a managed network solution in the CEE region. The proposed CEENet network structure makes use both of EMPB and EBONE which are accessible either directly from an individual country or through concentration points such as Vienna or Warsaw (see figure), but the detailed structure is still subject to changes according to the further development. However, it is likely that by the time this paper is published CEENet will already work on the installation of a generally agreed, consistent and optimized network infrastructure, for the benefit of not only the Central and Eastern European countries.




## V. References

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[2] M. Sterba, „An overview of East and Central European networking activities", Version 5, Ripe-74, November 1992.

[3] M. Sterba, „An overview of East and Central European networking activities", Version 6, Ripe-86, May 1993.

[4] M. Dekker, „Report on the NATO Advanced Workshop 'Research Networking in Central and Eastern Europe'", Computer Networks and ISDN Systems 25, Suppl. 2 (1993), page 87-91.

[5] RARE, Proceedings of the NATO Advanced Networking Workshop, Budapest, October 1993.

## Author Information

Peter Rastl is Director of the Vienna University Computer Center, Austria, since 1976. In 1992 his institution accepted responsibility for the Austrian Academic Computer Network (ACOnet), since then he represents Austria in various networking organizations (RARE, EARN). In particular he has been active in providing support in the area of computing and networking to the CEE countries. Currently he holds the position of a vice-chairman of CEENet.

Dr. Rastl studied chemistry, physics and mathematics at the University of Vienna where he received his Ph.D. in 1974.