Slovak Academic Network (SANET) and European Schools Project (ESP) in Slovakia

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Abstract

This paper briefly describes SANET (Slovak Academic Network) and its relation to secondary and primary schools which are involved in ESP (European Schools Project). We will discuss the cheapest solutions for full IP connection of Secondary and Primary Schools to Internet in Slovakia and how the ESP project can answer the students' and teachers' question, „Why connect to Internet?"

1 SANET as an Internet provider for schools in Slovakia

Since 1991, when the SANET organization was founded and the first SANET node in Banska Bystrica was connected to Internet via leased 14.4 kbps line, SANET has grown to be a large community with more than 400 members including academic, research, scientific, governmental, non-profit and commercial organizations.

At this time, SANET provides a communication infrastructure which consists of two international lines to the Czech Republic (Prague) and Austria (Vienna) and also eleven local lines inside Slovakia (Figure 1.) The main backbone operates on two 64 kbps leased lines which join Bratislava, Banska Bystrica and Kosice. The International line to Prague operates at 128 kbps rate and will be upgraded to 256 kbps very soon.

Most of the SANET nodes are located and maintained at universities. The main Internet services (e.g. E-mail, telnet, ftp), WWW, Gopher, USENET NEWS, X500, and Netfind servers are available for all SANET members. SANET is a non-profit organization, funded by the Ministry of Education and is also a member of international network organizations, e.g. TERENA (Trans European Research and Education Network Association) and CEEnet (Central and Eastern European Network).

The organizational structure of SANET consists of the General Assembly of SANET, SANET Executive Committee, and SANET Technical Team. SANET is open to everyone (organizations and individuals) who agrees with the rules of SANET and pays the yearly membership fee.

All schools and organizations which are funded by the Ministry of Education have free, no charge access to SANET. They must pay for only telephone fees when using dial-up access or for leased lines to the nearest SANET node.

1.1 A cheap solution to connect a school's LAN to SANET

At the beginning of 1993, there were no secondary or primary schools connected to SANET because the schools neither knew about such a possibility nor did they have any equipment (e.g. modem). The problems were also at the site of

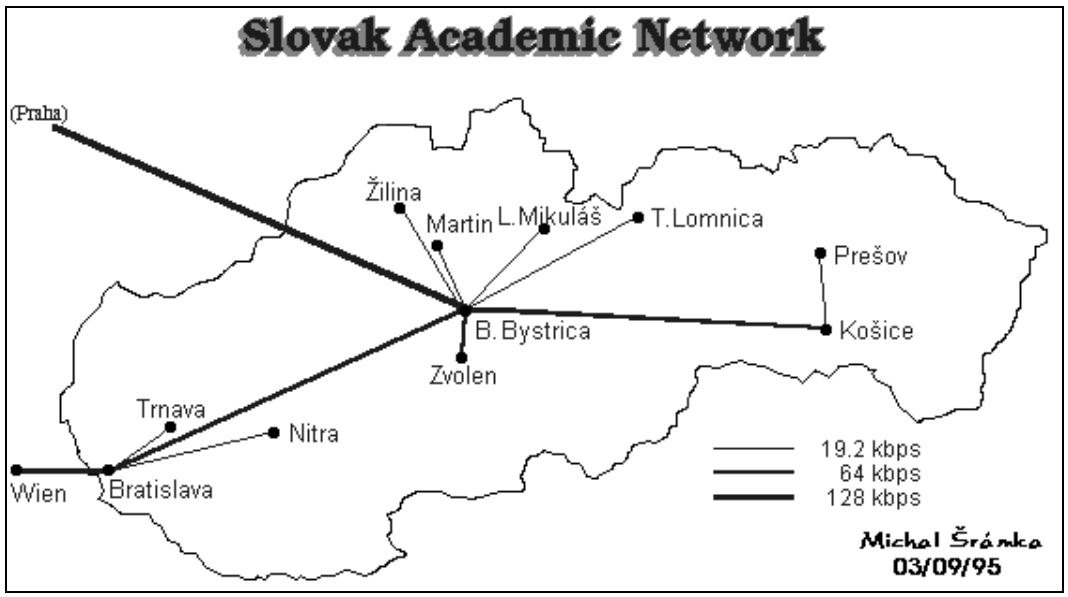

Figure 1. The map of SANET

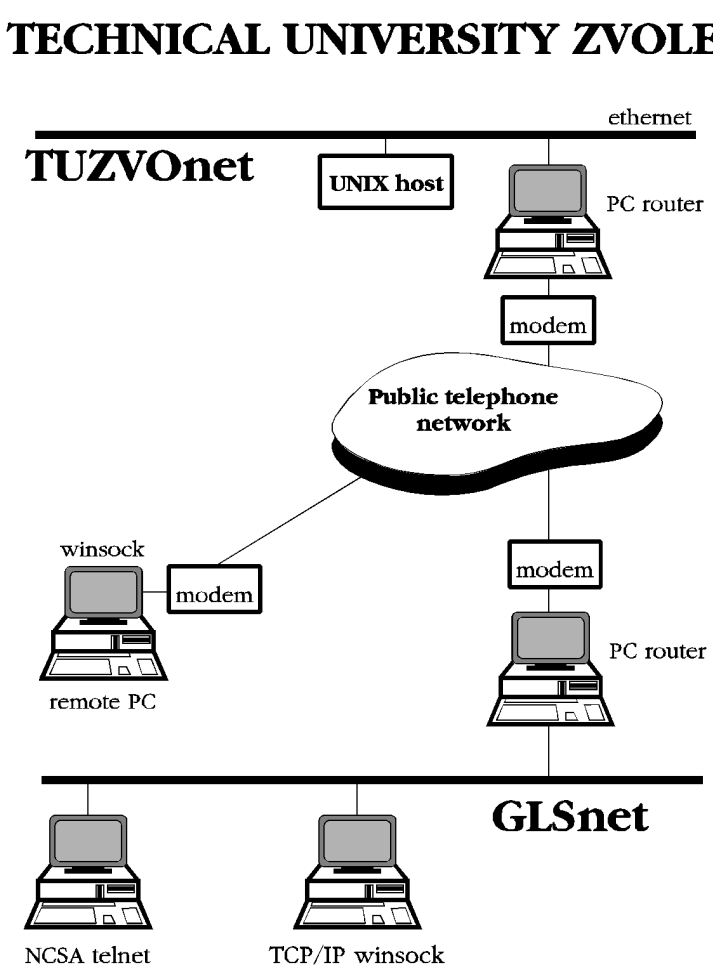

Figure 2.

SANET nodes because some of them had no terminal servers or other equipment for dial-up access. Only serial ports on hosts connected to LANs of some SANET nodes had been used for UUCP connection.

At that time, most of SANET lines were joined via PCrouters. Such a problem also existed at the Technical University in Zvolen which operates a SANET node called TUZVO.

The secondary grammar school - Gymnasium of Ludovit Stur in Zvolen (GLS) had several computer rooms where teachers, together with students, prepared letters for partner schools involved in the ESP project (which will be discussed below). Student letters were copied onto diskettes and one of the teachers brought them to the university where they mailed them out.

This kind of communication was not very flexible and therefore we decided to create a LAN and to connect it via a dial-up modem to SANET.

We decided to use two old diskless PCs (286/12 Mhz with 640kb RAM with one floppy drive) from the Technical University as routers using the routing program KA9Q. At first, only three computers at the Gymnasium were joined to the ethernet LAN. Figure 2 shows how the LAN of the Gymnasium has been connected to SANET via a dial-up line.

We have to emphasize that there has never been any server at the Gymnasium.

We split one IP address of class C to several subnets. One subnet of 16 numbers has been used for the network of the Gymnasium of Ludovit Stur called GLSnet. The second subnet has been used for a SLIP connection of PCrouters. We defined static routes on both PC routers. The students and mainly teachers of the Gymnasium have used the NCSA telnet program for access to Internet. We have used ZyXEL U-1496 S+ modems for the connections. The main reason why we chose these modems was the fact that they have a button for control on the front panel.

When teachers started their lessons, they simply pressed only one button several times on the modem connected to the PCrouter and it started to dial the telephone number of the Technical University which has been stored in its memory.

It has also allowed inexperienced teachers to establish full IP connections. After finishing, they similarly canceled the connection in the same way. We should say that the PCrouter was located out of the computer rooms and only authorized people could connect it to the university. The reason for that is clear - the telephone bills, as usual.

Experience has shown that the PCrouter program from Vance Morrison (pcroute2.24.tar.Z), written in assembler, is better than KA9Q for performance of routing functions via dial-up lines, so we have exchanged them. The same program has been used on the PC at the Technical University.

Later we tried to change the PCrouter at the Technical University to a Cisco terminal server CS-516 and we had no problem with the connection. This way of connecting the school to Internet has also been used in other towns. Some schools use only one PC for connection because there is no LAN.

We have also successfully tried out Peter Tatam's winsocket TCP/IP stack under MS-Windows (twsk20b.zip) that enables full IP connection via SLIP or PPP protocol and manual dialing.

On the opposite site there was a PCrouter as a SLIP server. It has been a very important experiment since Mosaic (wmos20a2.zip) for MS-

Windows as a winsocket application has been freely available. We have also successfully tried out other applications like FTP client (ws_ftp.zip), Telnet (trmptel.zip), POP mail client (eudora14.exe), SMTP Mail and POP Mail server too. This solution is also very advantageous for individuals and has been tested on several notebooks.

At this time SANET is supplying to all its nodes, professional terminal servers (e.g. CISCO or ANNEX) for improving access services to their members. Currently, the way of connecting schools is different. Some of them have UUCP possibility only, but on the other hand, some have their LAN directly connected to SANET via optical fibre or by the way described above. It depends on the location and technical capabilities of the schools. But one thing is common - none of them have to pay for access to SANET.

2 The European Schools Project

The European Schools Project is a network organization which supports a community of schools worldwide to explore applications of educational telematics.

ESP was initiated in 1988 by the University of Amsterdam. Participation in ESP has spread to 26 countries with over three hundred teachers, and thousands of students. The ESP aims at improvement and innovation of educational activities and its organization. It offers educational, organizational and technical support and provides opportunities for:

- electronic communication between individuals, schools and educational networks,
- the design, performance and evaluation of teleprojects,
- the creation and usage of information resources to enhance better learning and teaching.

2.1 Teleproject

Teleprojects are co-operative distance learning projects in which telematics and foreign languages are communication tools. Teachers mutually determine a central topic of the curriculum around which students execute local (research) activities. Results are discussed and exchanged by means of electronic mail.

2.2 Organizational infrastructure

The ESP consists of:

- pupils and students of primary, special, secondary and vocational education,
- teachers of primary, special, secondary and vocational education and
- innovators of educational activities and systems through educational applications of telematics.

The ESP is an open organization. A condition for participation is to contribute to the aims and thus to be generous to each other both in communication and in providing educational resources. Every year the ESP-Conference takes place in one of the ESP-related countries. Although the members of ESP are connected by telematics throughout the year, the personal face-to-face contacts have proved to be an important extra and very valuable element for designing successful curriculum collaborations. The conference offers an opportunity to exchange materials and to meet other interest groups and representatives of other educational networks.

3 European Schools Project in Slovak Schools.

In March 1993 the first secondary school - Gymnazium Ludovita Stura (GLS) in Zvolen was connected through SANET to Internet. The main reason for this connection was our interest in making teleprojects within ESP.

Since the 7th ESP conference in Schwerte, Germany (1993), we started our first E-mail contacts with teachers from foreign countries to prepare teleprojects for the 1993/94 school year. The realization of teleprojects has continued with the collaboration of language and informatics teachers together with students from GLS and partner schools from Denmark and the USA.

Five teleprojects involving nine teachers from GLS and neighborhood schools have been run in total.

The most successful teleproject was „Learning to use e-mail in English Classes". Students exchanged letters in English by e-mail in 1-2 month intervals. The topics of their letters were: my family, our school, our work day, our town, etc. They sometimes wrote letters alone or sometimes in groups, depending on the topic. They also exchanged photos and picture materials. Having a correspondence partner in Denmark, meaning a real person whom they wrote to, has been a great

motivation for students to learn English and also to use e-mail.

The most exciting moment of this project was its ending when 12 Slovak students went to Denmark for a 10 day study-stay at the end of April 1994. The students could learn many new things about Denmark, Danish people, their way of life, and schooling. On the other hand, our Slovak students opened the way for Danish students, their teachers, and parents to learn about Slovakia and our culture. The Danish students also had an opportunity to visit Slovakia in February 1995. This project has shown how using e-mail can improve learning English and make friendships between people.

In April 1994, teachers from GLS organized the first Slovak ESP meeting for other primary and secondary schools in Slovakia, with an aim to disseminate information about ESP and teleproject experiences. The people in the Slovak schools have found the ideas of ESP to be fascinating. In the beginning of March 1995, 23 schools were connected in Slovakia, and 17 teleprojects were established. The teleprojects have involved 27 teachers from 10 schools.

Although ESP was the main reason for making connection to Internet for Slovak schools, they are using Internet services outside of teleprojects. For example, they use E-mail for:

- exchanging messages among schools,
- making contacts with Slovak students studying for a few months or one year at foreign schools,
- asking for information about university study for students,
- delivering student's magazines, etc.

In November 1994, the first secondary school's student mailing list, TEENAGER, was established (maiser@willy.gymmt.sk). Some of the schools have SLIP connection to Internet and a possibility for interactive services. In the beginning, the most interesting thing for the students is the TALK service because they can immediately see a response to their action and they are more inspired for further use of Internet services. During the last few months, the WWW service has become very popular for teachers and students.

The following information can be found on the WWW servers in Slovakia:

- **http://www.tuzvo.sk/esp**
  (basic information about ESP, present teleprojects, list of schools connected to Internet)

- **http://www.tuzvo.sk/Budyk**
  (Student magazine BUDYK „alarm clock" in Slovak language),

- **http://www.savba.sk/logos/news/list.html**
  (Daily and weekly newspapers, six Slovak and many from other countries, information about new books, galleries and projects can be found at SAV in Bratislava).

- **http://www.tuzvo.sk**
  (Basic information about Slovakia with a weather map of Europe, that is updated every four hours from a satellite, can be found at TUZVO).

Students can find through WWW or Gopher the most current information for their study projects and written works. It is very good idea to show this information to students and pupils during lessons because it makes it much more attractive.

There are more possibilities to use Internet services in schools, but there needs to be a well organized training system in using Internet resources in education for teachers and students as well. Lack of technical resources is preventing wider usage too. Only a few schools have local area networks connected to Internet in their computer labs. Therefore, access to the Internet for the time being, is limited to stand alone machines with modems. The first training courses in using Internet services were taken by the teacher's training center in the Central Slovakia region. Internet services have become a part of the curriculum of the subject Informatics at a few gymnaziums in Slovakia.

4 Problems and barriers

There are quite few problems and barriers preventing teachers and schools from making the connection and using Internet services in education:

- only a few teachers (except language teachers) can speak foreign languages like English, German or French,
- lack of computer literate language teachers,
- no financial resources for modems and local area network's equipment,
- teachers and students are not aware of the benefits of the Internet,
- problems with implementing teleprojects for the subjects,
- not enough literature about Internet and Internet services in education.

5 Experiences and Future

We have some experience from completing the teleprojects which can help us in future development:

- work in groups has proved to be most advantageous (associating teachers of language with informatics teachers),
- attention must be paid to the design of projects (to be informed about dates of holidays of partners, to have a well-scheduled plan of the exchange of letters, to work in pairs or in bigger groups). Nothing dissuades students more from the work than irregularity and a long delay when waiting for new information!
- help for teachers who are beginners is desirable in order to introduce the work with teleprojects during classes. Completing teleprojects outside of classes is not attractive for a lot of students (because of too much work or other duties)
- minimalization of technical problems which dissuade many beginners. It is more effective to try to obtain the best available technical equipment and user-friendly software in this respect.
- Teachers who are beginners must be helped by means of organizing meetings and the exchange of experiences with teachers from schools of the region. At least once a year, a national meeting of teachers has to be held
- to encourage the highest possible number of teachers to take part (also in international workshops).

6 Conclusion

For future development and improvement it is important that:

The state must pay more attention to new information technologies and Internet as a communication and information tool.

A strategic plan for Information Technology, which outlines a vision for the use of computer and communications systems in schools, should be developed.

Government and other organizations dealing with education should plan enough financial resources for improvement in all areas related to information technologies.

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Author Information

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Currently his main activities are in projecting the high speed Zvolen Metropolitan Area Network based on ATM technology, supporting TUZVOnet users and coordinating some internetworking projects.

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