Contemporary Challenges to Information Exchange between the Balkan Astronomers

Svetoslav T. Christov
South-West University "N. Rilski", Blagoevgrad, Bulgaria
stc@gate.fmns.swu.bg

Abstract

The purpose of this report is to acquaint the participants with the opportunities, which are given by the computer networks and Internet for exchange of scientific information. The status of the Bulgarian information infrastructure and the problems of the Bulgarian astronomers are also considered. Some suggestions for improvement of the effectiveness of the information exchange between the astronomers of the Balkan peninsula are given.

Introduction

We live in a world where the communications play a significant role. In everyday live everyone of us uses telephone, listens at the radio, watches TV. We cannot imagine our world without them. As the computers become cheaper and more accessible, many people start to use them in their work. Although the computer itself helps for improving the quality of our work, soon the problem of connecting computers arises. Nowadays there are many computers organized in *computer networks* which give the opportunity to do our work in more effective way.

1 Computer Networks

Computer network consists of computer equipment connected with some type of communication media and capable to exchange data. Nowadays, it is easy and cheap to build a computer network.

There are two main types of computer networks - Local Area Network (LAN) and Wide Area Network (WAN). The first one covers a small territory such as one office or one building. They are under a centralized management. Example of this kind of computer network is the optical computer network in the campus 7 km of the Bulgarian Academy of Sciences (BAS). The second one covers very large areas such as continent or many continents. The most well-known computer network of this type is **Internet**.

The computer networks provide many services. One of the widely used service is the so called *file sharing*. This means that the file is stored in a way in which it may be used by many people, without the necessity to be copyed on each one's own computer. The benefit of such organization is the saving of disk space. When the files are very large, the saving of disk space can be very significant. There is also special devices called *file servers* specially dedicated to this purpose. This is an important feature of the computer networks especially for the Balkan countries, where most of the used computers are relatively old and without large disk drives.

Another way to use the computer network is to access remotely a common printing device. Let us assume a situation when one institute has a high quality printer and the only way to print the obtained results is to copy them on a diskette and have to go to the computer where the printer is connected. If the results are with relatively small size this is possible, but if the results have to be transfered with 10 or more diskettes the things become more complicative. If the computer network exists and the printing device is configured to be accessible from everyone, the results can be printed from each computers directly attached to the computer network.

It is also an usual practice in the scientific organizations to have one powerful computer where heavy calculations are done. Without the existence of a computer network the access to this computer is normally difficult. When a computer network is used to access this computer, it is possible to start remotely calculations and to obtain data directly.

These are the most well-known ways of using the computer networks. They also provide many other useful services.

2 The Internet

Next step to extend capabilities of the computer network is to connect it to some WAN such as Internet. WANs give the necessary international connectivity and widely extend the amount of services provided by the computer network. Internet is known as the largest WAN existing in the world today. It connects millions computers all over the world and provides access to a wide range of information. In fact Internet consists of many smaller computer networks connected together. Several years ago the BAS also became a part of the Internet.

The most popular service provided by Internet is the electronic mail. It is a method of communication similar to the ordinary mail. You have an opportunity to write a letter, address it and send it to the recipient. Normally your electronic letter is delivered for minutes while the ordinary letter is delivered for days or weeks. This essentially increases the effectiveness of the scientific work. It is also possible to use the electronic mail for exchange of different kinds of information. Articles, documents, images *attached* to electronic letter are delivered to the recipient with the letter. It is important to mention that the attaching large files may cause significant delay and the letter will be delivered for a longer time, or will not be delivered at all. Another risk is that such a letter can bother the proper operation of the servers responsible for the electronic mail exchange and with this many people can be affected. Avoiding the usage of the electronic mail to exchange large amounts of data is preferable. There are other ways to transfer such information. Another interesting feature of the electronic mail is the subscription of information services that provide automatic information about the news in the specified areas of interests. In the Internet exist the so called *mailing lists*. They give a way of *virtual conferencing*. To use them you must *subscribe* to the list with special electronic mail letter and this gives you the opportunity to receive information from everyone subscribed to this list. Every letter sent to the list is delivered to all subscribers. This information exchange is similar to the conferencing. The difference is that it takes longer time.

The *Network News* are another service provided by the Internet. Everyone can post a message and the interested people can read it. No subscription is required. It is simply needed to build a list of the areas in which we are interested in.

There are also services for a *real time* communication. The information sent by using them is immediately delivered. Usually these are small text messages. Examples of such kind of services are ICQ and IRC. The first one is oriented in person-to-person communication. The second one is organized as *rooms* where everyone can go into and discuss some topics of interest.

Internet also gives the opportunity to access powerful computers located in another countries of the world. Services used for this are *telnet* and recently *secure shell*. Someone who uses these services works with his own display and keyboard, but the real work is done by the remote computer.

Service specially intended to transfer large amount of data is the so called *FTP*. It is simple and effective way to transfer large files over Internet. FTP is very popular service in Internet.

Another very popular service in Internet is the World Wide Web (WWW). The information is organized in *pages* which contain different kinds of information - text, images, animations and so on. The most important feature of this service is the presence of the so called *hyperlinks* in the pages. They are the way in which pages are linked together and thus form *the Web*. It is important to mention that such organization makes the use of this service very easy. In the Web there are many *search engines* that speed up the process of searching the needed information.

In Internet also exist many other services more or less popular to different kind of people.

3 Bulgarian communication infrastructure and the problems of the Bulgarian astronomers

Two years ago in the campus of BAS where are located institutes doing researches in different areas of Physics finished the building of a large optical computer network. It connects about 10 buildings and provides very fast data exchange. The Institute of Astronomy is a part of this computer network. The connection to the Bulgarian Internet space is also very good. Although this is a large success for us there are many problems in front of the Bulgarian astronomers. The computers used in their work in most cases are old and slow. They do not have enough capacity to perform effective processing of large amounts of data. There is no computer communication with the observatories yet. There are also problems with the access to Internet.

4 Information exchange between the countries on the Balkan peninsula

The current connectivity of Bulgaria to the other Balkan countries is not very good. In the most cases the information exchanged between them crosses all the world. The astronomers from the Balkan peninsula meet some common problems. It is difficult to search valuable information in Internet. Sometimes the obtaining of information takes a very long time as a result of the relatively slow Internet connection. Thus the information exchange between the astronomers from the Balkan countries is relatively difficult. There are many ways to change this. It is possible to make the obtained results available with publishing them in WWW. To speed up the search of information it is recommended to register the created web sites in some of the existing search engines. Another way to improve the information exchange is to set up mailing lists especially for the Balkan astronomers. The possibility of direct connecting the astronomical institutes in the Balkan countries can be also discussed.