





# Annual report 2003











# 2003 Annual Report

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The year 2003 was an exceptional one for BELNET, because our organisation celebrated its tenth birthday. A span of time that, for people, barely suffices to outgrow the childhood years, is practically an eternity for us. We are evolving quickly, after all.

When founded, our network managed a capacity of 64 kilobits per second (Kbit/s); enough to send a brief message in one second. According to the plans, the computer network was to grow linearly so that, after years, two megabits per second (Mbit/s) could be achieved on the large connections, i.e. thirty times faster. Secretly, we hoped we could offer our largest clients guaranteed access to that capacity in the medium term. Our most ambitious expectations were exceeded: today we supply a capacity of 5 gigabits per second (Gbit/s), or 2,500 times more than the most optimistic prognosis.

In the past decade, telecommunications has also undergone a complete revolution. From the inertia of a monopoly situation, we have evolved to become a dynamic, deregulated market in which fierce competition prevails. The industry has seen the rise and fall of a whole generation of companies. As-yet-unknown communications services like the Internet broke through and are now indispensable means of distributing information.

In that decade, we have continued to grow and we not only have developed our infrastructure and technologies, but also our legal standing, organisation and team. BELNET is now an operational organisation that has sufficient resources at its disposal to successfully meet all priority objectives, and to do so to the full satisfaction of our users. This was clearly shown by our 2003 survey, more about which will follow below.

This annual report is not only intended to provide an overview of the achievements of the past year, but also to provide a snapshot – bearing in mind how quickly the industry evolves – of the situation of the network. That creates the possibility to make comparisons in the longer term.

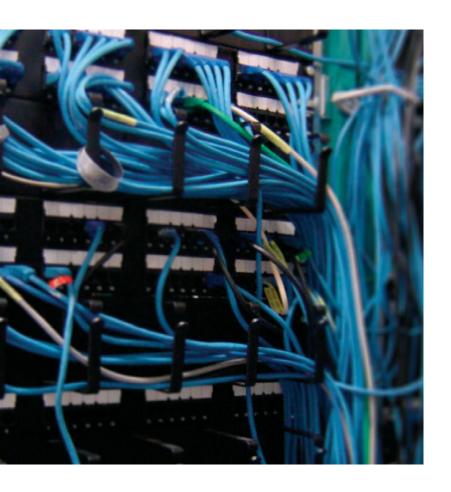
I hope you enjoy reading it.

Pierre Bruyère

Director

# INTRODUCTION





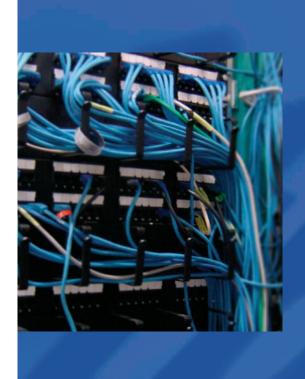
# MISSION

BELNET, government service with separate management, founded as part of the Belgian Federal Science Policy (Act of 7 May 1999), is responsible for the development and management of the Belgian telecommunications research network for:

- institutions of higher learning, research and scientific services associated with or subsidised by the Federal Government, the Municipalities or the Regional Authorities;
- · private organisations that perform scientific research;
- the federal and regional governments.

The mission of BELNET resulted in operational objectives that are described in the three-yearly 2002-2004 framework programme of our activities. In essence, the organisation must maintain an advanced, high-calibre computer network. The characteristics of the network must correspond to the current and future demands of users, while the costs must be kept as low as possible. To achieve this, BELNET must have capable, experienced staff and an adequate organisation.

In addition to this mission, we provide the management and accommodations for BNIX (Belgian National Internet eXchange), the nexus of internet suppliers in Belgium; and for FedMAN (Federal Metropolitan Area Network), the computer network that connects all federal administrations with each other and the internet.



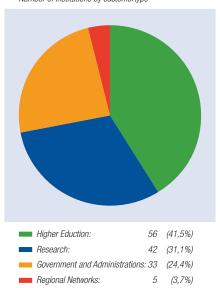


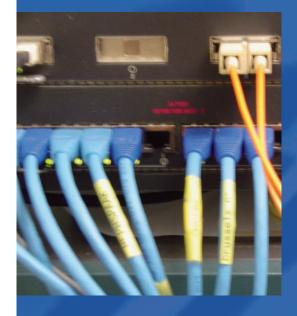
# **CLIENTS**

In accordance with its job as a supplier of the Belgian research network, BELNET supplies internet services via the BELNET network to the following four types of clients:

- higher education: this group includes all certified Belgian universities, the majority of institutes of higher learning and several continuing education institutes;
- research: research agencies and labs located in Belgium;
- government and administrations: small to very large government services at federal, regional, provincial and local level;
- regional networks: organisations that make their services available to government agencies, regional or local government services or educational institutes. Examples include the FedMAN network (for all federal government services), the ICT network of the Flemish Community, CIGB-CIRB (Brussels Regional Authority), EPL (Liege province) and WIN (supplier of the Walloon Regional Authority).

Number of institutions by customertype





The first two categories (research and educational institutes) are the target groups that are our first priority. These institutions enjoy an inexpensive rate for their internet connection, in addition to free access to the international research networks. The other clients of the BELNET network enjoy service of the same quality, but do not necessarily have the same financial benefits.

Outside the BELNET network, we installed and maintain the FedMAN network for the federal Belgian government and BNIX for internet service-providers who are active in Belgium.

#### **BELNET-users**

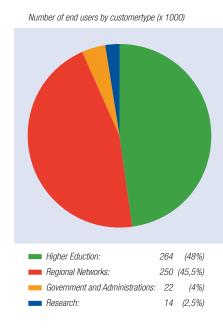
At the end of 2003, there were 135 small to large institutes, organisations and regional networks connected to the BELNET network. Twelve new clients connected to the research network (among them were three educational institutes, two research centres, five government agencies and a public broadcasting company). Ten institutes terminated their direct connection with BELNET. They either opted for an intermediate regional network with which to gain access to the BELNET network, or for a lower-capacity connection.

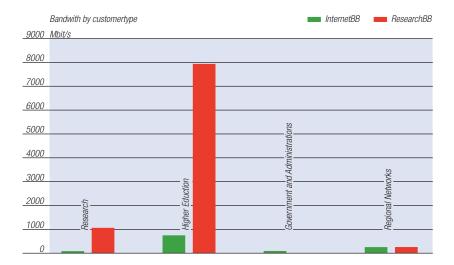
A total of some 550,000 end users had access to the internet and the research networks. We find the largest groups of end users in the educational sector: universities, institutes of higher learning and other educational institutes via the regional networks. Some 280,000 students, pupils and members of research and instructional staff can use our internet services. The universities and institutes are the largest consumers of bandwidth and network capacity. They thereby anticipate the demands of their large group of end users and systematically increase their bandwidth. Nine of the ten largest are universities, with the largest being Université de Liège and the K.U.Leuven. A second large group of end users is the 80,000 civil servants working for the federal, regional and provincial governments.

#### Bandwidth

We connect our clients directly to two types of networks. On the one hand, there are the technologically advanced and very fast research networks like Géant and Internet2; on the other the commercial internet. In both cases, we provide sufficient bandwidth. The bandwidth to international research networks is provided free of charge to institutions whose primary activity is research or education. Their average consumption of research bandwidth amounted to 91.68 Mbit/s per client, or about one hundred times more than an average commercial broad-band connection.

The basic capacity of the BELNET network is sufficient to fulfil the demand of bandwidth of our clients. On the other hand, many networks of our clients are nearing their internal limit; a general tendency at European universities. Because of the structure and relative age of their networks, they cannot always increase the capacity they offer to their end users any further.





As for data traffic to and from the internet, we set the minimum level at 1 Mbit/s in early 2003 and raised it to 2 Mbit/s at the end of 2003. BELNET supplies advanced network access. It is not in line with our mission to offer low bandwidth connections that people can readily find on the market. The average bandwidth used per client accordingly totalled 8.77 Mbit/s.

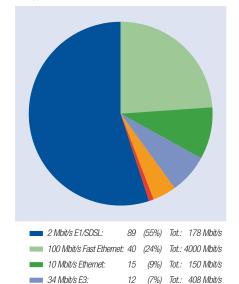
At the end of 2002, some 50 of our clients still had an access circuit with a bandwidth under 2 Mbit/s. Thanks to a substantial reduction in rates – the rate per Mbit/s was cut by about 50% for all types of clients in early 2003 – nearly all clients who had a lower-bandwidth connection decided to increase to 2 Mbit/s or more. Five institutions switched to a different supplier besides BELNET, because they did not need the capacity that BELNET offers as a standard option.

In total, we supplied all clients a combined capacity of 1.18 Gbit/s, more than twice the total of 2002, when we supplied 500 Mbit/s.

#### Customer satisfaction

We continually inform our users of new applications and improvements to the network and encourage them to make full use of the powerful infrastructure provided to them. We do this via electronic newsletters, as well as in information sessions, demonstrations and the annual users meeting. Thus, we bring the research network even closer to the users. In conjunction with the Free University of Brussels, we conducted an on-line survey among our clients to gauge their satisfaction with our service. The level of response was 67 per cent. The graphs show that all our clients are generally satisfied to highly satisfied with our services. We continue to aspire to maintain this satisfaction and even to increase it. We have also started focusing more on the areas our users find important. Internet security, in particular, will receive extra attention.

Types of customer connections



Tot.: 7000 Mbit/s

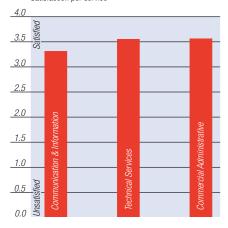
Tot.: 310 Mbit/s

(1%)

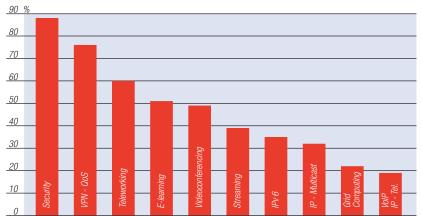
Satisfaction per service

1 Gbit/s Ethernet:

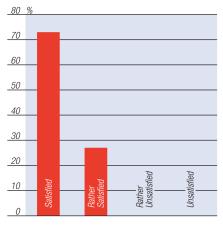
155 Mhit/s STM-1

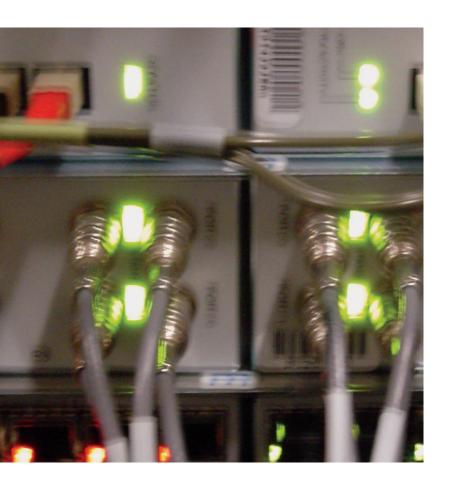


Interest of the customer in (new) technologies



General satisfaction of the BELNET customer





## **ACTIVITIES**

#### Infrastructure

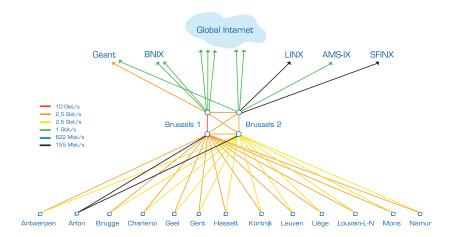
In early January 2003, we launched the improved GigaNet network to meet the increased expectations of our users. Over the course of 2003, it became clear that the gains in performance and stability were more than adequate. Adjustments are regularly made to the network infrastructure to enhance its quality and reduce user costs. In addition to upgrading the research network, we are focusing mainly on offering new services and improving those we already offer. BELNET can look back on a year of innovation and progress.

In June, we put a new access point into operation at the Fondation Universitaire Luxembourgeoise in Arlon. As the number of clients in this region is less than in other access points, we opted for a single installation. The lines to the core of the BELNET network are double, however. One of these lines runs over the network of the Walloon Ministère de l'Equipment et des Transports (MET), our permanent partner for the supply of network connections in Wallonia.

On 1 September, we upgraded the connection capacity to the internet to 2 Gbit/s. The BELNET network is linked via two primary and three backup connections to the commercial internet. After an evaluation of the market, we also decided to replace one of our two suppliers. Our annual contracts allow us to flexibly choose the suppliers who can offer the best price/quality ratio.

We also upgraded our connection to the European Géant research network in 2003. The BELNET network was already linked by a 2.5 Gbit/s connection to the Géant, but now we have added a backup connection with a capacity of 1 Gbit/s. This enables us to anticipate unforeseen problems and our users get increased availability of the connection to Géant.

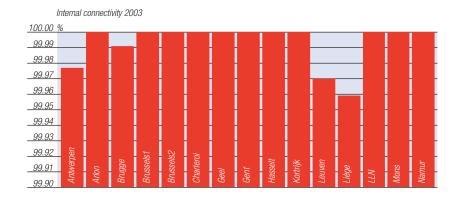




At the end of 2003, we replaced the connection to the Dutch internet exchange AMS-IX by a 1 Gbit/s connection using MPLS technology, increasing the previous capacity 10-fold. The choice of a shielded VPN internet connection made it unnecessary to lease a separate line and network equipment in the AMS-IX. In the future, we aim to use this method for our connections to other European internet exchanges. The BELNET network is connected directly to the internet exchanges of Belgium (BNIX), the Netherlands (AMS-IX), France (SFINX) and Great Britain (LINX). A large portion of our users' communication is between these countries. By opting for a direct connection, we accelerate the information flow and ease the burden of data exchange on our connections to the internet.

### Constant management

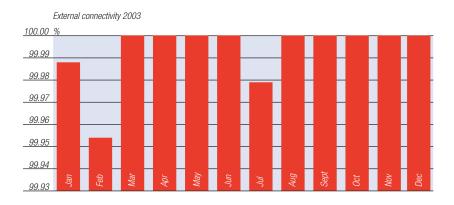
We maintain the strictest standards for the quality of our network. These standards are guaranteed in contracts with our clients. Those contracts and the included SLA (Service Level Agreement) include penalty clauses in the event we should fail to meet our objectives. That is why we not only need an advanced, high-calibre network, but also its constant management.

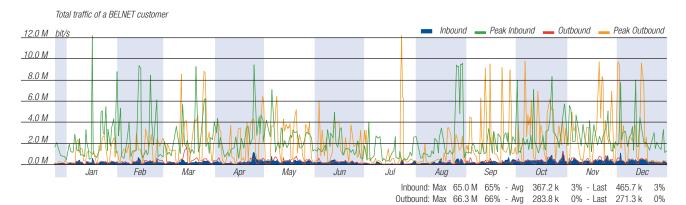


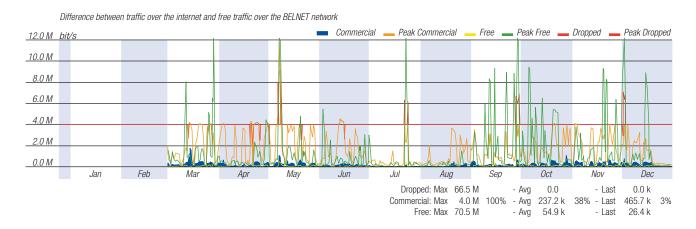
The average degree of availability of the BELNET network annually was 99.9914%, with slight differences from customer to customer and access point to access point. The average availability of the internet and research network was 99.9944%. Those are both exceptionally high numbers that are far above the minimum requirements and which never jeopardised our targets agreed upon with clients. These numbers attest to the quality of our network and support our mission.

The day-to-day monitoring of the network is in the hands of the technicians at BELNET's Network Operations Centre (NOC). The NOC ensures the continuing good condition of the network and customer satisfaction on the technical front. All activities of the NOC are of vital importance for compliance with contractual obligations to our clients.

Because of the many positive user responses, we have expanded the number of network parameters being monitored. Besides the total network traffic, since February the difference between the traffic over the internet and the free traffic over the BELNET network or research networks is indicated. All sorts of events, such as saturation level and network attacks can be viewed immediately by our clients and analysed thanks to the extra graphs. We provided a detailed, clear handbook on how to interpret those graphs.





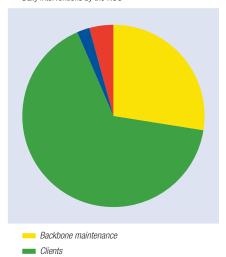


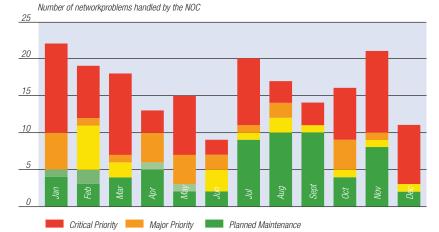
Our people are assisted in monitoring the network by an external monitoring service that is constantly active. Most of the NOC's attention, however, is on users and their possible problems. This ranges from information provided via our help desk to extensive assistance in the configuration and installation of network connections at client premises, or setting them up and testing them. Potential network disruptions are solved by the NOC itself. Then there are the necessary upgrades of both hardware and software, and also the functions of the network are regularly updated by the NOC.

#### Daily interventions by the NOC

External attack / abuse

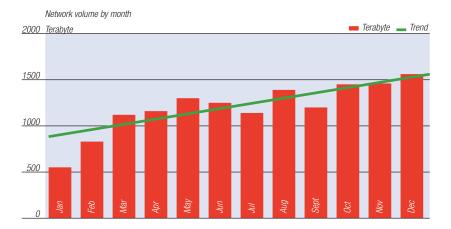
Upgrades





Finally, the NOC monitors the safety of the network. We handle the safety of our infrastructure in the broadest sense, including the service used for the benefit of our users. After all, we have to ensure that all our equipment and systems do not become the target of malicious acts. We have various procedures and methods in place to prevent wrongful access to the various systems. We are also active as an intermediary in the communication of complaints about fraudulent practices that we receive from other internet users. BELNET would like to improve its expertise in this area by setting up a CERT (Computer Emergency Response Team) in 2004.

Medium Priority



### New services

Low Priority

As an addition to our basic service, particularly network access, we offer a wide range of extra possibilities. Some are essential for the proper functioning of the network or allow the capacity of the network to be used to the fullest, while others are optional features or support scientific research and experiments. For example, we launched various extra functions and applications in the BELNET network in 2003, such as IPv6, IP multicast and BEgrid. We communicated extensively with our clients and users regarding all these services in work groups, lectures, technical explanations, etc.

The significance of **IPv6** for the further development of the internet is certain. It now allows more devices to be connected to the internet; compare it with the extra digit that was added to existing telephone numbers. The scientific world is already an active user of IPv6. Scientists are the ones who are responsible for the development of new, previously unknown applications, after all. Their results can bring about a new revolution in the use of the internet. To support science in its studies, we adapted the BELNET network to be compatible with the IPv6 protocol.

The use of modern **multicast** technologies is vital to be able to offer high-quality streaming over the internet in the future – for television signals, for example. With multicasting, the same message is sent to different users in an efficient manner. Internet users can view the same video, thanks to the protocol, without heavily burdening the computer network. From now on, the BELNET network supports IPv4 multicasting and allows researchers to set up tests, studies and experiments. To further stimulate the use of IPv4 multicast, we are broadcasting videos over the BELNET network, including animations by IAD students from Louvain-la-Neuve and a movie by Géant. In addition, we have entered into a research agreement with RTBF for the development of new activities on the network.

With **BEgrid**, the BELNET grid initiative, we want to provide information about grid computing and promote its use. Grid computing blurs the distinction between the computers and the network that connects them (a grid combines separate computers into one virtual entity). The application of grid computing is still in its embryonic stage, but here too BELNET wants to stimulate scientific research. So as to allow BELNET clients to test a grid infrastructure and software, we constructed a test system with computer systems donated by several sponsors. Thanks to BEgrid, our users can contribute to European research projects. They can connect their own systems to our central grid infrastructure without having to provide all the basic functions themselves. Five institutes are already testing their grid systems this way for connection to BEgrid. The Flemish Community has also shown interest and has co-developed with BELNET a proposal to request subsidies for the purchase of grid equipment by Flemish research institutes. Finally, we not only want to make our contribution with the installation of a grid in our network, but also by certifying local users by providing basic support with installation, creating mailing lists, by running the basic functions in a grid infrastructure and by organising informational sessions on installation and use.

#### Trial projects

In 2003, we tested several possibilities for offering extra services, such as VPN-technology and 'digital certificates'.

A **VPN** is a shielded network connection on a shared public medium, such as the internet. It makes secured, separately leased lines unnecessary because one can use existing internet connections. Clients with different branches could for example, link their administrative applications with it, or centralise them. This is relevant in the context of associations between universities and institutes. We could also connect research groups at different locations. They would then be able to more easily share their sensitive computer infrastructure and information. We have examined various technologies and further concrete tests are planned for 2004.

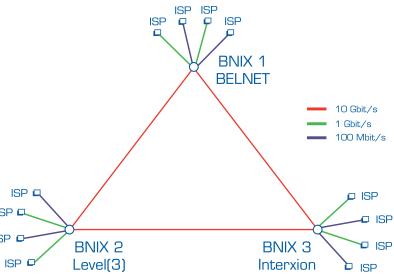
In a second trial project, we started setting up a verification system based on **digital certificates**. We worked in conjunction with ISPA (the Belgian association of internet service-providers) and several Belgian internet service-providers. We demonstrated the feasibility of mutual communication between internet service-providers, sending secure electronic mail, secure chatting and verification of VPN use. Although digital certificates can prove their merit universally, our clients can also gain specific benefits from them. We are thinking for example of a pan-European electronic student card.

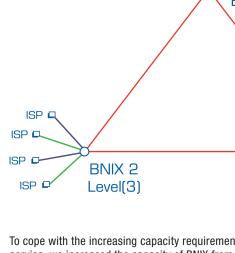
#### **BNIX**

All internet service-providers have their data exchange merge at internet exchanges. There, the national traffic is separated from international traffic, allowing computer data to be exchanged by the shortest possible route. Internet exchanges are crucial to fast, affordable internet connections. The Belgian internet exchange, called BNIX (Belgian National Internet eXchange), is operated by BELNET. By accommodating BNIX at BELNET, we can guarantee our clients affordable, extremely fast connections. BELNET operates BNIX according to a cost-sharing principle and does not make a profit on it.

In 2003, seven new clients connected to BNIX (Arcor, DNS.BE, Firstlink Networks, Intouch, Interoute, Proserve and Realroot). Eleven existing clients also upgraded their connection or decided to add a connection to BNIX. In 2003, there were 45 companies connected to BNIX, for a combined 64 connections and a total bandwidth of 24 Gbit/s.

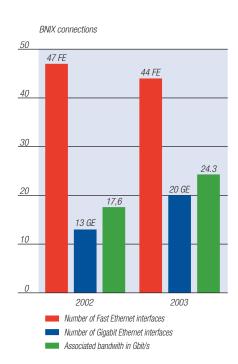
Over the past three years (2001-2003), we have measured a total increase in traffic of 1,118 terabytes. The development of more and more intensive applications such as internet radio and video or the exchange of music and growth of the number of residential broadband users will only cause this trend to continue in the years to come. The growth of data is also accelerating; in 2001, the average monthly growth was 14 terabytes. In 2002, this was 36 terabytes a month and in 2003 traffic grew by 44 terabytes a month.

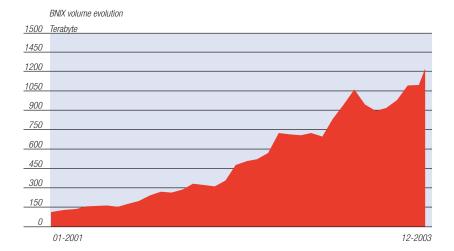




To cope with the increasing capacity requirements and to continue to guarantee optimal service, we increased the capacity of BNIX from 1 Gbit/s to 10 Gbit/s. This level of capacity is fairly unique worldwide. The new fast exchange was fully operational at the end of 2003. Thanks to the improved infrastructure, BNIX has strengthened its position as one of Europe's key exchanges for internet traffic. Given its strategic importance for the internet in Belgium, BNIX also demands constant monitoring. Daily monitoring of BNIX is the responsibility of the technicians of BELNET's Network Operations Centre (NOC).

Although BELNET does not guarantee any minimum capacity or availability for BNIX, we adhere to stringent standards. The exchange is under constant surveillance. Registration of activity allows problems to be detected and guickly responded to. The monitoring also provides a view of bandwidth use and is an efficient tool for capacity planning. In 2002, availability of BNIX was 99.988%; in 2003, 99.570%. This decreased availability was caused by planned down-time associated with the installation of the new infrastructure.



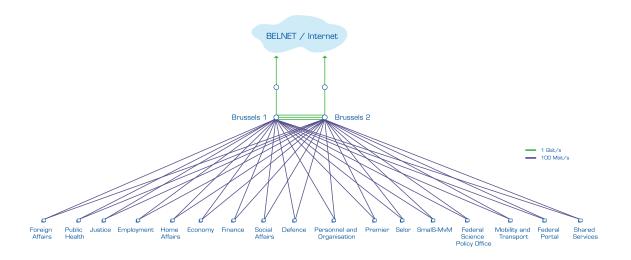


#### **FedMAN**

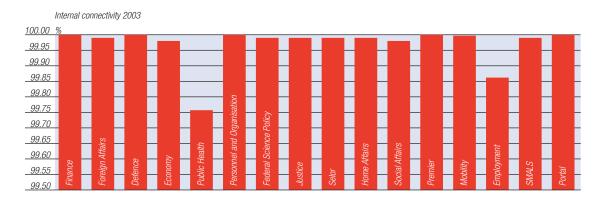
Besides our legal mission as national research network, FEDICT, the federal government agency for information and telecommunications technology, commissioned us to install and operate the FedMAN network in 2002. The computer network connects 16 federal government departments (FODs) with each other and the internet via the BELNET network. The government also makes maximum use of our existing infrastructure and competence, and thus enjoys scale benefits.

Service levels are contractually defined in agreements between BELNET and FEDICT. A report is drafted on a monthly basis stating the availability and performance of the previous month. If the set standards are not met, a penalty must be paid according to the contractual stipulations. The network is very stable; since its completion in 2002, the SLA values have always been met and consequently no penalties have been paid. The average availability from and to the various FODs that are connected was 99.971%. The FedMAN network also serves as the central entry to the internet via the BELNET network, with the availability mentioned above of 99.9944% annually.

In 2003, after consultation with FEDICT, we introduced a simplified connection method for smaller government services. Four autonomous government agencies have since connected: the Council of State, the Auditor's Office, FAVV/AFSCA and the Buildings Directorate. We commenced the procedure for connection of OFOIFA and FedASIL in 2003, with actual connection planned for 2004.



The initially planned bandwidths (100 Mbit/s per FOD and 1 Gbit/s to the internet) are still more than adequate to meet current demands. The graph below illustrates the development of the volume of data for the year 2003. We expect that as more functions and applications become available (VPN services, tax on web, the federal portal site and others), this will result in a further increase in volume.





# OBJECTIVES 2004

BELNET, that has had a powerful, extremely reliable network infrastructure since late 2002, will focus in 2004 primarily on the development and application of new services for its users. This pertains mainly to:

- the creation of a BELNET CERT, a team of experts in the field of security who share information and warnings with network users;
- VPN services that meet specific client requirements;
- co-operating with further initiatives for a system of digital certificates and statements of authenticity (authentication) that open the way for a whole series of possible new applications (such as monitored remote access for students, telecommuting for researchers, secure e-mail).
- the creation of a portal site that combines all useful information for a client (such as administrative and technical data, access usage graphs, DNS data, contacts);
- promotion among users of the advanced possibilities of the network, such as IPv6 and multicast via specific web pages and attractive applications;
- support of activities linked to grid computing to promote the participation of Belgian researchers in these types of projects that enjoy the ample support of the European Union.

In addition, we will take measures to make the services we offer even more professional and to improve the team's efficiency. This concerns network management; the internal ICT systems; our own logistics; buildings and infrastructure. We will perform a systematic analysis of existing ICT systems and examine the feasibility of outsourcing support in full or in part. This could relieve the technical team of non-priority or routine tasks so it has more time to concentrate on the network users' requirements.

Although the current infrastructure is still very recent, we already have to start thinking about preparations for its further evolution, the next step towards which we are



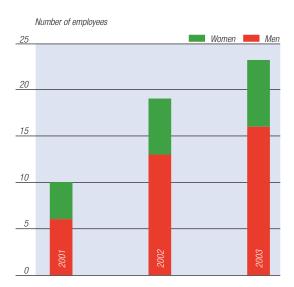
taking at the end of 2005. After all, it takes a long time to complete this, bearing in mind the technological lead of the network and the special rules to which we are subjected in respect of government assignments. The target is to expand capacity further within the same budgetary space to keep pace with the expected evolution at the European level. To achieve this, we have to identify and study technologies, new approaches and future partnerships as quickly as possible. For the network technology, we are mainly thinking of 10 Gbit/s for the backbone, lambda switching for fast, efficient use of fibre-optic networks, and long-term user rights for fibre-optic connections. As for partnerships, we will try to reach an agreement with the Flemish Community to use their fibre-optic network. That would place us in a position to substantially reduce the rates for agencies of the Flemish community, as is already the case today for the Walloon Regional Authority via our agreement with the Ministère de l'Equipment et des Transports.

To guarantee that the development of BELNET and the services offered remains aligned with users' requirements, we will set up a cohesive, integrated client approach to invite users to formulate their requirements and to make appropriate feedback of that information possible. We will not only continue the media campaigns we launched in 2002, but we will strengthen them as compared to 2003.

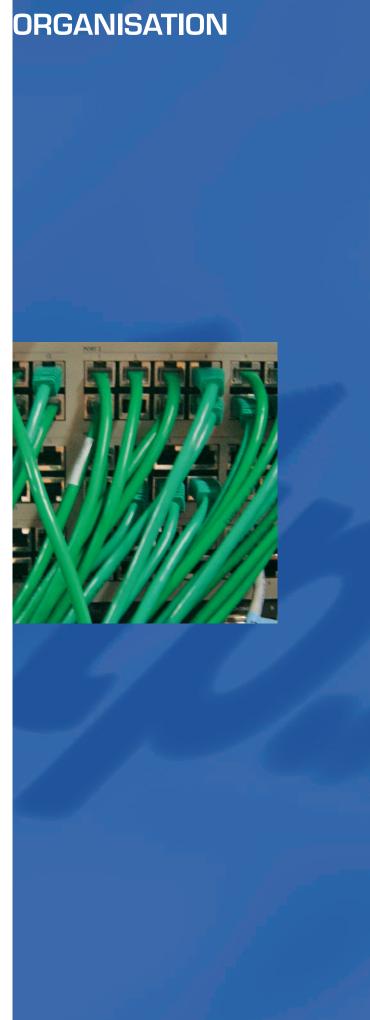
The charter of public service with independent management that BELNET has enjoyed since 1 January 2000 has brought a great improvement as compared to the previous situation. Without that change, BELNET might not have survived. We would not have been in a position to stand up to the radical changes that the information and telecommunications industry has experienced in recent years. The current charter is showing some weaknesses, however, and entails restrictions that impede our mission and optimum development of the network: slowness and complexity of purchasing procedures; impossibility of sponsoring; important restrictions to new partnerships; difficulties regarding recruitment and staff salaries; lack of flexibility for human resource management; insufficient autonomy in the area of leasing and acquisition of property; significant restrictions regarding bank accounts and financial management. It remains essential to examine the possibilities of adjusting the current charter or even switching to a different legal form that is better suited to the specific activities of BELNET.

#### Staff

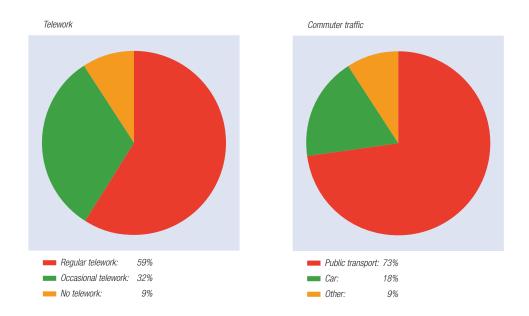
At the start of 2003, the technical team was expanded by three persons. Two members of the staff left BELNET. On 31 December 2003, 22 people worked at BELNET. Three quarters of the BELNET staff (74%) takes public transport to work, 18% commute by car and 9% walk or ride a bicycle. This proves that a central location and easy accessibility by public transport stimulates its use.



BELNET started a trial teleworking project in 2003 for the employees whose job allows. Because of the rapid growth of our organisation, this helps us keep our offices from being too crowded on some days. Several employees, especially those who live far from the office, can also save travel time this way. One can opt for "regular teleworking" when an employee regularly works at home on one set day; or "occasional teleworking", when an employee works at home now and then. Every employee received a PC from BELNET

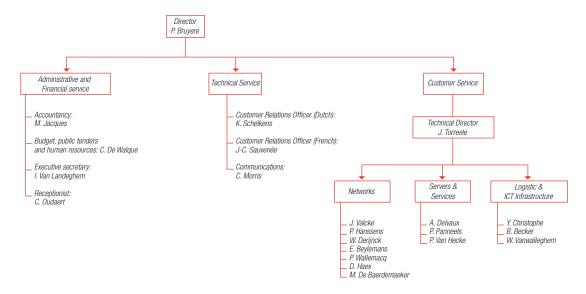


and a broadband connection to use. A total of 59% opted for the "regular teleworking" formula, and 32% for the "occasional teleworking" formula.



### Organisational chart

### Organisational chart on 31/12/2003



# FINANCIAL RESULTS

The rules for financial and equipment management of the BELNET network were set out in the Royal Decree of 1 February 2000. The decree mainly defines the working method and powers of the administrative bodies (management committee and ordinariat), specifies the responsibilities of the accounting officer and sets out the principles for drafting the budget and accounts (account of budget operation, management account and statement of assets). The form that the budgetary and patrimonial accounting of BELNET must take is regulated by the ministerial decision of 25 March 2003. The accounts of the 2003 financial year were drafted on the basis of this decision and satisfy the principles determined by the Commission for the normalisation of government accounting. They were audited by the firm of Mazars & Guerard, corporate auditors.

#### Distribution of proceeds and expenditures

BELNET closed the year 2003 with a negative balance of 2,560,770.69 euros. Added to the balance of the 2002 budget year, BELNET had a credit balance at the end of the year 2003 of 6,487,386.19 euros, to be forwarded to 2004. A large portion of this is reserved for the FedMAN project.

In 2003, BELNET had a budget of 11,821,516.79 euros to cover all its activities. This amount was composed of four types of income:

- financial resources (1%);
- proceeds from services provided to the private sector, education, research and the government (16%);
- deposit by FEDICT for the development of the FedMAN network (17%);
- maintenance surcharge awarded by the federal Research Policy (66%).



### Results Account

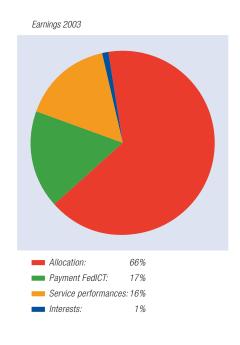
	Financial Year 2003	Financial Year 2002
Costs		
Other use of consumable goods and services from third parties	7 792 141,34	8 028 076
Property tax and miscellaneous taxes	0	0
Direct and indirect staff remuneration	926 805,49	657 274
Amortisation on intangible assets and establishment costs		
on tangible assits	1 850 950,31	1 740 744
Transfers of income (expenses) other than company benefits	21 563,00	51 373
Losses in capital on existing assets and liabilities	842,92	4 753
Provisions for future liabilities and charges	0	2 890 297
Result in general accounting	1 229 213,73	-1 138 578
Overall total costs	11 821 516,79	12 233 939
Profits		
Invoiced services provided	3 834 248,73	3 990 569
Interest and other financial income	155 116,22	316 038
Capital gains on existing assets and liabilities	11,30	268 332
Releases on provisions for future liabilities and charges	44 293	0
Transfers of income other than taxes and NI contributions	7 787 847,54	7 659 000
Overall total profits	11 821 516,79	12 233 939

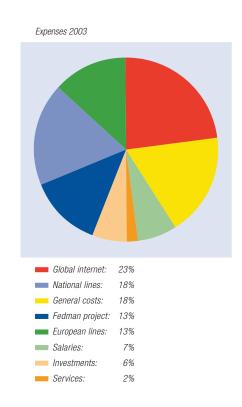
### Balance Sheet

	Financial Year 2003	Financial Year 2002
Tangible assets	3 568 751,05	4 900 308
Long-term debts by third parties not subject to PCG	59 623,37	84 568
Long-term debts by third parties subject to PCG	11 048,77	2 271 856
Certificates and cash bonds	8 193 000,01	4 193 000
Bank accounts on demand and giro cheques — stamps and cash funds	2 419 565,79	466 403
Securities due to be cashed and internal financial transfers		-11
Asset adjustment and suspense accounts	730 138,33	1 062 313
Total assets	14 982 127,32	12 978 437
Net assets or company assets or net liabilities	10 452 752,77	9 223 539
Provisions for liabilities and charges	3 543 003,99	3 587 297
Long-term debts to third parties not subject to PCG	314 006,65	-51 996
Long-term debts by third parties subject to PCG	595 127,54	37 911
Liabilities adjustment and suspense accounts	77 236,38	181 686
Total liabilities	14 982 127,33	12 978 437

In 2003, BELNET was faced with three types of expenditures for a total of 9,260,746.10 euros

- investments (6%);
- recurrent expenses (81%);
- costs connected with the FedMAN network (13%).







## **GLOSSARY**

Backbone: central network infrastructure of internet networks.

**Bandwidth**: the capacity of a data connection, measured in hertz (analogue networks) or bits per second (digital). Bandwidth designates the amount of data that can be transferred in a certain time.

**Bit**: binary digit (or the binary numbers 0 and 1). Basic unit with which a computer system works, usually combined in a sequence of bits.

**BNIX**: Belgian National Internet Exchange. A central exchange where internet service-providers who are active on the Belgian market exchange data traffic with each other. The term IX (Internet eXchange) is used internationally for internet exchanges.

Byte: a sequence of eight bits.

**CERT**: Computer Emergency Response Team. A centre for the prevention and solution of problems connected with computer security.

**FedMAN**: Federal Metropolitan Area Network. Belgian computer network built by BELNET for FEDICT, connecting the Brussels federal administrations with each other and with the internet.

**Géant**: the European research network created from a joint venture of 26 national research networks and the European Commission. More info is available at www.geant.net.

**Grid computing**: advanced, embryonic technology based on the global linking of computers for shared processing of large quantities of data. BEgrid is the BELNET grid initiative for stimulating grid computing in Belgium.

Internet2: consortium of 250 US universities, industry and the government for the development of advanced network application and technologies. More info is available at www.internet2.edu.



**IP**: Internet Protocol, the standard for transporting data over the internet according to a series of set communications rules.

**IPv6**: Internet Protocol version 6, the latest generation of the Internet Protocol and the successor of IPv4.

ISP: Internet Service Provider, provider of internet services.

**Lambda switching**: advanced technology to send information quickly and accurately over optic networks.

**MPLS**: Multiprotocol Label Switching, standard technology to implement VPNs with guaranteed quality-of-service in an IP-network.

**Multicast**: technology where a flow of data is sent to multiple recipients at once, ideal for sending graphics and audio.

**PoP**: Point-of-Presence, access point of a network, the geographic location where one can connect to a main network. The access in a PoP is usually shared by dozens to hundreds of users.

**Streaming**: technology to send data uniformly and uninterruptedly. Streaming allows an incoming multimedia file to be opened before it has been transferred in its entirety.

**VPN**: Virtual Private Network, often called a tunnel, part of a public network for shielded communication between two or more end points.

Text: BELNET End editing: www.quadrantcommunications.be Photo's: BELNET Graphic design & lay-out: www.netlash.be



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