

2006 Annual Report

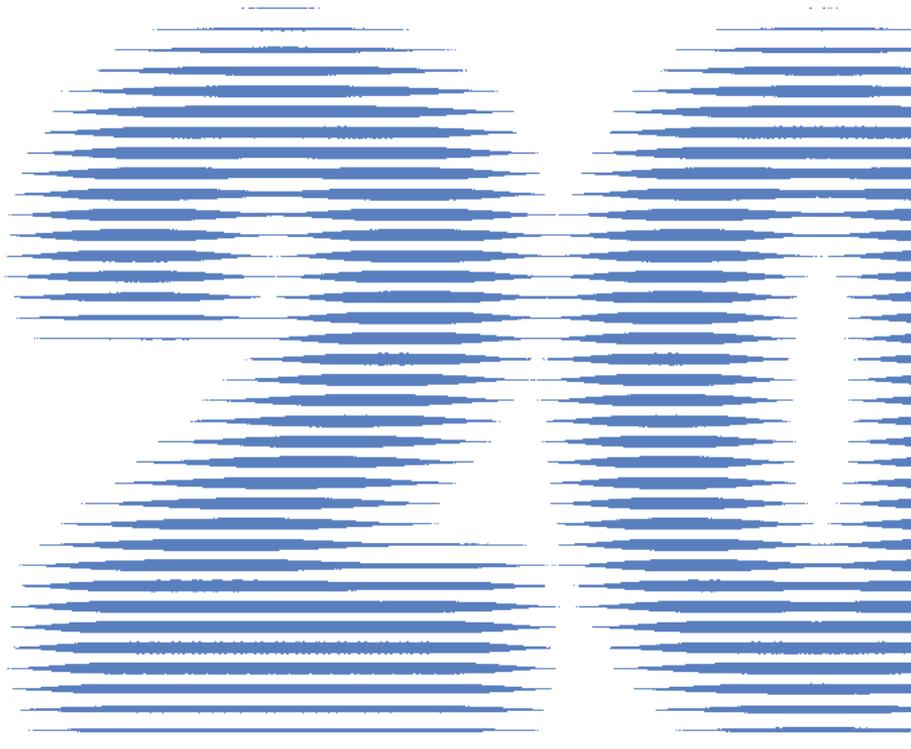
# The Network of Knowledge and its Users



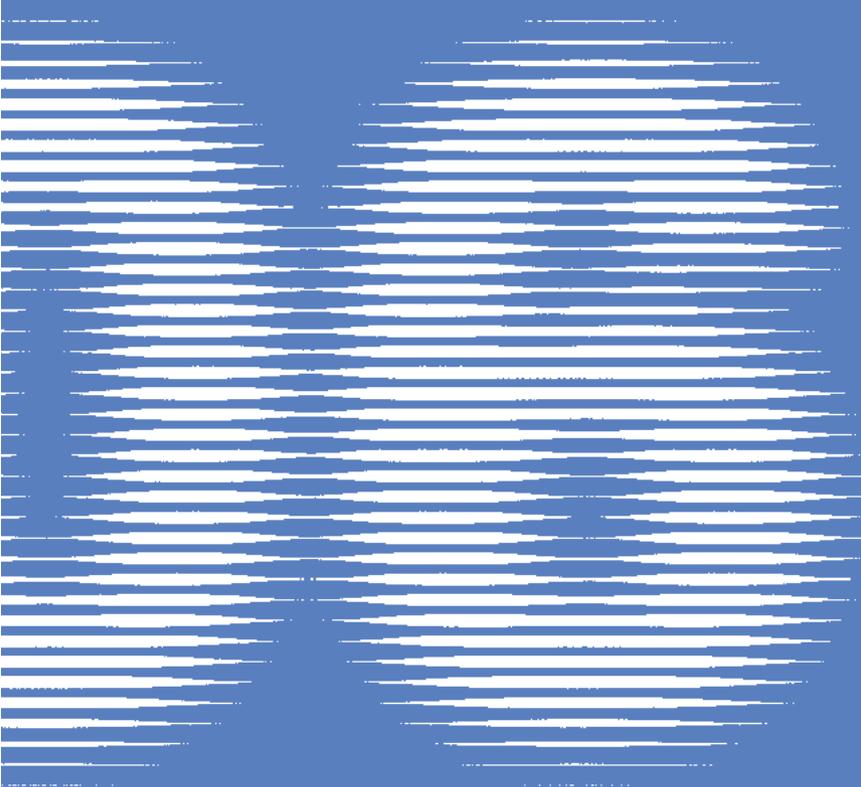
BELNET wants to be recognised and acknowledged as a partner no-one can afford to be without. Not because it is a monopoly or offers favourable rates, but because of the quality of the services we offer, the abilities of our staff and the optimum focus of our services on the needs of our target group. BELNET also aims to become a central point in a network of people who are active in ICT, and more particularly in the development of services and applications for communication networks. We therefore give priority to knowledge workers (researchers) and knowledge disseminators (higher education). Internally, we have all the necessary knowledge, experience, ability and technological know-how to carry out every facet of our mission.

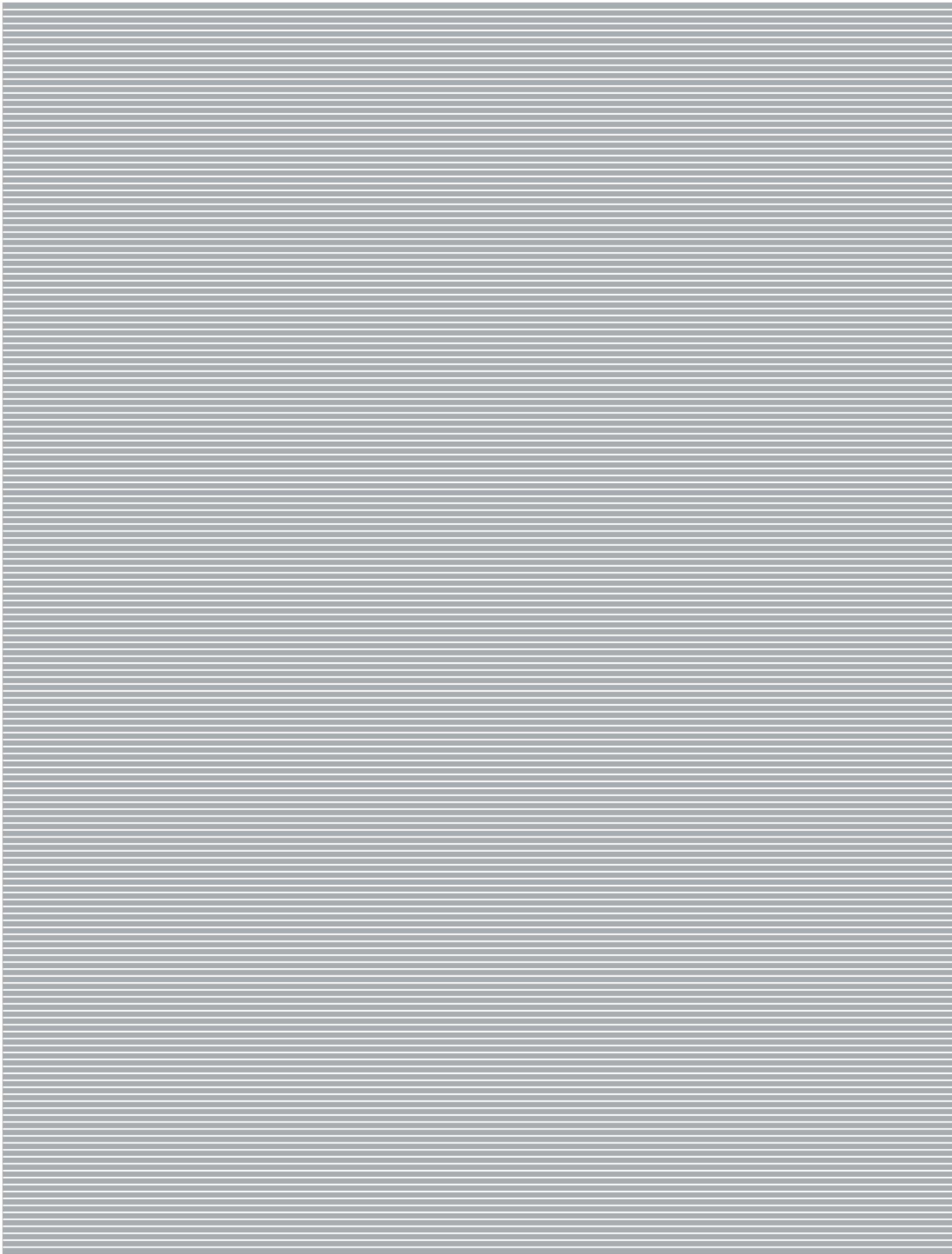
## BELNET, from 1989 to the present day

BELNET was established in 1989 as part of the Information Technologies Impulse programme set up by the Science Policy Office's programming department. This programme originally intended to promote the use of supercomputers by Belgian researchers and to investigate the possibilities of a research network. The first generation of the BELNET network became operational in 1993 and ten years later, from 2003, the emphasis began to shift from a technical infrastructure towards the development of advanced services. The 2006 strategic plan consolidated this evolution and threw it into sharper focus. The management plan for the next few years makes the mission, vision and goals more tangible and precise.



ANNUAL REPORT 2006  
The Network of Knowledge  
and its Users





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## Contents

### Part 01

The user in the foreground

by Pierre Bruyère, Director ..... 7

### Part 02

Users and organisations ..... 16

Networks, technologies and services ..... 24

Staff, management and partners ..... 38

Finance ..... 50

### A few users have their say

Christophe Joris, Second lieutenant engineer ..... 14

Wouter Vermeylen,

Building management officer ..... 22

Antal Bulanza, BEgrid engineer ..... 36

Mirko Widenhorn, Student officer ..... 48

### Part 03

Key projects in 2006 ..... 61

Day to day activities ..... 69

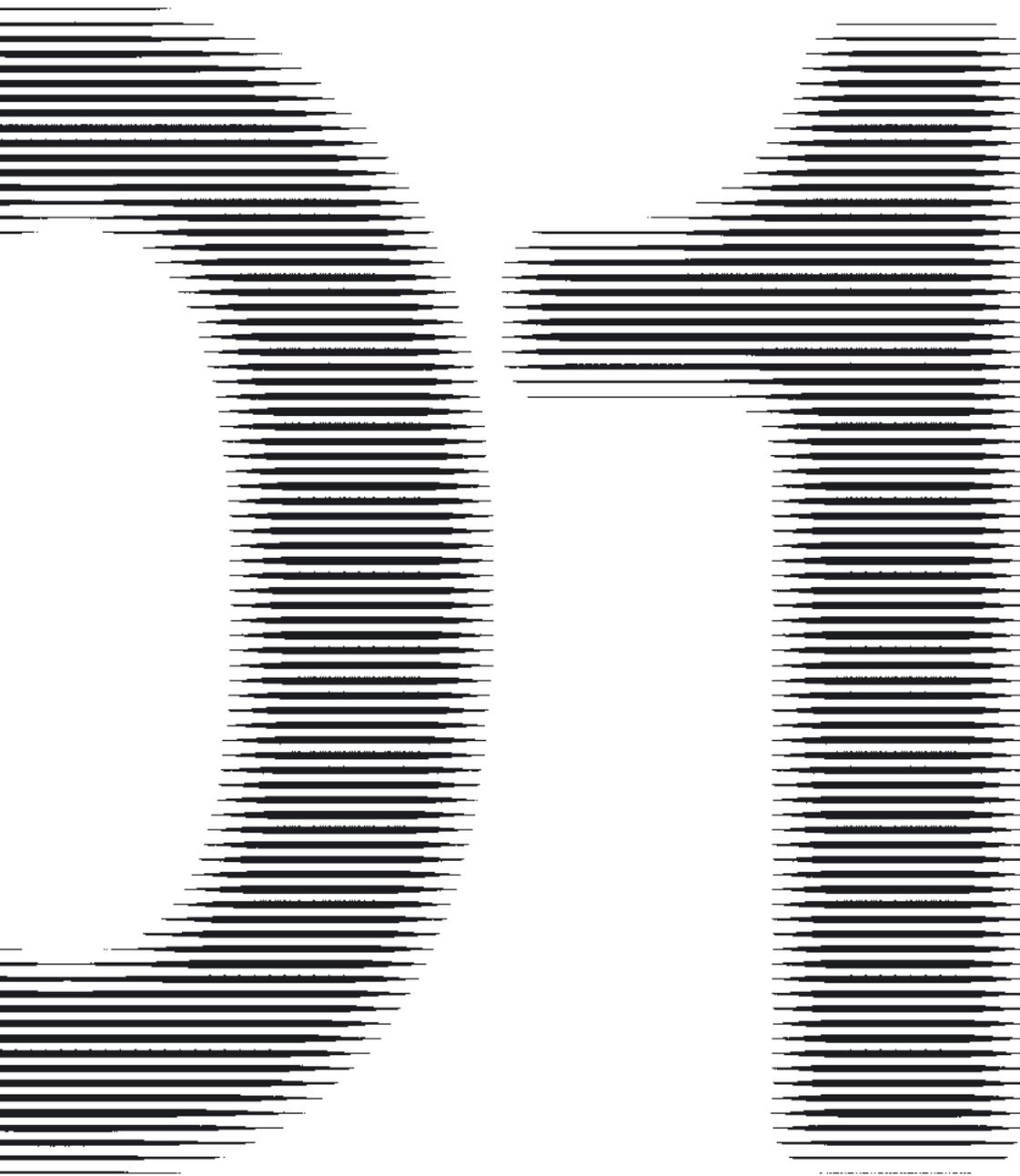
Conclusion ..... 80

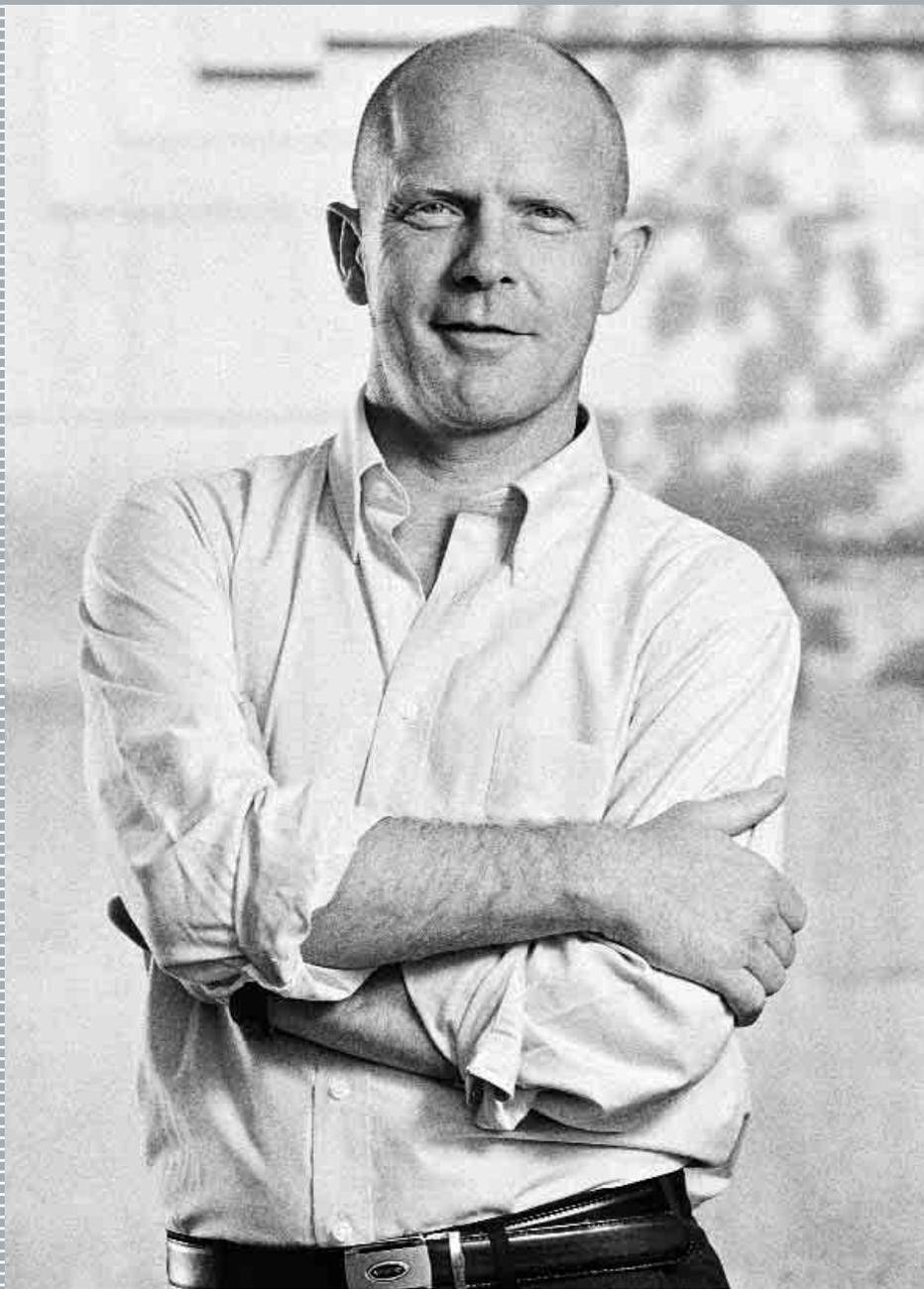
Glossary ..... 82

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— The user in the foreground  
by PIERRE BRUYÈRE, Director





Pierre Bruyère, Director

## THE USER IN THE FOREGROUND

BELNET wants to be the network of knowledge. Our first concern is to offer high value network access to Belgian higher education and research institutions. Initially, we were involved with the infrastructure, building the network itself and then extending its capacity. Even today, we continue to optimise our network, adapting it and extending it, but now the major challenge lies elsewhere. Via our network, we want to offer services which meet the needs of our clients. And as an organisation, we want to deliver specific added value.

In the strategic plan that we drew up in 2006, and which we had already started thinking about in 2005, the emphasis was definitely on our relationship with the user and the client. From an organisation offering Internet access, we have evolved into a service provider and advisor. Our users made it very clear that they wanted us to take on this role. They wanted us to keep our finger on the pulse of technology and to familiarise them with new innovative possibilities. That became apparent from the user survey that we carried out last year. In research and higher education, as we saw once again, there is a lot of demand for support, advice, training and guidance, also often due to the limited budgets and lack of staff in this sector.

BELNET wants to and can adapt to these requirements. We are very familiar with the sector and its problems and we will listen to all its concerns. Above all, we don't serve any commercial interests. This is a great advantage to higher education and research. Researchers, IT managers and academic personnel can be sure that they will receive unbiased advice from us and know that we have all the expertise and know-how to recommend high quality solutions. It is in these fields, namely network access, expertise and advice, that we offer significant added value.

## An important player in the development of the Belgian knowledge community

Through our experience and specific competences, we can develop further into a major player in the development of the Belgian knowledge community. In order to realise this ambition more fully, we follow all major innovations and participate in large European and international projects. This means that we have been actively involved for many years in the development of the European research network, Géant<sup>2</sup>. And through our involvement in the Eduroam project ('educational roaming'), we can vastly improve the mobility of Belgian researchers, students and academics.

In the context of our international cooperation, I would like to mention that, in 2008, BELNET will organise the TERENA Networking Conference, the most important European conference about advanced network technology. It is a token of international recognition that BELNET has been entrusted with the organisation of this conference. The conference will, once again, place our country firmly on the map as an important region for ICT and will bring the latest possibilities and applications even closer to the Belgian user.

## A communicative, advisory approach

In the management plan which was developed in consultation with all BELNET's staff, we have made the user-oriented approach operational and settled on a number of projects, priorities, media and budgets. From a technical administrative approach, we have moved towards a more communicative, advisory approach. As a small organisation, it is impossible for us to help every single user individually. This is why we have chosen an indirect approach with workshops, guest speakers, services via a web interface, a portal site and information through the press. We must emphasise that we do not want to deliver some kind of monologue, but that we do want to make the necessary efforts to maintain a dialogue with the user. The departure point is always: 'What does the user need to carry out their academic or research work to the best possible degree?' To answer that, we first need to know their requirements. Only then can we offer the right

solutions and, at the same time, point out innovations that users didn't know about or weren't familiar with. Every year, BELNET organises the BELNET Networking Conference. The aim is for users to exchange ideas and experiences during the conference and also to swap thoughts with BELNET staff.

### Also for governments, administrations and companies

We also look beyond the academic and research worlds and try to make a major contribution to the Belgian information and knowledge community as a whole. We do this by also offering our technology and know-how to the governments, administrations and regional networks across the country. As a result, FedMAN<sub>2</sub>, the network of the governments' administrations, was delivered in March 2006. And from a number of technologies that we introduced for scientific applications, such as BEgrid and multicasting, companies in this country will eventually collect the rewards.

BELNET will become even more emphatically user-oriented. We will help users to make more secure, profitable and efficient use of the knowledge network. I would like to thank all our colleagues, partners, clients, users and governments who have already helped us with this task and will continue to do so in future.

PIERRE BRUYÈRE  
Director

## A two-fold mission

BELNET has a dual mission. On the one hand, BELNET stimulates scientific development through innovative high-quality network infrastructures with matching services and maintenance, to the benefit of Belgian higher education and research. On the other hand, BELNET accelerates the growth of the knowledge and information community, thanks to the expertise it has amassed, its unique position in the market and its economies of scale.

## BELNET's strategic objectives

1. BELNET intends to meet the needs of educational and research institutions and their end-users as far as network infrastructure and services are concerned in an optimum manner.

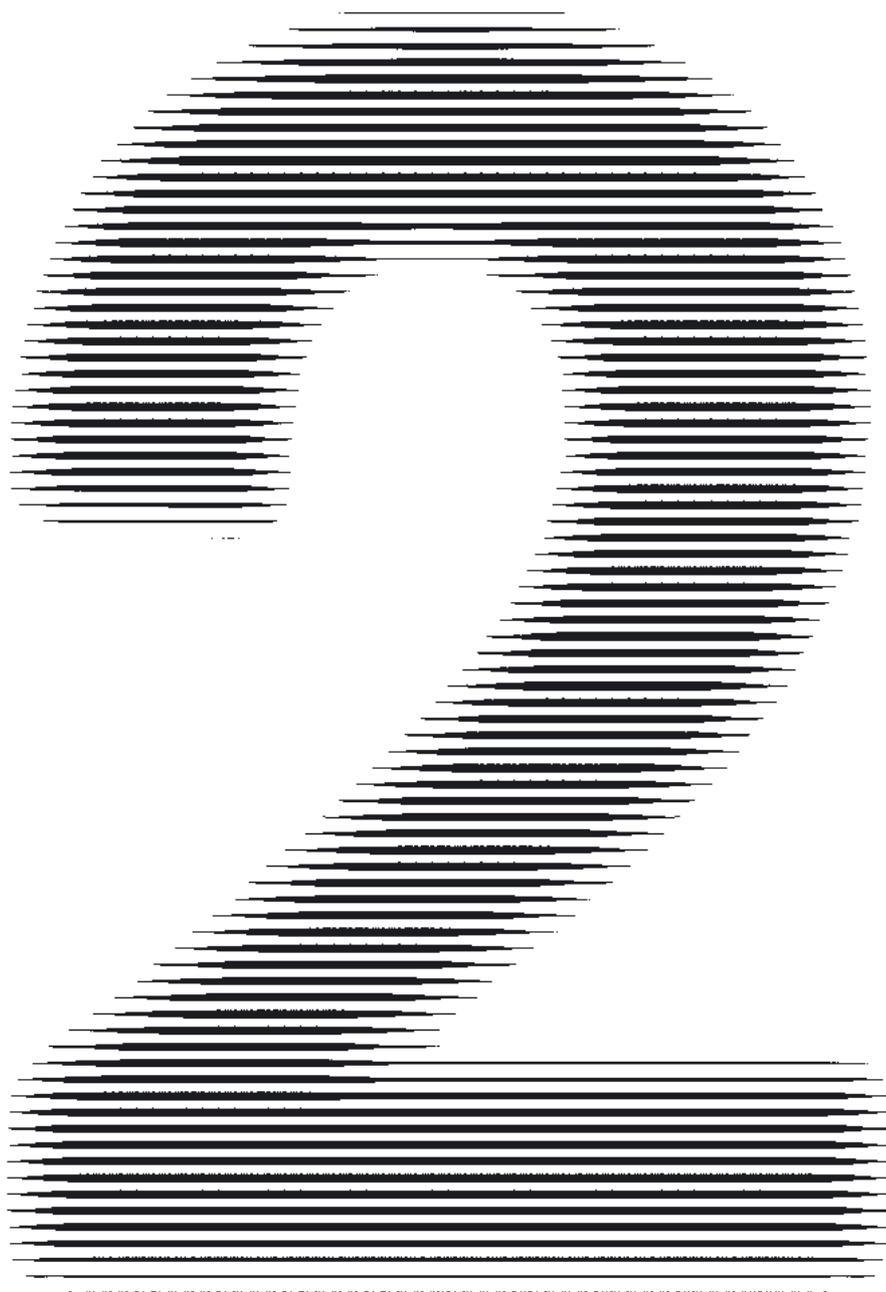
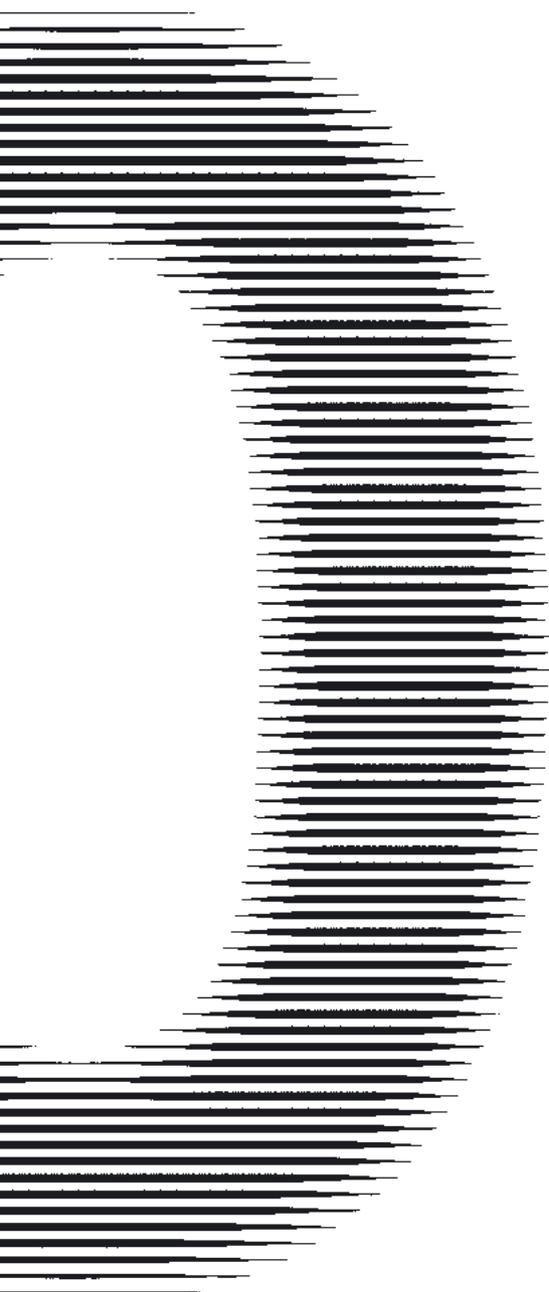
2. BELNET intends to deliver innovative networks and applications which will adapt to future needs.

3. BELNET intends to be a strong, visible organisation accessible to all educational and research institutions.

4. BELNET intends to deploy means and people in an effective manner within an optimised structure.



- Users and organisations
- Networks, technologies and services
- Staff, management and partners
- Finances







## COMPUTING POWER FOR SIMULATIONS AND RESEARCH

The Royal Military Academy is a military establishment for university education which is entrusted with the academic, military and sports training of officers. “To carry out a number of its duties, the Academy needs computers with a huge amount of computing power,” says second lieutenant Christophe Joris who has just completed his studies as a technical engineer in telecommunications. “We also need a lot of computing power in the field of nuclear and atomic physics.” That's why Christophe researched the possibilities of grid computing within the framework of his graduate studies. He studied the performance of a cluster of computers within the school itself and compared it with BEgrid. “BEgrid seemed to be very interesting,” concludes Christophe. “More so than our own cluster. BEgrid's computing power is vast, the system is very stable and, above all, BELNET offers support and advice.”

Christophe Joris  
Second lieutenant engineer  
Royal Military Academy

**Users and organisations** In 2006, the number of users on the BELNET network rose to an average of 585,600 per day. The largest proportion of these users, from 161 different organisations, were students, researchers or academic staff members.

**Putting users' needs on the map** BELNET wants to adapt itself to its users' needs as fully as possible. With this in mind, in 2006 it carried out a survey amongst a number of key users and decision makers from the academic and research worlds. BELNET not only asked them about how they valued BELNET's services, but also about their current needs and their anticipated future expectations and requirements.

From this research, it seems that the reliability of the network and BELNET's technical competence were highly valued. But user awareness of BELNET was still limited and decision makers were not always aware of the range of services that BELNET offers. Educational and research institutions are also struggling with a number of problems, such as limited financial and human resources and problems concerning computer security. They expected advice and technical support from BELNET so that they can get the optimum use from their networks. Future expectations revolved around security, mobility and data storage. They also wanted to make the most of BELNET's economies of scale and network coverage. The research resulted in some tangible measurements. This led to a plan being drawn up to reform and strengthen the Customer Relations department in 2007 to provide users with better service.

In 2006, BELNET adopted a customer-oriented approach in no uncertain terms.

**Towards more efficient management** To optimise our customer management, we decided to introduce a Customer Relations Management (CRM) system in 2006. This system makes it possible to deliver a systematic follow-up of customer contacts and their requirements. It also means that we can carry out our customer management in an efficient manner. An application for suppliers and contract management is also linked to this customer management system to help BELNET's financial division.

**Users in research** The majority of research centres and labs give their personnel network access via BELNET. This is a total of some 151,000 people in 56 institutions, making up around 35% of our customer base. In 2006, several more organisations joined BELNET for their research activities: the Walloon Institute of Assessment, Forecasting and Statistics (IWEPS), the Christian General Hospital of Mid-Limburg and the research arm of the biotechnology company, Devgen. The Kunstencentrum Vooruit (Vooruit art centre), which is playing a pioneering role in ICT in the cultural sector, was also welcomed to BELNET's research network as a customer.

Every day, almost 600,000 people use  
our network.

**Users in higher education** By the end of 2006, we had a total of 314,100 users in 55 institutions. In 2006, we linked up with the Technofutur-TIC technological training centre.

In Flanders, all the recognised higher education institutions have been connected to BELNET since 2002. In Wallonia and Brussels, a large number of colleges are still not using BELNET. Thanks to a partnership agreement with the Walloon Region and a BELNET initiative in the Brussels Capital Region, the rest of the colleges in these regions will join in 2007. It is the intention that all colleges and universities in the country make use of BELNET.

**Users in government and administrations** BELNET also delivers network infrastructure and services to 20,100 users in 39 governments and administrations. This number of institutions comprise 24% of our customer base and 3% of our users. In 2006, 5 new government services joined: the Economic Bureau of the Province of Namur, the city of Mons, the Maritime Safety and Coordination Centre of the Flemish government, the Schelde radar network of the Flemish government and the Flemish Radio and Television service (VRT).

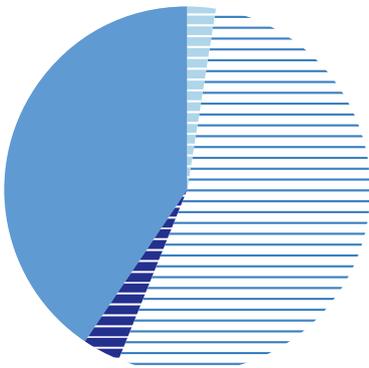
We aim to make a major contribution to the future development of the Belgian knowledge and information community.

**Users in regional networks** In total, 11 regional networks have joined us. Amongst these groups, we count FedMAN, the federal government services' administrative network, and the office networks of the Wallonian and Flemish administrations.

Together, the regional networks make up 7% of our customer base, with some 236,300 users or 40% of BELNET's total user base.

A large number of primary schools have joined via these networks.

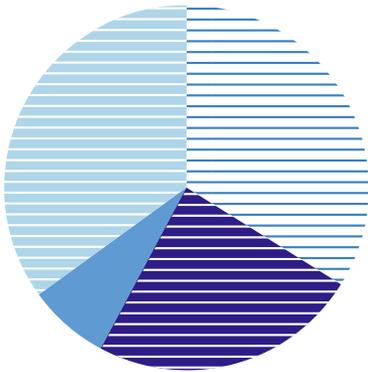
#### Number of users per customer group



	2006		2005	
Research	15,100	2.58 %	15,150	2.60 %
Higher education	314,100	53.64 %	314,100	53.78 %
Government and administrations	20,100	3.43 %	18,450	3.16 %
Regional networks	236,300	40.35 %	236,300	40.46 %
<b>Total</b>	<b>585,600</b>	<b>100 %</b>	<b>584,000</b>	<b>100 %</b>

We will be paying extra attention to security, mobility and data storage in the future.

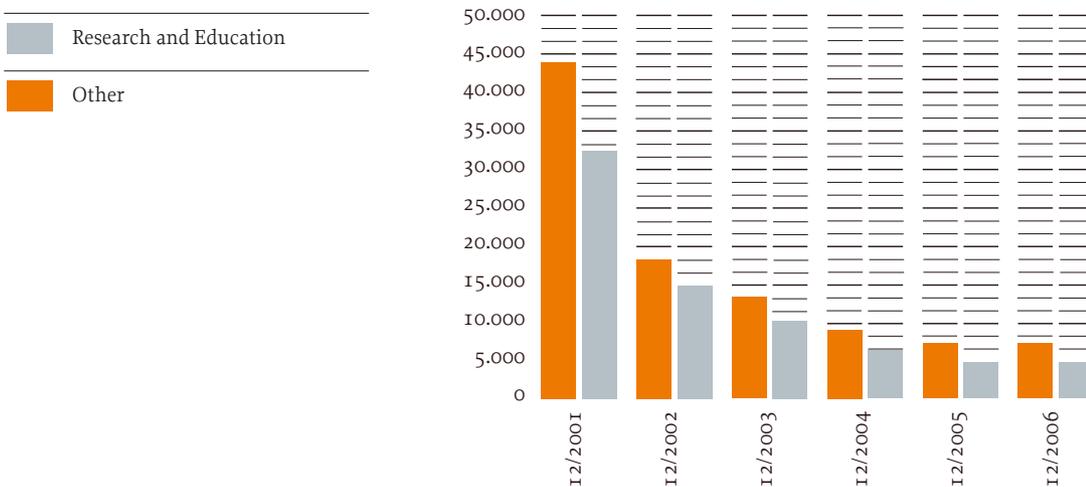
## Number of institutions per customer group



	2006		2005	
Research	56	34.78 %	54	34.84 %
Higher education	55	34.16 %	56	36.13 %
Government and administrations	39	24.22 %	34	21.93 %
Regional networks	11	6.83 %	11	7.10 %
<b>Total</b>	<b>161</b>	<b>100 %</b>	<b>155</b>	<b>100 %</b>

In comparison with 2003, the number of institutions which have joined has risen by almost 20%. In comparison with 2004 and 2005, the numbers have grown by 13% and 4% respectively.

## Annual price evolution in euro of a basic 10 Mbit/s connection in the period 2001 – 2006







## INNOVATION IN THE PERFORMING ARTS AND NEW MEDIA

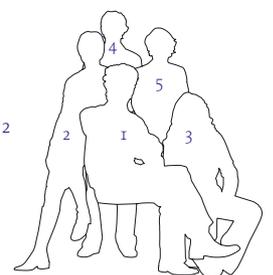
Kunstencentrum Vooruit is unique in the field of research and development in contemporary performing arts and new media on both a national and international level. The centre's ambition is to play a pioneering role in the digital revolution. "With the arts centre of the future, we want to find out how Vooruit can use digital developments to adapt to the needs of the public, artists and our own staff, and to implement solutions," says Wouter Vermeylen, Building management officer of the arts centre.

"We have made a major investment in ICT infrastructure so that we can provide digital access to information, knowledge and culture," explains Wouter. "However, we don't see the arts centre of the future simply as a technical project. We're working together with all the departments of Vooruit to shape the arts centre of the future."

Because of its innovative way of working, Kunstencentrum Vooruit has been recognised by BELNET as a research institute. "This is very important for us," says Wouter Vermeylen. "Because, amongst other things, extremely high speed connections make it possible to work on large collaborative multimedia projects with partners and universities abroad. And, thanks to BELNET, at an affordable price. In the future, we hope to be able to collaborate further with other research institutions on interesting projects."

Wouter Vermeylen  
Building management officer  
Kunstencentrum Vooruit

Wouter Vermeylen,  
Building management officer<sup>1</sup>  
Karen Van der Plaetse,  
Head of marketing, press and communications<sup>2</sup>  
Eddy Naert,  
Web design and development officer<sup>3</sup>  
Alain Quackelbeen, ICT coordinator<sup>4</sup>  
Henk Catry, Project coordinator<sup>5</sup>



**Networks, technologies and services** Offering network access remains BELNET's core activity, but it also offers a whole range of services that support research and higher education in Belgium. In addition to offering services which allow researchers to do their work more quickly and efficiently, or which make new scientific research possible, BELNET also offers services which improve security and communication in higher education.

## Networks

BELNET's different users gain network access via three high quality networks.

Via the **BELNET network**, Belgian researchers communicate with the rest of the world. The network gives them access to the European Géant2 research network and the American and Asian research networks.

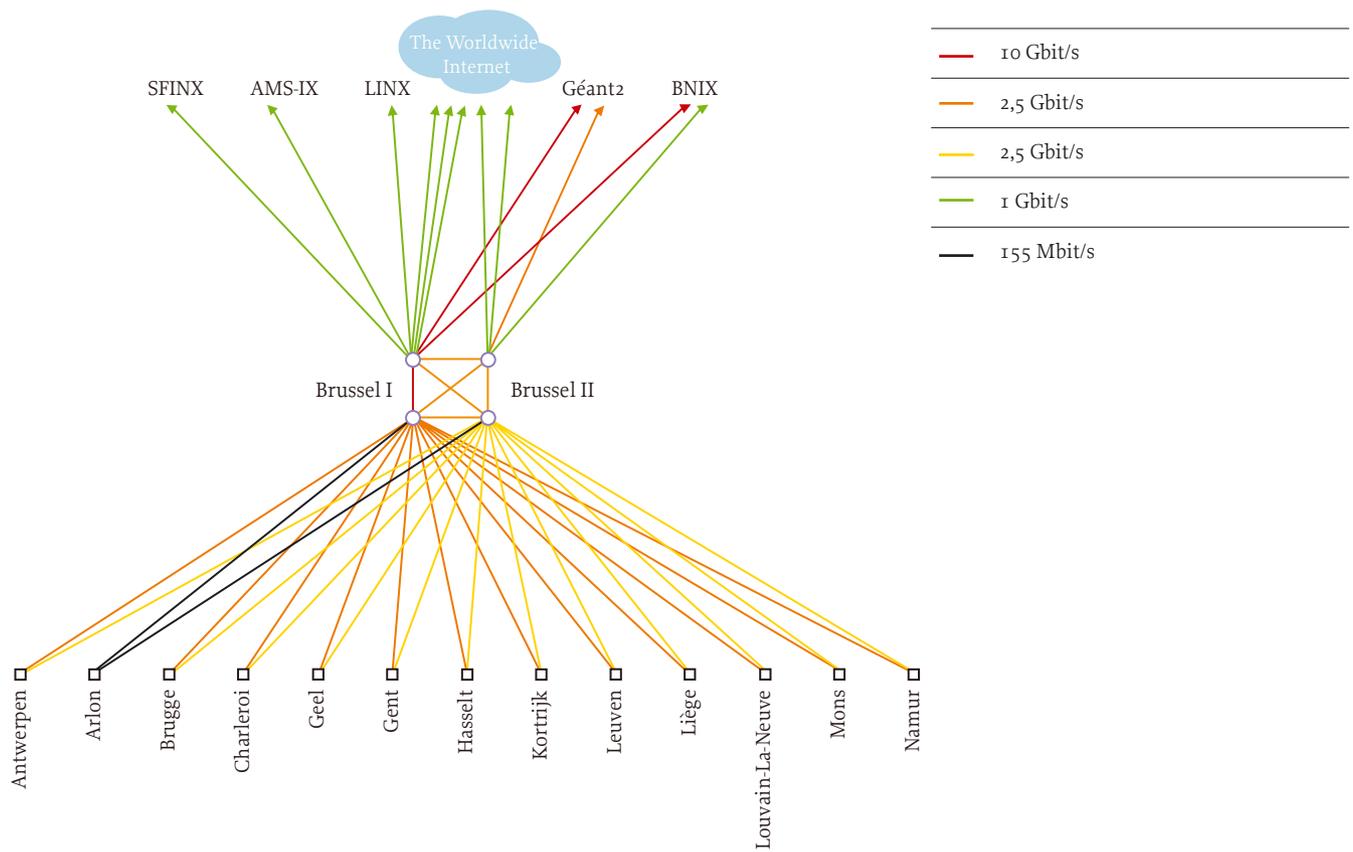
In 2006, an average of 442 terabytes of information was exchanged every month via the BELNET network. That's the equivalent to the content of 55,000 DVDs.

The needs of our users, the developments in the (inter)national research and academic communities and fundamental technical/economic broadband research led us to a project to build a new BELNET network from 2006. In July 2006, the Federal Minister for Science Policy and the entire Council of Ministers approved this project, which has a total value of 26.1 million euro.

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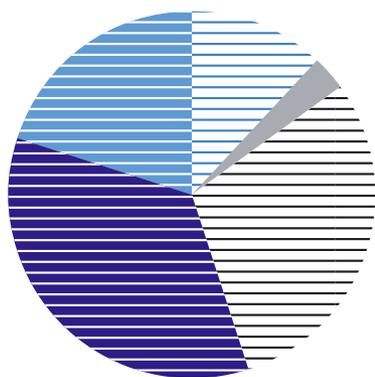
## The BELNET network

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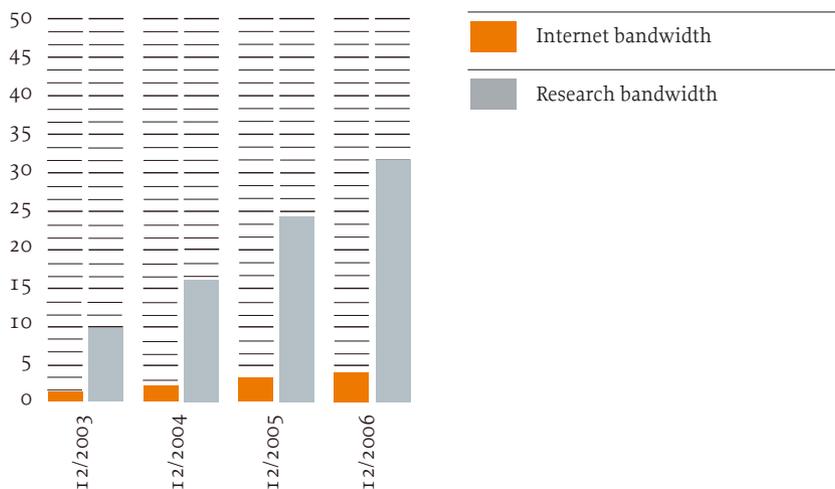
As a national research network, the BELNET network consists of two star-shaped structures centralised in Brussels. From the central nodes (Brussels I and Brussels II), 2,5 Gbit/s data transmission lines radiate out to 15 national PoPs (Points of Presence), two of which are in Brussels itself. The maximum availability of the network is guaranteed by the double, fully redundant set up.

## Division of the connected organisations by connection type – Total of 186 connections at 31/12/2006



	2 Mbit/s E1/SDSL	22	11.83 %
	34 Mbit/s E3	6	3.23 %
	10 Mbit/s Ethernet	56	30.11 %
	100 Mbit/s Fast Ethernet	65	34.95 %
	1 Gbit/s Gigabit Ethernet	37	19.89 %
<b>Total</b>		<b>186</b>	<b>100 %</b>

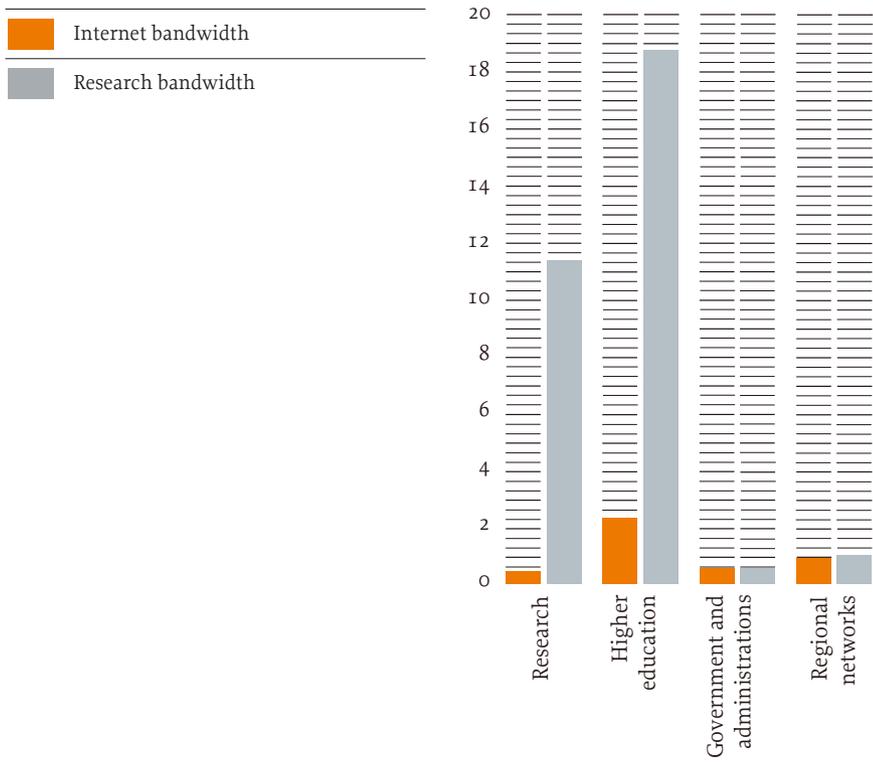
## Evolution of the access capacity of the connected organisations, in Gbit/s



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## Division of the types of bandwidth per customer group at the end of 2006, in Gbit/s

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The **FedMAN network** (Federal Metropolitan Area Network) was developed on behalf of the Federal Public Service Information and Communication Technology (Fedict) and is the main pillar of e-government in Belgium. It links the federal administrations to one another and to the Internet.

Because of the yearly growth of bandwidth use and the needs of attendant services, Fedict asked BELNET to develop and implement a new FedMAN network. This FedMAN2 project represents a budget of 8 million euro over a period of 4 years.

On February 24<sup>th</sup> 2006, the last federal government service migrated to FedMAN2. In addition to the network itself, BELNET operates a 24/7 Network Operations Centre (NOC), that guarantees reactive and proactive problem control.

Every federal government service now has a connection of 1 Gbit/s. The new network consists of 16 nodes and 24 departments and about 80,000 people. In 2006, they exchanged an average of 78 terabytes of information per month.

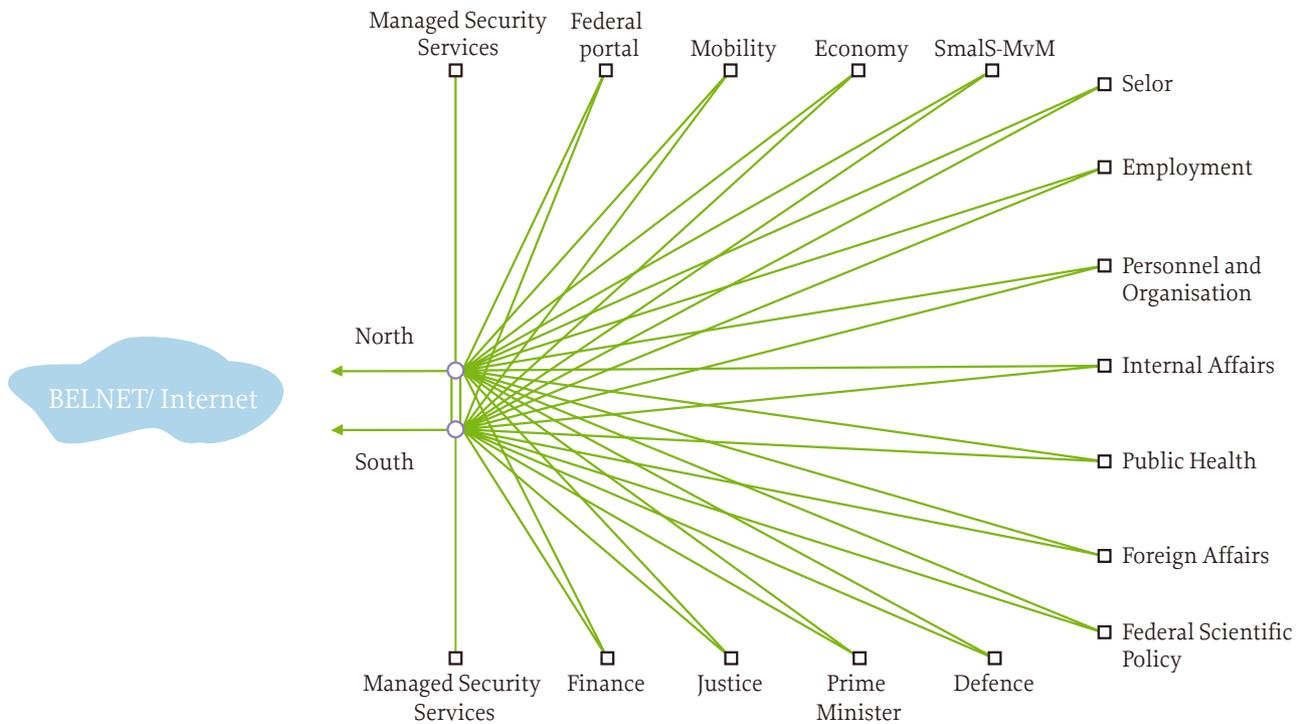
The new FedMAN network also serves the common citizen. Amongst other things, it provides a superfast and secure connection to all e-government applications, like the federal portal site [www.belgium.be](http://www.belgium.be), the Crossroads Bank for Social Security (CBSS), Tax-on-web and the Crossroads Bank for Enterprises (CBE).

Since all the components of the computer network are doubled up and the 'double' elements are then housed in two different locations, the availability of the network is guaranteed even if catastrophe strikes. Because BELNET integrated the Multi-Protocol Label Switching-technology (MPLS) into FedMAN<sub>2</sub>, the linked government services save costs. This advanced network technology makes totally secure connections in Virtual Private Networks (VPN), avoiding the need for any further costs for hiring relatively expensive lines for secure data transfer.

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## The FedMAN network

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FedMAN (Federal Metropolitan Area Network) allows government services to communicate with one another via FedNAPs (FedMAN Network Access Points). Each FedNAP has redundant Gigabit Ethernet connections of 1 Gbit/s to the central routers. These routers are connected to one another by two separate fibre optic circuits, which increase the reliability of the network. Via the BELNET network, the central routers offer access to the Internet.

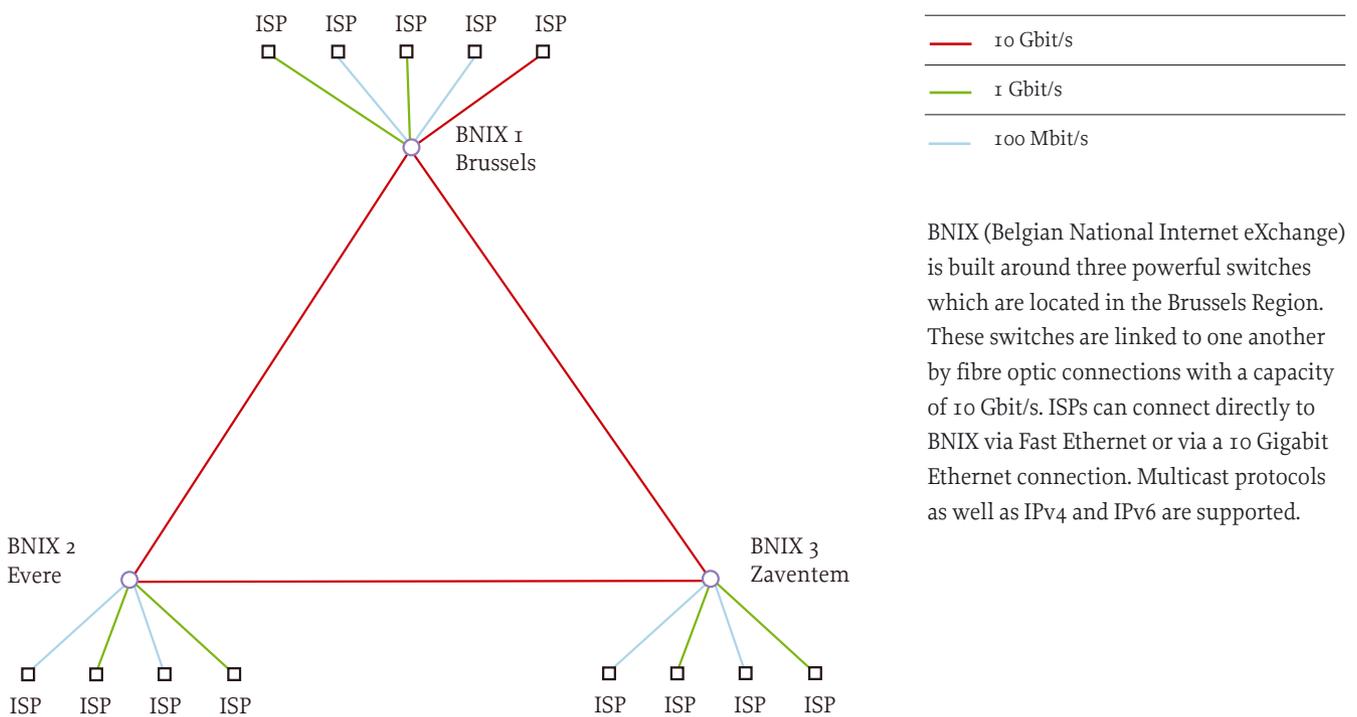
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— 1 Gbit/s

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The **BNIX network** (Belgian National Internet eXchange) is an essential component of the Internet in Belgium. It provides Belgian Internet Service Providers (ISPs) with a central infrastructure for fast interconnection. BNIX therefore improves the quality of national connections. Furthermore, thanks to BNIX, BELNET network users get a better connection for a lower price. At the end of 2006, BNIX had 48 members, 2 more than in 2005.

## The BNIX network



## Services

BELNET stimulates scientific development by offering services which are either not available elsewhere or only at higher prices, such as Server Certificate Service, Eduroam, BEgrid, IPv6 and multicast. Besides this, BELNET also offers a wide range of practical services to its users and connected organisations.

Thanks to **Server Certificate Service (SCS)**, higher education and research institutions can set up free, secure websites. For these secure websites, BELNET supplies official digital certificates. The Server Certificate Service thus contributes to a safer Internet.

**Eduroam** provides users with fast, secure and simple access to their own institution's network and to that of other research and academic institutions. A Belgian researcher or student who is visiting another university or college can log onto the network using their own password and user name, as they do in their own institution. Eduroam is an initiative of the Mobility taskforce within TERENA (Trans European Research and Education Networking Association). Even in the United States, Australia and Asia, research and academic institutions are unveiling initiatives to share in Eduroam.

BELNET is making a major contribution to the development of grid computing through the **BEgrid** project. Grid computing unites geographically remote computers into one network to create a virtual supercomputer with vast computing and data storage capacity. This technology makes new scientific applications possible and leads to new insights into, amongst other subjects, high-energy physics, astrophysics, hydrology, medical imaging and mathematics.

Furthermore, BELNET is a pioneer in the field of **IPv6**, the new standard for transporting data packets over the Internet. We are already preparing users to work and experiment with the new protocol, thus giving them early experience and preparing themselves for the future.

**Multicast** is another advanced service that BELNET offers. Thanks to multicast, large quantities of data can be sent to different recipients simultaneously. This technology accommodates the need to exchange multimedia information. Multicast is, for example, very useful in relation to real-time video streaming.

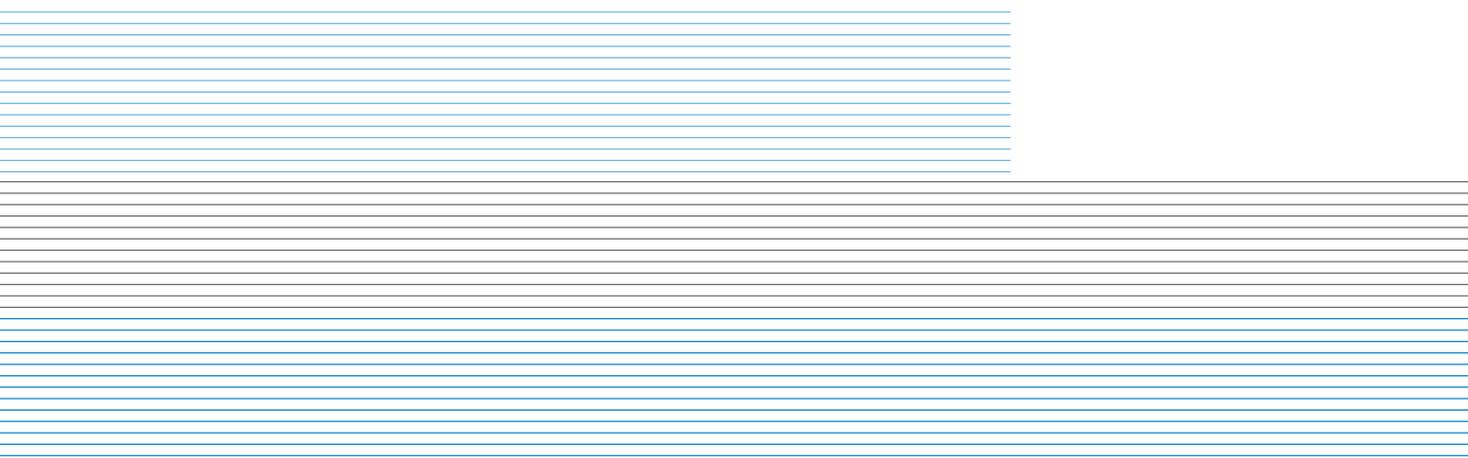
BELNET arranges the registration of **.be and .eu domain names**. The .eu domain was launched on December 7th 2005 and, since April 2006, has been available to everyone. The presence of a DNS .be name server and a global DNS root server in the BELNET server park is testimony to the national and international recognition that BELNET enjoys.

In addition, BELNET makes access to **software** easier and cheaper for researchers and academic personnel. On the one hand, we offer a large amount of free software via our own FTP server. On the other hand, via our network, we give access to commercial software at advantageous rates.

From a customer satisfaction survey, it was apparent that security was one of the biggest current concerns of our connected organisations, which is why we set up BELNET **CERT** (Computer Emergency Response Team). This CERT, the only one of its kind in the country, gives the most up to date information about computer and network security.

For connected organisations who need **videoconferencing** facilities for more than two parties, BELNET has two Multipoint Control Units (MCUs) available.

With **Virtual Leased Lines** (VLL), we also offer an economical and simple alternative to expensive conventional leased lines. In the context of associations between universities and colleges, these are highly relevant.







## VIRTUAL TEAMWORK ON BEGRID

“We see to it that researchers can collaborate around the same subject.” That’s how civil engineer Antal Bulanza sums up a major part of her work. Antal is a BEgrid engineer at BELNET and she maintains the BELNET equipment that forms part of BEgrid. “But there’s more to BEgrid than just equipment,” explains Antal. “It’s also a number of virtual organisations. These are groups which use a defined part of the grid. For instance, it could be a group of scientists testing and working on developing a malaria vaccine together. BEgrid is divided in such a way that scientists can use specific computers and machines on the grid for their tests and calculations. Other virtual organisations use different BEgrid computers.” Antal Bulanza is studying how she can further improve BEgrid and is installing the necessary software and middleware. She is also working on improving the user interface even further.

Antal Bulanza  
BEgrid engineer  
BELNET

**Staff, management and partners** In the past, BELNET approached needs from a technological point of view. Today, our approach is based on services and on developing added value. This means that we are evolving even further in the direction of a client-focused culture. Today, our staff start from a broad, global vision of the needs and wishes of our users and connected organisations.

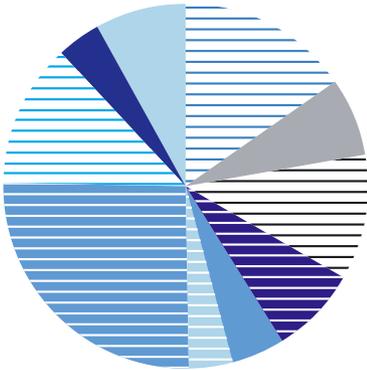
**Staff** BELNET is a young and dynamic organisation that, above all, employs highly trained people. More than half of our staff, 68% to be precise, are under 36 years old. Sixty percent of our staff have a technical job, 81% are employed at level A and have at least a Master's degree.

In 2006, BELNET had the equivalent of 9.2 full-time female workers and 16.3 male. There is a broadly even balance between French (53%) and Flemish (47%) speaking staff at BELNET. About half of all our staff do regular teleworking and almost 40% do it occasionally. The great majority, 88%, get to work using public transport.

It is difficult to fill some vacancies as a result of the legal requirements linked to our status as an autonomously managed state service. Previously, BELNET compensated for the shortfall by using external consultants to fill a position on secondment.

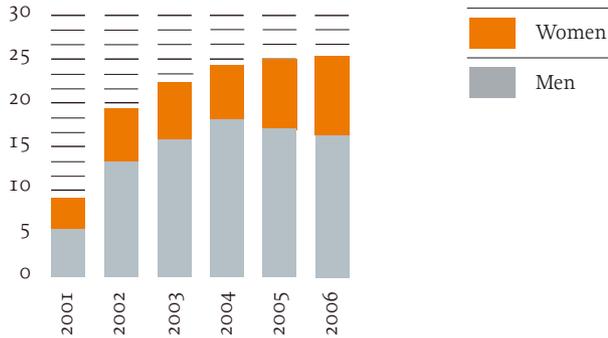
Our staff start from a broad, global vision of the needs and wishes of our customers.

## The average number of employees in different departments, in full-time equivalents

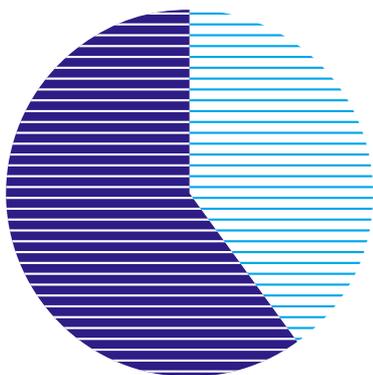


Management	2.0	7.9%
Administration, finance and HR	3.9	15.3%
Customer Relations	2.8	11.1%
Communication	1.8	7.0%
Legal advice	1.0	3.9%
Logistics	1.2	4.6%
Networks	6.5	25.6%
Servers, services and ICT	3.3	12.8%
CERT	2.0	7.9%
BEgrid	1.0	3.9%
<b>Total</b>	<b>25.4</b>	<b>100%</b>

## The evolution of BELNET staff, in full-time equivalents

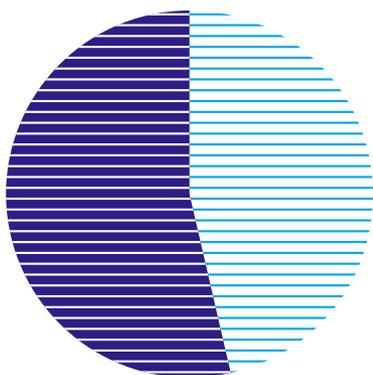


The ratio of administrative to technical staff, in full-time equivalents



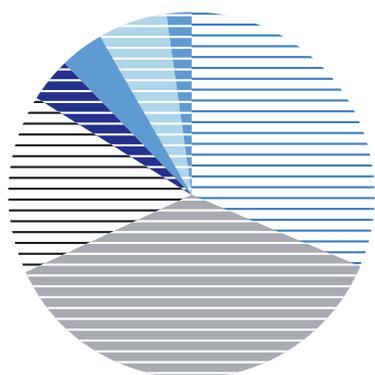
Administrative	10.2	40.0%
Technical	15.3	60.0%
<b>Total</b>	<b>25.4</b>	<b>100%</b>

The ratio of Flemish to French speaking staff, in full-time equivalents



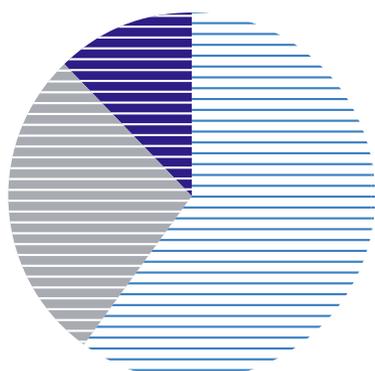
Dutch speaking	11.8	46.5%
French speaking	13.6	53.5%
<b>Total</b>	<b>25.4</b>	<b>100%</b>

### Staff in 2006, divided by age, in full-time equivalents



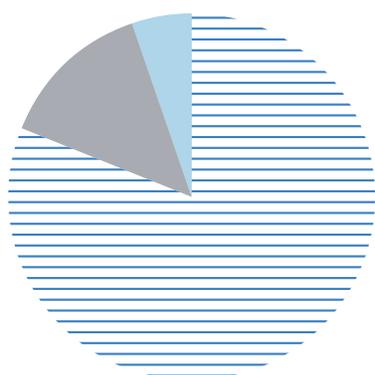
26-30	8.0	31.6%
31-35	9.3	36.6%
36-40	4.0	15.7%
41-45	1.0	3.9%
46-50	1.0	3.9%
51-55	1.6	6.2%
56-60	0.5	2.0%
<b>Total</b>	<b>25.4</b>	<b>100%</b>

### Staff in 2006, divided by contract, in full-time equivalents



BELNET	15.3	60.2%
FPS Science Policy	7.0	27.5%
External	3.1	12.2%
<b>Total</b>	<b>25.4</b>	<b>100%</b>

### BELNET staff, divided by level, in full-time equivalents

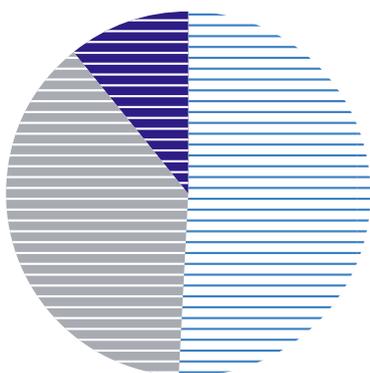


A (master)	20.6	81.2%
B (bachelor or college)	3.5	13.6%
C (high school, third level)	1.3	5.2%
D (high school, first level)	0.0	0.0%
<b>Total</b>	<b>25.4</b>	<b>100%</b>

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**Staff in 2006, according to the frequency of their home working, in full-time equivalents**

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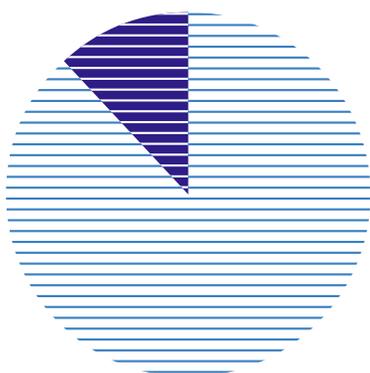


	Regularly	13.0	51.1%
	Occasionally	9.7	38.3%
	Never	2.7	10.6%
<b>Total</b>		<b>25.4</b>	<b>100%</b>

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**Staff in 2006, divided according to the mode of transport used, in full-time equivalents**

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	Public transport	22.4	88.2%
	Own transport	3.0	11.8%
<b>Total</b>		<b>25.4</b>	<b>100%</b>



## Board

### Chairperson

Monnik Desmeth, general advisor for Scientific Affairs, FPS Science Policy <sup>1</sup>

### Vice-chairperson

Pierre Bruyère, director, BELNET <sup>2</sup>

### Voting members

Marc Achery, professor at the Royal Military Academy <sup>3</sup>

Fabrice Carton, deputy advisor for Scientific Affairs, FPS Science Policy <sup>4</sup>

Paul Lagasse, professor at the University of Ghent

Henri Malcorps, director of the Royal Meteorological Institute <sup>5</sup>

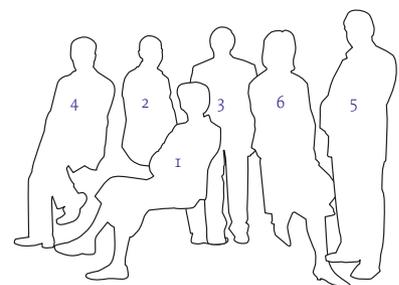
### Members with an advisory role

Guy Snykers, general inspector Finance

Marianne Jacques, accountant, BELNET

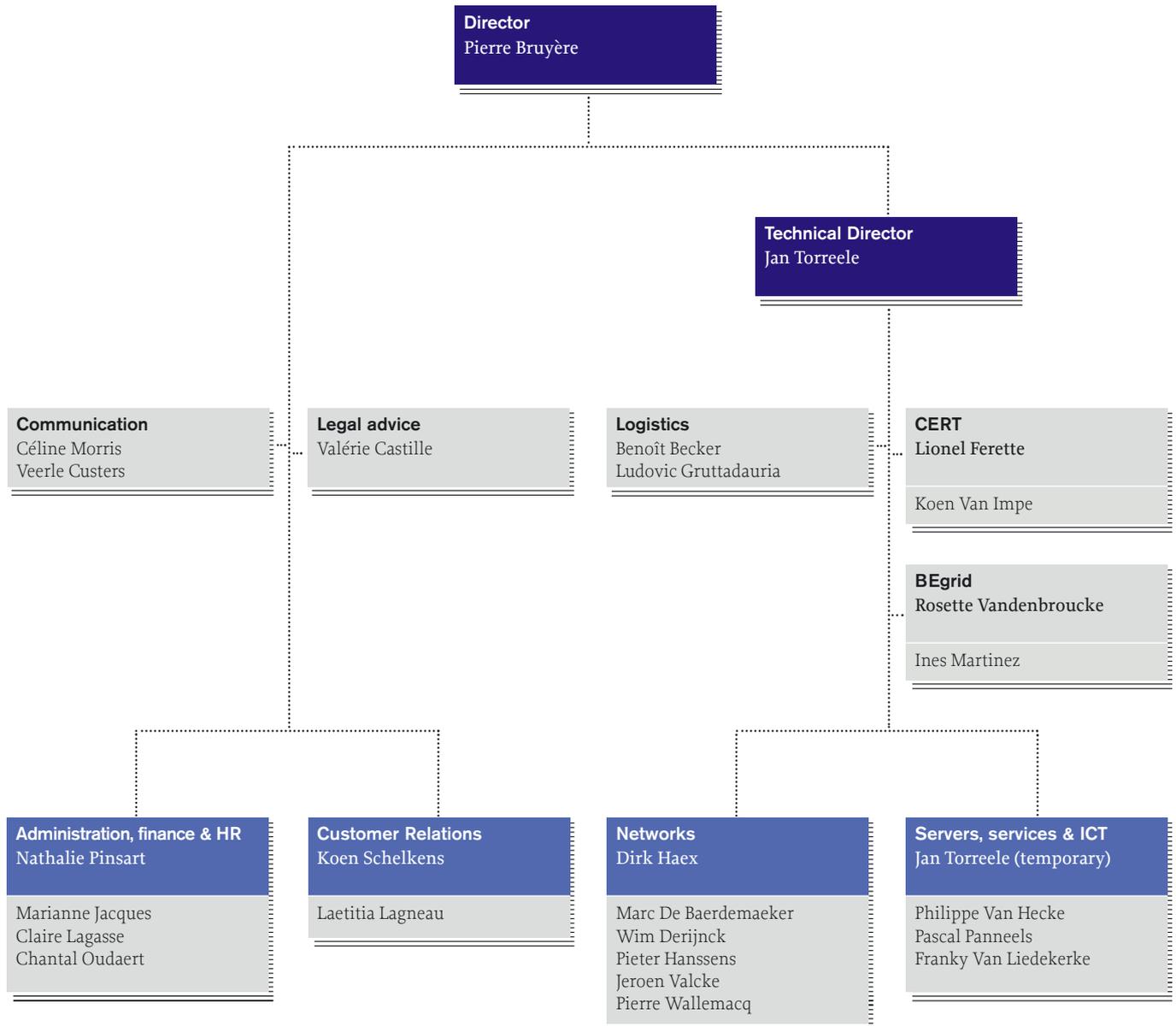
### Secretary

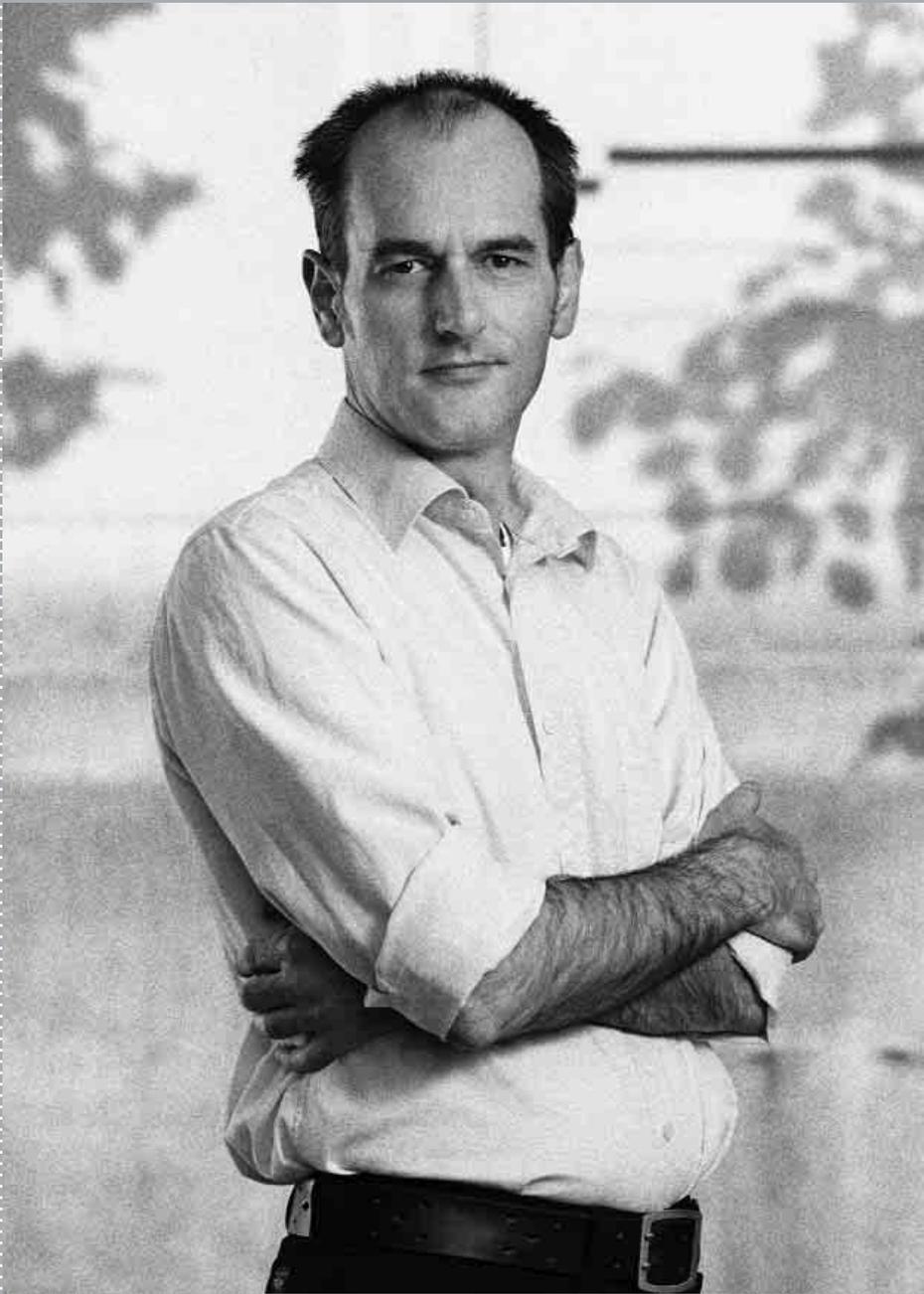
Nathalie Pinsart, administration, finance and HR coordinator, BELNET <sup>6</sup>



**Board** BELNET is managed by its director, Pierre Bruyère, and by a board. This board is, amongst other things, responsible for the approval of the management programme, expansion, the investment programme, accounts, rates, public tenders and appointments.

The BELNET organisation chart, end of 2006





Jan Torreele, Technical Director

**Partners** BELNET works in partnership with domestic and foreign organisations so that, together, they can shape the knowledge community.

**Belgian universities** have provided space and facilities for hosting BELNET's network equipment (PoP). This is managed via BELNET.

BELNET has set up various projects with the **Flemish government**, amongst which are financial grants for the connection of Flemish colleges and for the improvement of their network access. We are also working with the Flemish government on the development of the grid infrastructure.

BELNET has a 15-year cooperation agreement with **SOFICO** (the Walloon company that offers complementary financing of infrastructures). In the context of this collaboration, BELNET is offering higher education institutions in the Walloon Region extremely advantageous and high-value network access.

BELNET works with **Géant2**, the international network that links European research networks together. This network is half-financed by the European Commission and half by the national research networks themselves.

The FedMAN network was set up on behalf of **Fedict** (the Federal Public Service Information and Communication Technology). In 2006, the second generation of this network, FedMAN2 became operational.

BELNET is a member of **TERENA**, the European association of research and education networks. TERENA is a forum for pan-European cooperation, innovation and knowledge exchange which promotes the development of Internet technology, infrastructure and services to serve the academic community. Amongst other things, the organisation addresses questions relating to mobility and security. BELNET takes part in various TERENA taskforces.

BELNET is a founder member of the Internet **Service Providers Association Belgium** (ISPA) and Jan Torreele, BELNET's technical director, is the ISPA representative on the **DNS BE** strategic committee.







## PAN-EUROPEAN COMMUNICATION

“BELNET solutions form an important part of our communication infrastructure, and their importance increases every day,” says Mirko Widenhorn. With postgraduate students from all over Europe and beyond, the College of Europe is a genuine pan-European institution. Students follow courses in European studies on the College’s two campuses in Bruges and Natolin (Warsaw). “We regularly use BELNET’s videoconferencing services for contact between the two campuses,” explains Mirko Widenhorn. “We not only use the service to hold meetings between students from both campuses, but also to allow students on the other campus to follow speeches by top level guests and to take part in the ensuing debate. We also sometimes use videoconferencing for potential employers who want to interview our students.” The College of Europe uses different BELNET services, such as DNS, domain name registration and CERT.

Mirko Widenhorn

Communications manager and student officer  
College of Europe

Maxime Gaudissart<sup>1</sup>

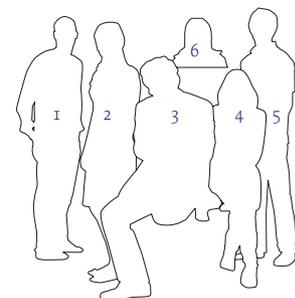
Lavinia Taranu<sup>2</sup>

Alexis Brunelle<sup>3</sup>

Julia Heydemann<sup>4</sup>

Antonio Seabra Ferreira<sup>5</sup>

Silvia Pronk<sup>6</sup>



The photo shows a number of College of Europe students, regular users of the BELNET videoconference service. They were photographed on the construction site of the extension of the Bruges campus.

**Finance** As with the previous year, there were a few changes in 2006. Grants fell slightly, service productivity increased and the average level of investment increased. During the 2006 financial year, the chief investment was in network equipment for the FedMAN2 network.

## Explanation of the final accounts

The final accounts showed a positive balance of 1,490,647 euro. After the federal government's budget audit in the middle of 2006, grants dropped slightly.

The increase in invoiced services is mainly the result of funds from the FedMAN2 project. In accordance with the Fedict contract, worth 8,000,000 euro, services will be delivered over four years, from May 1<sup>st</sup> 2006 until February 28<sup>th</sup> 2010. The yield in the accounts brought in an amount of 1,338,000 euro in 2006.

The balance of provisions for risks and costs for the FedMAN1 project were fully utilised by the closing of this project and its replacement by FedMAN2 on March 1<sup>st</sup> 2006. The agreed repayment of provisions came to 323,000 euro.

As far as recurring activities are concerned, there was a slight rise, despite the notable drop in the price of Internet bandwidth and the impact of this on BELNET's rates. This increase is thanks to the increase in the number of clients and the bandwidth they have requested.

In the context of our two cooperative agreements, namely with SOFICO and the Flemish government, BELNET contributed 1,000,000 euro per partner for the investment in the connection of colleges to the BELNET networks via fibre optic cable.

BELNET is evolving into a  
service supplier and consultant.

Personnel costs dropped slightly in comparison with the 2005 financial year as a result of the drop in personnel numbers. The shortfall caused by this was filled using consultants, temporary and seconded staff.

The increase in financial yield in comparison with the previous financial year is, to a large extent, explained by a higher average investment during the 2006 financial year.

The exceptional income recorded in 2005 notably involved the repayment of 50% of the participation costs in Géant2 from the European Commission.

## Explanation of the balance

Investment in the 2006 financial year mostly involved network equipment for the FedMAN2 network (1,134,000 euro). The depreciations for the financial year amounted to 1,010,000 euro. These were carried out in agreement with the recommendations of the Commission for the Inventory of State Assets.

The increase in activities carried forward can mainly be attributed to the second tranche (3,803,000 euro) of the grant for operations and equipment for the 2006 financial year which was only paid by the FPS Scientific Policy in February 2007.

Our own assets total 15,724,617 euro and comprise the following elements:

Positive balance in the final accounts	1,490,647 euro
Reserve fund	421,888 euro
Transfer of our own assets at the beginning of the financial year	13,812,082 euro

This does not include the external debts incurred in developing the accounting system in the first year. These consist of the cost of maintaining the BELNET network, the lease of lines in December and participation costs in Géant2. Payment of all large balances was arranged at the beginning of March 2007.

The debit balance (625,000 euro) with the Central Service for Fixed Expenditures (subject 'To external debts incurred in developing the accounting system in the first year') has risen sharply, because the salary provision has not been paid since May 2006. This balance was carried forward in full in January 2007.

The increase in debts carried forward is mainly due to the transfer of profits from the FedMAN2 project, already invoiced to an amount of 4,000,000 euro.

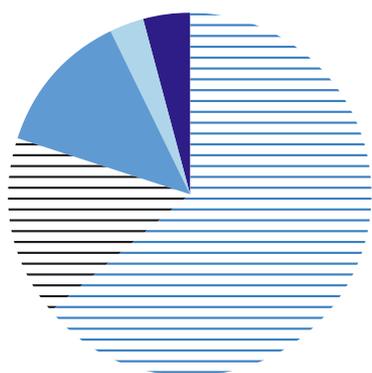
## I. Balance sheet, in euro

<b>ASSETS</b>	<b>YEAR 2006</b>	<b>YEAR 2005</b>
Tangible fixed assets	1,937,091	1,509,532
External receivables due in no more than one year, not subject to accounting system	59,007	60,422
External receivables due in no more than one year, subject to accounting system	504,618	15,643
Share certificates and treasury certificates	12,693,000	9,443,000
Bank and giro accounts – cash in hand and stamps	87,425	4,683,283
Transitory account	4,468,346	1,569,948
<b>Total assets</b>	<b>19,749,487</b>	<b>17,281,828</b>
<b>LIABILITIES</b>	<b>YEAR 2006</b>	<b>YEAR 2005</b>
Equity	15,724,617	14,233,970
Provisions for risks and losses	0	322,947
External debts due in no more than one year, not subject to accounting system	394,629	228,166
External debts due in no more than one year, subject to accounting system	652,952	31,586
Transitory liabilities	2,977,289	2,465,159
<b>Total liabilities</b>	<b>19,749,487</b>	<b>17,281,828</b>

## 2. Profit and loss account, in euro

<b>EXPENDITURE</b>	<b>YEAR 2006</b>	<b>YEAR 2005</b>
Other use of consumer goods and external services	5,866,727	6,364,412
Direct and indirect personnel salaries	1,011,892	1,121,436
Economic depreciation on accommodation expenses, intangible and tangible fixed assets	1,009,952	1,766,370
Transfer of income (expenditure) other than social security payments	2,060,106	56,410
Capital losses on existing assets and liabilities	228	65,487
Additions to reserve fund	0	25,258
General accounting result	1,490,647	2,494,957
<b>Total expenditure</b>	<b>11,439,552</b>	<b>11,894,330</b>
<b>INCOME</b>	<b>YEAR 2006</b>	<b>YEAR 2005</b>
Services invoiced	2,899,730	1,464,396
Interest and other financial income	350,453	205,778
Extraordinary income	11,422	93,820
Transfer of income other than taxes and social security allowances	7,855,000	7,985,020
Deductions from provisions for future risks and charges	322,947	2,145,316
<b>Total income</b>	<b>11,439,552</b>	<b>11,894,330</b>

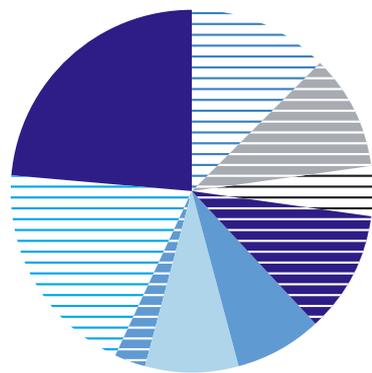
## Excerpts from the budgetary accounts\*: income in 2006, in thousands of euros



Grants	7,855	63.91%
FedMAN2 project	2,000	16.27%
Services invoiced	1,574	12.81%
Interest	350	2.85%
Deductions towards provisions and transfer of receipts	511	4.16%
<b>Total</b>	<b>12,290</b>	<b>100%</b>

\* budgetary accounts: the "account for achieving growth"

## Excerpts from the budgetary accounts: expenditure in 2006, in thousands of euros



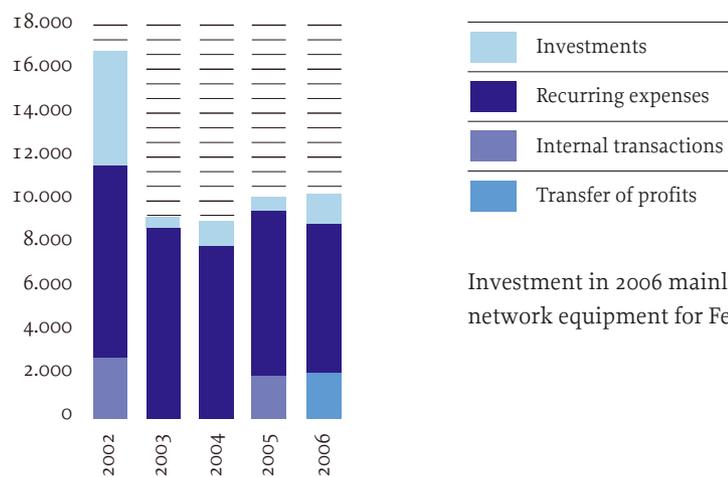
National lines	1,301	12.54%
European lines	1,081	10.41%
Commercial Internet	451	4.35%
Maintenance of service contracts	1,141	11.00%
Overheads	790	7.62%
Salaries	864	8.32%
Other investments	303	2.92%
Transfer of profits to SOFICO and the Flemish government*	2,000	19.28%
FedMAN2 project (including investment)	2,444	23.56%
<b>Total</b>	<b>10,376</b>	<b>100%</b>

\* in the context of the collaboration agreement for the connection of colleges in Flanders and Wallonia

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## Summary of expenditure in recent years, in thousands of euros

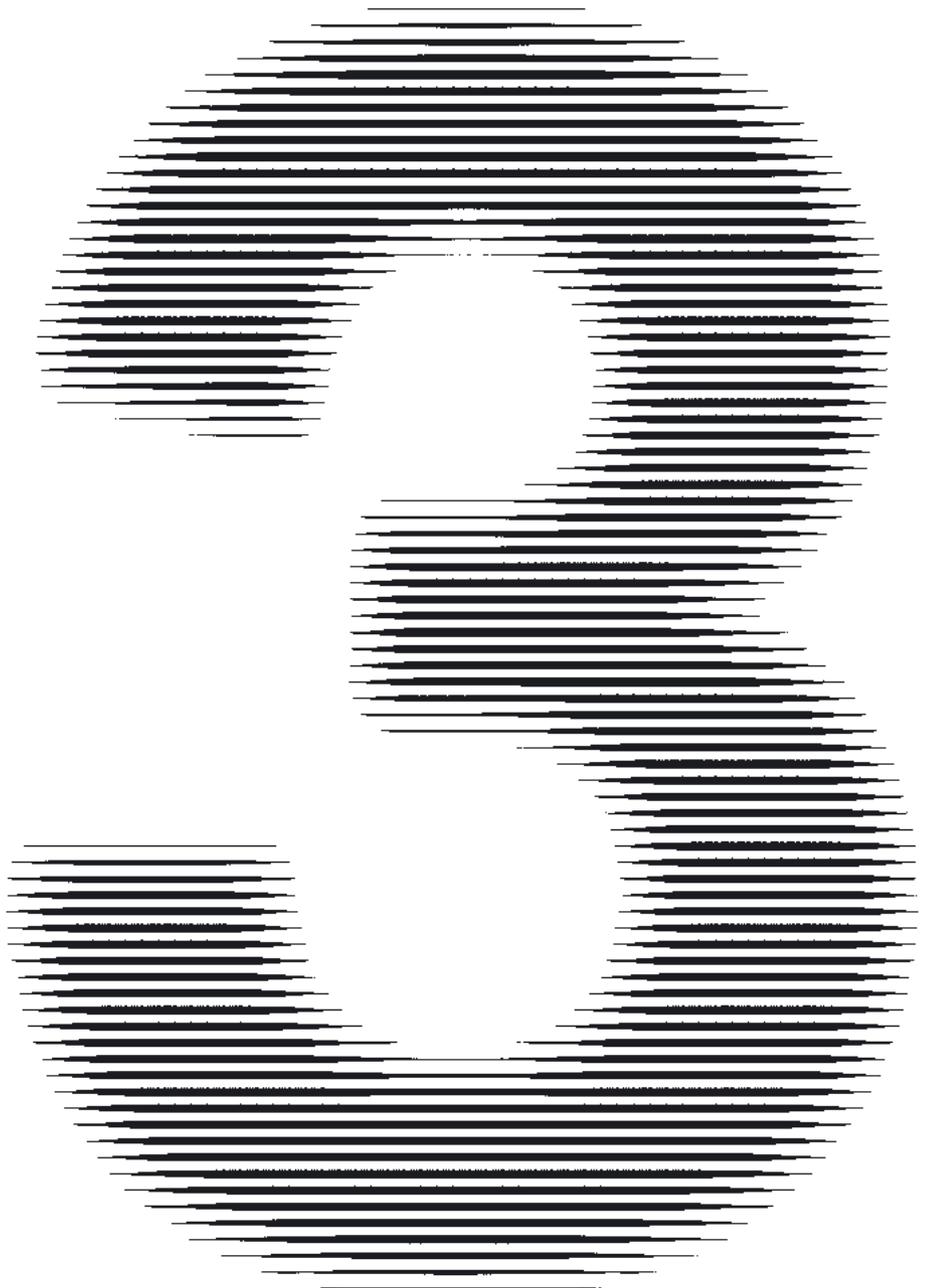
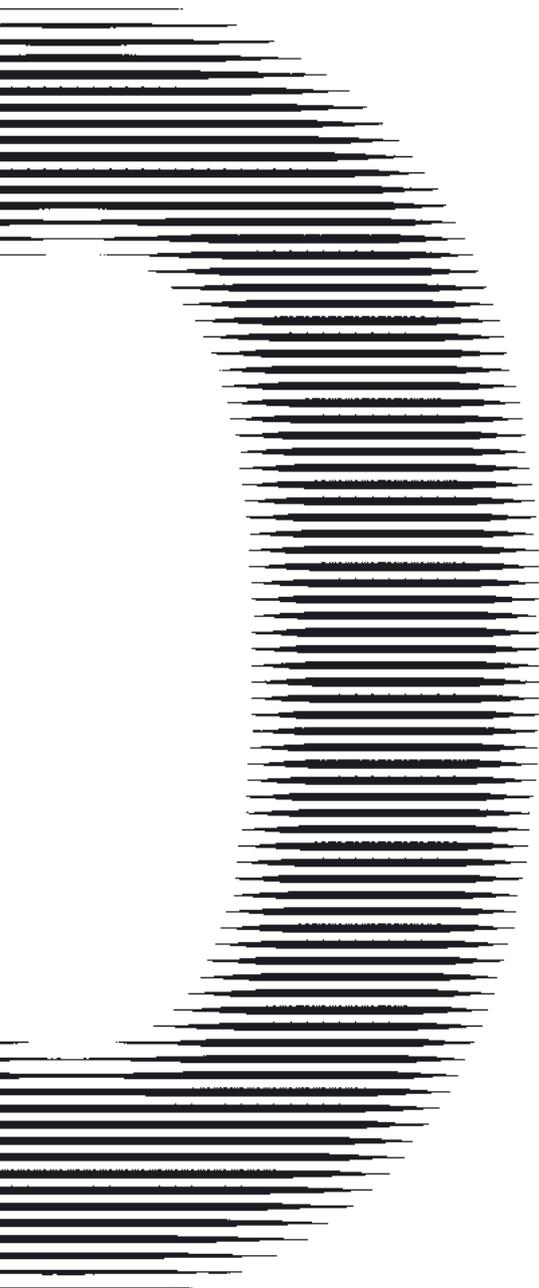
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Investment in 2006 mainly concerned network equipment for FedMAN2.



- Key projects in 2006
- Day to day activities





## Key PROJECTS in 2006

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- The new BELNET network
  - FedMAN2
  - 2006 User survey
  - Customer Relations Management
  - Colleges Project
  - Eduroam
  - Server Certificate Service (SCS)
  - New legal status project
  - TERENA Networking Conference
-

## The new BELNET network

In 2006 we started to build a new BELNET network with its own fibre optic infrastructure. The project is based on the conclusions and recommendations of our technical-economic broadband study from 2005. The objective is the development and implementation of a new, stable and powerful state-of-the-art network that answers the different current and future expectations of our connected organisations, such as those which emerged from our 2006 User survey. The changing needs of the organisations connected to BELNET, the national and international developments in the research and academic communities, and the fact that the existing network could no longer support these developments caused BELNET to begin this project. The project was officially launched in the first quarter of 2006. Given the complexity and the scope, it was decided to execute the project in 5 phases. A detailed dossier was drawn up on the basis of these phases and submitted to the Minister of Scientific Policy and the full ministerial council for approval. The project, with an overall budget of 26,100,000 euro, was approved on July 20<sup>th</sup> 2006.

The first phase of the project, the selection of the two data centres, was completed in the fourth quarter of 2006. In the third quarter of 2006, BELNET also started negotiations for the acquisition of fibre optic cables with exclusive rights of use for a period of 15 years. These phases, along with all the others, will be completed in 2007. The migration from the current to the new BELNET network is planned for the last quarter of 2007. After that, users will be able to exchange information at speeds of 10 Gbit/s or even very much faster. Other services such as OPNs (Optical Private Networks) and light paths will also be available.

## FedMAN2

In 2006, BELNET completed the migration of all relevant government services to FedMAN2. Since July 2002, the FedMAN network has linked all the federal government services in Brussels to one another and to the Internet. This transfer took place in a powerful, stable and redundant manner. Centralised Internet access is via the BELNET network. Because of the annual growth of bandwidth use and the increasing demand for attendant services, Fedict, the commissioning authority asked for a new FedMAN network to be developed and implemented. Fedict set aside a budget of 8 million euro for this network, spread over a 4 year period. One large section of this project was already carried out in 2005: the market research, the new design and the framework of the task books. The concrete implementation, configuration, test phase and final delivery of the FedMAN2 network took place at the beginning of 2006. The last federal government service migrated to FedMAN2 on February 24<sup>th</sup> 2006, well in advance of the contractually agreed date.

The FedMAN2 network consists of 16 nodes linking 24 authorities and serves about 80,000 people. FedMAN2 offers every federal government a 1 Gbit/s service, with no volume restrictions. The capacity is ten times greater than that offered by the first version of the network. Ordinary citizens also benefit. Thanks to FedMAN2, they have superfast access to all e-government applications, like the federal portal site [www.belgium.be](http://www.belgium.be), the Crossroads Bank for Social Security (CBSS), Tax-on-web and the Crossroads Bank for Enterprises (CBE).

Almost all the components of the new computer network are doubled up, at two different locations, guaranteeing the continued availability of the network in case of catastrophe. BELNET has integrated Multi-Protocol Label Switching technology (MPLS), which allows the connected government services to save costs. Fixed lines for highly secure communications between two defined services or applications have become obsolete through the introduction of this technology. With this new network, completely secure links, so-called VPNs, can be created.

On top of the network itself, which consists of telecommunication links and active equipment such as routers and switchers, a 24/7 Network Operations Center (NOC) has been set up, which provides better reactive and proactive management of problems.

## 2006 User survey

With an eye to further improving its network and network services, BELNET decided to commission research in 2006 to gain a better understanding of the specific needs and expectations of the most prominent users in higher education and research. For this project, BELNET chose a company which specialises in both quantitative and qualitative research. This research project took place between January and June 2006, with a total budget of 53,598 euro.

A number of key users and decision makers from the academic and research worlds, connected to BELNET, were asked about BELNET's services, their current needs and their expectations. The objective of the survey was to develop a network and services as closely matched to users' needs as possible.

Three major conclusions emerged from the survey. The first was that BELNET was still not well enough known by the end-user. Furthermore, the decision makers were still not aware of all the possibilities that the BELNET network offers. They have great admiration for BELNET's technical competence and for the reliability of the network.

Secondly, users were struggling with the fulfilment of their needs due to a number of limitations, such as a lack of human resources and financial means.

Thirdly, users wanted more advice and technical guidance. They saw BELNET playing a larger role at this level, so that they could take more advantage of the network and network services. Expectations covered security, mobility, storage and benefits of scale. The survey led, amongst other things, to a plan to revise and strengthen the Customer Relations department.

## Customer Relations Management

With the aim of improving relations with its connected organisations further, BELNET decided to introduce a Customer Relations Management system in 2006. First, the internal needs were examined and then the task books were set up. The call for tender on a European level was published on October 26<sup>th</sup> 2006. The total budget amounted to 250,000 euro. An application for suppliers and contract management was linked to the Customer Relations Management system on behalf of BELNET's financial division.

## Colleges Project

In mid-2006, the Flemish and Wallonian governments signed a cooperation agreement. This agreement will improve colleges' access to the BELNET research network and make it more economical. This provides for the immediate replacement of expensive leased lines to the Points of Presence (PoPs) by new high speed fibre connections. Thanks to the regional governments' partnership, about 40 Wallonian and Flemish colleges get a fibre optic broadband connection of at least 1 Gbit/s with BELNET for a minimum of 5 years. Just like the universities, the colleges get all the network capacity they need for their current and future requirements for research, e-learning and e-collaboration. In the past few years, BELNET has invested 2 million euro in the project, split between the two regions. All the connections will be operational in the spring of 2007. BELNET has also set aside a budget for the 10 French language colleges in the Brussels Capital Region and their connections will be completed in the second half of 2007.

## Eduroam

Since 2006, BELNET has been involved in the Eduroam project (educational roaming). This infrastructure, which is RADIUS-based, offers inter-institutional wireless roaming. The Eduroam service offers users secure and simple access to their own institution's network, via their own name and password, and to other BELNET connected institutions' networks which offer Eduroam.

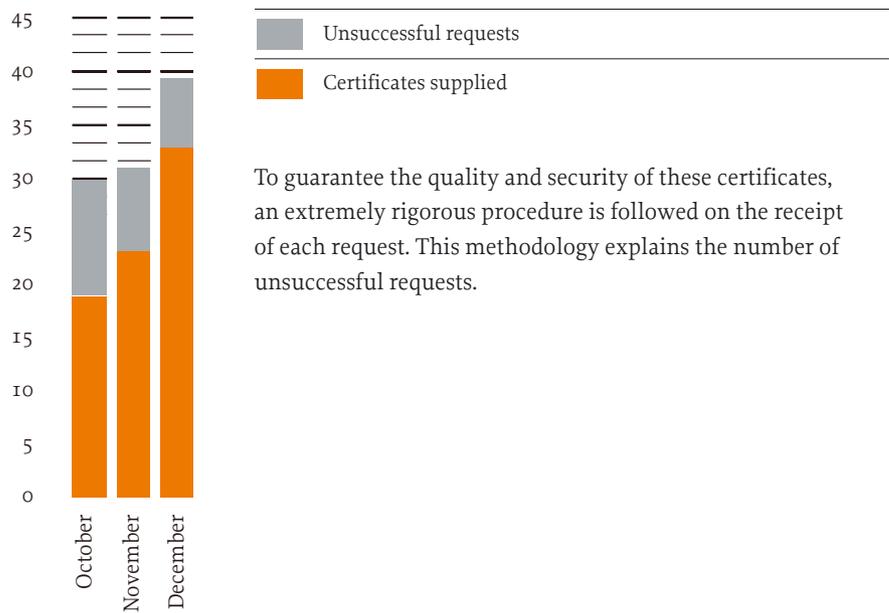
## Server Certificate Service (SCS)

In 2006, BELNET launched the Server Certificate Service (SCS) in the interests of promoting security on the Internet. Thanks to this service, research and higher education institutes can, for example, set up a secure website easily and for free. For these secure https-websites, BELNET supplies the official digital certificates. The Server Certificate Service helps to combat phishing, a form of Internet fraud in which an imitation of a real website is created to collect users' personal data, amongst other things.

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### Server Certificate Service: number of requests since it went into service in October 2006

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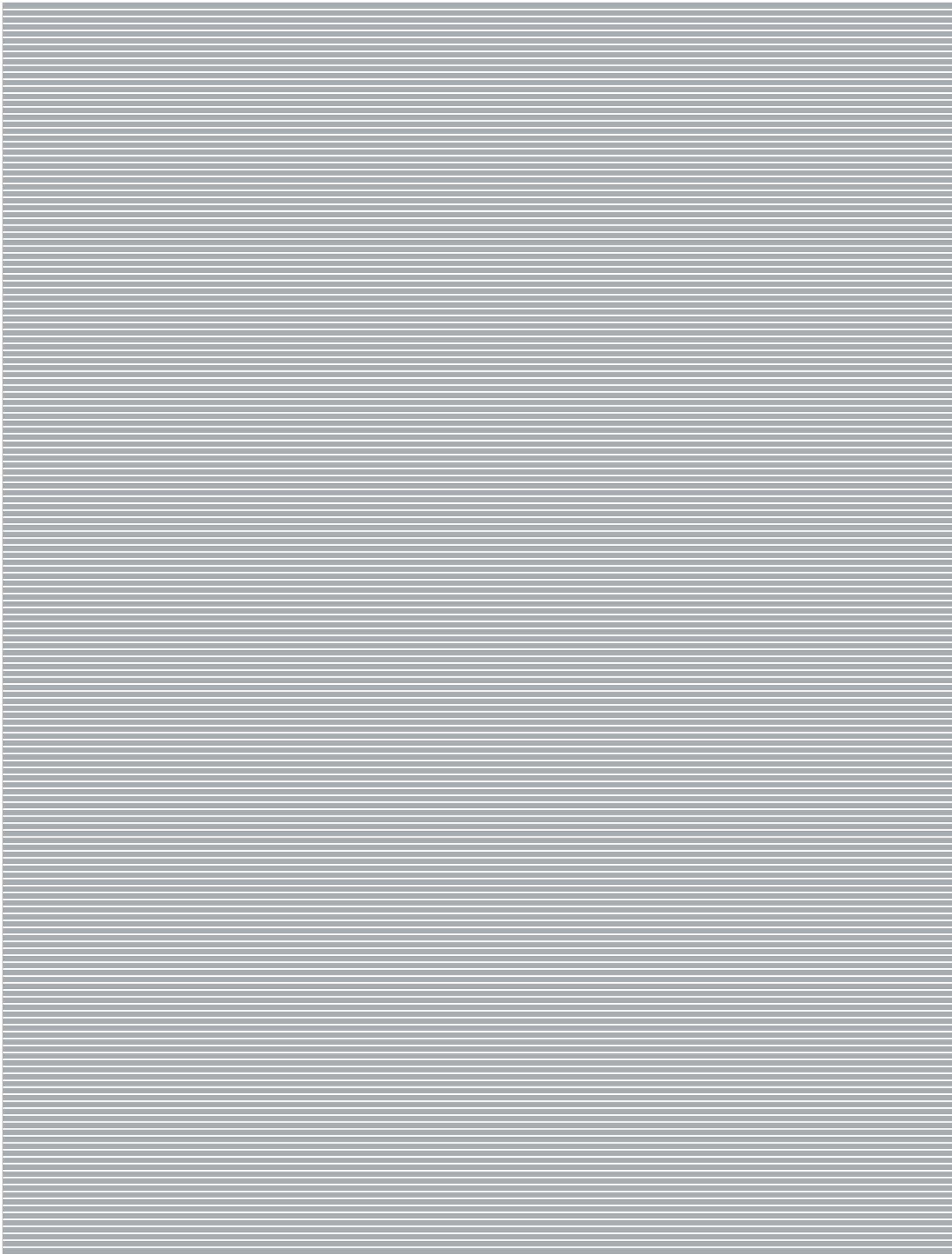
## New legal status project

In 2006, BELNET commissioned a specialist law firm to set up a legal project to turn BELNET into a public limited company. This proposal must eventually lead to BELNET having more autonomy, especially in the realm of hiring and employment conditions. This autonomy is necessary to solve the current structural problem in human resources. In 2005, the law firm had already researched different alternatives to its current status as an autonomously managed state service: an adaptation of its status to an autonomously managed service, the transformation of BELNET into a public limited company and the transformation of BELNET into a private limited company. It appears from the research that transforming BELNET into a public limited company is the best solution to BELNET's most urgent needs, which are mainly in the area of personnel. By restructuring BELNET into a public limited company, the legislator can work out a specific regulation regarding BELNET personnel. It is expected that the proposal will be on the political agenda by the end of 2007.

## TERENA Networking Conference

In May 2006, BELNET successfully put itself forward as a candidate to organise the 2008 TERENA conference. TERENA, the Trans European Research and Education Networking Association, is an organisation which encompasses all European national research networks. The TERENA Networking Conference has a technical programme which emphasises the latest developments in network technology. The conference, which will take place in Bruges, will provide Belgian researchers with the opportunity to discover, locally, the latest technological developments in research and development on a European level. Furthermore, the conference will underline BELNET's 15 year existence. The target for this conference comprises staff of all the research networks, network technology researchers, IT suppliers, etc.

The conference will last for four days and will be attended by approximately 450 delegates.



## Day to day ACTIVITIES

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- Management
  - Customer Relations
  - Communication
  - Legal activities
  - Administration, finance and HR
  - Logistics activities
  - Technical activities
-

## Management

Day to day leadership is in the hands of Pierre Bruyère, BELNET's Director. Technical activities are carried out under the supervision of Technical Director, Jan Torrele. Furthermore, every BELNET department is led by its own coordinator. In collaboration with all the staff, and based on BELNET's strategic plan, in 2006 management developed an operational plan for the next few years.

## Customer Relations

Customer Relations looks after the non-profit making account management, and coordinates customer administration of the 161 BELNET connected organisations and the 48 BNIX connected organisations. This department is, first and foremost, BELNET's ears for its organisations and users. In 2006, our two Customer Relations staff visited 118 of our connected organisations and another 26 prospects. In order to focus our services as accurately as possible on the needs of our target group, Customer Relations carries out regular satisfaction and needs analyses. In 2006, it also carried out a major user research project.

Through visits and daily contact via e-mail and telephone, the department attempts to give quick answers to the questions and needs of customers and prospects. Using an integrated approach to customer handling, Customer Relations ensures that all important information and all customer questions flow swiftly through to the relevant BELNET staff. Conversely, Customer Relations also informs our connected organisations about BELNET's services. Customer Relations maintains relations with organisations which represent a large group of customers, such as Regional government services responsible for higher education and research and the linking organisations within the research and academic sectors.

Finally, Customer Relations is responsible for developing our services and takes an active role in TERENA's international service management taskforce.

## Communication

The Communication department is a supporting service which falls under the direct responsibility of BELNET's Director. The department is responsible for internal and external communication. Amongst others, it maintains contact with the press, looks after BELNET documentation, both online and offline, and organises workshops and seminars, such as the BELNET Networking Conference 2006. The Communication department also develops information campaigns, looks after public relations and takes part in TERENA working groups. It also organises events such as team building, workshops and seminars for BELNET personnel.

In 2006, the Communication department put forward a proposal to TERENA to hold the TERENA Networking Conference in Bruges. This proposal was accepted by the TERENA Executive Committee. Furthermore, in 2006, the Communication department started to organise free workshops for all connected organisations and their users. These involved practical, hands-on sessions, presentations or demonstrations. The subjects offered included IPv6, BEgrid and videoconferencing. The workshops were held on a small scale and lasted a day or half a day.

## Legal activities

Our legal department is responsible for the analysis and drawing up of contracts with suppliers and connected organisations, amongst other things. It lends assistance in the acceptance and execution of government commissions. The most important project in 2006 was the follow-up and supervision of the external study regarding the revision of BELNET's status. The legal department is an active member of the Legal Workgroup within ISPA. In this capacity, it works with other competent authorities in Belgium on themes such as privacy, data retention and spam.

## Administration, finance and HR

The Administration and finance department looks after overall financial management, bookkeeping, personnel supervision, the secretariat and reception. Management of tenders is also one of Administration and finance's tasks. In 2006, BELNET awarded twenty government tenders to a value of over 25,000 euro (excluding VAT) via negotiations (15), general government tenders (2) and limited government tenders (3).

## Logistics activities

The logistics department has a wide range of responsibilities, including stock management and office equipment. The department also provides services for events and other activities. It also manages BELNET's PoPs (Points of Presence) and computer rooms.

## Technical activities

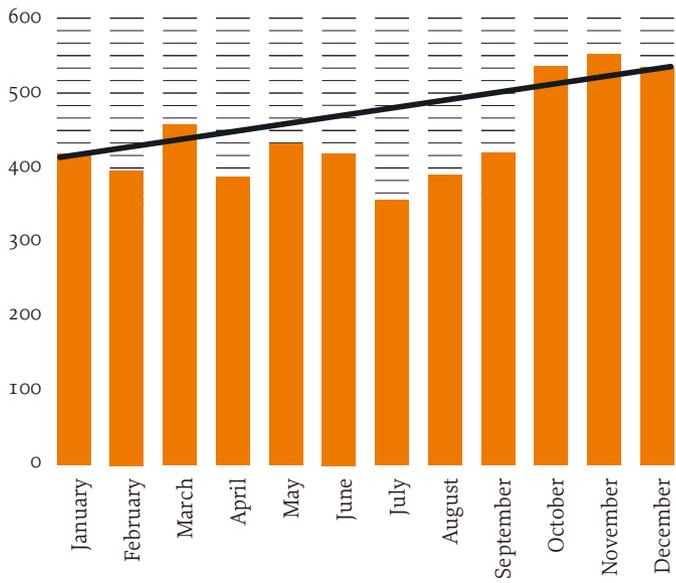
BELNET's technical activities involve the development, promotion and support of network access, new technologies and practical services. Technical activities cover four major areas:

**Networks** BELNET's network department manages, controls and maintains three networks: the BELNET network, the FedMAN network and the BNIX network. Research into the introduction of new, interesting network technologies and services is equally part of the core tasks of the BELNET network department. It is represented in many international working groups and taskforces, specifically those involved with Géant2 and TERENA. BELNET's network engineers follow regular training so that they can carry out these activities professionally.

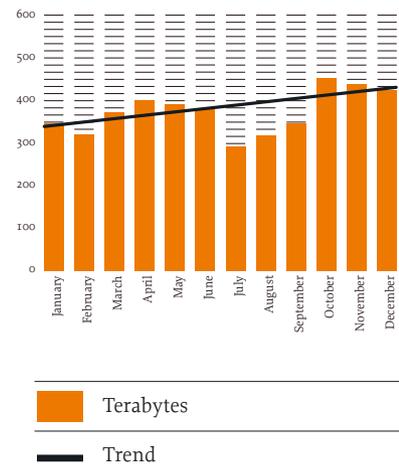
The three networks controlled by BELNET are under permanent (24/7) surveillance by BELNET's NOC (Network Operations Center). Moreover the level of network access can be set contractually via strict Service Level Agreements (SLA) which provide compensation when the agreed level of service is not achieved. Maximum downtime and connection quality are amongst the SLA conditions. To date, BELNET has not had to pay any compensation, which illustrates the quality of the infrastructure.

Through its Helpdesk in the NOC, the BELNET network department provides support to network controllers. This support encompasses the provision of information such as assistance with installing and testing networks connections. The NOC gives connected organisations comprehensive online information about their total network traffic over the BELNET network and traffic over other research networks. This is how overloads, network crashes and other problems can be detected and solved.

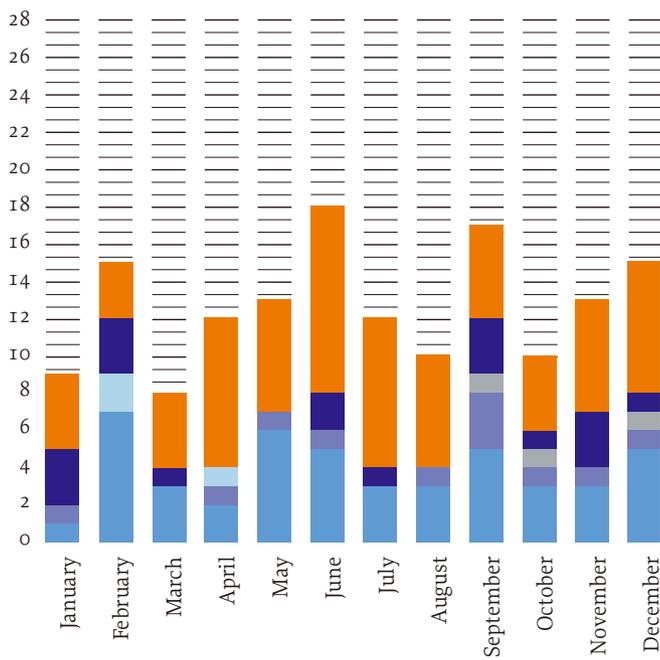
## The BELNET network: total network volume in 2006



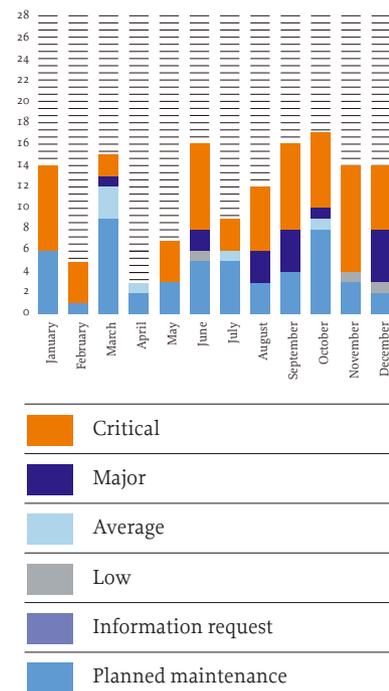
## in 2005



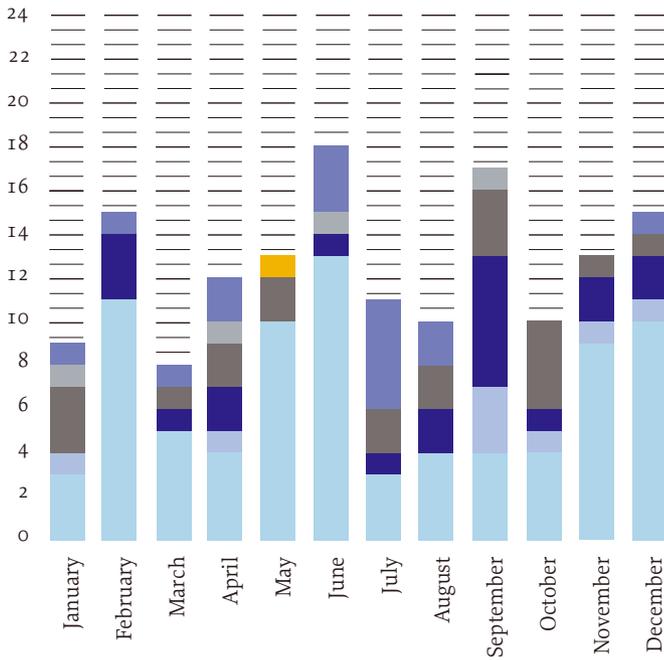
## The BELNET network: number of incidents and priorities in 2006



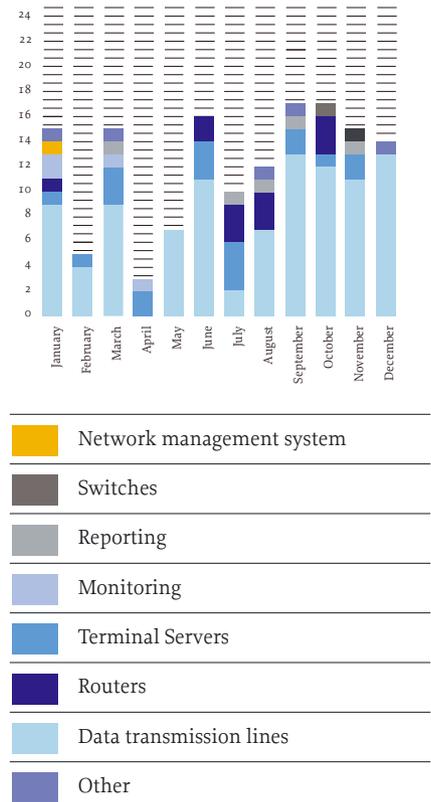
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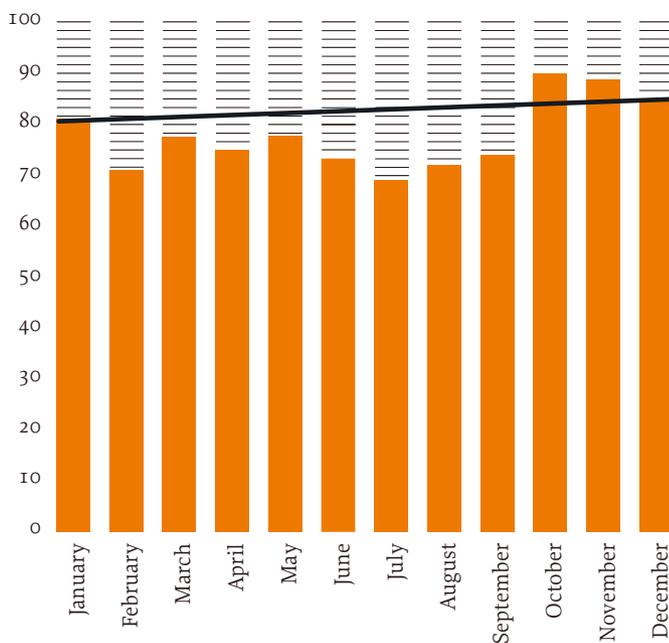
## The BELNET network: incidents by type in 2006



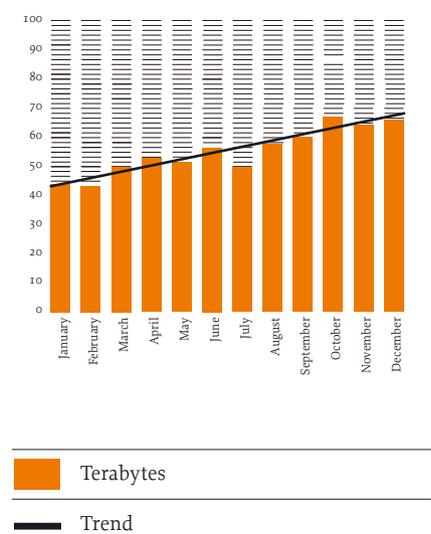
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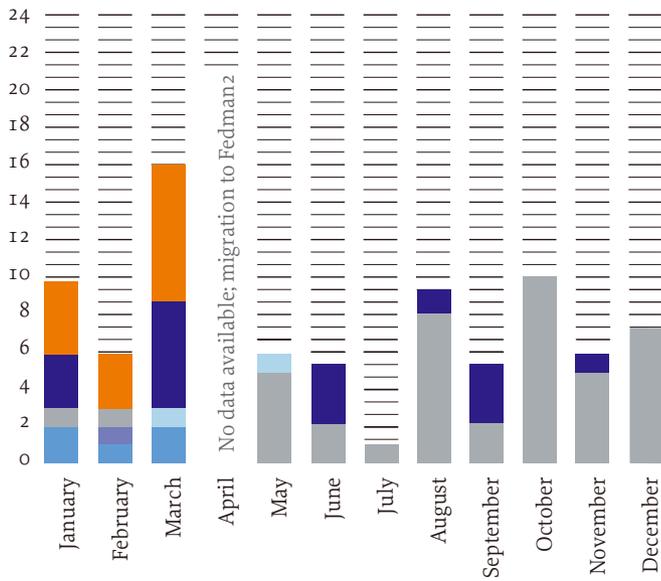
## The FedMAN network: total network volume in 2006



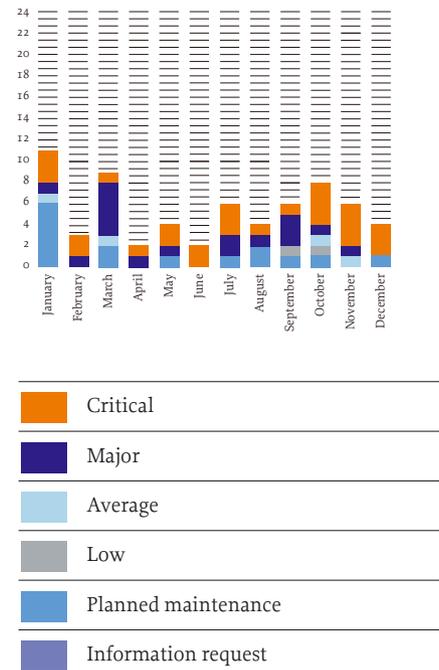
## in 2005



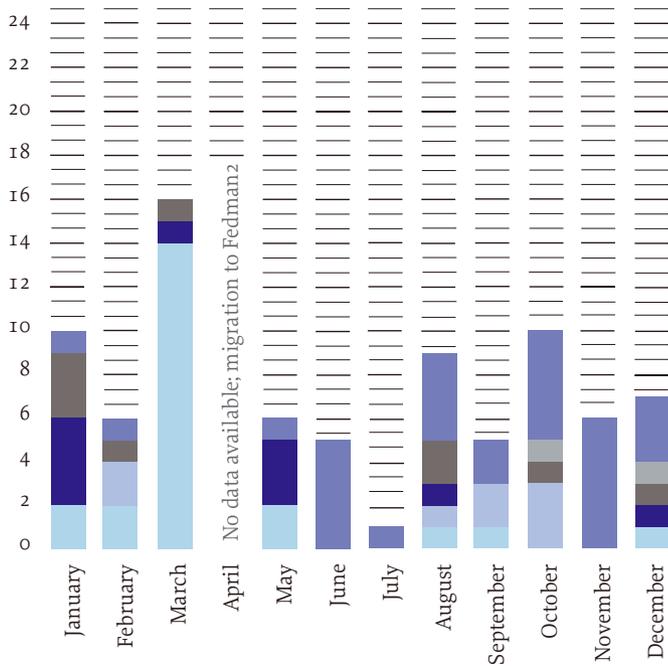
## The FedMAN network: number of incidents in 2006 and their importance



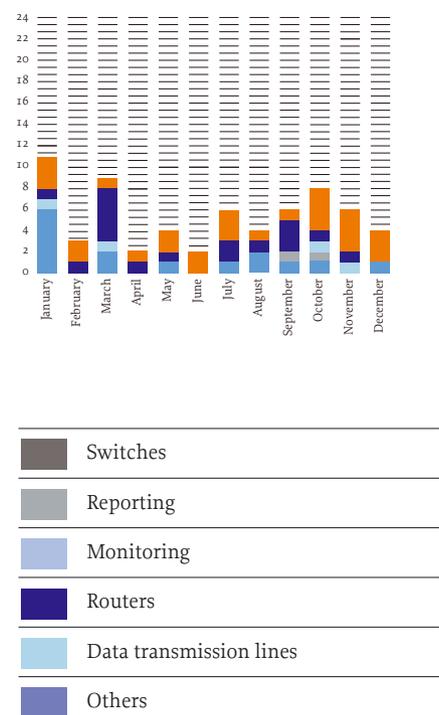
## in 2005



## The FedMAN network: incidents per type in 2006



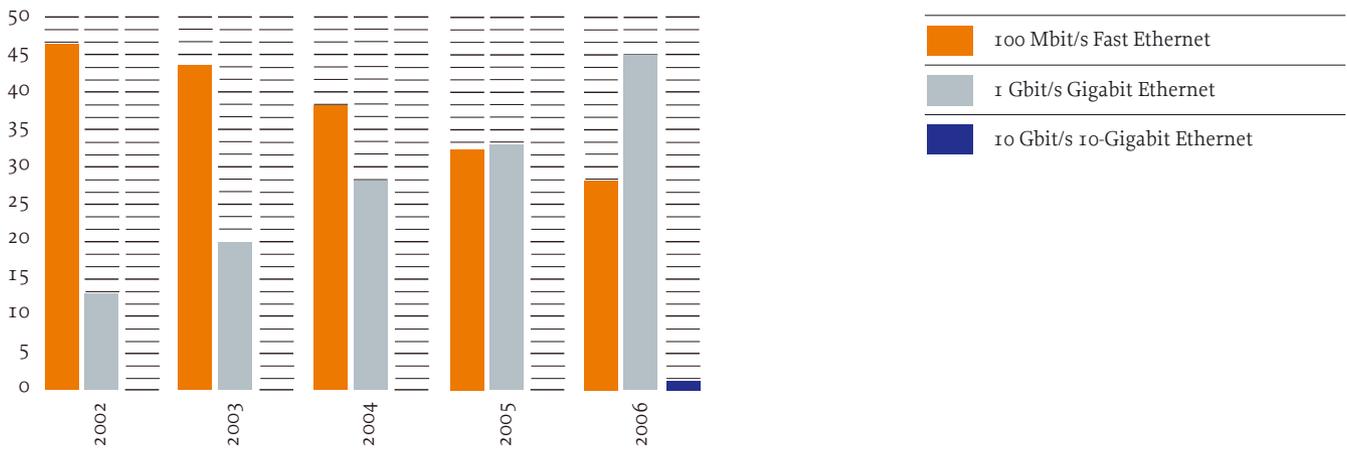
## in 2005



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## Number of BNIX connections

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**Servers, services and ICT** This department deals with the development, implementation and exploitation of BELNET services like Eduroam, Server Certificate Service and Videoconference. This department's workload includes the daily management and surveillance of services, but also research into evaluating new or innovative applications. This department also looks after BELNET's internal ICT needs.

**Grid computing** The Grid computing department looks after the BEgrid project. This project is run in cooperation with a number of connected organisations. This encompasses the construction and operation of a grid infrastructure, with its associated services, to meet the needs of Belgian researchers. BELNET ensures a number of essential grid services so that even small institutions can connect to BEgrid. By the end of 2006, BEgrid comprised some 440 computer elements and storage capacity of 4 terabytes. BEgrid is part of EGEE (Enabling Grids for E-Science in Europe), a grid project within the European Commission's 6<sup>th</sup> framework programme which intends to build an international grid and also to establish links with grid infrastructures

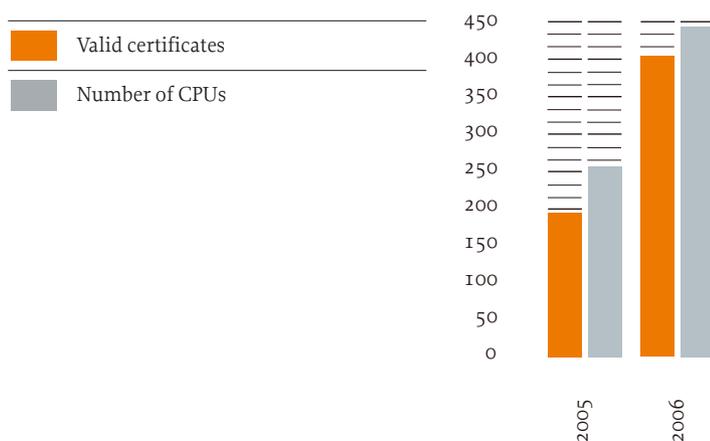
in the US, Japan and China. A bilateral agreement has also been reached with the Dutch grid project. Users in Belgium and the Netherlands can now set up virtual organisations in a transparent manner with the grid infrastructure that works in both countries.

Via its Grid computing department, BELNET is the Certificate Authority (CA) for BEgrid and signs all the user and machine certificates needed to use the Belgian grid infrastructure. These certificates are valid internationally thanks to our collaboration with EUgridPMA. The Grid computing department is also responsible for communication with grid users, participating institutions and international grid initiatives. The department controls the content of the BEgrid website, follows up on the working of infrastructure, organises BEgrid Management Meetings and follows up the resulting activities. The department also organises the annual BEgrid seminar.

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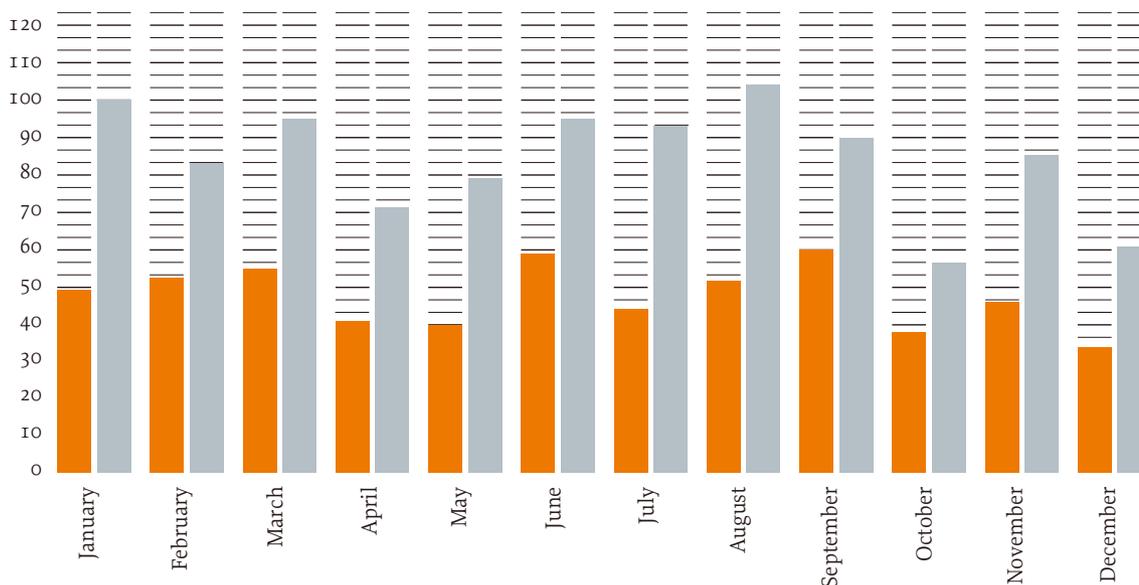
## BEgrid

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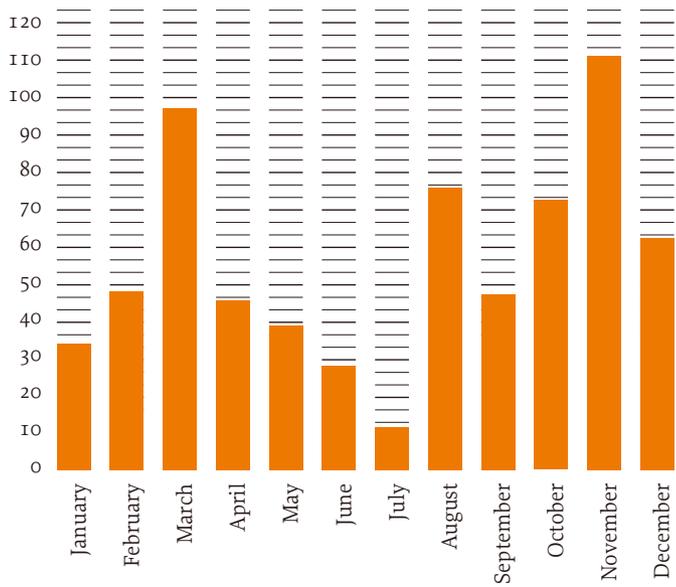
**BELNET CERT** BELNET's CERT has been operational since July 1<sup>st</sup> 2004. It disseminates information about security issues via its website, publishes a newsletter and sends e-mails with security alerts or advice. In total, 570 mail alerts were sent and 1,014 pieces of security advice were formulated in 2006. A total of 874 incidents were reported. BELNET CERT is accredited at a European level where it can collaborate efficiently with other European CERTS. In 2006, CERT was also accredited by FIRST, which is a world level accreditation. The CERT department supports BELNET's connected organisations in security matters. These organisations are notified about security questions that are relevant to systems in their network. The department also follows up on any complaints from connected organisations about other networks and offers any necessary assistance. In addition, the CERT department issues regular best practice notices, participates in European taskforces and permanently improves follow-up on hacker activity. In order to follow up attacks more thoroughly, to measure and analyse them, BELNET installed a so-called 'honeypot' system in 2006. This is a detection system for intruders such as viruses.

### Mail alerts and security advice in 2006

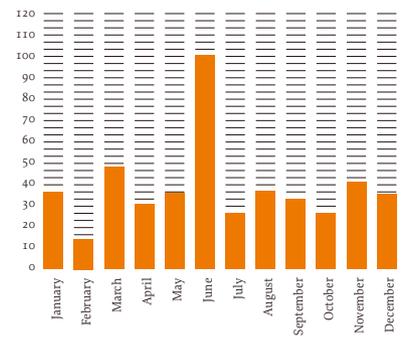


In 2006, BELNET's CERT issued some 570 mail alerts and around 1,014 pieces of security advice.

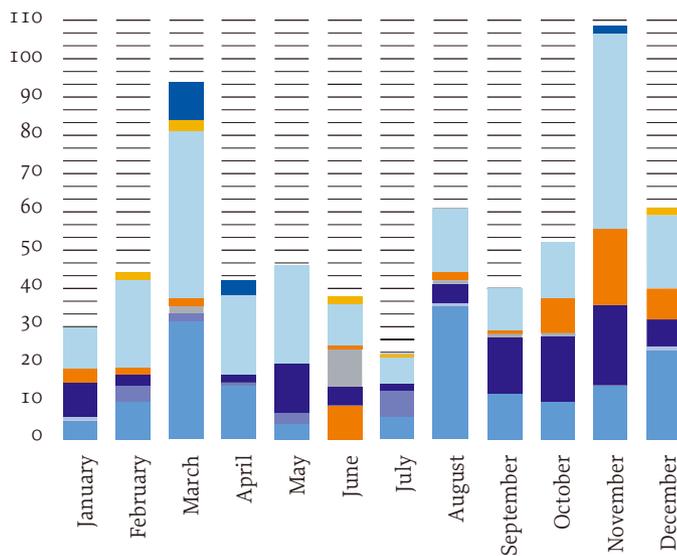
## CERT: number of reported incidents in 2006



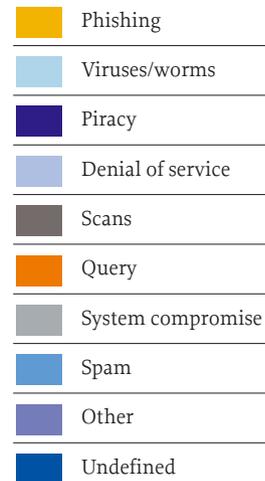
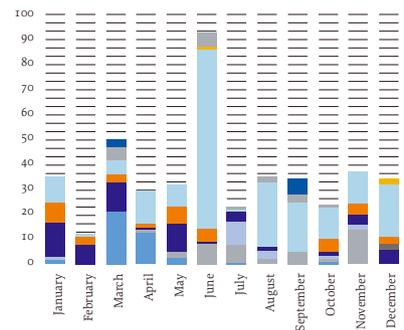
## in 2005



## CERT: number of incidents handled by type in 2006



## in 2005



## Conclusion

In 2006, BELNET took a definitive decision to adopt a user-oriented approach. The approach was laid out in a strategic plan and later ratified in a management plan. The common thread is clear: we want to adapt to the needs of our target group as much as possible. This means that we have to get to know our target group better. In 2006, we carried out a major survey and held a BELNET Networking Conference. In 2007, we will extend our customer service department to improve our service delivery and customer support.

On the request of our users and customers, over the past few years we have undertaken a number of important initiatives. In 2006, one of the things we did was to start the introduction of a new BELNET network based on our own fibre optic cabling. And with services like Eduroam, we have made the work of researchers, students and

lecturers easier, more pleasant, faster and more efficient. The need by the government and the administrations for greater bandwidth has been met by FedMAN2. Security remains a major concern. We launched a Server Certificate Service in this area for higher education and research.

Over the course of the next few years, we will develop even more user-oriented services to support research and higher education, improve communications and guarantee security. We will do this in collaboration with our partners. The objective is always to provide our users with the best possible service.

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## Glossary

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### bandwidth

The capacity or bandwidth of a data connection, measured in Hertz (analogue networks) or bits per second (digital). Bandwidth designates the amount of data that can be transferred within a given time.

### BEgrid

The BELNET grid initiative. Further information on [www.begrid.be](http://www.begrid.be).

### bit

Abbreviation of 'binary digit' (binary numbers 0 and 1). Basic unit used by computer systems, usually combined in a succession of bits. Eight bits constitute a byte.

### BNIX

The Belgian Internet exchange (Belgian National Internet eXchange). A central exchange where Internet service providers active on the Belgian market exchange data traffic with one another. The term 'IX' is used internationally in most Internet exchange abbreviations.

### byte

A succession of eight bits.

### CERT

Abbreviation of 'Computer Emergency Response Team'. A centre for preventing and resolving problems in connection with computer security by means of permanent controls and international information exchange and cooperation.

### Distributed Denial of Service (DDoS)

A DDoS attack is an attack on an Internet system. It entails such a large number of connection requests being created that the server crashes or is temporarily unable to offer its services. The attack generally involves computers in various locations across the world, which may or may not be centrally controlled.

### Eduroam

Abbreviation of 'educational roaming'. The Eduroam service offers users secure and simple access to their own research or academic institution's network or to the network of another connected institution which offers Eduroam.

### FedMAN

An acronym for Federal Metropolitan Area Network 'federal government network'. A Belgian computer network constructed by BELNET on behalf of Fedict, which connects the federal administrations in Brussels to one another and to the Internet.

### FTP

File Transfer Protocol, a protocol for exchanging files over the Internet.

### Géant2

The second generation of the pan-European research network, created through cooperation between 30 national research networks and the European Commission. Further information on [www.geant2.net](http://www.geant2.net).

### Grid computing

An innovative technology in full development, based on computers linked worldwide for joint processing of large quantities of data. BEgrid is the BELNET grid initiative for stimulating grid computing in Belgium.

### IP

Internet Protocol, the standard for transporting data over the Internet in accordance with a series of established communication rules.

### IP address

A unique identification number for a computer system within a network. Within an isolated, internal network, use of IP addresses is as good as free. However, to connect computer systems with the Internet, registered IP addresses are needed to avoid duplication with other computer systems so that transmitted data reaches the right computer (see also IPv6).

### IPv6

Internet Protocol version 6, the newest generation of the Internet Protocol and the successor to IPv4. Amongst other things, IPv6 allows a large increase in the number of IP addresses (addresses which computer systems need in order to connect directly with the Internet).

### ISP

Internet Service Provider, supplier of Internet services.

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## Glossary

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### MCU (Multipoint Control Units)

Equipment that is often used to make the various connections needed for videoconferencing connections.

### MPLS (Multi-Protocol Label Switching)

A technology used to set up virtual connections within an IP network.

### Multicast

A technology by which a data stream is simultaneously sent to several recipients, suitable for transmitting images and sound.

### phishing

Phishing is a criminal practice whereby individuals are defrauded through a copy of a trusted website. The visitor believes that the copy is authentic and unsuspectingly provides certain confidential information such as his credit card number.

### PoP

Point of Presence, access point to a network, the geographical location where connection to a main network is possible. A PoP is usually shared by tens to hundreds of users.

### query

In informatics, a query is an instruction sent to a database. The term is also used to specify the search criteria that are entered into a search engine.

### SCS (Server Certificate Service)

A service which supplies secure websites (https) with official certificates.

### Service Level Agreement (SLA)

An agreement between two parties setting out the quality requirements that a service has to satisfy.

### spam

Spam is undesired electronic mail. It is often advertising distributed on a large scale.

### streaming

A technology for transmitting data uniformly and without interruption. Streaming enables an incoming multimedia file to be opened even before it has been fully transmitted.

### VLL

Virtual Leased Lines. With VLL, geographically dispersed local computer networks can be linked to each other in a virtual private network (VPN).

### VPN

Virtual Private Network, part of a public network – often called a tunnel – for protected communication between two or more end points.

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If you would like more information about the data in this annual report, please contact Veerle Custers. You can reach her via [communication@belnet.be](mailto:communication@belnet.be) or by calling 02-790 33 33.

We would like to thank the following people and institutions for their enthusiastic and willing support:

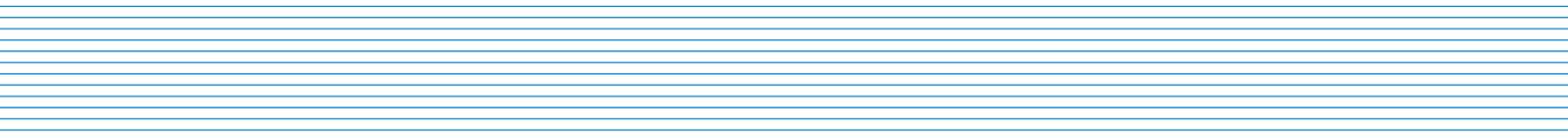
Christophe Joris and the Royal Military Academy, Wim Mees, Marc Acheroy, Bart Van Compernelle and Jean Marsia specifically.

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