

# ANNUAL REPORT 2020

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1

Belnet provides its services exclusively to **250 institutions** that represent more than **829,000 end users**.

2

Belnet is the federal government organization that, since 1993, has been **responsible for the Belgian National Research and Education Network** that provides very high-speed internet access and internet services to universities, high schools, research centres and Belgian government services.

# *What is Belnet?*

3

Belnet has **83 employees** and is part of the Federal Science Policy.

4

Belnet is also **responsible for BNIX**, the Belgian National Internet eXchange for internet service providers, content providers, hosting companies and large private enterprises.



*Our organization has shown its societal values by ensuring continued service, as well as by enabling researchers to work on solutions in the fight against COVID-19.*

**Dirk Haex,**  
Technical Director (a.i.)  
and Co-General Director for Belnet

*In May 2020, the President of the Federal Science Policy appointed Nathalie Pinsart and Dirk Haex as the new Co-General Directors.*

# *Belnet as a Player in Managing the Health Crisis*

***As a network provider to key institutions involved in the fight against coronavirus (COVID-19), Belnet has played a key role in managing the crisis, thus reinforcing its societal role. While the organisation ensured continued service, it also provided new tools to its customers and worked on a range of projects.***

For Belnet, 2020 was important in several ways. *'As the use of digital technology exploded due to the pandemic,' Dirk Haex points out, 'our organization displayed its societal value, not only by ensuring continued service to its customers – universities and colleges, research centres and federal public services (FPSs) – but also by allowing researchers to work on solutions to combat COVID-19 through Belnet's participation in the European GÉANT research network.'*

Furthermore, in the autumn, Belnet was named in the government agreement when a new federal government was formed. *'The new government highlighted the importance of Belnet,' Nathalie Pinsart continues, 'which is probably the result of actions we carried out to be more visible on a political level, and due to the role Belnet played during the health crisis. The federal government also showed its willingness to seek solutions to help us find specialized IT candidates.'*

## Staff

At the start of the first lockdown, staff started working entirely remotely, which allowed Belnet to continue its activities. *'Working from home was complicated for some,'* Nathalie Pinsart explains, *'and we thank all our employees for their adaptability in difficult circumstances. However, in terms of human resources, the crisis attracted new talent. Our staff numbers went up from 79 to 83.'*

## Virtual events

All meetings and gatherings, both internal and external, took place virtually. Of the eight customer events organized in 2020, seven were held online.

## Crisis management

Changes in infrastructure are rarely incident-free. Continued service was our top priority. At the start of the crisis, Belnet decided to put on hold or slow down certain projects. In addition, priority status was given to FPSs playing a vital role in the fight against coronavirus, Sciensano and around 20 hospitals, and operations were carried out to increase their network capacity if needed. In mid-May, a meeting was organized by the regulator of the electronic communications market (BIPT; Belgian Institute for Postal Services and Telecommunications) and the FPS Economy with the universities. Following this, Belnet set up an action plan for online exams to be conducted efficiently.

## New

Despite the pandemic, Belnet continued to offer tools and solutions to its customers and invest in critical projects:

- The **framework agreement** on the maintenance and purchase of network and optical equipment launched in 2019 spiked interest among 30 customer institutions. *'The specifications we worked on in 2020 give them access to this equipment on attractive terms that we negotiated with major suppliers,'* says Nathalie Pinsart. *'This contract was awarded in early 2021 and we are preparing another framework agreement related to connectivity.'*
- In February, the first Belgian node in the European **Blockchain Services Infrastructure (EBSI)**, established by Belnet, went live.
- After renewing the optical backbone of the FPS Chancellery of the Prime Minister in 2019, a **27<sup>th</sup> PoP** (Point of Presence) was implemented in April 2020 as a means to connect other federal organizations to the network and strengthen information security and connection performance.
- Furthermore, Belnet, which has already developed and operates the wide area networks (WANs) for the FPSs Finance, Economy and Chancellery, took over the installation and management of the **WAN for the FPS Employment** in 2020.
- **FedSender**, an application for transferring large files, was put into operation for the FPSs. It is a replica of FileSender, the version for the R&E (Research and Education) sector.

## Security for Belnet and its customers

Security remains vital for Belnet. Our new CISO (Chief Information Security Officer), who started in April 2020, established a programme which resulted in hundreds of security-related actions taking place in 2020:

- Belnet Advanced Mail Security (**BAMS**), a complete solution for secure mail traffic, replaced Antispam Pro.
- A new version of our **Distributed Denial-of-Service (DDoS) Mitigation** software solution was launched, ensuring greater efficiency in blocking denial-of-service attacks.
- *'Furthermore, we are working with the federal Computer Emergency Response Team (CERT.be) and the Belgian Centre for Cybersecurity (CCB) to improve our **DNS service** blocking malicious sites, as well as to automatically inform our customers of vulnerabilities via a platform'*, says Dirk Haex.
- At the end of 2020, we implemented the Resource Public Key Infrastructure (**RPKI**) to improve the security of the BGP routing protocol used on our network. Belnet is one of Belgium's first internet suppliers to have done this, further contributing to the security of BGP routing and the internet in general.

Finally, a **Risk Office Board** was created. Made up of the CISO, the DPO (Data Protection Officer) and Belnet management, the Board meets every month to assess the risks and make the appropriate decisions.

## BNIX transformation

BNIX is the Belgian internet node, managed by Belnet, for traffic exchange between internet service providers and content providers. In 2020, 57 Belgian and international companies and organizations were connected to BNIX. It celebrated its 25<sup>th</sup> anniversary last September with a virtual event. *'BNIX has seen record traffic due to widespread teleworking'*, Dirk Haex reports. *'While the capacity is still largely sufficient, we are still aiming for further development. We launched the BNIX Transformation project at the end of 2020, following two incidents that occurred on the BNIX network on 24 July and 8 September. The goal is to renew the current platform to increase its resilience and support technological evolutions and growth in data traffic.'*

## Continuous improvement

*'On 14 January'*, Dirk Haex recalls, *'an incident on the Belnet network connecting colleges and universities, research centres and public administrations, affected 17 of Belnet's 250 customers. We established an action plan for more thorough management of the changes to our infrastructure, on both the technical and the communications fronts, including critical periods such as exam times at an academic level, or tax-on-web periods at a federal level.'*

At the same time, the last stages of the Belnet network restructuring project, which started in 2017, were finalized in November. As a result, stability, redundancy, and network performance were improved. Further improvements and investments will be carried out in the future.

## Quality is our main concern

The performance and availability of Belnet services and applications, such as digital certificates, cloud storage and eduroam, are more crucial than ever. Consequently, the organization has launched the *'For a more reliable and efficient service platform'* project to improve redundancy and resilience between the data centres that host these service platforms.

## A research tool

Belnet's primary task is to manage and develop the national research network. In October, the organization was nominated to represent Belgium within the EOSC (European Open Science Cloud), an association tasked with creating a new European data network to encourage research. *'Our customers are looking for networks to associate with their research strategy,'* Nathalie Pinsart explains, *'and Belnet has a role to play as a development tool for the national and European Open Science strategy, not only as a connectivity provider, but also by offering other value-added solutions such as data repository, data management, secure authentication systems and so on, in support of Open Science.'*

## Targeted Strategic Objectives

*'Community Boards began to be organized in 2020, to better understand the needs of our R&E customers, enhance trusting relationships with them and further develop co-created products. A first meeting was held at the end of the year with university CIOs; a process that will continue in 2021 with IT managers from colleges and teaching hospitals.'*

*'Our R&E community, federal administrations and BNIX customers have different expectations,'* Nathalie Pinsart concludes. *'For this reason, we have shifted our strategy towards a more differentiated approach depending on our customer segments, and have developed business models that are specific to these segments with a programme of action for the years to come.'*



“

*We have shifted our strategy towards a more differentiated approach depending on our customer segments.* ”

**Nathalie Pinsart,**

Community Director (a.i.) and Co-General  
Director and Administration for Belnet

# *Belnet in practice*

## Our mission

Belnet is the Belgian National Research and Education Network (NREN). It encourages deployment of the knowledge and information society by providing and maintaining high-quality, innovative network infrastructures and associated services to meet the specific needs of higher education, research and public sector administration in Belgium, thanks to its expertise, unique market position and economies of scale.

## Our vision

Belnet provides specific connectivity in the fields of services, federation and networks for several clearly identified target groups within education, research and public sector administration. Furthermore, it provides access to (services on) the global internet as well as to (inter)national research networks on every continent.

## Our values

### **Trust**

Belnet is a reliable, stable, non-commercial and neutral partner to its customers.

### **Professionalism**

Belnet operates professionally with the required expertise and know-how.

### **Dedication**

Belnet is dedicated to its customers and develops an infrastructure and services adapted to their needs.

### **Effectiveness**

Belnet is an effective, dynamic, high-quality organization.

## Our strategic objectives

### **Operational excellence**

Belnet seeks to provide a quality service that its customers can trust.

### **Security**

Information security is a priority and is an essential element of its operating method, services and activities.

### **Dedicated services**

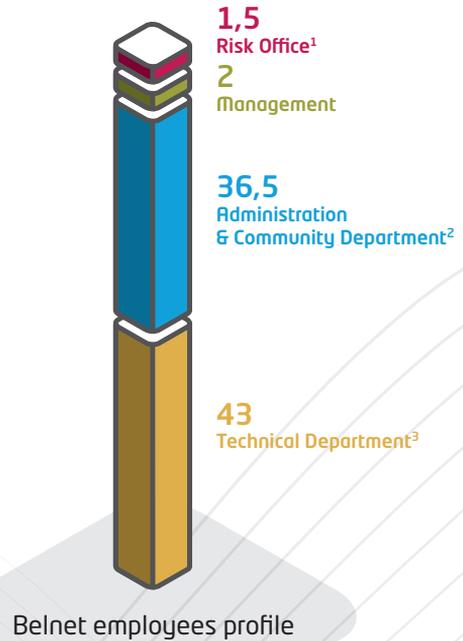
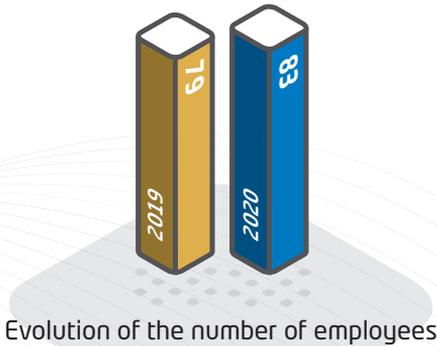
Belnet provides services that meet the specific needs of its customer group.

### **Performing organisation**

Belnet is a professional, performing organization that is perfectly adapted to fulfilling its mission.

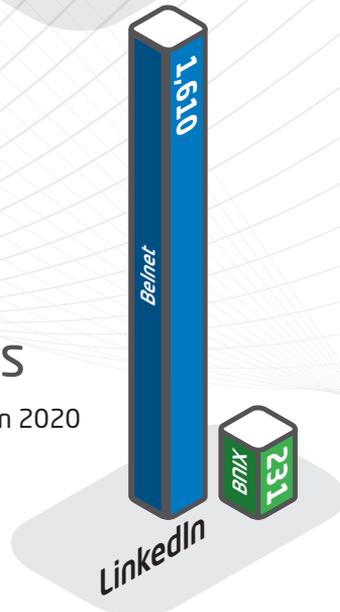
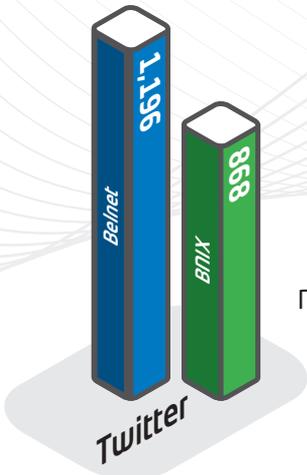
# Belnet in 2020

## Employees



## Social networks

Number of followers in 2020

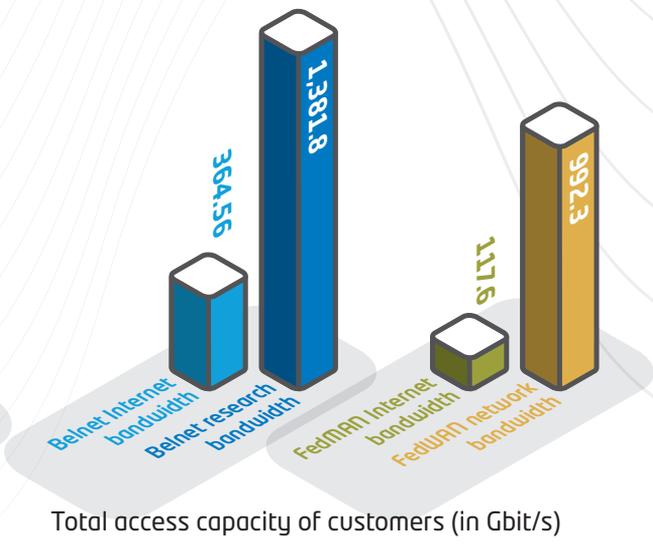
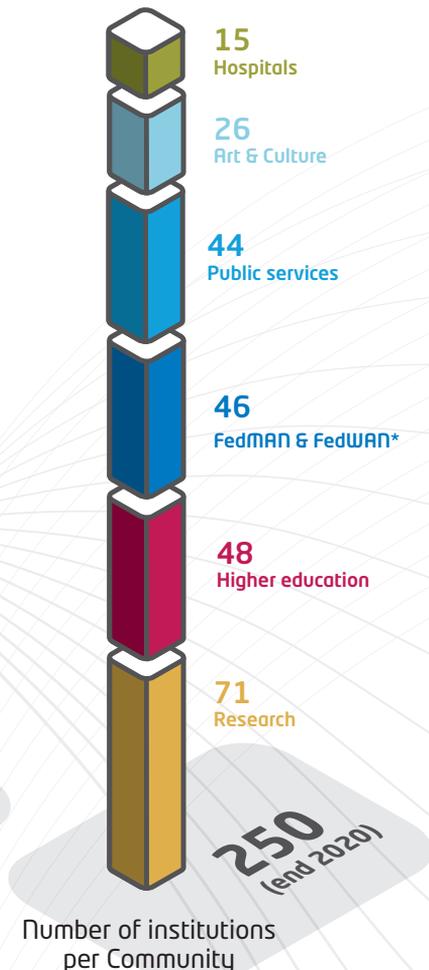
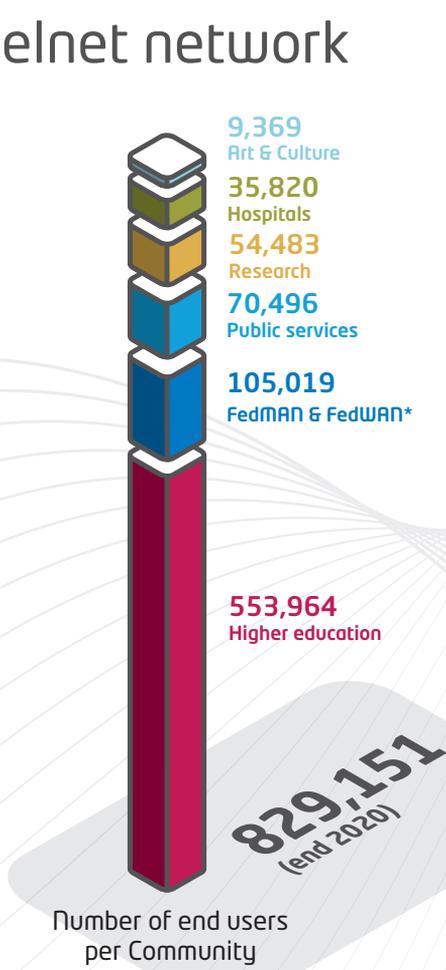


1 CISO & DPO

2 Management Support, Legal, Purchasing, Finance, Human Resources, Reception, Business Management, Customer Relations, Marketing & Communication, Product Management

3 Networks, ICT Logistics, Services & Security, Project Management Office, Information Technology Service Management

# Belnet network

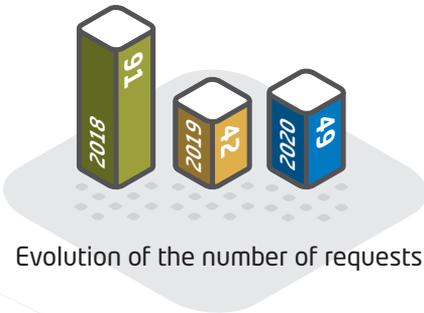
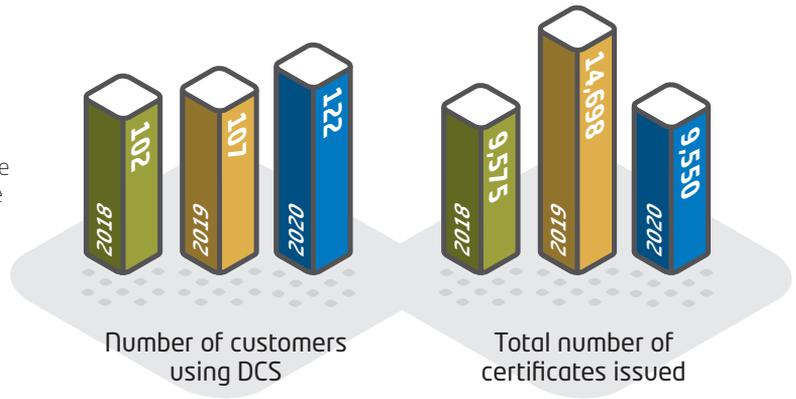


\* Federal institutions

# Belnet network

## Digital Certificates Service (DCS)

Belnet's **DCS** offers a wide range of digital certificates that can be simply and securely managed by research or higher education institutions and Belgian public services organizations.

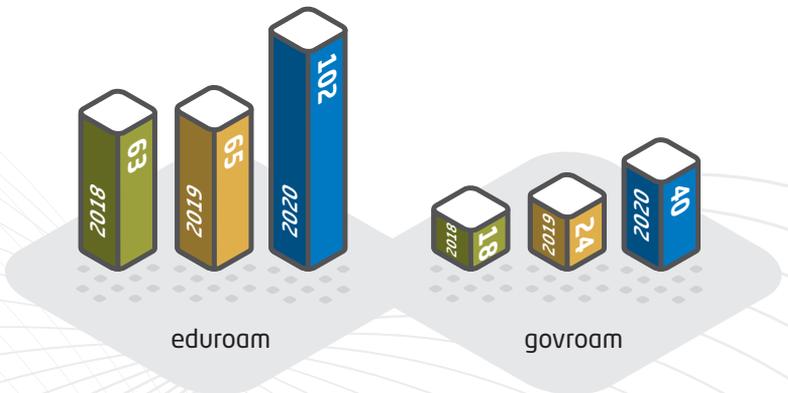


## Belnet Leased Line (BLL)

The **BLL** service allows higher education and research organizations as well as Belgian public services organizations to easily connect to the Belnet network.

Belnet looks for the most suitable leased line to an access port on its network for these organisations and sets up a monitoring system to guarantee high-performance and permanently available connectivity.

## Evolution of the number of institutions using eduroam and govroom services



**eduroam** is a service that provides users at research and higher education institutions with simple, secured access to both their own organization's wireless network and also to the networks of other participating organizations across the whole world.

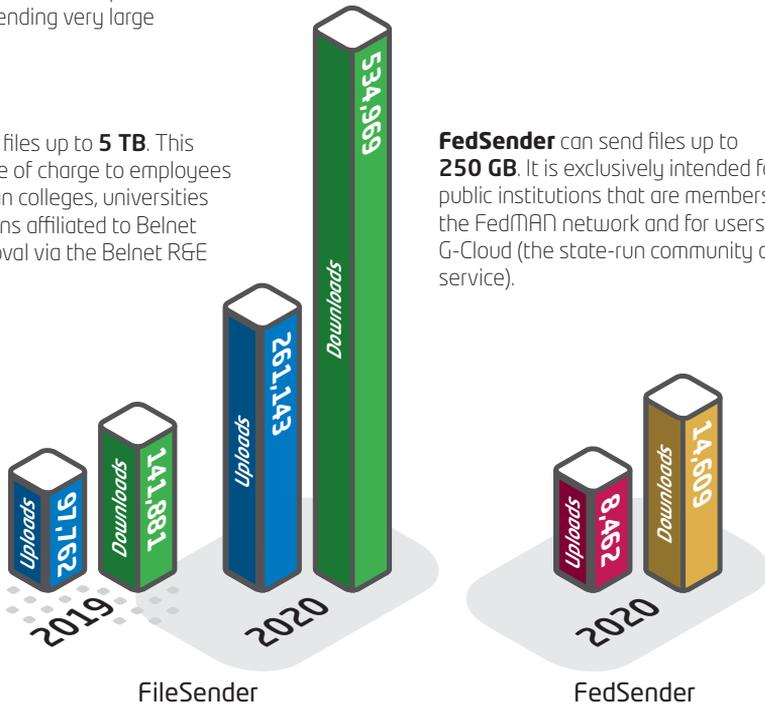
**govroom** is a service that allows civil servants to surf securely and wirelessly across all affiliated public services organizations in Belgium.

## FileSender and FedSender

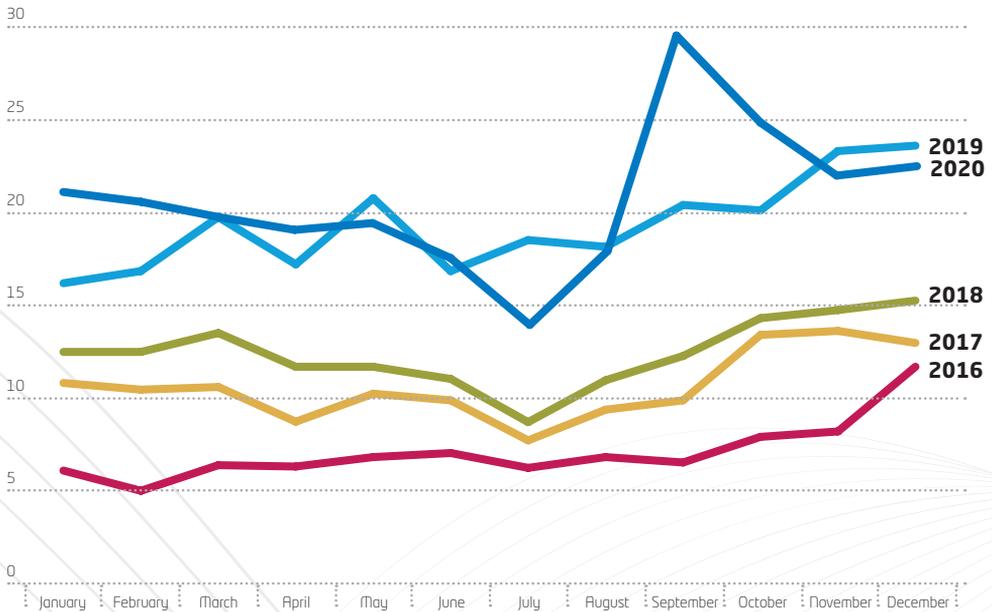
FileSender and FedSender are simple, safe applications for sending very large files.

**FileSender** can send files up to **5 TB**. This service is available free of charge to employees and students of Belgian colleges, universities and research institutions affiliated to Belnet (registration and approval via the Belnet R&E Federation).

**FedSender** can send files up to **250 GB**. It is exclusively intended for public institutions that are members of the FedMAN network and for users of G-Cloud (the state-run community cloud service).



## Evolution of the external traffic (in Petabyte)



# Belgian National Internet Exchange (BNIX)

## Traffic evolution

160 Gbit/s  
in 2019



220 Gbit/s  
in 2020

## Record traffic on the BNIX Internet node

Due to lockdown and the large increase in telework, the Belgian BNIX Internet node managed by Belnet beat records in all fields. There was almost 40% of additional traffic via the node in 2020 compared to 2019, representing an average of 220 Gbit/s (compared to 160 Gbit/s in 2019). On Tuesday, the 15th December 2020, around 2:20 p.m., traffic on BNIX even went beyond 600 Gbit/s.

Never in Belgian history has so much internet traffic gone through BNIX. It is also noteworthy that peaks on the BNIX platform last year were particularly prevalent in the afternoon rather than in the evening, mainly due to the massive surge in telework.

869,616,000 GB

2020 data volume

In 2020, the Belgian Internet node treated almost 869,616,000 GB of data, which is 249,907,584 more than in 2019.

BNIX continues its development to satisfy the demand for more efficient connections - Belnet carried out seven upgrades for BNIX participants in 2020, four of which were to 100 Gbit/s. For this reason, Belnet will renew the BNIX platform and its associated services in 2021.

# The BNIX platform



3

DATA CENTERS



57

PARTICIPANTS



INFRASTRUCTURE

13.2 Tbps

is the switch capacity

**These are 4x more powerful than the previous ones.**

4 new participants joined the BNIX platform in 2020 : Combell, Wordline, Proximus Luxembourg and Localitel, bringing the total number of participants to 57.

## Active connections: number and types

10

connections 100 Gbit/s

40

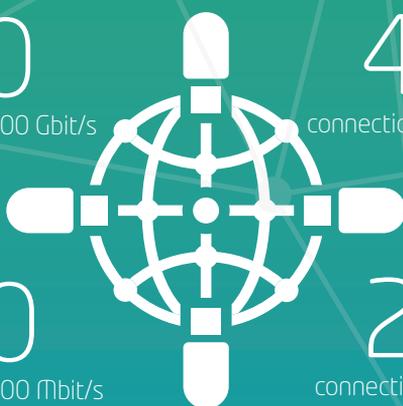
connections 10 Gbit/s

10

connections 100 Mbit/s

23

connections 1 Gbit/s



# *Budget outcome and accounts*

Positive result

EUR 470,579

Services invoiced

EUR 8,755,087

Allocation

EUR 8,773,000

# Income statement

## Reserve fund and investment fund

In 2020, no allocation was made to the investment fund; the fund total was EUR 18,295,000 and was estimated to be sufficient for the coming years. The positive result will be added to the net assets of the balance sheet.

This investment fund was established to finance future investments based on the multiannual plan.

## Income

Services invoiced for the development and management of WAN networks amounted to EUR 2,870,000 and decreased by 16.8%.

Other invoiced services amounted to EUR 5,885,000 and showed an increase of 1.5% compared to the financial year 2019.

In total, the invoiced services will have seen a decrease of 4%.

The gross financial profit was

**EUR 470,579**

## Expenditure

Expenses related to human resources increased from the previous financial year because of recruitment costs in 2020.

Other costs also increased compared to 2019, as a result of more investment and more general expenses. This mainly relates to the purchase of investment equipment for stock, for a faster response to customer requests. General expenses rose in line with the increase in Belnet's activities.

## Income Statement, in euros

	Financial year 2018	Financial year 2019	Financial year 2020
<b>Expenditure</b>			
Other use of consumer goods and third-party services	9,799,193	9,189,121	<b>9,283,405</b>
Property and other expenditure	5,932	912	<b>26</b>
Direct and indirect staff pay	5,798,202	5,886,465	<b>6,425,580</b>
Financial depreciation on set-up costs, tangible and intangible assets	2,060,802	1,464,142	<b>1,556,202</b>
Income (expenditure) transfers other than social contributions	110,110	186,004	<b>39,980</b>
Capital losses on existing assets and liabilities	0	0	<b>0</b>
Allowance for reserve fund	0	0	<b>0</b>
Allowance for fund allocated to investment	0	2,000,000	<b>0</b>
Allowance for funds allocated to income	0	0	<b>0</b>
Allowance for provision for risks and expenditure	0	0	<b>20,000</b>
Overall net accounting result	190,001	-696,336	<b>470,579</b>
Overall total expenditure	17,964,240	18,030,308	<b>17,795,772</b>
<b>Income</b>			
Services invoiced	9,019,209	9,121,040	<b>8,755,087</b>
Interest and other financial income	0	0	<b>0</b>
Exceptional income	40,668	0	<b>0</b>
Income transfers other than taxes and social contributions	8,904,362	8,909,268	<b>9,040,686</b>
Allowances for provisions for future risks and expenses	0	0	<b>0</b>
Allowances for reserve funds	0	0	<b>0</b>
Overall total income	17,964,240	18,030,308	<b>17,795,772</b>

# Balance sheet

## Investments

The investments made during the financial year 2020 (EUR 2,139,706) were mainly related to network equipment, which is required for the further development of the Belnet research network. During this financial year, depreciation was set at EUR 1,556,202, which was an increase from the previous year. The depreciations were carried out in accordance with the recommendations of the Commission for the Inventory of State Assets (25% for computer equipment, 20% for rolling stock, and 10% for other investment equipment).

## Payables and receivables

Accounts payable within one year to third parties not subject to the General Accounting Plan (GAP) saw an increase compared to 2019. This was partly due to technical adjustments in the billing system. We expect this figure to stabilize again next year.

Accounts receivable within one year from third parties not subject to the General Accounting Plan (GAP) increased once again, following a fall in 2019. This increase was attributable to a receivable from the VAT administration.

## Balance sheet, in euros

	Financial year 2018	Financial year 2019	Financial year 2020
<b>Assets</b>			
Tangible assets	2,416,599	2,113,809	<b>2,697,313</b>
Debts more than a year old payable by third parties not subject to the GAP	38,492	38,492	<b>43,630</b>
Debts a year old at most payable by third parties not subject to the GAP	2,044,393	797,385	<b>1,916,007</b>
Debts a year old at most payable by third parties subject to the GAP	2,807,047	3,205,608	<b>2,492,753</b>
Certificates and treasury bills	18,193,000	17,193,000	<b>17,193,000</b>
Demand bank accounts and postal orders - cash deposits and stamps	4,066,936	6,674,051	<b>7,548,934</b>
Asset balancing and pending accounts	874,914	1,523,225	<b>804,719</b>
Total assets	30,441,380	31,545,570	<b>32,696,357</b>
<b>Liabilities</b>			
Net assets or net corporate assets or liabilities	10,495,583	9,799,246	<b>10,269,826</b>
Reserve funds	821,888	821,888	<b>821,888</b>
Funds allocated for investment	16,295,000	18,295,000	<b>18,295,000</b>
Funds allocated for income	-	-	-
Provisions for risks and expenditure	-	-	<b>20,000</b>
Debts a year old at most payable to third parties not subject to the GAP	2,176,366	2,002,378	<b>2,486,047</b>
Debts a year old at most payable to third parties subject to the GAP	641,771	590,837	<b>767,525</b>
Liabilities balancing and pending accounts	10,772	36,222	<b>36,071</b>
Total liabilities	30,441,380	31,545,570	<b>32,696,357</b>

# Budget outcome

The budget outcome was  
**EUR 519,004**

EUR 17,793,301 (income) - EUR 17,274,297 (expenditure)

## Allocation for operations and other public funding

The allocation was EUR 8,773,000 in 2020, an increase of EUR 127,000 on 2019 (EUR 8,646,000). This increase was a result of indexation and a one-off additional allocation for the cost of moving to the WTC III building.

## Summary of budget accounts

	Financial year 2018	Financial year 2019	Financial year 2020
<b>Expenditure (1000s euros)</b>			
National lines	400	337	<b>558</b>
European lines	226	752	<b>692</b>
Commercial Internet	251	245	<b>345</b>
Maintenance of network equipment and services	5,279	5,342	<b>3,794</b>
Overhead costs	1,150	1,055	<b>1,473</b>
Wages	5,210	5,432	<b>5,664</b>
Other investments	1,804	1,013	<b>2,140</b>
WANFIN project	3,179	3,086	<b>2,440</b>
WANECO project	2	131	<b>114</b>
WANPREM project	0	0	<b>26</b>
WANWASO project	0	0	<b>28</b>
Allocations to the Reserve Fund	0	0	<b>0</b>
Total	17,502	17,393	<b>17,274</b>
<b>Income (1000s euros)</b>			
Allocation	8,546	8,646	<b>8,773</b>
Capital transfers from EU institutions	358	263	<b>267</b>
WANFIN project	3 908	3 353	<b>2,731</b>
WANECO project	0	108	<b>115</b>
WANPREM project	0	0	<b>9</b>
WANWASO project	0	0	<b>13</b>
Services provided	5,561	5,793	<b>5,885</b>
Interest	0	0	<b>0</b>
Reversal of provisions and carryover of income	0	0	<b>0</b>
	18,374	18,163	<b>17,793</b>
Outcome	872	770	<b>519</b>
Expenditure - Total excluding investments	15,697	16,380	<b>15,134</b>
Overhead costs	1,150	1,055	<b>1,473</b>
Maintenance of network equipment and services	5,279	5,342	<b>3,794</b>
Revenue - Allocation	8,546	8,646	<b>8,773</b>
Revenue - Services provided	5,561	5,793	<b>5,885</b>

# Services offered by Belnet in 2020



## Cloud

- Belnet Storage
- GÉANT Cloud Solutions
- Belnet FedSender



## Community Support

- Belnet FTP
- Belnet Service Desk
- Belnet Portal



## Trust & Security

- Antispam Pro
- Belnet DDoS Mitigation
- Digital Certificates Service



## Identity, Mobility & Federation

- FileSender
- Belnet R&E Federation
- eduroam
- govroom
- Belnet guestroom



## Connectivity & Internet

- Internet connectivity
- Belnet Leased Line
- Belnet Media Transport Service
- Network Time Protocol
- Belnet Cloud Connect - MS AZURE
- DNS Service
- Domain Name Registration
- Fiber Channel
- International connectivity
- Multipoint



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