



INSTITUTE OF  
COMPUTER SCIENCE  
Masaryk University

# ANNUAL REPORT 2017





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at ICS**
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# INTRODUCTION

To better connect the activities that are essential to development in all units of IT infrastructure at the university, we changed our internal organization at the start of 2017 by reshaping divisions. This reorganization has allowed us to make significant progress in digitizing the university's various procedures and agendas and to intensify our collaboration with and support for areas of research. Then, during the course of the year, the institute began to coordinate a pair of OP RDE projects intended to build the capacity of two large research infrastructures—CERIT-SC and ELIXIR CZ.

We have been outstandingly successful in the area of cybersecurity: C4e became the only Brno institution of higher education to be awarded an OP RDE Research Excellence project. We also made a substantial contribution to boosting MU's international standing by joining the H2020 project OpenAIRE Advanced, thereby taking responsibility for involving the Czech Republic in open science and free access to academic information. On the scale of pan-European infrastructure, we collaborated in proposing a key successful H2020 project called EOSC Hub, whose implementation will begin in 2018. These results in both domestic and international projects support the institute's efforts to build the university's cloud infrastructure, using both MU's own facilities and those offered by Microsoft Office 365, making for a cloud environment with superb characteristics

that is fully GDPR-compliant. It will also be gradually readied to handle sensitive data such as patient records. System Perun, which has been co-developed as a key element of international AA infrastructure, has enabled the creation of a concept for a unified login to all university systems, aimed at facilitating the work of users while maintaining or bettering their security.

To promote easier orientation among the IT services and tools we offer, we have created a catalogue to which we will also be adding services supported by the individual faculties and other MU units. And we have put together MuniWeb, a website development environment. The university website has already been converted to it, and the websites of the individual faculties and other units will follow. This will give the university a clearer online presence which, along with the unified graphic style, will make it more visible. In addition, there is Portal MU, which went into pilot service in 2007 and constitutes a cluster of authenticated university systems.

We took the initiative in reacting to the GDPR and coordinated preparations for a development project that involved every institution of higher education in the Czech Republic.

For all these achievements and for the 'invisible' care they take of the university's IT infrastructure, we thank the institute's employees, who are its most valuable resource.

*Prof. Ludek Matyska*  
*Director*

# OUR NINE GREATEST ACHIEVEMENTS AT ICS

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## 1

### **New websites for the Faculty of Economics and Administration and the Faculty of Arts**

We created and launched websites for the Faculty of Economics and Administration and the Faculty of Arts. In the case of FA, this included a series of websites for almost every individual department.

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## 2

### **Easier login to university systems and services**

We conceived and put into operation a university-wide unified login that allows users secure access to systems and services without the hassle of individual registration and logins for each site. It can be used to log in to the Portal, INET, WebCentrum and MS Office 365, among others.

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## 3

### **An important cybersecurity research project**

We successfully obtained funding for the project Centre of Excellence for Cybercrime, Cybersecurity, and the Protection of Critical Information Infrastructure under the OP RDE Research Excellence program.

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## 4

### **Making a global showing**

The prestigious journal IEEE Communications Magazine published our article Toward Stream-Based IP Flow Analysis. It described the processing and analysis of big network data and was published as part of a special issue on Traffic Measurements for Cyber Security.

# OUR NINE GREATEST ACHIEVEMENTS AT ICS

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5

## **New access and security systems at the faculties**

We updated the access and security systems at the Faculty of Law, the Faculty of Education, and the Faculty of Economics and Administration. The transition required a complete overhaul of the systems' internal components, including adapting them to the new university identity system.

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6

## **Improving our support for the sciences**

We wrote and implemented an innovative algorithm to reconstruct 3D maps of the electron density of biomolecules, enabling faster processing of big data and massive calculations.

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7

## **Faster, more stable, more secure**

We increased the capacity of the university's backbone network to 3×40 Gbit/s. We also boosted its reliability and security by connecting to the CESNET infrastructure.

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8

## **Quality, effective cloud technology**

We set up Microsoft Office 365 accounts for all university students and employees. In this way, we continue to improve our collaboration tools at the same time we make use of the latest applications.

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9

## **Support for education and free access to information**

By becoming members of the H2020 project OpenAIRE Advanced, we became involved in open science and providing free access to academic information. In doing so, we also helped to strengthen MU's international standing.



# USER SERVICES

## What we do

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- Provide user and technical support
- Take care of specific user needs
- Train and educate users, conduct seminars
- Oversee central services:
  - Office 365 as a universal platform for collaboration and communication
  - Central administration of computers and terminal servers
  - University-wide helpdesk and call centre
  - Administration of university computer rooms and the University Computer Centre (UCC)
  - Printing services for students and employees
  - Provision of university software licenses
  - Administration of the university's voice and mobile telephone networks
  - Administration and maintenance of MU access and security systems
  - University IT services catalogue [it.muni.cz](http://it.muni.cz)

## Key events in 2017

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- Deployment of collaboration platforms at MU: we made the Office 365 collaborative environment available to the entire university, and launched the Yammer social network.
- Collaboration with Information Technology Centres was significantly broadened at the individual faculties. We support the university IT community with an increasing number of regular meetings with ICTs that cover current IT themes, news, and detailed technical topics like framework agreements, central administration of PCs, Office 365, SafeQ, and others.
- Readying of the MUNI4Students project.
- Migration of the access and security systems at the Law, Education, and Economics and Administration faculties to the new version (WinPak PE 4.0). The migration required that internal system components be reworked, including their adaptation to the new MU identity system.
- 3D printing access was made possible in the University Computer Centre.





## Working together in an up-to-date, effective way

At the start of 2017, we took the administration of Office 365 accounts over from the IS team and, after putting the necessary mechanisms in place, set up accounts for all MU students and employees. At the same time, we launched the internal social network Yammer into regular operation. This means the university now has a full range of cloud services available, as well as software that offers modern tools and technologies for efficient work and collaboration.



## Office 365

We set up

**50,000**

accounts for all students and employees

Users activated another

**10,000**

MS Office licenses and established

**550**

new discussion and work-groups

More than

**9,000**

messages were posted to Yammer

## Preparations for reconstructing the UCC

The University Computer Centre (UCC), located on Komenske Namesti, is a space for independent work and study, open nonstop to all MU students and employees. In 2017, we proposed and the IT Council approved a concept for reconstructing the UCC to bring it in line with changing demands on its use. Since the last reconstruction, which took place in 2006, there have been substantial changes to the structure of the student body, the way students use the UCC, and their needs. The goal of the project is to construct an attractive space for independent study, group work, and social activities for students from all disciplines, while maintaining the centre's unique 24/7 availability with adequate technical and social facilities. The UCC will now be divided into three zones: a study zone intended exclusively for independent study, a quiet zone for relaxation and refreshment, and a social zone for teamwork.

Implementation is planned for 2018 and is part of the university's MUNI4Students project.

## MU printing services

In addition to being in charge of all the printers at MU, in the winter semester we expanded students' options for printing in the UCC by adding 3D printing. Pilot operation was undertaken in conjunction with Y Soft.

## Access and security systems

These systems control and monitor the movement of persons in secure areas and are designed for Building Administration, the IT Department, and reception areas. They also allow remote security monitoring of detached units, automatic monitoring of attendance at seminars, and so on.

At the end of July 2017, the remaining faculties—FLaw, FEdu, and FEA—were migrated to the new environment. Because of changes to the rooms during reconstruction over the years, big changes were made as well to the mapping of all the facilities. At the end of 2017, we also converted all the access systems in Faculty of Arts buildings to the new PERUN login system.

Currently, then, all the locations we administer—the UCC, FLaw, FEA, FEdu, FA, the Sumava Centre, and the university's Telc Centre—have been brought over to the new environment.

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**10,000**

students took advantage of UCC services in 2017 during

**289,000**

visits.

Students printed

**497,000**

pages at the UCC out of a total

**1,611,000**

pages printed at all faculties.



## Photos and ID cards

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In all, we photographed

**9,105**

persons.

We issued

**10,278**

ID cards.

## Central administration of computers at MU

The services provided by central administration had outlived their technological lifetime and ceased to meet the needs of the university. Basic problems included client-side performance, a lack of flexibility in launching applications, inadequate support for alternative work regimes, and no support whatsoever for notebooks. During the year, then, we designed and implemented a fresh concept based on System Centre Configuration Manager (SCCM) technology. In addition to solving these problems, the change brought new ways to support users and allowed better integration of the various MU units. We launched the new technology into pilot operation at the UCC.

In 2018, we are planning to carry out a fully functional launch of the SCCM at MU and prepare migration from the older environment. Our priority is to support the MUNI4Students project and to connect the faculties to the shared SCCM environment at MU.

## Overview of PCs administered in university computer rooms

<b>University Campus Bohunice</b>	<b>242</b>	<b>Komenskeho namesti</b>	<b>167</b>
→ Chemistry classroom	25	→ UCC	109
→ Classrooms	102	→ Teiresias	58
→ Campus library	115		
<b>Faculty of Science</b>	<b>150</b>	<b>Faculty of Arts</b>	<b>337</b>
→ Kotlarska 2–classrooms	57	→ Arna Novaka 1–library	113
→ Kotlarska 2–study halls	93	→ Veveri 26–classrooms	31
		→ Gorkeho 7–classrooms	53
		→ Gorkeho 14–classrooms	41
<b>Faculty of Law</b>	<b>110</b>	→ Janackovo Namesti–classrooms	15
→ Veveri 70–classrooms	25	<b>Faculty of Social Studies</b>	<b>95</b>
→ Veveri 70–study halls	85	→ Jostova 10–classrooms	54
<b>Faculty of Education</b>	<b>130</b>	→ Jostova 10–study halls	24
→ Porici 31–classrooms	83	→ Jostova 10–library	13
→ Porici 31–study halls	47	→ Jostova 10–practice room U3V	4
<b>Vinarska Dormitory</b>	<b>3</b>	<b>Telc</b>	<b>76</b>
→ Study hall	3	→ Classrooms	76

### We listen to the university

We deepened our collaboration with the Information Technology Centres (ITCs) at the individual faculties in 2017. We organized three regular ITC meetings which summarized the direction and development of IT at MU. In addition, we organized ten ITC workshops on concrete topics to do with services and IT, such as framework contracts, central PC administration, Office 365, and others. Through the workshops, participants gained a deeper understanding of the issues, practical experience, and the chance to have a discussion with service administrators.

### Catalogue of Services [it.muni.cz](http://it.muni.cz)

We intensified our internal university communications campaign to raise awareness of the use of IT services, especially support for academic activity in the form of instruction and research. Student flyers, videos, and a special microsite were created, along with an improved look for the annual report, and we got involved in popular events like Open Day MU, Noc Vedcu, Open-Day, KypoLab, and Prvakoviny. We also worked with the MUNI editorial staff (newsletter, online MUNI) and opened the new website [it.muni.cz](http://it.muni.cz) featuring the catalogue of IT services at MU.

### New in IT: MUNI4Students

Beyond the 2017 plan, ICS got intensively involved in the last quarter of the year in developing the concept and gathering the materials for the MUNI4Students project, particularly with respect to personal computers, AV technology, strengthening the WiFi network, coordinating mandatory operation of electronic information sources, and reconstructing the UCC.

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In all, we administer

**2,887**

computers, of which

**1,204**

are student computers  
running Windows 10

**106**

are student computers  
running Windows 7

**771**

are employee computers  
running Windows 10

**806**

are employee computers  
running Windows 7.

### Landlines and mobile tele-phones

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In all, we adminis-tered

**6,470**

landlines and

**1,440**

mobile telephone  
numbers.

Landlines were used  
in more than

**136,000**

hours of conversa-  
tion.



## We work together with students

### Thanks to an award-winning thesis, we have been able to improve our authentication services at Masaryk University

An ideal marriage between the operation and development of large-scale university services and student instruction and work experience came with the defence of Martin Cuchran's masters thesis at UCC. Titled 'The Integration of Masaryk University Identities with the Microsoft Office 365 Cloud Environment, its goal was to analyse, design, and implement an authentication system for Masaryk University with the required identities using the Microsoft Office 365 cloud environment, all with a view to the university environment and with only minimum impact on users. The thesis received an award from the MU Faculty of Informatics and its results are in daily use in offering Office 365 services to the university.

### An outstanding masters thesis explored methods for assessing the readiness of users

Testing the knowledge and skills of users before the start of educational activity increases the efficiency of practical instruction. This thesis represented a pioneering attempt to test the knowledge of prerequisites in the field of cyber security. MU student Valdemar Svabensky created a methodology for designing new security games that tested entry-level knowledge and resulted in the first test of prerequisites for a security game in the Cybernetic Polygon at Masaryk University. The test was then evaluated in an experiment that included real players. The results showed that the skills of players as reflected in their game scores could be predicted on the basis of the prerequisite test. The thesis was awarded the Dean's Prize of the Faculty of Informatics as well as the Industrial Partners Prize for Best Thesis at the Faculty of Informatics. It was accepted for publication in the top-rated proceedings of the ACM SIGCSE 2018 conference. Motivated by his success, Svabensky has gone on to enrol in the doctoral program.



## ICT employee involvement in university instruction and supervising masters theses

A total of

**33**

ICT employees taught

**91**

courses.

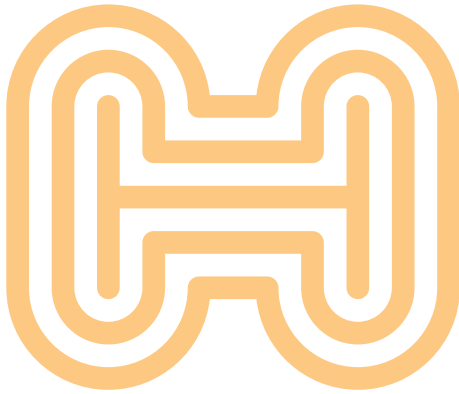
ICT employees supervised

**140**

masters theses and served on the thesis committee for

**49**

others.



## Got an IT problem? The Helpdesk is here to help.

The IT Helpdesk, which serves as the contact point for IT support at Masaryk University solves problems and delegates requests for expert support.

Users may send an email to [helpdesk@ics.muni.cz](mailto:helpdesk@ics.muni.cz) or telephone (549 49) 7722. In 2017, we resolved 1067 student and employee issues from around the university and its faculties. Other issues in the areas of finance and HR were addressed for users via the special helpdesk application on INET.

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### Eduroam

The Eduroam WiFi network was used by

**77,000**

university employees, students, and visitors.

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### VPN

A total of

**7,700**

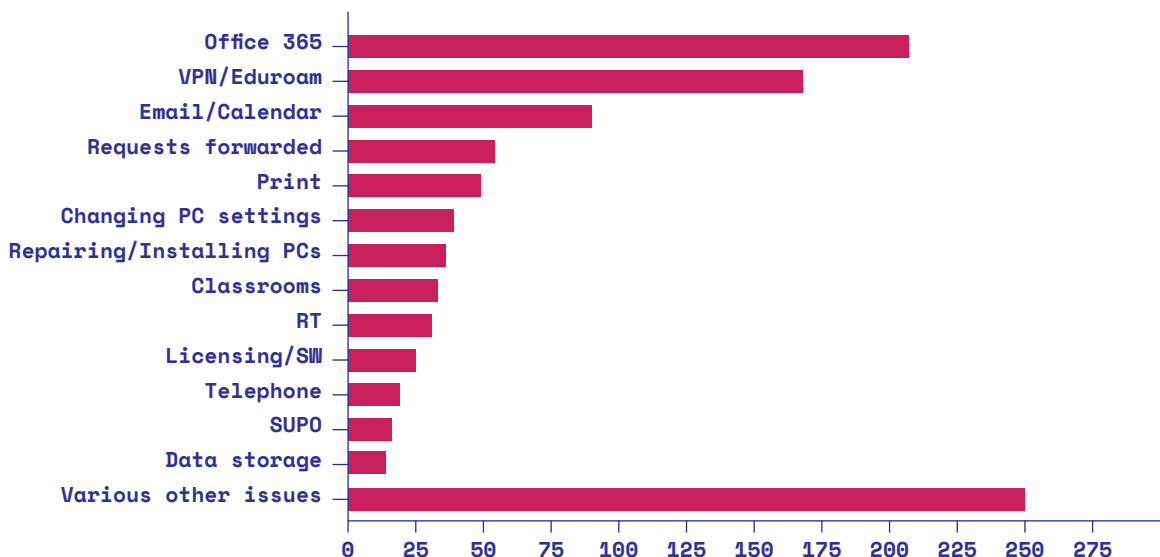
users connected via the virtual private network (VPN), making

**322,641**

connections.

## Statistical breakdown of helpdesk tickets successfully closed

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# E - INFRA - STRUCTURE



## What we do

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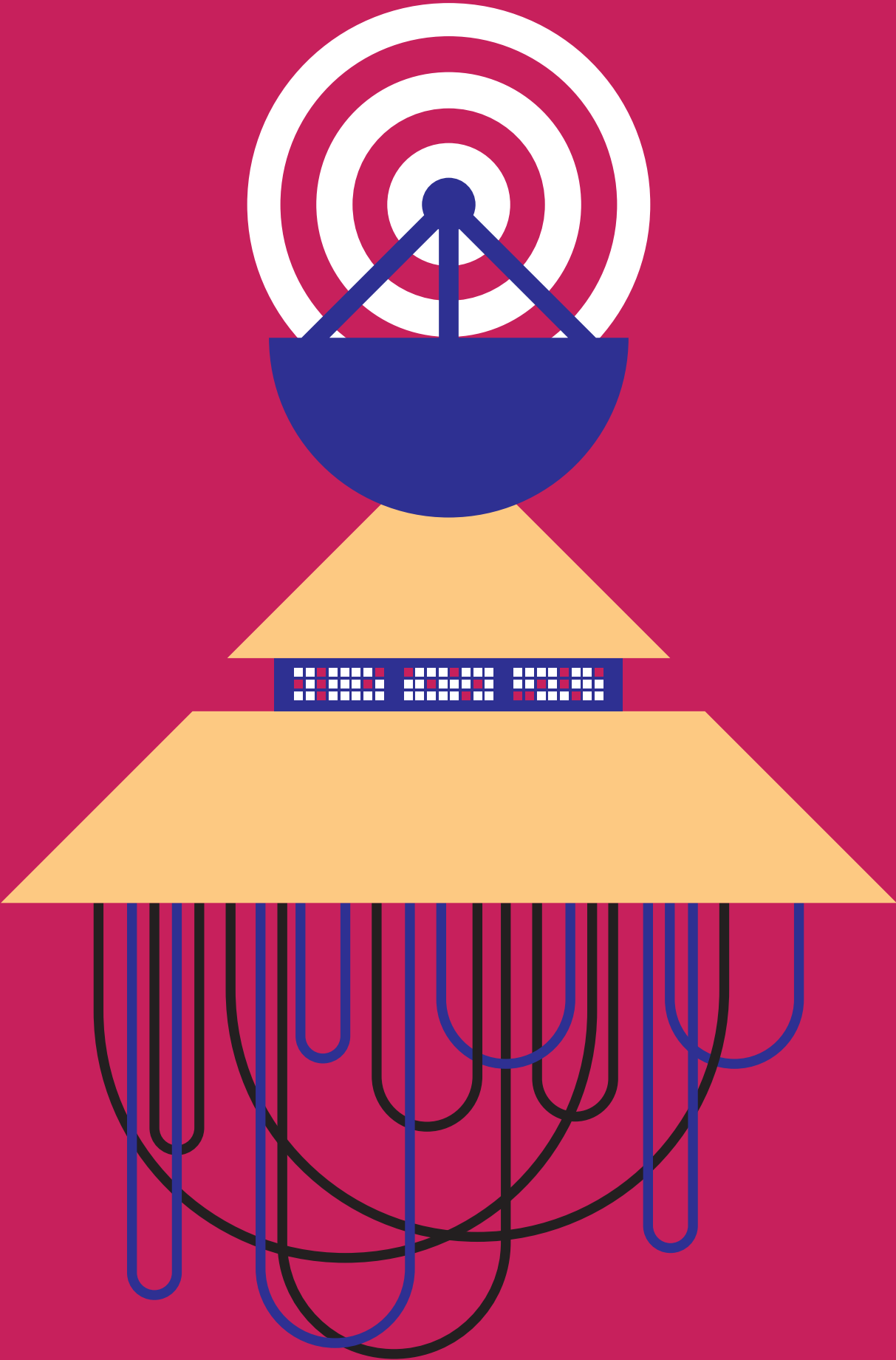
- Comprehensive administration of network backbone and networks in selected locales
- Provide support for computational servers, data storage facilities, and application add-ons
- Integrate similar systems owned by other university units
- Offer custom infrastructure solutions requested by significant user groups

## Key events in 2017

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- Conversion of the university's network backbone and connection to CESNET at 3×40Gbit/s
- Development of the concept of the unified login at MU and the creation of the necessary operational infrastructure
- Launch of the OP RDE projects CERIT-SC and Elixir Capacity Building
- First significant investment in infrastructure from these projects
- Consolidation of infrastructure research teams (big data and calculation-intensive)







# UNIVERSITY DATA NETWORK AND OPTICAL INFRASTRUCTURE

A functional data network is as essential to the life of the university as the electrical system. ICT is the established operator and developer of the institution's cable and wireless infrastructure.

In 2017, we converted the network backbone to 3×40 Gbit/s, resulting in robust double connections to a number of locations. With support from the OP RDE MUNI4Students project, we have been preparing to reconstruct the wireless network, which will require the upgrading of more than 1000 access points to later generation equipment. At the same time, we have begun planning for consistent Wi-Fi coverage for all dorms. Another important objective is the consolidation of the MeDiMed network using a design that is homogeneous with the standard network.

## We administer

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**441**

routers and switches

**22,900**

end sockets

**1,025**

Wi-Fi access points

# IT INFRASTRUCTURE

Server capacity for intensive calculation is located in the CERIT-SC Administration Centre. Most of the equipment was acquired in the preceding period under the OP RDI project. Servers of four basic categories are available, with each type suited to different tasks:

- HD (high-density) clusters with 8-20 cores per node and memory ranging from 96 to 128 GB. They cover the needs of applications with limited internal parallelism utilizing a large number of concurrent instances. Some nodes are equipped with GPU cards.
- SMP (Symmetric Multiprocessing) clusters with 40-80 cores per node and memory of up to 1.3 TB, oriented to applications with high memory requirements or that demand a large number of processors communicating via pooled memory.
- Special SMP machines (SGI UV2) with extremely large pooled memory of 6 TB and a large number of processor cores (currently up to 384), oriented to highly parallel jobs and applications that are extremely demanding of memory.
- A special cluster with Intel Xeon Phi processors and a massively parallel architecture comprised of a large number of x86 cores (the so-called Many Integrated Core). In contrast to conventional processors, Xeon Phi processors have limited performance per core; their power comes when they are used for highly parallel jobs tailored for this type of processor.

### In 2017

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- A new SMP cluster was acquired (including a special node with 4×P100 GPU), along with a storage facility
- Transition to a new PBS Pro planning system
- Containers (Singularity) were put into operation



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The machines owned by CERIT-SC run in a dual-track mode thanks to thoroughgoing virtualization—both purely in the cloud (MetaCloud) and in batch mode (PBS Pro). The number of cores in the cloud are apportioned according to current demands in both environments. The total number of CPUs depicted is less than that in the CERIT-SC centre; for technical reasons, large SMP and NUMA machines are excluded from this mode of operation. As is visible in the figure, the number of sources allocated to batch processing (the blue surface) gradually declines in favour of sources connected to MetaCloud (red surface).

### Virtual servers with high availability requirements

An environment built on VMware vSphere technology places maximum emphasis on stable operation. This is advantageous for critical production services—for mail servers, main university website components, information systems, authentication and file servers, and so on. The overall capacity of this platform is intentionally limited. The relatively expensive VMWare licenses are used only in justified cases.

### Unified cloud infrastructure

We evaluated the pilot run of the OpenStack cloud infrastructure, and on the basis of our combined experience with it, with running the CERIT-SC Centre, and our collaboration with CESNET, we began to build a new generation of general cloud infrastructure at MU. To do so, we acquired storage capacity (360 TB) and 17 servers, some with GPU accelerators that we have been making intensive use of recently for scientific work.



### The CERIT Scientific Cloud contains

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**5,500**

CPU cores

**4 PB**

of disk space for  
user data

**96 to 6,144 GB RAM**

per computer node



# STORAGE INFRASTRUCTURE

The Institute of Computer Technology offers and oversees a wide range of options for data storage. The total capacity of storage available is more than 7 PB.

Individual variants depend upon available capacity, speed, reliability, the means of accessing the data, and the administration mode. Users thereby have an adequate range of storage options suitable for day-to-day work with the most varied types of data, from everyday documents and tables to extensive experimental data and simulation results, as well as to share and archive that data. The storage centre provides internal redundancy, so that the failure of a certain number of disks will cause neither data loss nor service interruption. For critical data, we take the additional step of backing the data up using tape storage.

In addition, our servers possess the required storage capacity to save virtual machine images and active working data.

We have acquired and put into operation a secondary storage centre for user data with a capacity of 2 PB. This storage facility is located at Komensky Namesti and serves as backup should there be a fatal outage in the primary storage centre. Without the secondary storage facility, it could take weeks to restore the data from backup, which would be unacceptable to the majority of users.

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**2 PB**

user data storage  
facility

**1.2 PB**

storage facility  
serving study halls  
and virtual servers

**3.5 PB**

CERIT-SC special  
hierarchical storage  
facility

**1 PB**

tape backup capacity

# CERIT-SC CENTRE AND RESEARCH COLLABORATION

## What we do

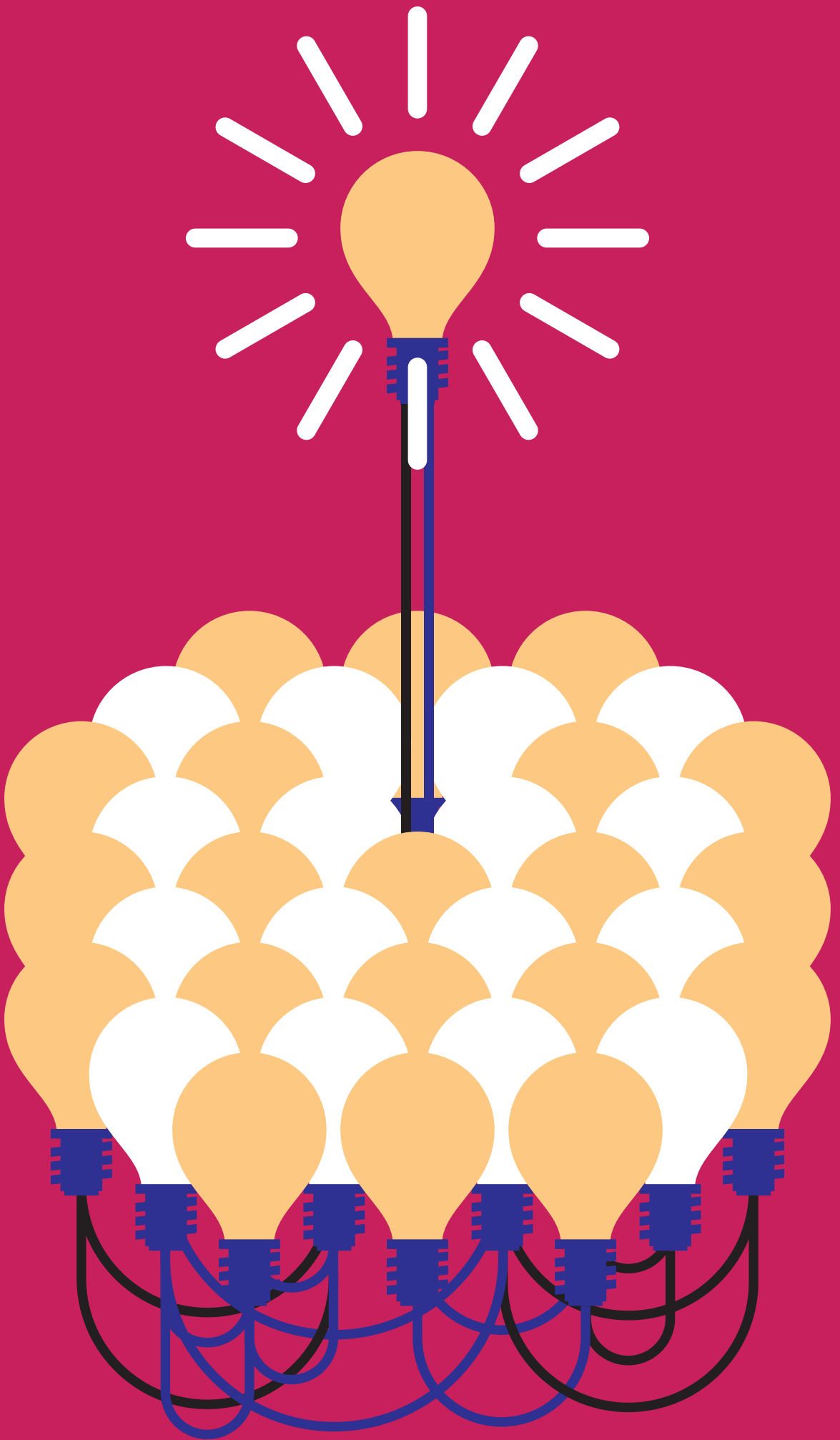
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- Operate and encourage innovative use of the CERIT-SC Centre infrastructure
- Conduct research that supports the development of IT infrastructure
- Conduct interdisciplinary research and development with research partners, including supervising interdisciplinary student theses
- Take a direct part in national and international research projects
- CERIT-SC is on the Czech Roadmap of Large Infrastructure for Research, Experimental Development, and Innovation, and thus an important component in the national e-infrastructure, with direct involvement in the international EGI infrastructure

## Key events in 2017

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- Obtained the project EU H2020 EDIReX: European Distributed Infrastructure for Research on Patient-Derived Cancer Xenografts and led key project activities
- Led key activities in the EU H2020 West-Life: Worldwide E-Infrastructure for Structural Biology project
- Involvement in the ELIXIR Competence Centre in the EOSC-Hub project (ICT Director Ludek Matyska was nominated for the Project Management Board)
- The launch of two OP RDE infrastructure projects—CERIT-SC and ELIXIR CZ: Building Capacity
- Start of negotiations for assuming representation of the Czech Republic in the OpenAIRE Consortium (Open Access, Open Data), playing the role of a NOAD (National Open Access Desk), from Q2,2018 with funding from the related H2020 project
- Preparing for engagement with other H2020 projects to do with e-infrastructure (INFRAEOSC-04 and CanadaEGA)





The CERIT-SC (CERIT Scientific Cloud) Centre is a national centre that operates computational and storage infrastructure for realizing extensive "in-silico" experiments, normally in close cooperation with other academic disciplines. It targets experimental, innovative use of its resources, and is built on three interlocking pillars:

- Providing computational and storage capacity to the academic community—a diverse range of computing nodes, from 8-core CPUs with 96 GB of RAM to SGI UV systems with 384 cores and 6 TB of RAM, as well as storage capacity for user data like ordinary disk systems and hierarchical archive storage. Users may avail themselves of a standard environment with a batch management system and hundreds of installed applications, or run their own virtual machines
- Excellence in research into selected areas of computer science:
  - Big data analysis—processing large volumes of normally unstructured data, searching for unknown patterns.
  - High performance computing—developing and optimizing algorithms, in particular those aimed at parallel and distributed computing and at accelerators (at present GPU and Xeon Phi).
  - Custom configuration and optimization of e-infrastructure for concrete uses such as the simulation of large-scale energy systems, cybersecurity training, and others.
- Long-term collaboration with user groups in many disciplines—where the center acts as a research partner and not just your provider of 'canned' technical solutions.

## CERIT-SC Centre in 2017

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**1,908**

users, who ran calculations amounting to

**4,296**

CPU years working on

**780,000**

tasks.

Total data stored

**2.7 PB.**



## Joint Interdisciplinary Research

### Computational chemistry and structural biology

The EU H2020 West-Life project continued in collaboration with the Madrid laboratory Centro Nacional de Biotecnología. We developed a modified version of an algorithmic reconstruction of a 3D map of the electron density of biomolecules from electron microscope images. The method permits more extensive GPU parallelization, speeding the process by up to a factor of 30.

In addition, we worked jointly with the European Bioinformatics Institute (EMBL-EBI) to develop faster methods of searching the Protein Data Bank for similarities.

In the GAMU project, we focused on advanced hybrid methods by which to study transport processes in proteins and their utilization in biocatalysers and continued to develop and evaluate the CaverDock tool. We presented the first public version at several conferences in mid-2017. We are continuing to develop the tool, particularly with regard to improving its ability to search through variant ways of passing through the tunnel.

In molecular dynamics, we have been researching coarse-grained models (Plumed, Gromacs) in conjunction with CEITEC.

### Bioinformatics

CERIT-SC is an official partner of the Czech national node ELIXIR Czech and, together with CESNET, is responsible for the operation and development of computational and storage infrastructure and provides expertise in various areas of IT. The national node of ELIXIR I, an international ESFRI project, uses the PERUN system we developed to administer identities.

We continue our collaboration with RECETOX from past years on the LAS laboratory system. Our focus is on building infrastructure to process bioinformatics data. We have begun by adapting software for the analysis of mass spectrometry data. We are taking part in preparations for the joint EIRENE RI European Environmental Exposure Assessment Network project.

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Users have thanked CERIT-SC for the use of its infrastructure in

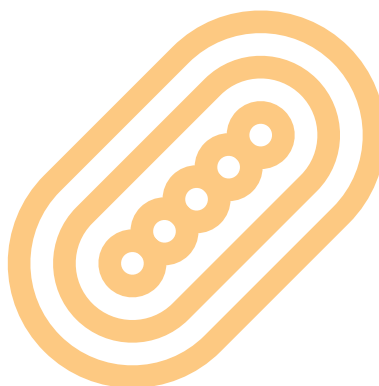
**72**

publications in the Web of Science Core Collection.

CERIT-SC team members have published

**7**

articles.



In conjunction with bioinformatics experts from CESNET and MU, we developed and tested a new version of our ECHO2 tool for genome processing.

We are collaborating closely with BBMRI ERIC, a European distributed research infrastructure that has been designed to create and operate a network of biological material banks for biomedical research, particularly in oncology.

### Climate models

In 2017, we worked together with CzechGlobe to implement a vision and strategy in individual areas and to optimise IT operations. Our focus was on providing comprehensive support for implementing and administering selected IT components, improving the level of information technology available for priority areas, defining HR IT demands, and participating in hiring procedures. We also looked at deploying groupware tools more widely, user training, IT consulting and support, and implementing and optimising methods and calculations within the CERIT-SC research infrastructure.

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Our authors contributed to

**27**

publications, including

**13**

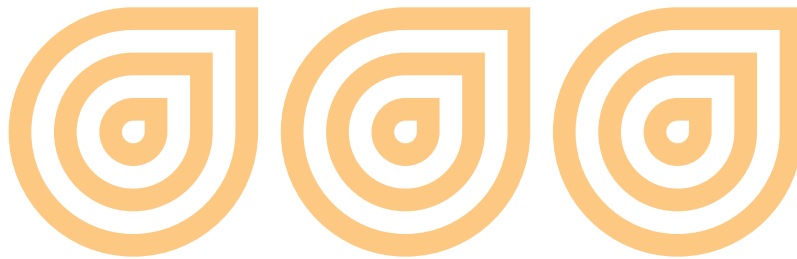
conference proceedings

**3**

journal articles

**2**

prototypes.



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### Completed projects

**7**

national and

**6**

international

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### Submitted and accepted

**2**

international projects



# C4E CENTRE OF EXCELLENCE AND CYBERSE- CURITY



## What we do

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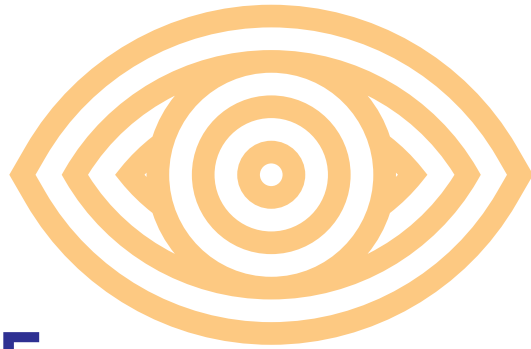
- Ensure a safe cybernetic environment at the university through the CSIRT-MU security team
- Coordinate steps and address security incidents in the MU network
- Manage user digital identities and access to services
- Conduct research and development in topical areas related to cybersecurity
- Collaborate nationally and internationally in cybersecurity

## Key events in 2017

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- Amendment of the directives governing the administration and use of information technology at MU
- Writing the content for ICT security courses for the university community
- Conducting the CyberCzech technical exercises with international participation
- Conducting a secondary school cybersecurity competition and the European Cybersecurity Challenge
- A unified login for MU services the launch of the Perun system in national and international research infrastructures
- Memoranda of Cooperation with the National Agency for Communication and Information Technology and the Ministry of Defence of the CR
- Funding approved for the C4e project under OP RDE Excellence in Research via MEYS
- Preparations for implementing the GDPR, the new EU personal data protection regulation





## C4E CENTRE OF EXCELLENCE

The Czech CyberCrime Centre of Excellence (C4e) is an academic expert centre created as one of two ICT research centres that target excellence in research, development, and education in studying cybercrime, cybersecurity, and the protection of critical information infrastructure. Research activity is divided into three areas:

- **Cybersecurity**—the research team focuses primarily on modelling, analysis, and the suppression of cyber-attacks and cybercrime against a background of constantly rising numbers of novel threats
- **Law**—the C4e legal team analyses and reviews the national legal code, adaptations of European law, and performs comparative analyses and develops individual legal implementation tools.
- **Protection of Infrastructure**—this third area mostly centres on advanced techniques for designing and implementing robust IT infrastructure, especially from a security standpoint and with regard to securing the confidentiality of sensitive data.

### Projects

- **LIVE-FOR**—focused on the identification of barriers to implementation of Directive 2014/41/EU regarding the European Investigation Order in Criminal Matters and on designing mechanisms for the use of the EIO to provide cross-border electronic evidence.
- **SENER**—targets the creation of an international network of national centres of excellence in the fight against cybercrime. The motivation is to allow national centres to use a common methodology, coordinate with each other, and make efficient use of funding.
- **SmartGrid**—one of several contractual research projects implemented by MU in conjunction with the Czech Academic Expert Group for Smart Grid. These projects are focused on designing technological, legal, and security specifications for implementing intelligent measurement systems within the electrical energy infrastructure.

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**Perun, the central system for user administration and access management, administered**

**76,607**

**user accounts,**

**356**

**groups and**

**139**

**external identities at MU.**

## CYBERSECURITY

### **We rewrote the directive on the administration and use of information technology at MU**

Two new security regulations came into effect at the end of October at Masaryk University in reaction to developments in technology, the law, and internal organization. The original 2011 directive was replaced by two shorter, more understandable documents, one targeting regular users and the other IT administrators.

### **A unified MU login**

The security of MU's unified login was boosted during the year. It successfully underwent penetration testing by CSIRT-MU. Further services were integrated, including SKM MU. The unified login was also successfully tested for connection to Microsoft Office 365.

### **We're educating the university community about cybersecurity**

We have long tried to raise awareness of security and promote security literacy among university students and employees. We are using the experience we have gained in awareness campaigns to create effective educational materials, which we then use to put together prototype courses on security basics on the edX platform.

### **We organised our first international security conference**

Building on our successful series of national Cyber Czech exercises in prior years, this year we conducted a pair of exercises for foreign participants. The first exercise took place at the end of February and involved security teams from Albania, Bosnia and Herzegovina, Montenegro, Kosovo, Macedonia, and Serbia. Then in May, we organized exercises for members of the Central European Cyber Security Platform. In addition to the Czech Republic, participants came from Hungary, Austria, and Slovakia.

### **Summer school finalists in the Secondary School Cybersecurity Competition and the European Cyber Security Challenge**

We conducted a summer school in the Cybernetic Polygon for the finalists in the Secondary School Cybersecurity Competition. It consisted of brief lectures complemented by examples from the work of the CSIRT-MU team, as well as practical instruction in the form of cybersecurity games and tutorials. The goal was to create a national team to represent the Czech Republic in

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We resolved a total of

**88,230**

security incidents,

**99.8 %**

of which were taken care of automatically, with only 169 requiring manual intervention. 708 incidents originated within the MU network.



the European Cyber Challenge in Malaga, Spain in November of 2017. The competition team was composed of seven finalists from the secondary schools, two university students representing MU, and one representing CVUT.

### **Preparation and implementation of the General Data Protection Regulation (GDPR)**

Since the start of 2017, we have established a new Data Administration Department which began intensively preparing for the GDPR. A project was launched at the start of the year under the CESNET Fund to undertake legal analyses, set up basic procedures, and obtain experience for a more extensive project. The pilot project was followed by a full project for all 26 public universities from MEYS entitled 'Comprehensive Protection for Personal Data in the University Environment'. ICT served as the coordinator and principal investigator. The project was submitted in autumn of last year, and implementation began in December 2017.

## **CSIRT-MU Collaboration**

### **Sharing what we've learned with security teams from other universities**

We share our experience with security teams working in the university environment. As an example, we helped Ostrava University set up its CSIRT-OSU security team. As part of the Erasmus program, we organized multi-day training sessions for members of CSIRT-UPJS at Pavol Jozef Safarik University in Kosice and established collaboration with the MASTER.CZ-CSIRT security team.

### **Working with industry**

We are creating cutting-edge technology in conjunction with Flowmon Networks to analyse computer network operations. The results of our collaboration are being used by IT professionals around the globe, who use them to understand network events, boost application performance, and protect their systems from modern cyber threats. In addition, we created a simulation environment for AXENTA for the detection of cyber-attacks that uses a centralised log repository and detects data leaks in sysadmin accounts.

### **CSIRT-MU projects**

KYPO II—Simulation, detection, and suppression of cybernetic threats endangering critical infrastructure. This project focuses on the research and development of tools for the costly, time-consuming simulation of real-life critical information infrastructures (CII), the detection of new cyber threats, and the suppression of their unfavourable impact on CII.

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**In 2017, we started work on**

**4**

**projects and obtained**

**1**

**new C4e project under MEYS' Excellence in Research.**



## **SABU—Sharing and analysis of security incidents in the CR**

Working with CESNET, we developed a system to share and analyse security incidents which allows further attacks to be predicted and their impact on the national cyberspace of the Czech Republic minimised. In 2017, we focused on data mining methods for analysing shared events and detecting frequent patterns of attack. We analysed the legal aspects of shared cybersecurity data, particularly from the standpoint of the GDPR.

## **CRUSOE—Research into tools for evaluating the current state of systems and supporting decision-making by CSIRT teams in protecting critical infrastructure**

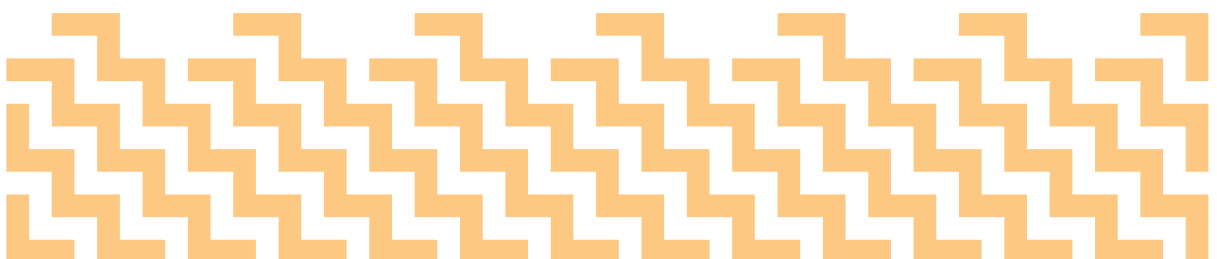
This project creates tools for CSIRT team members to quickly orient themselves in the current state of protected network infrastructure. Ongoing cyber-attacks may be detected, as may vulnerabilities; requirements for confidentiality may then be taken into account, along with the accessibility and integrity of KII.

## **ITOA—Research and development of advanced tools for analysing security and performance issues in network infrastructure, applications, and services**

Under this project, tools are created to monitor and analyse the performance characteristics of networks and applications. These tools allow network operations to be analysed and performance issues to be identified in both the network and applications, including the source of the problem. The project outputs will be of help to IT Operations Analytics (ITOA) administrators.

## **Security Cloud—Technology for the processing and analysis of big network data**

This project enables the processing and analysis of extremely large volumes of data in real time. The results are a response to current network data processing demands, and have been commercialised by Flowmon Networks. The Stream4Flow tool was created by CSIRT-MU members for real-time stream processing of network data.



# INFORMATION AND PRESENTATION SYSTEMS

## What we do

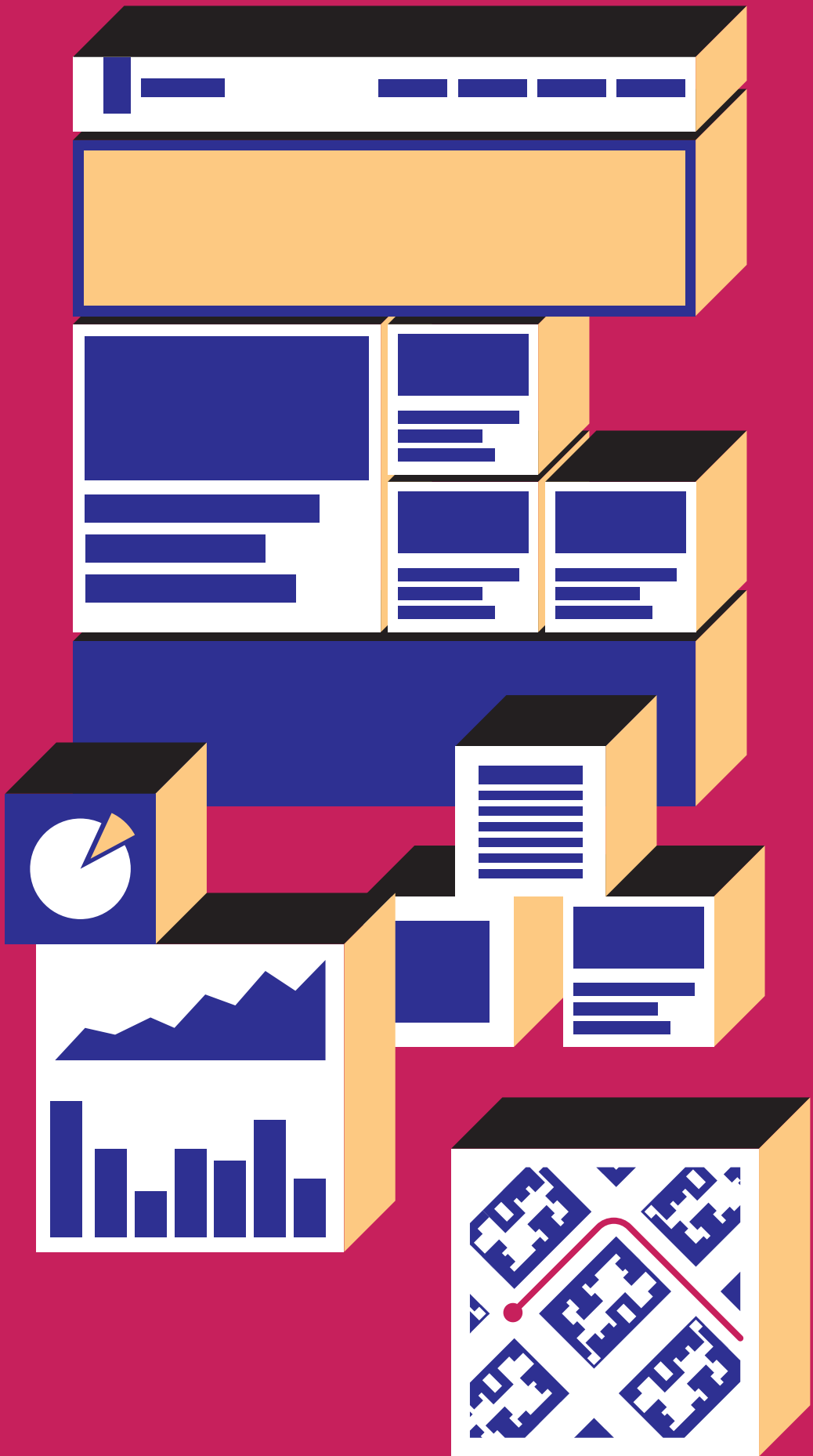
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- The MU Portal for employees
- Digitizing and optimising the MU financial and administrative agenda
  - Coordinating the operation and development of the Magion information system
  - Operating and developing INET, the financial and administrative intranet
- The university-wide editing system for creating websites
  - Operation and development of the Umbraco editing system and the website and newsletter modules in MU's unified visual style that it supports
  - The creation and administration of modular websites (for the university, faculties, departments, workplaces, conferences, projects, and others)
  - Development of custom websites and website components
- Map applications and the GIS Kompas website
- Information systems and registries for ministries (of education and health)

## Key events in 2017

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- Design of the production version of the MU Portal
- Updating of the Portal, INET, and Umbraco to the unified MU login
- Joint project of users of the Magion, IFIS and SAP financial administration systems, legislative development of Magion and INET
- Preparing for the launch of INET at Ostrava University. Digitization of the request and approval process for stipends, internal purchasing, approval of financial contracts.
- Creating an environment for the implementation of large university websites within the university-wide editing system. Utilization of this service for the FA and FEA websites. Close cooperation with the IT centre at the FA to set up department websites.
- Development of the munimap map library
- Development and operation of MEYS systems, development of systems for the Ministry of Health



# UNIVERSITY FINANCIAL AND ADMINISTRATIVE SYSTEM

Comprehensive support for the financial and administrative areas of the university, as well as for HR and associated operational areas, is provided by two systems, EIS Magion and the INET MU intranet. They are supplemented in the area of property management by the online Kompas geographic information system (GIS). The central access point for internal university data and applications is the newly constructed MU Portal. A public layer was built over the top of the university data and systems using the webpage builder WebCentrum. Aside from EIS Magion, all these systems were developed by our institute. We also develop information systems and registers for the Ministries of Education and Health.

- The MU Portal is designed for university employees—more than 8000 users—as an environment for integrating and connecting the university's information and communication systems
- EIS Magion serves almost 900 users in the university's finance and HR departments, and is made up of finance, property administration, and HR modules.
- The INET system serves the needs of more than 40.000 users around the university. It is an add-on to the Magion system that substantially complements and expands its functionality, covering the humanities and sciences, research, internal administration, and operations.
- Kompas has been specially designed to meet the needs of employees of the operations unit and building administration and targets real property and technology.
- WebCentrum is a universal website builder used by 400 internal editors, almost 28.000 registered users, and millions of external visitors to the websites every year.

In 2017, we had:

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**866**

active users of EIS Magion,

**32,000**

active users of INET,

**878**

active users of Kompas,

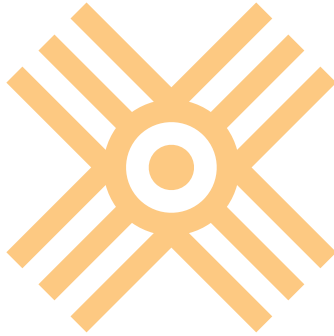
**399**

active users in WebCentrum, and

**1,300,000**

visitors to the [www.muni.cz](http://www.muni.cz) website.





# MU PORTAL— EVERYTHING AT A SINGLE LOCATION

The objective of the MU Portal is to serve as a central access point for all of the university's important information sources. It facilitates the delivery of information and the sharing of information with both students and employees and enables internal MU sources to be searched. In 2017, we connected the Portal to the unified MU login, allowing users to navigate between connected systems without having to log in anew. Currently, the pilot version is in operation, with the production version scheduled for launch on the 100th anniversary of the founding of the university. In 2018, the Portal will become an access point as well for information issued in conformance with the GDPR.

## EIS MAGION

Seven universities are working together on development of the Magion system. They are all part of MagNet, a network coordinated by Masaryk University. Since 2012, it has also worked closely with 12 other universities that run the iFIS finance system. In 2016, that number expanded to take in another six universities that run the SAP system. In 2017, we worked on a joint project, and another is slated for 2018.

### Jobs.MU

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**2,336**

e-applications

**82 %**

of all applications.

In terms of inter university collaboration, MU is also involved at the EUNIS CR level, sitting on the executive committee, and is responsible for the area of EIS.

New functionality was added to Magion in 2017 in response to legislative changes and the demands of university operations. One change made due to legislation was to the way timesheets are to be processed under Act No. 25/2017. Operational considerations prompted changes to the HR/Wage module focused on foreign wage payments and monitoring the workload when payment is made on the basis of an agreement. Changes were also made to the finance modules for bank card operations and access to contracts. And finally, the Contract and Order modules were connected to MU's internal contract registry.

## INET

2017 was a major year for INET: it was launched into service at the University of Ostrava, and a unified login was introduced for internal services at MU. Bursars at universities running EIS Magion also signed an agreement for the use of INET for no charge, and work was done on the development of an e-office for use across the INET system. The latter will bring the following benefits:

- Completion of the module for electronically auditing stipends and its installation at 3 faculties and in the Rector's Office
- Audit of financial contracts
- Centralized purchasing under framework contracts
- Inclusion of SUPO in the creation of statements in accordance with 25/2017
- Approval of monthly attendance records
- Recordkeeping of creative leave (employee placements outside MU)
- Support for the work of academic boards
- Development of project reporting
- Recordkeeping for and administration of telephone networks
- Administration of end-user and administrative Office 365 accounts




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**900,000**

documents saved

**CZK 142,000,000**

annual turnover in the SUPO cashless payment system

# PROPERTY ADMINISTRATION AND GIS SYSTEMS

The online GIS system Kompas is built on the ESRI platform, designed mainly for operations and building administration employees to search and visualise real property and technical facilities in 3D.

The data used in Kompas is also employed in INET, IS, on [www.muni.cz](http://www.muni.cz), and in WebCentrum. We present it using the publicly accessible map library munimap. Kompas and munimap, along with other specialised mapping applications, are accessible via the Geoportál MU navigation site to the entire university community.

In 2017, we added new functions to munimap (entrances to buildings, public transport stops, points of interest) and launched it on INET and on the websites of the natural science and arts faculties.

# FAST AND EASY WEBSITES

The university's WebCentrum was built using the Umbraco editing system and uses data from the university's internal systems. Under the name MuniWeb, we have built an extensive collection of components in the university's unified visual style to construct the Masaryk University website [muni.cz](http://muni.cz) as well as dozens of other web presentations and applications and a set of newsletters. In this way, we constructed websites for the Faculty of Arts and the Faculty of Economics and Administration, and began work on the websites of the Faculty of Education and the Faculty of Social Studies. In addition to faculty websites, we took a hand in creating websites for almost every department, institute,

## Assets

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**267,000**

asset items in inventory

**80,000**

software licenses

## WebCentrum

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**80**

new websites in MuniWeb

a total of

**238**

websites operated



and unit of the Faculty of Arts. We also moved the existing catalogue of IT services at it.muni.cz to MuniWeb and started work on a comprehensive new version of the administrative system for the JobChallenge trade fair. As we have previously done with Portal and INET, we converted Umbraco to the unified login in 2017.

In addition to the technical facilities we provide, we have also begun to offer users assistance in creating websites, including analysing website requirements, designing the website structure, and creating sample pages. We offer these services primarily for the websites of university units and their work.

## INFORMATION SYSTEMS FOR MINISTRIES

We are under contract to operate and develop 7 information systems for MEYS departments on a nationwide basis:

- SIMS—register of university students
- REDOP—register of associate professors and professors
- PPSVS—assessing the standing of university study abroad
- ISACC—IS Accreditation Commission, the new national accreditation office
- NVS—register of requests for recognition of university study abroad
- UOK—recognition of professional qualifications
- RUV—register of artistic outputs

Our main focus in 2017 was on making changes to the SIM, NVS, and REDOP systems to bring them into conformance with amendments to the University Act. Other extensive changes were made to the ISACC system in connection with modification of the accreditation process and to the SIMS system in connection with accepting students from foreign higher education providers in the CR (branches of foreign universities).

Within the Ministry of Health, we worked closely with the Institute of Health Information and Statistics of the Czech Republic on developing national medical registries. Our focus in 2017 was on the NRZP (National Registry of Healthcare Workers) and especially on the NRHZS (National Registry of Reimbursed Healthcare Services) and its communication with ISZR (Information System of Essential Registries).

The MEYS systems are  
used by

**3,531**

active users and

**72**

universities.





# OPEN DIGITAL SCIENCE



## What we do

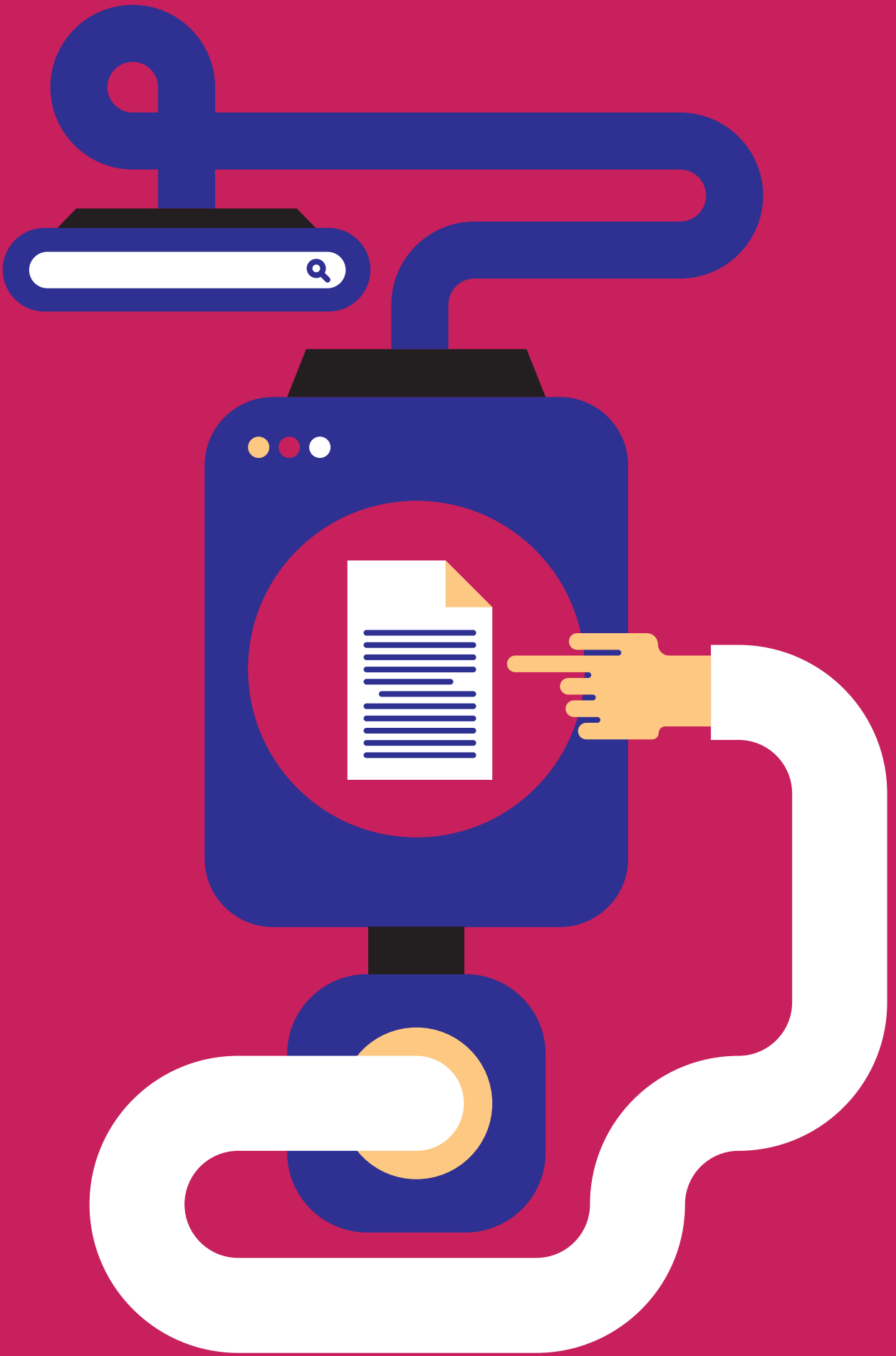
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- Coordinate development of the university library network using the MU Library Information Centre (KIC MU)
- Operation and utilisation of the university-wide library system Aleph-MUNI4Students
- Procuring digital information sources (DIS) for research, instruction, and education at the university
- Implementing technologies for accessing and using DIS
- Digitizing and creating digital libraries
- Coordination of library projects and consortiums

## Key events in 2017

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- Procuring DIS for academics and research at MU for the 2018-2022 period
- Connecting MU to the national CzechELib centre
- Creating the organisational and financial means to maintain DIS using funding from RDI projects (including tenders for DIS for the 2018-2019 period)
- Coordination of DIS for the MUNI4Students project
- MU librarian training program
- Development of a system for long-term archival
- Development of digital libraries
- Preparations for involvement with the OpenAIRE Advanced project





## We are responsible long-term for R&D information sources

Our focus is on ensuring the availability of key digital information sources. In 2017, we:

- Prepared a long-term plan for securing and funding digital information sources for the university. The plan includes a system for selecting a DIS and funding its use, which combines MU central funding and faculty funding.
- Became involved in the national CzechELib center—ICS is on the Advisory Board that prepared the methodological materials and the procedures for selecting and providing DIS to the Czech academic community. MU was successful in acquiring all the essential information sources.
- We once again won a tender, this time for the 2018-19 period, to provide DISs that had been used before in the natural sciences, medicine, and computer science. We located a DIS supplier for the university's MEDINFO project and also coordinated the purchase of digital sources for another seven OP RDI partner projects. The overall result was 25 DIS packages.
- We coordinated the selection of DISs for university students in the MUNI4S-tudents project. This involved a total of 14 source packages containing historical archives of selected journals and e-book collections targeting various disciplines.

## The MU Coordinated Library System

# 15

main libraries  
(8 central faculty libraries, 2 special libraries, 5 branch libraries)

# 1,683,000

physical library units in the stocks of MU libraries

# 39,767

new physical library units this year

## The Aleph-MU Library System

# 1,340,000

library units in the electronic catalogue

# 36,000

registered users

# 629,000

registered borrowings

## Training university librarians

In accordance with the strategic plan for developing MU's libraries, we have set up a training system for university librarians. In 2017, we implemented a cycle of eight lectures and training sessions in the areas of IT technology, library standards, and information trends that were attended by hundreds of participants. We want to continue these sessions in coming years.

## Implementing the ARCLib Project

The ARCLib project continued into its second year this year, developing an open-source system for the long-term preservation of digital libraries and archive collections. We developed a method of long-term preservation of digital data, prepared a detailed methodology for the storage of large volumes of library data and protecting them at the bit level. We also completed the technical and functional specifications for the ARCLib system, and in collaboration with the selected development firm, started the implementation process. In addition to the MU Library Information Centre, other leading Czech libraries are involved in the project, including the Library of the Czech Academy of Sciences, the National Library of the Czech Republic, and the Moravian Library in Brno.

## Digital Information Sources

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**130**

packages of licensed  
DISs (subscription  
or purchased)

**27,500**

e-journals

**210,000**

e-books



## Discovery.muni Search Service

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**228,000**

connections

**462,000**

unique searches

## Digital library development

The development of digital libraries for the needs of both the university and the national academic community continued. Among the most significant are the Czech Digital Mathematics Library, the Digital Library of the Faculty of Arts, the Digital Library of the Faculty of Law, the MU Digital Photography Library, and E-prezencka, a system for digitizing hard-to-find textbooks and making them available. By continually digitizing and including new documents, we are expanding the content of these digital libraries, upgrading the technology employed, and adapting the libraries to new user requirements.



## Digital libraries

5 digital library systems (E-prezencka, MU Digital Photography Library (DPL-MU), Czech Digital Mathematics Library (DML-CZ) Digital Library of the Faculty of Arts (DL-FA), Digital Library of the Faculty of Law (DL-FLaw))

E-prezenčka

**12,200**

digitised  
books

DPL-MU

**61,000**

photographs in

**33**

photo collec-  
tions

DML-CZ:

**38,000**

articles by

**16,300**

authors

DK-FA:

**31,000**

documents by

**7,100**

authors

DL-FLaw:

**2,000**

books/docu-  
ments by

**1,200**

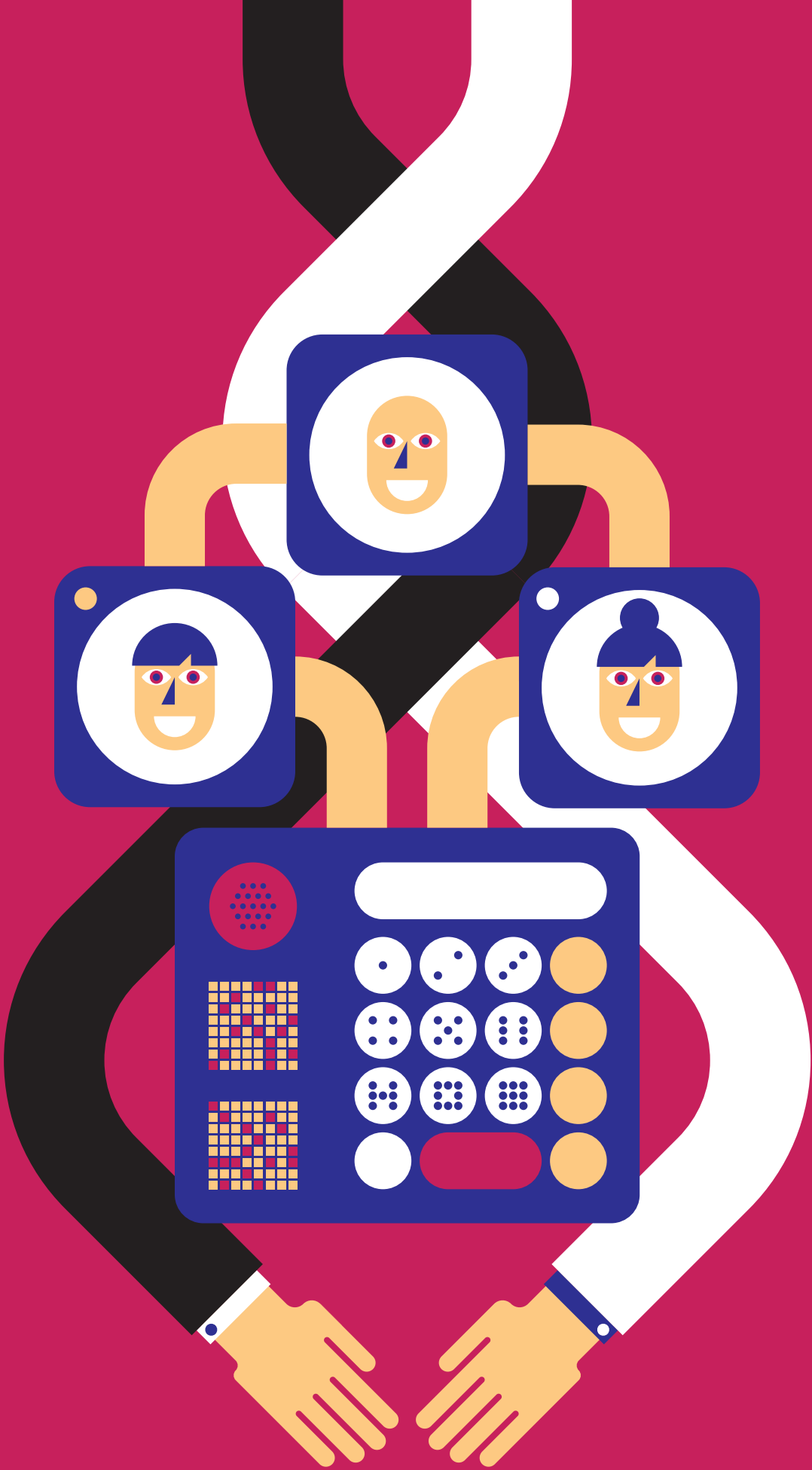
authors



# FINANCE, HR, PROJECTS, AND COLLABORATION







## ICS Employee structure

	Elementary education	Secondary education	Bachelors degree	Masters degree	PhD	CSC
Manual workers	3					
Specialized workers		20	8	58	7	
Professionals				7	13	
Administrative workers		6	1	24		1
Assoc. Prof.					2	1
Professors						1

## ICS MU Income and Expenses (in CZK)

Non-investment activity	2013	2014	2015	2016	2017
Educational activity 1111/2112	96,197,000	96,197,000	96,997,000	96,500,000	96,197,000
Educational activity CF 1112 <sup>1</sup>	32,791,000	35,833,000	41,093,000	42,715,000	39,170,000
R&D institutional funding	1,241,000	1,506,000	1,977,000	2,612,000	3,094,000
<b>Total</b>	<b>130,229,000</b>	<b>133,536,000</b>	<b>140,067,000</b>	<b>141,827,000</b>	<b>138,461,000</b>
<b>Total non-investment budget of ICS<sup>2</sup></b>	<b>251,192,000</b>	<b>289,838,000</b>	<b>294,285,000</b>	<b>271,225,000</b>	<b>262,706,000</b>
<b>Total ICS employees<sup>3</sup></b>	<b>132</b>	<b>142</b>	<b>130</b>	<b>126</b>	<b>128</b>
<b>number paid from 1111</b>	<b>93</b>	<b>95</b>	<b>102</b>	<b>102</b>	<b>99</b>
Non-investment income	2013	2014	2015	2016	2017
Projects and instrumental funds, including FISP	124,500,000	61,400,000	42,453,000	38,135,000	49,121,000
Economic activity	27,415,000	26,970,000	23,737,000	26,859,000	32,885,000
<b>Total</b>	<b>151,915,000</b>	<b>88,370,000</b>	<b>66,190,000</b>	<b>64,994,000</b>	<b>82,006,000</b>
Investments: from funding, IDP and FRFA	2013	2014	2015	2016	2017
buildings, networks, easements	5,000,000	5,000,000	5,318,000	4,852,000	4,080,000
software, licenses, machines, equipment	29,170,000	46,170,000	39,064,000	28,225,000	43,621,000
<b>Total</b>	<b>34,170,000</b>	<b>51,170,000</b>	<b>44,382,000</b>	<b>33,077 00</b>	<b>47,701,000</b>
<b>ICS net income</b>	<b>3,822,000</b>	<b>4,513,000</b>	<b>2,994,000</b>	<b>4,963,000</b>	<b>2,841,000</b>

1 CF does not include payroll expenses

2 including write-offs

3 on average

# FINANCE, HR, PROJECTS, AND COLLABORATION

## Public contracts—ICS MU

Type of contract		In CZK
Open call, above-threshold	4	25,505,000
Above-threshold, without prior publication	2	21,339,000
Sub-threshold, SSP	5	17,420,000
Small-scale public contracts	15	14,644,000
<b>Total</b>	<b>26</b>	<b>78,908,000</b>

## ICS MU Project Overview

Project name	Project type	Duration	ICS Revenue
Udržitelný rozvoj ERP systémů VVŠ	MEYS development project	2017	555,000.00
ICS- Contribution to IP 2017	MEYS development project	2017	246,365.78
Revize a harmonizace lokál. záhlaví—phase 2017	VISK Ministry of Culture	2017	300,000.00
CERIT-SC VI	MEYS Large Infrastructures	2016—2019	9,297,000.00
ELIXIR-CZ VI	MEYS Large Infrastructures	2016—2019	2,882,000.00
ELIXIR-CZ OP RDE	MEYS OP RDE	2017—2021	2,242,842.30
CERIT-SC OP RDE	MEYS OP RDE	2017—2021	2,259,508.45
Vývoj spolehlivých metod pro automatizovanou charakterizaci motility	GA CR Junior projects	2016—2018	93,750.00
Vícečásticové kvantová provázání a bezpečnost (MULTIQUEST)	GA CR LA projects	2017—2019	896,000.00
NAKI ARCLib	NAKI Ministry of Culture	2016—2020	950,000.00
Simulace, detekce a potlačení kyber. hrozeb (KYPO2)	Ministry of Interior	2016—2019	7,319,241.26
Sdílení a analýza bezpečnostních událostí v CR	Ministry of Interior	2016—2019	2,338,372.92
Výzkum nástrojů pro hodnocení kybernetické situace (CRUSOE)	Ministry of Interior	2017—2020	2,983,869.53
Komplexní analýza a vizualizace heterogenních dat	Ministry of Interior	2017—2020	1,634,364.01
Technologie pro zpracování a analýzu síťových dat velkého rozsahu (ITOA)	TA CR ALFA	2014—2017	942,576.00
Výzkum a vývoj pokročilých analytických nástrojů (ITOA)	TA CR Epsilon	2017—2019	1,005,843.44
Wearable IoT	MEYS EUREKA CZ	2017—2020	75,000.00
Advanced Onboard Data Recording	MEYS EUREKA CZ	2015—2017	558,000.00
Total			<b>36,579,733.69</b>

### Foreign Projects

SDI4Apps (Uptake of Open Geographic Information Through Innovative...)	EU-CIP	2014—2017	459,151.48
Senter	EU-Other community programs	2016—2017	440,701.30
LIVE_FOR	EU-Other community programs	2016—2018	916,707.04
Thalamoss	EU-7.RP	2012—2017	372,004.88
ELIXIR-EXCELERATE	EU-Horizon 2020.RIA	2015—2019	2,282,562.02
West-Life	EU-Horizon 2020.RIA	2015—2018	5,502,155.90
Total			<b>9,973,282.62</b>

<b>Total</b>			<b>46,553,016.31</b>
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# ORGANIZATIONAL STRUCTURE

## Management

- **prof. RNDr. Luděk Matyska, CSc.**, Director
- **Ing. Martin Veselý**, Deputy Director for Strategy and Service
- **doc. Ing. Otto Dostál, CSc.**, Vice-Director for Research and Development
- **JUDr. Dana Šrubařová**, Bursar
- **RNDr. Miroslav Bartošek, CSc.**, Head of the Library and Information Centre
- **RNDr. Jana Kohoutková, Ph.D.**, Head of the Information Systems Division
- **Mgr. Aleš Křenek, Ph.D.**, Head of the User Support Division
- **Mgr. Kamil Malinka, Ph.D.**, Head of the Computational and Storage Infrastructure Division

## Director's Council

**prof. RNDr. Luděk Matyska, CSc.**, **Ing. Martin Veselý**, **doc. Ing. Otto Dostál, CSc.**, **JUDr. Dana Šrubařová**, **RNDr. Miroslav Bartošek, CSc.**, **RNDr. Jana Kohoutková, Ph.D.**, **Mgr. Aleš Křenek, Ph.D.**, **Mgr. Kamil Malinka, Ph.D.**, **RNDr. Tomáš Rebok, Ph.D.**, **Mgr. Břetislav Regner**, **Mgr. Michal Vičar**

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- Support and Service Department
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- Information Systems Administration
- Information Systems Development

## Cybersecurity and Data Administration Division

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- Security team—CSIRT-MU
- Library-Information Centre

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- Technical and Operational Office
- Investment and Public Tender Office
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Ministry of the Interior  
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National Cyber Security Centre  
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