

# ANNUAL REPORT 2016

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**cz.nic** | CZ DOMAIN  
REGISTRY

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The background features several large, thin white circles of varying sizes. Scattered throughout are solid-colored dots in blue, red, and grey. A white rectangular box is centered horizontally, containing the text.

# **1 ASSOCIATION PROFILE**

# 1 ASSOCIATION PROFILE

CZ.NIC is an interest association of legal entities, an open and independent entity, whose long-term goal is to support the development of the Internet community both in the Czech Republic and abroad.

The core activity of the association is the administration and security of operation of the top-level national .CZ domain registry. The activity of the association in the field of security is also very important, both through the Czech CSIRT.CZ National Security Team and through security projects, particularly the Turris home router ecosystem.

In addition to these activities, the association is dedicated to research and development in the field of the Internet, Internet protocols or network traffic. Other activities include education and trainings in the Internet and new technologies domains.

The CZ.NIC association was established in May 1998 and the main reason for its establishment was the growth of the importance of the Internet and thus the number of its users and those interested in registering domain names in ccTLD .CZ. By the end of 2016, the association had already 112 members, which are divided into three chambers.

At present, the association represents a stable and trustworthy entity capable of ensuring the reliable operation of the Czech national domain .CZ. Since 2013,

CZ.NIC is the holder of the ISO 27001 certificate confirming the safe handling of information, including the setting of appropriate rules and procedures.

For domain owners, registrars but also other entities that use the Internet for their work and leisure time, the association is a reliable partner that not only provides domain name management, but also safeguards Internet security and socially beneficial activities - whether in the form of laboratory projects or education.



# **2 FOREWORD OF THE CHAIRMAN OF THE BOARD OF DIRECTORS**

## 2 FOREWORD OF THE CHAIRMAN OF THE BOARD OF DIRECTORS



Dear Ladies and Gentlemen,  
also last year we were successful in fulfilling our vision, i.e. managing the Czech national domain .CZ without mistakes, operating and developing trustworthy, secure and robust infrastructure and innovative Internet services. For domain owners, registrars and other entities using the Internet for their work or leisure time, we continue to be a reliable partner that not only firmly holds the rudder of the .CZ domain administration, but also cares to increase the stability and security of Internet services and socially beneficial activities in this area.

The number of registered domain names .CZ grew to 1.28 million last year, which is good news because some European national registers have seen a decrease in the number of domains. Other domain names would probably appear with the introduction of IDN (i.e. enabling a national or other alphabet in domain names), but in a survey on its launch the Internet community (both businesses and individuals) was against the introduction of IDN, mostly by referring to compromised security after the introduction of this system.

Our biggest current project is Turris - a project aimed at protecting end users using our own routers and their central security management. In this research project we have successfully tested hardware development and manufacturing, operating system modifications and building central management software. The desire among users for a commercial version resulted in a crowdfunding campaign for the Turris Omnia product, aimed at a higher user segment.

We managed to collect more than USD 1 million, especially among users in the Czech Republic, but also from significant contributors from the USA, Germany and Switzerland. The end devices with these parameters promised could be developed thanks to the team's relentless spirit, and all those interested from the campaign have been satisfied. At the end of last year, we started selling the device through various distribution channels and already have thousands of satisfied users. We are currently planning additional versions for a wider range of customers.

From the other exclusively open-source technology projects, I would like to mention myMID (simple and secure authentication of Internet users with a base of more than half a million users), Bird (software routing daemon for UNIX environment), KnotDNS (a powerful purely authoritative DNS server) or Netmetr (measuring the quality of the Internet line in cooperation with the Czech Telecommunication Office (ČTÚ)). In the area of trainings and education, our television series - the traditional Jak na Internet (How to tackle the Internet) or the new Nauč tetu na netu (Teach your aunt with the internet) are also known to the general public. I would also like to mention our Tablexia educational application (designated primarily for dyslexic children).

Our CSIRT.CZ team continues to oversee the security of the Czech cyberspace, and in 2016 this team sent more than 6,500 messages to address security incidents, which is certainly a significant contribution to security. The operation

## 2 FOREWORD OF THE CHAIRMAN OF THE BOARD OF DIRECTORS

of the National CERT is a non-profit activity, but we are glad that we can contribute to protecting Czech internet networks against various attackers through our experience, knowledge and hard work.

Last year, we managed to exceed CZK 210 million in turnover. Profit before tax exceeded CZK 20 million, which confirmed the fulfilment of the adopted plan, as the profit after tax serves as a reserve for the operation of key activities of the association.

We must certainly thank all employees of the association for their excellent work, which has ensured the smooth operation of our organisation, providing great services the Czech Internet community already for many years. The good reputation of our association on the domestic scene and abroad is certainly deserved and stems primarily from our reliability and our ability to create new and useful technologies.

You can find all the essential information about the association in this Annual Report. I firmly believe we will not disappoint you in the years to come.

**RNDr. Karel Taft, MBA** | Chairman of the Board



# **3 INTRODUCTORY WORD OF THE CEO**



### 3 INTRODUCTORY WORD OF THE CEO



Dear Ladies and Gentlemen,

also the year 2016 is very easy to evaluate in this regular preface of the Annual Report. And so I am not afraid to say again that it was a very successful year. Although it is often not commonplace abroad, the Czech national domain has continued to grow strongly. Thanks to this, we have overtaken our southern neighbour, Austria, in the number of registrations. The qualities of our FRED registration system are best supported by the fact that more and more national domains are deploying it. Last year the eighth largest country in the world, Argentina, migrated to our system.

But the number of registrations themselves are not the only thing we focus on. We place great emphasis on securing the domains, and last year we achieved a milestone when the number of domains secured with the DNSSEC technology exceeded the number of unsecured domains. In deploying this security technology, the Czech domain is one of the world's top leaders.

And perhaps one more milestone is worth mentioning: the number of mo-jelD users exceeded the half-million mark. We firmly believe that this service will continue to gain importance and help the state build a system of national electronic identities.

One of the most visible projects in the media is the Turrís security project, and last year it was mainly the production of the new Turrís Omnia router which followed an exceptionally successful crowdfunding campaign. All campaign participants got their routers and then started the commercial sale in regular electronics stores. This of course meant a profound change

in the company's internal organisation that has never been set for sales to end customers across the European Economic Area.

The CZ.NIC association has always supported an open and free Internet, so we have stubbornly opposed the adoption of certain paragraphs of the amendment to the Hazard Act that allow the Ministry of Finance to order blocking websites. Although our "Censor Coming" campaign was quite visible and resonant in the media, we were unfortunately not successful in this respect and we were not able to convince the legislators of the harmfulness of such a measure. I firmly believe, however, that we have clearly declared to the state what is the standpoint of the local Internet community regarding such things, and that every subsequent introduction of censorship will hit harsh resistance.

Finally, I would like to emphasise that our association does not only deal with current issues, but of course also thinks about the future – and education of the youngest part of our population is of course related with this. This is why we co-operated with the Czech Television on the successful education TV series "Nauč tetu na netu" (Teach your aunt with the internet), which was broadcast on the CT :D channel.

All I have to do now is thank all my colleagues for doing a really great job, which has shifted our association a great deal forward again, and I hope we have laid the foundation for further development and growth in the years to come.

**Mgr. Ondřej Filip, MBA** | CEO



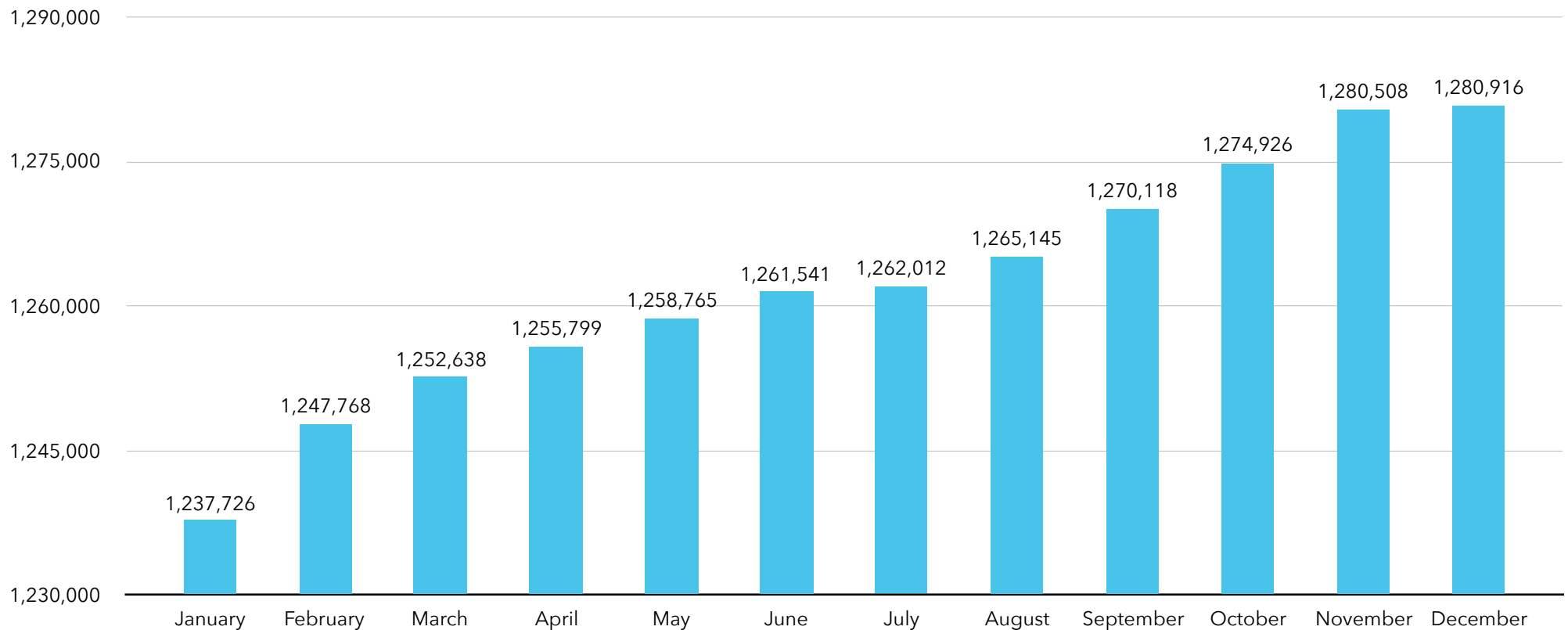
# **4 THE .CZ DOMAIN**

## 4.1 Registration status and trends

During 2016 the total number of domains in the .CZ zone rose by 50,586, which constitutes growth of almost 4%. The Czech national domain .CZ therefore

reflects a trend that is being experienced by almost all national registers: a falling tendency of national domain registrations (ccTLD), caused mostly by market saturation and partly also by new alternatives for domain name registration through so-called new generic domains (new gTLD).

Total number of registered .CZ domain names in 2016

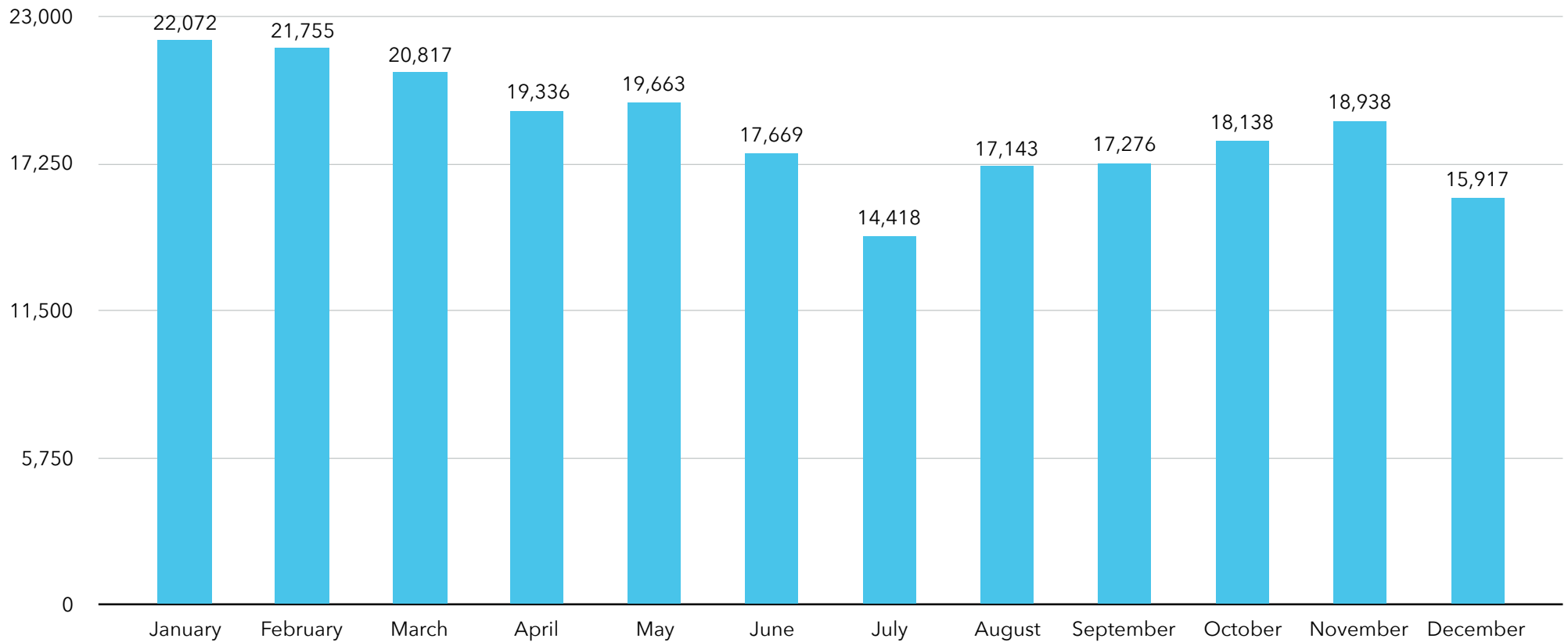


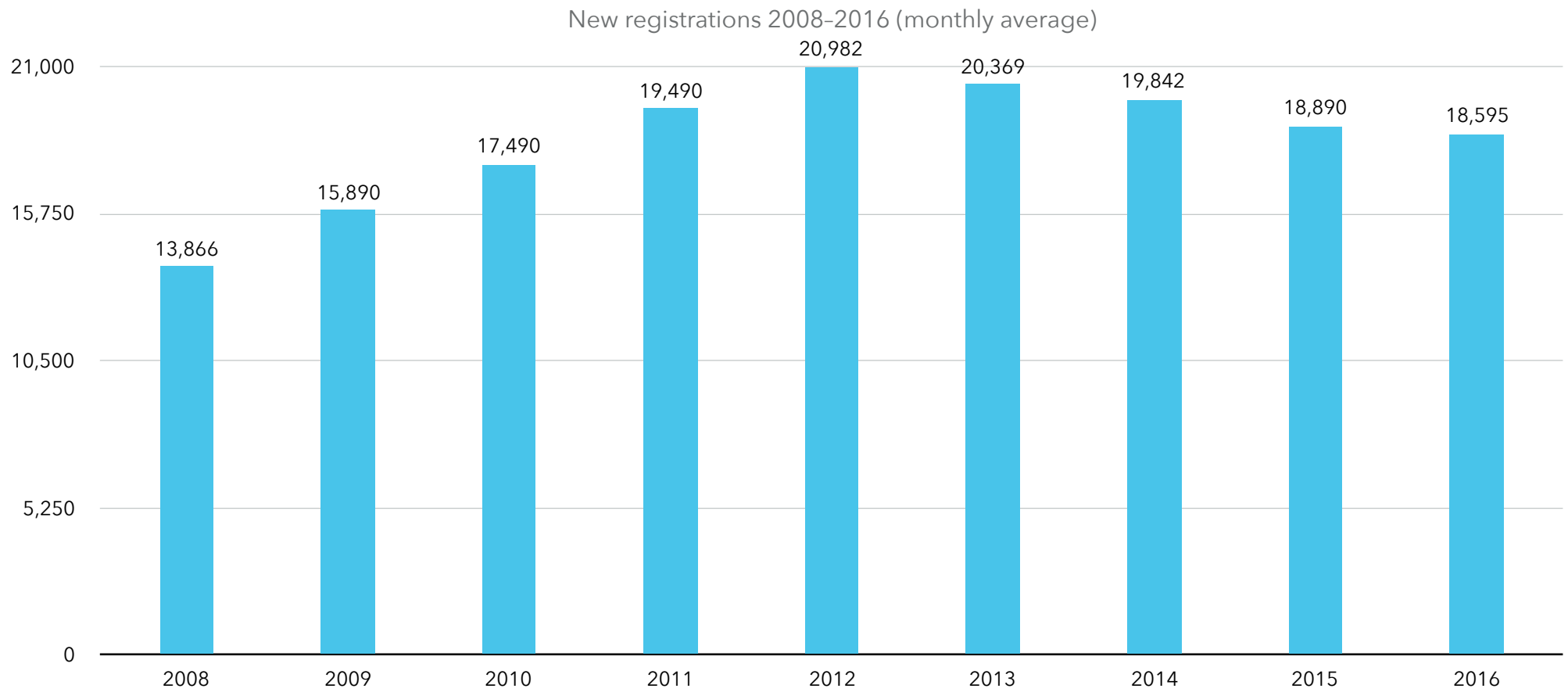
# 4 THE .CZ DOMAIN

In 2016 an average of 18,595 new domain names were registered every month. Like in the past period, this slight drop in the average number of registrations reflected the trend of global growth in new domains. The following

charts show the number of new registrations on a month-to-month basis in 2016 and the trend of the average number of new registrations since 2008.

New registered .CZ domain names in 2016





## 4.2 Registrars

The administration system of .CZ domain names is based on the so-called distributed principle where contracting partners of CZ.NIC - registrars perform the domain name registration. CZ.NIC acts similarly as a wholesale partner towards them but provides the technical aspects and functionality of the .CZ domain of the highest level.

In 2016 contracts were signed with two new registrars - the French company 4X and the British Nom-IQ Ltd, dba Com Laude. K 31. 12. As of 31 December 2016, the registrar 1X s.r.o. terminated the agreement.

At the end of the year, a total of 46 companies, 29 domestic and 17 foreign, had the registrar contract. This number offers a wide choice for end user, but also provides sufficient competition.

### 4.2.1 List of .CZ domain name registrars

#### List of all certified registrars as of 31 Dec 2016 12. 2016

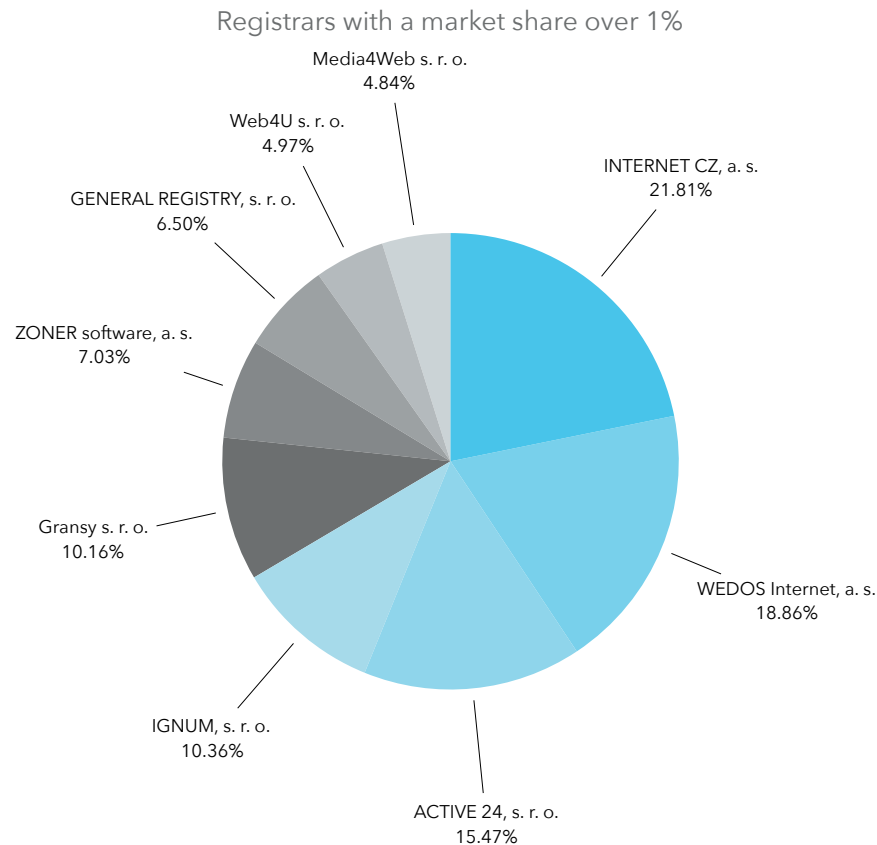
1API GmbH	Ascio Technologies inc.
4X	ASPone, s. r. o.
Above.com Pty. Ltd	AXFONE s. r. o.
ACTIVE 24, s. r. o.	CORE ASSOCIATION
AERO Trip PRO s. r. o.	Dial Telecom, a. s.

e-BAAN Net s. r. o.  
Economia, a. s.  
Gandi SAS  
GENERAL REGISTRY, s. r. o.  
Gransy s. r. o.  
IGNUM, s. r. o.  
Instra Corporation Pty Ltd  
INTERNET CZ, a. s.  
InterNetX GmbH  
IP Mirror Pte Ltd  
Key-Systems GmbH  
KRAXNET s. r. o.  
MarkMonitor Inc.  
Media4Web s. r. o.  
MIRAMO spol.s r.o.  
NEW MEDIA GROUP s. r. o.  
nexum Trilog a. s.  
Nom-IQ Ltd, dba Com Laude

O2 Czech Republic a. s.  
ONE.CZ s. r. o.  
ONEsolution s. r. o.  
OVH, Sas  
PIPNI s. r. o.  
ProfiHOSTING s. r. o.  
Safenames Ltd.  
Seonet Multimedia s. r. o.  
Sonexo B.V.  
Stable.cz s. r. o.  
TELE3 s. r. o.  
TERMS a. s.  
united-domains AG  
Variomedia AG  
Web4U s. r. o.  
Websupport, s. r. o.  
WEDOS Internet, a. s.  
ZONER software, a. s.

## 4.2.2 Major domain name registrars

The most important registrar according to the number of administered domains was the same as last year: the INTERNET.CZ, a.s., company followed by WEDOS Internet, a.s., ACTIVE 24, s.r.o., IGNU, s.r.o., and Gransy s.r.o. An overview of registrars with a market share above 1% is shown in the following chart.



## 4.2.3 Registrar Certification

Launched in the middle of 2011, the certification project shall make it easier for end users (i.e. parties interested in a new registration as well as existing domain name holders) to find their way through among the high number of registrars, particularly regarding the portfolio and service quality. The certification method was prepared in collaboration with APEK (Association for Electronic Commerce) registrars and organisations.

Registrars who participate in the programme can always get the "Certified Registrar" logo for one year. From initially nine registrations performed under voluntary certification in 2011, the number rose to twelve. The end customer can hence enjoy constant service quality improvements.

At the end of 2016 it was 10 registrars who met the most demanding criteria for the award of five stars. There is also no longer a registrar among the certified registrars with only three stars. The service quality of registrars, reflected by the number of stars, is shown in the next chart.

	2011	2012	2013	2014	2015	2016
*****	3	6	8	9	10	10
****	3	5	4	3	2	2
***	2	1	–	–	–	–
**	1	–	–	–	–	–

### 4.2.4 Cooperation with registrars - co-marketing scheme

The CZ.NIC association seeks to support registrations of .CZ domains of the highest level in the long term which complies with its industry practices. Given the distributed administration method of the national domain, the CZ.NIC association has limited options how to address potential domain name holders through direct marketing.

This fact gave birth to the co-called co-marketing scheme, within which CZ.NIC contributes to registrars (provided they have fulfilled applicable requirements) to their communication campaigns, promoting domain name registrations in ccTLD .CZ. The amount of this contribution from CZ.NIC depends on the registrar size, campaign volume and compliance with other factors such as the use of mojID or domain security through DNSSEC, all of which shall motivate the registrar to extend these technologies.

The popularity of the co-marketing scheme, thanks to which the .CZ domain has become more and more visible for example on outdoor advertisement surfaces, has been growing in terms of the registrars involved and the volume of funding. In 2016, the scheme was attended by 12 registrars, to which CZ.NIC paid a record amount of CZK 10,160,000.

### 4.3 Register data improvement

Quality improvements of data maintained in the domain name register continued also in 2016 when, like in 2014, the aim was to merge multiple duplicate contacts which have been accumulating in the database over the years. Also, user data were verified to improve security, correctness and hence make it easier for CZ.NIC to contact the holder for example when there was a risk that the domain would be cancelled due to an outstanding payment of the registration fee. Domain name holders were motivated to update and verify their data - a small reward (promotional item of CZ.NIC) was offered to them.

In 2016 a total of 10,683 contacts were verified on the postal address level.

#### 4.3.1 Handling disputes for .CZ domain names

As the average duration of a legal dispute with a general court is about three years, which is too long for the dynamic internet environment, it was necessary to find an alternative solution for disputes regarding domain names that would be fast (and hence as inexpensive as possible), stable and transparent. Therefore, the so-called Alternative Dispute Regulation (ADR) system has been in use since the summer of 2014. The system worked as the so-called arbitrator of public offer and disputes related to domain names, aimed against its owner, could be held with the Court of Arbitration attached to the Czech Chamber of Commerce and Agrarian Chamber of the Czech Republic as arbitration



proceedings. During the ten years of existence of this alternative dispute solving method, the Arbitration Court discussed over one hundred disputes.

Based on the judgement of the Supreme Court, which questioned this arbitration agreement method, and following numerous independent legal analyses, consultations and seminars, a new ADR was introduced on 1st March 2015. The basic dispute solving principles are similar with those that have been successfully used in UDRP and ADR .eu. This and the fact that the platform where the disputes handled is administered by the Arbitration Court, as decided in the memorandum made with CZ.NIC, allows the users to utilize the knowledge and experience of experts obtained in disputes for domain names already registered under a different TLD. The new ADR system is not an arbitration process complying with the arbitration law and this is also reflected in the terminology used. The system is based on contractual negotiations and only a domain name transfer or cancelling (no other claims such as damage compensation) can be claimed. The decision is not an execution title for the judgement and a dispute pending according to ADR rules, effective since 1 March 2015, does not obstruct litispence (i.e. proceedings pending in the same matter) and an ended dispute does not obstruct decided matters. The same claims can be therefore forwarded to a general court during the proceedings or afterwards.

The new ADR method is binding for those domain name holders who registered their domain either after the effect date of the new Registration Rules or extended after this date the validity of their existing domain they had

registered before. This is obviously one of the reasons why only a few disputes were handled this way in 2015.

In 2016 this method of dispute resolution was gradually adopted and used by the parties. A total of 23 disputes were started, of which 20 were in the ADR system at the Arbitration Court (2015 it was only 5 disputes) and three with the General Court - more precisely with the City Court. It should be noted that these are disputes about which the CZ.NIC association is informed. Particularly in cases handled by general courts this does not have to be the final number, as the parties to the dispute do not always inform the association or request co-operation.

Year	Number of disputes in the ADR system
2015	5
2016	20

### 4.3.2 Customer support

24/7 customer support is an integral part of the secured operation of the .CZ domain. The customer support shall first of all ensure the best possible care of domain holders, particularly in scenarios where the domain might be cancelled, contact details change or the domain is transferred. Assistance to mojID service users and their validation is also an integral part of customer support.

In the relationship with domain holders, customer support is based on a pro-active approach, the aim of which is to prevent domain unregistration or expiry due to obsolete contact details or forgotten payment. Given the distributed .CZ domain administration system, customer support is the only case where the CZ.NIC association is in direct touch with domain name holders.

Besides standard e-mails sent to customers on an automated basis by the domain registration system that mostly notify about the failure to pay the extension fee, our customer support has, for example, manually reviewed nearly 200,000 domains prior to decommissioning and more than 93,000 holders, whose domains were facing termination, were contacted. The following chart shows activity trends converted into the monthly average.

	2010	2011	2012	2013	2014	2015	2016
Manual check of domains facing unregistration	–	8,916	15,176	18,586	21,598	20,512	20,894
Manual check of domains facing cancellation	–	4,314	11,061	14,378	16,666	16,041	16,529
Phone calls made to customer whose domain was facing cancellation	4,263	4,314	4,767	6,690	7,808	7,367	7,826
E-mails sent prior to unregistration	1,201	1,429	1,708	1,716	1,915	1,718	1,849
Responses to e-mail queries	828	1,240	1,746	1,945	2,782	3,015	2,074
Responses to phone queries	561	1,063	1,120	1,242	1,416	1,262	1,227
Requests (validation, blocking, etc.)	145	180	248	315	455	405	701

The data constitute the average number of tasks per month.



# **5 INFRASTRUCTURE**

## 5.1 Technical aspects of domain administration

The DSDng register central system was designed as a fully redundant system. All hardware and software are located in three mutually independent locations:

- the TOWER data centre of České Radiokomunikace in Prague 3,
- Telehouse CE Colo in Prague 10 and
- non-public location outside Prague.

All locations have their own Internet connection, but also a connection to the power grid. The TOWER data centre is connected to the distribution network from three independent transformer stations, the Telehouse CE Colo and the location outside Prague are supplied from two transformer stations. A back-up power supply is available in all data centres via UPS and possible longer outages are bridged by power from diesel generators.

The system is built as a fully heterogeneous system – any defect of any hardware manufacturer must not bring down the central register. Therefore, systems from different suppliers are installed in every location. The same approach applies to authoritative DNS servers, operated even on three different systems (KNOT, Bind and NSD).

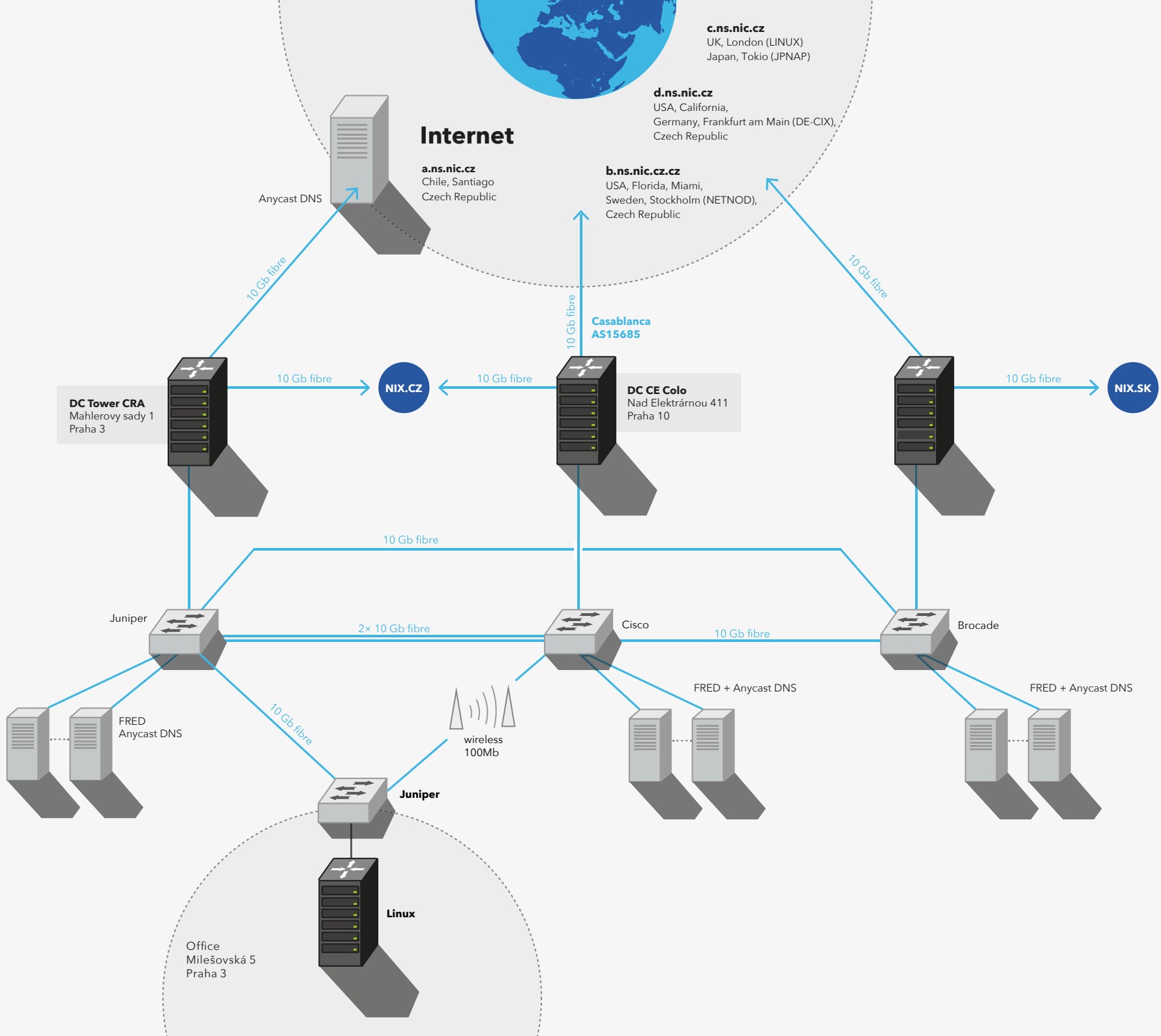
The actual software of the central register is designed in a way ensuring that any component of the architecture can be replaced by any copy running

on the server in the other locations. A critical component is the PostgreSQL database, which is – in routine operation – replicated in both other locations. In the event of the primary location failure, traffic can be converted to the replicated database without any limitation or impact on functionality. Back-up systems are designed and operated in a way as to make it possible to take over any components within a short period of time and take over their operation in the registry.

In 2016 the DNS infrastructure of anycast was boosted by increasing the number of DNS servers connected and by upgrading backbone switches. Due to the increasing risks associated with DoS-type attacks, it was decided to build a significantly more robust DNS infrastructure in the years to come. Contracts were also reviewed for backbone routes and connectivity. This is also connected with the reduction of their costs of CZK 200,000 p.a. The cooling system in the DC CE Colo was also improved thanks to the use of the cold and warm aisle principle and the back-up system was upgraded.

### **FRED (Free Registry for ENUM and Domains)**

The software, developed for the central registry and operated by CZ.NIC, was made available as open and free software as part of our support of smaller registries. This way, smaller and starting registries can operate their domains on the system, designed for the Czech domain environment and prepared (thanks to its parameters and capacity) for a much higher number of domain names than currently registered in ccTLD .CZ.



Besides the Czech Republic, this system was controlling in 2016 the domain management in nine more countries. It is used to administer the domains of Costa Rica (.cr), Faroe Islands (.fo), Tanzania (.tz), Angola (.it.ao and .co.ao), Albania (.al), Macedonia (.mk) and since 2016 also Togo (.tg), Malawi (.mw)

and Argentina (.ar). The deployment in Argentina has become the second largest instance of the FRED system with more than half a million registered domains. At the turn of 2015 and 2016 the use of the FRED system was terminated in Estonia (.ee), as they programmed their own system.



Servers administering .CZ domain records are operated by the CZ.NIC association in several locations worldwide including Sweden (Stockholm), Austria (Vienna), Great Britain (London), Germany (Frankfurt), Chile (Santiago de Chile), United States (Redwood City and Culpeper), Japan (Tokio) and, of course, the Czech Republic (2× Prague and one non-public out-of-Prague location).

The central registry system is prepared for operation on IPv4 and IPv6 and its current implementation for the .CZ domain (as well as all DNS servers) is operated on these both protocols.

Refactoring was done on a large part of the central registry in 2016, particularly concerning the implementation of the EPP protocol, which is used for communication between registrars and registers. A portion of the registry code is therefore completely overwritten after 10 years in accordance with today's standards and safety requirements. An update to the RDAP protocol implementation (WHOIS successor) according to RFC standards and in accordance with .CZ extensions was also implemented. The CZ.NIC RDAP server was the world's first registered domain in the global registry administered by the IANA organisation. The new design of the <https://fred.nic.cz> website and the new FRED documentation have been published and are available at <https://fred.nic.cz/documentation/>, both with the aim of supporting the use of FRED by foreign registries.

## 5.2 Internet infrastructure support

### 5.2.1 Support of IPv6

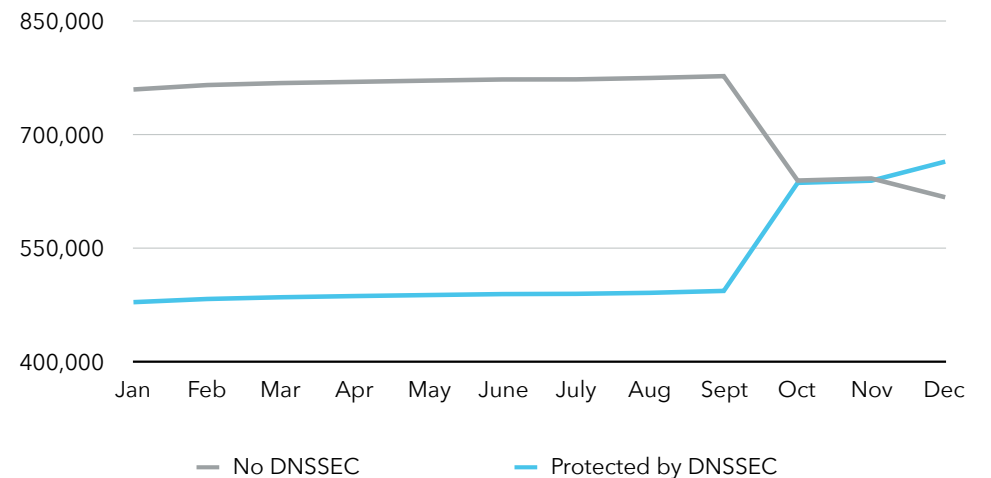
IP addresses are the basic building element of the internet. It is not possible to connect to the worldwide network without IP addresses, i.e. mutual recognition and hence connection between PCs within the global network is not possible. The current space of IP addresses of the version 4 (IPv4) internet protocol has been almost exhausted. The new internet protocol of version IPv6 is the response to the lack of IPv4 addresses, as it offers a much bigger bank of addresses and also new options.

Support of the introduction of this new technology on all levels (i.e. content, networks and end devices) is among the long-term objectives of CZ.NIC. CZ.NIC also cooperates with registrars who often provide webhosting, so it can seek support for IPv6 on the side of web, e-mail and DNS servers. The association is also participating in promoting the use of IPv6 in state administration in close cooperation with the Ministry of Industry and Trade. A government decision made by the end of 2013 also contributes to accelerated introduction of IPv6 in state administration.

Thanks to these activities, IPv6 has been enjoying growing support in the Czech Republic and according to independent surveys our country belongs to the world powers in IPv6 introduction.

	2010	2011	2012	2013	2014	2015	2016
Web servers	5.19	9.48	15.06	19.46	23.33	25.95	29.28
DNS servers	20.31	45.90	51.27	55.11	60.71	59.16	73.40
Mail servers	8.61	8.70	13.15	15.22	16.08	16.15	17.31

Support of IPv6 within the Czech national domain (percentage)



Besides the support from registrars, DNSSEC has been gradually introduced among main internet connectivity providers in the Czech Republic, which has made this system fully functional for the majority of standard internet users.

### 5.3 Support of basic Internet infrastructure

The CZ.NIC association continued to operate mirrors on root servers F, K and L, thus running mirrors on three of a total of thirteen root name servers that are the basis of the Internet domain names system (DNS). They increase security and stability of root servers on the global scale and make them available mostly in the European region.

### 5.2.2 Support of DNSSEC

DNSSEC extends the domain name system (DNS) and improves its security. The DNSSEC technology gives the users the certainty that the information they obtained from DNS was provided from a correct source, it is complete and its integrity was not compromised during the transfer.

Within the Czech national domain .CZ, the DNSSEC technology can be used since 2008. The number of such secured domains has grown steadily since then, and co-operation with registrars is also contributing to this. Since 5th December 2016, most .CZ domains have been secured by DNSSEC and at the end of 2016 the support rate reached almost 52%. A higher share of signed domains can be found only with the .NO domain and then with the .CZ domain, so the share of signed domains makes the Czech Republic be among the world leaders.

2010	2011	2012	2013	2014	2015	2016
14.74	34.07	37.70	37.12	38.57	38.77	51.83

Share of .CZ domains secured through DNSSEC (percentage)



Besides these root servers, CZ.NIC uses its infrastructure to support growing registries through secondary name servers for their ccTLD. Angola, Tanzania and Macedonia are using this option for the administration of their national domains.

Hosting the websites of some NGOs (e.g. the popular Ubuntu linux distribution) is another form of support of the local internet community.

CZ.NIC is also actively involved in the RIPE Atlas Global Monitoring Network project. As one of the first organisations, CZ.NIC supported this project by hosting fixed monitoring points called RIPE Atlas Anchor.

One of the key operating conditions of many computer systems is correct time synchronisation. Systems connected to the Internet for this purpose use the NTP Internet Protocol. CZ.NIC hosts a public top-level NTP server (stratum 1) controlled by GPS and fitted with a high-quality oscillator of the OCXO DHQ type.



# **6 CSIRT.CZ SECURITY TEAM**

The growing importance of the internet and the rising number of its users is connected with an increasing number of security incidents (misuse of PC, a network element or network for an illegal purpose, e.g. spam, copyright breach, phishing, tapping of confidential data) and the gravity has been growing as well. This creates an acute need for creating efficient protection against these attacks and giving it a formal shape. So-called CSIRT teams (Computer Security Incident Response Teams) are created for this purpose.

CZ.NIC, an entity with long experience with internet infrastructure projects, engages security teams on the national and academic levels. CZ.NIC has its own CZ.NIC-CSIRT team, responsible for dealing with incidents within AS25192 as well as incidents affecting name servers for the .CZ domain and 0.2.4.e164.arpa.

### 6.1 CSIRT.CZ - National CSIRT of the Czech Republic

The CSIRT.CZ security team is the official security team of the Czech Republic and is operated in accordance with act No. 181/2014 coll. on cybersecurity and the public contract made on December 18, 2015 with the National Security Authority. The mission of the CSIRT.CZ team is to deal with incidents connected with cybersecurity in networks operated in the Czech Republic. The team collects and evaluates information on reported incidents and forwards

such reported incidents to persons responsible for the network or services being the source of the incident and/or it provides help with coordination.

An important task for 2016 was to pass an audit for the Dedicated level. This fulfilled the requirement for a public contract being concluded between CZ.NIC and the National Security Authority.

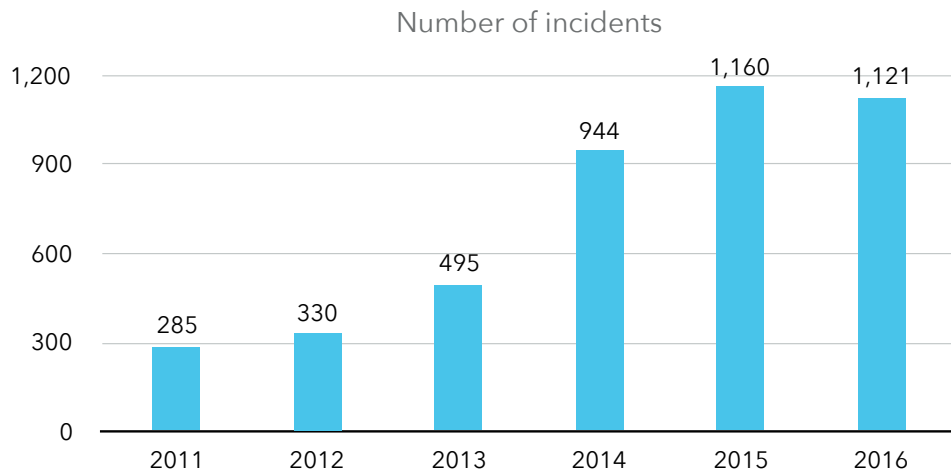
The team cooperates with entities on the national level (National Security Office, the government CERT, academic CSIRT, ISP, banks, etc.) and international level (national CSIRT of other countries, ENISA, FBI and other) and exchanges information on incidents and the way they were resolved with these entities based on a relationship of mutual trust.

CSIRT.CZ also participates in a number of grant projects, including PROKI (Prediction and Protection against Cyber-Incidents), which is supported by the Security Research of the Czech Republic in 2015–2020. In 2016 the implementation phase of the project began. The team members were involved in SIC CZ (Safer Internet Centre) project activities, in particular in operating a hotline for reporting illegal on-line content, where experience from incident management and other education is used.

## 6.1.1 Operating statistics

The year 2016 was the first in the history of CSIRT.CZ when the number of solved incidents slightly decreased. While in 2015 a total of 1,160 incidents were resolved, in 2016 it was 1,121. However, there were more incidents that require a deeper analysis and complex solutions year-on-year. In the past year, CSIRT.CZ sent a total of 6,527 messages, mainly due to an increase in Botnet-type incidents (from 2 in 2015 to 71 in 2016).

An increase in the complexity of incidents in terms of the number of networks involved made the CSIRT.CZ team create and publish the Convey open-source tool. This tool allows for automated processing of large incidents and automated distribution of adequate parts of messages to their respective networks.



<b>Closed - solved</b>	204
<b>Closed - we are informed</b>	205
<b>Closed - positive change</b>	639
<b>Closed - unsolved</b>	73

### Security incidents

<b>Botnet</b>	71
<b>DoS</b>	12
<b>Malware</b>	104
<b>Pharming</b>	2
<b>Phishing</b>	363
<b>Probe</b>	13
<b>Port scan</b>	6
<b>SPAM</b>	290
<b>Trojan</b>	79
<b>Other</b>	181

### Type-based incident statistics

In the context of incident management, work with incidents was also reviewed last year. In the course of 2016, CSIRT.CZ expanded its services, so now it also tracks freely available information resources to inform domain name holders in the .CZ zone if defacement was made on their websites by attackers, i.e. a visible change in the content of the website.

### 6.1.2 Awareness and educational activities

CSIRT.CZ was also devoted to awareness and educational activities. The already established collaboration in the creation of the popular series *Postřehy z bezpečnosti* (What we spotted about security) on the root.cz server continued. As part of the CZ.NIC Academy, the courses *Počítačová bezpečnost prakticky* (The practicalities of computer safety), *Základy fungování CSIRT týmu* (How the CSIRT team works) a *Jak pracovat na Internetu bezpečně a anonymně* (How to work safely and anonymously on the Internet) were organised. In addition to this, trainings were organised for non-profit organisations and journalists in this activity, lectures and workshops were held during the European Cyber-Security Month, and a project of a secondary school competition focused on cyber-security issues was supported. The team members were also devoted to writing news articles for the association blog and a number of other print media. Regarding other activities, we can mention professional conferences, radio and television broadcasts.

### 6.1.3 National and international cooperation

In 2016 the CSIRT.CZ team was developing cooperation with national and international partners. As part of an improvement of this cooperation, a meeting of security teams associated in TF-CSIRT and the FIRST organisation took place in January 2016 and the association was responsible for the organisation of this meeting. The team was also commenting on the Network and Information Systems in the Union (NIS) Directive and on the guidelines for national elec-

tronic communications regulators (BEREC) to implement network neutrality. As part of the CS Danube project, an international conference was organised and a training hosted on mobile malware organised by ENISA. The team also participated in CSIRT Network activities based on the NIS directive.

On the national level CSIRT.CZ has newly established close cooperation with the National Cybercrime Department of the National Centre against Organised Crime of the Criminal Police and Investigation Service, both in training their specialists and in dealing with specific cases. CSIRT.CZ also organised a working group twice, continued the established cooperation with CBA, and contributed to commenting on the amendment to the Cyber-Security Act, and cooperated in drafting a decree on this amendment.

### 6.1.4 Preventive action

CSIRT.CZ also engaged in preventive activities in the past year as well. In the co-ordinator role, it took part in the testing of hosting companies after some of them showed they were suffering from an old but dangerous vulnerability associated with session management in shared hosting. The team traditionally sent information about threats to specific systems. This was information about compromised servers distributed in cooperation with the government govCERT office, and alerts about various vulnerable or poorly configured devices. We also continued sending unknown malware samples to antivirus companies. As part of our service allowing the testing of system

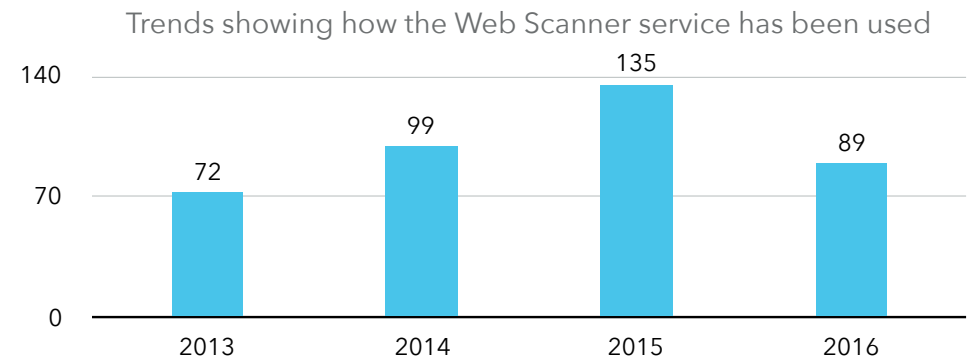
resistance against DDoS attacks, CSIRT.CZ tested in cooperation with the State Treasury of the Shared Services Centre a part of the EET system (System of Electronic Revenue Records).

### 6.1.5 Web Scanner

The web scanner is one of the preventive security services that was launched in 2013. It is intended for website providers and administrators and free-of-charge help to them with revealing potential vulnerability of their internet presentation. The service is primarily intended for NGOs, the public administration and SMEs that cannot afford such investments in a commercial solution, but are aware of the fact that vulnerability of their websites can easily become a problem for other internet users.

Vulnerability analysis is performed in two phases. First with the use of automatic tools and then in a manual website test by a senior tester who evaluates, among other things, the vulnerabilities he/she found in the entire website and offers corresponding solutions. Finally the party that ordered the test is sent a final report containing detected vulnerabilities, their classification based on the gravity level and also proposals of possible ways how the vulnerability can be handled. The service is based on its own measurements and experience of the security team and on a list of general top ten most serious security risks according to Open Web Application Security (OWASP).

In 2016 the websites of applicants began to be controlled also from the point of view of the content of information that can be misused, particularly in the form of metadata that organisations often forget. Therefore, the final report now also contains information about the content of metadata in documents published on the organisation's website. The Web Scanner service also allows domain owners to request testing by using the databox, making the entire order process as easy as possible. In 2016 CZ.NIC tested 89 web presentations under this project.



### 6.2 CZ.NIC-CSIRT

The CZ.NIC-CSIRT team is responsible for handling incidents affecting name servers for the .CZ domains and 0.2.4.e164.arpa and AS 25192. As provided in the registration terms, the CZ.NIC association can cancel the domain name

delegation if it is used in such a way that it compromises national or international computer security, mostly through distributing malign content (viruses and malware) through the domain name or service, or pretending the content of another service (particularly phishing).

The CZ.NIC-CSIRT team can cancel the domain name also when the server, available through the domain name, is the control centre of networked hardware which distributes the malign content (botnet).

### 6.2.1 Activities of CZ.NIC-CSIRT in 2016

CZ.NIC-CSIRT operates its own system used for searching websites with .CZ (MDM) domains that have been attacked. During 2016 the incidents processed were also expanded by defacement, i.e. a visible change in the content of the website. This information is retrieved from publicly available sources and then passed on to domain owners, so they can learn about the site attack as soon as possible and take appropriate action ideally sooner than further damage occurs.

In 2016 the CZ.NIC-CSIRT team continued with collaboration on the Turris project and supplied data on dangerous IP addresses and provided practical experience with data use and evaluation from these unique routers.

In the CZ.NIC association the CZ.NIC-CSIRT team implements internationally accepted information security management systems (ISMS) in compliance with the ISO 27001 standard. In 2016 there was a so-called large recertification, i.e. a comprehensive audit of the state of the information security management system which the CZ.NIC association again passed. Some procedures and documentations have also been revised in 2016 to better reflect the current threats that modern IT companies are facing.



# 7 MOJEID



## *Internet without password and registrations*

### **7.1 When we say mojelD...**

Launched six years ago, MojelD is a unique service giving the internet users in the Czech Republic the possibility of logging to different websites and electronic services using uniform identification data.

Internet users who use mojelD do not have to set a new account and go through the registration process over and over again. Besides higher user convenience, the service providers obtain verified information for their users about their visits and offer the users more benefits.

The mojelD service is based on the OpenID standard extended with unique features which other OpenID services do not have – e.g. user identity data transfer with every user login and user validation on multiple levels in different ways.

When this service was being developed, emphasis was placed on security, personal data protection and trustworthiness of the whole system. The registry of these data is protected on the same high level as the .CZ Domain Registry. The user can define with every login which data he/she gives from his/her profile to the provider to which he/she wants to log in using the mojelD service. This gives the user full control over his/her data. The user also knows what data he/she provided to what entity.

MojelD is constantly evolving and responding to the current needs of its users. In recent years, the service has introduced for example a business card, the possibility of directly establishing the mojelD account and pre-filling data directly from social networks such as Facebook and LinkedIn. Additionally, mojelD has been expanded to include the ISIC card number in the account profile, which confirms the validity of the “student” title or the possibility of repeated sending of PIN3 and the handling of accessibility of mojelD for physically disabled people.

An innovation in 2016 was the use of two-factor authentication for a safer login with my mojelD Android authenticator or to perform account validation by sending a message from the ISDS data box. On top of this, the possibility of using and authenticating alternative e-mail was introduced, a system supporting validation sites was put in place to streamline the validation process and new documentation was issued for mojelD providers. We also started sending newsletters in 2016 in monthly intervals where users learned news from the world of mojelD and two product videos were created. One for the user and one for the provider and their aim is to clarify what is actually mojelD and what are its main advantages.

In 2016 a production link was made between mojelD and the Czech Academic Federation of Identities (eduID) and the operation of the PEPS Gateway from the STORK project continued. The first service providers were connected

via this gateway. Also, negotiations started with the Ministry of the Interior on the operation of the eIDAS node (new PEPS) with the involvement of mojelD.

## 7.2 Support of mojelD

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Service providers are the key factor in further service expansion. The growing number of servers using mojelD affect the number of new users for who it is important to be able to use a single login and password to access as many services as possible, no matter if those used on the daily basis or those (e.g. on-line shops) they visited for the first time. MojelD saves their time with registration and gives them control over the data they provide.

In relation with the providers, the primary effort is to penetrate new market segments and reinforce its standing in existing domains such as on-line shops, community servers or web presentations of cities and municipalities.

In the field of internet shopping it is now possible to login through the mojelD username and password, for example in one of the largest internet bookstores Kosmas.cz, the Wayfar.cz portal, Tornadoshop.cz or the bitcoin server Easycoin.cz.

MojelD was also introduced into the Xchat.cz discussion server, the Letuška.cz flight ticket portal and the DobráPráce.cz job portal in 2016. In the area

of public administration, mojelD appeared on the Kutná Hora website (kutnahora.cz) as well as in the tool for submitting applications for support programmes of the Technological Agency of the Czech Republic (taacr.cz). Logging with mojelD is now also available at Edesky.cz, processing open data from official announcement boards of public administration authorities..

## 7.3 External validation points

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To simplify the validation option for end users, i.e. the highest level of mojelD account validation, CZ.NIC focused on the extension of the external validation point network in 2016. This has been built mainly in libraries - for example in the Masaryk Public Library of Vsetín. A validation point in the Municipal Library of Pardubice, the Regional Library in Karlovy Vary and the Library of the City of Pilsen is also an innovation. Seventeen new points, where the mojelD account can be validated free of charge, were added in 2016.

Also the participants in major industry conferences where mojelD was the event partner - E-Business Forum 2016 (EBF 2016), the Czech Internet Forum 2016 (CIF 2016), Internet and Technologies 16 (IT16) and the Internet in state administration and self-government (ISSS 2016).

#### 7.4 MojelD users

The users are the most precious part of mojelD. It would be difficult to win new and so reputable service providers and raise the service awareness among the broad public without a growing user base. CZ.NIC continued to provide care of its users but also raised the share of so-called identified accounts in 2016 (i.e. validated through correspondence address). During the year 2016 my service won 42,272 new users, with half the half-a-million-mark attacked already at the beginning of the year, and at the end of 2016 already 541,430 registered users had the mojelD service.

Year	Validated contact	Identified contact	Partly identified contact	Users total
2010	163	2,168	1,324	3,655
2011	680	17,218	24,369	42,267
2012	1,760	75,513	86,218	163,491
2013	3,324	143,364	144,376	291,064
2014	5,920	207,242	211,409	424,571
2015	8,280	249,649	241,270	499,199
2016	10,446	273,334	257,650	541,430

Account security level of mojelD

#### 7.5 MojelD as a tool of cross-border authentication in Europe

Thanks to external validation sites, the number of validated users (i.e. validated on the basis of a valid identity document) has increased significantly - to more than 10,000. Their credibility was certified within the European project STORK 2.0 as QAA3 (Quality Authentication Assurance), i.e. on the same level as e.g. Swiss electronic identity cards.

MojelD is thus the only identification and authentication tool in the Czech Republic developed in accordance with the European legislation on electronic identification, called eIDAS (European Parliament and Council Regulation (EU) No. 910/2014 on Electronic Identification and Confidence-Building Services for Electronic Transactions In the Internal Market.



# **8 CZ.NIC LABS**

CZ.NIC labs are a research and development workplace with independent organisation where innovative projects from the domains of networks, network security and internet standards are investigated. Many projects also overlap to other domains such as open data, eGovernment, support of disadvantages users and open source support.

### 8.1 Summary of 2016 activities

New staff were hired for all Labs in Prague, Brno, Pilsen and České Budějovice in 2016. The capacity of workplaces in Brno and Pilsen was expanded. The laboratories focused on further development of existing projects. These larger projects mostly involved the Turris project, focused on end network security, a pair of DNS servers – the authoritative Knot DNS and Knot Resolver, the BIRD routing demon and the Tablexia teaching app for children with dyslexia.

### 8.2 Projects and activities

#### **BIRD**

The routing demon for dynamic IP protocol routing is designed for Linux and BSD. The project was set up at the Faculty of Mathematics and Physics of Charles University in Prague and the CZ.NIC labs have been participating in its further development. According to the survey of EURO-IX, associating

the biggest exchange points (IXP), the share of BIRD has been growing and in 2016 it was used by two thirds of all exchange points. The Czech software is therefore the most popular and unrivalled software for route servers in Europe, far ahead of Quagga and CISCO. The peering centres using BIRD include the biggest: the Frankfurt DE-CIX, London LINX and Amsterdam AMS-IX. Outside the old continent, it is for example the South-African NAP Africa, Point of Nigeria and the Japanese JPNAP. BIRD is also used in Netflix and its Open Connect Appliances.

#### **Knot DNS**

This is an authoritative DNS server being developed and its primary focus is on performance and it achieves the highest performance (qps) among the open source solutions (BIND, NSD), without compromising the functionality and standard support. In 2016 several new releases were published in the branch with long-term support (LTS, version 1.6.x) as well as in the main development branch (2.x). The latest releases are 1.6.8 and 2.3.3.

#### **Knot Resolver**

The development version of the Knot Resolver DNS server was introduced in 2015. This is the extension of the open high-performance Knot DNS server in the area of recursive resolvers. During 2016 version 1.0.0 was released after several beta versions, followed by another release with the latest number 1.1.1. The Knot Resolver was deployed as the default resolver on Turris Omnia routers during the year.

### Multi-platform interface for data box access

As part of our support of the internet infrastructure and free and open software, the CZ.NIC Labs developed an interface for access to the data box information system (ISDS) in 2010. The Datovka software is now available for PC users with operating systems Linux, Windows and OS X. An app for mobile devices such as tablets and smartphones is available also for Android and iOS (iPad, iPhone).

In 2016 a new version of mobile Datovka was introduced, using the same platform based on the Qt5 multi-platform library, allowing partial code sharing with the desktop Datovka. This change made it possible to unify the functionality of both main mobile versions. By the end of 2016 it was already over 35,000 users – particularly SMEs, freelancers and natural persons – who were using all applications.

### NetMetr

The NetMetr application for the measurement of fixed and mobile connection speeds is being developed in cooperation with the Czech Telecommunication Office (ČTÚ) based on an open application developed for the Austrian RTR regulator (die Rundfunk und Telekom Regulierungs-GmbH, RTR-GmbH). The primary objective of the mobile app is to offer users the possibility of verifying their internet connection quality (both mobile and Wi-Fi) and compliance with network neutrality terms. NetMetr can be downloaded free of charge for Android and iOS platforms. In 2016, some new application features such

as continuous signal strength measurement without data rate measurement, the possibility of measurement from the web browser environment and other minor enhancements were added. The NetMetr mobile application was used by more than 5,000 users in 2016. The project outputs, including open data, are available at [www.netmetr.cz](http://www.netmetr.cz).

### Tablexia

Tablexia is an education app for tablets, designated for the support of cognition abilities among children with dyslexia and grade 2 of primary schools. The CZ.NIC Labs collaborate with top Czech experts in education of children with dyslexia in the development of this app. This open software application is available for Android and iOS platforms for free.

It contains eight separate games set in a unifying environment of a detective story, of which two were created in 2016. The German version of this app was also launched and fully adopted to the specifics of the German language and manifestations of dyslexia in this language environment, the German version of this app is currently being tested.

In 2016 the Tablexia team supervised testing with children in a number of collaborating schools. Besides these schools, Tablexia is also used for work with children in the DYS-centre Prague and many pedagogical and psychological counselling centres. By the end of 2016 Tablexia was used by more than 12,000 users.

### **Turris**

The Turris project was upgraded in 2015 and 2016 from a pure research project addressing the security situation in end-user networks and researching cyber-attacks into a successful commercial project.

Towards the end of 2015, a crowdfunding campaign on the Indiegogo platform was launched and ended in January 2016. With more than \$ 857,000 collected, the amount exceeded our expectations more than eight times. Subsequently, the campaign was transformed into the so-called in-demand mode and ended in September 2016. A total of \$ 1,200,000 was collected. The campaign ended with the successful distribution of more than 4,000 routers to users in the autumn of 2016 and regular retail sale of the route started.

### **Development of internet standards and international cooperation**

The staff of CZ.NIC Labs are actively working in the IETF work group (Internet Engineering Task Force) which deals, among other things, with the development of internet standards (so-called RFC - Request for Comments). For example, they participate in standards connected with the DNSSEC, DANE, and NETCONF protocol. In 2016 it was RFC 6594, 7951, 7952 and 8022.

### **Education in the CZ.NIC Academy**

The CZ.NIC Labs staff significantly contributed to education in the CZ.NIC Academy where they head courses focused on DNS and DNSSEC, the IPv6 protocol, the BGP

routing protocol and the GIT versioning system. They also give lectures at many professional conferences in the Czech Republic and abroad.



# **9 EDUCATION AND AWARENESS**



### 9.1 Communication with the public

They include press releases and messages for professional journalists but also journalists from media covering the broad public or specific recipients only.

CZ.NIC publishes these releases in section News at [www.nic.cz](http://www.nic.cz). The News section also belongs to information website of the CZ.NIC Academy, the association's education centre.

Other communications channels include accounts on social networks Facebook, Twitter and Google+. Information was intensively published on these accounts in 2015. The news were supported - in some cases by numerous - images, photos and graphics on a daily basis. This is also one of the reasons why CZ.NIC had over 2,600 fans at the end of 2015, which is about 30% more than in 2015. Also the fan base on Twitter grew year-on-year from about 2,370 at the end of 2015 to more than 3,088 in December 2016. The association also used Google+ communication in 2016, although this service is not as popular with the public as the previous two, but still the number of people interested has grown. The NIC-NEWS newsletter was another communication tool. It was distributing messages to people interested who were logged in the e-mail conference almost every week. The CZ.NIC employees were notified about current activities through the IN newsletter with the same periodicity.

An on-line blog of CZ.NIC staff is also an essential communication element. 59 contributions were published in 2016 thanks to activities of the association

employees. The CZ.NIC blog has been a semi-official communication channel for a long time already (unlike accounts on social networks). It is no exception that journalists with different focus use this information for their needs.

The topics communicated in 2016 were connected with the association itself, with its designers and activities, but also with topics that more or less affect CZ.NIC and its activities.

Like in 2014, the portion of media with technical and non-technical orientation was more balanced. From the technically oriented media the most frequent were Root.cz, Lupa.cz, Linux EXPRES and printed magazines Securityworld and IT Systems. CZ.NIC communicated with the general public mostly through the Novinky.cz server. Topics connected with internet security were enjoying great popularity also in 2015.

The CZ.NIC staff published 57 papers in 2016 not only on the above mentioned internet portals and in the magazines, but also in such media as Data Security Management and School Counselling in Practice. Ondřej Filip, the CZ.NIC CEO, and other employees (mostly from security teams) were hosts in TV shows and broadcast programmes.

In 2016 two major media campaigns were launched by the association, devoted to the gaming act (The Censor is Coming) and the open-source router with advanced security features Turrus Omnia.

	Outputs in media		Social networks (fans)	
	Papers	Blog	Facebook	Twitter
2012	21	97	900	630
2013	29	95	1,100	1,000
2014	38	84	1,500	1,750
2015	57	82	1,800	2,370
2016	57	59	2,600	3,088

## 9.2 Popularisation TV series

### 9.2.1 Jak na Internet

The *Jak na Internet* series is the most visible educational activity of the association. Throughout the year, it was possible to watch the repeat of all its parts on the Czech Television channels and at out-of-date episodes, already recorded, were updated at the same time.

### 9.2.2 Nauč tetu na netu (Teach your aunt with the internet)

The second achievement of the successful videos of the *Jak na Internet* series is the new learning series *Nauč tetu na netu* (Teach your aunt with the internet), which was created to raise awareness among older children of the possibilities of using the Internet, Internet technologies and of on-line security. The CZ.NIC association co-produced 16 episodes with Czech Television, targetting topics such as cyberbullying, advertising, passwords, piracy, e-mail, proprietary

or malicious content. The series is primarily intended for children aged 10-12 and was broadcast on CT :D from March to June 2016.

### 9.2.3 Nebojte se Internetu (Don't be afraid of the Internet)

*Nebojte se Internetu* (Don't be afraid of the Internet) is another awareness and education project of the CZ.NIC association. The aim of this sitcom is to bring the Internet and its technology closer to more mature audiences and also the Elpida organisation, dedicated to the education of senior citizens, helped with the content.

A total of 10 episodes were produced, with the first two minutes of each episode broadcast on the CT1 and CT2 channels between October and December 2016. The followers could watch the continuation of the episode at [www.nebojteseinternetu.cz](http://www.nebojteseinternetu.cz), where the whole series can now be seen. More than 1,500,000 viewers watched each episodes on TV.

## 9.3 CZ.NIC Academy education centre

Like in the previous years, the CZ.NIC Academy offered courses for the professional and non-professional public also in 2016 and expanded the their number by adding some innovations. During the year, three new courses were launched: *Turris Omnia prakticky* (The practicalities of Turris Omnia), *Úvod do Linuxu* (Introduction to Linux), *Arduino pro učitele* (Arduino for teachers)

and *Nařízení eIDAS přehledně* (The eIDAS regulation in a clear way). For the *Arduino pro učitele* (Arduino for teachers) course a special shield for Arduino (EduShield) was also set up in the CZ.NIC Laboratories where the lessons are being taught.

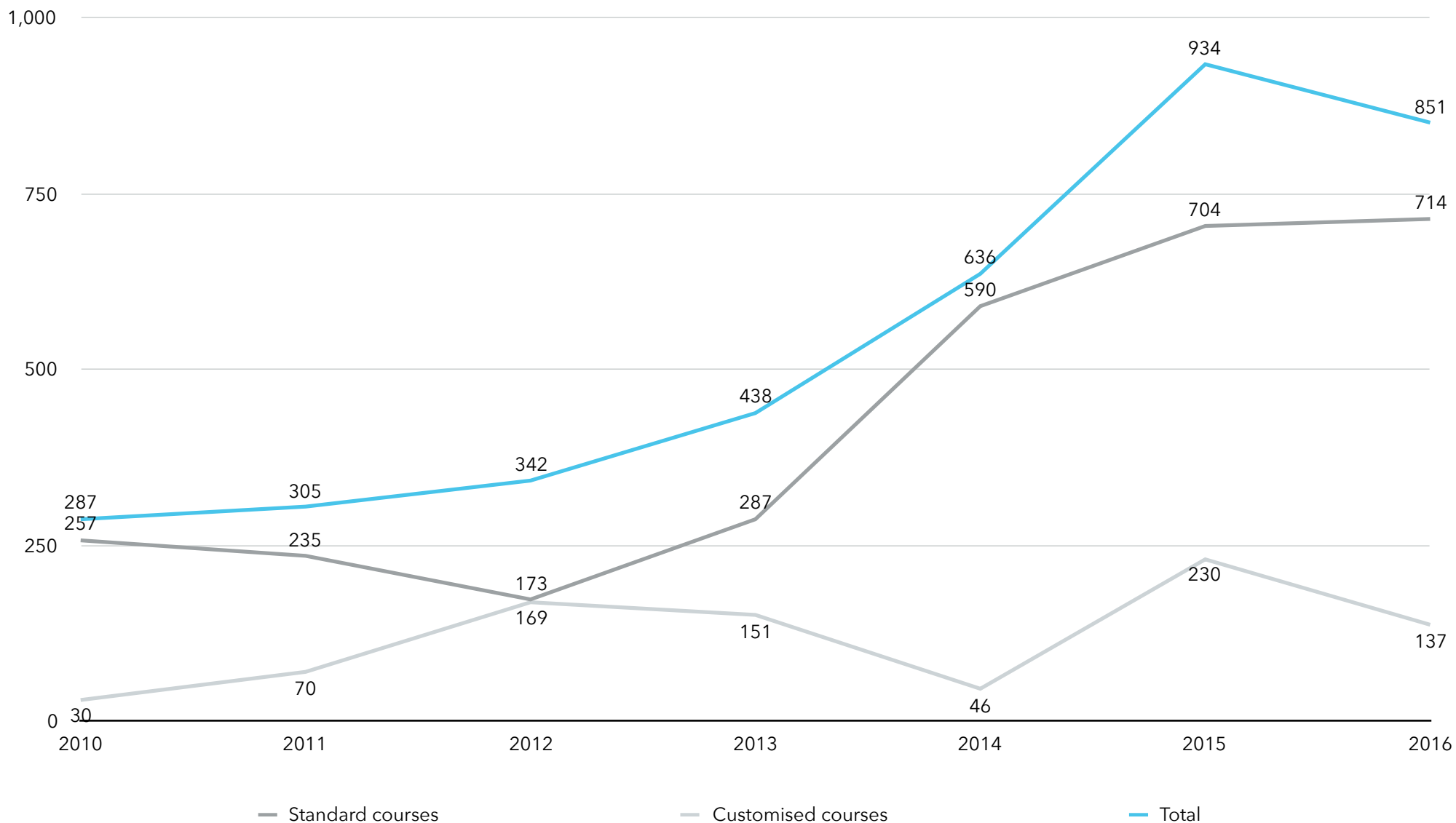
In addition to standard courses offered at the Academy, one-off courses on how to work safely and anonymously on the Internet - *Jak pracovat na internetu bezpečně a anonymně*, intended primarily for journalists and staff of non-profit organisations, took place at the Academy. As part of the European CodeWeek education event, we then offered the MicroPython course to the general public interested in information technology. Courses at secondary and primary schools, focused on safe Internet browsing and the DNS system, were also held under the CZ.NIC Academy.

The CZ.NIC Academy was providing not only conventional courses throughout the year, but also found space for additional internal trainings such as *Linux pro začátečníky* (Linux for beginners), regular seminars of CZ.NIC Laboratories and trainings focused on the development cycle or quality assurance software.

Good transport availability, high-quality technical equipment and good reputation are key elements of the CZ.NIC Academy, which make these spaces a desirable destination for meetings for both Czech and foreign organisations. In 2016 the CZ.NIC Academy hosted for example a meeting for the CZ.PEPS project, a workshop for technical documentarists, an ENISA training,

a CS Danube project meeting, CE 2016, Evenings with Turris, the NetMetr working group, the RIPE NCC training and the CENTR R&D Workshop. The premises of the computer room were also used by non-profit organisations Czechitas and PyLadies which organised regular courses for women's programming here.

Development of the number of students in the CZ.NIC Academy



## List of professional courses conducted at the CZ.NIC Academy in 2016

Name of course	Number of rounds	Number of students
3D printing	3	17
Arduino for teachers	1	20
DNSSEC - DNS security	3	19
E-signature and public keys infrastructure	2	16
Git - universal versioning system	6	77
IPv6 implementation	5	51
Internet of things	4	31
IP telephony - SIP protocol	1	17
How to work safely and anonymously on the Internet	1	18
MicroPython - a gateway to the world of IoT	1	13
The eIDAS regulation in a clear way	4	49
Practical aspects of computer security	5	96
Advanced networking in Linux	7	104
DNS principles and administration	4	37
BGP routing protocol	6	57
The practicalities of Turris Omnia	1	16
Introduction to Linux	1	13
Vim	4	41
How the CSIRT team work	1	22

## List of customised courses conducted at the CZ.NIC Academy in 2016

Name of course	Number of rounds	Number of students
3D printing	2	29
The eIDAS regulation in a clear way	1	9
Git - universal versioning system	2	85
Advanced networking in Linux	1	14

## Total number of courses organised by the CZ.NIC Academy in 2016

Course type	Organised in total	Students total
Professional courses	60	714
Customised courses	6	137
Total	66	851

### 9.4 Conferences

In 2016 CZ.NIC organised two conferences, the focus of which was the internet and IT, in the Czech Republic in cooperation with its partners. The two-day conference Internet and Technology (16), held at the end of May and June, featured Internet security topics, the impact of the lottery law and its Internet blocking requirements and offered an accompanying programme in the form of a workshop and seminars. Registrars and the NIX.CZ association, the event partner, also introduced their latest innovations. Among other things, the participants obtained up-to-date information

about the Turris project and projects connected with DNS. The conference was attended by 140 people and 1,654 viewers were watching the lectures on-line.

The one-day continuation of Internet and Technology (16.2) took place on December 3, 2016 on the premises of the Faculty of Information Technology of the Czech Technical University in Prague. In the contributions, news from projects Turris Omnia, DNS Knot, Knot DNS Resolver, myPeople were presented and the participants could listen to the outputs of Internet of Things (IoT) safety and keySet elliptic curves. Workshops, where the participants were able to get acquainted with the Turris Omnia router and where the training EduShield for Arduino was introduced to them, drew great attention. The conference was attended by 114 visitors and 1,398 viewers were following on-line.

The CZ.NIC association was presenting itself in 2016 at many professional events and conferences in the Czech Republic and abroad. From the domestic ones we can mention for example the Czech Internet Forum, Dyskorunka, the E-Business Forum, Hackathon with the Czech Telecommunication Office (ČTÚ), INSPO, ISSS, the IT Security Workshop, Křišťálová Lupa (Crystal Magnifying Glass), Kyberpsycho, Law FIT ČVUT, Linux Days, OpenAlt, Peering Days, Security Fest!, Srdce na dlani (The Heart on the Palm) (Christmas concert), TEDxNTK, TK Czech Banking Association and others.

### 9.5 Editions of CZ.NIC books

Publishing industry and popularisation books with topics connected with the internet and its technologies is one of the educational and awareness-raising activities of CZ.NIC. In the CZ.NIC edition printed and electronic books are published. All titles are available for download free of charge on the <https://knihy.nic.cz> website in the PDF format as well as EPUB and MOBI that are suitable for electronic readers.

Two more titles as well as a comics, inspired by the *Jak na Internet* series, were added to the existing 12 titles. The first book published in 2016 is *The Performance of Open Source Applications* by the Canadian author Tavish Armstrong and it expanded the edition in the first half of the year. In the second half of the year, *CyberCrime* was added. The author of this publication is a renowned cyber-security expert and experienced teacher Jan Kolouch and the book helps readers orient themselves in the world of computer security and crime.



# **10 COOPERATION AND PARTNERSHIPS**

Today, without exaggeration, the Internet is the most important communication tool that connects tens of millions of users across continents, including Antarctica. We can often hear that the Internet has no borders and does not fall under the authority of any government. This does not mean, however, that the Internet would not be controlled and had no rules. However, unlike many other industries, the rules are often created by an internet community representing a large family of fans and supporters of this global network. To ensure that no efforts of any member or organisation are in vain, mutual cooperation is essential, both on the national and international level.

Co-operation with domestic partners helps find the most acceptable system for national domain administration for the Czech user and at the same time contribute, mostly thanks to the projects of our Laboratories, to the expansion of new technologies and the development of the information society.

International cooperation helps not only follow world trends, but also - thanks to active participation of the association's employees - contributes to their creation and shaping, which affects our everyday lives.

Thanks to its high level of expertise, the representatives of the association, both management and staff, are the welcome guests in domestic and international expert forums.

## 10.1 Czech Republic

Thanks to the importance of the implemented activities, CZ.NIC is the natural partner of both public administration and interest associations operating in the Internet domain.

### 10.1.1 Cooperation with public administration

The importance of the domain name administration system and related Internet infrastructure is comparable to that of other critical infrastructures, for example in the energy and transport sectors. The CZ.NIC association, as the administrator of the national domain, considers the protection of this infrastructure its duty and a moral obligation to the Czech Republic. It follows up to the co-operation with a number of state bodies such as the National Security Authority, the Czech Telecommunication Office, the Ministry of the Interior and the Ministry of Industry and Trade.

The representatives of the CZ.NIC association from the "Development Projects" department made significant contributions to the implementation of Regulation (EU) No. 910/2014 of the European Parliament and Council of 23 July 2014 on electronic identification and trust-building services for electronic transactions in the internal market (the so-called EIDAS regulation). Jiří Průša began working in the European Commission and the Ministry of the Interior expert groups and has become a sought-after and respected



expert in this European legislation. The CZ.NIC association also participated within a grant scheme in a research project analysing the impacts of the eIDAS regulation on the data box system.

Another of the recently started activities carried out in cooperation with the public administration was cooperation on the so-called School Connectivity Standard within the funding from the Integrated Regional Operational Programme (IROP) financing.

The Association also cooperates with the Czech Police, execution authorities, the courts and authorities according to the legal authorisation, i.e. the Office for Personal Data Protection, trade and financial authorities, etc.

Like in previous years, the CZ.NIC association supported the Zlatý erb (Golden Coat of Arms) competition for the best website of the city and municipality in 2016. As the technical partner of the competition, the association creates the evaluation criteria "support IPv6 and DNSSEC" and also contributes to the evaluation of other criteria.

## 10.1.2 Collaboration with the non-profit sector and social responsibility

### Člověk v tísni (People in need)

Other social activities of the CZ.NIC association include the support of the Člověk v tísni (People in Need) Foundation, in particular its *Jeden svět*

*na školách* (One World in Schools) educational project, which offers schools documentary films and accompanying methodological aids to teach current topics of the contemporary world and modern history.

### Forum for open data

The CZ.NIC association continued its partnership with the Forum for Open Data, which was created on the basis of the Otakar Motejl Fund's initiative and thanks to the support of the Faculty of Informatics and Statistics of the University of Economics and the Faculty of Mathematics and Physics of Charles University. The key task of this activity is to show the possibilities of using open data in practice and provide methodological and consulting support to the public administration and general public. The CZ.NIC CEO Ondřej Filip was the chairman of the expert jury of the 4th year of the competition *Společně otevíráme data* (We jointly open the data) that appreciated the best student and public applications using open data for socially beneficial services.

### Helping animals

The CZ.NIC association has been contributing in the long term to the Prague and Zlín Zoos to the breeding of the Australian cassowary, whose original home is New Guinea and Australia. In the Czech Republic, we can rarely see its relative cassowary domain, who has hardly been scientifically studied. You can study it in detail at [www.kasuar.cz](http://www.kasuar.cz).

## **The Srdce na dlani (The Heart on the Palm) endowment fund**

Within its support of children from children's homes, the CZ.NIC association became a partner of the 12th benefit concert of the *Srdce na Dlani* endowment fund which took place on November 23, 2016 in the National House in Vinohrady. The proceeds from the benefit concert of the endowment fund were used for activities of children from children's homes.

### **10.1.3 Membership in industry and interest organisations**

#### **NIX.CZ**

The largest Czech Internet Exchange Point (IXP) covers domestic and foreign Internet service providers for the interconnection of their networks. The NIX.CZ association is the largest IXP in the Czech Republic and one of the most important in the world. The CZ.NIC association is a member of NIX.CZ and actively contributes to its activities primarily through the FENIX project. Important is also the use of the CZ.NIC Laboratories products, especially BIRD within NIX.CZ.

#### **Involvement in the FENIX project**

CZ.NIC helped establish the FENIX node on the platform of the biggest Czech peering node NIX.CZ in 2013. Its aim is to provide availability of internet services between entities involved in this activity in case of massive DoS attacks. The FENIX project is intended for businesses providing connectivity for major connectivity and content providers who need to secure their operation also in the most critical situations.

Any entity that meets the entry terms can join the FENIX project. These terms go hand in hand with the values of CZ.NIC and its mission, i.e. development of a transparent, secure and stable internet infrastructure and services of general interest. This primarily involves the development of trustworthy, secure and stable Internet infrastructure and services of general benefit. To join the FENIX project, the applicant must for example run its CERT/CSIRT team, support IPv6 and DNSSEC, have the response rate limiting implemented and use BCP-38 source address filtering in its network.

### **10.2 Abroad**

Thanks to the activities of the association on the international internet scene or interested foreign organisations are increasingly selecting CZ.NIC as a partner for cooperation and the Czech Republic as the venue for their meetings. The CZ.NIC association welcomes this fact, as the representatives of the local Internet community gain easier access to interesting topics as well as to leading experts from the world of the Internet.

#### **10.2.1 Membership in industry and interest organisations**

##### **APWG (Anti-Phishing Working Group)**

A global coalition of private companies, state institutions and security forces focused on the global fight against cyber-crime, especially spam.

## **CENTR (Council of European National Top Level Domain Registries)**

A non-profit organisation associating top-level and national top-level domain name administrators. It primarily targets European registries, but among the members are also the representatives of more remote regions - e.g. Canada or Japan. The CZ.NIC association has been a member since 2001 and has been regularly involved in individual working group meetings. In 2016 Jaromír Talíř was appointed as one of the heads of the CENTR Technical Working Group and Bedřich Košata for the CENTR R&D Working Group.

## **CECSP (Central European Cyber Security Platform)**

Joint initiative of the Czech Republic, Slovakia, Poland, Hungary and Austria, aiming to share information, best practices and know-how on cyber threats and potential attacks. The platform supports team activities co-ordination, joint training and exercises. The countries should also seek common positions on international issues across the platform. Regular meetings are used for building trust between teams and for sharing information.

## **DNS-OARC (The Domain Name System Operations, Analysis and Research Center)**

A trusted platform where key stakeholders meet and share their experience with DNS operation, analyses and research, so that they can coordinate their work as efficiently as possible, particularly in the field of security. In 2016 Ondřej Surý was elected to the Board of Directors, replacing the CEO

of Czech National Domain Administrator Ondřej Filip, who had been in the governing body of the DNS-OARC organisation since 2010.

## **EURid (The European Registry of Internet Domain Names)**

An association which, under the authority of the European Commission, administers the .eu Top Level Domain. CZ.NIC is an associate member and has a representative in the board.

## **EuroISPA (European Internet Services Providers Associations)**

The European Internet Service Provider (ISP), the largest organisation bringing together more than 2300 organisations around the world. The main objective of EuroISPA, to which CZ.NIC is a member since 2008, is to represent ISPs within the legislative processes of the European Union and facilitate the exchange of experience between individual internet services providers.

## **CSIRT Network**

An interest group of CSIRT teams which fulfills the role of the contact point for obligated persons identified in the NIS directive. The CZ.NIC association, through the CSIRT.CZ team, fulfills the role of the CSIRT team for digital service providers and is therefore expected to participate in this group. The group primarily deals with technical issues related to the implementation of this agenda. In 2016 CSIRT.CZ participated in the first two unofficial meetings and helped define the rules and membership of the CSIRT Network. Officially, the group will start operation in February 2017.

## **FIRST**

The First international organisation associating security teams. Currently, it has 363 members and American and European teams are represented to a significant degree. It is the only organisation that provides membership to teams from around the world and also covers product teams. The team became member of the FIRST organisation in 2015.

## **ICANN (Internet Corporation for Assigned Names and Numbers)**

An international non-profit organisation founded in 1998, the main task of which is not only to administer and assign generic top-level domain names (gTLDs) and top-level national domain names (ccTLDs) but also IP addresses. The CZ.NIC association, as a national domain administrator, sends its representatives to regular meetings and its experts actively participate in activities of the working groups. Ondřej Surý is a member of the Root Server System Advisory Committee Caucus (RSSAC) and the Registry Services Technical Evaluation Panel (RSTEP), and Ondřej Filip, the CZ.NIC CEO, acts as a member of the prestigious SSAC (Security & Stability Advisory Committee) committee.

## **IETF (Internet Engineering Task Force)**

An organisation founded in 1986, which is directly linked to the birth of the Internet. It includes an international community of leading experts, network architects and representatives of the commercial sphere. IETF approves and enforces Internet standards, so-called RFC documents, which govern most Internet traffic, and our employees are actively involved in some of them. The meeting of this organisation

has also taken place several times thanks to the cooperation of the CZ.NIC association in Prague.

## **RIPE NCC (Réseaux IP Européens Network Coordination Centre)**

An independent non-profit organisation supporting the Internet infrastructure. Its core activities include the RIR operation (Regional Internet Registry) which allocates Internet resources and related services (such as IP addresses) to its members. The CZ.NIC association, as one of the members, attends not only regular meetings, but also participates in other thematic meetings and trainings organised by this organisation.

## **TF-CSIRT**

TF-CSIRT is an organisation that brings together about three hundred security teams from Europe. The CSIRT.CZ and CZ.NIC-CSIRT team it its accredited member. In 2016 Zuzana Duračinská, a computer security specialist with CZ.NIC, was appointed to the TF-CSIRT's Steering Committee.



# **11 GRANT PROJECTS**

In line with its long-term objective of developing Internet technologies and the information society and the medium-term concept of the association for the years 2016-2019, the CZ.NIC association is actively involved in the investigation of grant projects.

Thanks to the great success, grant projects are an increasingly important source of funding for the entire association, of which some parts (mostly the CSIRT.CZ security team) are now largely paid from these funds. In 2016 the grant funds also significantly contributed to the financing of the TURRIS project.

## 11.1 Involvement in European cooperation projects

European cooperation projects represent not only a significant source of income for CZ.NIC, but also the possibility of participating in unique projects that often help determine the future direction of the information society.

Within the projects supported by the European Commission from the European Interconnection Facility (CEF), CZ.NIC became the most successful Czech applicant and one of the most successful in the whole EU. Thanks to these projects, CZ.NIC is significantly involved in building infrastructure intended primarily for cross-border electronic services of the public administration. The implementation of these projects also helps strengthen the status of the association as a trusted partner of the state.

Thanks to its unique experience in the CEF programme, CZ.NIC started offering grant advice to other entities, mostly to security teams from Central and Eastern Europe, for which they prepared commercial proposals for their projects for European Commission funding.

The following projects were implemented with the support of the European Commission in 2016:

### **CS Danube (Cyber Security in Danube Region)**

In 2016 CZ.NIC association ended the implementation of CS Danube project in which it was the main partner of the international consortium. The aim of the project was to strengthen trust and cooperation among CERT/CSIRT security teams and share their know-how. To this end, CZ.NIC organised an international conference on 15 March 2016 in Prague, followed by a training led by representatives of the European Network and Information Security Agency (ENISA). The implementation of the project supported by the START EU Strategy for the Danube Region scheme was also supported by partners from Austria, Slovakia, Croatia, Serbia and Moldova.

### **CZ.PEPS (Czech Pan European Proxy Services)**

The objective of the CZ.PEPS project, launched in January 2016, is primarily the implementation and operation of national infrastructure (so-called eIDAS node) for cross-border recognition of electronic identification in Europe in accordance with Regulation No. 910/2014 of the European Parliament

and Council (eIDAS). As part of this project funded by the European Commission through the Connecting Europe Facility, it is envisaged that it will be connected with the National Identity Authority (NIA) established by the Ministry of the Interior and/or Basic Registries Administration. The project ensures the operation of the node until the end of 2019, i.e. more than one year after the legal effect of the relevant eIDAS provisions.

### **e-SENS (Electronic Simple European Networked Services)**

Implementation of a project aimed at supporting electronic services and tools such as electronic identification or electronic delivery of documents started in April 2013. The aim of the project is to help support the development of the digital single market and e-services of the public and private sectors.

### **SIC CZ (Safer Internet / Bezpečnější Internet)**

In 2016 the CZ.NIC association joined the SIC CZ project aimed primarily at enhancing on-line children security and their protection in cyberspace. CZ.NIC ensures within this project the operation of the hotline (STOPonline.cz) for reporting of illegal on-line content, and at the same time significantly contributes to awareness-raising activities in order to continue and further develop the recent initiatives of the association.

## **11.2 Engagement in national and other projects**

In addition to European projects, the CZ.NIC association also participates in national projects, especially within the framework of Czech security research.

### **HaaS (HoneyPot as a Service)**

The aim of the HaaS project is to develop and implement a so-called public honeypot, to which end-users of the Internet can redirect attacks on their end devices (typically home routers). The behaviour of the attackers will be further analysed on the honeypot to uncover new, unknown attacks or malware samples. The project, supported by the Czech Technology Agency within the Delta scheme, is being developed in cooperation with the Institute for Information Industry from R.O.C. (Taiwan).

### **PROKI (Prediction and Protection from Cyber-Incidents)**

The aim of the project, supported within the security research of the Czech Republic for the years 2015-2020, is mainly the development of a system addressing the analysis of information on cyber-incidents from a wide range of sources and the evaluation of this information by the National Security Team CSIRT.CZ operated by the CZ.NIC association pursuant to Act No. 181/2014 Coll. on cyber-security. When developed, the system will then enable the sharing of information on cyber-threats among key players, especially national and governmental CERT/CSIRTs and major ISPs.

## **Effects of the eIDAS Regulation on the electronic delivery system in the Czech Republic**

The aim of the project, supported by the Czech Technology Agency and implemented in cooperation with the Prague Metropolitan University, was to analyse the impact of the eIDAS Regulation on the data box information system (ISDS) and propose possible changes to this system in connection with the eIDAS Regulation and relevant national legislation, particularly Act No. 297/2016 Coll. on confidence-building services. The project is a showcase of activities focused on expert consultancy in the area of the eGovernment, provided to the state administration.





# **12 STRUCTURE OF THE ASSOCIATION**

## 12.1 Member base

The member base of the association is made up of a number of entities which are significantly involved in the functioning of the Czech Internet. Among the members we can find not only representatives of Internet and telecommunication service providers, domain name registrars, publishers of Internet and printed media, e-commerce entrepreneurs but also entities for which the Internet and domain names are an important communication tool.

The CZ.NIC association is one of the places where these representatives can meet and so influence the future direction of the Czech Internet. The wide range of members' business activities and their involvement in the activities of the association, either through participation in general meetings, working groups and seminars, in e-mail conferences or directly in the bodies of the association, enriches and extends the knowledge portfolio of the association, makes its management more effective and responds to the constant development that is so typical of the Internet.

### Membership terms

Any legal entity that fulfills the general membership terms, including the location of a registered office or an organisational unit on the territory of one of the Member States of the European Union, the holding at least one domain name in ccTLD .CZ and payment of an entry membership fee, can become member of the association.

The members of the association are divided into three chambers - a chamber of domain name holders, an ISP chamber and a registrar chamber. The special conditions of the membership in the individual chambers are governed by the statutes. The chamber arrangement brings benefits to the members of the association who can easily specify and defend their opinions and interests together with other similarly oriented entities. The chamber arrangement also streamlines the course and the meetings of the association bodies, in particular board and general meetings.

### 12.1.1 Members count according to chambers

As of 31 Dec, 2016 CZ.NIC had a total of 112 members. Five members have left the Chamber of domain name holders and two members have left the Registrar chamber.

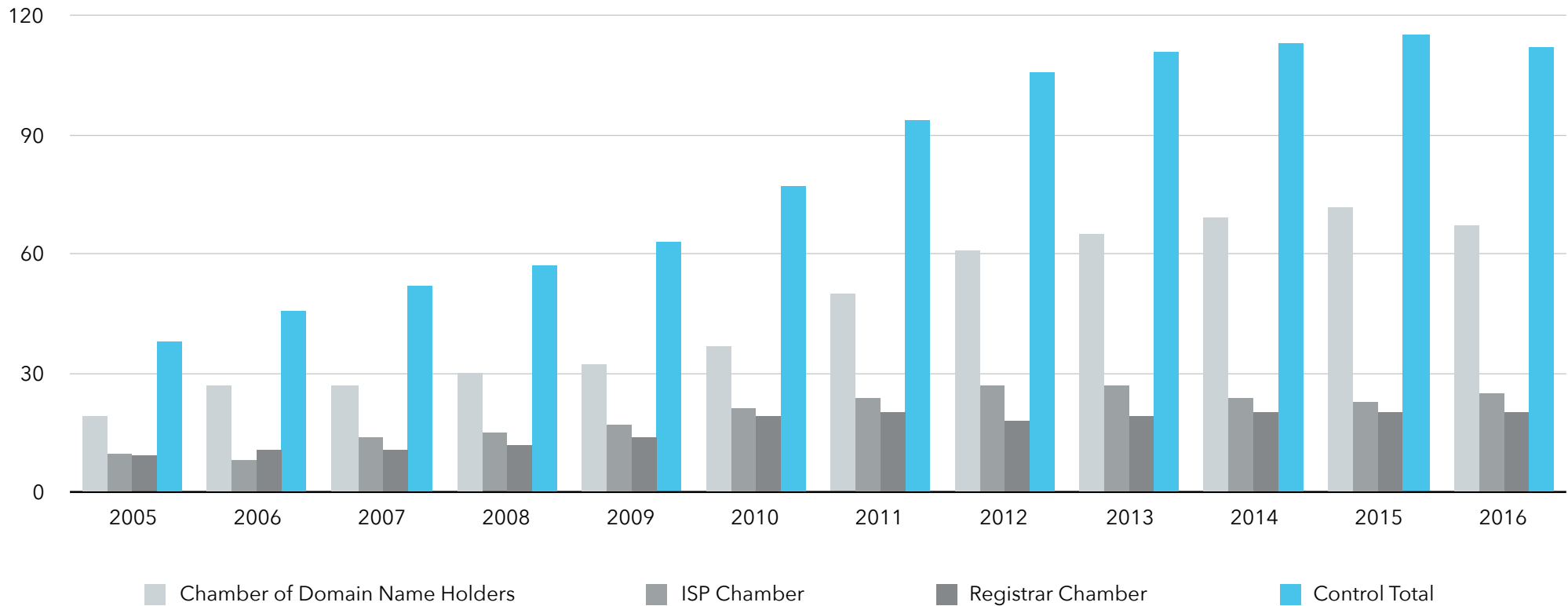
Chamber of Domain Name Holders	60%
ISP Chamber	22%
Registrar Chamber	18%

Member division according to chambers

# 12 STRUCTURE OF THE ASSOCIATION

Member count	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Chamber of Domain Name Holders	19	27	27	30	32	37	50	61	65	69	72	67
ISP Chamber	10	8	14	15	17	21	24	27	27	24	23	25
Registrar Chamber	9	11	11	12	14	19	20	18	19	20	20	20
Control Total	38	46	52	57	63	77	94	106	111	113	115	112

Member count development by chamber



## 12.1.2 Member overview by chamber

Overview of chamber members as of 31 Dec, 12. 2016

### Chamber of Domain Name Holders (company, reg. No.)

ABRATICA s. r. o.	26108534
ACOMWARE s. r. o.	25047965
ADAPTIVITY s. r. o.	24156027
AdminIT s. r. o.	27864901
Advio Network, s. r. o.	28565673
AKREDIT, spol. s r. o.	25797387
ALENSA, s. r. o.	27179681
AliaWeb, spol. s r. o.	26117363
Asociace pro elektronickou komerci	68684797
AUDITEL, s. r. o.	26775034
BT Limited, organizační složka	70802025
CD PROFESIONAL security agency, s. r. o.	25712713
CISCO SYSTEMS (Czech Republic) s. r. o.	63979462
ComSource s. r. o.	29059291
Com-Sys TRADE spol. s r. o.	16188781
CQK HOLDING a. s.	28405579
CYBERSALES a. s.	26199653
Datahost s. r. o.	26390973
DELL Computer, spol. s r. o.	45272808

Dimension Data Czech Republic s. r. o.	26175738
ekolo.cz s. r. o.	27141659
EXPLORER a. s.	26726653
Fortion Networks, s. r. o.	26397994
Greenlux s. r. o.	28608747
Holubová advokáti s. r. o.	24686727
ICZ a. s.	25145444
igloonet, s. r. o.	27713482
I. H. P. společnost s ručením omezeným	48117846
INBES, spol. s r. o.	14502593
Intell. Net s. r. o.	27971546
Internet Info, s. r. o.	25648071
Internet Mall, a. s.	26204967
i-hregistry s. r. o.	28451082
Klíč, spol. s r. o.	28129377
Laurián s. r. o.	29018919
MAFRA, a. s.	45313351
MARIAS s. r. o.	26136139
MASANTA s. r. o.	25730533
MEDIA FACTORY Czech Republic a. s.	26288311
Michal Krsek & partneři s. r. o.	27418570
MITE Infonet s. r. o.	25660292
Moonlake Web Services, s. r. o.	29249911
Neutral czFree eXchange, z. s. p. o.	75093201

Nux s. r. o.	27234631
Občanské sdružení Ubuntu pro Českou republiku	22674608
Orego finance s. r. o.	24718955
PharoCom s. r. o.	25172131
Prague Business Office s. r. o.	27143481
Pražský Účetní Servis s. r. o.	26740575
Q3, s. r. o.	26226073
Seznam.cz, a. s.	26168685
Skymia s. r. o.	28238613
Software602 a. s.	63078236
Socha, spol. s r. o.	48291153
SuperNetwork s. r. o.	25492063
SVBsoft, s. r. o.	28523644
Tech Ware spol. s r. o.	14891107
TIKWI s. r. o.	28917651
Trustica s. r. o.	26514362
Unie vydavatelů, z. s. (Czech Publishers Association)	15887081
ÚVT, s. r. o.	25701118
Vema, a. s.	26226511
VIZUS.CZ s. r. o.	27155315
VOLNÝ, a. s.	63080150
Vymáhání a odkup pohledávek s. r. o.	27566510
Webarium, s. r. o.	26089602
Webnames s. r. o.	44848692

## ISP Chamber (company, reg. No.)

ABAK, spol. s r. o., čes., ABAK, GmbH, něm., ABAK, Co.Ltd., angl.	40763153
CASABLANCA INT s. r. o.	25079832
CentroNet, a. s.	26165473
CESNET, z. s. p. o.	63839172
COOLHOUSING s. r. o.	14893983
ČD - Telematika a. s.	61459445
České Radiokomunikace a. s.	24738875
Dragon Internet a. s.	27237800
Družstvo EUROSIGNAL	26461129
Faster CZ spol. s r. o.	60722266
FreeTel, s. r. o.	24737887
INTERNEXT 2000, s. r. o.	25352288
IPEX a. s.	45021295
ISP Alliance a. s.	28205812
JHComp s. r. o.	26051362
LAM plus s. r. o.	25129619
Master Internet, s. r. o.	26277557
NetArt Group s. r. o.	27612694
PODA a. s.	25816179
Qnet CZ s. r. o.	25518097
STARNET, s. r. o.	26041561
T-Mobile Czech Republic a. s.	64949681

ÚVT Internet s. r. o.	24288705
VSHosting s. r. o.	61505455
2 connect a. s.	29007542

ZONER software, a. s.	49437381
1X s. r. o.	44632142

## Registrar Chamber (company, reg. No.)

ACTIVE 24, s. r. o.	25115804
Dial Telecom, a. s.	28175492
e-BAAN Net s.r.o.	26867257
GENERAL REGISTRY, s. r. o.	26027267
Gransy s. r. o.	28087755
IGNUM, s. r. o.	26159708
INTERNET CZ, a. s.	26043319
KRAXNET s. r. o.	26460335
Media4web, s. r. o.	26735903
NEW MEDIA GROUP s. r. o.	26124611
ONE.CZ s. r. o.	25503651
ONEsolution s. r. o.	27710335
O2 Czech Republic a. s.	60193336
Seonet Multimedia s. r. o.	27522041
Stable.cz s. r. o.	28741048
TELE3 s. r. o.	26096960
TERMS a. s.	14499037
Web4U s. r. o.	26058774

## 12.2 Bodies of the association

### General Meeting

The supreme body of the association is the General Assembly, in which all members of the association are members. They are divided into three chambers - Registrar Chamber, ISP Chamber, and Chamber of Domain Name Holders. Each member of the association has the right to participate in the General Meeting and promote its ideas, provide opinions and comments.

### College

The college is a body of the association consisting of members elected by the individual chambers of the general assembly and/or by other persons. The powers of the college include for example approvals of the conception and budget of the association, electing and recalling members of the board of directors and members of the supervisory board. The college has a total of 21 members, of which 18 members elect the individual chambers of the general assembly. Three members are nominated by public administration bodies. The term of office for the College members is three years.

## **Members of the College elected by the general assembly from 1 Jan to Dec 31, 1. 31. 12. 2016**

### **Chamber of Domain Name Holders**

Marek Antoš

Dan Ohnesorg (elected instead of Jiří Peterka who is stepping down)

Michal Pajr

Jiří Peterka (resigned from the function on 7 Aug, 8. 2016)

Jan Redl

Jan Šváb

David Vorlíček (re-elected at the general assembly on 8 Dec, 12. 2016)

### **ISP Chamber**

Ondřej Filip

Tomáš Košnar (re-elected at the general assembly on 8 Dec, 12. 2016)

Jiří Kysela

Vlastimil Pečinka

Zbyněk Pospíchal (re-elected at the general assembly on 8 Dec, 12. 2016)

Karel Taft

### **Registrar Chamber**

Petr Šmída

Tomáš Fiala (re-elected at the general assembly on 8 Dec, 12. 2016)

Martin Kukačka

Stanislav Kysela (re-elected at the general assembly on 8 Dec, 12. 2016)

Erich Syrovátka

Jaroslav Štětina

### **College members nominated by state administration bodies**

1. 1.-30. 11. 2016

Marek Ebert, Czech Telecommunication Office

Marie Moravcová, Economic Chamber of the Czech Republic

Markéta Petruňová, Ministry of Industry and Trade

1. 12.-31. 12. 2016

Jiří Peterka, Czech Telecommunication Office

Marie Moravcová, Economic Chamber of the Czech Republic

Markéta Petruňová, Ministry of Industry and Trade

## 12.3 Board of Directors

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The Board of Directors is the statutory body that represents and controls its activities. The powers of the Board of Directors include approvals of domain name registration rules or other services provided. The Board of Directors consists of five members whose term of office is three years. The election and dismissal of the members of the Board of Directors lie within the scope of competence of the College.

### Members of the Board of Directors 1. 31. 12. 2016

Karel Taft (\*1971), Chairman of the Board of Directors

Marek Antoš (\*1979), Vice-Chairman of the Board of Directors

Tomáš Košnar (\*1965), member

Martin Kukačka (\*1980), member

Jiří Kysela (\*1955), member

## 12.4 Supervisory Board

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The Supervisory Board represents the control body of the association which oversees the exercise of the powers of the Board of Directors and the activities of the association. The Supervisory Board is a three-member board and the term of office of its members is, as for the Board of Directors, three years.

### Members of the Supervisory Board 1.-31. 12. 2016

Jan Redl, Chairman of the Supervisory Board

Ilona Filípková, member

Vlastimil Pečínka, member





# **13 HUMAN RESOURCES**

The strength of the association lies in the professionally competent and qualified employees who are essential for achieving its mission and further development. For many employees it is possible to say without exaggeration that they are leading experts in the field who have not only domestic but also international reputation. To strengthen individual competencies, all employees are continuously educated, both in the field of foreign languages, so-called soft skills, and in professional knowledge, so that they can achieve the highest possible professional and personal qualities and contribute with their knowledge and skills to further development of the Czech Internet and the association. CZ.NIC creates for its employees a non-smoking environment that has positive impacts not only from the health perspective.

## 13.1 Staffing status and development

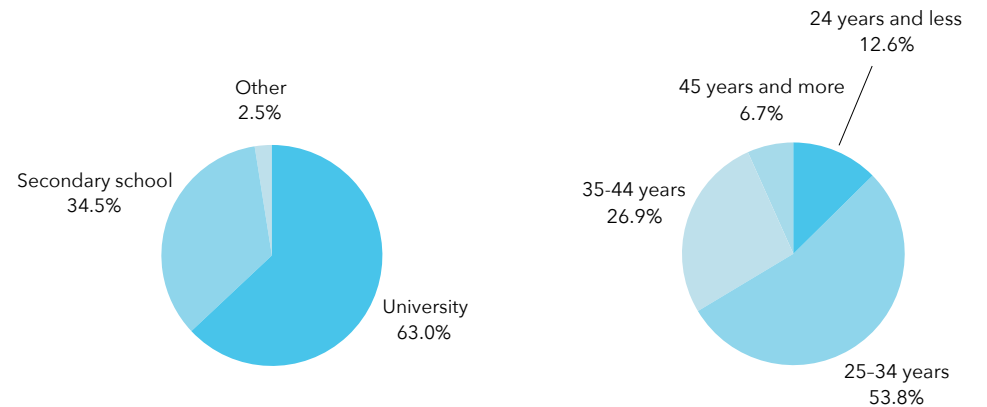
In 2016 an increase in the number of employees of the association continued, reflecting above all the need for staffing for the development and implementation of new activities. Significant staff growth occurred in the CZ.NIC Laboratories in connection with the Turris project and the expansion of other projects in line with the concept of the association (e.g. NetMetr, projects related with data boxes and more). The development team has been strengthened to ensure good functionality of the registry and infrastructure and, for the same reason, the team of network administrators has been boosted. The total number of employees increased by 12 last year, which was the same number as that of new work contracts.

Department	Number of employees (1 January 2016)	Number of job positions (1 January 2016)	Number of employees (31 December 2016)	Number of job positions (31 December 2015)	Change in employee count (percentage)	Change in job position count (percentage)
Lead workers	7	7	8	8	100	14
Marketing/PR	6	6	6	6	0	0
CZ.NIC Academy	2	2	2	2	0	0
Vývoj	16	14.7	19	17.5	19	19
Network administration	6	6	9	7.6	50	27
CZ.NIC Laboratories	37	31.55	48	39.45	30	25
Legal department	1	0.5	2	1.25	100	150
Administrative workers	1	1	3	2.25	200	125
Customer support	11	11	12	12	9	9
CSIRT	8	6.2	8	6.95	0	12
EU projects	1	1	2	2	100	100
<b>Total</b>	<b>96</b>	<b>86.95</b>	<b>119</b>	<b>105</b>		

## 13.2 Structure of employees

### Structure of employees by education

Most employees of the association have a university degree. The CZ.NIC association gives an opportunity to acquire professional experience also to fresh graduates from universities, for which it is trying to build suitable conditions and places them in its branches in Brno, České Budějovice and Plzeň. As a result of this, the association again managed to maintain a high portion of university graduates among its employees in 2016.

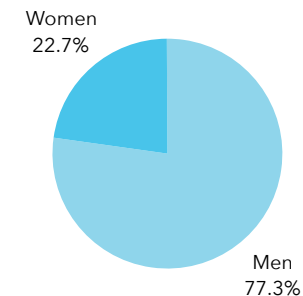


### Structure of employees by age

The average age of employees of the association is 32.8 years. Thanks to the arrival of new employees in 2016, the employees of the association "became younger" by an average of 6 months. In terms of the age structure, employees aged between 25 and 34 prevail, mainly due to the high number of university graduates and the support of university graduates.

### Structure of employees by gender

In recruiting new employees, CZ.NIC encourages equal opportunities and the involvement of women. In 2016 the CZ.NIC association managed to increase the share of employed women. Due to the structure of graduates in the technical branches of higher education institutions, however, the proportion of men still prevails like in other technology companies.





**14 SELECTED  
FINANCIAL INDICATORS**

## 14 SELECTED FINANCIAL INDICATORS

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Revenue	137,632	139,167	133,050	155,848	119,376	140,994	137,751	136,998	141,912	222,736	199,898	197,704	210,708
Costs	139,669	106,557	117,618	132,369	65,909	97,799	100,781	104,370	125,352	209,127	186,092	211,703	189,057
Profit after tax	-2,037	32,610	15,432	23,479	53,467	43,195	36,970	32,628	16,560	13,609	13,806	13,999	21,650



# **15 BALANCE SHEET**

# 15 BALANCE SHEET

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Assets total</b>	100,982	147,926	168,026	171,222	221,778	275,087	312,202	361,566	387,674	405,154	431,392	449,278	491,643
<b>Fixed assets</b>	6,347	3,044	10,156	8,381	8,135	8,268	12,258	8,781	63,840	77,095	101,406	89,398	84,611
<b>Intangible assets</b>	1,841	1,179	3,210	3,806	1,522	0	0	0	300	249	331	281	1,914
<b>Tangible property</b>	4,506	1,865	6,946	4,575	6,613	8,268	12,258	8,781	63,540	76,846	101,075	89,117	82,697
<b>Financial investments</b>													
<b>Securities</b>													
<b>Current assets</b>	94,251	144,882	156,678	161,456	212,200	265,160	292,563	351,125	322,087	326,095	327,745	358,842	406,080
<b>Stocks</b>				55	211	48	184	278	189	277	453	798	14,340
<b>Long-term receivables</b>			106		715	1,196	1,351	1,379	1,335	59	59	58	58
<b>Short-term receivables</b>	880	852	2,872	1,018	1,051	1,851	4,338	12,180	10,676	18,540	22,100	4,948	6,282
<b>Financial property</b>	93,371	144,030	153,680	160,383	210,223	262,065	286,690	337,288	309,887	307,219	305,133	353,038	385,400
<b>Other assets</b>	384	0	1,192	1,385	1,443	1,659	7,381	1,660	1,747	1,964	2,241	1,038	952

# 15 BALANCE SHEET

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Liabilities total</b>	100,982	147,926	168,026	171,222	221,778	275,087	312,202	352,036	387,674	405,154	431,392	449,278	491,643
<b>Own equity</b>	6,014	38,624	54,056	77,535	131,181	174,197	211,167	243,795	261,094	274,591	288,397	302,395	324,045
<b>Registered capital</b>													
<b>Capital funds</b>													
<b>Profit funds</b>	7,627	7,627	7,627	7,627	7,627	7,627	7,627	44,597	44,597	93,784	107,393	121,198	135,197
<b>Economic result of past years</b>	424	-1,613	30,997	46,429	69,908	123,375	166,570	166,570	199,937	167,198	167,198	167,198	167,198
<b>Economic result of the accounting period</b>	-2,037	32,610	15,432	23,479	53,646	43,195	36,970	32,628	16,560	13,609	13,806	13,999	21,650,
<b>Foreign sources</b>	16,786	26,831	18,753	13,706	16,764	13,851	14,877	15,988	17,684	27,479	22,497	32,140	48,059
<b>Reserves</b>								9,530	884	1,832	1,662	2,662	2,359
<b>Long-term liabilities</b>					193				241	304	235	1,344	617



# 15 BALANCE SHEET

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Current liabilities</b>	16,786	26,831	18,753	13,706	16,571	13,851	14,877	15,988	16,559	25,343	20,600	28,134	45,083
<b>Bank loans</b>													
<b>Other liabilities</b>	78,182	82,471	95,217	79,981	73,833	87,039	86,158	92,253	108,896	103,084	120,498	114,743	119,539



# **16 PROFIT AND LOSS STATEMENT**



# 16 PROFIT AND LOSS STATEMENT

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Extraordinary revenues</b>													0
<b>Extraordinary costs</b>	1,638		6,124	9,777	15,312	12,070	10,388						0
<b>Extraordinary profit / loss</b>	-1,638		-6,124	-9,777	-15,312	-12,070	-10,388						0
<b>Profit after tax</b>	-2,037	32,610	15,432	23,479	53,646	43,195	36,970	32,628	16,560	13,609	13,806	13,999	21,650



**17 SALES GROWTH**

# 17 SALES GROWTH

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sales	136,250	139,020	128,952	144,741	108,523	109,576	120,701	127,133	134,144	138,755	150,880	166,318	194,897



**18 DATA ON THE FACTS  
BETWEEN THE DATE OF  
THE FINANCIAL STATEMENTS  
AND THE GENERAL ASSEMBLY**

## **18 DATA ON THE FACTS BETWEEN THE DATE OF THE FINANCIAL STATEMENTS AND THE GENERAL ASSEMBLY**

No events occurred during the period of time reported affecting the data presented in the 2016 financial statements.





# **19 AUDITOR'S REPORT**

## ZPRÁVA NEZÁVISLÉHO AUDITORA pro členy zájmového sdružení právnických osob

### Výrok auditora

Provedli jsme audit přiložené účetní závěrky zájmového sdružení právnických osob CZ.NIC (dále jen „CZ.NIC“) sestavené na základě českých účetních předpisů, která se skládá z rozvahy k 31.12.2016, výkazu zisku a ztráty, za rok končící 31.12.2016, přehledu o změnách vlastního kapitálu, přehledu o peněžních tocích a přílohy této účetní závěrky, která obsahuje popis použitých podstatných účetních metod a další vysvětlující informace. Údaje o CZ.NIC jsou uvedeny v části 1 přílohy této účetní závěrky.

Podle našeho názoru účetní závěrka podává věrný a poctivý obraz aktiv a pasiv zájmového sdružení právnických osob CZ.NIC k 31.12.2016 a nákladů a výnosů a výsledku jejího hospodaření za rok končící 31.12.2016 v souladu s českými účetními předpisy.

### Základ pro výrok

Audit jsme provedli v souladu se zákonem o auditorech a standardy Komory auditorů České republiky pro audit, kterými jsou mezinárodní standardy pro audit (ISA) případně doplněné a upravené souvisejícími aplikačními doložkami. Naše odpovědnost stanovená těmito předpisy je podrobněji popsána v oddílu Odpovědnost auditora za audit účetní závěrky. V souladu se zákonem o auditorech a Etickým kodexem přijatým Komorou auditorů České republiky jsme na CZ.NIC nezávislí a splnili jsme i další etické povinnosti vyplývající z uvedených předpisů. Domníváme se, že důkazní informace, které jsme shromáždili, poskytují dostatečný a vhodný základ pro vyjádření našeho výroku.



### Ostatní informace uvedené ve výroční zprávě

Ostatními informacemi jsou v souladu s § 2 písm. b) zákona o auditorech informace uvedené ve výroční zprávě mimo účetní závěrku a naši zprávu auditora. Za ostatní informace odpovídá představenstvo CZ.NIC.

Náš výrok k účetní závěrce se k ostatním informacím nevztahuje. Přesto je však součástí našich povinností souvisejících s auditem účetní závěrky seznámení se s ostatními informacemi a posouzení, zda ostatní informace nejsou ve významném (materiálním) nesouladu s účetní závěrkou či s našimi znalostmi o účetní jednotce získanými během provádění auditu nebo zda se jinak tyto informace nejeví jako významně (materiálně) nesprávné. Také posuzujeme, zda ostatní informace byly ve všech významných (materiálních) ohledech vypracovány v souladu s příslušnými právními předpisy. Tímto posouzením se rozumí, zda ostatní informace splňují požadavky právních předpisů na formální náležitosti a postup vypracování ostatních informací v kontextu významnosti (materiality), tj. zda případné nedodržení uvedených požadavků by bylo způsobitelné ovlivnit úsudek činěný na základě ostatních informací.

Na základě provedených postupů, do míry, již dokážeme posoudit, uvádíme, že

- ostatní informace, které popisují skutečnosti, jež jsou též předmětem zobrazení v účetní závěrce, jsou ve všech významných (materiálních) ohledech v souladu s účetní závěrkou a
- ostatní informace byly vypracovány v souladu s právními předpisy.

Dále jsme povinni uvést, zda na základě poznatků a povědomí o CZ.NIC, k nimž jsme dospěli při provádění auditu, ostatní informace neobsahují významné (materiální) věcné nesprávnosti. V rámci uvedených postupů jsme v obdržených ostatních informacích žádné významné (materiální) věcné nesprávnosti nezjistili.

### Odpovědnost představenstva CZ.NIC za účetní závěrku

Představenstvo CZ.NIC odpovídá za sestavení účetní závěrky podávající věrný a poctivý obraz v souladu s českými účetními předpisy a za takový vnitřní kontrolní systém, který považuje za nezbytný pro sestavení účetní závěrky tak, aby neobsahovala významné (materiální) nesprávnosti způsobené podvodem nebo chybou.



Při sestavování účetní závěrky je představenstvo CZ.NIC povinno posoudit, zda je CZ.NIC schopno nepřetržitě trvat, a pokud je to relevantní, popsat v příloze účetní závěrky záležitosti týkající se jejího nepřetržitého trvání a použití předpokladu nepřetržitého trvání při sestavení účetní závěrky, s výjimkou případů, kdy představenstvo CZ.NIC plánuje zrušení CZ.NIC nebo ukončení její činnosti, resp. kdy nemá jinou reálnou možnost než tak učinit.

#### **Odpovědnost auditora za audit účetní závěrky**

Naším cílem je získat přiměřenou jistotu, že účetní závěrka jako celek neobsahuje významnou (materiální) nesprávnost způsobenou podvodem nebo chybou a vydat zprávu auditora obsahující náš výrok. Přiměřená míra jistoty je velká míra jistoty, nicméně není zárukou, že audit provedený v souladu s výše uvedenými předpisy ve všech případech v účetní závěrce odhalí případnou existující významnou (materiální) nesprávnost. Nesprávnosti mohou vzniknout v důsledku podvodů nebo chyb a považují se za významné (materiální), pokud lze reálně předpokládat, že by jednotlivě nebo v souhrnu mohly ovlivnit ekonomická rozhodnutí, která uživatelé účetní závěrky na jejím základě přijmou.

Při provádění auditu v souladu s výše uvedenými předpisy je naší povinností uplatňovat během celého auditu odborný úsudek a zachovávat profesní skepticismus. Dále je naší povinností:

- Identifikovat a vyhodnotit rizika významné (materiální) nesprávnosti účetní závěrky způsobené podvodem nebo chybou, navrhnout a provést auditorské postupy reagující na tato rizika a získat dostatečné a vhodné důkazní informace, abychom na jejich základě mohli vyjádřit výrok. Riziko, že neodhalíme významnou (materiální) nesprávnost, k níž došlo v důsledku podvodu, je větší než riziko neodhalení významné (materiální) nesprávnosti způsobené chybou, protože součástí podvodu mohou být tajné dohody (koluze), falšování, úmyslná opomenutí, nepravdivá prohlášení nebo obcházení vnitřních kontrol.
- Seznámit se s vnitřním kontrolním systémem CZ.NIC relevantním pro audit v takovém rozsahu, abychom mohli navrhnout auditorské postupy vhodné s ohledem na dané okolnosti, nikoli abychom mohli vyjádřit názor na účinnost jejího vnitřního kontrolního systému.
- Posoudit vhodnost použitých účetních pravidel, přiměřenost provedených účetních odhadů a informace, které v této souvislosti představenstvo CZ.NIC uvedlo v příloze účetní závěrky.



- Posoudit vhodnost použití předpokladu nepřetržitého trvání při sestavení účetní závěrky představenstvem a to, zda s ohledem na shromážděné důkazní informace existuje významná (materiální) nejistota vyplývající z událostí nebo podmínek, které mohou významně zpochybnit schopnost CZ.NIC nepřetržitě trvat. Jestliže dojdeme k závěru, že taková významná (materiální) nejistota existuje, je naší povinností upozornit v naší zprávě na informace uvedené v této souvislosti v příloze účetní závěrky, a pokud tyto informace nejsou dostatečné, vyjádřit modifikovaný výrok. Naše závěry týkající se schopnosti CZ.NIC nepřetržitě trvat vycházejí z důkazních informací, které jsme získali do data naší zprávy. Nicméně budoucí události nebo podmínky mohou vést k tomu, že CZ.NIC ztratí schopnost nepřetržitě trvat.
- Vyhodnotit celkovou prezentaci, členění a obsah účetní závěrky, včetně přílohy, a dále to, zda účetní závěrka zobrazuje podkladové transakce a události způsobem, který vede k věrnému zobrazení.

Naší povinností je informovat představenstvo CZ.NIC mimo jiné o plánovaném rozsahu a načasování auditu a o významných zjištěních, která jsme v jeho průběhu učinili, včetně zjištěných významných nedostatků ve vnitřním kontrolním systému.

Ve Strakonících, dne 16. června 2017

ADU.CZ s.r.o.  
Záměstí 68, 387 06 Malenice  
oprávnění Komory auditorů České republiky číslo 368  
za auditorskou společnost vypracovala Ing. Simona Pacáková, auditor  
auditorské oprávnění Komory auditorů České republiky číslo 1825



Digitálně podepsal Ing.  
SIMONA PACÁKOVÁ  
Datum: 2017.06.17  
00:32:13 +02'00'





# **20 REGISTERED OFFICE AND CONTACT DETAILS**

### **CZ.NIC, z. s. p. o.**

Milešovská 1136/5

130 00 Praha 3

Company reg. No.: 67985726

VAT reg. No.: CZ67985726

Phone: +420 222 745 111

Fax: +420 222 745 112

[www.nic.cz](http://www.nic.cz)

The Association is registered in the association registry kept with the Municipal Court in Prague, file number L 58624.

CZ.NIC - non-stop customer support

Phone: +420 222 745 111

Tel.: +420 731 657 660

e-mail: [podpora@nic.cz](mailto:podpora@nic.cz)