

# *REPORT 2022*

of the .ch Registry

SWITCH



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# Critical DNS infrastructure

## The homework of a registry



The internet has become one of the most important pillars of our information society. The Swiss economy, in particular, is dependent on the global communications network. Education, research and innovation in Switzerland are now unthinkable without digital media. Consequently, the Federal Office for Civil Protection has declared the internet a critical infrastructure.

For SWITCH, it was clear from an early stage that DNS, in particular, needed to be highly available. We have been looking for cooperation with other registries in order to be able to set up name servers in different locations around the world. We later added professional Anycast providers, which, in combination with the servers operated by SWITCH, can guarantee 100% availability for .ch and .li, even in crisis and conflict situations. This 100% availability was a criterion in OFCOM's tender for the operation of the registry and is now the industry standard for all registry offices.

SWITCH has bought in the knowledge of how to operate IT systems efficiently and securely across the globe from three Anycast providers. Detailed DNS expertise, on the other hand, is one of the core competencies of a registry. Critical infrastructure requires technical and organisational knowledge within reach. With its own CERT, SWITCH shows that we take the responsibility seriously.

Has SWITCH done all its homework? I'd like to answer yes. However, with regard to recent events such as the war in Ukraine and the electricity shortage, I am not entirely sure. That's why we deliberately chose these topics for the 2023 Domain Pulse conference, to hear from the experts. We want to be prepared and are in contact with the regulatory authority OFCOM, the Federal Office for Civil Protection and, of course, the Registrars. In Switzerland, we have a pragmatic approach that is based precisely on this established collaboration in emergencies.

**Urs Eppenberger** Head of Registry, SWITCH  
(Photo: SWITCH)

# Combating cybercrime

## COMPROMISED WEBSITES

The number of compromised webpages that were misused for phishing and malware fell in 2022. The majority of cases were reported by the National Cyber Security Centre (NCSC).

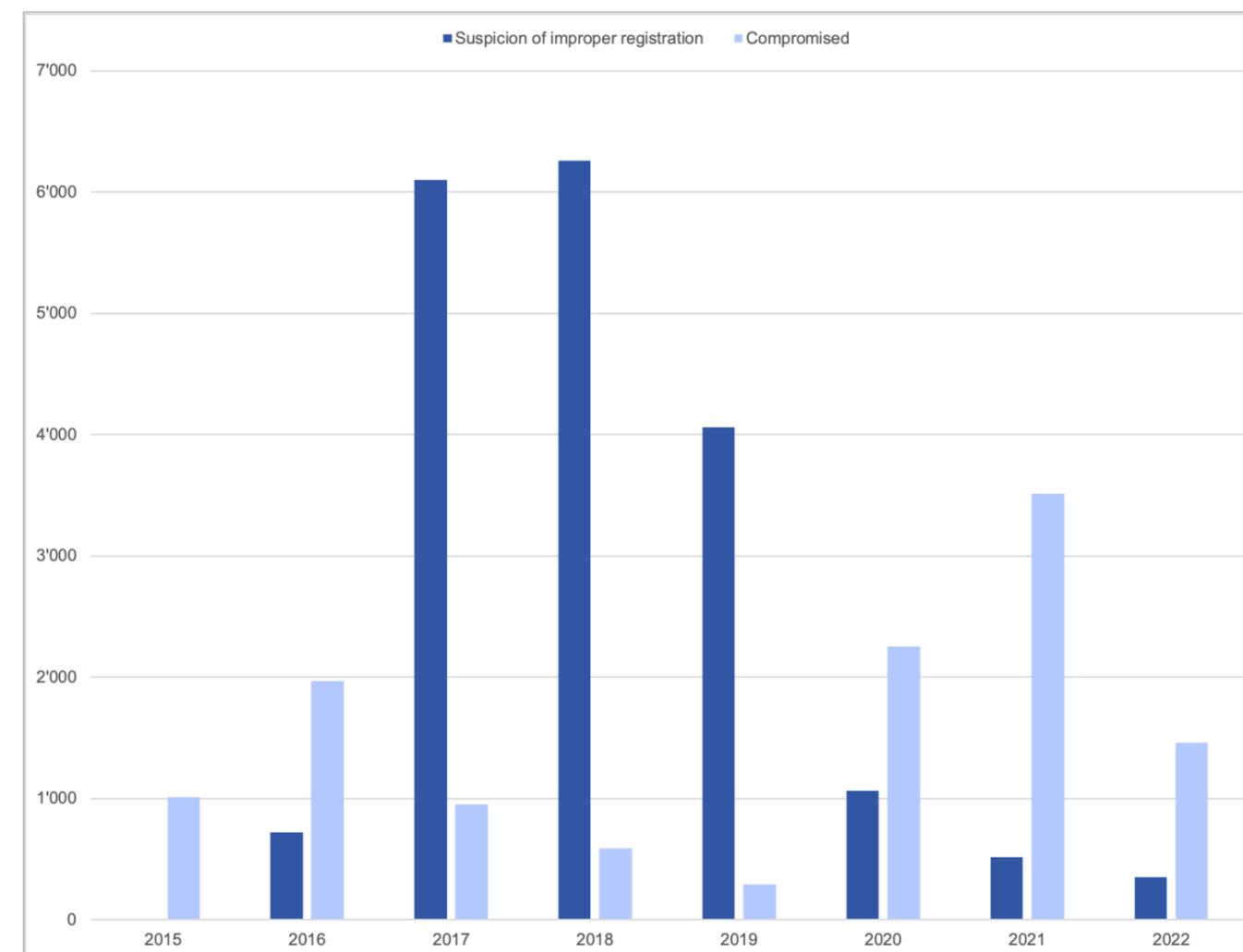
## IMPROPER REGISTRATION

The number of domain names suspected of being registered improperly also continued to decline.

Whether this is related to the deferred delegation that began at the beginning of 2022 cannot be determined with certainty, but it is possible.

Website: <https://www.saferinternet.ch>

## TYPE OF ACCESS TO DOMAIN NAMES



# Dealing with cases of suspected abuse

## REQUESTS FROM RECOGNISED AUTHORITIES – OID ART. 15.1

In 2022, accredited authorities sent a total of 28 requests under OID Art. 15.1 for immediate blocking (technical/administrative) of domain names related to phishing or malware.

Requests	Consequences	2022
Not answered	Domain name deleted	27
Answered	Domain name reactivated	1
<b>Total</b>		<b>28</b>

All authorities recognised by OFCOM are listed on the following website:

[Recognised authorities](#)

## ADMINISTRATIVE ASSISTANCE – OID ART. 16.3

At the request of an intervening Swiss authority acting within its area of responsibility, 321 requests were submitted for Swiss correspondence addresses under OID Art. 16.3.

Requests	Consequences	2022
Not answered	Domain name deleted	162
Answered	Domain name reactivated	159
<b>Total</b>		<b>321</b>

# Security awareness

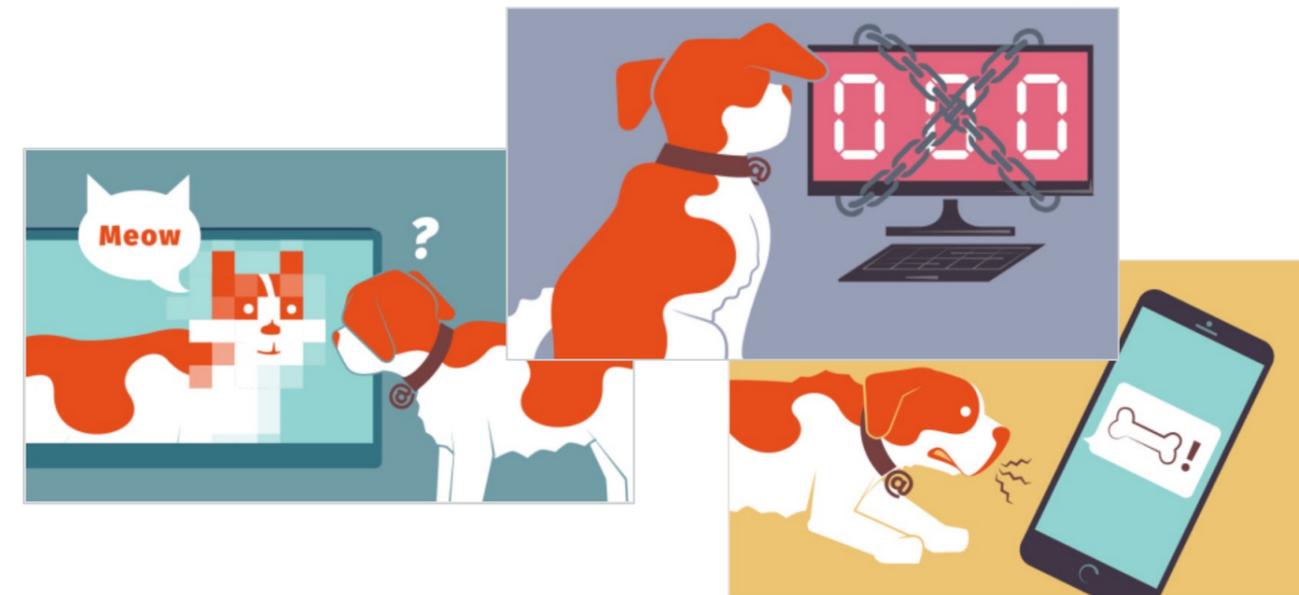
## SWITCH SECURITY AWARENESS DAY

On 26 October 2022, SWITCH hosted its fifth Security Awareness Day. This year, 69 people met on site in Bern and 44 people met online via Zoom. Participants on site were able to network with other experts during various networking breaks between the exciting presentations.

Once again, the purpose of this year's programme was to heighten awareness of security-related issues in the SWITCH community, while also sharing ideas and encouraging communication and interaction.

All presentations are available online:

<https://www.switch.ch/security/security-awareness/security-awareness-day>



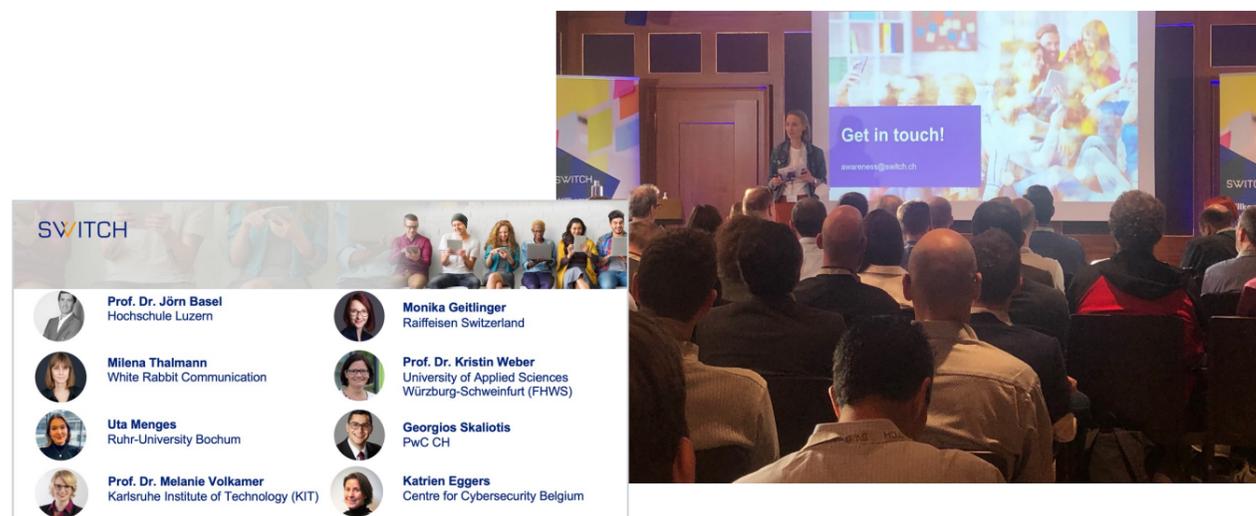
## IBARRY AND SISA

In collaboration with SISA, SWITCH continues to support raising awareness among the Swiss population.

With three new information campaigns (Deepfake, Ransomware, Smishing) and the launch of the website check, iBarry.ch provides information, guidance and support in the event of uncertainty and questions relating to internet security.

<https://checkawebsite.ibarry.ch/en>

<https://ibarry.ch/en>



SWITCH

 <b>Prof. Dr. Jörn Basel</b> Hochschule Luzern	 <b>Monika Geitlinger</b> Raiffeisen Switzerland
 <b>Milena Thalmann</b> White Rabbit Communication	 <b>Prof. Dr. Kristin Weber</b> University of Applied Sciences Würzburg-Schweinfurt (FHWS)
 <b>Uta Menges</b> Ruhr-University Bochum	 <b>Georgios Skaliotis</b> PwC CH
 <b>Prof. Dr. Melanie Volkamer</b> Karlsruhe Institute of Technology (KIT)	 <b>Katrien Eggers</b> Centre for Cybersecurity Belgium

# Check a website:

Have you received a suspicious link?

Enter the link you'd like to check... 

# Security awareness

## HACK THE HACKER – THE SWITCH SECURITY AWARENESS ADVENTURE

‘Hack the Hacker – the escape room’ was the first of three SWITCH security awareness adventures, followed by ‘Track the Hacker – the scavenger hunt’ and ‘Piece of Cake – the role play’. Hack the Hacker continues to enjoy great popularity: in 2022, SWITCH held the fun security training programme a total of 40 times.

The participants set out as a team on the mission of finding a decryption key. A short introduction explains the basics of security. These must then be put into practice during the game. In a debrief session, attendees explain and discuss what they have learned and experienced.

<https://swit.ch/security-awareness-adventures>



## PODCAST: SECURITY AWARENESS INSIDER

In December 2022, the 26th episode of the (German-language) ‘Security Awareness Insider’ podcast was released.

Katja Dörlemann (SWITCH) and Marcus Beyer (Swisscom) talk about raising employee awareness of security issues and new and creative methods, tools, and training approaches, provide insight into the security awareness programmes of companies and organisations, and much more.

Since the podcast launched, it has already been downloaded 8,913 times, with an average of 200 to 220 downloads per episode.

Available on Spotify or here:

<https://www.securityawarenessinsider.ch>



# Security awareness

## SAFERINTERNET.CH RELAUNCH, OCTOBER 2022

Safer Internet is the information platform for the prevention of domain name abuse and is aimed at website owners, regardless of their technical knowledge.

Here, website owners can find information about why websites are increasingly being attacked, what threats are looming, how to protect themselves, their website and their visitors, and the best course of action in the event of damage or loss.

<https://www.saferinternet.ch>

The new website was presented on Swiss Web Security Day and shared across all SWITCH channels. The relaunch was communicated in an email to all Registrars at the beginning of November, with a notice to share the page and to use the content (text and images) in their own communications.

Patrick Seemann's blog post on dnip.ch (in German) refers to Safer Internet. <https://dnip.ch/2022/10/27/wenn-mans-sich-einfach-macht-und-websserver-dann-ungewollt-zu-viel-preisgeben>

The screenshot shows the Saferinternet.ch website with a red and orange header. The main heading is "Secure your website and email". Below the heading, there are three testimonial cards:

- Card 1:** "Our online shop and email service suddenly stopped working." by Daniel 45, Toy mail order business. [Read story](#)
- Card 2:** "Visitors to my website landed on a third-party page." by Michelle 38, Trustee. [Read story](#)
- Card 3:** "Hackers stole all our customer data through our website." by Toni 57, Real estate manager. [Read story](#)

Below the testimonials, there is a paragraph: "Having your own website comes with responsibilities. So as the owner, you should be aware of the risks. On saferinternet.ch, you'll find out which measures keep your website secure and your visitors safe, and learn how best to proceed in the event of damage."

Two main action points are highlighted with icons:

- Avoid unnecessary costs and effort:** Represented by a clock and a dollar sign icon. [Learn more](#)
- Protect your reputation and your business:** Represented by a person icon with a shield and checkmark. [Learn more](#)

At the bottom, there is a section for "Important topics" with a [Show all topics](#) link. Four topic cards are shown:

- Passwords:** Passwords and two-factor authentication protect against access by cybercriminals. [Learn more](#)
- Updates:** Prompt, regular updates help to keep your website secure. [Learn more](#)
- What should you do if you suspect something?:** If you suspect anything, scan the website and take the warning seriously. [Learn more](#)
- Protect your domain:** Protect yourself from domain loss with a variety of measures. [Learn more](#)

# Community events

## SWISS WEB SECURITY DAY 2022

On 19 October 2022, SWITCH joined forces with SISA and SWICO to host Swiss Web Security Day at Casino Bern and online. In the morning there was a block for Registrars and hosts, in the afternoon a joint block with law enforcement organisations (LEOs). The event was a superb success, with 80 participants in attendance from Switzerland and abroad, and very positive feedback.

Topics included dark patterns, hacked websites, protection of web applications, best practices for web and e-mail hosts, and a panel on the modernisation of monitoring law with the SPTA.

The event took place virtually and on site in Bern in a hybrid format.

The Swiss Web Security Day will be held again next year on 17 October 2023 in Bern.

Most of the contributions are available online:  
<https://tube.switch.ch/channels/snbHaIryTG>



# LEO event

## Cooperation with law enforcement organisations



### TARGET GROUP AND TOPICS

This year, to ramp up cooperation with the authorities, SWITCH organised the LEO event for the third time.

LEO stands for 'law enforcement organisations'.

SWITCH sent out invitations to all authorities who are involved in combating domain name abuse and interested in joining forces. The aim: to make the internet in Switzerland more secure. The focus is on operational cooperation in the fight against crime in Switzerland. The exchange takes place in a closed context, to share information and knowledge and to support each other. This exchange is now in its second year.

Various topics were discussed. The core topic was working together in the community to prevent cybercrime. For example, the regulation on internet domains and the shortage of skilled workers were discussed. Another focus was the cooperation between the internal security departments of companies and law enforcement agencies from the perspective of the police.

### BERN, 27 OCTOBER 2022

The law enforcement community met in Bern on 27 October 2022. There were 45 people present at the LEO event. Many participants took part last year and brought their interested colleagues along. The distribution between the regions was very balanced, with lectures given in all national languages and English. The participants came from the cantonal police forces, the cantonal public prosecutor's offices and the Liechtenstein National Police. Authorities such as Swissmedic, SECO and OFCOM were also represented.

### FEEDBACK

The event was a superb success. Participants discussed current developments and projects relating to domain abuse and cybercrime. Processes, interfaces and opportunities to simplify cooperation were also covered.

# ISMS surveillance audit

The formal ISO 27001 surveillance audit took place at the SWITCH office on 4 October 2022. The ISO certification is checked every three years by means of recertification and, in between recertifications, by means of an annual surveillance audit.

The auditor examined how SWITCH operationally manages the information security management system (ISMS) with the integrated improvement process. He reviewed the new directives on the disposal of data carriers and the handling of passwords. He also reviewed a number of projects, such as identity and access management, IT risk assessment and SWITCH's IT strategy, which serve to improve the security and resilience of the registry. He also paid particular attention to the implementation of the new Data Protection Act with the establishment of a DSMS.

No deviations, conditions or improvements were identified during the surveillance audit. A quote from the audit report:

*'The impression is positive. There is a high level of commitment and awareness among all employees interviewed.'*

**ISO 27001**  
Certificate for the  
SWITCH registry

SV Cert.



**ZERTIFIKAT**  
Nr. 315-ISMS-21

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Hiermit wird bestätigt, dass das Managementsystem der

**SWITCH**  
Werdstrasse 2 - 8021 - Zürich (Zürich, Switzerland)

**Geschäftsstellen:**  
Werdstrasse 2 - 8021 - Zürich (Zürich, Switzerland)

die Anforderungen der Norm für das Information security management System

**ISO/IEC 27001:2013**

für folgenden anwendungsbereich erfüllt:

Domain name registration

SOA Ausführung	Erstausgabedatum	Datum der Änderung	Ablaufdatum des Zertifikats
1.4 vom 14.10.2021	05/12/2017	04/10/2022	04/12/2023





Für die Zertifizierungsstelle  
**SV Certification Sro**



(Gaetano Spera CEO SV CERT.)

Die Gültigkeit des Zertifikats unterliegt einer regelmäßigen jährlichen Überwachung und einer vollständigen Überprüfung des Systems alle drei Jahre. Die Verwendung und Gültigkeit dieses Zertifikats unterliegen der Einhaltung der Zertifizierungsbestimmungen der SV Certification Sro.

SV CERTIFICATION Sro, HQ: Jégého 220/19, Bratislava  
Mestská časť Ružinov 821 08 – SLOVAKIA  
Info & Contact: svcertification.com – info@svgroupcert.ch

# DNS resilience programme

## Mission and visible success

### GREATER RESILIENCE FOR .CH DOMAIN NAMES

The use of open security standards is critical for resilience against cyber threats.

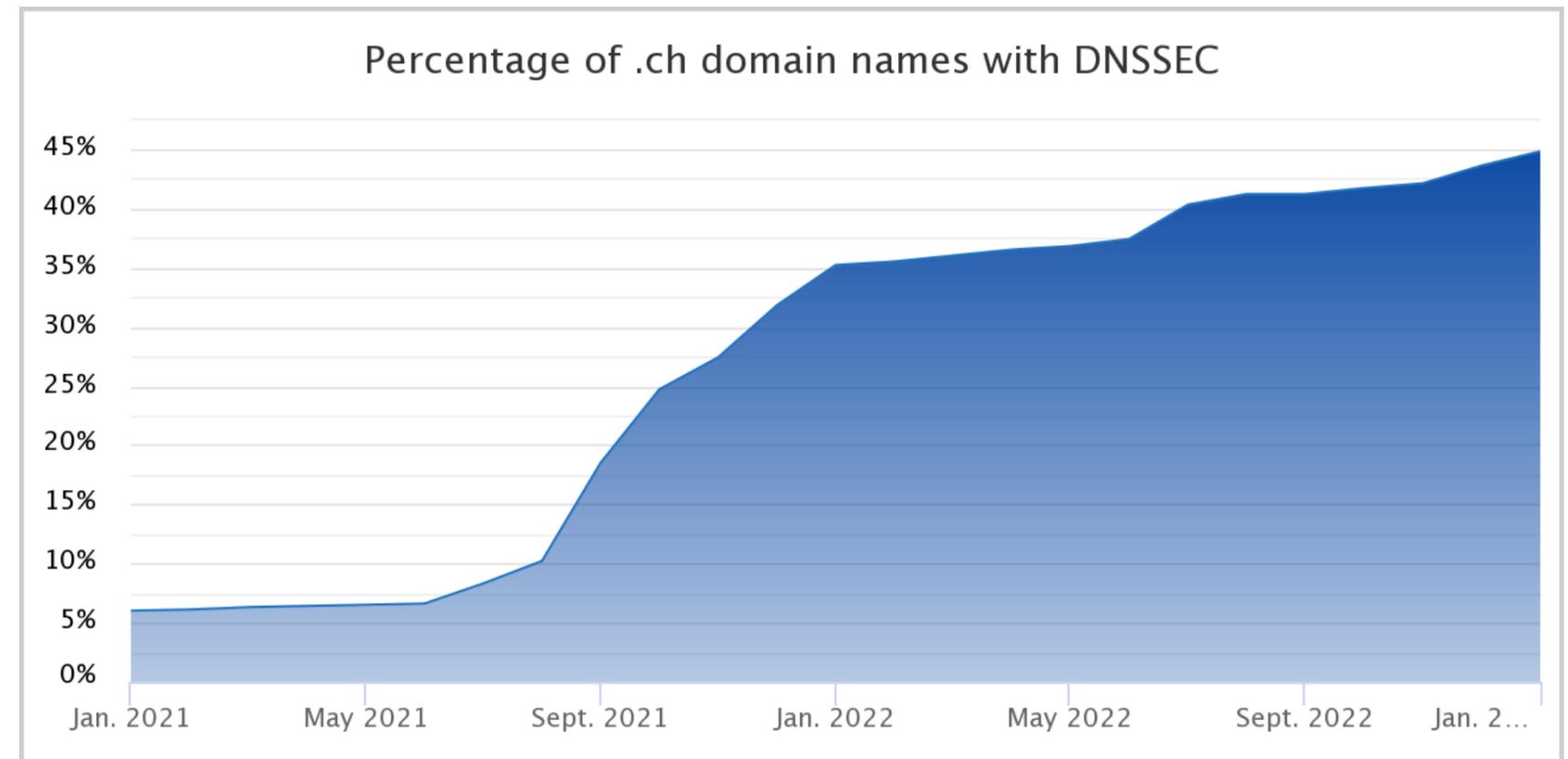
The DNS resilience programme promotes the introduction and use of open security standards for .ch and .li domain names.

The programme is based on a financial incentive scheme and will run from 2022 to 2026.

The DNSSEC Advisory Board defines the security standards to be supported. OFCOM, a representative of the Registrars, and SWITCH are all represented on this committee. The main objective is to promote the signing of domain names with DNSSEC. From 2024, the e-mail security technologies SPF and DMARC will also be promoted.

### DNSSEC SIGNING: CONTINUED SIGNIFICANT INCREASE

Since the programme was announced back in March 2021, the number of domain names signed with DNSSEC has risen sharply. 45% of all .ch domain names were already signed as at 1 January 2023.



*Increase in the number of signed domain names  
January 2021 to January 2023*

# *DNS resilience programme*

## Communication

On 1 January 2022, SWITCH launched the DNS resilience programme as planned. The programme is accompanied by various communication measures.

- SWITCH keeps all Registrars up to date with the latest developments relating to the DNS resilience programme through timely communication.
- A portal with access control is available to Registrars at registrar.nic.ch. This portal has been expanded for the DNS resilience programme. Among other things, they will find information on the current status regarding the signing of your domain names.
- The Registrars are actively supported in the implementation of DNSSEC. SWITCH experts visit the Registrars or provide information via the usual support channels.

It's generally the Registrars and hosting companies that are responsible for implementing DNSSEC for the .ch domain names they manage.

Nevertheless, the holders of these domain names also play an important role in the digitalisation of Switzerland. They can ask their Registrar to sign their domain names with DNSSEC.

In a press release to the public at the beginning of January 2022, SWITCH announced its five-year programme for increased protection against cybercrime.

Website: <https://www.switch.ch/news/Greater-protection-against-fake-websites>

# DNS resilience programme

## Quality control measurements

The DNS resilience programme is about more than just whether a domain name is signed with DNSSEC or not. We also want to ensure that existing DNSSEC configurations are correct. The measurements from the external service provider OpenIntel are, therefore, an important part of the programme. The results are relevant for setting the price and participating in the reimbursement. Details of the measurement results can be accessed on the [dashboard](#), a public website operated by OpenIntel.

- Every day, all DNSSEC domain names are tested (i.e. ‘measured’) for correct signatures in accordance with the rules of the resilience programme.
- Registrars receive a daily report about their faulty domain names, with a link to the dashboard.
- Details of the measurement results can be seen in the dashboard. Measurement results from previous days can also be displayed.
- The aim is for the Registrars to correct the incorrect configurations and, therefore, expand their expertise in DNSSEC.
- The measurements and their interpretation were optimised over the course of the year in collaboration with the Registrars. Not every anomaly measured is an error that is within the Registrar’s sphere of influence. These cases should not be to their detriment.

The error rate remained more or less constant at a very low level over the year. Less than 0.5% of all DNSSEC domain names had errors.

**As of 31 December 2022:** Out of 1,107,780 DNSSEC domain names tested, 2,340 domain names were reported as faulty, or 0.21%.

The screenshot displays the SWITCH DNS Resilience Dashboard for the domain switch.ch on 2023-01-26. The status is 'Well done!' with a green checkmark icon, indicating that the domain name fulfills the technical requirements of the DNS resilience programme. The evaluation report shows the following checks, all of which are marked as passed (green checkmarks):

Check	Status
Find help below	✓
Measurement data available	✓
Compliant algorithm	✓
Properly signed	✓
NSEC(3) record present	✓
Compliant NSEC(3) records	✓

The dashboard also includes navigation links for 'Dashboard', 'Statistics', and 'About', and a footer indicating it was developed and operated by OpenIntel.

**Dashboard**  
Measurement result for the domain name switch.ch

# *Replacement of outdated algorithms*

The cryptographic hashing algorithm SHA-1 has not been considered secure for several years and is, therefore, no longer supported by SWITCH. This only applies to DNSSEC DS records with

- digest type 1 (SHA-1) and
- key algorithms 5 (RSASHA1) and 7 (RSASHA1-NSEC3-SHA1).

Other digest types and key algorithms remain valid.

## **DECOMMISSIONING PROCESS IN TWO PHASES**

The Registrars were informed in early November 2022 that in an initial phase, effective immediately, no applications for activation of DNSSEC that introduce DS records with digest type 1 or key algorithms 5 or 7 will be accepted via EPP and CDS.

In a second phase, since the end of January 2023, changes to existing DNSSEC entries containing digest type 1 or key algorithms 5 or 7 have only been possible if they are upgraded to a more modern algorithm.

# Cooperation with authorities

## **NEW RECOGNISED BODIES TO COMBAT CYBERCRIME**

In 2022, further bodies to combat cybercrime were approved by OFCOM. These are the Brigade de Criminalité Informatique (BCI), the Brigade des Cyber Enquêtes (BCE) in Geneva, the Graubünden Cantonal Police in Chur and the Polizia Cantonale Ticino in Lugano.

Pursuant to Art. 15. OID, these authorities may instruct SWITCH to temporarily block a domain name if there are reasonable grounds to suspect that it is being used to:

- access sensitive data using illegal methods (phishing),
- spread or use malicious software (malware) or
- to support such actions.

All recognised authorities are listed on the following website:

<https://www.bakom.admin.ch/bakom/en/homepage/digital-switzerland-and-internet/internet/fight-against-internet-crime.html>

## **NEW CONTRACT WITH THE LIECHTENSTEIN OFFICE OF COMMUNICATIONS**

The contract between the Office of Communications of the Principality of Liechtenstein and SWITCH concerning the allocation and management of .li domain names dated 30 July 2020 was amended with the Amendment Agreement dated 15 March 2022. The reasons for the change were updates to the modalities for the Whois service and the promotion of security standards for the .li domain.

DETEC approved the contract amendment on 24 January 2023.

# Domain name inventory

## Developments 2022

### DEVELOPMENT OF .CH

The inventory of .ch domain names increased by 50,000 in the past year. This corresponds to an increase of 2.38%, similar to before the pandemic. As expected, it was no longer possible to achieve the growth rate of 4 to 5% achieved during the pandemic.

	2021	2022
New registrations	315,728	281,610
Deletions	251,142	258,724
Reactivations*	31,950	31,097
Domain inventory as at 31/12	2,467,461	2,521,444

### *Domain name inventory*

*Development of the domain name inventory for .ch and .li*

*\* Deleted domain names that were reactivated by the Registrar within the 40-day transition period.*

### DEVELOPMENT OF .LI

The inventory of .li domain names increased by almost 2,000 within a year. This corresponds to an increase of 2.48%.

	2021	2022
New registrations	9,178	10,094
Deletions	9,083	10,178
Reactivations*	1,918	1,823
Domain inventory as at 31/12	68,740	70,478

# Information service

## 2022 statistics

### INFORMATION SERVICE

SWITCH grants anyone who can credibly demonstrate an overriding legitimate interest free access to the domain name holder's personal data contained in the RDDS database (Whois).

These statistics record all requests that were made in the reporting year using the information service's forms. The number of enquiries remained at the same level compared to the previous year.

	Private	Authorities
Information provided	447	150
Information not provided	50	2
General requests *	4	0
<b>Total requests</b>	<b>501</b>	<b>152</b>

\* These are requests about processes, procedures and legal bases.

### SIMPLIFIED ACCESS VIA RDAP FOR .CH AND .LI

If an authority or organisation has the appropriate permissions, it can query domain names with personal data via RDAP (Registration Data Access Protocol). In 2022, the following authorities had access:

- NCSC (National Cyber Security Centre)
- Zurich Cantonal Police, Cybercrime Department
- Bern Cantonal Police
- Liechtenstein National Police
- State Secretariat for Economic Affairs (SECO)

	Requests
Valid requests	7,740
Invalid requests *	287
<b>Total requests</b>	<b>8,027</b>

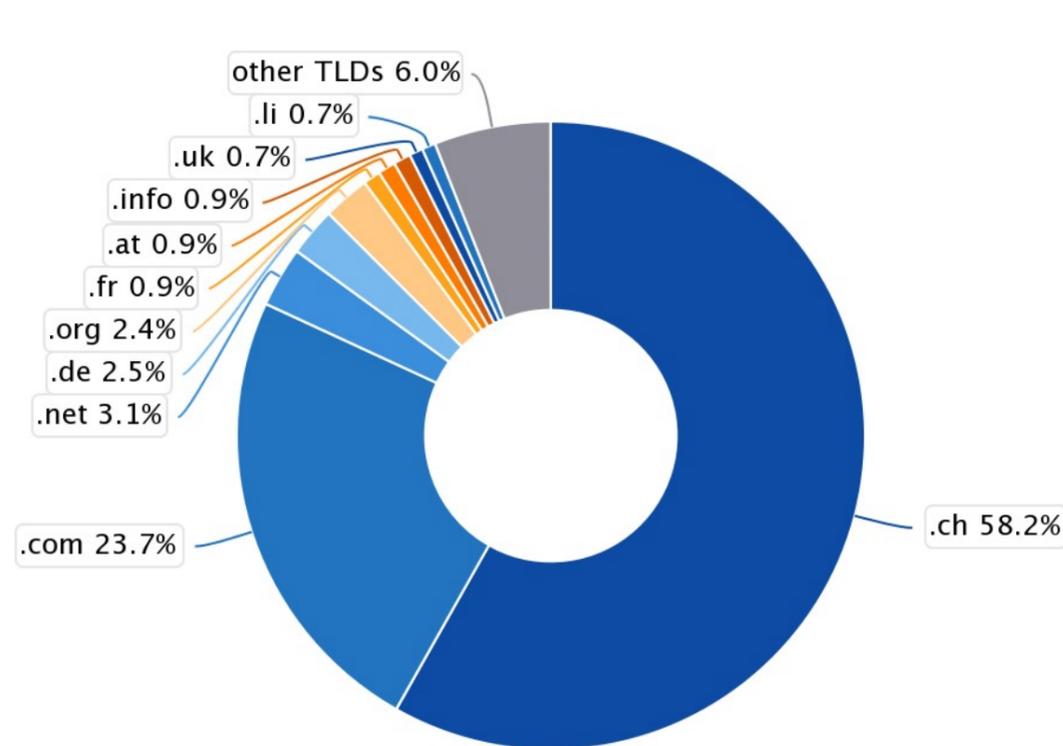
\* These are requests about domain names that do not exist or that SWITCH is not responsible for.

# Market share of .ch and .li

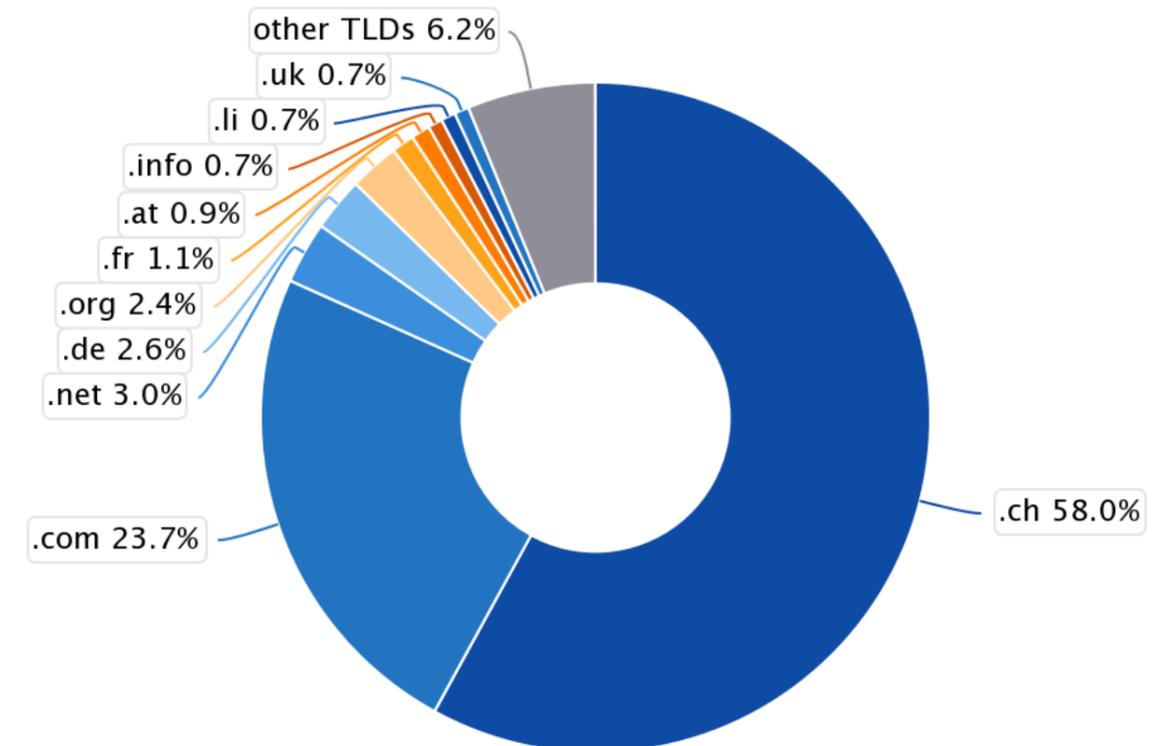
among Swiss domain name holders

The market share of the TLD (top-level domain) **.ch** among holders in Switzerland remained nearly unchanged from October 2021 to October 2022.

There was little change in the market share for the generic TLDs **.com/.net/.org**, or for **.li** domain names.



**Market share October 2021**  
of various TLDs among domain name holders in Switzerland  
Source: CENTR



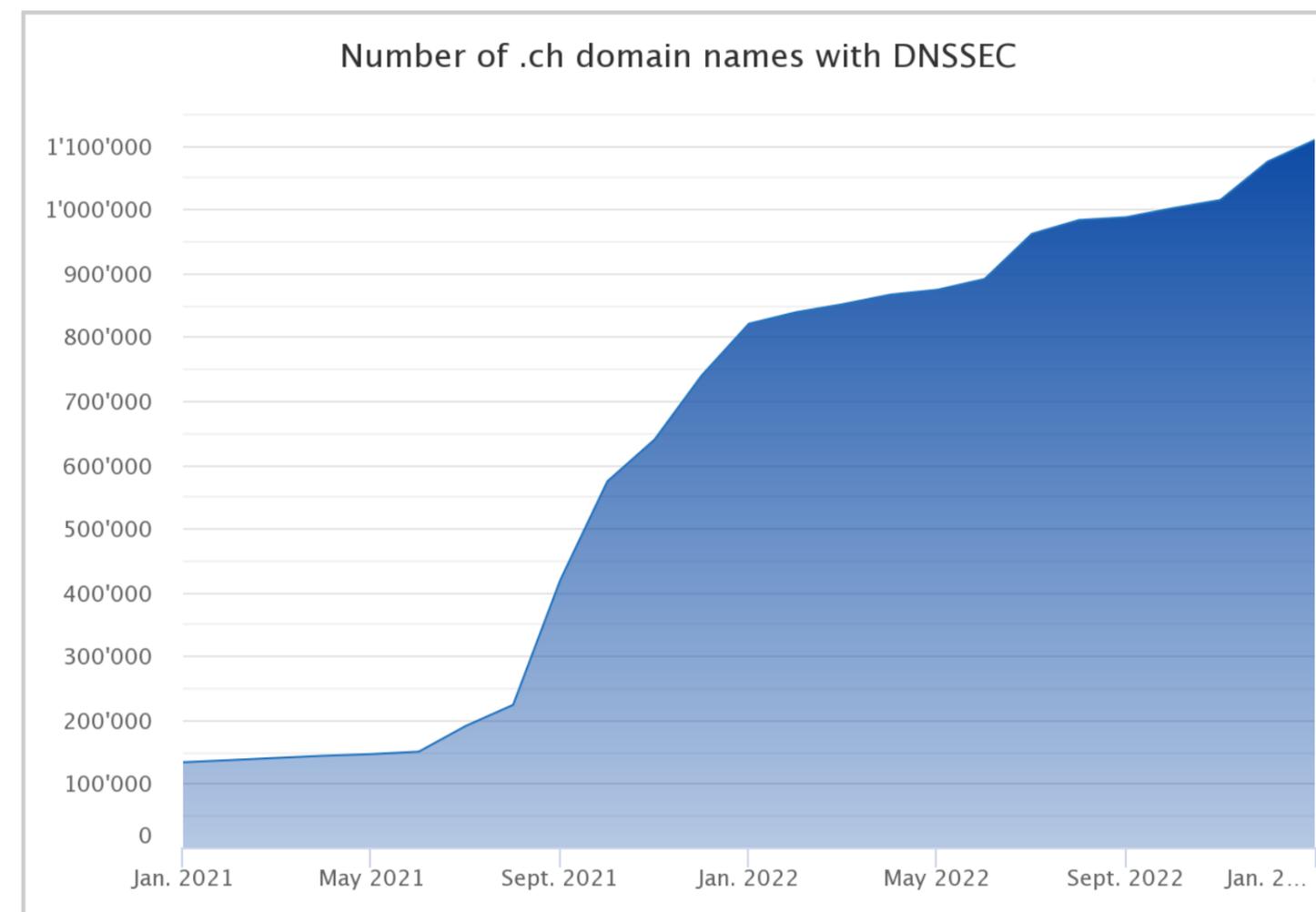
**Market share October 2022**  
of various TLDs among domain name holders in Switzerland  
Source: CENTR

# DNSSEC developments

## Number of signed domain names

The number of .ch domain names signed with DNSSEC increased to more than a million by the end of 2022.

This corresponds to a share of 45% of all active .ch domain names compared to 35% in the previous year. This continued strong increase was driven primarily by DNS hosting providers and Registrars, which signed all of their customers' domain names as part of the DNS resilience programme.



**1,107,780 .ch domain names signed with DNSSEC on 1 January 2023**

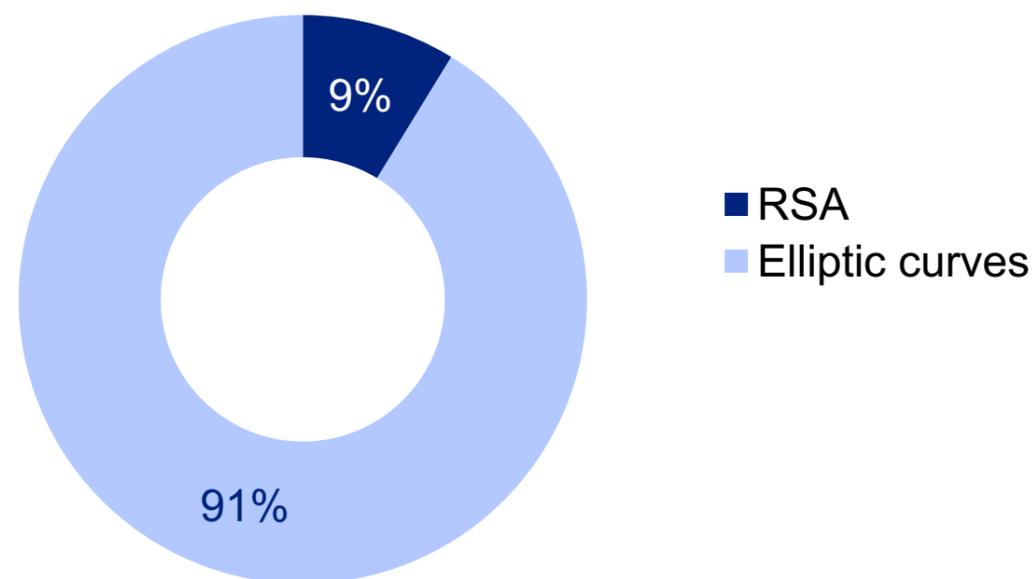
# DNSSEC developments

## Distribution of DS algorithms

More than 90% of all .ch domain names now use the currently recommended algorithm 13 (ECDSAP256SHA256).

Algorithms 5 and 7, which are no longer considered secure due to their SHA-1 signature, will no longer be supported from 2023. This currently affects around 650 domain names.

The Registrars concerned are encouraged to adapt to more up-to-date algorithms in order to continue to benefit from protection by DNSSEC.



Percentage of DNSSEC algorithms

DNSSEC algorithm	Number	Percentage
5 - RSASHA1	45	0.00%
7 - RSASHA1-NSEC3-SHA1	607	0.05%
8 - RSASHA256	97,098	8.96%
10 - RSASHA512	67	0.01%
13 - ECDSAP256SHA256	1,018,855	91.22%
14 - ECDSAP384SHA384	139	0.01%
15 - ED25519	61	0.01%
16 - ED448	14	0.00%

DNSSEC signatures used

# DNSSEC validation

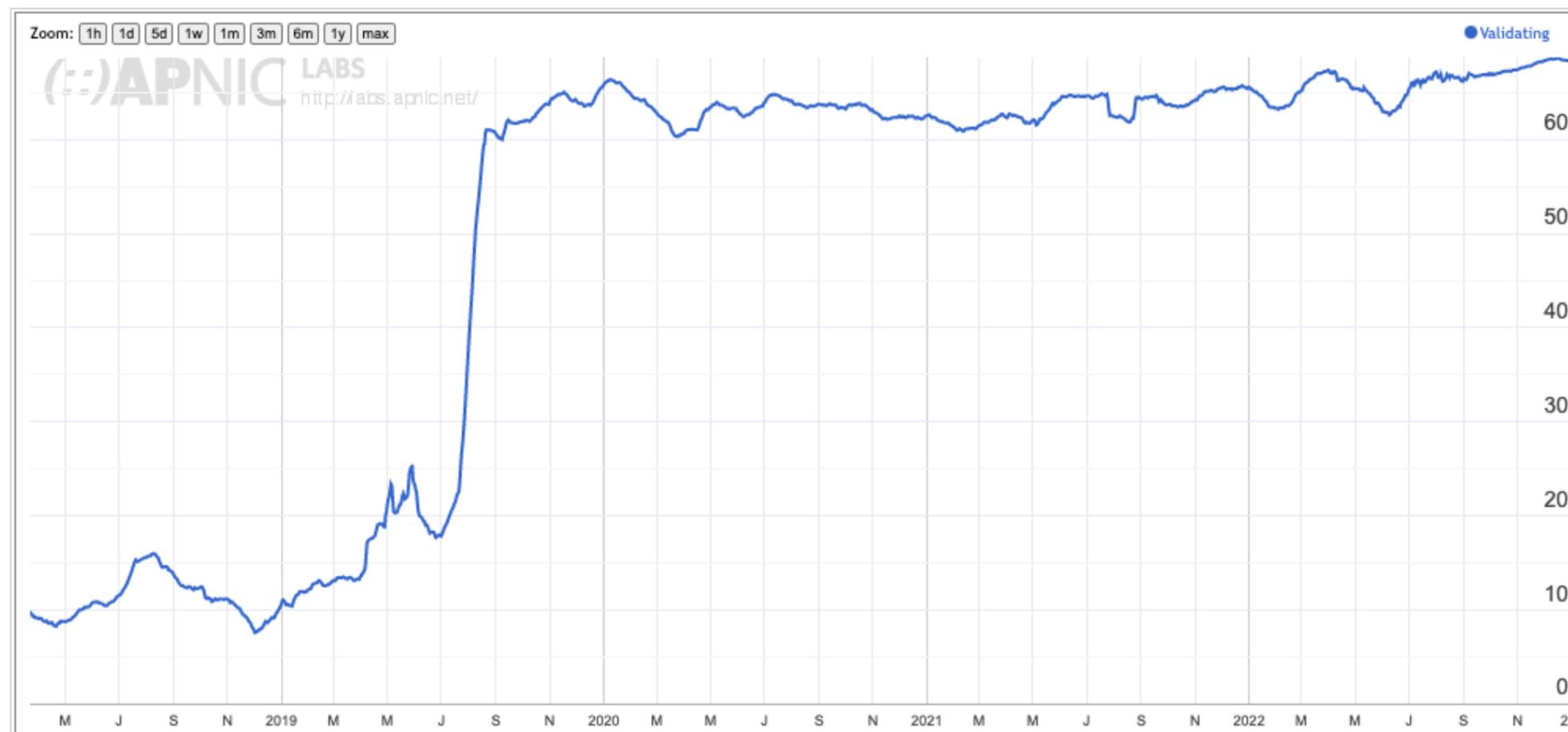
## in Switzerland

### DNSSEC VALIDATION

According to APNIC measurements, the validation of DNSSEC on resolvers of Swiss ISPs remained constant at around 65% in the past year.

The validation rate has stagnated at this level for three years. The introduction of the DNS resilience programme will increase the signing rate of .ch domain names. This creates the prerequisites for further resolver operators to be convinced of the security gain that DNSSEC validation brings.

Website: <https://stats.labs.apnic.net/dnssec/CH>



*DNSSEC validation  
on Swiss resolvers*

# Deferred delegation

## LEGAL BASIS

With Article 25 of the OID entitled ‘General conditions of allocation’, OFCOM has established the legal basis that enables a registry to defer activation of a domain name for a fixed period of time and to refrain from entering the name servers in the zone file if there is suspicion that the domain name is being used unlawfully or its purpose is unlawful. This process is referred to as ‘deferred delegation’.

## PROCESS

Since deferred delegation was introduced on 6 December 2021, the process has been gradually brought into production.

We have developed a dashboard that gives us an overview of the current process metrics at all times. The criteria are regularly revised and refined using data analysis. Deferred delegation should as far as possible only aim at improper use; authorised users should not be hindered.

We regularly discuss possible new criteria and detection algorithms with other registries.

	2022
Total new registrations	281,610
Domain names deferred	1,589
Domain names deleted	1,195

*Deferred delegation key figures*

# Dispute resolution

SWITCH has been tasked by OFCOM with providing an affordable dispute resolution service. Since 2004, SWITCH has been using the WIPO (World Intellectual Property Organization) dispute resolution service for this purpose. WIPO operates an ICANN-accredited dispute resolution service for over 70 other registries.

In 2022, the experts made decisions on 15 .ch domain names. The expert decision is the final step in the process. A somewhat smaller number of cases are closed, for example, during arbitration or because proceedings are abandoned.

WIPO decision	2021	2022
Transfer to applicant	17	13
Complaint rejected	3	2
<b>Number of decisions</b>	<b>20</b>	<b>15</b>

	Domain names
Transfer to applicant	premiumnovartis.ch pokerstarssports.ch blixk.ch tucon.ch digitecshop.ch arlafood.ch lurpak.ch micafil.ch bitpanda.ch invasight.ch swisslifesolution.ch gonetlogin.ch gonetlogon.ch
Complaint rejected	belfius.ch belfiusmobile.ch

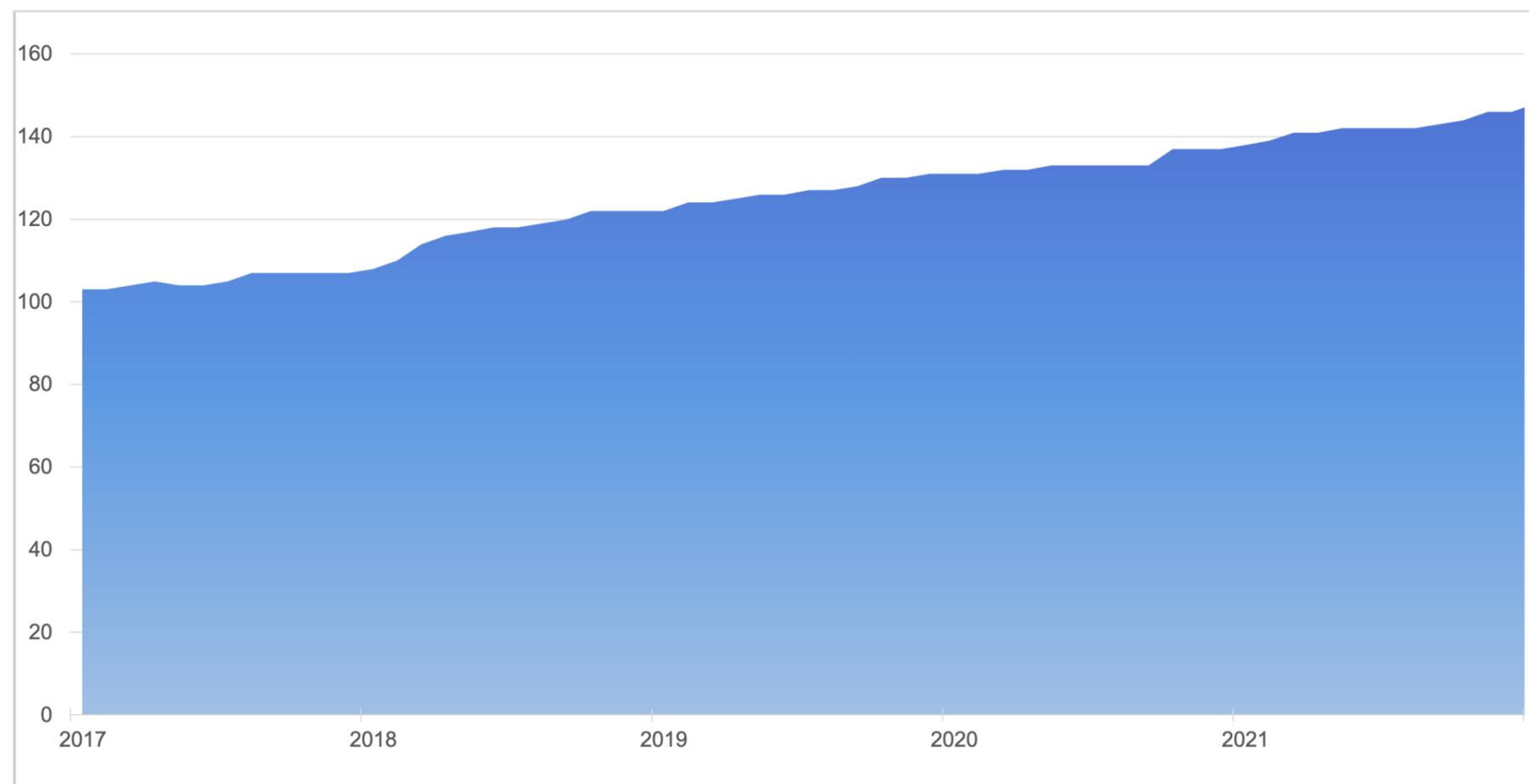
*Dispute resolution*  
WIPO decisions as of January 2023

# Registrar developments

There were only three additional Registrars in 2017. In 2018, considerably more Registrars than expected were added; by the end of the year, we recorded 122 Registrars. In 2019, the number of Registrars rose to 131, and the registry had 137 Registrars at the end of 2020. In 2021, the number of Registrars increased by nine to a total of 146.

In 2022, 11 Registrars first signed a test contract for access to the test system. We switched these Registrars to the productive system once they had successfully completed the test phase and passed the test course. The total number of recognised Registrars therefore increased to 157.

The market is working well and potential holders of domain names have a wide range of providers to choose from.



**Inventory development**  
At the end of 2022, the registry had  
157 active Registrars.

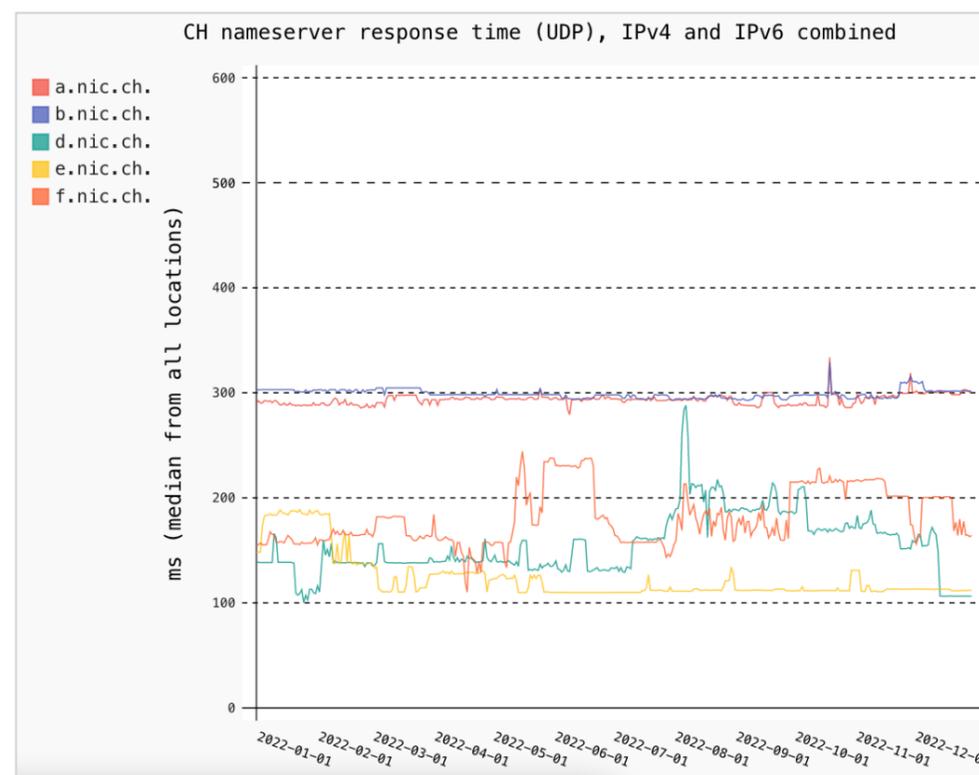
# Name server performance

In terms of DNS performance measurement, SWITCH relies on the response time requirements for DNS queries stipulated by the ICANN Agreement: queries in the CH zone must be answered by at least one logical name server within 500 ms (UDP) or 1,500 ms (TCP).

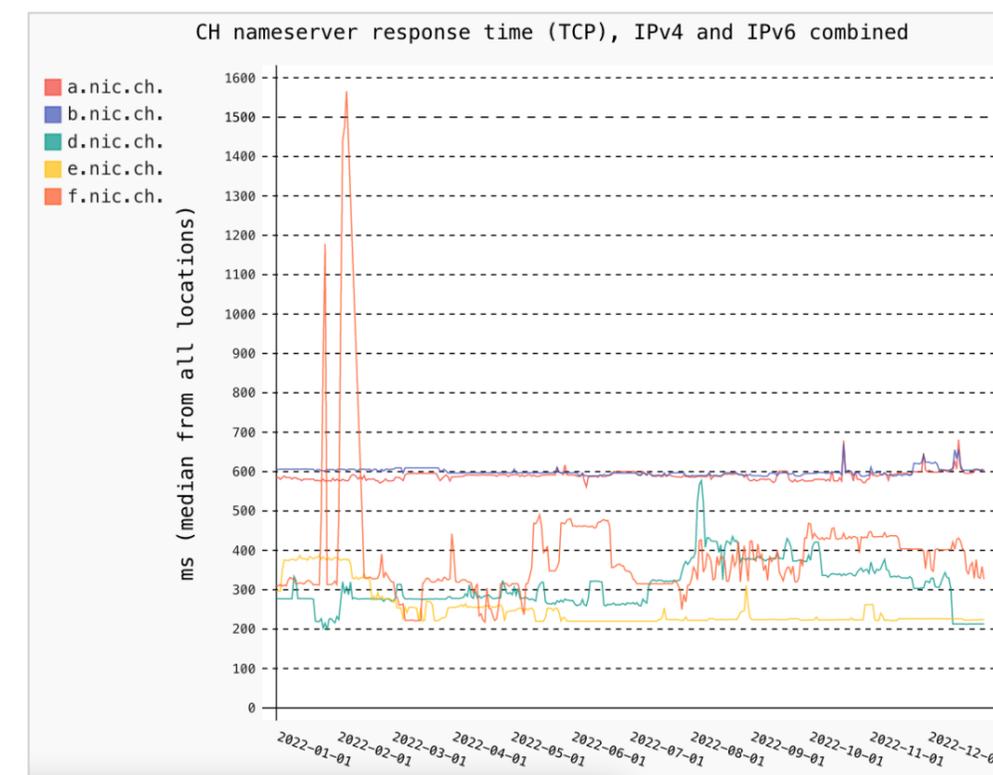
In 2022, this requirement was met in each instance. The measurements were carried out by RIPE and are available to the public. <https://atlas.ripe.net/dnsmon/group/ch>

**UNICAST** a.nic.ch (CH), b.nic.ch (CH),

**ANYCAST** d.nic.ch, e.nic.ch, f.nic.ch



**UDP response times**  
Combined response times of IPv4 and IPv6



**TCP response times**  
Combined response times of IPv4 and IPv6

# Cybercrime

## QUANTITATIVE

In the reporting year, we captured and processed the following cases:

	# malware cases	# phishing cases
Reports received	924	672
Suspicion confirmed	647	364
Number of blocked domain names	269	186
Reason for lifting block:		
- Statutory period expired	47	15
- Eliminated after block	168	26
- In progress on the cut-off date	3	64
Revoked domain names	51	89

*Number of malware and phishing cases 2022*  
quantitative view

## QUALITATIVE

The time spent on cases was:

	Duration	
Duration of blocking according to OID Art. 15 (1), (2), (3) Max. blocking time 30 days (720 hours)	Min. time	0.77 h
	Average	111.49 h
	Max. time	744.00 h
Response time from SWITCH following notification	Average	8.03 h
Time until removal of threat after notifying the holders	Average	103.52 h

*Number of malware and phishing cases 2022*  
qualitative view

# DNS Health Report

## Checking the availability of name servers

### FUNCTION

The DNS Health Report checks the accessibility of name servers and .ch and .li domain names. In the event of technical problems, SWITCH informs the operator and makes recommendations for resolving them. As such, the DNS Health Report improves the reliability of the internet in Switzerland.

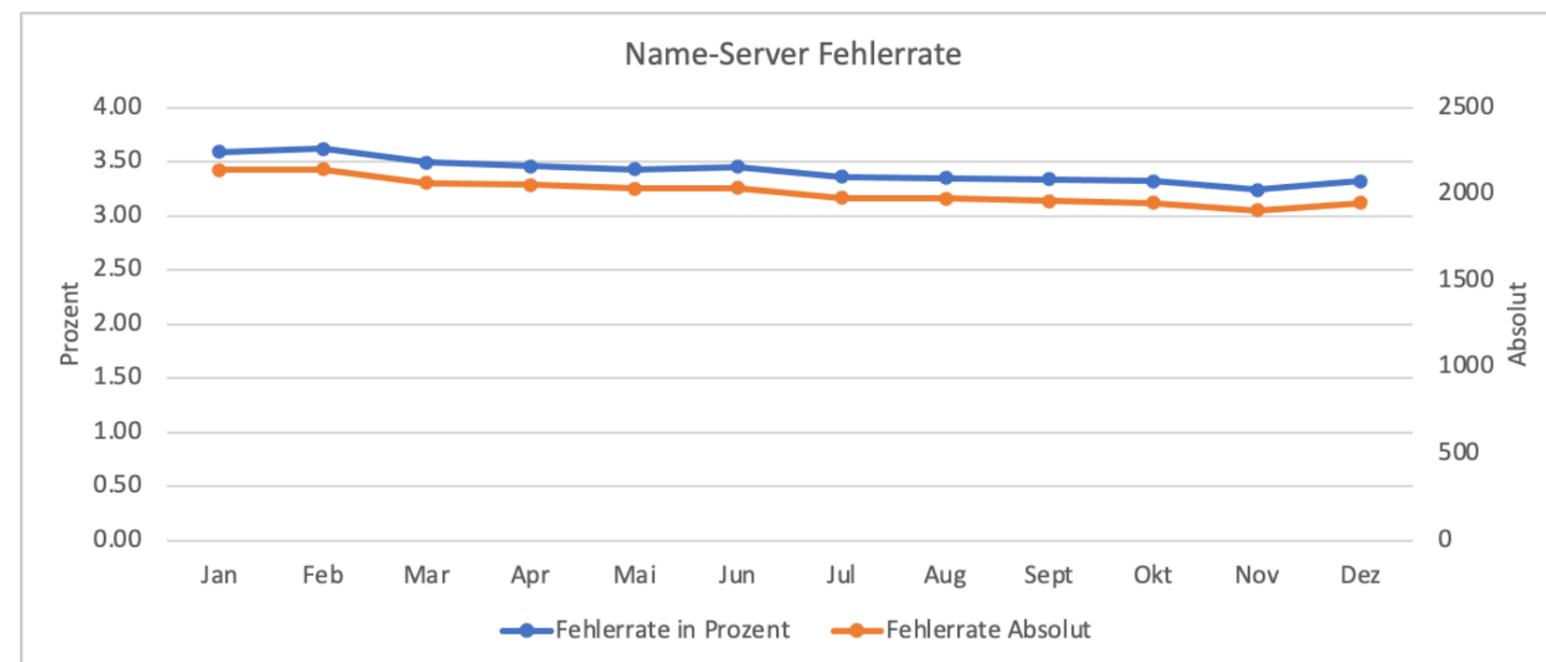
What is being checked:

**Name servers:** The function of the name servers is being checked for compliance with the DNS standards.

**Domain names:** It checks whether DNSSEC-signed domain names can be resolved using a validating recursive resolver.

### NAME SERVER REPORT

The DNS Health Report reaches its goal when the number of errors decreases in the long term. This trend is correct in the measurement period for the name server report. We suspect that the decline in faulty name servers is mainly due to the replacement of old infrastructure components such as firewalls, name server software or operating systems.



*Error rate in the accessibility measurement of name servers over time*

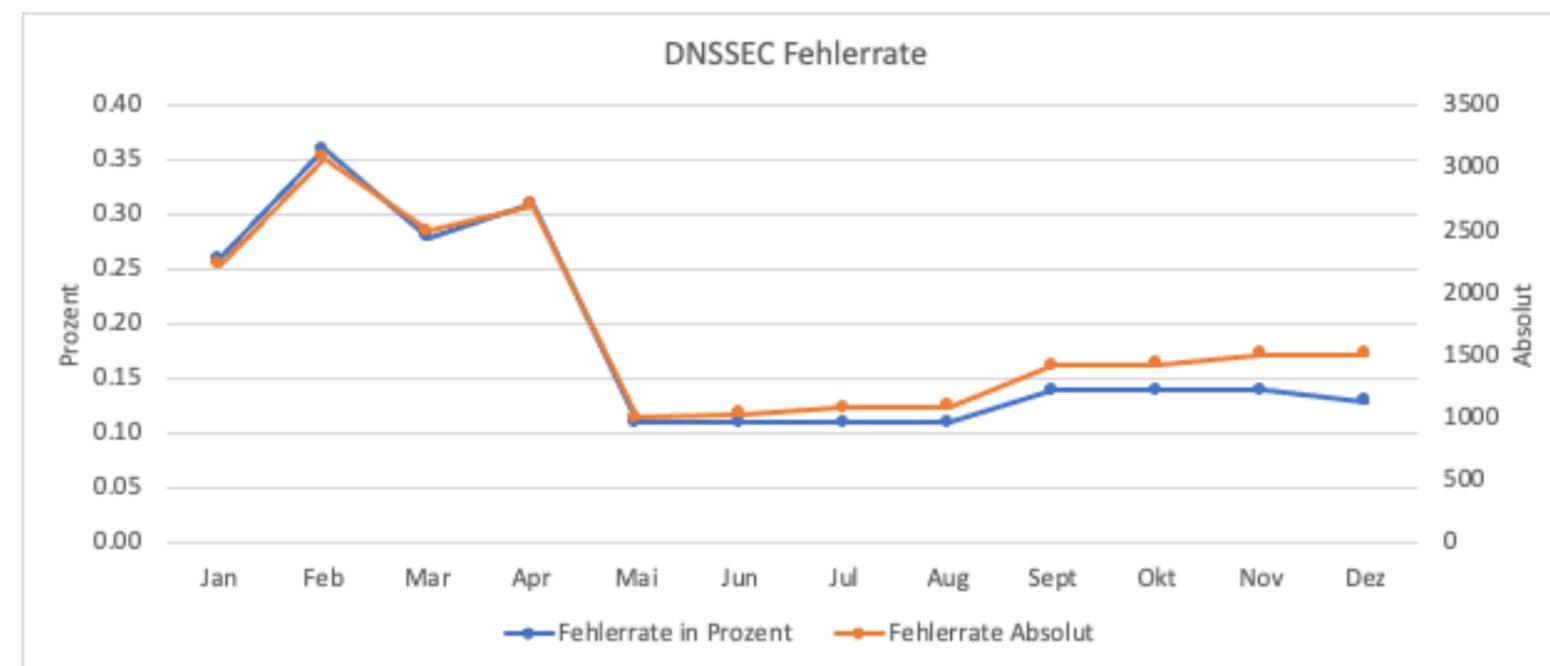
# DNS Health Report

## Checking the availability of domain names

### DOMAIN NAME REPORT

The number of DNSSEC errors detected increased sharply in the first few months of 2022. In December 2021 (not shown in the graphic), the number was 747 (0.09%). The increase in errors can be traced back to the strong increase in signed .ch and .li domain names in connection with the DNS resilience programme.

The DNS resilience programme promotes secure internet standards such as DNSSEC through financial incentives. The programme also checks whether the configuration of DNSSEC is correct, and incorrect configurations are reported to the Registrars. As a result of this and the DNS Health Reports to the name server operators, the error rate fell sharply in May 2022 and stabilised at a level similar to the last few months of the 2021 measurement period.



*Error rate in the accessibility measurement of domain names over time*

# DAAR .ch

## ICANN Domain Abuse Activity Reporting

With the publication of the .ch zone, SWITCH is taking part in ICANN's DAAR (Domain Abuse Activity Reporting) project. The project compares reports of suspected abuse in different TLDs.

The programme and the reports for ccTLDs are still at the beta stage. However, the graphic already allows us to compare .ch and other ccTLDs and gTLDs. ICANN did not provide an explanation for the outlier in the ccTLD figures in May 2022.

### WHAT IS MONITORED

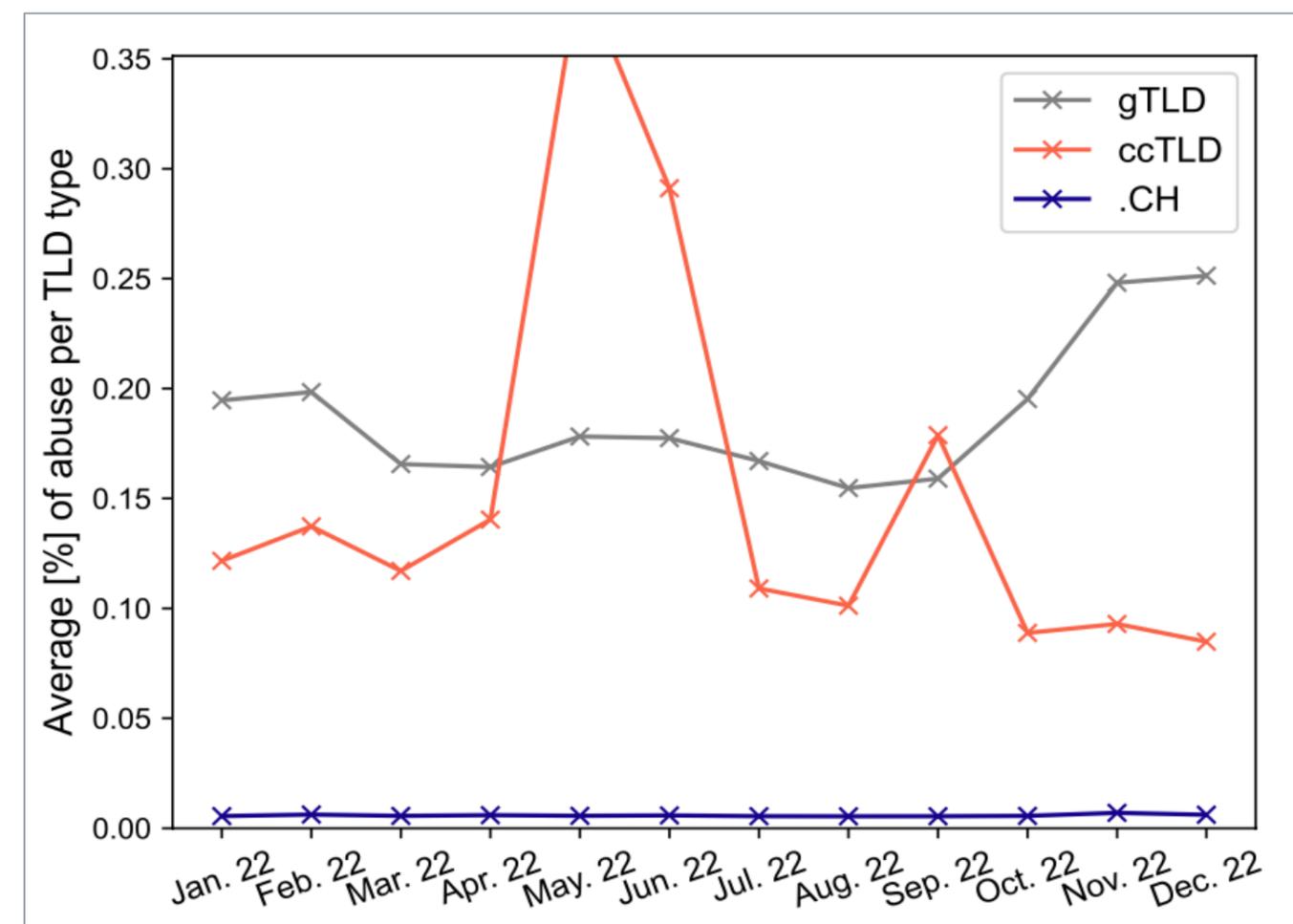
The proportion of .ch domain names (as %) identified as a security threat compared to the average number of domain names in other TLD zones.

Detailed information is available from ICANN:

<https://www.icann.org/octo-ssr/daar>

### ANALYSIS OF .CH

The DAAR report reveals that domain name abuse is low for the .ch ccTLD compared to the average for all TLDs. This confirms the effectiveness of the ongoing measures aimed at combating cybercrime and the effective cooperative relationship with Swiss authorities and international organisations.



# DAAR .li

## ICANN Domain Abuse Activity Reporting

With the publication of the .li zone, SWITCH is taking part in ICANN's DAAR (Domain Abuse Activity Reporting) project. The project compares reports of suspected abuse in different TLDs.

The programme and the reports for ccTLDs are still at the beta stage. However, the graphic already allows us to compare .li and other ccTLDs and gTLDs. ICANN did not provide an explanation for the outlier in the ccTLD figures in May 2022.

### WHAT IS MONITORED

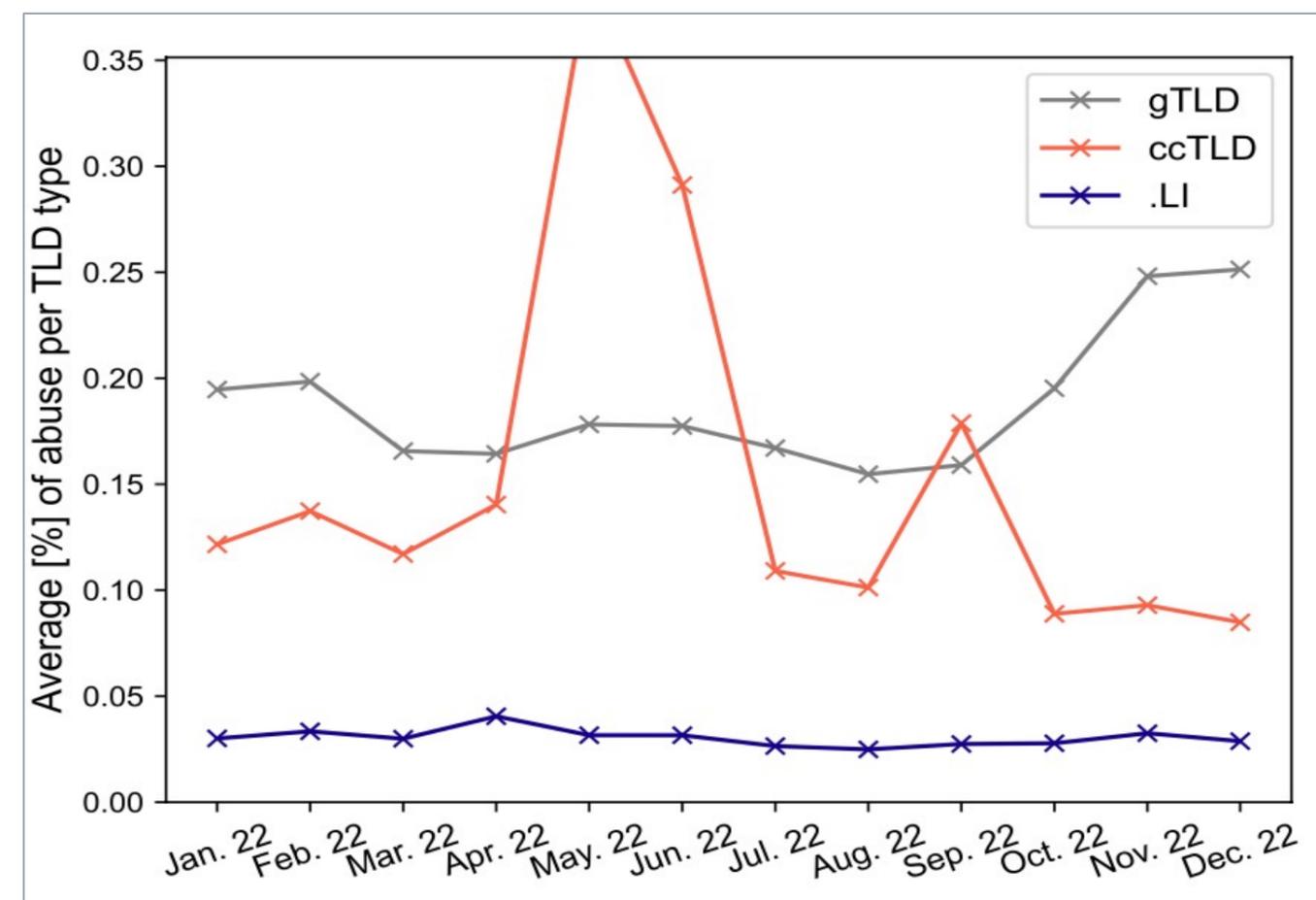
The proportion of .li domain names (as %) identified as a security threat compared to the average number of domain names in other TLD zones.

Detailed information is available from ICANN:

<https://www.icann.org/octo-ssr/daar>

### ANALYSIS OF .LI

The DAAR report reveals that domain name abuse in the .li ccTLD has been eliminated except for nearly two dozen domain names. This low value can only be maintained if the cooperative relationship between the registry and the authorities remains as effective.



# *Economic indicators*

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The Foundation Council session of 15 June 2023 will approve the SWITCH Foundation's 2022 annual report, along with the balance sheet and income statement. Publication will take place from 16 June 2023.

No figures will be published at this point. Instead, interested parties will be referred to the comprehensive documents of the 2022 SWITCH Annual Report.

# *Orientation and goals 2023*

## Looking back at 2022

In addition to the secure and stable operation of .ch and .li, the registry worked on three main goals.

### **OPERATIONAL START OF THE DNS RESILIENCE PROGRAMME**

Preparations for the resilience programme were already in full swing from mid-2021. From 1 January 2022, the results of the measurements do not only count towards a discounted price, but also towards the reimbursement.

For the next period from 2024, the DMARC/SPF criterion has been defined for reimbursement. To enable Registrars to prepare themselves accordingly, well-attended and technically demanding training courses were offered.

The reimbursement affects the financial processes of the registry and SWITCH. This also had to be clarified carefully with the tax authorities. The software was adapted and tested for the calculations and the correct receipts. However, the first reimbursement was only made after the end of the year with the January receipts in 2023.

### **DEFERRED DELEGATION**

After completing the groundwork in 2021, testing operations began in 2022. An algorithm decides whether or not an assigned domain name is given the status 'deferred'. The data for this algorithm come from two sources:

- Swiss authorities report abuse of domain names whose patterns are used to detect other domain names.
- Contacts of our CERT with registries and other CERTs in the context of FIRST, through which we also receive information on how to train the algorithm.

2022 was viewed as a test of the processes. 2023 will show how the methodology works in full operation.

### **TRAINING OF AUTHORITIES**

The registry is increasingly perceived by authorities as a forum for constructive cooperation in cybercrime. Through training and direct contacts, we have clarified what the role of the registry is, what it is permitted to do on the basis of law and what is not within its remit. The specialist contacts are highly valued by both sides and form a reliable basis for collaboration.

# *Orientation and goals 2023*

## General outlook for 2023

For the European ccTLD registries, 2023 will be dominated by the requirements of the EU's NIS 2 Directive. Identifying the owners entails a massive change in processes. The principle of user identification at the request of public authorities used for .ch and .li has proven its worth; however, the EU is taking a different approach that is more burdensome for Registrars and registries.

It is important for SWITCH to set up an EU TLD ISAC (Information Sharing and Analysis Center), also as part of the implementation of NIS 2. The aim is for a common and coordinated approach. It is planned that CENTR will coordinate the two-year set-up phase. The core task of the EU TLD ISAC will be the exchange of threat intelligence among the participants. The processes for this need to be defined.

Through its own CERT, SWITCH already has many years of experience in international cooperation to combat cybercrime. For other registries without their own CERT, the expertise for useful cooperation in an ISAC has yet to be developed.

SWITCH aims to become a formal member of the EU TLD ISAC. We are already actively involved in this in the founding phase in the first half of 2023.

The DNS resilience programme gave DNSSEC the desired breakthrough. Almost 50% of domain names are now signed.

The NSEC3 algorithm was initially selected for the signature of the zone file. This prevented 'zone walking' of the zone file via NSEC records and was ideal for low signing rates.

Today we have a high signing rate and the zone file is public. Our studies have shown that the NSEC algorithm is better under these conditions:

- It saves resources on name servers (computing and traffic).
- It allows abuse traffic on the caches to be stopped.

We expect the change from NSEC3 to NSEC to increase the resilience of the overall system. We are currently planning the implementation together with the Anycast providers. It remains to be seen whether this will be implemented in 2023.

# *Planned innovations 2023*

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## **RDAP WEB FRONT END FOR AUTHORITIES**

The LEO event in October 2022 was very well attended. A survey showed that direct access to the RDDS database (Whois) via the RDAP interface is useful for the work of law enforcement agencies. However, not every authority is able to operate its own RDAP client for this purpose.

SWITCH, therefore, offered to develop a web front-end that essentially offers the same functionality. The high level of interest justifies implementation. A prototype will be presented in the first half of 2023. With user feedback, we will be able to make the new website operational as a service by the end of 2023.

## **DANE TRAINING**

Together with OFCOM and SWITCH, the Registrars have set out to include DANE as another security standard in the DNS resilience programme. This criterion will be decisive to the refund from 2025. In preparation, SWITCH will offer training on DANE for Registrars and name server operators.

## **SECURITY AWARENESS**

Every available space on the Security Awareness Day in October 2022 was filled. The topic is demonstrably gaining momentum.

The next Security Awareness Day is scheduled for 26 October 2023, again at Casino Bern. The topics are aimed not only at employees of Registrars, but also at specialists in communications, security, marketing and teaching in general. This allows us to reach and activate broad target groups.

The Security Awareness Adventures (see page 7) will continue. The benefits are clear; the combination of fun and knowledge transfer leads to a lasting learning effect.

In 2023, the adventures offered by SWITCH will be supplemented by training for security awareness specialists so that they can develop their own measures suitable for their organisations.

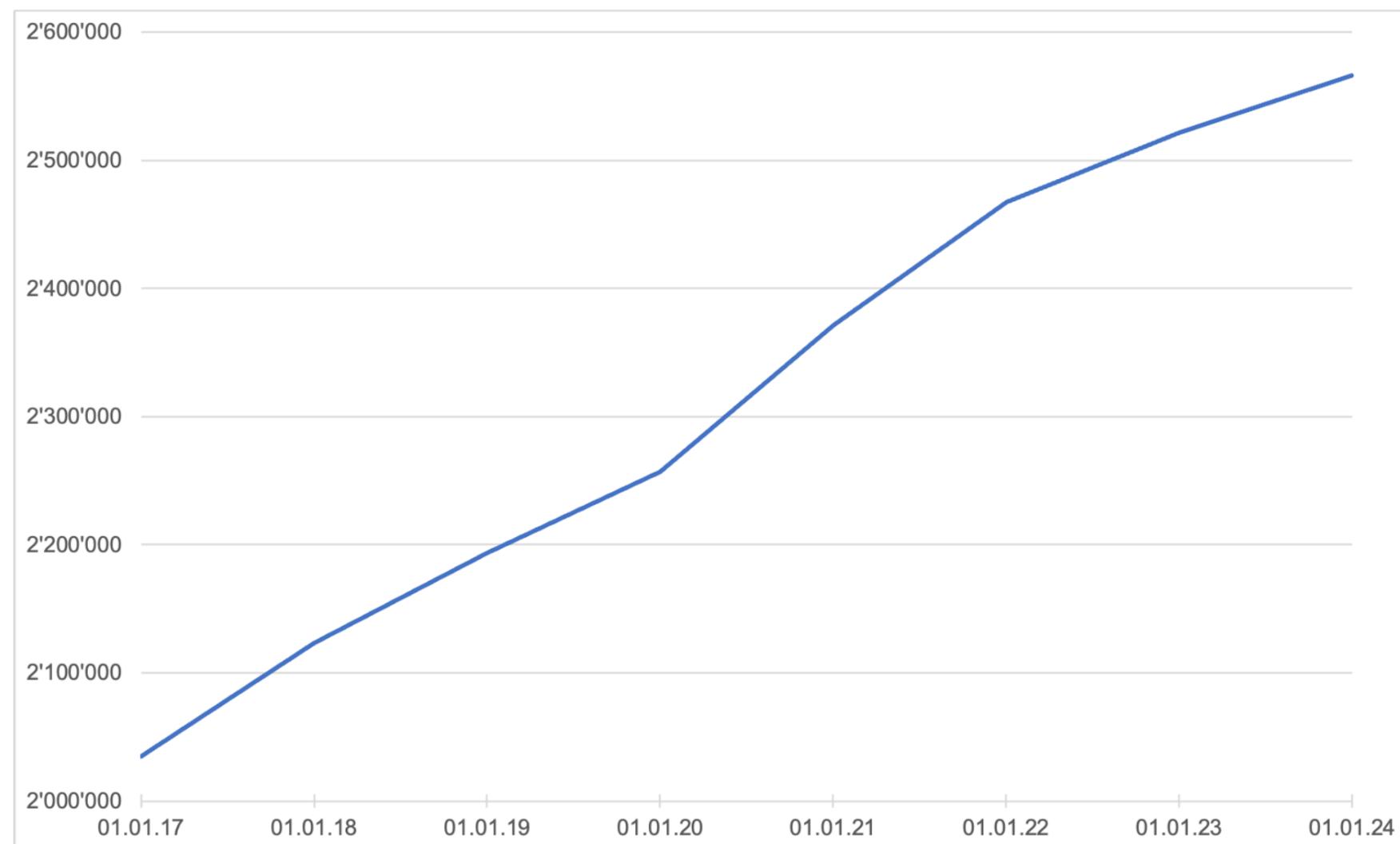
# Growth forecast

## .ch domain names

The three years 2017 to 2019 showed an increase that was slightly lower from year to year. In 2020, the pandemic-related surge in digitalisation and the marketing initiatives of web hosting companies led to increased demand and growth of 4.8%. The increase had already fallen to 3.9% in 2021, but was still higher than before the pandemic.

In 2022, the registry recorded growth of 2.1%. The surge in digitalisation lasted two years and resulted in an unexpected increase of around 100,000 domain names.

This means that the figures are back to the subdued growth from 2017 to 2019. Consequently, our forecast for 2023 is for growth of 1.8%, slightly lower than in 2022.



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