

2023

Annual Report



For confidence online

2023

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Foreword

“Innovating to keep the internet open, secure and accessible to all.”

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Roelof Meijer
CEO SIDN



Loek Bakker
CTO SIDN



Foreword

Innovating to keep the internet open, secure and accessible to all

The .nl domain is one of the world's largest and most secure country-code domains. As the operator of .nl, we work with other actors within the .nl ecosystem to ensure that all its domain names remain reachable every minute of every day. So that internet users in the Netherlands and beyond always have access to everything from banking to health care and public services, and that e-commerce can thrive.

Our primary focus is the quality, security and reliability of our core systems: the Domain Name System (DNS) and the Domain Registration System (DRS) for .nl. In that realm, we work closely with the .nl registrars, the government and other partners. We are also committed to using the latest proven technologies, open standards and generic open-source applications. Such tools enable us to extensively automate the secure and reliable management of our systems, freeing capacity to continue and accelerate innovation in the DNS and DRS for .nl. That in turn enhances our ability to counter growing and evolving cyberthreats and keep .nl secure for internet users. Because, ultimately, all we do is in the service of those users. Through innovation, we also contribute to a secure digital infrastructure for the Netherlands and Europe. Hence, we play a lead role on the global stage, and we are able to help others attain and maintain similar levels.

In the course of last year, we made a number of important and consequential strategic decisions. In that context, we updated our ICT strategy, which guides the way we address the technological challenges before us: developing a new Domain Registration System, assuring the continuity of our services, maintaining the security of the .nl zone, continuing the standardisation and streamlining of our processes and systems, and potentially migrating

our existing registration system to the AWS public cloud in 2025. Migration to the public cloud will enable us to safeguard the stability and continuity of our registration system even more effectively, bring down management costs and increase the capacity available for security optimisation of .nl, knowledge development and innovation. An important feature of our migration planning is an exit strategy, based on the use of open standards wherever possible and the avoidance of any form of vendor lock-in. We also intend to use generic, open-source technology. Over the last year, we have been busy preparing for migration and have restructured our ICT Department in line with our new ICT strategy.

Continuous innovation is needed for problem-free, opportunity-rich digital living.

Our senior executive structure has been modified to complement those moves, by the addition of a Chief Technology Officer (CTO) to create a 2-person Executive Board for SIDN with effect from 1 September 2023. The new CTO's appointment reinforces SIDN's focus on delivering optimum-availability, reliable, future-proof digital services. With experience in digital transformation, cybersecurity, IT strategy and IT architecture, the CTO has assumed responsibility for technological innovation and the quality of systems such as the DNS and DRS.

Loek Bakker, Chief Technology Officer (CTO) at SIDN: *"SIDN possesses great expertise, and its people are highly committed. The emphasis on collaboration with colleagues, the Strategy Consultation Group, the Supervisory Board, the Staff Council and external partners is very valuable as well. Collaboration helps us secure our shared goals and achieve positive outcomes for the internet community."*

“As CTO, I’m closely involved with the new ICT strategy and the associated processes, such as the implementation of our IT sourcing strategy and the migration to cloud technology. Our choice of technology partners was guided principally by our desire to assure the constant availability of .nl and to safeguard our data. Because, as a registry, those are our primary responsibilities. Amongst the improvement goals included in our plans for 2024 are working in a more result-focused way and daring to be critical of ourselves and our colleagues. It is also important that we communicate our passion to the outside world more effectively. Our people have valuable expertise and devote themselves wholeheartedly to assuring the stability and security of .nl and the wider internet. Together, we play a vital role in ensuring that the internet works well for the Netherlands and the wider world.”

Another important step we have taken is to form a partnership with CIRA, the registry that operates Canada’s .ca domain. We will become co-owners of their Fury Registry Platform, and will work with them to refine Fury into a flexible, future-proof, cloud-native system. Our decision to partner with CIRA was based on a number of key considerations. First, the service quality expectations and continuity expectations of our stakeholders and regulators are rising year on year. Although our own DRS5 registration system works well, its management and maintenance are labour-intensive. Furthermore, the complexity and cost of our core ICT services have risen considerably, and look set to go on rising in the years ahead. Partnering with CIRA will enable us to pool our expertise and capacity, and to share the burden of registration system maintenance and development. Our ability to quickly realise technical changes will be enhanced, and the way will be open to offering the new registration system to other registries in the future. Before the partnership, we already had close ties with CIRA, since we were using their DNS service as an element of our wider DNS solution. Moreover, CIRA’s expertise, technology and values dovetail neatly with our own. Like us, CIRA is committed to fostering innovation and promoting a secure, open and stable internet.

CIRA’s values, expertise and technology dovetail perfectly with our own, so the partnership is a true joining of forces.

Communal responsibility for digital society

As well as boosting our capacity for innovation, we work to tackle abuse in the .nl domain and we offer services such as SIDN BrandGuard, which protects brands against phishing and reputational damage. We also promote the use of modern, open and secure internet standards and open-source software. We are constantly striving to maximise .nl’s value to the Dutch internet community, for example.

However, our mission to promote problem-free, opportunity-rich digital living for everyone extends beyond the .nl domain. All around the world, we form partnerships, share knowledge, invest in cybersecurity and participate in international research, innovative schemes, associations and forums. Through SIDN Fund, we support promising internet projects with added value for society. A good example is the [Filterbubble](#) platform, which offers lesson plans to help students at vocational and practical secondary schools to build up their critical media skills. Meanwhile, SIDN Labs undertakes applied research to boost the security and resilience of the current and future internet infrastructures. To that end, the team carries out large-scale internet measurements and prototypes new technologies, such as SCION. In various fields, SIDN Labs and SIDN Fund operate in tandem. In 2023, for example, they worked together on Packet Run, a marble run that demonstrates the inner workings of the internet.

Anticipating global opportunities, challenges and crises

We concerned ourselves – and continue to concern ourselves – with many things besides internet abuse and growing cyberthreats. The very rapid progress of artificial intelligence (AI) is one example. Over the last year, various new functions have been added to the ChatGPT chatbot, and AI can now be used to generate photos and videos that cannot be distinguished from their conventionally produced equivalents. Such developments offer exciting prospects and are in any case irreversible. It is therefore important that we utilise AI’s potential, while also addressing the associated risks and dangers, such as the scope for criminal use. SIDN Labs has accordingly defined 2 criteria for assessing whether it is responsible for us to use AI in a given situation. It must be both possible and desirable to use historical data as a basis for future decision-making, and to attach accurate, neutral labels to data. We ourselves make active use of AI in systems such as RegCheck, our tool for detecting malicious domain names at the time of registration. The way we prepare for AI-related developments depends to a significant extent on how AI is regulated by law. In 2024, the European Union adopted the AI Act. The Act provides a framework for developers

and enterprises, defines parameters for high-risk AI systems, and outlaws manipulative techniques and other undesirable forms of AI.

We need to utilise AI's potential, while also addressing the associated risks.

As well as various technological and digital challenges, we faced a number of global crises in 2023. Various conflicts around the world continue to claim many lives, and their impact on ordinary people is beyond description. Natural disasters such as the earthquake that hit Turkey in early 2023 also caused widespread dismay. Far-reaching conflicts, rapid technological developments and growing inequality again underscore the importance of an open, reliable and secure global internet.

Such phenomena demonstrate the importance of the internet as a medium for the distribution of reliable information and the coordination of crisis response. And as a platform for international cooperation and the promotion of equal opportunities for all.

Those are themes that SIDN Fund addresses, by supporting projects such as De [Bubbelmachine](#) and [Cybersoek](#), for instance. In addition, SIDN Fund encourages the development of a responsible internet by sponsoring the Responsible Internet Thesis Award for students whose research relates to this vital theme. In October 2023, the United Nations stressed the importance of a secure, open and reliable internet at the annual Internet Governance Forum (IGF) in Japan, which we also visited. At the IGF, we discussed how we can utilise digital technologies, minimise the associated risks and reduce inequalities in the fields of digital governance and internet access. The UN Global Digital Compact has a key role to play in getting to grips with such issues. The Compact is ultimately intended to define a responsible international approach to the internet.

Developments and sustainable improvements in the sector

In the first half of 2023, the .nl domain experienced expansion driven by a sharp rise in new registrations. Growth did not continue into the second half of the year, however. As a result, we ended 2023 very much as we started, with about 6.3 million .nl domain names. Inflation and recent price increases

led some registrants to look more critically at their domain name portfolios and cancel names they were not using. The developments seen in the .nl domain were consistent with the European market as a whole, where other large domains, such as .de (Germany) and .uk (United Kingdom), witnessed little or no net growth. There was consequently barely any change in .nl's market share or position relative to other domains. At the global level, the .com top-level domain remains the market leader, with more than 160 million domain names. Meanwhile, developments with blockchain-based domain names continue to attract the attention of investors, the DNS community and, of course, SIDN. We continue to monitor developments in this field, where Unstoppable Domains and Handshake are still the main players. The concept of blockchain domain names is far from mature and poses numerous administrative and legal difficulties. Nevertheless, it is a dynamic market, as evidenced by the multiple blockchain-related patent applications made by .com's operator Verisign and by the growing number of integrations between DNS top-level domains and Unstoppable domains.

While blockchain domain names represent a fairly recent development, climate change has been a prominent issue on the global agenda for a good many years. As the consequences of a changing climate become increasingly apparent, stricter regulatory and legislative measures are being introduced, some of which have implications for SIDN. From 2024, for example, the EU's Corporate Sustainability Reporting Directive (CSRD) will come into effect, requiring large enterprises to publish annual sustainability reports. Two years later, listed SMEs will also need to comply with the CSRD. Non-listed SMEs will ultimately have to do so as well. Although the directive's provisions will not apply to SIDN for some time, we feel it is important that we too report on our sustainability and on our human and environmental impact. Over the last year, therefore, we have sought to implement the UN's Sustainable Development Goals (SDGs) within our own activities. So, for example, we invested in the use of 100 per cent renewable energy in 2023, and in staff development. We also began a valuable partnership with DNS Belgium, with a view to cooperating on sustainability matters and making our sector more sustainable. Nevertheless, we see major challenges ahead. We therefore attach great importance to international collaboration, which we will pursue while also working hard to reduce our own carbon footprint.

We are focusing on the Sustainable Development Goals that we can support most effectively.

Transfer of Yivi to the Privacy by Design Foundation

Over the last few years, we invested significantly in the further development and professionalisation of Yivi. We did so because we have great confidence in the potential of this privacy-friendly identity wallet. Our investment has driven substantial growth in the number of new users, and has delivered a much more mature open-source system. An important milestone was reached when the Dutch and European governments embraced the principles on which Yivi is based. Nevertheless, the adoption of Yivi has not progressed as quickly as we hoped. Organisations have remained cautious, partly because of uncertainty about what the Digital Government Act would ultimately require. We also encountered difficulty finding partners to share the cost of continuing Yivi's development. At the end of 2023, we therefore announced our intention to return Yivi's stewardship to the Privacy by Design Foundation in 2024. The Foundation will now oversee the next phase of Yivi's development in collaboration with other members of the identity management community.

Outlook for 2024

In 2024, we will implement the ICT and development plans drawn up in 2023, with the emphasis on further improvement of our DNS and DRS services. We will continue our dialogue with stakeholders, including the government, regarding the rationale for the proposed transfer of part of our technical infrastructure, including the DRS, to the AWS public cloud at the end of 2025. In that context, we will look at the results of a quick scan that the Dutch government's economics ministry will carry out with

stakeholder support to establish whether any Dutch or European alternative that meets our requirements can be identified. Furthermore, any migration will ultimately depend on the fulfilment of a number of criteria, including a positive Data Protection Impact Assessment finding, a positive Data Transfer Impact Assessment finding, and the availability of an exit strategy. We will also keep the Dutch Authority for Digital Infrastructure informed about how we intend to assure compliance with the Networks and Information Systems (Security) Act.

Working as a unified team with our colleagues at CIRA, we will progress development of the new registration system, with a view to deploying it for .nl by the end of 2025. Meanwhile, SIDN Labs will continue to work on a secure and robust infrastructure for the internet of today and the internet of the future. That will involve collaborating with academic research teams and experimenting with future internet architectures, such as SCION. SIDN Fund will continue its work as well, supporting promising projects that help build a strong internet for all. In 2024, the Fund particularly wishes to identify and support pioneering projects that involve the responsible use of AI for ethical purposes. Both internally and externally, we will continue to seek regular face-to-face contact, especially during periods of change. With regard to outside developments, we expect inflation to remain influential in the domain name market this year. We will accordingly intensify our efforts to discourage cancellations and to promote the active use of .nl domain names. Our sector is also likely to be influenced by international developments in the field of AI and machine learning, economic challenges, new legislation and regulations such as the NIS2 Directive, and political turbulence.

In this Annual Report, we look back at what we did in pursuit of our mission and strategy in 2023. We hope you enjoy reading about the highlights of our year and all we achieved, as well as about our plans for 2024.

Roelof Meijer, *CEO*
Loek Bakker, *CTO*



Problem-free, opportunity-rich digital living for everyone

About SIDN

As manager of the .nl top-level domain, SIDN operates at the heart of the Dutch internet. It is a source of great pride for us that .nl is one of the world's largest and most secure country-code domains. However, we are active in many other fields as well. We share our knowledge, develop cybersecurity services and support initiatives that help to make the internet better and stronger. Our mission is therefore to promote problem-free, opportunity-rich digital living for everyone.

Key figures

6,300,000

More than 6.3 million .nl domain names



We work with about **1,100** registrars



The .nl domain is now 38 years old



We have a staff team of **107** people



SIDN has operated .nl for **28** years

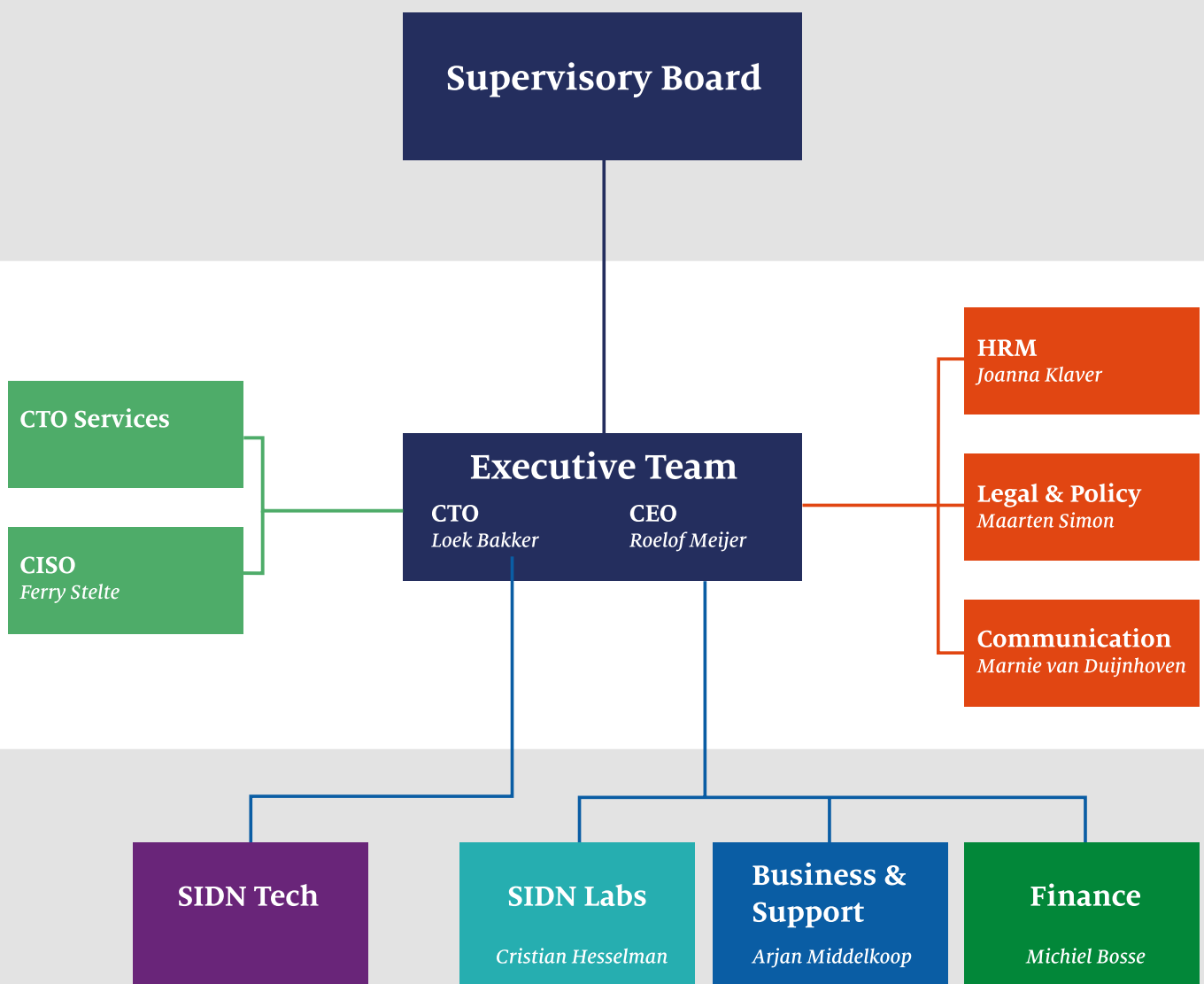


Over **60%** of .nl domains are DNSSEC-enabled



Organogram

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02

Our value to the internet community

Our strategy

Our central role in the Domain Name System (DNS) implies great responsibility towards all Dutch internet users. Ever since we started running the .nl domain, security and reliability have been our top priorities. Our strategy is the means by which we translate our goal of problem-free, opportunity-rich digital living for everyone into practical action. It has 5 central themes, each linked to priorities, activities and strategic choices aligned with our role and responsibilities for the Netherlands and the wider world. Details are provided below.

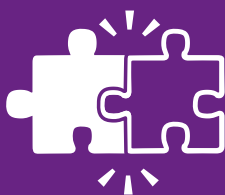
Themes and priorities



A globally prominent .nl domain



Putting internet users centre stage



Turning problems into opportunities



Contributing to a future-proof internet



Collaboration

02

A globally prominent .nl domain

In the Netherlands, .nl remains by far the most popular domain. It also plays a leading role on the global stage. We uphold the security of .nl by actively fighting internet abuse. In that context, the top priorities are the quality, security and reliability of our core systems (the DNS and DRS) and .nl services. We are therefore upgrading our DNS and DRS on the basis of open-source applications, and we are working with CIRA to develop a new cloud-native registration system. We are also committed to increasing the utilisation of existing data sources, such as RegCheck and our SIDN Insights data platform. Finally, we are increasing our impact within the ccTLD community by expanding our registry services.

> For details, see [section 3](#) and [section 6](#).

Putting internet users centre stage

We are dedicated to the service of internet users, a goal we pursue together with registrars, service providers, internet community partners and others. We work with the internet community to produce and share research findings, open-source software, data and open standards, and to promote the adoption of such standards. Moreover, SIDN Fund supports projects that empower internet users. And in the field of digital autonomy, we advance the principles of privacy by design, open-sourcing and decentralisation. Our efforts have helped to get those fundamental principles of electronic identity more firmly embedded in Dutch and European legislation and regulations.

> For details, see [section 3](#), [section 4](#) and [section 5](#).

Turning problems into opportunities

We are constantly striving to increase the security of internet users and to promote optimal, responsible internet use. For example, we develop services such as SIDN BrandGuard, which protects brands against online abuse and reputational damage. SIDN Fund also contributes to the security of internet users. The Fund supports innovative internet projects that help build a strong internet for all, such as initiatives to promote digital accessibility or awareness of cybersecurity and disinformation. For its part, SIDN Labs undertakes applied technical research in close collaboration with the internet community,

addressing problems that affect the internet infrastructure.

> For details, see [section 3](#) and [section 4](#).

Contributing to a future-proof internet

Drawing on the work that SIDN Labs does to increase the security and resilience of the internet infrastructure, we realise high-potential solutions for the internet of today and of the future. SIDN Labs is also experimenting with post-quantum cryptography in the DNS and with SCION, an architecture designed with inter-network security in mind. In line with our commitment to open digital autonomy, we use open standards and software, while SIDN Fund supports initiatives that promote an inclusive and fair digital society.

> For details, see [section 4](#).

Collaboration

At SIDN, we work as a single team. We invest in an inspiring working environment and in the ongoing professional development of individual staff members. We also pursue partnerships with actors who share our values in the Netherlands, other European countries and beyond. By sharing knowledge and drawing on one another's expertise, we are able to realise innovations and progress more effectively, more quickly and more efficiently. At the European and global levels, we collaborate with registries, registrars, government, our Strategy Consultation Group, educational institutes, former staff members, and other key partners. We also play an active role in various international forums.

> For details, see [section 4](#) and [section 6](#).

Strategy Consultation Group

We work for the Dutch internet community. At the end of 2022, we therefore set up a Strategy Consultation Group in order to maintain a continuous strategic dialogue with people representative of our key stakeholder groups. The Strategy Consultation Group includes people from government ministries, universities, internet industry players (including registrars), community groups and lobby groups. At our meetings with the consultation group, we seek input for and feedback on our strategy, which are then used to inform subsequent strategic decision-making. We attach



particular importance to obtaining insight into – and promoting the clarification and discussion of – the interests of our various stakeholder groups.

In 2023, we organised 2 consultation group meetings. In connection with the theme of 'an opportunity-rich internet', the May meeting was devoted to the opportunities afforded by the internet, and SIDN's role in relation to them. The advice from stakeholders was that we should concentrate on internet security and the future of the internet. It was also felt that SIDN should focus on activities that are in the direct or indirect interests of Dutch internet users, that have been neglected by other actors, and that are a good fit with our core services, the DNS and DRS. The theme of the November meeting was 'digital open strategic autonomy'. Topics discussed included the transfer of Yivi to the Privacy by Design Foundation, collaboration with CIRA, our IT sourcing strategy and the role of SIDN in the pursuit of digital open strategic autonomy.



“Discussing things with the group helps SIDN to make better decisions about how to use their time and resources.”

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Haroon Sheikh

Senior Researcher at the Scientific Council for Government Policy, Endowed Professor of Strategic Governance of Global Technologies at the Free University and Chair van SIDN's Strategy Consultation Group (WRR/photo: Arenda Oomen)

Input and feedback on SIDN's strategy

We want to serve the Dutch internet community in the best possible way. To help us do that, we set up a Strategy Consultation Group in 2022. The group is made up of a wide variety of stakeholders, who provide us with valuable input and feedback on our strategy. Haroon Sheikh: “The makeup of the consultation group reflects the full spectrum of the Dutch internet community. At the meetings, SIDN tells us about their plans, explains the various interests at stake and the considerations involved, and asks us for feedback and suggestions. Discussing things with the group helps SIDN to make better decisions about how to use their time and resources, and so maximise their impact.”

> [Read more about the Strategy Consultation Group on sidn.nl.](https://sidn.nl)

03

Focus on a reliable and stable .nl

A globally prominent .nl domain

One of the fields in which we are a global leader is tackling internet abuse. We work tirelessly to stamp out abuse in the .nl domain, which consequently remains one of the most secure domains in the world. To this end, we cooperate with others working in the same field. We also help companies and other organisations to protect their brands – by providing our SIDN BrandGuard service, for example. In 2023, the size of the .nl domain remained stable, at roughly 6.3 million domain names. As in previous years, we worked to promote .nl registrations and the active use of domain names. We also extended our partnership with the Registrars' Association (RA).

03

Tackling internet abuse

As manager of the .nl domain, we are continually taking steps to further increase the security of the zone and to help tackle internet abuse. We investigate malpractices involving domain names and we work with .nl registrars, universities and other actors, such as the National Cyber Security Centre. We also deploy a system called RegCheck to automatically identify suspect domain names at the time of registration. Developed by SIDN Labs, RegCheck assigns risk scores to new registrations. The ability to identify malicious registrations immediately and intervene promptly is very important because scams often claim most of their victims in the first 24 hours. If a registration is flagged up as suspicious, we ask the registrant for proof of identity, after which they have 3 days to respond. In that way, we are able to prevent a great deal of abuse and ensure that the registration of .nl domain names is fair and accessible to all. Our approach has proved to be successful, as evidenced by the fact that only 1 in 250,000 .nl registrations is malicious: fewer than in any other country-code domain. The next lowest TLD rates are in Canada's .ca domain and Belgium's .be, where, respectively, 1 registration in 217,391 and 1 registration in 208,333 is malicious (source: DNS Abuse Institute, 2023).

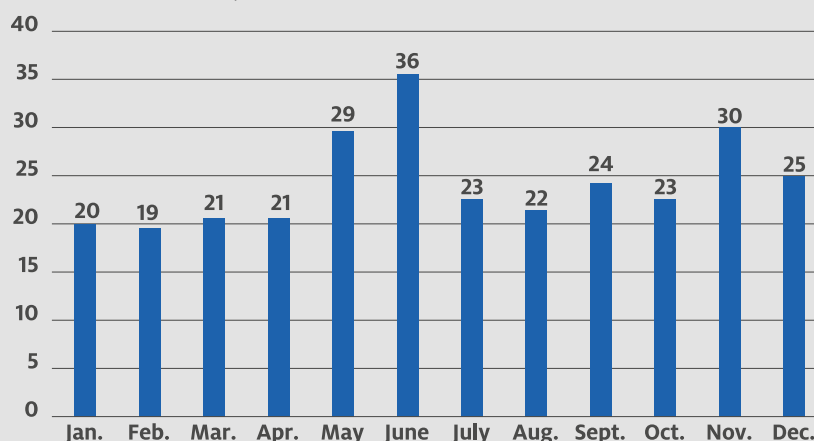
In 2023 we linked up with DNS Belgium, the registry for the .be domain, which was working on a system similar to RegCheck for .be. We refined RegCheck together and integrated certain features of DNS Belgium's system into ours. DNS Belgium has since started using RegCheck

to facilitate the early detection of potentially malicious registrations.

Only 1 in 250,000 .nl registrations is malicious.

As well as working to detect suspect registrations, we seek to stop .nl domain names being abused for internet-based criminal activities, such as phishing, malware and fake webshops. Whenever we discover that a .nl domain name is associated with phishing or malware, we send a detailed report to the registrant, the registrar and the hosting service provider. That gives them the opportunity to resolve the issue and prevent more internet users falling victim. In 2023, our reports led to registrars taking down 64.5 per cent of phishing sites and malware distribution sites within 24 hours. In 612 cases, we intervened ourselves by making the domain name and thus the associated website unreachable. Such action is taken only after detailed investigation of the individual case. In the fight against fake webshops, we work closely with the Netherlands Consumer Authority (ACM), the police and other partners. If the Police National Internet Fraud Desk ask us to investigate a domain name, we approach the registrant for evidence that

Fig. 1 | Average up-time of phishing sites and websites with malware, in hours



the registration data is correct. Court proceedings can also lead to intervention. We aim to be open and transparent about our intervention activities, because they can have major consequences for the parties involved. We therefore publish quarterly Transparency Reports on our website.

> For details, see sidn.nl

In collaboration with the Platform for Internet Standards, we promote the use of modern, open internet standards: internationally agreed quality and security requirements that internet connections must meet. The implementation of such standards helps to make the internet secure, stable and accessible. We therefore promote their use through our Registrar Scorecard (RSC) scheme, and we are a partner in Internet.nl, a joint initiative by various internet industry players and the Dutch government. Our collective efforts are helping to drive up the use of modern internet standards. In addition, we support internet users with publications, we share our knowledge through the SIDN Academy, SIDN TechTalk, webinars and practical guides, and on our website we publish answers to frequently asked questions about the standards.

> For details, see sidn.nl

SIDN BrandGuard

Trademark infringement and the exploitation of slips made by internet users when typing domain names are relatively common forms of abuse that tarnish the reputations of affected brands and often prove to be the first phase of a targeted phishing attempt. We therefore provide SIDN BrandGuard: a monitoring service that now protects more than 300 brands against phishing and reputational damage. Subscribers include government departments, banks, insurance companies, telecom companies and organisations such as BouwGarant. They receive a notification when, for example, a domain name resembling their brand name is registered under

.nl or another extension. The notification goes out before the domain name goes live online.

As an optional feature of the service, subscribers can receive notifications about domain names registered in other TLDs. BrandGuard also has a logo detection module, whose users receive information about the use or abuse of their logos on .nl websites. If the system detects third-party use of a logo, substantive assessment will often be required. In such cases, subscribers can request specialist assistance from our legal consultants ICTRecht, and can undertake action themselves.

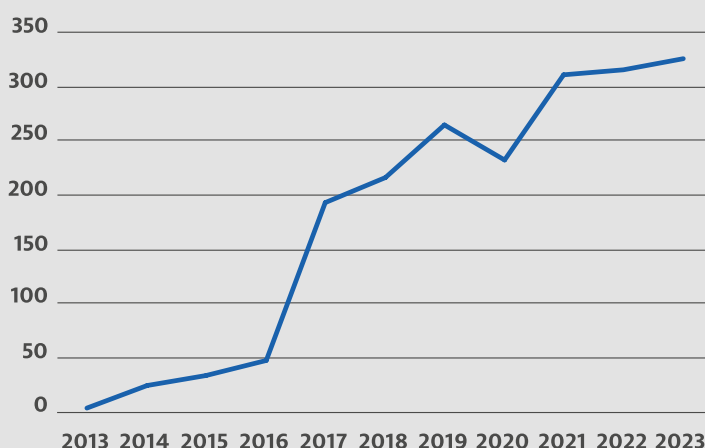
Continuing the trend of the last few years, turnover from SIDN BrandGuard grew by 25 per cent, with Allianz and the Franciscus Hospital amongst the new subscribers. We also piloted SIDN SME BrandGuard, a new version of the service tailored to smaller businesses, who are increasingly being targeted by cybercriminals. Subscribers are sent reports about online use of their logos, and about domain names that resemble their trading names. The first 4 agents to partner with us in marketing SIDN SME BrandGuard are i24, Comprá, Realtime Register and Let's Brand.

SIDN BrandGuard protects businesses and governments against reputational damage.

Development of the .nl domain and domain name market

The SIDN Panel is a consultation body whose members are regularly invited to take part in short surveys. One of the surveys focused on members' expectations for e-commerce in 2023. Of the respondents, 34 per cent said that, in the event of an economic downturn, they would invest more in e-commerce. And 42 per cent said that inflation was one of the main things that could prompt them to cancel a domain name. Our statistics subsequently showed that people were indeed doing both of those things. In the first half of 2023, the .nl zone gained about 20,000 domain names. However, the cancellation rate went up as well to just over 14 per cent, almost matching the pre-pandemic rate. As a result, .nl's growth came to a halt in the second half of the year. The domain ended 2023 with 6,297,384 domain names: almost the same as at the close of 2022.

Fig. 2 | Number of brands protected by SIDN BrandGuard





*“We use modern
internet standards
wherever possible.”*

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Rene van Lieshout

Proprietor of hosting service provider and .nl registrar Bluerail

SIDN Academy provides basic and in-depth knowledge of modern standards

“At Bluerail, we’re actively involved in information security and standardisation. Wherever possible, we use modern internet standards, and we like to use them the way they’re supposed to be used. The e-learning modules offered by the SIDN Academy provide accessible extra insight into all sorts of standards, from DANE and STARTTLS for securing mail traffic to DNS(SEC) and IPv6.

Following SIDN Academy modules has enabled us to breathe new life into projects that had run out of steam. The modules provide a sound base for anyone who wants to learn about the standards, but also in-depth knowledge for people who already know the basics.

We’re already looking forward to the next one!”

That figure makes .nl the fourth-largest country-code domain in the world, after .cn (China), .de (Germany) and .uk (United Kingdom) (source: Verisign, 2023). There is a worldwide total of roughly 360 million registered domain names. The .com domain has the biggest share of that total, accounting for 160 million domain names.

Price adjustment

Our costs are rising, mainly because of high inflation, the need for ICT investment and a stressed labour market. However, we are seeing little or no compensatory autonomous income growth, because the number of .nl domain names is largely stable. We therefore follow a policy of annual price adjustment. The adjustments are necessary to assure our long-term financial health and stability. In January 2023, we increased our prices by 6 per cent. The cost of registering a .nl domain name for a year rose to €3.76, while the registrar's account fee went up to €75 a month.

Market share

With a market share of 62 per cent in 2023, .nl dominates the Dutch domain name market. The second biggest-selling extension is .com, with 25 per cent of the market. In the Netherlands, therefore, .nl remains by far the most popular domain, especially within the business community. Amongst start-up businesses, the brand preference for .nl dropped slightly to 67 per cent, the level it was at before the coronavirus pandemic. The decline is linked to a rise in .com's brand preference in 2023, from 23 per cent in 2022 to 31 per cent. That in turn reflects the fact that many Dutch businesses are turning their attention back to international markets after focusing on the home market during the pandemic. Together, .nl and .com have the Dutch market largely to themselves, with a combined brand preference of 97 per cent and a combined market share of 88 per cent.

Developments in the registrar community

Last year saw continued consolidation amongst .nl registrars, driven by mergers and acquisitions. Given the developments taking place, it is important that we take account of our registrars' different needs and interests. We have therefore been working with the Registrars' Association (RA) to categorise individual registrars, so that we can tailor our communications appropriately. Our categorisation method is based mainly on the registrars' core activities, specialisations and interests. In 2023, there was a slight fall in the number of .nl registrars. We started the year with 1,110 registrars and ended it with 1,079.

Registrar satisfaction remains high

Last year, registrars gave our services a satisfaction score of 8.1 out of 10: slightly up on the 7.9 they gave in 2022. Registrars are particularly positive about the personal contact at events, with account managers, with our Support Department and so on. Registrars gave Support 8.5 out of 10, mainly because of the staff's willingness to engage with enquiries. One aspect of our performance that registrars are less positive about is how quickly we upgrade our systems. The satisfaction score for that was 7.2. Although that score was better than the 6.8 awarded the year before, there is clearly still room for improvement. And we are working hard to bring about improvement, by upgrading our ICT services and partnering with CIRA to develop a future-proof registration system.

Registrars value personal contact at events and with our Support Department.

Co-funded marketing campaigns and technology

As in previous years, we supported registrars' efforts to raise the profile of .nl and promote .nl registrations. There were 14 SIDN-supported marketing campaigns in 2023, which yielded about 50,000 extra registrations. We also encouraged initiatives and campaigns by registrars and resellers that made a positive contribution to .nl. From our website, registrars were able to download campaign toolkits consisting of ready-to-use marketing resources. Additional support was made available to registrars via SIDN Insights, a data platform we have set up, which is proving particularly popular amongst larger .nl registrars.

New for 2023 was our co-funded technology programme, through which we help registrars to implement internet standards by providing practical support and contributing to their rollout costs. We received a total of 6 applications, leading to the award of 3 support grants. In total, we spent roughly €20,000 on co-funded technology initiatives.

Cooperation with the RA

The Registrars' Association (RA) engages in dialogue with SIDN on behalf of .nl registrars. At the end of 2023, we extended our cooperation agreement with the RA for another year. We worked closely with the RA's Marketing & Communications Committee and



Fig. 3 | Development in customer satisfaction



Fig. 4 | Development of the .nl domain

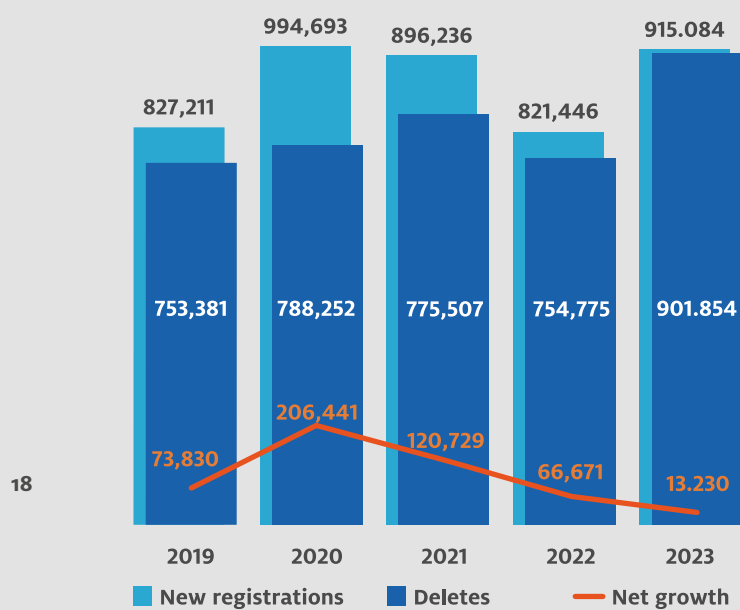


Fig. 5 | Market share in 2023

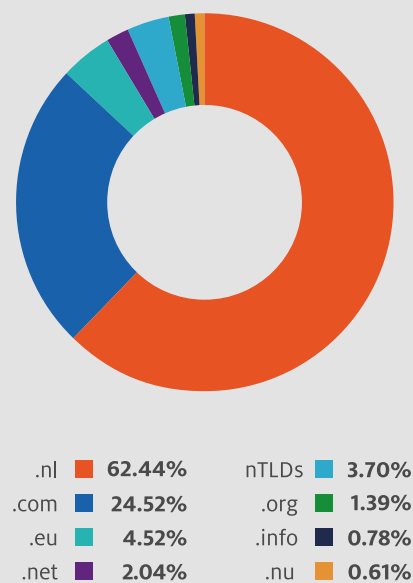


Fig. 6 | Price levels of .nl and peers (excl. discounts and registrar fees, euros)

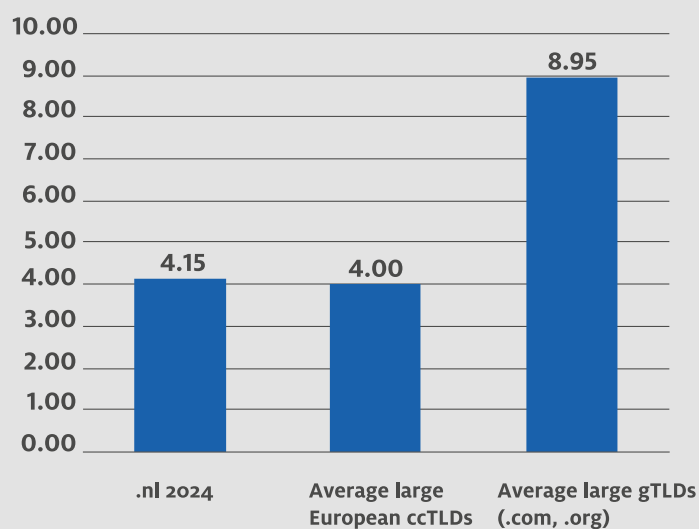
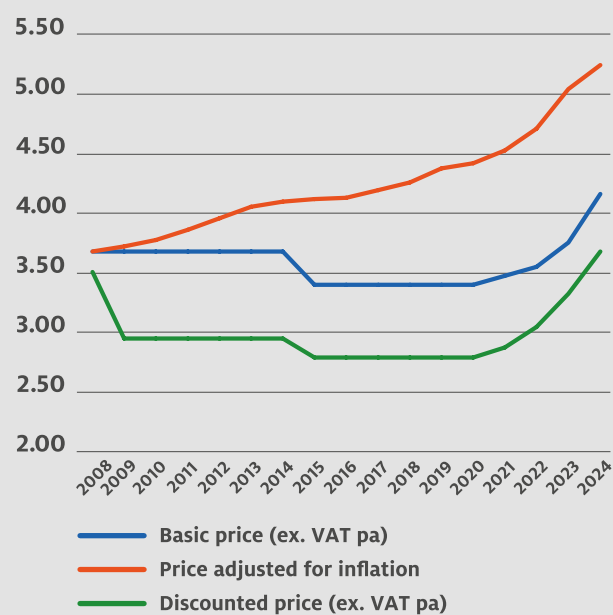


Fig. 7 | .nl price change over time (euros)



Technical Committee, discussing developments such as our partnership with CIRA and our planned cloud migration.

Funding of projects that benefit registrars

We are responsible for continuously improving the .nl domain. Since 2018, we have therefore been funding projects that contribute to that aim and have commercial benefits for .nl registrars. Our work in this field is done in partnership with the RA.

The funded projects include the following:

SIDN Academy

We operate an online platform called the SIDN Academy, where .nl registrars can brush up on topics relevant to a secure and stable .nl domain. In 2023, we published various e-learning modules on the platform. We added a module on Domain Name System Security Extensions (DNSSEC), for example, plus 2 micro-modules: one about the security.txt internet standard and one about buying and selling domain names.

VPN-whitelisting for DRS5

A VPN-whitelisting service for our DRS5 Domain Registration System is available to .nl registrars free of charge. VPN-whitelisting allows particular IP addresses to be cleared for access to a network via a VPN. Each registrar is assigned a unique, business-specific IP address, so that they can sign on to DRS5 securely, wherever they are.

Legal Help Desk

For some years, .nl registrars have been able to contact the Legal Help Desk for answers to questions about things such as privacy law or the terms and conditions governing domain name registrations. However, use of the service has been declining in recent times, because more organisations have their own legal counsels. The Legal Help Desk was therefore closed at the end of 2023.

Facilitating the sale of existing domain names

Since last year, we have been facilitating the sale of existing domain names through a pilot running on sidn.nl. We began the scheme at the RA's request. If a visitor uses our .nl Suggestion Tool to check the status of a domain name, and the name is 'Active' and 'For sale', a pop-up providing details automatically appears. Domain name vendors set their own prices,

and payment transactions are arranged between buyers and sellers, without SIDN's involvement. In 2023, a total of 200,000 domain names were given 'For sale' status. We will evaluate the pilot in 2024.

Registrar Scorecard

The Registrar Scorecard (RSC) is an incentive programme for nl registrars. Through the programme, we offer financial incentives in order to promote the active use of domain names and the adoption of modern, open internet standards that enhance the security of the .nl domain. In 2023, we changed the format of the RSC. Under the new arrangements, the incentive criteria are better aligned with registrars' current requirements. No new incentives were introduced, as we continued using the RSC to promote the adoption of IPv6, DNSSEC and the e-mail security standards StartTLS, DANE, DMARC, DKIM and SPF. The RSC helped to push the adoption of IPv6 from 35 per cent in

October 2022 to 43 per cent by October 2023. Since the start of 2023, DNSSEC support has been a basic requirement within the RSC programme, and the number of DNSSEC-enabled .nl domain names has been growing as a result. For a registrar to qualify for any RSC incentive, at least 10 per cent of the .nl

Fig. 8 | Development in the number of DNSSEC-enabled domain names (x 1,000)

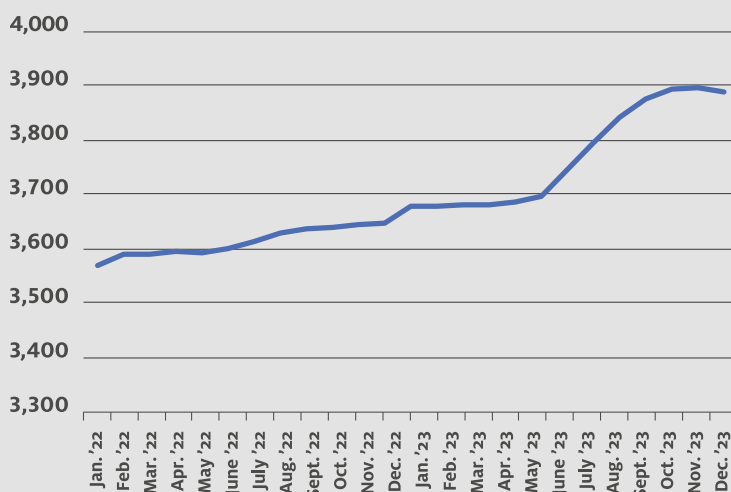


Fig. 9 | IPv6-enabled domain names (x 1,000)

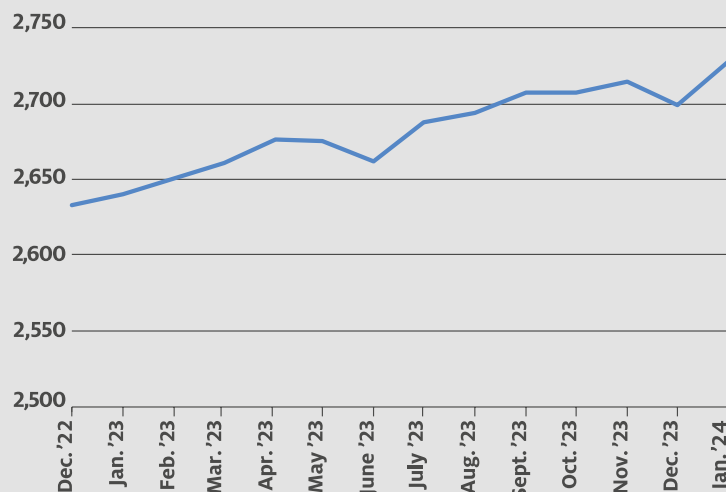
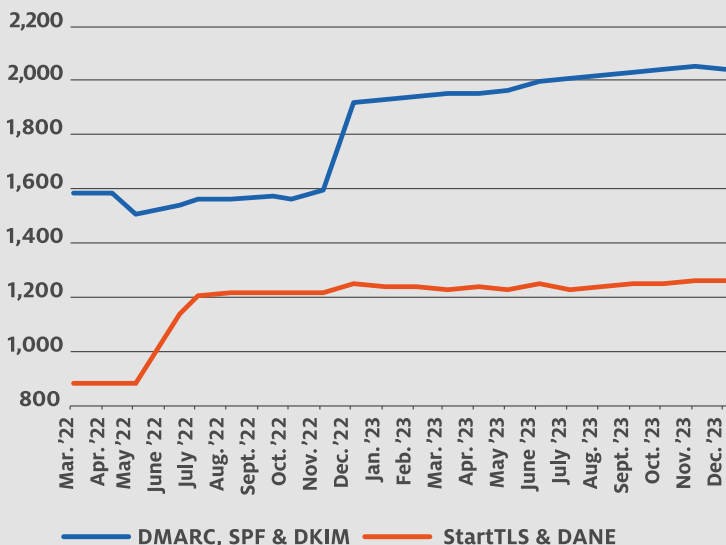


Fig. 10 | Use of e-mail security standards (x 1,000)



domain names in their portfolio must be DNSSEC-enabled.

As well as paying financial incentives, the RSC gives registrars performance feedback via a personalised dashboard. Stats on abuse prevention and registration data quality are made available too. In 2023, the financial incentive payments made to RSC participants totalled €1.0 million.

SIDN Panel

In 2023, the SIDN Panel had about 450 members, who together formed a representative sample of Dutch registrants. Panel members are invited to give their views by completing survey questionnaires. The findings are then used to help us tailor our services to the needs of internet users, registrants and the business community. Last year, the questionnaires sent to Panel members addressed topics such

as cybersecurity, open standards, phishing and preferences when choosing domain name extensions. In anticipation of the NIS2 Directive's enactment in Dutch law, another questionnaire focused on registrant identification. There was also one about expectations for 2024. An average of 150 Panel members responded to each survey.

Complaints and Appeals Board

The registration and assignment of .nl domain names nearly always goes without a hitch. In the rare cases where a .nl registrant or registrar is unhappy with a decision made by SIDN, they can appeal to the Complaints and Appeals Board for .nl Domain Names (C&AB). The C&AB also considers complaints about domain name registrations that are believed to be inconsistent with public order or decency – in other words, morally unacceptable to society. In 2023, an updated version of the C&AB website went live. The site explains how to make a complaint or an appeal, and how they are dealt with. All C&AB decisions are also published there. In 2023, the C&AB received one appeal, which is due to be decided in 2024.

Dispute Resolution System for .nl Domain Names

Sometimes, a disagreement arises regarding a domain name's similarity to a brand name, trading name, personal name or organisation name. Our Dispute Resolution Regulations for .nl Domain Names lay down the rules for handling such disputes. The system offers registrants and other internet users a relatively low-cost alternative to taking a dispute to court. In 2023, 36 dispute cases were started. Our mediators handled 19 cases. In 8 of them, successful mediation led to the dispute being settled early.

Notice and Take Down Code

The Notice and Takedown (NTD) Code provides the internet industry with guidance on how to proceed when told about unlawful or criminal internet content, such as child sexual exploitation material, discriminatory content, plagiarised content or phishing material. There is no legal obligation to follow the Code, but it serves as a framework for responding appropriately to requests to take down internet content. Along with very many other internet industry actors, we support the NTD Code. When problematic content is detected on a .nl website, we are among the actors with a part to play. However, the person seeking to get the content taken down has to take a number of steps before we can intervene. We received 60 notice-and-take-down requests in 2023. In 22 cases, we decided to disable the domain name involved. In the other cases, either someone else intervened or we decided that the content was not clearly criminal or unlawful.



“Updates to the zone’s DNS(SEC) system have to be prepared thoroughly and implemented with great caution.”

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Stefan Ubbink

DNS & Systems Engineer at SIDN

New DNSSEC algorithm for .nl

“In 2023, we migrated the .nl domain from DNSSEC algorithm 8 to algorithm 13 to align the .nl zone with the latest recommendations in this field. The .nl zone is hugely important to Dutch society and to the national economy. Updates to the zone’s DNS(SEC) system therefore have to be prepared thoroughly and implemented with great caution. However, updates do need to be made promptly, because excessive delay would undermine stability and security. If you let yourself dwell on the social and economic consequences of the zone going down, you wouldn’t dare do anything. So we approach this kind of task primarily from a technical perspective.”

> [Read more about our algorithm rollover on sidn.nl.](#)

Introduction of the Registration Data Access Protocol

The Registration Data Access Protocol (RDAP) is a replacement for Whois. It specifies how to access data about domain names, such as the registrant's details and the domain's name server. RDAP is mandatory for all gTLDs. Registries, registrars and other players running applications based on Whois will therefore have to migrate to RDAP. Although the use of RDAP will not be mandatory for ccTLDs such as .nl, we introduced an RDAP service for the .nl zone last year, and began using the protocol internally well before that.

Algorithm transition for .nl

DNSSEC is a cryptographic security extension to the DNS, which involves attaching digital signatures to DNS information. The signatures are generated using a cryptographic algorithm. Last year, we migrated the .nl domain from DNSSEC algorithm 8 to algorithm 13 (ECDSA Curve P-256 with SHA-256). The new algorithm makes DNS responses more secure and has other advantages.

Prohibition of privacy and proxy services

Privacy and proxy service providers are third-party service providers that act as the nominal registrants of domain names. They developed because some internet users, mainly private individuals, who wanted to be able to register domain names without publicly disclosing their identities via the registry's Whois. However, the names, addresses and phone numbers of .nl registrants have not been publicly visible since 2010. Consequently, there is no longer any reason for privacy and proxy services where .nl domain names are concerned. Furthermore, anyone with a legitimate reason for withholding their personal data altogether has been able to make an opt-out request since 2003. Another important consideration is that we need to be able to check registrants' identities and to contact them in order to take effective action against domain name abuse. Therefore, on 1 October 2023, we stopped allowing third-party privacy and proxy service providers to act as the nominal registrants of .nl domain names. We now monitor new registrations, and approach any privacy and proxy service providers and registrars that continue to act as nominal registrants for their clients. We are also working with registrars and other relevant stakeholders to gradually eliminate privacy and proxy registrations from the .nl domain as far as possible, by also getting existing registrations amended.

Covenant with Ministry of Economic Affairs and Climate Policy

Since 2008, we have had a covenant with the Ministry of Economic Affairs and Climate Policy

(EZK). In the covenant, we and EZK agree to work together to assure the reliability and availability of the .nl domain. We also undertake to maintain .nl's ties with the Netherlands and to keep SIDN based in the country. In connection with the covenant, we held regular discussions with EZK in 2023.

Supervision by the Dutch Authority for Digital Infrastructure

In 2018, the Network and Information Systems Security Act (Wbni) took effect in the Netherlands. The Act is intended to boost the digital resilience of the Netherlands, mitigate the impact of cyber-incidents and prevent disruption to society. Under the Wbni, SIDN was designated an 'operator of essential services' (OES): an organisation that provides services that are vitally important to Dutch society. As an OES, we are subject to supervision by the Dutch Authority for Digital Infrastructure, and we have a duty to manage the security risks to our network and information systems and safeguard against incidents. We are also required to report any incidents that have major implications for service stability. No such incidents occurred in 2023.

European NIS2 Directive

The second Network and Information Security Directive (NIS2) is an EU law designed to address digital threats to network and information systems. The ultimate aim being to increase member states' digital and economic resilience.

NIS2 includes requirements on domain name registrations and the accuracy of the associated data, such as registration data. For example, all registries and registrars for domains in the EU will have to publish information about how they verify their Whois data. NIS2 also designates all DNS service providers as operators of essential services. As such, like SIDN, they must meet strict security requirements and new cybersecurity requirements, and they have a duty to report certain matters to the competent authority. Exactly what impact NIS2 will have on registrars, registries and DNS service providers remains to be seen.

From January 2023, EU member states have 21 months to incorporate NIS2 into national legislation, which is liable to result in variation between EU countries. That may be a major challenge for registries, and particularly for registrars that offer registration services under multiple TLDs and therefore have to comply with multiple countries' rules. A further complication is that .nl domain names are made available by registrars and resellers all over the world. If a Dutch registrar registers a .be domain name for a French customer, it is unclear whether the transaction will be subject to Dutch, French or Belgian rules.

will be subject to Dutch, French or Belgian rules. However, member states are aware of such pitfalls, and are working to avoid them by coordinating the implementation of NIS2 as far as possible. In 2023, we held discussions on NIS2 with the government and with registries and registrars in the Netherlands and Belgium. We also proposed the adoption of a staged approach to implementation, with introduction of the e-mail verification system used for gTLDs as the first step. The rationale for such an approach is that it would be realistic and workable for the domain name industry.

Registry services for .amsterdam, .aw, .politie and .cw

As well as operating the .nl domain, we act as registry service provider for 2 generic top-level domains (gTLDs), namely .amsterdam and .politie, and for Aruba's country-code domain .aw. In 2023, we also started providing DNS services for Curaçao's .cw domain. Our partnership with Canada's registry CIRA is expected to pave the way for the joint expansion of registry service provision in due course.

Outlook

Registry fee uplift

With effect from the start of 2024, we are increasing our prices by 10 per cent. The price uplift is needed to counter the effect of inflation on our cost base, and to help cover the extra investment we need to make in our ICT systems. From 2024, the basic annual cost to a registrar of registering a .nl domain name is €4.15. The registrar's account fee is €83 a month.

Targeted communication with registrars

In 2024, we will continue our push to categorise .nl registrars and to tailor our communications with them to match their expertise and interests and the challenges they face. That will require us to gather information about the roles of the individual personnel that we deal with.

Sustainable growth of .nl

In the year ahead, we intend to intensify our efforts to discourage cancellations and to promote the active use of .nl domain names. To that end, we will be looking into the best campaign forms to use. We will also support initiatives by registrars that contribute to online security and the adoption of open internet standards. Our aim is to achieve sustainable growth for the .nl domain, so that we have a firm foundation for the future.

SIDN Insights

In 2024, we will prepare our SIDN Insights data platform for migration to the new registration

system. One of our aims is to divide the platform into modules, so that registrars can import data from various sources to their own platforms. Internationally active registrars are particularly keen to have that capability, since the data can provide useful insights into their opportunities, challenges and performance on the European market. We additionally plan to encourage registrars to make more use of the platform.

Registrar Scorecard

Lack of reliable information about the adoption of IPv6 is making it increasingly difficult for us to develop promotion policies. Against that background, we are gradually phasing down our IPv6 incentive. In addition, we are increasing the level of DNSSEC support required to qualify for RSC incentives from 10 per cent to 20 per cent. In other words, at least 20 per cent of the .nl domain names in a registrar's portfolio must be DNSSEC-enabled before the registrar qualifies for RSC incentives. No new incentives will be introduced for the first half of 2024. However, we are working on an incentive to promote the adoption of security.txt, with a view to introducing it the second half of the year. We will also continue incentivising .nl registrars to use the standards StartTLS, DANE, DMARC, DKIM and SPF, and promoting the active use of domain names.

SIDN BrandGuard

Our goals for the SIDN BrandGuard service are to increase internet security by offering logo detection to existing customers, and to increase turnover by at least 22.5 per cent.

Launch of .nl Control 2.0

In light of factors such as the need to prepare for the upgrading of our registration system, we decided to delay the launch of .nl Control 2.0 until 2024. The enhanced service will offer .nl registrants even more control of their domain name registrations. In the year ahead, we will work on refining .nl Control and simplifying the underlying processes. We will also liaise with registrars, with a view to ensuring that the enhancements we are making result in a service that registrars find more saleable. The new version of .nl Control will support eHerkenning login.

European NIS2 Directive

Member states have until the middle of October 2024 to translate the NIS2 Directive into national legislation. We will therefore remain in conversation with the government, other registries and registrars in the Netherlands and Belgium in order to prepare for NIS2 as best we can. After introduction of the system for e-mail verification, the next phase in our staged introduction model involves extension of data controls.

04

A resilient Dutch and international digital society

Working together on a secure, stable and future-proof internet

SIDN is a private organisation with a public role that is important to the Netherlands, Europe and the global internet community. We are a non-profit organisation, and we use the income from the .nl domain to enhance the internet's societal and economic value. We play an active role in various international forums and support initiatives that deliver significant value for the internet. We also address issues in the fields of cybersecurity and the internet infrastructure. Much of that work is done through our research division SIDN Labs, which is dedicated to further enhancing the security of the internet infrastructure through applied technical research. Through SIDN Fund, we invest in innovative projects that contribute to a strong internet for all. SIDN Labs and SIDN Fund often work together and with partners to maximise their impact.

O4

SIDN Labs

In the modern world, the internet plays a vital role. Modern digital societies are therefore highly dependent on a secure internet infrastructure. The infrastructure is an indispensable layer that transports data from A to B, typically across multiple networks. Our research team, SIDN Labs, works to continue increasing the security of that infrastructure for the Netherlands, Europe and the wider world. SIDN Labs' research agenda spans 3 primary themes: domain name security, infrastructure security and emerging internet technologies. The team collaborates with universities, infrastructure operators and other research centres on both short-term and long-term projects. Particular attention is paid to operational challenges of concern to SIDN and .nl. SIDN Labs brings research and practice together and acts as a bridge between the research world and the operational world. The team's research findings are made available to the public and are widely applicable, so that other stakeholders can make their own contributions to internet resilience.

In 2023, experts from SIDN Labs taught courses on Advanced Networking and Security Services for the IoT at the University of Twente (UT). SIDN Labs' Director

also delivered his inaugural lecture as a professor at the UT. Guest lectures were given at Leiden University and Radboud University, and a total of 6 MSc students were supervised. We also collaborated closely with the UT within the TUCCR consortium, providing cybersecurity input that TUCCR used in the development of new solutions. We seconded 4 of our team members, each for 1 day a week, to various universities for joint research and teaching: Delft University of Technology (1), the University of Amsterdam (1) and the University of Twente (2).

In his role as a professor at the UT, SIDN Labs' Director joined the Cyber Security Council (CSR) with effect from 1 September. The Council is an independent national body that advises the Dutch government. Its members are high-ranking academics and representatives of various public and private-sector organisations. As a member of the CSR representing the academic community, SIDN Labs' Director can help to guide efforts to enhance the security of the Dutch and European internet infrastructures. Another member of the SIDN Labs team joined the Advisory Panel of SIDN Fund.

Some of the projects undertaken by SIDN Labs in 2023

Packet Run

Few users understand the internet's inner workings. SIDN Labs therefore teamed up with SIDN Fund and the Moeilijke Dingen design agency to develop an installation called Packet Run. Packet Run is an interactive marble run that lets people experience how the internet transports data from source to destination via multiple intermediate networks and operators. The installation is based on PathVis: a tool developed by SIDN Labs to visualise internet routing information. Packet Run consists of 27 marble runs, which together make concepts such as data packets and routing tangible. We exhibited the installation at Dutch Design Week 2023, with the aim of giving visitors insight into how the internet works and encouraging debate about the concept of a responsible internet.

Packet Run demonstrates the inner workings of the internet.

DDoS Clearing House

For the European CONCORDIA project, we developed the DDoS Clearing House in partnership with SURF, the UT and organisations from other countries, such as Telecom Italia and the University of Zurich. The Clearing House generates DDoS fingerprints, which essential service providers, including governments, banks and internet access providers can use to automatically share information about DDoS attacks. In 2023, we delivered the DDoS Clearing House and concluded the technical pilot. The DDoS Clearing House was very well received by the European Commission. The National Anti-DDoS Coalition will use the system to support its 21 member organisations.

Internet time services

The Network Time Protocol (NTP) enables computers to synchronise their clocks, so that they are always accurate to within a millisecond. Stable, accurate time is vital for purposes such as generating and verifying digital certificates, securing the DNS with DNSSEC, and pinpointing the date and time of .nl registrations. In order to highlight the importance of the NTP, we provide a public internet time service called TimeNL.

One well-known time service is the NTP Pool. In 2023, we performed a measurement study, which showed that the NTP Pool is the most popular time service on the internet. We also identified various problems with the way that the NTP Pool assigns NTP servers to clients. All clients in 21 countries were assigned to just 2 NTP servers. If those servers were to go down, the countries in question would experience serious problems. We therefore proposed certain techniques that the NTP Pool operators could use to increase fault resilience and reduce the probability of various types of attack.

New naming system for the DNS root

There are currently 13 DNS root servers around the world. When queried, the root servers enable computers to find the right server for a top-level domain, such as .nl. That server then gives the IP address of the website the user wants to visit. Each DNS root server has a name that starts with a letter from a to m, followed in all cases by 'root-servers.net' (e.g. a.root-servers.net). The servers therefore all depend on the .net top-level domain and do not have DNSSEC protection.

Against that background, ICANN asked us and NLnet Labs to investigate how the DNS root servers would be affected by each of the 5 alternative naming schemes proposed by the Root Server System Advisory Committee (RSSAC) in its advisory report RSSACo28. We built an open-source testbed for automated testing of all 13 root servers. Our experiments showed that adoption of any of the naming schemes would entail challenges. Our findings also made an important contribution to the debate about making the DNS root more secure and stable, which is very important for top-level domains such as .nl.

Cloudburst

Last year, we developed Cloudburst, a tool that makes it easy for ICT teams to simulate cloud outages in a controlled manner. Cloudburst blocks connections to particular cloud service providers, such as Google and AWS, enabling an ICT team to assess their organisation's dependency on a given provider by observing effects such as website unavailability. That then opens the way for preparing the organisation's processes for a possible cloud outage or fault, by for example providing for temporary fallback to local storage. We demonstrated Cloudburst at the NWO ICT.OPEN2023 conference in Utrecht, the PublicSpaces Conference 2023 and SIDN Inspire. We made the Cloudburst source code open via GitHub.

Cloudburst enables us to see how dependent we are on cloud operators.

DNS2Vec

Representation learning is a technique for automatically identifying the key characteristics in a body of raw data. It can be used for things such as pattern recognition, classification or prediction. It has been the basis of numerous machine learning successes over the last 10 years, but it is largely unknown in the DNS community. We therefore ran a project called DNS2Vec to establish whether representation learning has added value for the DNS. Applying Word2Vec technology to our DNS data in our open-source data



“This partnership is enabling SIDN and DNS Belgium to learn a lot from each other.”

27



Thymen Wabeke and Thijs van den Hout

Research Engineers at SIDN Labs

Joining forces to fight suspect domain name registrations

We believe it's very important to keep the .nl domain as secure as possible. SIDN Labs therefore does internet security research and develops tools for tackling malicious domain names. Thymen Wabeke: “We're always looking both to share our knowledge and experience in this field with other registries, and to learn from them. So SIDN has got together with DNS Belgium to work on software for detecting malicious domain names at the time of registration. In other words, domain names registered for abusive or criminal purposes, such as phishing, malware distribution or domain squatting.” Thijs van den Hout adds: “Many registries are facing similar problems where internet abuse is concerned, and we're often working on similar solutions. This partnership is enabling SIDN and DNS Belgium to learn a lot from each other. In 2024, we hope to get other registries involved as well.”

> [Read more about our collaboration with DNS Belgium on sidnlabs.nl.](https://sidnlabs.nl)

platform ENTRADA, we automatically generated a list of the characteristics of every DNS resolver that looked up a .nl domain name. The results indicated that the application of representation learning to DNS data is a promising technique for things such as classifying resolvers.

Study of phishing in the .nl, .be and .ie domains

Together with DNS Belgium and IE Domain Registry, we investigated phishing attacks in the .nl, .be and .ie domains. The aim was to improve understanding of the similarities between phishing attacks in the Netherlands, Belgium and Ireland, and to establish what kinds of organisation were most often targeted. We found that US and Dutch-Belgian financial service providers were the most frequent targets. We also observed similar attack patterns in the Netherlands and Belgium. In early 2024, we plan to summarise our results in a technical report and an article.

Autocast

In 2023, we developed a first prototype of Autocast (automation of anycast), an observation platform for our DNS operations team. Autocast provides action-oriented observations of an anycasted DNS service for .nl, such as performance problem reports and recommendations regarding the shedding or acquisition of .nl anycast locations. It does so using DNS data that we have collected with ENTRADA. Autocast is designed to be suitable for use by other DNS operators as well.

In 2023, we developed a first prototype of Autocast.

Post-quantum cryptography in the DNS

PATAD (Post-quantum Algorithm Testing and Analysis for the DNS) is a project we are running to clarify the impact of post-quantum cryptography (PQC) on DNSSEC. Unlike current algorithms, including RSA, PQC algorithms such as SQIsign and Falcon will be hard for quantum computers to crack. Although quantum computers are unlikely to be available for 10 or 20 years yet, it is important to investigate their potential impact now, because it can take several years before a PQC algorithm is widely available on the internet.

In 2023, we completed a first version of our PATAD testbed, which is based on a PowerDNS server and the Falcon PQC algorithm. Falcon has been the default algorithm for PQC-based digital signatures since 2022. Using the testbed, we are able to test various PQC algorithms. We also added support for the quantum-safe hybrid algorithm X25519Kyber768 to our DNS4all public resolver.

SCION-NL

SCION is an experimental architecture for a new internet, which is intended to fundamentally improve inter-network security. In 2023, we built the SCION-NL testbed in collaboration with SURF and the University of Amsterdam. The testbed enables us and other organisations in the Netherlands active in this field to experiment with the SCION internet architecture. SCION is a long-term development for experimentation in connection with the Emerging Internet Technologies research theme.

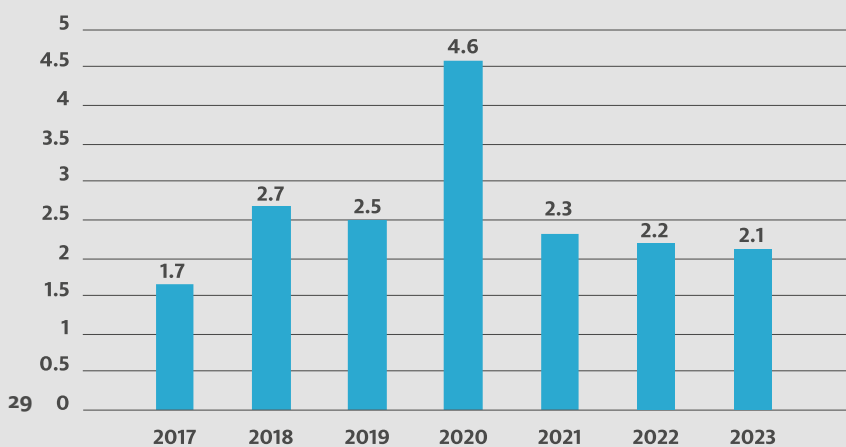
SIDN Fund

The internet has great benefits for present day society, and for the society of tomorrow. SIDN Fund therefore works to promote a strong internet for everyone by supporting innovative projects that contribute to an open, free and trustworthy internet. The focus is on 3 fields: a strong internet, strong internet users and the societal side of the internet. In 2023, the new working method adopted by SIDN Fund the previous year took clear shape. The new method involves the combination of themed public calls for proposals with project scouting. By combining those strategies, the aim

is to parachute successful SIDN Fund-supported projects into particular contexts, in collaboration with other actors. SIDN Fund has developed strategic partnerships with the Dutch National Library and with the cities of Amsterdam, Rotterdam, The Hague and Eindhoven under the banner of the Responsible Internet. In 2023, SIDN Fund also began a joint initiative with the Ministry of the Interior and Kingdom Relations to promote digital commons in the Netherlands. Other topics addressed by the Fund included digital inclusion and accessibility.

In the first half of 2023, SIDN Fund made a call for proposals linked to the theme of Getting a Grip on Polarisation. The call followed on from 2 calls on the theme of Getting a Grip on Disinformation in 2021 and 2022. The emphasis was on the adoption of promising solutions and projects designed to mitigate the negative effects of internet mechanisms. Proposals were invited for projects and tools that could increase understanding of and control over online polarisation. With the Fund's support, 8 projects linked to the theme were started. As in previous years, pioneering project organisers were able to make applications for grants of up to €10,000 at any time, rather than within a particular window. The Fund also scouted projects with significance for society and the potential to make an impact in one of the 3 focus fields.

Fig. 11 | Annual contribution to SIDN Fund (€m)



Some of the projects supported by SIDN Fund in 2023

The role of search engines and search behaviour in digital polarisation

Every day, internet users perform billions of internet searches. Yet little is known about how search engines influence the information seen by internet users or about the role of information filtering by search engines in online polarisation. With the aim of investigating those questions, the University of Twente developed a digital tool that automatically collects (anonymous) data from various search engines. The project was supported by SIDN Fund as part of the Getting a Grip on Polarisation themed call in 2023. Following a successful initial pilot, the UT is now carrying out follow-up research with its partners. In collaboration with the Centre for Digital Inclusion, the UT is actively involving the public in collecting and analysing data on digital polarisation. The initiative has two aims: to help support policy development, and to raise awareness amongst stakeholders and the general public regarding the influence of search behaviour and matters such as security, privacy and digital literacy.

The University of Twente developed an online tool that sheds light on digital polarisation.

Raising the Internet.nl API user caps

The implementation of modern open internet standards is important for a secure, accessible and trustworthy internet. In 2014, the Platform for Internet Standards therefore introduced the Internet.nl online tool. Internet users can use the tool to test whether their website, e-mail, domain name and internet connection support modern internet standards. Last year, SIDN Fund supported a pioneering project by ECP | Platform for the Information Society and partners from the Dutch internet community,

which involved refining the open-source software behind Internet.nl. The modified software is easier for users to install on their own systems, and bulk users are not constrained by the public site's cap on the number of domain names that can be checked. Registrars and others can also incorporate the software into the services they offer their customers.

Adoption of the security.txt internet standard

The security.txt open internet standard facilitates communication between website operators and ethical hackers. Vulnerabilities can then be reported to website operators quickly and easily, before they are exploited by malicious actors. The RA is promoting the adoption of security.txt by helping its members to automate the standard's use. The RA is also working with key vendors to the industry, with the aim of getting security.txt enabled by default in control panels.

CO2.js for a fossil-fuel-free internet

The Green Web Foundation's goal is a fossil-fuel-free internet by 2030. As part of its efforts to encourage transition, the organisation maintains the world's biggest open dataset of websites that run on green energy. The Green Web Foundation is also developing an open-source JavaScript library called Co2.js for estimating the carbon emissions linked to websites. A successful pilot led to major players such as Firefox and WordPress expressing interest in CO2.js. The Green Web Foundation is now working to refine the code and promote further adoption of the tool.

The Green Web Foundation's tool CO2.js estimates the carbon emissions linked to websites.

Ethical Risk Assessment Tool

Algorithm Audit is a foundation dedicated to the responsible development of ethical algorithms. An algorithm is a series of steps that a computer system performs for a purpose such as making predictions. Algorithm Audit is investigating questions such as what variables should and should not be considered by digital risk assessment tools of the kind used to vet people applying for mortgages or social security payments. With the support of an independent audit committee, the foundation is also looking into data processing methods, for example. As well as making recommendations on ethical issues and sharing its findings publicly, Algorithm Audit has developed a bias scanning tool for audit committees. The tool uses an intelligent calculation method to identify groups of users who are disproportionately likely to be misclassified.

Responsible Internet Thesis Award

The Responsible Internet Thesis Award is an initiative by SIDN Fund, Mijndomein, Freedom Internet and the Royal Dutch Society of Sciences and Humanities. The award is open to the authors of masters' theses linked to the theme of a responsible internet that is more secure, accessible and better for all users. The jury considered 17 theses and presented its awards in November. First prize of €2,000 went to the author of Global Vulnerability Vigilance: Timely Disaster Notification using Internet-Scale Coordinated Vulnerability Disclosure. The €1,000 runner's up prize was given to the author of Anonymous dissent outside the motherland: Transnational activism on Instagram among overseas Chinese. The award scheme is designed to reward students who do research into responsible interaction with the internet.

Contributions to organisations and conferences

We place great emphasis on collaborating with partners in the Netherlands, the European Union and beyond. For example, we play an active role in various international forums, and we organise events ourselves. Our main involvements are outlined below.

ICANN

The Internet Corporation for Assigned Names and Numbers (ICANN) is a non-profit stakeholder organisation that performs a number of important internet-related tasks. It assigns IP addresses, for example, and decides the policies governing the issue of gTLDs, such as .com, .net and .shop.

One particularly significant function for SIDN is management of the ‘root’ and the root server system, which is done by ICANN’s affiliate IANA. We play an active role in several working groups, particularly the ccNSO, the body for country-code registries within ICANN. In 2023, ICANN again held 3 meetings. The first, in March, was in Cancun, Mexico. The second was held in Washington, USA, in June, and the third in Hamburg, Germany, in October. At the latter, we organised a social event for .nl registrars attending the meeting. We also linked up with the Dutch government’s economics ministry to organise a pre-ICANN session for stakeholders in the Netherlands.

RIPE NCC

RIPE’s Network Coordination Centre (NCC) is responsible for tasks such as issuing IP addresses to internet service providers and other bodies in Europe, the Middle East and parts of Central Asia. In 2023, RIPE held 2 physical meetings, both of which we attended. They took place in May and November-December, with Rotterdam, the Netherlands, and Rome, Italy, as host cities. One member of the SIDN Labs team co-chairs RIPE’s DNS Working Group.

IETF

The Internet Engineering Task Force works on evolution of the internet architecture and on optimising the internet’s operational security and efficiency. Various network operators, designers, vendors and researchers participate in this international community, membership of which is open to all. In 2023, the IETF held 3 physical meetings, in Yokohama, Japan, San Francisco, USA, and Prague, Czechia. During the year, SIDN Labs team members contributed to 2 IETF documents: a research agenda for post-quantum cryptography in DNSSEC, and a proposal regarding a RESTful version of EPP.

DNS-OARC

The DNS Operations, Analysis and Research Center (DNS-OARC) is a platform for key operators, analysts and researchers to share information and knowledge and coordinate responses to attacks and other problems. In 2023, the platform held 2 international meetings for stakeholders. OARC 40 took place in Atlanta, USA, while the venue for OARC 41 was Da Nang, Vietnam. At OARC 41, an SIDN Labs team member presented the results of our research with LEMMINGS (deLetEd doMain Mail warNinG System). LEMMINGS is our system for alerting the former registrants of recently cancelled domain names if their mail domains are continuing to attract traffic.

CENTR

CENTR is an association of European ccTLD registries. CENTR and its members are jointly responsible for 80 per cent of all registered country-code domain names in the world. We are active members, with our CEO sitting on CENTR’s Board, while a member of our ICT team co-chairs the Technical Working Group and an SIDN Labs team member co-chairs the R&D Working Group. Last year, CENTR held various workshops in Europe on marketing, security, administration, legislation, research and development. We were also actively involved in the Annual CENTR Meeting and the CENTR Leaders Day, which was held in Brussels. At the latter event, we made a presentation on the background to and aims of our partnership with CIRA, and we invited .nl registrars to attend the annual Registrar Day. We presented technical findings to the CENTR Technical Working Group and R&D Working Group on 4 occasions.

ECP Annual Festival 2023

From its neutral, independent position, ECP | Platform for the Information Society contributes to a trustworthy, opportunity-rich and resilient digital society. It works in partnership with both public and private organisations. Last year’s ECP Annual Festival was held in The Hague, with SIDN in attendance as a partner. Together with SIDN Fund, we organised a session on the theme of Participating in Digital Government, which covered a number of projects supported by the Fund. SIDN Labs team members and staff from the University of Twente also presented the findings of their joint study of the government’s DNS infrastructure.

EuroDIG

European Dialogue on Internet Governance (EuroDIG) is an open platform where stakeholders exchange ideas about the internet and its governance. EuroDIG promotes discussion and collaboration within the internet community linked to the theme of public internet policy. We are active members of the platform, and we sponsored the annual EuroDIG conference, which was held in Tampere, Finland in June.

Internet Governance Forum

The United Nations' Internet Governance Forum (IGF) brings stakeholder groups from all over the world together to discuss internet governance and digital policy. Various important themes were addressed in 2023, including cybersecurity, emerging technologies, data management and trust, artificial intelligence and internet fragmentation. As usual, we attended the annual IGF meeting as part of the Dutch delegation. The 2023 event took place in Kyoto, Japan. In the lead-up, the annual preparatory meeting was hosted by NL IGF, which is a partnership involving the Dutch government's economics ministry, ECP and SIDN. That meeting focused particularly on future-proof internet governance and the power of stakeholder collaboration.

OneConference

The ONE Conference is an annual event organised by the National Cyber Security Centre, the Dutch government's economics ministry, and the Municipality of The Hague. Held at the World Forum in The Hague, the ONE Conference is Europe's most important cybersecurity event, where knowledge, best practices and research results are shared. The main themes of the 2023 edition included malware detection, digital incident response, public-private partnerships and recent cybersecurity research. At the conference, SIDN Labs made a presentation about LEMMINGS.

The State of the Internet

On 9 March, Waag Futurelab hosted the fifth annual State of the Internet lecture. The event was organised in partnership with Amsterdam Public Library, the publisher Singel, the City of Amsterdam, De Groene Amsterdammer, SIDN and SIDN Fund. The speaker was writer, artist, journalist and technologist James Bridle, who looked at key questions in the fields of privacy, autonomy, digital rights and the proliferation of internet platforms. After 5 years, we have now ended our involvement with The State of the Internet.

Chamber of Commerce Start-ups Day

At the invitation of the Chamber of Commerce (CoC), we had a presence at the CoC Start-ups Day in November. On our stand and during the 2 presentations we made in partnership with the Benelux Office for Intellectual Property (BOIP), we showcased our .nl Suggestion Tool, answering visitors' questions about the best brand names and domain names to use. We also gave advice on hosting, website design, commercial e-mail and the requirements relating to security and modern internet standards. We supported our presence at the event with a small campaign, which received 300,000 views.

SIDN Inspire

On 25 May, we held the third edition of SIDN Inspire at Media Plaza in Utrecht. The theme was 'The internet is magic'. During his presentation, technology expert and trendwatcher Jarno Duursma talked about the synthetic revolution and the rise of artificially intelligent software such as ChatGPT. Topics and services covered included NIS2, digital accessibility, eIDs, Mastodon and SIDN BrandGuard. SIDN Labs presented a demo version of Cloudburst, a tool for simulating cloud outages.

SIDN TechTalks

Every year, we organise 2 SIDN TechTalks for technical professionals and students. At our offices in Arnhem, we share knowledge and discuss developments relating to issues such as abuse, security and data. Team members also present the results of relevant research and projects, such as our RegCheck system. Our 2023 TechTalks were held in April and October.

Involvement with outside organisations

Acting as both a knowledge partner and a sponsor, we support organisations and projects that promote use of the internet or address its unwanted side-effects.

Collaboration within Europe

In order to continue getting the better of cybercriminals, it is important that registries like SIDN share knowledge and work together efficiently. In 2023, a 12-strong consortium of which we were a member set up the European Top-Level Domain Information Sharing and Analysis Centre (TLD ISAC). Our CEO sits on the TLD ISAC steering committee, and CENTR is supporting the initiative. The TLD ISAC Working Group pools cybercrime-related insights, knowledge and experience. By sharing such information with each other, consortium members can protect their services and the critical infrastructure more

effectively and enhance the security of Europe's top-level domains. At a later stage, additional partners will be able to join the TLD ISAC. ISACs for sectors such as water and energy have existed in the Netherlands for some time.

Internet Security Platform

SIDN is a member of the Internet Security Platform (known by its Dutch initials, PIV). The PIV is a partnership of commercial and public organisations that want to make a structural contribution to improving internet security for all users. Important issues addressed by the PIV include privacy, phishing, and how to stop child sexual exploitation material being shared on the internet. The PIV serves as a neutral forum for strategic discussions, leading to concrete agreements and initiatives.

Notice-and-Take-Down Working Group

SIDN is a member of the Notice-and-Takedown Working Group, which operates under the auspices of the Internet Security Platform. The Working Group's main aims are management of the national Notice and Take Down Code and the sharing of knowledge and experience relating to the working of the Code. The Code is a stakeholder framework for dealing with reports of unlawful or criminal internet content.

Offlimits

Offlimits is a spinoff of the Online Child Abuse Expertise Bureau. The organisation supports people who have encountered inappropriate behaviour or abuse on the internet, especially the sexual exploitation and abuse of children and adults. The organisation also works to make the online world safer and to strengthen the position of internet users. SIDN sponsors Offlimits.

Public-Private Partnership for Online Content Moderation

On the initiative of the Dutch government's justice ministry, organisations including hosting service providers, registrars, social media platform operators and SIDN hold regular meetings with the relevant public bodies to discuss ways to optimise the removal or blocking of illegal content. The meetings are organised as part of the new European Digital Service Act regime. A related low-threshold reporting system for internet users is also being developed.

IDnext

Independent knowledge and networking platform IDnext supports and facilitates innovative methods and approaches in the field of electronic identities. The platform is intended for use by experts in IT, business and marketing, enabling them to keep in touch and maintain a leading position on technology matters. In 2023, we partnered with IDnext for the last time to organise a conference called The State of Identity at Utrecht's Villa Jongerius. At the event, we discussed developments linked to themes such as privacy, trust, inclusivity, data, artificial intelligence, ethics and security. We have now stepped down from our role as IDnext's co-organisers because we are no longer involved with eIDs such as Yivi.

Alert Online

Alert Online is an initiative by the Dutch government's economics ministry. It is intended to boost awareness of online security issues, and to promote cybersecure behaviour and knowledge amongst government bodies and the Dutch public. During Cybersecurity Month in October, Alert Online encourages cybersecure behaviour and online security awareness. In our role as a partner in the initiative, we support the campaign. In 2023, for example, we published material aimed at the business community, on topics such as the abuse of e-mail, and we conducted the annual Alert Online survey of cyber-awareness for the Ministry of Economic Affairs and Climate Policy.

Bits of Freedom

Bits of Freedom campaigns for internet user freedom and for an open and fair information society. The foundation influences policy and legislation by means of legal action, campaigning and lobbying in the Netherlands and Brussels. As a sponsor, we help to ensure that Bits of Freedom is able to work independently for privacy and freedom of communication.

TUCCR

The Twente University Centre for Cybersecurity Research (TUCCR) is an association of knowledge partners, experts, professionals, businesses, researchers and students working in the field of cybersecurity. The Centre works to reinforce the security and digital autonomy of our society.

As one of the partners, we contribute to applied cybersecurity research, and we support other academic research undertaken within TUCCR. Our CEO sits on TUCCR's Management Board, while an SIDN Labs team member co-chairs the Centre's Network Security group. We also co-fund a PhD student who is researching the phenomenon of routing hijacks.

DINL

Digital Infrastructure Netherlands (DINL) is a vehicle through which various organisations work together to campaign for a strong digital infrastructure as the foundation of the Dutch digital economy. We are one of DINL's co-founders and partners. DINL helps governments, businesses and private citizens to make their way in the online economy, and shows how they can reinforce the Netherlands' position as an international digital leader.

ECP | Platform for the Information Society

Within the ECP, member companies, governments, community organisations and knowledge centres collaborate to shape our digital society. As an ECP Partner, in 2023 we were involved in the Dutch Internet Governance Forum (NL IGF), the Internet Security Platform, the veiliginternetten.nl website, and the ECP Annual Festival. We also played an active role in the ScamCheck tool, the Platform for Internet Standards and the further development of Internet.nl.

NLnet Labs

NLnet Labs is a non-profit organisation that develops free, open-source software for the DNS and BGP routing. The NLnet Labs team also undertakes research, develops standards and supports the internet community. We sponsor this important work, and one of our colleagues chairs the organisation's managing board. NLnet Labs also partners SIDN Labs on various research projects, such as investigating how new naming schemes would impact the DNS root servers.

European Summer School on Internet Governance

As we have done for some years, we sponsored the European Summer School on Internet Governance (EuroSSIG): a non-profit organisation that provides an annual introductory programme for students, academics, businesses and government bodies. EuroSSIG helps them to understand global internet governance debates and broadens their knowledge of pertinent issues. In July 2023, the 17th edition of the summer school was held in Meißen, Germany.

Dutch Cloud Community

The Dutch Cloud Community is an association that acts as the point of contact and lobbyist for Dutch providers of internet, hosting and cloud services. Along with more than 100 affiliated companies from the sector, the Dutch Cloud Community represents the country's digital infrastructure. As the association's sponsor, we support the DCC's aim of promoting an open, secure and free internet.

Dutch Anti-DDoS Coalition

The Dutch Anti-DDoS Coalition is a public-private partnership of government bodies, internet providers, non-profit organisations, banks, internet exchanges and academic institutes. We are one of the Coalition's partners. Members work together to minimise the societal impact of DDoS attacks by sharing knowledge, studying attacks that do occur and organising drills. In 2023, SIDN was involved in the Coalition's Clearing House Working Group and Legal Working Group, and co-organised the second edition of the Workshop on Collaborative DDoS Mitigation in Utrecht.

CONCORDIA

Within the CONCORDIA project, European universities, industrial partners, government organisations and other organisations studied new cybersecurity applications and systems. SIDN Labs was a member of the consortium, focusing mainly on further development of the DDoS Clearing House: a system that the Dutch Anti-DDoS Coalition will use to share information with its members about DDoS attacks. The CONCORDIA project was formally concluded in 2023.

2STiC

SIDN Labs is one of the founders of 2STiC (Security, Stability, and Transparency in inter-network Communication). Within this community, we work with the other members to investigate extensions and upgrades to the internet infrastructure, including emerging infrastructures such as SCION, which increase the security of internet communications.

Abuse Information Exchange

The Abuse Information Exchange used to collect and analyse data on botnet infections and make it available to providers, who could then alert their customers when an infection occurred. For example, the Exchange improved the sharing of information about botnets and other forms of internet abuse in the Netherlands. We were one of the organisations involved in setting up the exchange, and were involved with it until the end of 2023, ahead of its closure in early 2024.

Liaison with the National Cyber Security Centre

The National Cyber Security Centre (NCSC) is part of the Ministry of Justice and Security, which works with partners to promote internet security in the Netherlands. As an NCSC liaison organisation, we contribute to its work by sharing our knowledge and connecting the NCSC with other partners.

Outlook

SIDN Labs

RegCheck

In 2024, we will extend RegCheck in collaboration with DNS Belgium and at least one other European registry. By means of a pilot, we will investigate whether information on domain name registrations held by registrars can be included in the process. Once that work is complete, our aim is to make RegCheck available to all European registries some time after 2024.

Our aim is to make RegCheck available to all European registries some time after 2024.

Packet Run

In the year ahead, we will hold further discussions with a view to finding a (permanent) home for Packet Run. The intention is that the installation can then be built up to provide more people with insight into the inner workings of the internet. We will also work with SIDN Fund to continue the visualisation of complex and often invisible elements of the internet. Our role in the partnership involves providing measurement results and datasets.

DDoS-clearinghouse

From January 2024, the National Internet Providers Management Organization (NBIP) is taking over management of the DDoS Clearing House on behalf of the National Anti-DDoS Coalition.

DNS2Vec

The study we carried out in 2023 yielded very promising results. We intend to follow up by developing a number of concrete use cases, such as

the detection of malfunctioning resolvers.

We will also look into how we can make more use of representation learning in our research results.

Autocast

We plan to extend the existing Autocast prototype. The design and the prototype will also be made more generic, so that we can use it for other DNS operators and protocols, such as the NTP.

Post-quantum cryptography (PQC) in the DNS

Together with the University of Twente and Radboud University, we will carry out measurements and practical tests using the PATAD testbed in the year ahead. The work is intended to provide insight into the impact of PQC algorithms on SIDN and the DNS community. In 2024, we will continue refining the testbed with the ultimate aim of making it available to other researchers. We will also work with partners in the IETF to develop a research agenda, setting out what is required to include PQC in DNSSEC

BGPsec testbed

BGPsec is a security extension to the Border Gateway Protocol (BGP), the internet routing protocol. BGP selects routes across the internet to destinations such as DNS servers. The protocol is vulnerable to attack, which BGPsec can prevent in most cases. However, the security extension is rarely used. In 2024, we therefore plan to set up a testbed, for studying how BGPsec works, what challenges are associated with it, and what added value it may have.

SCION-NL

We will be connecting the [SCION-NL testbed](#) to the larger but nevertheless fairly small SCION internet. We built SCION-NL in partnership with SURF and the University of Amsterdam in 2023 to enable experimentation with the [SCION internet architecture](#). The testbed makes it easier for us to give interested researchers and organisations in the Netherlands access to SCION technology.

SIDN Fund is looking to support pioneering projects involving the use of AI for ethical purposes.

SIDN Fund

In 2024, SIDN Fund will continue to operate on the basis of an approach that combines scouting and themed calls. Suitable projects will be scouted and the organisers invited to submit proposals linked to the theme of a Responsible Internet. The organisers of both large projects and pioneering projects will be able to respond to the Fund's themed calls. In addition, organisers will again be able to submit applications at any time for grants of up to €10,000 in respect of pioneering projects linked to any of the 3 focus fields. In the coming year, SIDN Fund is particularly looking to support pioneering projects involving the responsible use of artificial intelligence (AI) for ethical purposes. In the spring, a call will be made linked to an internet sustainability-focused theme. The Fund will also continue its strategic partnerships with SIDN Labs and its sponsorship of the Responsible Internet Thesis Award.

“If letters are hard to understand, it’s the people writing the letters who are at fault, not the readers.”

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Hester Benedictus

Policy Officer at the City of Amsterdam and initiator of the Lees Simpel app

App that explains hard-to-follow letters in easy language

Letters from the Tax Service, local authorities and others often contain very important information. But that information doesn’t reach many of the people it’s meant for, because they can’t understand the over-complex language that the letters are written in. Hester Benedictus: “In my work, I was often coming across letters written in inaccessible language that lots of people couldn’t understand. As I saw it, it was the people writing the letters who were at fault, not the readers. So, at a hackathon, we developed Lees Simpel: an app that uses artificial intelligence to explain formal letters in everyday language. Later, with support from SIDN Fund, we were able to professionalise the app and improve its availability. It’s now used by tens of thousands of people. Better still, more and more letter-writers are using the app to test and simplify their letters before sending them out. That’s great, because of course the problem of hard-to-follow letters is best tackled at source.”

> [Read more about the Lees Simpel app on sidn.nl.](https://www.sidn.nl/en/lees-simpel)

05

Online identity as a personal privacy and autonomy tool

Opportunities for internet users

At SIDN, we work for internet users. In partnership with registrars, service providers and other members of the internet community, we promote users' autonomy and privacy. As described in Section 4 of this report, through SIDN Fund we invest in initiatives that increase knowledge and awareness of how the internet works, or that improve digital inclusion and accessibility. Until recently, we also promoted the privacy-friendly Yivi platform, whose key design principles are decentralisation, open-source code and user control. At the end of 2023, we decided to return Yivi's stewardship to the Privacy by Design Foundation in 2024.

National and European identity wallets

In the Netherlands and at the European level, various actors are working on electronic identity solutions that meet the EU's Electronic Identities and Trust Services Regulation (eIDAS Regulation). The eIDAS Regulation sets out the rules agreed by the EU member states to ensure the standardisation and interoperability of EU-recognised logins. In 2021, the European Commission adopted the principles embodied in Yivi, for use in the development of new European identity wallets. At the national level, the principles of privacy by design, open-sourcing and decentralisation were also more firmly embedded in the proposed Digital Government Act (WDO), passed by the Dutch parliament in March 2023. The WDO is ultimately intended to enable people to log in with other municipalities and care service providers using any public or private login system approved by the government. Yivi is an open-source, privacy-friendly login solution of the kind envisaged.

Yivi and Yivi Connect

Yivi is the successor to IRMA, the platform created by Bart Jacobs, Professor of Computer Security, Privacy and Data Management at Radboud University and Chair of the Privacy by Design Foundation. In 2019, we entered into a formal relationship with the Privacy by Design Foundation and assumed responsibility for managing the platform's technical infrastructure. Later, we also took on the tasks of managing Yivi, continuing its development and promoting its adoption.

Using Yivi, whose name is derived from the Dutch for 'your digital life', private individuals and organisations can securely log in online, exchange data and sign or approve electronic documents. The system works by users loading and managing identity attributes in the Yivi smartphone app. Users keep control of their data, and share only the attributes that are actually required with organisations and government bodies that ask for it. The related Yivi Connect service is a straightforward solution that businesses and other organisations can implement so that their customers or users can easily and securely log in, identify themselves online, sign electronic documents and share data without compromising their privacy.

Transfer to Privacy by Design

As Yivi's technical operator and promoter, we invested significantly in the system's further development over the last 5 years. We also worked hard to promote the principles on which Yivi is based. Nevertheless, even though Yivi has more than 100,000 users and its potential is being actively explored by many municipalities, care service providers and other organisations, adoption has not progressed as quickly as we had hoped. The main reason for the slow adoption is ongoing uncertainty as to the requirements that the WDO will make regarding eID solutions. Against that background, many actors are cautious about implementing and using Yivi. Furthermore, we have been unable to find enough other parties willing to partner with us in investing in Yivi's future. We have therefore agreed to return Yivi's stewardship to the Privacy by Design Foundation in 2024. We have accordingly also withdrawn from DC4EU and EWC European pilot projects. Yivi's transfer will assure Yivi's continuity and enable us to focus on other developments within SIDN. At the time of writing, discussions with Privacy by Design regarding the transfer are still ongoing.

After investing substantially in Yivi's further development, we agreed to return stewardship of the platform to the Privacy by Design Foundation in 2024.

Developments, pilots and partnerships

Although we will be relinquishing the stewardship of Yivi in 2024, last year we continued to invest in the platform's further development. In January, we

launched the redesigned Yivi app and website. Yivi also received the MyData Operator Award for the second time in 2023, emphasising the strength of its design principles and confirming the importance of an ethical, person-focused approach to personal data.

Furthermore, various organisations started using Yivi. We worked with the Chamber of Commerce to enable Trade Register data to be imported to the Yivi app. Businesspeople registered with the Chamber of Commerce can therefore load their Trade Register details into the Yivi app for secure sharing. In July, the Ministry of Health, Welfare and Sport (VWS) started a pilot with Yivi to test its suitability as an alternative to the UZI smartcard, which care professionals use to identify themselves.

We also ran a pilot with the City of Amsterdam, which has been involved in development of the Yivi app since 2019. The City wanted to know how local people felt about using the app to log in and check the status of nuisance reports or public space reports that they had made.

The City of Nijmegen is another long-term user of the Yivi platform. Since 2023, Nijmegen residents have had the option of using Yivi to log in the personalised municipal service page, 'My Nijmegen'.

Outlook

Yivi

It has been agreed that Yivi's stewardship will gradually be returned to the Privacy by Design Foundation in 2024. Discussions with Privacy by Design regarding the transfer are still ongoing. Once the transfer is complete, our active involvement with Yivi will end. We will not therefore be investing further in Yivi's development in 2024. We continue to believe in Yivi's value as a secure, privacy-friendly and open-source login solution that puts the user centre stage.



“We’re grateful to SIDN for its substantial commitment, which has provided a foundation for further progress.”

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Bart Jacobs

Professor of Security, Privacy and Data Management at Radboud University, Nijmegen, and Yivi pioneer

Yivi is now the most widely adopted privacy-friendly eID solution

Over the last few years, we’ve invested significantly in further development of the Yivi eID solution. Successful pilot schemes in various economic sectors have shown that an open-source solution featuring privacy by design works well and has great benefits for users and organisations. As a result, Yivi is ready for the next phase in its evolution, with the Privacy by Design Foundation taking the reins once more and SIDN ending its investment. Bart Jacobs: “Thanks to SIDN’s input, Yivi – originally a Privacy by Design concept known as IRMA – is now a mature solution with well over 100,000 users. It’s become the most widely adopted privacy-friendly eID solution operating on the principle of self-sovereign identity in the Netherlands and beyond. Privacy by Design is grateful to SIDN for its substantial commitment over the past years, which has provided a foundation for new eID applications with new partners.”

> [Read more about Yivi on yivi.app.](#)

06

Utilising knowledge and modern technologies to the full

Internal developments

To a large extent, 2023 was characterised by significant technological developments. We revised our ICT strategy, drew up an IT-sourcing strategy and prepared for the ICT transition and the proposed migration to the public cloud. We also began an important strategic partnership with CIRA, the registry for Canada's .ca domain. The international nature of the partnership provides opportunities for SIDN, as well as professional development opportunities for our ICT staff. The Staff Council advised us on those important plans and the changes that took place over the last year.

Legal restructuring

At the start of 2023, our organisation assumed a new legal structure. The new structure enables us to spread our business risks as effectively as possible, and to assure the continuity of .nl even more firmly. With effect from 1 January 2023, responsibility for operational activities linked to management of the .nl zone were transferred to a new subsidiary called SIDN BV. The right to operate the .nl domain (the 'delegation') and the contingency buffer that we set aside to enable us to cope with unforeseen setbacks remain in the hands of the Foundation for Internet Domain Registration in the Netherlands (SIDN): the original foundation that all the SIDN group companies belong to. Within the structure, ultimate control also remains with the foundation, overseen by the Supervisory Board.

Changes to SIDN's Executive Board

Since 1 September 2023, SIDN has had a Chief Technology Officer (CTO), who has joined our CEO on a two-person Executive Board. The CTO's appointment enables us to assure the quality and security of our data and digital systems, increase our capacity for innovation, and reinforce our role and position on the national and international stages. Our CTO is responsible for the availability, confidentiality, reliability and future-proofing of our digital services.

Migration to a cloud is necessary for security, stability, capacity for innovation and cost management.

ICT strategy and transition

Use of the latest proven technology is a key element of our strategy. Accordingly, in line with our revised ICT strategy and with a view to reinforcing the role we play for the internet community, we continued to upgrade our digital systems in 2023. We also designed a new ICT architecture and drew up an IT

sourcing strategy. The new strategy is aligned with the 5 main technological challenges facing us:

1. Developing a new domain registration system
2. Assuring the continuity of our services
3. Maintaining the security of the .nl zone
4. Continuing the standardisation and streamlining of our processes and systems
5. Migrating our registration application to the public cloud

The proposed migration to the public cloud is consistent with technological developments, and will enable us to continue safeguarding the continuity and stability of our services. Further advantages are that it will allow us to increase our capacity for rapid innovation and reduce our management costs. In that context, the emphasis will be on innovations in the field of domain name registrations and secure management of our DNS infrastructure.

It is important that our organisational structure matches our new ICT strategy. We therefore integrated our Security Operations Centre (SOC) and the CISO. We additionally developed a new matrix structure for our ICT Department, enabling us to focus even more sharply on the technological challenges ahead. Appropriate attention was paid to the professional development of our personnel, and the department was renamed SIDN Tech.

New domain registration system

In October 2023, we formally began a partnership with CIRA. To a significant extent, the move was motivated by the increasingly high service quality expectations and continuity expectations of our stakeholders and regulators. Other important considerations were the continuing growth and increasing sophistication of cyberthreats, the complexity and expense of our ICT services, and the absence of any significant compensatory autonomous income growth. The independent development, use and management of a new registration system is unduly expensive, time-consuming and risky. We are therefore working with CIRA to develop a new cloud-native registration system based on CIRA's existing platform. We expect to start using our new registration system in late 2025.

Size of the workforce

In preparation for the proposed migration to the public cloud, we welcomed a number of new personnel recruited to support the process. We also encouraged existing personnel to take additional training in fields such as cloud technology and security. In 2023, a total of 9 new professionals joined the workforce, while 17 of our colleagues left the organisation. Hence, we ended the year with a workforce of 107 (98.5 FTEs).

Personal sponsorship budgets

As usual, every member of staff was allocated a personal sponsorship budget for them to donate to a good cause of their choice. In 2023, the budgets were used to support various local institutions, such as primary schools, football clubs and tennis clubs. A very large number of our staff also donated to an appeal to help victims of the earthquake in Turkey, and we matched the sum donated by individual colleagues. Other initiatives that we supported included the Dutch Cancer Society, the Royal Society for the Protection of Dogs, and Quiet, a charity that seeks to help people living in silent poverty.

ISO27001 certification

Certification under ISO27001 is the gold standard for information security. In 2023, the annual external audit confirmed that we remain compliant with the standard.

Privacy Board

As the operator of the .nl domain, we process personal data in order to continue increasing the security and stability of the .nl zone. We therefore have an internal Privacy Board, which reviews all data processing activities to make sure that they are responsible and performed with due diligence. The Privacy Board asks the owner of every new study or project to draw up a privacy policy, which is then submitted to the Board for review. All privacy policies and the associated Privacy Board assessments are published on our website. In 2023, the Privacy Board reviewed the privacy policy for Utrecht University's FIRMBACKBONE project.

> For details, see sidn.nl

Staff Council

In 2023, the Staff Council advised on the enlargement of SIDN's Executive Board and the associated appointment of a Chief Technology Officer (CTO). The Council also gave advice on the partnership with CIRA, our IT sourcing strategy and the restructuring of our ICT organisation. In addition, the Council considered an approval request concerning the policy on psychosocial workloads. In January and September, the Council met SIDN's Supervisory Board.

Outlook

ICT transition

The new structure for our ICT Department, now renamed SIDN Tech, comes into effect in January 2024. We will also be working to streamline and standardise our processes and to reinforce the link between SIDN Tech and SIDN Labs. That will allow us to fully utilise the knowledge and expertise within both teams. In addition, we will be preparing for the proposed migration of the new registration system to the public cloud and deploying modern technologies to accelerate innovation. Any migration of systems to the public cloud will ultimately depend on the fulfilment of a number of criteria, including a positive Data Protection Impact Assessment finding, a positive Data Transfer Impact Assessment finding, and the availability of an exit strategy. Our aim is to have the cloud version running by the end of 2024. Then, in tandem with registrars, we will turn our attention to migration of the new registration system for registrars, registries and other industry players in 2025. In that context, particular emphasis will be placed on the use of open standards and the development of open-source software. Our intention is to remain cloud-agnostic as far as possible, so as to help us collaborate within the sector and avoid becoming tied to any particular cloud service provider. Hence, if the need arises and a viable alternative is available, we can transfer our systems relatively easily.

In 2024, we additionally plan to further increase the availability of our anycast platform in order to make our DNS infrastructure less susceptible to cyber-attacks and other threats. Using anycast routing technology, it is possible to implement an immediate fallback if the needs arises, and to automatically redistribute tasks across a network of available servers. Plans have also been made for raising our information security level from ISO27001:2013 to achieve ISO27001:2022. We will therefore modify our processes and documentation in line with the requirements of ISO27001:2022.

SIDN Insights data platform

Our data platform SIDN Insights is an important tool in relation to our ambition to become a data-driven registry, as originally expressed in 2017. It enables us to enhance the availability of data, both to registrars and internally. Another aim for 2024 is the establishment of a data team within SIDN Tech. Our focus is on the development of new data-driven products that are valuable to .nl registrars. Registrars will be involved in all relevant developments.



*“By joining forces,
we’re safeguarding
the future growth
and security of both
.ca and .nl.”*

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Loek Bakker
CTO at SIDN

Committed to using the newest and best standard technologies

Use of the latest proven technology is a key element of our strategy. So we have partnered with CIRA to develop a new registration system. Loek Bakker: “By joining forces, SIDN and CIRA can both benefit from accelerated development, shared resources, lower costs and reduced risk, helping to assure the future growth and security of .ca and .nl. That will have real advantages for the registrants and registrars of .ca and .nl domain names, because the underlying technology will be more robust and resilient than ever.”

> [Read more about our ICT transition on SIDN.](#)

07

Our impact on a sustainable digital society

Sustainability report

We aim to play our part in building a sustainable digital society. That implies working with customers, partners and suppliers to promote an opportunity-rich, secure and healthy living and working environment for everyone at SIDN and in the wider community. In our efforts to fulfil our sustainability ambitions, we are guided by the United Nations' Sustainable Development Goals (SDGs). We have selected the 6 SDGs that are most relevant to us, and in relation to which we can achieve the greatest impact.

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The SDGs we selected



Affordable and clean energy



Good health and well-being



Industry, innovation and infrastructure



Climate action



Quality education



Partnerships for the goals

SDG 3: Good health and well-being

SDG 3 is “Ensure healthy lives and promote well-being for all at all ages”. In line with that goal, we took practical action to raise staff satisfaction even further by, for example, drawing on the results of the 2022 staff satisfaction survey. We also sought to promote health and well-being, with the aim of reducing sickness absence. The rate of sickness absence last year was 5.04 per cent, up from 2.3 per cent in 2022. The rise was attributable to an increase in prolonged sickness absence for non-work-related reasons.

In 2023, we also defined a policy for addressing psychosocial workloads (‘PSW policy’). The policy is intended to prevent work-related stress and excessive psychosocial workloads, in support of our ambition of realising and maintaining a safe and healthy working environment. The PSW policy includes a code of conduct for staff, explaining what we regard as desirable and undesirable behaviour and how we deal with such behaviour. In addition, we have set up a complaints procedure, defined an alcohol, drugs and medication policy (‘ADM policy’) and updated our health and safety policy.

SDG 4: Quality education

SDG 4 is “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. With migration to the cloud planned for 2024, our main focus last year was on development opportunities for or within our ICT Department. The aims being to increase and update knowledge of the latest technologies, to optimise the utilisation of talent, and to ensure the long-term employability of our personnel. In 2023, we began using an online learning platform, where colleagues with technical profiles were able to take training courses and follow webinars on topics such as cloud technology. We also encouraged the professional development of all personnel by once again reserving a sum equal to 7 per cent of our wage bill to development-related activities.

SDG 7: Affordable and clean energy

SDG 7 is “Ensure access to affordable, reliable, sustainable and modern energy for all”. In support of SDG 7, we are committed to reducing energy consumption per FTE and to the autogeneration of energy. About 20 per cent of the electricity we use is provided by our own solar panels. Our office building and our data centres also run entirely on renewable energy. In addition, we have sited meters in our offices to help us build up a more detailed picture of our energy use. The data collected will enable us to take targeted action and further reduce consumption.

SDG 9: Industry, innovation and infrastructure

SDG 9 is “Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation”. We are contributing to this goal by including the values and carbon emissions associated with our hardware when calculating our total carbon footprint for in 2022 and 2023. Wherever new hardware is required, we give preference to the most sustainable and circular options. Moreover, at least 95 per cent of our equipment is recycled or reused, and we use office fittings made from recycled materials.

SDG 13: Climate action

SDG 13 is “Take urgent action to combat climate change and its impacts”. In line with SDG 13, we are working to reduce our carbon emissions per .nl domain name. That implies striving to cut harmful emissions directly or indirectly caused by our activities. For example, all the energy we use comes from renewable sources (see SDG 7), and on quiet days we close 1 or 2 floors of our office block, so that the

lighting and climate control systems are not operating. We are also electrifying our lease vehicle fleet, and we operate a lease cycle scheme to encourage people to cycle to the office more often.

SDG 17: Partnerships for the goals

SDG 17 is “Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development”. We contribute to SDG 17 by seeking partnerships that will enable knowledge sharing and accelerate sustainability initiatives. In 2023, for example, we entered into partnerships with DNS Belgium and CIRA. We now share sustainability plans and other information with DNS Belgium, with the aim of realising coordinated improvements for the internet sector. Our partnership with CIRA is aimed at the development and pooling of knowledge, and the realisation of a resilient infrastructure. Within CENTR too, we collaborate with other registries to compare and improve sustainability-related measures, targets and performance. Furthermore, SIDN Labs is investigating future-proof security for both our own infrastructure and the internet infrastructure. The Labs team publishes its research findings so that others can utilise them.

Outlook

SDG 3: Good health and well-being

In 2024, we intend to continue promoting staff health and well-being by implementing the plans developed in 2023. We will seek our people's views on work-life balance, energy at work, workloads and enjoyment at work. People will also have the option of anonymous preventive medical checkups. Another aim for 2024 is to create awareness of the code of conduct in our PSW policy by linking KPIs to the code and engaging in dialogue with colleagues.

SDG 4: Quality education

In the year ahead, we will look at the possibility of making our online learning platform available to all personnel. We also plan to make the platform more structured by forming teams, adding certification and preparing training courses for use. A learning management system will be deployed as well, with registration open to all our colleagues. The system will facilitate course presentation, selection and participation, enhancing our ability to promote knowledge development and monitor what courses our people are following.

SDG 7: Affordable and clean energy

Migration to the cloud in 2024 will result in some displacement of our carbon emissions. We will accordingly work to ensure that our cloud use reduces our emissions. Within the cloud, we will be able to make much more efficient use of systems, reducing or eliminating the need to acquire and operate our own hardware in many cases. In addition, we plan to investigate the scope for generating energy for our offices by, for example, installing a wind turbine to convert wind energy into electricity. By the end of 2025, our aim is for autogenerated energy to cover 30 per cent of our consumption.

SDG 9: Industry, innovation and infrastructure

In 2024, we will continue to pursue the reuse or recycling of equipment and other materials wherever possible. We will also professionalise our procurement and vendor management. A procurement specialist will assess all equipment and materials procurement transactions above a threshold of €5,000, and will take sustainability into account when arriving at a decision. The approach is intended to result in more efficient, sustainable and cost-aware purchasing.

SDG 13: Climate action

In 2024, only electric vehicles will be made available to staff members who qualify for a company lease vehicle. Our people will also be encouraged to travel by train or electric lease vehicle in preference to any flight of less than 750 kilometres.

SDG 17: Partnerships for the goals

We aim to make even greater use of productive partnerships such as those with CIRA and DNS Belgium in the year ahead. We will also prepare for the EU's Corporate Sustainability Reporting Directive (CSRD), which is expected to indirectly apply to organisations like SIDN from 2025. When the CSRD takes effect, we will be required to report on our sustainability performance and on our human and environmental impact.



Report of the Supervisory Board

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Marjet van Zijlen

Chair of the Supervisory Board

The Supervisory Board (SB) oversees SIDN's policy and the general situation within the organisation. For example, the SB monitors the strategy and the risks associated with our business activities, the design and effectiveness of our risk management and control systems, and the realisation of our objectives. The SB also acts as a discussion partner for the Executive Board, and as the Executive Board members' employer.

Topics discussed in detail by the SB in 2023 included the progress of and decision-making on the ICT transition, including the ICT strategy, restructuring of the ICT organisation and the IT sourcing strategy. The SB additionally devoted considerable attention to the partnership with CIRA. The decision to cease involvement with Yivi and the adjustment of .nl registry fees from 1 January 2024 were also examined.

Reorganisation of both the SB itself and of SIDN's Executive Board were important work fields for the SB in 2023. It was decided that SIDN's Executive Board should be expanded by the appointment of a second executive. That decision led to Loek Bakker joining SIDN as Chief Technology Officer (CTO). In line with the change, the Standing Orders of the Executive Board were rewritten, and a Remuneration Code linked to the Standards for Remuneration Act was introduced. The Executive Board members' respective authorities were also redefined. The SB's own Standing Orders were subsequently modernised, and it was decided that the Constitution should be amended to enable the SB to respond to future developments more easily. Finally, the SB introduced a new procedure for registering and approving the outside interests of members of the Executive and Supervisory Boards.

In October, the SB attended the ICANN meeting in Hamburg, where, for example, members met their counterparts from various other country-code registries. The SB and several members of the CIRA Board attended the signing of the cooperation agreement between the two registries.

Under SIDN's Constitution and the SB's Standing Orders, SB members are required to be independent. However, the current rules allow for the participation of one non-independent member. None of the members was deemed non-independent in 2023. Nor were any potential conflicts of interest reported by SB members last year.

Meetings

In 2023, the SB held 4 ordinary meetings and 1 extra online meeting. The latter was needed to enable the cooperation agreement with CIRA to be approved in good time. The decision to appoint Loek Bakker as a Statutory Director was also taken outside the SB's ordinary meetings.

Other items approved or adopted included the following:

- Annual Reports and Annual Financial Statements of SIDN and all its subsidiaries for 2022
- Annual reports of the SB, the Selection and Appointments Committee, the Audit Committee and the Security and Stability Committee, and the CEO's Annual Declaration, in the context of corporate governance
- SIDN's annual plan and budget for 2024.

In connection with adoption of the Annual Financial Statement for 2022, the SB considered the risks associated with the business and the findings of the Executive Board's assessment of the design and performance of the internal risk management and control systems.

In April, the SB held a team-building session with the CEO and CFO, led by an external expert. In the autumn, the three-yearly detailed self-evaluation took place under the supervision of an external consultant. The results of the evaluation were discussed by the SB, the Executive Board members and the Secretary prior to the SB's December meeting.

Committees

The Selection, Appointments and Remuneration Committee (previously the Selection and Appointments Committee) held several meetings in 2023. The annual performance evaluations of the Executive Board members were discussed, as was the need to expand the Executive Board.

The Committee later had several discussions regarding the formulation and adoption of profiles for a new SB member, a successor to the CFO and the new Executive Board member. Together with the Executive Board members and relevant SB members, the Committee interviewed candidates for the vacancies. The HRM Manager was also involved at some stages. Candidates were then proposed to the SB. The CFO vacancy has not yet been filled.

The Audit Committee met 5 times. All the meetings were attended by SIDN's CFO and, following her departure in September, the interim CFO. The CEO also attended all except 1 of the meetings. Matters considered at the meetings with the Executive Board and the external auditor included the Annual Financial Statement and Annual Report for 2022, the audit report and the analysis of the annual data. In October, the Audit Plan for 2023 was also discussed with the external auditor. Other topics addressed included the budget for 2024 and the principle that the organisation must break even in the coming year. In that context, the adjustment of registry fees with effect from 1 January 2024 was considered, as well as the accumulation of an investment reserve to cover the future cost of replacing the existing registration system. The Audit Committee additionally discussed the financial aspects of the partnership with CIRA. Finally, the Audit Committee discussed the interim financial data and its implications for the forecasts for the current financial year and beyond.

The Security and Stability Committee held 4 meetings in 2023. With effect from 1 January, 3 new members joined the Committee. The Committee's fourth member retired in April. Despite the various changes in the Committee's membership, and in the relevant personnel within SIDN, the Committee was able to perform its role satisfactorily in 2023. Matters considered by the Committee included the ICT transition, including the new ICT strategy, the architecture and IT sourcing strategy and the partnership with CIRA. In relation to those matters, the Committee concerned itself with both the (strategic) decisions themselves and the progress of their implementation. As usual, the Committee discussed the reports on and findings of the ISO27001 audit in 2022, and the audit by the Dutch Authority for Digital Infrastructure, as well as the matters highlighted in those reports as warranting attention.

In the course of the year, the SB set up ad hoc committees for 2 purposes. The first ad hoc committee prepared the decisions regarding reform of the organisation's senior management structure, as well as the associated Remuneration Code and Standing Orders. Its members were Dennis Raithel, Sandra Konings and Marjet van Zuijlen. The second ad hoc committee, made up of Gerben van Leeuwen and Dennis Raithel, had the task of overseeing preparations for the planned partnership with CIRA. Since the cooperation agreement was signed in October, SIDN and CIRA have been working out how the partnership will work in practice. The aim is to reach agreement on the relevant matters by the middle of April 2024, and to formalise them in a series of implementation agreements. On behalf of the SB, the committee is monitoring the progress of that work and will make appropriate preparations for approval of the resulting implementation agreements by the SB.

Membership

On 31 December 2023, the SB had 7 members.

Marjet van Zuijlen, *Chair, also Chair of the Selection, Appointments and Remuneration Committee*
 Mark Frequin, *Vice-Chair, also member of the Selection, Appointments and Remuneration Committee*
 Wim Hafkamp, *also member of the Security and Stability Committee*
 Sandra Konings, *also member of the Security and Stability Committee*
 Gerben van Leeuwen, *also Chair of the Security and Stability Committee*
 Jeannine Peek, *also member of the Audit Committee*
 Dennis Raithel, *also Chair of the Audit Committee*

The following changes to the membership of the SB took place in 2023:

- Wim Hafkamp and Sandra Konings were appointed members of the SB with effect from 1 January 2023.
- Kees Neggers retired with effect from 31 March 2023, upon completion of the maximum term of office.

The following changes to the membership of the SB took place after 1 January 2024:

- Olaf Kolkman was appointed member of the SB with effect from 1 January 2024.
- Gerben van Leeuwen was reappointed with effect from 16 April 2024, following discussions with the Registrars' Association.
- Mark Frequin was reappointed for 2 years with effect from 1 April 2024, due to compelling circumstances*.

Retirement and reappointment rota for Supervisory Board members

In accordance with Article 29 of the Constitution, SIDN has a retirement and reappointment rota for SB members. As of 1 April 2024, the rota is as follows:

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	First appointment	Latest permitted term end data	Committee membership(s)
Jeannine Peek*	1 July 2015	1 Juli 2025	Audit Committee
Wim Hafkamp	1 January 2023	1 January 2026	Security and Stability Committee
Mark Frequin*	1 April 2015	1 January 2026	Selection, Appointments and Remuneration Committee
Gerben van Leeuwen**	16 April 2021	1 July 2029	Security and Stability Committee
Dennis Raithel	5 November 2021	1 January 2030	Audit Committee
Marjet van Zuijlen	1 September 2022	1 January 2031	Selection, Appointments and Remuneration Committee
Sandra Konings	1 January 2023	1 January 2032	Security and Stability Committee
Olaf Kolkman	1 January 2024	1 January 2033	

* In March 2024, the Supervisory Board decided to extend the terms of office of Mark Frequin and Jeannine Peek by, respectively, 1 year and 2 years beyond the normal limit, in order to prevent the Supervisory Board losing an excessive amount of its knowledge and experience.

** Gerben van Leeuwen's appointment was proposed by the RA. In accordance with Article 24, clause 3, paragraph c, of SIDN's Constitution, the RA will be consulted before the SB resolves on reappointment. In accordance with Article 24, clause 3, paragraphs a and b, of SIDN's Constitution, at the end of Gerben van Leeuwen's final term of office, the RA will be invited to propose a candidate to replace him, or will be consulted regarding a replacement proposed by the SB.



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Annual Financial Statement



Notes to the Annual Financial Statement

We aim to maximise the added value we provide while generating a responsible and justifiable positive result. Our financial policies are not therefore directed towards the maximisation of profit, but towards the maximisation of our contribution to society. With a view to safeguarding our long-term ability to make an appropriate contribution, we changed the legal structure of our organisation at the start of 2023.

We also increased our prices by 6 per cent in 2023. The increase was required because of inflation-driven cost increases, the need to hire agency personnel to cover unfilled vacancies, and the need for future investment in our ICT systems. In combination with an increase in the number of domain name registrations, the higher prices meant that our turnover rose by €1.5 million to a little over €23 million. As a result of changes to the ICT transition timetable and cost savings, our operating costs in 2023 were almost unchanged from 2022. The higher turnover and static operating costs yielded a much improved but nevertheless negative operating result. The operating result for 2023 is consistent with the line adopted in 2021, that we should work towards our (core) services yielding a healthy positive result by 2024.

Comparison with budget

The pre-tax result for the accounting year was a deficit of €0.1 million: considerably better than the budgeted deficit of €1.7 million.

The difference is accounted for by personnel costs in the accounting year being €0.4 million below the budget figure, other operating expenses being €0.9 million below the budget figure, and depreciation being €0.1 million below the budget figure. In the budget, financial expenditure was forecast to exceed financial income, but the reverse proved to be the case. Hence, the outcome was €0.2 million better than the budget.

Comparison with 2022

The pre-tax result for the accounting year was €1.8 million higher than in 2022. The improvement is attributable largely to the higher turnover and static operating costs referred to above, but higher interest income also contributed. Whereas banks were still charging interest on deposited funds in 2022, they returned to paying interest in 2023. The result before taxation was improved not only by the €1.5 million increase in net turnover and the almost static operating costs, but also by €0.3 million from financial income and expenditure.

Overall operating costs in 2023 were very similar to 2022. Having risen considerably in 2022 relative to 2021, total personnel costs stabilised in 2023. Although labour market conditions remain challenging, there was a slight improvement in the course of 2023. However, the effect of that improvement had yet to be reflected in our costs in 2023. As in 2022, some vacancies could not immediately be filled in 2023, necessitating the temporary use of agency staff. By 2024, however, we expect most positions to be held by permanent staff. For certain specialist roles, we used external personnel out of choice. That provides us with the flexibility needed to respond to incidents, developments and fluctuations in our

systems management capacity requirements, as well as facilitating downscaling in appropriate circumstances. That in turn enables us to safeguard the continuity of our services and ensure that the availability of our core systems always remains very high and in accordance with our agreed service levels.

Taxes

As a consequence of the changes to our legal structure, corporation tax for the period to 28 February 2023 is calculated separately for each entity. On 1 March 2023, a unified fiscal entity came into being, and the corporation tax due in respect of the remainder of the year is therefore calculated on the basis of the consolidated result for SIDN Groep BV. On 1 January 2023, the Foundation for Internet Domain Registration in the Netherlands ceased to be liable for the corporation tax. The corporation tax liability takes account of modest tax-deductible expenditure. In 2022, we extended the settlement agreement with the Tax Service for a period of 5 years. The corporation tax payable in respect of 2023 is €0.3 million.

Expenditure on activities and services

We believe it is important to be transparent about what we spend money on. We therefore make an annual estimate of the proportion of our expenditure attributable to activities and services under each of a number of headings. The figures for 2023 are presented below.

1. A valuable and value-based domain

This heading covers mainly expenditure on activities linked to management and development of the .nl domain. The other forms of expenditure included are:

- nl activities
- Discounts: direct debit and volume discounts
- Registrar Scorecard incentives
- Funding of projects for registrars and grant to the Registrars' Association (RA)

2. Research, development and sponsorship

The positive return on the operation of .nl is used for the benefit of the Dutch and international internet communities.

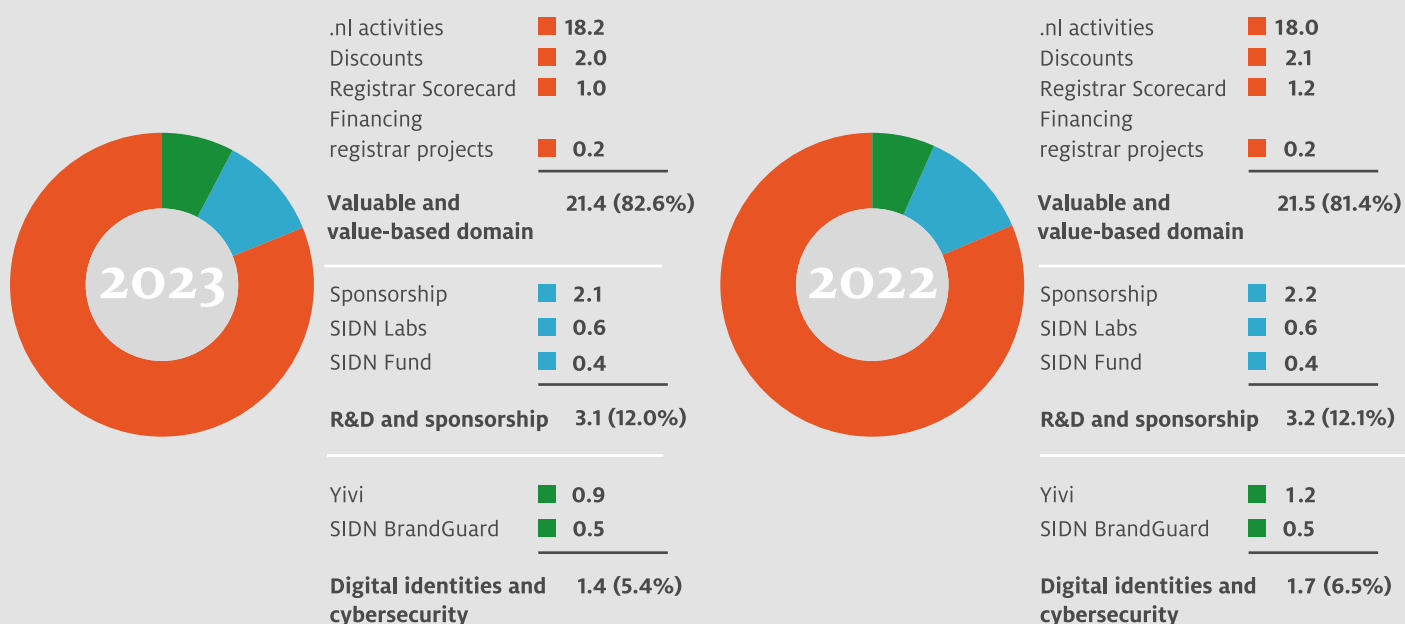
This heading covers expenditure in that context, namely our funding of SIDN Fund, SIDN Labs and partners, and our sponsorship of other organisations (including ECP, the Reporting Hotline for Internet Child Pornography, IDnext, Bits of Freedom and DINL).

3. Electronic identities and cybersecurity

This heading covers expenditure on Yivi and SIDN BrandGuard.

Total expenditure in 2023 was €0.5 million lower than in 2022. The personnel costs associated with .nl activities increased by €0.2 million, while the personnel costs associated with research, development, sponsorship, electronic identities and cybersecurity collectively fell by €0.2 million. Other operating expenses and depreciation charges remained almost unchanged since 2022. The value of discounts given in 2023 was down on 2022. Financial income and expenditure was €0.3 million better than in 2022 due to an increase in interest received.

Fig. 12 | Expenditure on activities and services, detailed breakdown (€m)



Financial policy

The cost of registering a .nl domain name for 12 months was €3.76 in 2023, or 6 per cent more than in 2022 (€3.55). In 2022, operating costs associated with our core activities increased by 13.2 per cent, while registry fees increased by 2 per cent. The 6 per cent increase in registry fees in 2023 partially offset the cost increases of 2022, which continued into 2023.

On the basis of cost management coupled with higher turnover from a combination of growth and higher fees, the budgeted result for 2024 is neutral. Hence, by means of sound financial management, we expect our equity capital to remain stable.

Risk management

Vision

Our strategic plan is reviewed on an annual basis and adjusted as necessary. To that end, we perform an analysis of opportunities, threats, strengths and weaknesses, the conclusions of which are translated into a statement of risks and countermeasures.

Governance

Our Supervisory Board (SB) oversees SIDN's strategy, policy and general operational position. The SB pays explicit attention to risk management, which is scrutinised by the SB's Audit Committee and Security and Stability Committee. The Security and Stability Committee supports the Board's supervision of the integrity, confidentiality and stability of our services, and of the system for monitoring compliance with applicable legislation, regulations and codes of conduct. The Security and Stability Committee additionally oversees significant business risks relating to security and stability, paying particular attention to the findings of the annual internal and external audits, including the audit by the Dutch Authority for Digital Infrastructure (previously known as the Radiocommunications Agency), and to implementation of the ICT Roadmap and Security Roadmap.

Organisation

The management team is responsible for risk policy and risk tolerance, and for the direction of control measures. Where information security risks are concerned, we are supported by the Security Officer. Line managers are responsible for primary risk management and the associated reporting. Since 2022, we have had an internal auditor and therefore a strong internal management system. The internal auditor tests

Outlook

Our focus for 2024 is on improving the stability, continuity and security of our services. To that end, we intend to modernise our ICT infrastructure, promote the professional development of our personnel and give concrete expression to our partnership with Canada's CIRA registry in connection with the development of a future domain registration system.

Where necessary, we will be adapting our working processes and organisation so that the quality of our services remains assured. As well as investing in technology, we will continue doing all we can to enable our personnel to take appropriate training. With a view to attracting suitably capable personnel to fill vacancies, our recruitment capacity will remain high. In addition to recruiting new personnel, it is very important that we are able to retain personnel. In order to promote staff health and welfare and to prevent sickness-related absence, we will be offering personnel the option of periodic medical check-ups, as well as continuing to make fruit available in our offices and encouraging physical activity.

Continuing inflation is expected to drive up our costs further in 2024. We also need to invest in the modernisation of our ICT systems. Meanwhile, the number of domain names is likely to remain stable after rising considerably during the coronavirus pandemic. Consequently, autonomous turnover growth is not expected to cover the anticipated cost increases and the investment requirement. In the interests of financial health and stability, we therefore need to increase our registry fees by 10 per cent in 2024.

the effectiveness of the management system and processes. When selecting audit subjects, the internal auditor refers to an estimate of the risk that a process is subject to insufficient control, resulting in under-utilisation of opportunities. With a view to providing the management with additional assurance, a number of operational audits were performed in the year under review. Particular emphasis was placed on assessing the management system, internal control of information security processes, and demonstrable compliance with privacy legislation.

Dealing with risks

Our risk policy involves the definition of parameters, standards and values with a view to maximising the effectiveness of our efforts to realise our objectives. We consider it important to operate transparently and with integrity.

Risks and risk tolerance

The most significant risks associated with our operations are identified below. Our risk tolerance in each area is defined on the basis of careful analysis. The defined risk tolerance then determines whether and to what extent a given risk should be taken. The risk tolerance definitions provide parameters for decision-making, control measures and course adjustments where additional intervention is needed to keep risks to the desired level.

The main risks and uncertainties in each area are described in the following paragraphs. The developments and control activities associated with each risk area are also summarised.

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Strategic risks

The main risks associated with SIDN's strategy stem from the strong dependence on (earnings from) the .nl domain. Our .nl domain registration services are sold through registrars. We therefore work closely with the registrar community, as represented by the Registrars' Association (RA), on the promotion of .nl domain names and on continuous improvement of the security and quality of .nl.

The coronavirus pandemic proved to be a strong driver of growth in domain name registrations. However, growth has since

plateaued, and we expect the .nl market to remain stable in the years ahead. Given our limited capacity to influence the end market, our strategic risk tolerance is moderate.

We are seeking to increase our impact and extend the range of services we offer. In the field of Electronic Identities and Cybersecurity, we accordingly plan to continue investing in SIDN BrandGuard.

Operating risks

The main risks associated with our operating activities are interruptions to the availability of our services and breaches of the confidentiality or integrity of important data. Such problems could arise from technical and/or human error, or from deliberate (targeted or indiscriminate) human action. A prolonged, large-scale problem in one of those fields has the potential to threaten the continuity of the organisation in 2 ways. First, by seriously damaging our reputation, giving rise to doubts in political circles and the community at large as to SIDN's legitimacy as the registry for the .nl domain. Second, by leaving us vulnerable to large compensation claims from clients.

Since 2011, we have been ISO 27001-certified. In the context of our Information Security Management System (ISMS), we perform business impact analyses. That involves following an annual cycle in accordance with a defined information security policy. We also identify risks, implement control measures and assess residual risks. The findings, reports and internal and external audits are regularly discussed, e.g. in our Tactical Security Meetings, after which any necessary improvements are implemented. The outcomes are monitored by means of biannual management reviews. In that context, consideration is given to the results of the audits and performance assessments, as well as to the status of audit action points and any security incidents that may have occurred.

We assess the significance of each key process for service continuity by means of business impact analyses in the context of the ISMS. Our DNS services – the basis of the functionality of registered domain names – are the most critical, closely followed

Fig. 13 | SIDN's risk tolerance

Category	Risk	Low	Moderate	High
Strategic	Dependency on .nl		•	
Operational	Service availability interruptions	•		
	Breaches of the confidentiality or integrity of important data	•		
Financial	Solvency	•		
	Liquidity risk	•		
	Market risk		•	
	Currency risk		•	
	Interest rate risk		•	
	Credit risk		•	
	Bad debt risk		•	
	Damage claims and penalties	•		
Legislation and regulations	Risk of non-compliance with legislation or regulations	•		
Reputation	Reputation risk		•	
Equity capital requirement	Risk of equity capital falling below the defined minimum		•	



by our registration services, which enable users to register new domain names and to update and cancel existing registrations. Also rated as critical are the public Whois/Is, the Registrar Whois/Is, the power supply, our office ICT systems, our website www.sidn.nl, and our communication and telecommunication systems. With a view to assuring availability, integrity and confidentiality, we have put a wide variety of risk management measures in place, designed to minimise the likelihood of serious problems, and to enable swift corrective action and minimise impact if problems do arise.

Our operating risk tolerance is low in relation to interruptions to the availability of our services and to breaches of the confidentiality or integrity of important data.

Financial risks

- *Solvency*
Solvency is equity capital expressed as a percentage of the balance sheet total. Our solvency at the end of 2023 was 60.2 per cent (slightly higher than the norm value of 60 per cent). Our equity capital has declined in recent years as a consequence of operating deficits. In 2023, we were able to reduce the deficit, and for 2024 we are budgeting a neutral result (neither negative nor positive). We therefore expect our equity capital to remain stable, within the norm value range.
- *Liquidity risk (including concentration risk)*
Liquidity risk is the risk of having insufficient liquid assets to meet our obligations. The balance of our liquid assets at the end of 2023 was €29.4 million, up €0.7 million on the close of 2022. Our liquid asset balance is amply sufficient to cover our short and long-term finance needs. Concentration risk is addressed by having our liquid assets spread across 3 Dutch banks.
- *Market risk*
Market risk is the risk of our government bonds and/or other securities decreasing in value. We intend to hold our Dutch and German government bonds until maturity. If circumstances should necessitate disposal of the bonds prior to maturity, we would face the risk of the bonds having lost some of their purchase value. Our holdings of other securities are at risk of declining in value. However, we have not detected any signs (trigger events) indicative of such an eventuality.
- *Currency risk*
Currency risk derives firstly from the risk that our other securities are devalued by movement in the value of the Norwegian krone. Secondly, there is the exchange rate risk associated with transactions in currencies other than the euro. Our .nl services are priced in euros and therefore entail no currency risk. Because we make little use of suppliers that charge us in currencies other than the euro, our purchasing entails very little currency risk either.
- *Interest rate risk*
Interest rate risk is the risk that our government bonds and receivable loans are devalued by movement in market interest

rates. Because we intend to hold our government bonds until maturity, the associated interest rate risk is negligible.

- *Credit risk*
Credit risk is the risk that a party with whom we have a contract defaults on their contractual obligations, as associated with other securities, accounts receivable and other receivables. Our bad debt risk is modest, because about 75 per cent of registrars pay by direct debit. Our General Terms and Conditions make provision for action to be taken if a registrar does not fulfil its financial obligations.
- *Damage claims and penalties*
This is the risk arising from service interruptions and data confidentiality or integrity breaches. Our General Terms and Conditions limit or exclude our liability for such problems. Our risk tolerance in this field is moderate to low.

Legislative and regulatory risks

Changes to national or international legislation and regulations have the potential to affect our organisation and operating processes. We take stock of potentially significant proposed or impending legislative and regulatory changes – e.g. changes in employment law, tax law or information security law – at an early stage. The impact of any such change is assessed and translated into organisational adaptations, which are then implemented. The HR Manager and Legal and Policy Manager advise on risks relating to legislation and regulations. We have also appointed a Data Protection Officer, and we have a Privacy Board, pursuant to the General Data Protection Regulation.

Our legislative and regulatory risk tolerance is low.

Reputation risk

With a view to managing reputation risks, we work closely with our stakeholders, including the .nl registrars, the RA and the Ministry of Economic Affairs and Climate Policy. Where the registrars are concerned, we pursue an active stakeholder-management policy through the RA. We attach great importance to the quality of our services and to the maintenance and elevation of service quality. In that context, we undertake an annual Registrar Satisfaction Survey. We also actively monitor our media coverage.

Weerstandsvermogen

In order to assure the continuity of our organisation, it is important that we have an adequate financial buffer to protect against the possibility of losing a large portion of our income. The contingency buffer additionally serves to protect against the financial implications of the materialisation of an identified risk. Moreover, in the event of discontinuation, we would require sufficient funds to ensure the orderly winding up and/or transfer of our .nl activities.

Since recalibration in 2020, our minimum equity capital requirement is a sum equal to our annual expenditure. Our equity capital is currently above the defined minimum. Our Finance Department monitors the sufficiency of our equity capital in relation to the defined minimum and periodically reports its findings.



Consolidated balance sheet as at 31 December 2023

	31 december 2023 (in €)	31 december 2022 (in €)
Assets		
Intangible fixed assets		
Intangible fixed assets under development	1,008,273	752,695
Software	183,058	262,677
	1,191,331	1,015,372
Tangible fixed assets		
Commercial property	4,613,717	4,796,988
Machinery and equipment	840,023	943,031
Other fixed business assets	516,439	543,716
	5,970,179	6,283,735
58 Financial fixed assets		
Other participating interests	1,300,000	1,300,000
Other securities	622,436	860,784
	1,922,436	2,160,784
Current assets		
Receivables		
Trade receivables	736,259	186,882
Tax and social security contributions	18	408,036
Accrued income and prepaid expenses	1,306,420	1,516,194
	2,042,697	2,111,112
Liquid assets	29,362,816	28,737,168
Total	40,489,459	40,308,171



Liabilities

Group equity

Short-term liabilities

Accounts payable

Tax and social security contributions

Accrued liabilities

Total

31 december 2023 (in €)

24,424,226

572,552

1,357,292

14,135,389

16,065,233

40,489,459

31 december 2022 (in €)

24,796,763

434,560

639,387

14,437,461

15,511,408

40,308,171



Consolidated profit and loss account for 2023

	2023 (in €)	2022 (in €)
Net turnover	23,004,433	21,526,124
Total operating revenue	23,004,433	21,526,124
Cost of sales	111,558	92,953
Personnel costs	12,922,996	12,894,519
Depreciation and revaluations	928,342	899,379
Other operating expenses	9,298,749	9,392,005
Total operating expenses	23,261,645	23,278,856
60 Operating result	-257,212	-1,752,732
Interest receivable and similar income	166,891	-
Interest payable and similar charges	-	-163,670
Financial income and expenditure	166,891	-163,670
Result before taxation	-90,321	-1,916,402
Taxes	-282,214	155,012
Result after taxation	-372,535	-1,761,390



Consolidated cash flow statement for 2023

	2023 (in €)	2022 (in €)
Operating result	-257,212	-1,752,732
Adjustment for depreciation	928,342	899,379
Movement in trade receivables	-549,377	541,655
Movement in other receivables	617,792	58,690
Movement in trade payables	137,992	-353,593
Movement in other short-term liabilities (excl. liabilities to credit institutions)	415,833	168,768
Cash flow from operating activities	1,293,370	-437,833
Interest received	166,891	-
Interest paid	-	-163,668
Profit tax paid	-282,214	155,012
Cash flow from operating activities	1,178,047	-446,489
Investments in intangible fixed assets	-255,578	-731,006
Investments in tangible fixed assets	-540,702	-1,005,280
Divestments of tangible fixed assets	5,535	1,683
Movement in other financial fixed assets	-35,431	31,345
Income from securities	273,777	130,000
Cash flow from investment activities	-552,399	-1,573,258
Movement in liquid funds	625,648	-2,019,747



Directors and officers



Executive Board

Roelof Meijer (*Chief Executive Officer*)

Loek Bakker (*Chief Technology Officer*)

Supervisory Board

Marjet van Zuijlen, *Chair*

Mark Frequin, *Vice-Chair*

Wim Hafkamp

Sandra Konings

Gerben van Leeuwen

Jeannine Peek

Dennis Raithel

63 MT and managers

Cristian Hesselman, *Director of SIDN Labs*

Arjan Middelkoop, *Commercial Director*

Michiel Bosse, *Interim Chief Financial Officer*

Joanna Klaver, *HR Manager*

Maarten Simon, *Legal and Policy Manager*

Marnie van Duijnhoven, *Communications Manager*

Special Advisors

Piet Beertema

Boudewijn Nederkoorn

Ted Lindgreen

Eddy Schuyer

Ondernemingsraad

Jeroen Roosen, *Chair*

Chris Faber

Jack van Kolck

Angelika Takes

Thymen Wabeke, *Vice-Chair*

Romana van der Heusen, *Secretary*

Complaints and Appeals Board

Peter Blok, *Chair*

Huib Gardeniers, *Secretary*

Bastiaan Goslings

Sylvia Huydecoper

Doeke Kingma

Thomas de Weerdt



II

Glossary



Abuse

Use of the internet for an inappropriate purpose. Common forms of abuse include sending spam, phishing and creating botnets.

Agile working

Working in a responsive and adaptive way. In an agile organisation, projects are often divided into small, surveyable periods and there is continuous consultation with the client. The agile working philosophy originates from the ICT industry and makes use of various techniques, most notably the scrum.

Anycast

Global anycast is a proven and effective technology for spreading network load across multiple instances of seemingly the same server. The way it works is as simple as it is effective: a number of servers share a single IP address, making routers 'think' that they are all the same server. IP packets are forwarded to the 'nearest' point. Local anycast differs from global anycast insofar as a number of local nodes are created. A node is a computer or another device connected to a given network, which can only be approached locally. As a result, worldwide DDoS traffic cannot ever reach a local node. The only DDoS traffic that can reach the node is locally generated traffic, which is much easier to control. Local anycast is therefore an effective response to the risk of major DDoS attacks.

Artificial intelligence (AI)

Artificial intelligence, or AI for short, involves the use of computers to perform tasks that normally require human intelligence.

Border Gateway Protocol (BGP)

The internet's main routing protocol, used for routing traffic between systems on the internet.

ccTLD

In full: country-code top-level domain. A top-level domain linked to a country, e.g. .nl (the Netherlands), .de (Germany) and .fr (France).

CENTR

An association for the registries that run ccTLDs, including SIDN. It is a forum

for discussion about policies that affect ccTLDs and a conduit for communication between the ccTLDs and other parties involved in the internet's (further) development, such as ICANN. See also centr.org.

CIRA

CIRA is the registry for Canada's .ca domain.

Complaints and Appeals Board (C&AB)

An independent body to which .nl registrars and registrants can appeal against certain types of decision made by SIDN. The C&AB also considers complaints asserting that a domain name's registration is inconsistent with public order or decency. See also cvkb.nl.

Cloud-native

Designed and built to fully utilise the distributed computing potential afforded by a cloud-based delivery model. Cloud-native applications benefit from the scale, elasticity, resilience and flexibility provided by the cloud.

DANE

DNS-based Authentication of Named Entities (DANE) is a protocol for the secure publication of public keys and certificates.

DDoS

A distributed denial-of-service attack is a concerted effort to make a computer, network or service unavailable to its intended user(s). DDoS attacks can be carried out in several different ways.

Disinformation

False, inaccurate or misleading information deliberately generated and distributed for financial gain or to harm a person, social group, organisation or country.

DKIM

DomainKeys Identified Mail (DKIM) prevents e-mail tampering. If the content of a mail message has been altered in transit, DKIM flags it up.

DMARC

Domain-based Message Authentication, reporting and Conformance (DMARC) is a system for telling mail servers what

to do with suspect incoming messages. Servers might be advised to delete all such messages, for example, or to forward them to a particular address. DMARC also provides mail domain operators with information about scam mail supposedly sent from their domain.

DNS

Abbreviation of Domain Name System or Domain Name Server. The global DNS is the system and protocol used on the internet to translate domain names into IP addresses and vice versa.

DNSSEC

Domain Name System Security Extensions (DNSSEC) is a suite of extensions to the DNS protocol. It involves the use of cryptographic techniques to prevent cybercriminals diverting internet traffic to fraudulent websites without the users realising. The basic DNS protocol does not provide optimum protection against such threats.

Domain name

A name within the Domain Name System (DNS), the internet's naming system. A domain name such as sidn.nl is made up of several parts: the top-level domain, '.nl', and the second-level domain, 'sidn'.

Registrant

The person or organisation in whose name a domain name is registered. Only the registrant is entitled to receive SIDN's services.

Domain Registration System (DRS)

The system that we make available to .nl registrars for registering .nl domain names and managing existing registrations.

Downtime

The time that a website is unreachable or an application is inactive.

ECP

ECP, the Platform for the Information Society, is a vehicle for the business community, the government and social organisations to work together to support the use of ICT in Dutch society. See also ecp.nl.



ENTRADA

An open-source big data platform developed by SIDN Labs for the analysis of large volumes of DNS data. The database that ENTRADA uses contains more than 100 million DNS queries.

Dispute Resolution System for .nl Domain Names

Anyone who registers a .nl domain name is responsible for making sure that the registration doesn't infringe anyone else's rights. If a registration appears to infringe someone's rights, a dispute can arise. That can happen if, for example, the domain name makes use of someone else's brand name, trading name, personal name or organisation name. If a registration appears to infringe someone's rights, a dispute can arise. SIDN's Dispute Resolution System has been set up as a quick and affordable alternative to using the law courts to settle a dispute.

gTLD

Generic top-level domain: one of the main types of internet domain. Well-known gTLDs include .com, .org and .edu. The introduction of numerous new gTLDs, including .amsterdam, began in 2014.

Hosting service provider

A hosting service provider is a business that provides web hosting services, involving the provision of storage space, processing capacity and network traffic handling capacity on a web server. As well as providing website and e-mail hosting on a dedicated or shared server, nearly all hosting service providers also provide domain name registration services.

ICANN

The Internet Corporation for Assigned Names and Numbers is a non-profit organisation that performs a number of important tasks, such as assigning and specifying top-level domains, assigning domain names and allocating IP addresses. ICANN does not manage any domain names itself. That job is delegated to registries such as SIDN (.nl) and VeriSign (.com and .net). See also icann.org.

IETF

The Internet Engineering Task Force is an international community of network

designers, operators, suppliers and researchers, which develops internet standards. See also ietf.org.

(Internet) extension

Another term for a top-level domain: the last part of an internet address, after the dot, e.g. '.nl' in 'sidn.nl'.

Internet governance

The development and application of shared principles, standards, rules, decision-making procedures and programmes that shape the way the internet is used.

Internet Governance Forum (IGF)

The Internet Governance Forum (IGF) is an annual gathering of governments, market players and non-governmental organisations, under the auspices of the United Nations. At the IGF, public policy issues are discussed with the aim of ensuring that the internet remains manageable, robust, secure and stable. The IGF does not define policy. See also intgovforum.org.

Internet of things (IoT)

A development of the internet, where everyday devices, such as thermostats and baby monitors, are connected to the internet and able to exchange data.

Internet Protocol (IP) address

A unique combination of numbers and/or letters. Every computer or server on the internet has an IP address, at which it can be found. If you visit www.whatismyip.com you can check the IP address of the device you are currently using.

IPv6

Every computer or server on the internet has an IP address, at which it can be found. Addresses are created in accordance with the Internet Protocol. IPv6 is the latest version of the protocol, which supports an almost infinite number of IP addresses. It has been developed to succeed IPv4 (version 4), because IPv4 addresses are running out.

Internet service provider (ISP)

A business that provides internet access services to other businesses or private individuals. Many ISPs also provide other services, such as e-mail, web hosting and spam filtering.

Malware

Any kind of malicious software, including computer viruses and worms.

Name server

A computer on the internet, which 'translates' a domain name into an IP address (a unique numeric internet address). The name server is part of the DNS.

Fake webshop

An internet site that looks like a normal webshop, but has actually been set up by fraudsters to trick people out of money and/or to steal data.

NL IGF

A joint initiative by the Ministry of Economic Affairs, SIDN and ECP. Its purposes are, first, to embed the conclusions of the international Internet Governance Forum (IGF) in national policy and, second, to ensure that the Netherlands has a voice and that Dutch issues are aired within the international IGF.

Notice-and-Take-Down Procedure

A voluntary internet industry code of conduct on dealing with reports of unlawful or illegal website content, such as child sexual exploitation material, plagiarised content, discriminatory content or content linked to the sale of illegal goods. The code describes the procedure for complaining about the content of a website.

A complaint should be addressed first to the provider of the offending content. If the provider cannot be contacted or refuses to take the content down, the matter may be taken up with the next party in the chain. The chain is as follows:

- Content provider
- Website provider (registrant)
- Website hoster
- Internet access provider
- SIDN (registry)

If all the other parties in the chain have been asked to take down the offending content but have not done so, SIDN can, in the last resort, disable the associated domain name.

NTP

The Network Time Protocol (NTP) is a protocol that interconnected computers use to synchronise their internal clocks with other computers.



Open-sourcing

A development philosophy based on making source material freely available to all. Open-source software is software whose source code is freely available, so that anyone may copy it, modify it or distribute it without having to pay for the privilege.

Phishing

A form of internet crime. It involves sending e-mails and setting up websites that look as though they come from or belong to well-known and trusted organisations, when in fact they are fakes. The forged messages and sites encourage people to part with information, such as log-in details and credit card details, which the criminals then use for their own purposes.

Polarisation

A process whereby people see the world increasingly in terms of 'us' and 'them'. Differences between different groups within society are amplified, leading to increasing social discord.

67 Post-quantum cryptography (PQC)

The development and use of cryptographic algorithms (usually with public keys) that are believed to be secure against cracking by a quantum computer; also known as quantum-proof, quantum-safe or quantum-resistant cryptography.

Registrar

An intermediary who acts for a registrant or prospective registrant in interaction with a registry. (The registry for .nl is SIDN.) Most registrars are hosting service providers, internet service providers or access providers.

Registrar Scorecard

An incentive programme for .nl registrars. Participating registrars can qualify for financial incentives by enabling modern internet standards such as IPv6 and DNSSEC for the .nl domain names in their portfolios.

Registry

In full: domain name registry. The register of all the internet domain names under a given top-level domain, or the organisation that manages that register.

Registry service provider

An organisation (typically a registry) that provides registry services for top-level domains delegated to other organisations. For example, we provide registry services for the .amsterdam and .politie domains.

Resolving

Responding to DNS queries.

Resolver

When you enter a web address (URL) into your browser's address bar, it is translated into the IP address of the relevant domain. The translation process is known as resolving, and the machine or software that does it as a resolver.

RIPE NCC

The Réseaux IP Européens Network Coordination Centre is the Regional Internet Registry (RIR) with responsibility for issuing IP addresses in Europe and the Middle East. RIPE NCC is one of the world's five RIRs, the other four being APNIC (for Asia and Australia), AfriNIC (for Africa), LACNIC (Latin America) and ARIN (for North America). See also ripe.net.

SCION

A new internet architecture designed to support route control, error isolation and the exchange of explicitly confidential information for end-to-end communication.

Sustainable Development Goals (SDGs)

The United Nations' 17 goals for making the world a better place by 2030. They serve as a global compass for tackling challenges such as poverty, education and the climate crisis. The goals were adopted by all 193 UN member countries in 2015, and apply to all countries and all people.

Security.txt

An internet protocol that standardises the use of a simple text file containing a website operator's contact details. The file is placed on the site's web server so that people such as ethical hackers and benevolent cyber-investigators can draw the operator's attention to issues they have detected. Adoption and use of the protocol ensures that issue reports go straight to the appropriate person or department.

Server

A powerful computer with a fast connection, which is set up to provide information. A web server is directly connected to the internet.

Internet service provider (ISP)

A provider of internet-enabled services, such as internet TV or internet telephony. Some ISPs also supply network equipment for domestic networks.

Signing

DNSSEC works with digital signatures, known as 'private keys'. For effective security, DNS data needs to be signed with a digital signature and the signature needs to be checked ('validated') by the data user.

Spam

Unsolicited e-mail.

SPF

Sender Policy Framework (SPF) is a technology for preventing mail 'spoofing' (sending mail pretending to be from someone else). With SPF, the authenticity of mail senders is checked.

StartTLS

A protocol for establishing secure connections between sending and receiving mail servers.

TLD

Abbreviation of top-level domain. The domain whose name forms the last part of an internet address, after the dot. For example, 'nl' in the domain name 'sidn.nl'.

Top-level domain

The domain whose name forms the last part of an internet address, after the dot, e.g. 'nl' in 'sidn.nl'.

Typosquatting

A form of internet abuse that takes advantage of the fact that people sometimes make slips when typing web and e-mail addresses. A user who mistypes an address lands on the typosquatter's site. Typosquatting is often associated with malicious activities such as phishing.

**Validation**

DNSSEC works with digital signatures, known as 'private keys'. For effective security, DNS data needs to be signed with a digital signature and the signature needs to be checked ('validated') by the data user.

Registrars' Association (RA)

Association that speaks for the .nl registrars in their relations with SIDN and regularly discusses the main features of registry policy with SIDN.

Whitelisting

Whitelisting means putting things on a 'trust list'. For example, you can whitelist IP addresses whose traffic can be trusted for forwarding.

Whois

A protocol for retrieving the details of a domain name, e.g. the name and address of the registrant and registrar, from a database. SIDN manages the Whois data for all .nl domain names. See sidn.nl/whois.

68**WIPO Arbitration and Mediation Center**

An independent, international non-profit organisation that arbitrates in domain name disputes and other cases. See also wipo.int.

Yivi

Yivi provides a privacy-friendly way to log in with service providers. First, the user 'populates' the Yivi app with validated data, or 'attributes'. Then, when the user accesses a service, the app passes on only the information about the user that the service provider actually needs. So data sharing is kept to the minimum, and the user stays in control of what they share with whom. Yivi was previously known as IRMA. The name was changed in 2022.

Zone file

A text file listing all the domain names in a zone, plus the associated webserver IP addresses.



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