

The background of the page is decorated with numerous overlapping circles of various sizes. Some circles are solid grey, some are solid white, and some are outlined in black. They are scattered across the page, with a higher concentration on the left and top right sides.

# Activity Report 2021

Figures, Data, Facts.

The background of the left page features a large, faint graphic consisting of several overlapping circles and arcs of varying sizes, creating a sense of depth and movement. The title 'The Future in Mind' is centered within this graphic.

# The Future in Mind

2021 was an exciting year for DENIC eG. We passed the 17-million mark for .de domains, celebrated a twin jubilee and entered into a new phase with a change in the Executive Board.

17 million domains – an impressive figure reached through impressive growth: In 2021, we recorded a net increase of nearly half a million, which makes us the largest country-targeted Top Level Domain (ccTLD) in the world. With this excellent result, 2021 will enter in the DENIC history as one of the Cooperative's economically most successful years.

Apropos history – 2021 also featured additional milestones: The German domain ending .de turned 35 and we are looking back on 25 years of the DENIC Cooperative. Since a quarter of a century DENIC has provided a reliable and modern technical infrastructure, coordinating its action with the membership, and has been committed to a free, open and secure Internet. True to this commitment, we continued to virtualise and automate systems and processes, advanced the infrastructure of our data centers according to cutting-edge standards and expanded our name servers' footprint as part of our activities in the last financial year.

For 2022, we also expect a range of interesting developments. The entire domain industry is experiencing a radical change. Additionally, we are increasingly faced with regulatory initiatives for digital services and infrastructures. The amendment to the EU Directive on security of network and

information systems, short NIS2, or the Digital Services Act, short DSA, are important buzzwords in this field, which will be on our and our members' agenda.

As a cooperative membership organisation with an extensive portfolio of expertise, we are ready and able to meet current and future challenges. We are looking forward to getting actively involved in shaping a wide array of topics and developments.

### Executive Board of DENIC eG

## The DENIC Executive Board



  
Thomas Keller



  
Martin Küchenthal



  
Andreas Musielak



  
Sebastian Röhler

# 2021 – An Eventful Year

## 17 Million .de Domains

In July 2021, the 17 millionth .de domain is registered and another million mark is passed.

## 25 Years of DENIC eG

On 17 December 1996, the DENIC Cooperative was founded by 37 Internet service providers.

## 35 Years of .de

The history of .de started in November 1986 when the country code .de was registered in the IANA database.

## New Executive Board Member



**Tom Keller**

Since 1 October 2021, Tom Keller is new member of the Executive Board of DENIC eG.



# “Many for Many”

## DENIC as a cooperative stands for .de and thus for the German namespace on the Internet

Websites, Internet services like e-mail, online shops, ticket systems, streaming services or social media platforms – more than 17 million .de domains offer a vast range of digital diversity. The DENIC name servers for .de answer about seven billion queries every day, within a fraction of a second, to make all these offers reliably available 24/7 to Internet users all over the world. DENIC manages and operates this important resource of the Internet in Germany as an impartial infrastructure service provider.

The core tasks of the Cooperative are:

- Operation of a worldwide name server network for the Top Level Domain .de
- Operation of the registration database for the central administration of all .de domains
- Provision of information services.

## An Organisation of National Importance

The Internet is increasingly assuming the central role for the ever more digital society and Germany as a business location. The technical systems behind .de are of utmost importance in this context and are thus classified as part of the national critical infrastructures (KRITIS). As the institution running these systems, DENIC is rated as one of the organisations that are of particular importance for public utility and safety in Germany.

## International Commitment

DENIC operates .de in compliance with the internationally recognised standards for domain registries. Being actively involved in the relevant bodies and standardisation organisations, the Cooperative helps to shape these standards and thus consistently lives its commitment to the evolution of an open and secure Internet.

## Long-Term Success as a Cooperative

The idea of solidarity has guided DENIC's actions from the very beginning and also was a driving factor for the decision to found DENIC as a cooperative more than 25 years ago. The organisational form of a not-for-profit community of cooperate members is globally unique among all the domain registries, and it has proven a success in many respects.

With more than 17 million registered domains, .de ranges consistently in the top league of the approximately 1,900 domain endings that exist in the world. Among the country-targeted domain endings, it is the largest one worldwide. For domain registrants in Germany, the national ending .de usually is the first choice. It has a 60-percent share in the German market.

## Through Self-Regulation Sustainable for the Future

Next to the independent and reliable operation of the technical infrastructure, it is DENIC's self-regulated domain management that provides the proven basis for its success. About

300 companies of all sizes and from all sectors of the IT and telecommunications industry in Germany and abroad live the idea of an impartial, not-for-profit organisation as members to the DENIC Cooperative. The concept relies on participation and consensus building of equal partners, who represent a broad basis of market participants as well as of the Internet community and its needs in all their abundance and diversity.

## Close Cooperation With a Broad Benefit

The central element of self-regulation is the intensive exchange and close cooperation with the DENIC members. It is the basis for advancing existing and developing new processes and systems. Concrete examples in 2021 are the new meeting format "DENIC in dialogue" and the "DENIC Open Hours". The former was used, for instance, to discuss specific handling processes of .de domains, which were then optimised on the basis of the discussion results. The latter is a defined time window during which members can discuss and investigate proposals and concerns with the Business Services Team.

The close cooperation also is beneficial for the domain holders. Optimised processes entail sustainably enhanced user friendliness. Communication with the domain holder within the TRANSIT domain handling process, for instance, has become leaner and easier to comprehend.

## Collective Competence

Today and in the future, DENIC can rely on the collective competence and the commitment to the DENIC mission of all Cooperative members and the DENIC staff, when making decisions and drafting the future of .de. They will be built on a sound and democratic basis true to the cooperative motto "Many for many".

# Stable Basis

## Financial Position

2021	K€	2021	2020	2019
Gross Earnings		13,592	13,409	13,805
Payroll & Material Expenses		12,982	12,590	12,992
Annual Surplus		2	67	28

From the annual surplus of EUR 2,167.11, the amount of EUR 216.71 was allocated to the statutory reserve as stipulated by the bylaws.

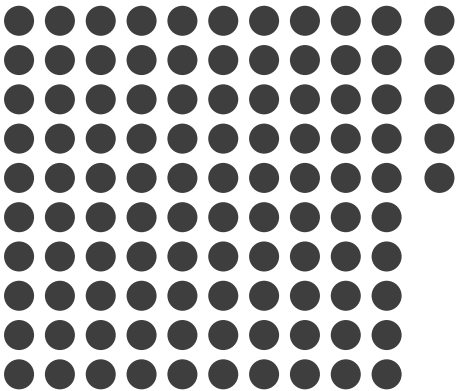
## Income & Expenses

2021 Income	K€	2021 Expenses	K€
Turnover Members	14,396	Material Expenses	1,331
Other Operating Income	201	Payroll Expenses	8,793
Other Non-Operating Income	327	Depreciations	381
Total Gross Income	14,924	Other Operating Costs	4,189
Net Earnings Before Tax (EBT)	217	Total Operating Costs	14,694
Annual Surplus	2		

● Turnover

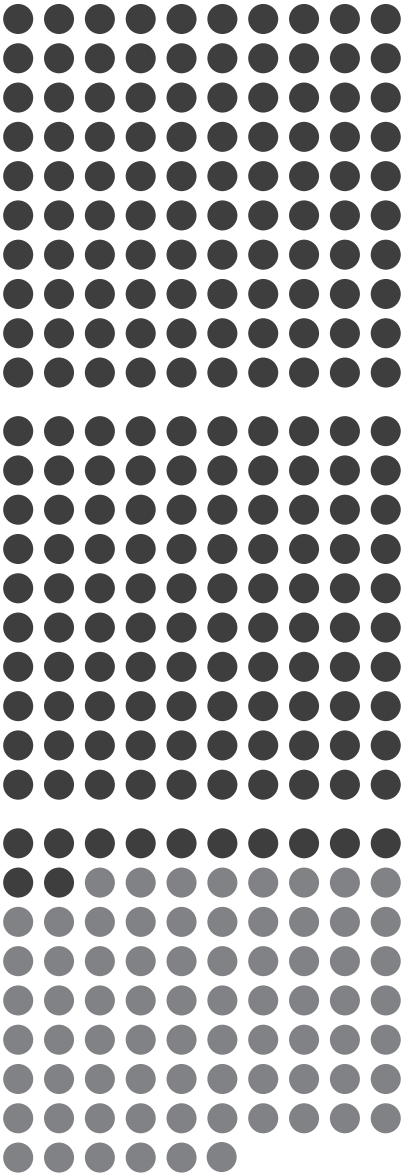


● Workforce



**105**  
Employees

● Membership



**286**  
Members

**74**  
Members from  
Abroad



# .de in the Focus

## Development of .de Domains

2021 was a very successful year for .de. Already in mid-July domain registrations reached the 17-million mark, and until the end of the year, another 160,000 domains were added. On 31 December 2021, all in all, 17,160,504 domains were registered with the German country code .de. This is a plus of about 460,000 or 2.8 percent within one year. The total number of registrations by German-based holders of .de domains increased by nearly 220,00 over that time. The growth can be seen in all the 16 federal states of Germany. The highest increase was scored by North Rhine-Westphalia with 53,000. de domains, while Saarland recorded hardly any plus at all (+200). Even more popular were .de domains in 2021 with domain holders residing outside Germany. Their number grew by about 240,000 to nearly 1.7 million, and they thus account now for nearly ten percent of all the .de domains under management. The champion among foreign countries of origin remains the United States with a share of 21 percent. The US has held this position for years.

## Development of .de Domains as of 31 Dec.



## GERMANY

# 90.1%

**+  
220,000  
Domains**

North Rhine-Westphalia  
3,356,179 = **21.8%**

Bavaria  
2,744,159 = **17.8%**

Baden-Württemberg  
2,041,373 = **13.3%**

Lower Saxony  
1,423,575 = **9.3%**

Hesse  
1,293,635 = **8.4%**

Berlin  
1,005,052 = **6.5%**

Rhineland-  
Palatinate  
656,858 = **4.3%**

Hamburg  
599,586 = **3.9%**

Schleswig-Holstein  
550,053 = **3.6%**

Saxony  
540,159 = **3.5%**

Brandenburg  
307,546 = **2.0%**

Thuringia  
228,802 = **1.5%**

Saxony-Anhalt  
186,047 = **1.2%**

Mecklenburg Western Pomerania 175,708 = **1.1%**

Saarland 141,091 = **0.9%**

Bremen 128,253 = **0.8%**

## WORLD

# 9.9%

**+  
240,000  
Domains**

US  
360,367 = **21.3%**

Netherlands  
217,970 = **12.9%**

Russia  
160,182 = **9.4%**

Austria  
146,894 = **8.7%**

Switzerland  
93,113 = **5.5%**

Great Britain  
81,812 = **4.8%**

Portugal  
80,750 = **4.8%**

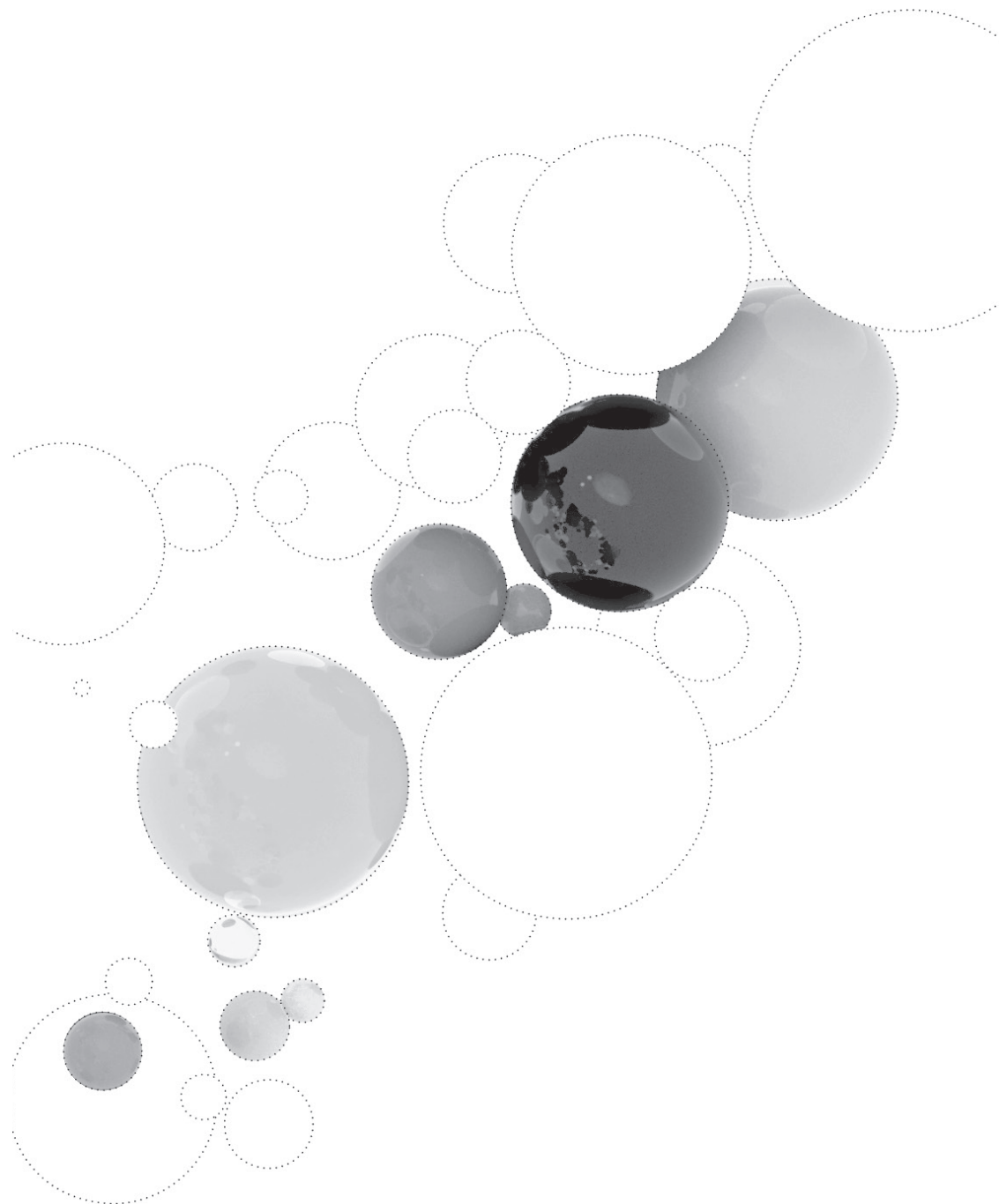
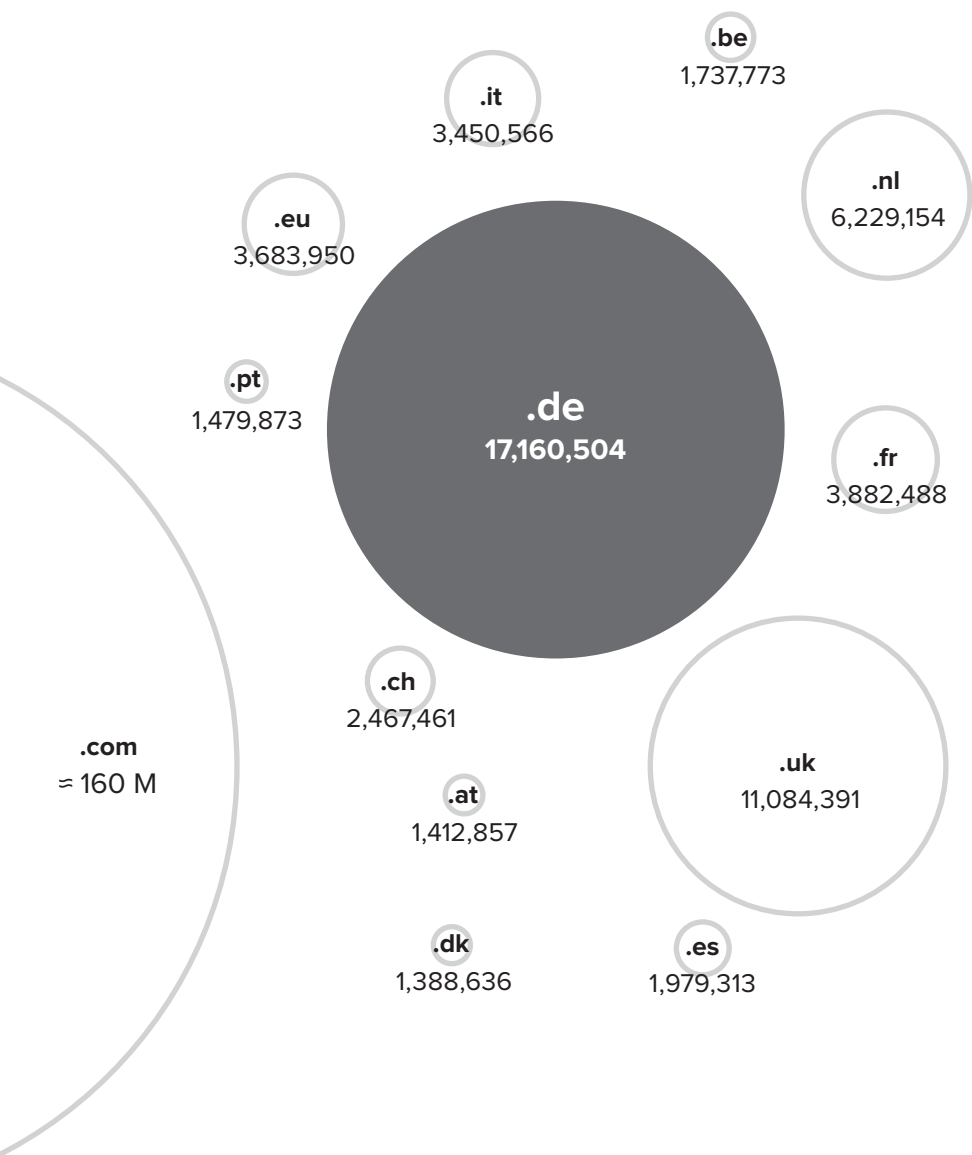
United Arab Emirates  
65,530 = **3.9%**

Vietnam  
51,371 = **3.0%**

France  
35,905 = **2.1%**

Others  
401,362 = **23.7%**

## .de Compared on an International Level





# Internet Governance

In its role as a DNS operator and TLD registry, DENIC is increasingly affected by regulatory initiatives at national and European level. Therefore, DENIC's continued intense participation in relevant fora is of ever growing importance. This is realised by submitting opinions inside and outside of public consultation processes, directly or through industry associations. In particular the common advocacy association CENTR, in which more than 60 European country-code registries have joined forces, provides a globally unique platform for discussion and consensus building on issues related to global Internet policies that informs the direct dialogue with relevant political and regulatory actors.

One of the key concerns in this respect is to raise policymakers' awareness as to the fact that regulatory interventions in the DNS landscape can have fundamental implications. Within the framework of multi-stakeholder organisations such as ICANN or the Internet & Jurisdiction Policy Network, DENIC is also actively involved in ongoing debates about the question in how far illegal content on the Internet can be or should be tackled also by taking action at the DNS level under certain circumstances. To date, no final consensus has been reached within the relevant bodies as to what, "DNS Abuse" actually means and which actions should constitute such abuse. Neither is there a common understanding about the question in which cases intervention by mere infrastructure operators such as DENIC, who are committed to technical stability and security of the Internet, could really be justified.

In DENIC's opinion, treating phenomena such as malware, phishing or spam as forms of DNS abuse is linked to the attempt to oblige the technical Internet community to intervene based on content – a call which is voiced again and again

in political circles and consumer protection groups. DENIC continues to be critical of all European and national efforts to make TLD registries act on the basis of content in a self-committed manner – similar to platform operators. This position is based on applicable case law, since as a TLD operator, DENIC neither has access to the content of websites nor are content offers transmitted via DENIC's networks.

In an attempt to create a modern legal framework that is in line with the requirements of the digital age, both the German government and the EU Commission have launched several new legislative initiatives as well as reforms of existing legal rules, some of which are basically intended to bring fundamental changes and increased regulation. DENIC keeps a watchful eye on these developments in order to observe whether such frameworks, in which domains/domain registries have not been included so far, might see their scope of application extended.

Beside the proposed Regulation on a Single Market for Digital Services (Digital Services Act, DSA), by which the currently applicable rules of the e-Commerce Directive dating from the year 2000 are to be updated, these efforts also refer to the amendment of the 2016 EU Directive for ensuring a high level of network and information security (NIS-2). The bodies involved in the European Union's legislative process – i.e. Parliament, Council and Commission – defined their negotiating positions on both projects in late 2021, before the trilogue negotiations are to start in 2022. This legislation is expected to enter into force in the course of 2023.

From DENIC's point of view, approaches that can be seen in the NIS-2 draft and that would require TLD registries and DNS service providers to register domain holders for identification purposes, based on the assumption that this contributes to the security, stability and robustness of the Domain Name System, should be better understood and discussed in detail: Last October, in a first statement in the context of the EU's public consultation process, DENIC noted that identifying the person who registers a domain does not provide information about the entity that actually exercises technical control of the namespace, nor about the entities that provide content or services within that namespace.

*“The Internet is extremely complex, in both a technical and a social sense. We contribute our expertise to the political processes to help shape regulation in a constructive form, so it achieves its objectives in an implementable way.”*

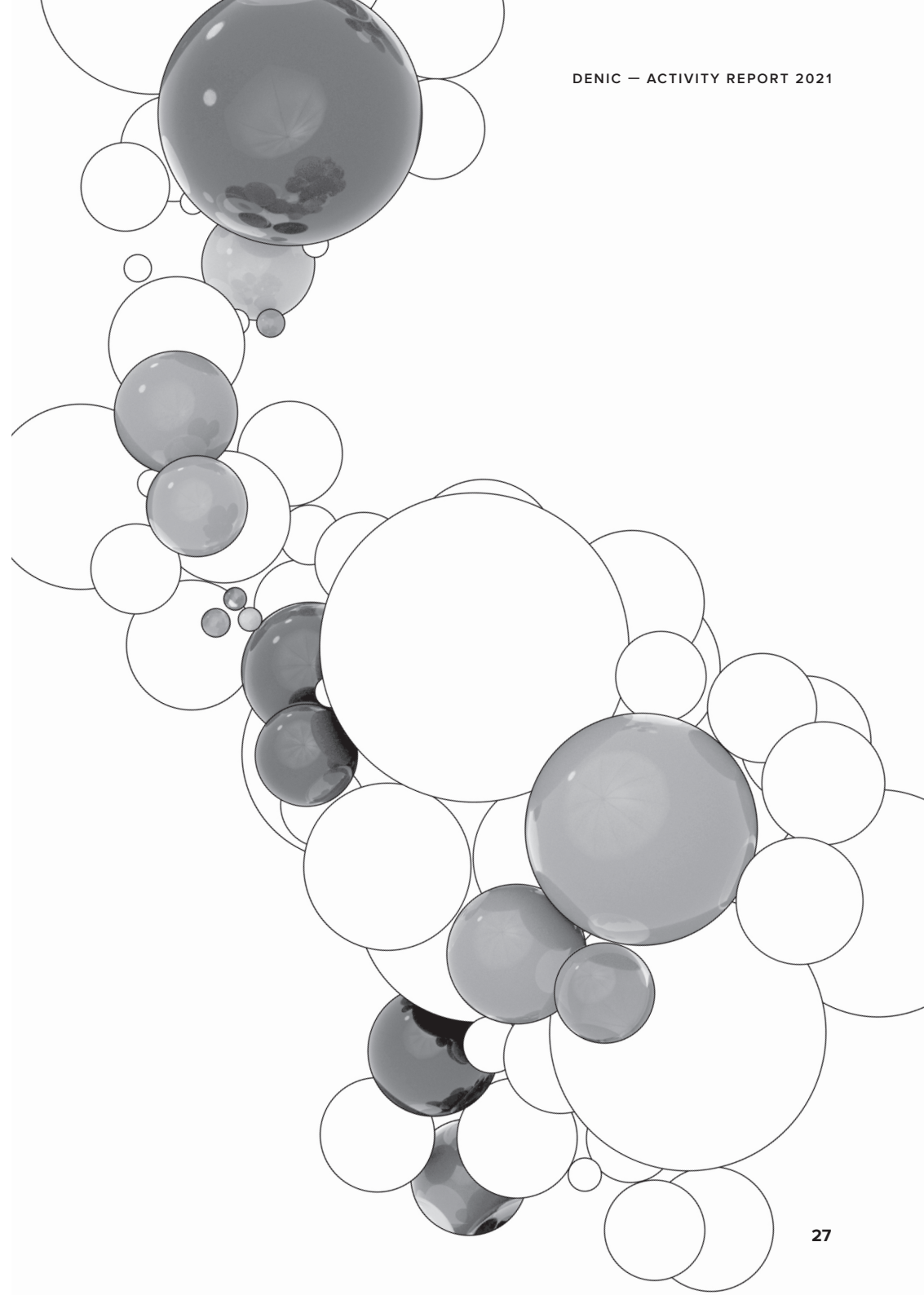
Another topic in this context that was highly relevant in 2021 are the implications that the reform of the German IT Security Act (IT-SiG 2.0) has for DENIC. It aims at finally transposing the currently applicable European NIS Directive on Network and Information Security into national law and anticipating, in part, its planned amendment (NIS 2) in the framework of the EU cyber security strategy. In line



**Peter Koch**  
Chief Policy Advisor

with this law, not only the authoritative name servers for .de, which have already been classified since 2017, but also the DENIC-administered registry for the Top Level Domain .de is classified, starting from 2022, as critical infrastructure (KRITIS) in Germany. For both categories, a reporting obligation applies that requires DENIC to report disruptions to the availability, integrity, authenticity or confidentiality of information technology systems, components or processes. Furthermore, there is an obligation to provide evidence of compliance with the defined requirements, which must be provided by an independent body in biennial security audits.

DENIC also participates in the Internet Infrastructures Working Group (BAK IIS) in the Information Technology and Telecommunications Sector under the German Critical Infrastructure Protection Implementation Plan (UP KRITIS). UP KRITIS is a public-private cooperation between critical infrastructure operators, their related associations and the German Federal Office for Information Security (BSI). Through this participation, DENIC is continuously involved in the process of coordinating security-related requirements that the players in the Internet industry must comply with, as well as in discussions with the Federal Ministry of the Interior, which is responsible for these matters.





# Technical News

## ● Revised In-House Application Platform: Optimised Solution Independent of Hardware

Virtualisation technologies and automated processes are central to the technical platform of the DENIC services. In 2021, the application platform was profoundly optimised and became substantially less dependent on the hardware on which the applications actually run.

The focal aim of the measures was enhanced user friendliness, security, monitoring and containerisation.

A new central administration interface allows convenient enabling and disabling of configurations such as monitoring, logging or backup. The implemented configuration management solution ensures that instances have the correct configuration state and includes automatic adjustment functions. Up-to-date images that are available on a monthly basis make updates quick and efficient, software packages can easily be implemented through RPM repository.

For monitoring, an autodiscover tool was introduced, which reliably compiles real-time metrics. Mesh technology has led to strongly optimised alerting mechanisms.



As to containerisation by means of Kubernetes, DENIC implemented a pipeline that automatically boots up an existing container cluster, updates it to the latest version and checks all applications on proper functioning. Only when the check has been successful, the productive clusters are updated. A container scan tool that detects vulnerabilities and targeted limitation of resources protect the productive cluster.

At present, DENIC is working at the implementation and migration of its services to the new platform. For some applications, including critical ones, the switch was already performed successfully.

## **New Infrastructure for DENIC Data Centers: Hyperconverged Architectural Concept**

Security and redundancy are essential for the DENIC services. For this reason, we operate two separate data centers in Frankfurt and Amsterdam, with all relevant services implemented on each of them.

A focal topic in 2021 was the redesign of the technical infrastructure of DENIC's data centers on the basis of a hyperconverged, i.e. software-centered architecture, where computing, storage and virtualisation resources are combined in one system, to reduce system complexity and the administrative overhead. The project included the implementation of a new back-up solution and the replacement of central network components.

*“We are undergoing a fundamental redesign of our infrastructure to make it perfectly viable for the future. Our central focus here is on high availability and security.”*

**Matthias Amrhein**  
Head of IT



## **Expanded DENIC Name Server Network: First Virtual Name Server Location in Sydney**

In July 2021, the name server location in Sydney was deployed and the fifth continent thus added to the DENIC name server map. Web offers under the ending .de are now much quicker available to Internet users in Oceania because response times could be reduced from 140 ms to less than 20 ms on average.

What's so special about the location, however, is the fact that it is a virtual location and thus marks the start of a new era of name server technology at DENIC. The big advantage of the solution: It can be operated on any target platform and thus enables easy rollout and operation. The crucial feature, however, is the highly flexible scaling options it provides for changing query volumes.



## **User-Friendly Public Dashboards: Statistics All Around .de, DNSSEC, IDN and ENUM**

Up-to-date and user-friendly statistics that provide well-structured information about .de at a glance, that's the aim of the new interactive dashboards DENIC makes available on its website at <https://www.denic.de/en/monthly-statistics/>.

The user can trace the development of the four segments .de domains, IDNs, DNSSEC and ENUM on a monthly basis and individually adjust the period to be considered. An interface connects the dashboards to the DENIC domain database, and the data for the graphic display on the website is made available in form of a JSON file.

## **Innovative vChecked Product Available as Beta Version: Domain Verification for Greater Transparency and Trust**

The aim of the vChecked product is to sustainably optimise the quality of domain holder data and thus create greater transparency, which, in turn, shall lead to an enhanced level of trust on the Internet users' side. vChecked relies on a multi-stage domain verification process to achieve this target.

DENIC has implemented a fully functional beta version for the DENIC members. With this version, the data can – in cooperation with external partners – be checked on consistency and accuracy, and in the last step, an identity check of the person responsible can be performed. The testing of the

beta version will be succeeded by an evaluation phase with the DENIC members with the aim of concretely following up on the topic.

## **Performance Indicators for Members' Domain Development: Individual Dashboards**

A first beta version of new interactive dashboards gives interested members the opportunity to get an overview of the individual development of the .de domains under their management and of their performance level compared to others in the same market field with the same business model.

The dashboards display domain gains and losses and show the individual market shares in .de domains and in the group that operates the respective business model. The DENIC members can also read out details of all the requests that have been submitted to the registration system via the member.

With the dashboards, DENIC wants to provide its members with a statistical tool that enables them to strategically strengthen and positively develop their business. The product shall be finalised after feedback has been obtained and is planned to be made available to all members in the first half of 2022.



# Engagement

2021, too, was characterised by the Covid-19 pandemic and for the domain industry by an accelerated global digitisation. This has made a safe, reliable, open and free Internet more important than ever. DENIC once again contributed in many ways and with great commitment in 2021 to reaching this aim.

## DENIC and Academic Institutions

Since 2018, DENIC has a cooperation agreement with CISPA – Helmholtz Center for Information Security to combine research with practical experience in the fields of cyber security and data protection. In 2021, CISPA worked on a study for DENIC that investigated a resolver reputation service designed to protect against DoS attacks. The results are expected in 2022. Also since 2018, DENIC is a member of the CAST Forum (Center for Applied Security Technology) that is related to the Technical University of Darmstadt.

## DENIC Sponsoring and Promoting Young Talents

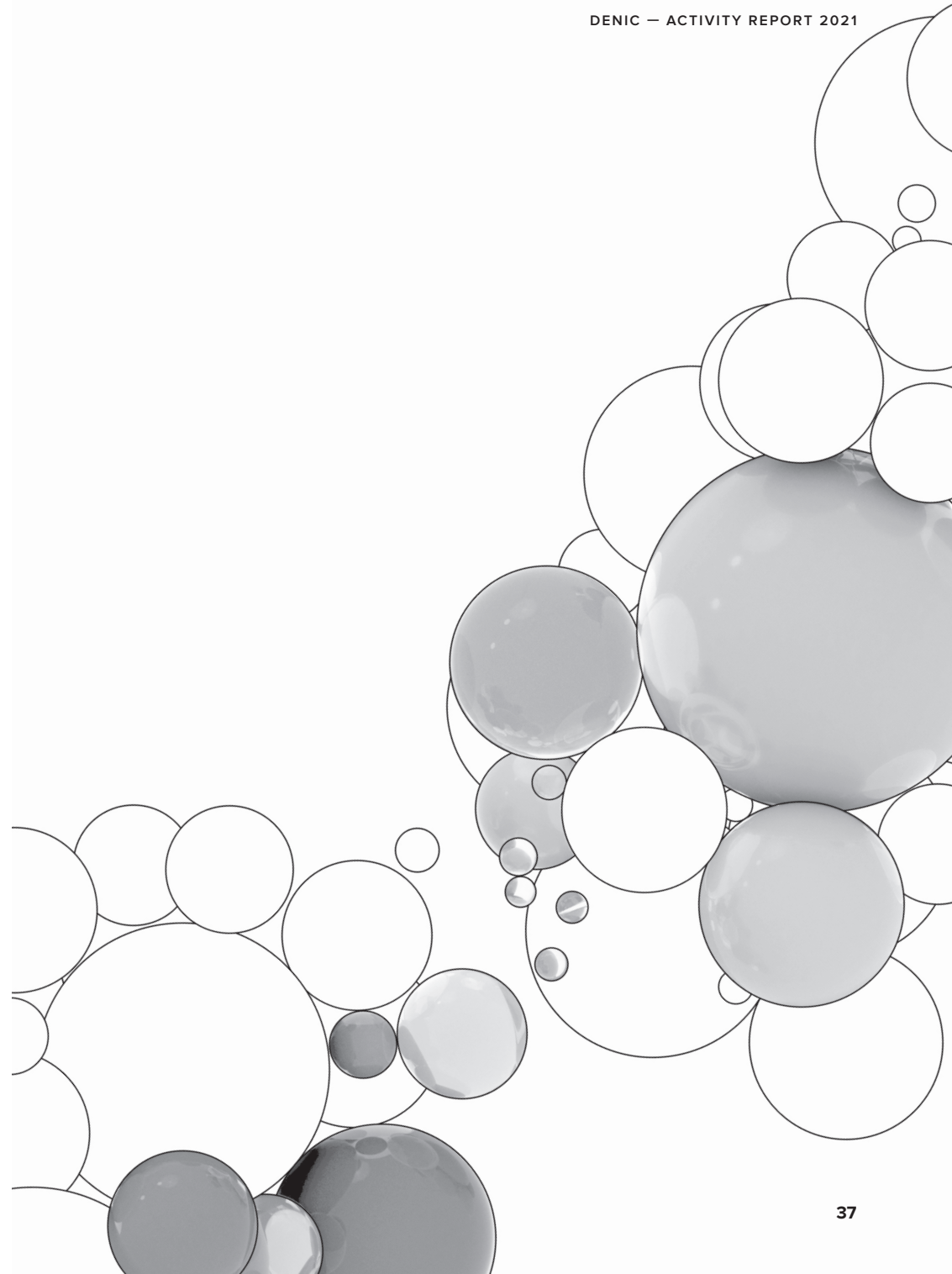
DENIC supports the training and further education of young talents with a wide variety of offers. The Cooperative has taken on apprentices and trainees for IT professions for more than two decades. Since 2007, it has been the main sponsor of the annual European Summer School on Internet Governance (EuroSSIG) in the East-German city of Meißen for future players in the Internet governance realm. Since 2018, DENIC has supported the local edition of the IT youth hackathon initiative “Jugend hackt” in Frankfurt, Germany. Under the motto “Improve the world with code”, young talents and qualified mentors jointly develop open data projects at this event.

DENIC also is a gold sponsor of the renowned CloudFest, the world's major conference of cloud, hosting and Internet service providers. Supporting the "Frankfurter Entwicklertag", DENIC provides funds for establishing agile methods in practical work. DENIC successfully applies agile methods already in many areas in the company.

## DENIC's Commitment to Sustainability & Corporate Social Responsibility

Next to an ongoing commitment, including the use of green electricity, regional and eco-friendly products or climate-neutral post service, DENIC has been engaged in social and sustainability projects for years. The Cooperative's 2021 activities included for instance the DENIC forest: On the occasion of the two jubilees, 25 years of DENIC and 35 years of .de, DENIC has started to plant a small forest in the area by donating trees. At the end of 2021, the DENIC forest had already grown to include 1,000 trees. The Cooperative further collected used mobile phones for reconditioning and recycling by an external provider. This project supports the insect protection fund of NABU, a German nature and biodiversity conservation union. With flower seeds and bug houses, DENIC also funded the bee saver project "Bienenretter" on the occasion of the world bee day.

Moreover, Arche Frankfurt e.V., an association of volunteers that has made it its aim to give children with a difficult financial background a perspective for the future, received IT donations in kind during the year, and DENIC participated in a Christmas special of the association. DENIC further gave a donation to the Frankfurt association for children suffering from cancer "Hilfe für krebserkrankte Kinder Frankfurt e.V." (HfK).





# DENIC Subsidiary

At the end of 2018, the DENIC subsidiary DENIC Services GmbH & Co. KG was founded. The KG operates the business fields Data Escrow, Anycast DNS and DENICdirect, all of which it has taken over from DENIC eG. They are progressively complemented by independent new business fields such as Digital Escrow.

You find information about the KG and its business fields at:

[www.denic-services.de/en](https://www.denic-services.de/en)

## Data Escrow

In 2021, the Data Escrow business continued to grow. Compensating the lack of face-to-face meetings with intensified activities on alternative channels such as social media, newsletter or webinars, DENIC Services GmbH & Co. KG successfully maintained good contact with its customers.

## Also the customer base and the geographic coverage have increased

New onboarding features made the Customer Service Portal for Data Escrow more attractive and viable for the future. With a leaner onboarding process for new customers and a facilitated handling of everyday operations, Data Escrow is well prepared for future challenges, including the integration of potential new gTLDs.

# 4.8

of 5 points



Customer satisfaction  
increases by 4% ↗



# RDE

Customer growth 6% ↗  
Now 4 continents covered  
Europe, Asia, North America  
new: South America

# RyDE

Customer growth 14% ↗  
Now 4 continents covered  
Europe, North America, Asia  
new: Africa



# 5

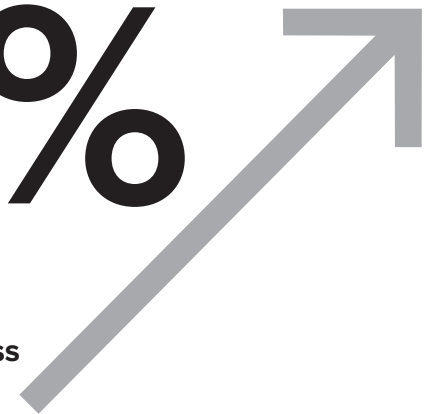
## Continents

Europe, North and South America, Asia  
new: Australia

# 3.2%

## Increase

in overall turnover of KG business  
from 2020 to 2021



## Anycast DNS

The network of globally distributed Anycast DNS servers was also expanded. With the new virtual Sydney location, the network now extends across five continents, and thanks to a new technology a location in Africa could be deployed very quickly if required.

Additionally, new filter options protect the Anycast DNS against DDoS attacks and have made it more robust. The related service is provided by DENIC eG.

## DENICdirect

DENICdirect looks after domains that are registered directly with DENIC eG. Amendments to the related processes at DENIC eG performed in 2021 led to the intended sharp drop in this business field at the subsidiary.

In 2021, DENIC Services GmbH & Co. KG achieved a cross-divisional increase in turnover of 3.2 percent.

## New Initiatives and Outlook

True to the motto “We protect your business”, DENIC Services GmbH & Co. KG will continue to work at the first Software-as-a-Service solution for digital escrow in the German market. The product can be used by all sectors that are looking for an escrow provider for their digital assets, such as source code, contracts or digital keys. The web shop for registering, configuring and making available the service with immediate effect is planned to go live in mid-2022.

*“Growing the company, maintaining and even increasing the quality of service to our customers, and getting all employees safe and healthy through this year marked by the pandemic, by distance and the cancellation of face-to-face meetings has been a challenge. But we did it again.”*

**Stefan Pattberg**  
Managing Director of  
DENIC GmbH & Co. KG





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