



NLNETLABS

ANNUAL REPORT 2025

Table of Contents

About NLnet Labs	5
Mission	5
Organisation	6
Our strategic goals	6
DNS activities and results	8
Routing activities and results	9
Community activities and results	10
25 years of NLnet Labs – the Silver Jubilee	10
Technical community and standards	10
Bridging Technology & Policy	11
Report of the Supervisory Board	12
Year in Brief	12
Key Themes	12
Composition	13
Financial Report	13
Income From Support and Development	13
Grants and Subsidies	13
Looking Ahead	14
Colophon	16

About NLnet Labs

NLnet Labs is a not-for-profit foundation, founded in 1999. Over the past 25 years our mission has been to develop open-source software and open standards for the benefit of the internet, and to perform applied research on internet protocols. We focus our efforts specifically on the Domain Name System and inter-domain routing. NLnet Labs' work supports the robustness, security and reliability of the internet and safeguards the privacy of its users.

You may not have heard of us. But if your email arrived, your government site loaded, or your cloud platform didn't blink—you've probably already met us.

Hospitals, banks, global platforms and backbone networks all rely on software developed by NLnet Labs. Much of our work happens quietly in the background, but it supports services and infrastructure that people depend on every day.

Since 1999, NLnet Labs has developed open-source software for DNS and routing. Our software is freely available, designed for use in demanding production environments, and supported by a team with deep technical expertise.

Our work extends beyond software development. We also contribute actively to the open standards and protocols developed within the IETF. Reliable internet infrastructure depends not only on good software, but also on open standards, long-term maintenance and responsible stewardship.

We believe that the systems on which the internet depends should be open, secure and resilient. Contributing to those systems, through software, standards and technical expertise, is at the heart of our mission.



Mission

NLnet Labs, established in 1999 as a nonprofit foundation, develops open-source software and publicly accessible standards designed to enhance the Internet. Open-source software allows anyone to review, modify, and improve the source code, while open standards are freely accessible guidelines created through open processes. We also actively collaborate with other developers to promote interoperability among implementations, encouraging widespread adoption of open standards. Our goal is to ensure a robust, secure, and reliable Internet while protecting user privacy.

To achieve our mission, we collaborate with key Internet organisations globally. Our peers recognise us as influential contributors in developing and advocating open standards and open-source software. We are widely regarded as leading experts in fundamental Internet

technologies, particularly DNS and routing. Our collaborations include work with organisations such as the Internet Engineering Task Force (IETF), Regional Internet Registries (RIRs), the Internet Corporation for Assigned Names and Numbers (ICANN), prominent Top Level Domain (TLD) operators, associations like CENTR, and networking communities including RIPE, OARC, NANOG, as well as individual researchers and major industry stakeholders.

Organisation

We are a lean organisation with a team of around 16 people, consisting almost exclusively of developers and researchers, with minimal overhead. We attract talented people who want to make a difference to the well-being of the internet, with a profound belief in open source and open standards.

We develop open-source software widely adopted throughout the Internet industry, from DNS root servers at the heart of the Internet to compact, embedded devices running secure recursive resolvers. Additionally, we create routing software designed to secure large operators' networks and enhance network observability and manageability.

Our researchers pioneer new technologies, help define future standards, and build prototypes of technologies that promise to improve the internet. We increase understanding of the internet by studying its fundamental building blocks. By actively participating in both worlds – development and research – we bridge the gap between academia and industry, and introduce solutions that are practical as well as innovative.

We also contribute to policy and governance by bridging technology and policy. Our technical expertise and advice is widely recognised by policy-making bodies. We advise on public policy decisions that affect the security and privacy of internet users across the globe, as well as the stability of the internet itself.

Our strategic goals

Our aim is to deliver solutions that strengthen trust, security, privacy, scalability, and the global nature of the Internet. To support this, we actively engage in research and innovation focused on DNS and routing technologies.

DNS

NLnet Labs is widely recognised for developing the authoritative DNS name server NSD and the recursive, validating DNS resolver Unbound. In 2025, we started the development of Cascade, the successor to OpenDNSSEC: a DNSSEC signing pipeline and key management solution designed according to operational best practices. Through these robust open-source technologies, we have strengthened the stability and resilience of the Internet and accelerated the adoption of DNSSEC.

We have also advanced DNS security and privacy at the user level through tools like dnssec-trigger and libraries like getdns, which bring protection directly to the end-user. These projects have influenced broader development efforts: dnssec-trigger concepts, for example, have been adopted by Gnome NetworkManager, while insights from getdns continue to inform our ongoing and upcoming work, as outlined in the following sections.

We remain committed to providing a stable and secure DNS, which supports broader Internet trust and security while safeguarding user privacy. Looking ahead, we are focusing on three key areas: improving DNS libraries and APIs for developers; enhancing modularity and ease of integration for DNS operators; and scaling up the size and performance of our solutions.



Routing

Our work in routing focuses on two main goals: (i) strengthening BGP routing by leveraging RPKI for greater robustness and future security, and (ii) giving network operators better visibility into BGP data to help them enhance the stability and quality of their infrastructure.

RPKI is primarily used for Route Origin Validation (ROV) to help prevent accidental route misoriginations. More recently, ASPA has emerged as an additional routing security technology built on top of RPKI to further improve path validation. NLnet Labs develops and maintains the widely used Krill RPKI Certificate Authority (CA) suite, which is used by a Regional Internet Registry (RIR), several National Internet Registries (NIRs), and more than 2,000 member organisations. Krill supports the publication and management of ASPA objects. For validation, our Routinator software is the most widely used RPKI validator suite, enabling network operators to filter routes with invalid origins. Routinator also supports ASPA validation.

We continued development of Rotonda to improve observability and manageability in (inter-domain) routing. Rotonda can collect and analyse BGP and BMP (BGP Monitoring Protocol) data from routers and provides operators with programmable components for monitoring and managing their BGP workflows. Rotonda can combine routing data with related data sources, such as RPKI information, to be integrated into routing filtering, selection and management. Stand-alone applications such as looking glasses can also be built using Rotonda.

Community

Over the past two and a half decades, NLnet Labs has worked carefully on its visibility and reputation as an expert on DNS and inter-domain routing. Our active involvement in the standardisation community at IETF and operations communities such as RIPE, CENTR and OARC

has established us as an organisation possessing extensive knowledge of the Internet's functioning and its foundational elements.

Beyond technical contributions, we actively provided expertise to the policy-making community through participation in the ICANN community and national governmental advisory committees on open standards. With the growing involvement of governments with internet governance, the regulation of internet operators and software itself, we are uniquely positioned to make meaningful contributions to these discussions. A recent example is our contribution to policy discussions in the EU about regulating software based on our decades of experience with open source software.

DNS activities and results

We have continued to develop and improve our prime products, NSD and Unbound, which are used at virtually every level of the internet by everyone from individuals to the largest network operators, content delivery networks (CDNs) and cloud providers. We are at the forefront of developing new standards and incorporating them into our software. We are also in dialogue with the industry to ensure that we can cater for their needs when it comes to offering services to their customers.



Our strategy is not to rewrite our existing products that currently power much of today's DNS infrastructure in the world but to rethink how people develop and deploy software that uses the domain name system. Over the next few years, NLnet Labs aims to provide a full-featured DNS library using the Rust programming language. This library will enable developers to create software that meets the demands of the modern internet, from applications on compact embedded devices to large-scale server farms. Adopting our library is expected to facilitate the seamless

integration of name services with applications and services, encouraging the use of secure and private defaults. Just as Let's Encrypt achieved worldwide adoption of TLS, we want to promote secure name resolution.

We started the development of 'domain', our DNS library in Rust, in 2018 as a Friday-afternoon project. From 2024 year onwards, the project got a dedicated team of developers and the organisation's long-term commitment. In light of this goal, we received a grant from Sovereign Tech Fund to expand the 'domain' library with essential functionality.



The 'domain' library aims to provide a comprehensive – ideally complete – range of building blocks necessary to build specialised DNS applications or include uses of DNS in other applications. By now, it provides several foundational features centered around representing the components of a DNS message – domain names, resource records, etc. – and creating, parsing, and processing them. In addition, it contains a simple, async stub resolver that you can use to initiate specific queries towards upstream resolvers. 2025 saw several releases of domain introducing the "new" API, an effort to modernize the domain crate interface and data structures based on user feedback, introduced a sample query router, added key management and other

features to be used by the upcoming Cascade DNSSEC signing solution (see below) along with the usual bug fixes and quality of life improvements.

Our goal is to enable operators to integrate their business logic and traffic engineering requirements directly into DNS infrastructure, while also removing barriers to DNSSEC adoption by providing a flexible and accessible signing solution.

One of NLnet Labs' key goals in the coming years is to develop a new DNSSEC signing solution. In October 2025 we announced on our website, on the OpenDNSSEC announcements mailing list and at the OARC 45 conference in Stockholm that OpenDNSSEC will no longer be supported after October 2027, with ongoing support and critical fixes only until then. Work on the replacement, Cascade, our new Rust based DNSSEC signing solution, was begun, in part funded by a grant from the Sovereign Tech Fund, with the project and initial alpha release also being announced at OARC 45.

Together, these efforts aim to modernise authoritative DNS services and make advanced functionality more accessible to a broader range of users.

The development of DNS diagnostics tool 'dnsi' continued with small features and improvements. The idea is to provide functions beyond simple DNS queries. For instance, it could allow you to check the DNSSEC status of a zone or whether your local resolver provides answers that match those given by the authoritative servers.

In 2024, we released the first version of dnst, a Rust-based DNS toolbox that provides drop-in replacements for the most commonly used Idns example programs like sign a zone, check the correctness of a zone, and so on. In 2025, we further extended dnst with key management support based on the Domain library, to be for use with Cascade.

Routing activities and results

Krill and Routinator are continually being developed to incorporate new standards and features based on industry needs. For example, we recently added full ASPA support to both Krill and Routinator.



To strengthen and expand our software portfolio, NLnet Labs aims to play a leading role in developing software that supports inter-domain routing. Our goal is to enhance the quality and security of the global routing system by building on our existing tools, Krill and Routinator, and enable monitoring and analytics with Rotonda.



Rotonda is a flexible tool that allows users to create custom BGP monitoring applications by combining programmable components. Its architecture supports real-time reprogramming and reconfiguration, offering high adaptability. Although designed for inter-domain routing, Rotonda is equally valuable for individual networks, enabling operators to build tailored monitoring and management tools. Its versatility and scalability make it well-suited to address key challenges such as security, visibility, and operational reliability.

As part of its development, we are creating a scalable data store with advanced search and query capabilities. This will provide network operators and



Internet Exchange Points (IXPs) with detailed, real-time views of the inter-domain routing landscape, strengthening the Internet's overall resilience and security.

Thanks to its modular design, Rotonda can power a broad range of applications for network operators and IXPs. These include looking glasses, route reflectors, route servers, and full-featured BGP routers—all built to scale efficiently, regardless of routing volume or session complexity.

Important developments in 2025 are the introduction of the RTR component, enabling operators to combine RPKI ROV information with their own routing data. Combined with the continued improvement and enhancement of Roto, the embedded scripting language, this paved the way for customizable hooks to let operators act on changes in the RPKI with specific effects on their routes. Another, less visible but important development was rewriting the internals providing the HTTP JSON API. With it becoming more flexible, it now allows for (again in combination with Roto) custom API endpoints. This gives operators flexibility in querying the stored data, with virtually no overhead at runtime.

Other developments include support for LocRib, and preparations to support non-unicast address families and Addpath. Together, these will form the basis to provide support for use-cases typical to larger (intra-domain) networks such as BGP-LS and FlowSpec.

Community activities and results

25 years of NLnet Labs - the Silver Jubilee

On Friday, February 2025, NLnet Labs celebrated twentyfive years of delivering on its mission. The 'Silver Jubilee' event saw 100 of our closest friends, partners and alumni across open source implementers, the operator community, internet standardisation and policy making join us in Amsterdam for a day of talks, networking and celebration of what we accomplish and enjoy doing together. Attendees from Amsterdam to Argentina illustrate the world-wide impact of our work and the connections we forge while doing so. A worthy successor to 'Twenty years of Awesome', our twentieth anniversary.

Technical community and standards

Over the past two and a half decades, NLnet Labs has carefully built its visibility and reputation as a leading expert in DNS and inter-domain routing. Our active participation in standardisation efforts at the IETF, and in operational communities like RIPE, CENTR, and OARC, has established us as a trusted authority on the Internet's core infrastructure.

Our involvement in the IETF aligns with our core objectives of ensuring the Internet's security, privacy, and stability. Ongoing discussions with industry partners regarding operational challenges and the delivery of practical solutions share our activities within those principles. NLnet Labs has actively contributed to and co-authored numerous Internet Drafts (I-Ds) and RFCs, initially focusing on DNS and expanding into RPKI and inter-domain routing. Developing

IETF standards places a significant emphasis on proof-of-concept implementations and interoperability, collectively called running code. By providing early implementations of (draft) standards, we actively contribute to the evolution of open standards within the IETF.

Another significant activity involves applied research to develop and evaluate new technologies, study operational challenges, and validate solutions. Historically, we have undertaken research projects in collaboration with or on behalf of various organisations, including NLnet, SURF, ICANN, ISOC, and RIPE NCC, as well as with companies such as Verisign and Comcast. The outcomes of these applied research projects have consistently earned high regard within the community, contributing to industry advancements. This impact is evident through deeper operational insights leading to improved operational practices (BCOPs – best current operational practices) and enhancements to standards and implementations. Our enduring relationships with these organisations often lead to invitations for project participation or research project tenders.

In 2025, we contributed:

- In 2024 we contributed to the study The reduced risk of redirected query traffic with signed root name server data. In this study, we evaluate the potential security benefits of DNSSEC signing the root-servers.net zone, which currently provides unsigned authoritative data for the root server identifiers.

Following up on this report, we engaged with the Root Zone Evolution Review Committee (RZERC) in 2025 on the task to ask ICANN to sign the root name server data. The RZERC is expected to publish a “Lessons Learned” report based on the feedback from the consultations performed in this context.

Bridging Technology & Policy

Beyond technical work, we contribute to policy discussions through engagement with the ICANN community and national governmental advisory committees, offering insights grounded in our long-standing experience with open standards and open-source software. As governments become increasingly involved in Internet governance and regulation, extending even to software itself, our role becomes ever more vital. An example is our multi-year contributions to EU policy discussions on software regulation. Embedding our expertise across standardisation, operational, and policy-making communities not only supports our strategic goals but also ensures our continued relevance and sustainability.

This engagement enhances our visibility, promotes adoption of our solutions, drives collaborative research, bridges gaps between engineers and policymakers, and helps secure development partnerships and support contracts.

In 2025, we contributed:

- Co-chairing research into the use of Free and Open Source Software in global domain name registration and DNS infrastructure in ICANN’s Security and Stability Advisory Committee (SSAC), resulting in the publication of SAC132 - The Domain Name System Runs on Free and Open Source Software (FOSS) for an audience of global policy makers and regulators.

- Continued engagement with the European Commission's DG-CNECT to improve draft guidance on the application of the Cyber Resilience Act to developers of Free and Open Source Software. The guidance is expected to be published in 2026.

Report of the Supervisory Board

The Supervisory Board oversees the policy of the Management Board and the general affairs of Stichting NLnet Labs. In addition to its supervisory responsibilities, the Board acts as a strategic sparring partner. In 2025, the main areas of attention were financial sustainability, governance and strategy.

Year in Brief

The Supervisory Board met four times with the Management Board. It approved the 2024 financial statements and annual report, as well as the annual plan and budget for 2026. The Board also conducted its annual self-evaluation to reflect on its own performance and effectiveness.

Key Themes

Finance and Risk

Financial sustainability remained an important topic throughout the year. The Supervisory Board reviewed the 2024 financial statements, the financial outlook for 2025, and the budget and operational plan for 2026. Particular attention was given to the organisation's funding mix, the use of reserves, personnel costs, and the further development of more structural and recurring sources of income. In this context, the contribution of Open Netlabs to the long-term financial sustainability of the organisation was also discussed.

Governance and Compliance

The Supervisory Board discussed the governance and organisational structure of NLnet Labs, including the allocation of responsibilities, costs, and activities within the organisation. Particular attention was given to maintaining a clear and transparent structure and safeguarding the foundation's ANBI status. External fiscal, legal, and accounting advice was sought where appropriate. The Board also continued to strengthen its own governance and supervisory processes.

Growth and Strategy

A substantial part of the Board's attention was devoted to the development of NLnet Labs' strategy for the coming years. Discussions addressed the organisation's strategic position and direction, its public-interest mission, and the conditions needed to support its long-term sustainability and growth. Together with the Management Board, the Supervisory Board discussed how to strengthen the connection between strategy and execution, with particular attention to product priorities, market position, customer retention, business development, and marketing.

Composition

As of 31 December 2025, the Supervisory Board consisted of five independent members, with terms of office and roles defined in the Board's regulations. The Board included some overlap in terms with newly appointed members to ensure continuity.

NLnet Labs Supervisory Board in 2025		
Name	Role	End of Term
Bart Nieuwenhuis	Chair	1 July 2027
Marieke Huisman	Secretary	1 January 2027
Andrei Robachevsky	Member	1 January 2027
Loek Bakker	Member	1 January 2027
Niels Westerlaken	Member	1 January 2027

Financial Report

Income From Support and Development

A key objective in 2025 was to further increase revenue from support contracts and sponsored feature development. These activities are carried out through Open Netlabs B.V., the wholly owned and taxable subsidiary of NLnet Labs, which operates in line with the foundation's public-benefit mission and governance framework.

Open Netlabs offers support contracts for our production-grade software, including NSD, Unbound, Krill and Routinator. These contracts provide customers with service-level support, early access to security patches, and an opportunity to contribute financially to our open-source mission. In addition, it provides training, software development on internet security standards, and consulting services such as installation support, optimisation, and audits.

Grants and Subsidies

Since 2012, NLnet Labs has received substantial annual support from SIDN, renewed in 2022 for another five years. We are also grateful for the long-term grants from Infoblox, Verisign, Meta, Comcast, and SUNET, as well as the many ad-hoc donations from organisations and individuals.

In-kind contributions were again vital in 2025: e.g. Fastly and Hertzner provided free services that enabled automated testing, analysis tooling, and a resilient production platform.

Income			
	2024 Actual (k€)	2025 Actual (k€)	2025 Budget (k€)
SIDN Subsidy	125	125	125
Other donations	271	299	170
Consultancy and other income	20	21	19
Research and projects	1300	170	555
Income from Interest	4	6	1
Total	1720	621	870

Expenditure			
	2024 Actual (k€)	2025 Actual (k€)	2025 Budget (k€)
Staff	719	712	675
Housing	40	36	37
Travel	37	33	31
Depreciation	3	2	0
Project Costs	550	1	0
Other Costs	44	41	39
Sub Total	1393	825	782
Negative Result Open Netlabs B.V.	-154	-62	0
Project Reservations	481	-142	88
Total	1720	621	870

Balance Sheet (k€)			
Assets		Liabilities	
Inventory	2	General Reserve	1446
Open Netlabs B.V. Stock and Loans	299	Special Purpose Reserves	0
Receivables	240	Current Liabilities and Accruals	125
Bank and Cash	1030		
Total	1571		1571

Looking Ahead

NSD, Unbound and Routinator continue to see strong demand for support contracts and remain important foundations of our work. At the same time, we are actively bringing newer projects to the attention of the broader Internet community and supporting their adoption in operational, academic and research environments.

In 2026, we will continue to promote deployment and operational use of our newer projects across academia, industry and the wider technical community. The progress on the Domain DNS library offers opportunities to build new DNS applications and services in Rust that strengthen the DNS ecosystem. These developments are also expected to support industry adoption and contribute to long-term financial sustainability. We'll continue to strengthen, extend and renew

the domain library, advancing it for users in general and in particular to meet the needs of Cascade with the intent to release a first production quality version of our new DNSSEC signing solution in 2026.

Rotonda continues to generate attention within the routing community, both in research and operational settings. In 2026, our focus expands to include support for intra-domain specific analytics, which opens up new funding avenues. Additionally, significant fundamental performance improvements based on deployment experiences in 2025 are planned, as handling large volumes of data is one of Rotonda's key features operators are interested in.

More broadly, we will continue exploring ways to apply our research and software development results in innovative solutions and services that benefit operators, academic users, industry partners and the Internet community as a whole. We also expect that increased adoption of our software and operational expertise will further strengthen opportunities for support contracts, collaborative development and long-term financial sustainability.

Our team has remained stable for several years, and we do not foresee additional growth in full-time equivalents in the coming years. We believe the current team size, combined with continued focus and prioritisation, provides a strong basis for achieving our strategic objectives while maintaining the quality and sustainability of our work.

Colophon

Photo Credits

Photo on page 7 by Brett Garwood on [Unsplash](#)

Contact

Stichting NLnet Labs
Science Park 400
1098 XH Amsterdam
labs@nlnetlabs.nl
www.nlnetlabs.nl

© NLnet Labs

You are free to use the content from this annual report, but we would like to be credited as the source. If you plan to use information from this report for your publication, kindly inform us in advance via labs@nlnetlabs.nl.



<https://creativecommons.org/licenses/by-nc-nd/4.0/>