NLnet Labs Mission & Goals

2023-2026

Executive Summary

The primary objective of NLnet Labs is to develop open source software and open standards for the benefit of the Internet, as well as promote widespread adoption of the standards and software that we contribute to. Our efforts are intended to support the robustness, security and reliability of the Internet and safeguard the privacy of its users. We also provide technical expertise to policy-making bodies, including regulators and governments.

Over the next three to five years we will continue our leading role in promoting technologies that stimulate trust, security, privacy, scalability and the global nature of the Internet. We create powerful and professional tools that are used widely within the industry. Our research engineers get the opportunity to nurture technologies that might not bring an immediate benefit to the Internet. The expertise and advice that we provide continues to be widely recognised. The activities of NLnet Labs are aimed at users of the Internet in the broadest possible sense. Our software is used by network operators, as well as the registry, research and enthusiast communities.

We strive to achieve these goals with minimal management overhead. The organisation values diversity, aiming at a fair representation between genders and to employ staff members from a wide range of nationalities, cultures and backgrounds.

With our activities we typically target the areas of DNS and routing. With the introduction of viable open-source alternatives with authoritative DNS name server NSD and the recursive validating DNS resolver Unbound, we contribute to the stability and resilience of the Internet and pushed the deployment of DNSSEC. In addition, we offer a DNSSEC key management and zone signing solution, as well as client/end-point DNS solutions that pushes security and privacy to the end-user. In the area of increasing safety of the inter-domain routing system, we will develop and maintain a comprehensive set of tools in the area of Resource Public Key Infrastructure (RPKI) to provide Route Origin Validation and work to make inter-domain routing behaviour observable, thereby enabling operators to easily improve the quality and stability of their infrastructure.

Our finances over the coming years are secured by a long-term subsidy by Stichting Internet Domeinregistratie Nederland (SIDN), donations from organisations who support our activities and income from our wholly owned, taxable subsidiary. Through this subsidiary, we continue to offer support contracts with a service level for our production-grade software packages, as well as training, software development in the area of Internet standards, consulting services such as installation and integration support, optimisation and auditing.

Elevator Pitch

NLnet Labs is a nonprofit foundation with the mission to develop open source software and open standards for the benefit of the Internet, particularly in the area of DNS and routing. Our efforts support the robustness, security and reliability of the Internet and safeguard the privacy of its users.

We also provide technical expertise to policy-making bodies, including regulators and governments so they have the understanding they need when making public policy decisions related to the Internet infrastructure. We are funded through long-term subsidy, regular donations, as well as support contracts, paid enhancements to our software, consultancy and training delivery.

1 Mission Statement

NLnet Labs is a nonprofit foundation founded in 1999. Our primary objective is to develop open source software and open standards for the benefit of the Internet. With open source software we mean software with source code that anyone can inspect, modify, and enhance. Open standards can be defined as standards which are developed based on a publicly accessible procedure and that may be used freely by everyone.

In addition to developing our own software, we actively try to enter into collaborations with other developers to support our primary objective. In addition, we promote widespread adoption of the standards and software that we contribute to.

Our efforts are intended to support the robustness, security and reliability of the Internet and safeguard the privacy of its users. We also provide technical expertise to policy-making bodies, including regulators and governments, so they have the understanding they need of how the Internet works, which (emerging) technologies should have their attention and what current best practices are when making public policy decisions.

To accomplish this goal, we work together within various other organisations in the Internet community, such as Internet Society (ISOC), the Internet Corporation for Assigned Names and Numbers (ICANN), the Internet Engineering Task Force (IETF), the five Regional Internet Registries (RIRs) and various Top Level Domain (TLD) operators.

2 Goals

Over the next three to five years we will continue our leading role in promoting technologies that stimulate trust, security, privacy, scalability and the global nature of the Internet. We are recognised as a major stakeholder in the creation and use of open standards and open software. In addition, we are leading experts on technologies that are at the core of the Internet, specifically in the area of DNS and routing.

We are a lightweight organisation with little overhead. Our developers and researchers, ranging from junior to senior, work in small, highly specialized teams. We remain small to stay flat, self-organized, focussed and innovation-driven. We are an organisation that attracts young talent so that fresh ideas are combined with experience and expertise. Our alumni, both students and staff, are found throughout the Internet industry.

We create powerful and professional tools that are used widely within the industry, ranging from root servers at the core of the Internet to small embedded devices running a secure recursive resolver. Our tools are used for signing and validation operations in both routing and DNS security applications and help operators to improve the quality and stability of their infrastructure.

Our research engineers get the opportunity to nurture technologies that might not bring an immediate benefit to the Internet. They contribute to new and emerging standards and create prototypes that can evolve into production-grade implementations over time. This can be achieved both within the organisation as well as through collaboration with other experts in the field.

Our expertise and advice is widely recognised with policy-making bodies, including regulators and governments. We play an advisory role in public policy decisions that affect the security and privacy of Internet users across the globe, as well as the stability of the Internet itself.

3 Target Audience

The activities of NLnet Labs are aimed at users of the Internet in the broadest possible sense. While our software is mostly used by network operators, it supports and enhances the fundamental core of the Internet, benefiting every user in areas such as reliability of services, security and privacy.

Typically, the users of our DNS implementations are operators who manage DNS at one of the Root servers, a Top Level Domain, a Content Delivery Network or enterprise. In addition, our software is at the heart of many commercial appliances such as VPN products, firewalls, etc. Our software in the area of Internet routing is used world wide by network operators who manage the Border Gateway Protocol (BGP), such as transit providers, Internet Exchange Points (IXPs), Internet Service Providers (ISPs), hosting and cloud providers, as well as enterprises. In addition, Regional and National Internet Registries are frequent users of our software, such as for running Reverse DNS or Resource Public Key Infrastructure (RPKI).

Last but not least, the research and enthusiast communities play an important role in our ecosystem, with people running our software on home routers though OpenWRT or using it on embedded systems.

4 Team

NLnet Labs strives to achieve its goals with minimal management overhead. The organisation values diversity, aiming at a fair representation between genders and to employ staff members from a wide range of nationalities, cultures and backgrounds. Our goal is to be as open and inclusive as possible, with the love for open source and open standards binding us together.

Almost all of the staff is comprised of software developers and research engineers. Both foundation and wholly owned subsidiary strive to remain small and self-organized, with a healthy mix of experience ranging from junior to senior and people who focus on software development or research. Research projects can be done by a single person, in a small team or through collaboration with research groups from other organisations. Knowledge, experience and resources are shared between NLnet Labs and the subsidiary's staff on a continuous basis.

If a software project grows into a mature product that is used in production environments, our goal is to have at least three developers who have a good working experience with the code in order to maintain stability and continuity.

Supporting responsibilities, such as accounting and auditing, staffing and recruiting, as well as sales and marketing remain in-house while effective, but are delegated or out-sourced when they are not.

5 Operational Strategy

Our goal is to offer solutions that promote the trust, security, privacy, scalability and the global nature of the Internet. We specifically target the areas of DNS and routing. With this in mind, we will be active in the several research and innovation areas:

5.1 DNS and DNSSEC

NLnet Labs is a well-established name for its development of an authoritative DNS name server NSD and the recursive validating DNS resolver Unbound. With the introduction of viable open-source alternatives, we contributed to the stability and resilience of the Internet and pushed the deployment of DNSSEC. OpenDNSSEC was one of the first complete environments for DNSSEC key management and zone signing, and still is unique in its policy-based management and signing. The design and implementation of client/end-point DNS solutions pushes security and privacy to the end-user. Tools like dnssec-trigger and libraries like getdns have been instrumental to realise these goals.

We are committed to continue our efforts to contribute to a stable and secure DNS that enables security and trust services for other applications; while guaranteeing the privacy of end users.

We have three areas of focus for the coming years. We will work towards memory safety for our software. We will improve (modular) extensibility of our software by DNS operators and simplify integration of our software in their operations. And we want to improve scalability: both in size and performance.

5.2 Routing

Our implementations are aimed at (1) leveraging RPKI to make BGP routing more robust and (in the future) secure, and (2) providing operators with insight into BGP data to help them improve the quality and stability of their infrastructure.

Currently RPKI is used primarily for Route Origin Validation (ROV). ROV provides routing safety in that it protects against accidental mis-originations. We maintain an RPKI CA suite (Krill, Krill Sync) which is currently used by a number of NIRs, and over 2000 member organisations, in order to make cryptographically signed statements about their routing (origin) intent. We also maintain the most widely used RPKI validator suite (Routinator, RTRTR) which is used by network operators to act on routes with invalid origins.

On the RPKI CA side, we will work to make Krill a usable option for the RPKI infrastructure of RIRs, including support for running as a trust anchor. More generally, we will continue to improve the RPKI CA server tooling, with a specific focus on improving resilience, and reliability, both in terms of our code as well as by working on improved IETF standards. We will continue work to support future RPKI-based solutions that protect against BGP path manipulation, such as ASPA and BGPsec, respectively as they are standardised in the IETF and adopted by industry.

Routinator and RTRTR are feature complete and will move towards a 1.0 release. While this shifts focus to quality of life features, we plan to add support for ASPA. Additional development will depend on community input.

We work to make inter-domain routing behaviour observable and enable operators to improve the quality and stability of their infrastructure. To this end, we work on a set of components which will be able to use BGP and BMP (BGP Monitoring Protocol) information from routers in a network and give operators a programmable set of observability and provisioning components that can help them in their BGP workflow. In the future we plan to leverage this code and experience in order to provide more BGP tooling—e.g. a route server.

6 Financial Plan

NLnet Labs was founded as a nonprofit foundation under Dutch law in 1999.

From 1999 to 2015, NLnet Labs relied solely on the subsidy of the NLnet foundation. This financial backing ended in 2015, meaning other sources of sustainable income had to be put in place. The most important new income stream established was a long-term subsidy by Stichting Internet Domeinregistratie Nederland (SIDN), which is now in its third five-year term.

Over time, NLnet Labs has diversified its sources of sustainable income. Today, the two other main sources of income are donations from organisations who support our activities and income generated by support contracts with a service level for our production-grade software.

Being a non-profit foundation, NLnet Labs is obliged to follow strict tax regulation and not allowed to offer taxable services. As a result, we have established a subsidiary, Open Netlabs B.V. The company is a wholly owned, taxable subsidiary of the NLnet Labs Foundation serving the non-profit public benefit goals of its parent, as well as being guided and managed according its charter. If practicable, the subsidiary will use the trade name NLnet Labs Services going forward, to clearly communicate its relationship to the foundation.

6.1 SIDN Subsidy

In 2012 Stichting Internet Domeinregistratie Nederland (SIDN) and NLnet Labs established a long running partnership on technical cooperation, for a period of five years. The agreement was extended in 2022 for a third period of five years up to 2026.

6.2 Donations

Over the years, many organisations have come to rely on the software developed by NLnet Labs. Packages such as Unbound and NSD are deeply engrained in the infrastructure of the DNS root servers, various Top Level Domain operators, Content Delivery Networks, Internet Exchanges and a vast array of Enterprises. Over 2000 networks are now running Routinator for RPKI validation, while Krill enables delegated RPKI in multiple regions of the world. Many of these organisations have pledged to support NLnet Labs with a donation because they support our general activities, they share our vision and wish to contribute to our mission. In addition, they want to see continued support and development of our various software projects. Lastly, there are organisations that subsidise very specific developments or types of research.

6.3 Support contracts

Open Netlabs B.V. offers support contracts with a service level for our production-grade software packages, such as Krill, NSD, Routinator and Unbound. In addition to receiving support and early access to security patches, the financial contribution also supports our mission to provide free and open software for all. Lastly, Open Netlabs provides training and software development in the area of Internet standards, as well as consulting services such as installation and integration support, optimisation and auditing.