

# NLnet Labs Strategic Plan 2019–2022

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## 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 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 securing the inter-domain routing system, we will make a comprehensive set of tools in the area of Resource Public Key Infrastructure (RPKI) to provide Route Origin Validation.

Our finances over the coming years are secured by long-term subsidy by Stichting Internet Domeinregistratie Nederland (SIDN), income generated by the wholly owned, taxable subsidiary Open Netlabs B.V. and donations from organisations who support our activities. Open Netlabs continues 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 security standards, consulting services such as installation and integration support, optimisation and auditing.

## Elevator Pitch

NLnet Labs is a not-for-profit 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 paid enhancements to our software, consultancy and training delivery.

## I Mission Statement

NLnet Labs is a not-for-profit 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.

At accomplish this goal, we work together with various other organisations in the Internet industry, 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 small overhead with a head count of about ten to twelve people, ranging from junior developers to senior researchers. 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.

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.

Our subsidiary Open Netlabs adds to the engineering prowess of NLnet Labs, with the addition of expertise in the area of DevOps (software engineering culture and practice that aims at unifying software development and software operation), User Interface and User Experience, customisation, integration, training, consultancy and outreach. The commercial services that originate from these activities provides a significant part of the funding of NLnet Labs.

## 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, benefitting every user in areas such as reliability of services, security and privacy.

Typically, the users of our 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 by network operators who manage the Border Gateway Protocol (BGP) at the edge, such as Internet Exchange Points (IXPs), 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 through 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. The foundation strives to maintain a head count of around ten to twelve people, 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 or through collaboration with other engineers.

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.

Other responsibilities such as management, product development, finance and auditing, staffing and recruiting, as well as sales and marketing are shared by two people. The wholly owned subsidiary Open Netlabs can grow in headcount to support the size and amount of projects it maintains. Knowledge, experience and resources are shared between NLnet Labs and Open Netlabs staff on a continuous basis.

## 5 Operational Plan

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 environment for DNSSEC key management and zone signing, and still 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 are 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.

### 5.2 Routing

Our implementations are aimed at making Internet routing more robust and secure. Practically, this means we will make tooling in the area of RPKI to provide Route Origin Validation. This system

allows operators to make cryptographically signed statements to convey routing intent and allows them to publish this data. In addition, tooling is provided to download and validate RPKI data and use it in the BGP decision making workflow.

We will continue to work on open standards to enhance the RPKI, as well as future work that should allow Path Validation.

## **6 Financial Plan**

NLnet Labs was founded as a not-for-profit foundation under Dutch law in 1999. Since that time, it 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 that was established was a long-term subsidy by Stichting Internet Domeinregistratie Nederland (SIDN). The two other main sources of income are donations from organisations who support our activities, in addition to income generated by the wholly owned, taxable subsidiary Open Netlabs B.V.

### **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 for another five years in 2017. This means NLnet Labs started focusing more specifically on technical developments with the potential to support the services of SIDN.

### **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. 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 Open Netlabs B.V.**

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 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.

Open Netlabs B.V. offers support contracts with a service level for our production-grade software packages, such as NSD 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 security standards, as well as consulting services such as installation and integration support, optimisation and auditing.