Stichting NLnet   **Annual Report 2003**

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1. Overview

NLnet stimulates network research and development
in the domain of Internet technology.

Open Source

NLnet actively stimulates the development of network technology and makes this technology freely available to the community in its broadest sense. To this purpose, a wide range of internet-related projects are currently being funded for which Open Source licensing conditions, and in most cases the General Public License (also known as GPL or GNU license), hold.

NLnet projects

The projects undertaken by Stichting NLnet can be divided into:

- *Network technology research*: e.g. IIDS, a research group working on interactive intelligent network agent technologies. Application areas include distributed and cooperative systems and e-commerce;
- *Network technology development and engineering*: e.g. NLnet Labs, which focussed on secure DNS and IPv6 in 2003. Application areas include top-level domain services;
- *"Productising" network technology, development and engineering* with a focus on concrete results: e.g. database backend support for DNS service (BIND V9 DLZ), safe and robust network infrastructure configuration for schools (schoolLAN), a generic framework for storing and querying RDF and RDF Schema (Open Sesame), a tool for developing, distributing and installing software (A-A-P), adaptive web access technology (AHA!), report generation from system and network logfiles (LogReport), and many more;
- *Sponsoring of other Open Source or educational initiatives* in the area of networking: e.g. Web contests (ThinkQuest), *open source development* (FSF, FFII and ISC), and *technology conferences* (Hackathon OpenBSD).

These and other NLnet projects are described in more detail in chapter 3.

Financing in 2003

In 2003 Stichting NLnet financed projects to the sum of € 1.287.286 (compared to € 1.565.384 in 2002). NLnet has budgeted € 1.600.000 for projects in 2004.

As an organisation, Stichting NLnet does not derive any financial benefits from the undertaken projects or their results.

Projects new or extended in 2003

A-A-P phase 2

The A-A-P project will provide a flexible and portable framework for software development, distribution and installation in an Internet environment. It should ease Open Source project development and deployment. The work started in March 2002 and the second phase will end in September 2004. This project involves a total of 1.6 man-years.

Ambulant

The Ambulant project will provide the first Open Source implementation of a full SMIL 2.0 media player for PCs and PDA's. The project started in April 2003 and will end in June 2004. This project involves of 1.6 man-years in total for this first phase.

Mail::Box phase 2

The Mail::Box project aims to improve the existing Perl Mail::Box (CPAN) library modules by implementing missing e-mail handling features, enforcing conformance to current RFC's for e-mail processing, and expanding and improving the documentation. The project started in May 2002 and ended in February 2003. Beginning in March 2003, this project continued with Mail::Box phase 2 and ended in December 2003. The implementation effort in total was about 0.6 man-year.

CAcert.org

CAcert.org provides Free Digital X.509 Certificates and is building a Web of Trust for certificates validation.

Extended projects for 2004

In 2004, Sesame 2 will start. This is phase 2 of the Open Sesame projected started in 2002. It involves a more dissemination-oriented effort for the Sesame 1 implementation results achieved in 2003.

Projects finalized in 2003

The ALIAS, A-A-P, AHA! Phase 2, Mail::Box Phase 1 and 2 and Atom-Based Routing projects finalized in 2003.

Projects ended before 2003

AGFL

The AGFL-GNU project (Universiteit Nijmegen, the Netherlands) started in January 2000 and finalized its work on the development of a natural language parser

generator in the end of 2001 with a generated parser for English documents. NLnet has sponsored this project with € 113.768 in total, with an implementation effort of nearly 2 man-years.

BIND V9	The Internet Software Consortium (ISC) governs the development of BIND V9 software. BIND V9 was the first public domain implementation of secure DNS (RFC 1034 & 1035) and is currently in Release 9.3. The initial work was done between 1998-1999. NLnet co-sponsored this effort with US$ 250.000.
LCC	The Local Content Caching (LCC) project provided a pilot implementation of an alternative scheme for search engine design. The work was done in 2002. NLnet sponsored this effort with € 45.791 and it involved 0.5 man-year in total.
MAPS	MAPS is an anti-SPAM (unsolicited e-mail) service initiated in 1999 by Paul Vixie. NLnet sponsored this initiation with a lifetime membership for US$ 25.000. MAPS continues to be a valuable anti-SPAM service.
NILO	The NILO project started in 1998 in order to provide a public domain implementation for PXE Ethernet network interface cards (Eprom). A low-level technical problem stopped this project in 1999. The available code has been taken up by the netboot project.
SIRS	The Scalable Internet Resource Server project lasted for three years (1998-2001). It developed a service that allows internet resources to be widely distributed and replicated across the Internet in a scalable way. The work is continued in the GDN work of the Distributed System research group at the Vrije Universiteit in Amsterdam. NLnet has sponsored this project with € 356.218 in total, with a total implementation effort of close to 6 man-years.
TimeWalker	The Timewalker project lasted for 1.5 years. It developed a graphical package implemented in Python to facilitate the view of voluminous time stamped data (e.g. system logging) and uses the human eye as a discriminating factor. NLnet has sponsored this project with € 150.000 in total, with an implementation effort of two man-years.

2. Project policy

Stichting NLnet's primary goal is to stimulate new developments in network (Internet) technology for managing and maintaining network connectivity, to improve existing technology, and to encourage new applications of existing technology.

Stichting NLnet has chosen to do this by supporting non-proprietary network-oriented projects.

Policy

Stichting NLnet's methods of contributing to the development of new network (Internet) technology, improvement of existing technology, and new applications of existing network technology are:

- Subsidise (fully or partially) software development;
- Finance advanced scientific research into network technology, in co-operation with universities;
- Provide financial and organisational backing for dissemination and exchange of knowledge about Internet technology through conferences, workshops and contests;
- Sponsor Internet knowledge development and knowledge exchange programmes between universities, colleges and research institutes.

Open Source

All results of projects are made freely available to the community,

public forum

and are presented, if possible, in one or more publications and/or at one or more suitable international conferences.

The Governing Board decides whether a project proposal is of interest to and appropriate for Stichting NLnet, possibly after consulting the Advisory Board and/or other experts in relevant field(s).

3. NLnet Projects in 2003

3.1 Projects

A-A-P
distributed software building

The first phase (14 months) of the A-A-P project began in March 2002 by Bram Moolenaar, who was employed full-time by Stichting NLnet Labs for this project.

A-A-P provides a flexible and portable framework for developing, distributing and installing software in the Internet era. The first phase ended in May 2003, but immediately after that a second phase was started in order to cater for easier access and use of the package. This phase completed in October 2003. The total costs for A-A-P in 2003 were € 50.454.

A-A-P has been presented at the O'Reilly Open Source Convention 2003 and at EuroBSDcon 2002. An article for Linux Journal was made ready for publication in 2003, and will be published in the May 2004 issue.

A-A-P 1.0 was released in July 2003. Numerous releases have been made since then.

It has proven difficult to get other developers involved with the work. In July 2003 an award was promised to people who made the best contribution to A-A-P, in order to attract more cooperation in A-A-P development. Awards were presented in October 2003 to Adriaan de Groot ("best contribution"), Rui Lopes ("most useful patch") and Joerg Beyer ("brightest idea").

results

Details of the software and the releases can be found at http://www.a-a-p.org/ and http://www.agide.org/. All releases of the software and the live CVS source tree have been made available via SourceForge. SourceForge showed an average of 280 (in 2002: 145) software downloads per month in 2003. In 2003 there were no software development projects known who took A-A-P as a base for their distributed development work.

AHA !
Adaptive Hypermedia for All

The AHA! (Adaptive Hypermedia for All!) software developments started in January 2001 at the Technical University of Eindhoven (TU/e) under the supervision of professor Paul De Bra (TU/e). The project aims to develop technology for extending Web servers with user transparent adaptive functionality.

The project focussed on generalizing support for documents from an external source, filtering Hyper Text Markup Language input files to eXtensible Markup Language format, using and modularising XML Document

Type Definition for external representation, and developing AHA! tags for XML parsing speedup.

The AHA! 2.0 release has been made available after a very long delay in October 2003. The ADAPT project (adaptive educational technology) and the Hypermedia Course used the technology.

The Phase 2 work started in July 2002 and ended in June 2003. It aimed at incorporating a number of extensions to turn AHA! into a much more versatile adaptive hypermedia platform.

results

Until now, the AHA! 3.0 software release has only been made available internally. A promised AHA! showcase has still to be developed.

AHA! has been presented at the NLUUG Spring 2003 conference, User Modeling conference 2003, PEG Conference 2003, ACM Hypertext '03 conference and WWW 2003 conference in Budapest. AHA! has found its way in the Adaptive Hypermedia research world.

More technical information on AHA and demonstrations of the software can be obtained via http://aha.win.tue.nl.

Stichting NLnet has sponsored the remainder of the AHA! Phase 2 project in 2003 with € 40.613. The total NLnet sponsoring of AHA! amounted to € 169.978.

The application of the AHA! software has been very limited to date, and this is probably related to the delay of the releases in 2002 and in 2003; however, interest in the software in the research world is gaining.

ALIAS
legal aspects of software agents

ALIAS is an interdisciplinary project that focuses on the legal and technical implications of the use of software agents in the context of Dutch, European and US law. The main topics explored in this project are: Autonomy, Identifiability and Traceability, Integrity and Originality, and Trust.

Three academic research groups have combined efforts to explore these topics: the IIDS group (Department of Computer Science, Vrije Universiteit), headed by professor Frances Brazier, the Computer Law Institute (Department of Law, Vrije Universiteit), represented by professor Anja Oskamp, and the Centre for Law, Public Administration and Informatization, (Department of Law, University of Tilburg), headed by professor Corien Prins.

The conceptual framework identifies a number of intermediary concepts (autonomy, identifiability,

traceability, integrity and trust), also including the relations to existing legal and technical concepts.

results The framework and other results of the research have been described in an extensive technical report published in July 2003 (Technical Report no. IR-CS-004, Faculty of Sciences, Vrije Universiteit Amsterdam). A final report with legal and software recommendations for good practices has been delayed until February 2004.

Three presentations on the ALIAS project have been given at the LEA workshop 2003 in Edinburgh, EUMAS 2003 in Oxford, and Agentcities in Barcelona.

More information on the ALIAS project is available via http://www.iids.org/alias/.

This two-year project started in February 2001, and ended with the publication the above-mentioned technical report in July 2003. Stichting NLnet has spent € 7.102 in 2003 on ALIAS (in total for 2001 – 2003: € 158.322).

The ALIAS project has led to a continuation of the inter-faculty initiative, also called ALIAS, within the Vrije Universiteit in Amsterdam.

Ambulant The Ambulant Phase I project carried out in cooperation
SMIL-2.0 player with CWI in Amsterdam, started in March 2003 to develop a multi-profile, multi-platform SMIL player for mobile and desktop systems running under a UNIX or Windows based OS. Besides supporting the W3C standard SMIL2.0 language, SMIL dialects like MMS 2.0 (Mobile Multimedia Messaging) and PSS-6/5/4(3GPP mobile multimedia) are also supported. Media types supported in the player are streaming video (mpg, DivX), streaming audio (wav, aiff, mp3), plain text, images (PNG, JPEG) and animation (SVG, Flash). The Open Source player is limited to codecs which are available under Open Source licensing terms. The player is planned to be a reference base for further research, development and standardisation work.

results The player will be finished in the summer of 2004. Source code, intermediate releases and the final results are made available via SourceForge.

NLnet subsidizes the work for a maximum of € 122.000. CWI is providing self-financing of € 80.000 for this project. In 2003, NLnet spent € 50.000 on Ambulant.

More details about the project can be obtained via http://www.ambulantplayer.org .

Atom-Based Routing
reduction of routing tables

The Atom-Based Routing project attempted to devise or adapt a routing protocol such as BGP to make use of atoms in order to achieve a protocol for routing in the Internet with a lower complexity, thereby severely reducing the number of routing table entries.

The project was carried out by CAIDA at the San Diego Supercomputer Center in the USA in cooperation with NLnet Labs and RIPE NCC.

results

The project started in October 2002 and was finished in October 2003, with a final report, scientific article and GPL software running under Zebra published in February 2004. The protocol proposals have been discussed at IETF meetings and via the project's e-mail list.

More details about this project can be viewed at http://www.caida.org/projects/routing/atoms/.

The work has not been followed up by NLnet Labs or RIPE NCC.

In 2003, NLnet spent € 50.051 on this project. The total cost for this project has been € 65.584.

BIND DLZ
dynamically loadable zones

The BIND DLZ (Dynamically Loadable Zones) project aims to develop extensions to the BIND V9 DNS server implementation, allowing DNS zone and record data to be stored in a database and modified without restarting or reloading the BIND V9 DNS server.

results

A generic interface and a specific driver for the Postgres database and database driver implementations for other databases like MySQL and the UNIX file system were completed in 2002. In 2003, this work was complemented with database drivers for Berkeley DB, ODBC and LDAP. Outstanding items for 2004 are a report on performance testing, and some additionally sponsored work on a high-performance Berkeley DB driver. The last release of DLZ was version 0.6.0 in November 2003. Before half 2004 the sponsored part of the work will be finalized.

An article for Linux Journal has been submitted at the end of 2003.

The software has been made available via SourceForge http://www.sourceforge.net/projects/bind-dlz . The project e-mail list also resides there. SourceForge showed an average of 125 in the beginning of 2003 and 100 later (in 2002: 77 downloads per month) software downloads monthly in 2003.

NLnet efforts to have the DLZ extensions bundled with the 'contributed' part of the official BIND V9 release have not been successful in 2003.

The project was started in December 2001 by Rob Butler in the USA. NLnet has spent € 12.505 in 2003 (€ 32.813 in 2002) on the project and has committed a total of US$ 46.000. The sponsored work is expected to be completed in Spring 2004.

CAcert
free X.509 certificates

CAcert.org is a community initiative to provide a free digital certificate (X.509 used in SSL, HTTPS, etc.) service. NLnet has taken a different approach here in contrast to the usual project policy: support and donations are provided when NLnet feels there is a need to. In 2003 NLnet sponsored CAcert with a € 1000 donation. It is expected that more support is needed by NLnet for CAcert in 2004. In general this support policy will entail NLnet-internal manpower in addition to a donation.

CP2PC
generalized peer-to-peer API

The CP2PC project started in February 2002 and developed a general design for a minimal programming interface supporting many different peer-to-peer (P2P) networks. Each P2P network typically has its own protocol set and does not interoperate with other P2P networks. A client-side "gateway" built on top of the CP2PC API can achieve interoperability between such P2P networks. The project has been done by the Distributed Systems research group at the Vrije Universiteit in Amsterdam and was supervised by professor Maarten van Steen.

The results expected to finalize at the end of 2002 provide an implementation of and interfaces to the GDN software (of the same group) and Gnutella. The group has cooperated with the Tristero development group on some of the API definitions.

One of the project members visited the CodeCon 2003 conference in order to attract interest to the work.

results

The results were made available in March 2003 on SourceForge. After the release, the average amount of downloads was 23 per month. The e-mail list activity on CP2PC has been very minimal.

There has not been any follow-up on the results of this project in 2003.

NLnet sponsored this project with € 1.402 in 2003, of a total of € 61.900 for the whole project, with about 1 man-year of work total.

Free Software Foundation (FSF)

The Free Software Foundation is known for its efforts in the area of freely distributable software development, most notably the GNU software and licensing policy. The well known GNU Public License (GNU GPL) and GNU Free Documentation License (GNU FDL) are used for many NLnet-sponsored projects. The European FSF section started in 2002 is concentrating on the European aspects of the FSF software philosophy. At the start of 2004 Stichting NLnet made a yearly donation to FSF and the European part of FSF.

More details on FSF can be found at http://www.fsf.org and http://www.fsfeurope.org.

Interactive Intelligent Distributed Systems (IIDS)
network/agent research

In 1999, Stichting NLnet and the Department of Sciences at the Vrije Universiteit Amsterdam agreed on a long-term collaboration in the field of Intelligent Interactive Distributed Systems (IIDS). Professor Frances Brazier heads the IIDS research group. The group's primary research directive is to devise a flexible, modifiable architecture for the development of large-scale interactive intelligent agents in a wide-scale distributed network. The research programme distinguishes three main lines of research:

- Middleware (an Agent Operating System [AOS] and an agent environment [Mansion])
- Services (including an Agent Factory, Directory Services and Management Tools)
- Distributed Applications to explore requirements and to test results (mobile co-operative information retrieval agents, embedded internet services, system administration, distributed design).

NLnet's research director currently spends approx 80% of her time on the research group. At the end of 2003, the group consisted of Niek Wijngaards (researcher), Benno Overeinder (researcher), five PhD students (David Mobach, Hidde Boonstra, Guido van 't Noordende, Sander van Splunter, and Elth Ogston, the latter three financed by the VU), Etienne Posthumus (scientific programmer). In the first half year of 2003, Debbie Richards, a research guest from Macquarie University Sydney, worked on the Agent Factory Service and the Semantic Web.

In 2003 the emphasis of the work was on providing a first prototype. The prototype is expected in early 2004.

Much of the AgentScape middleware development is done in close collaboration with professor Andy Tanenbaum and professor Maarten van Steen of the Computer Systems group that IIDS joined in 2003.

Other parts of research, such as directory services (FONKEY), are done in collaboration with NLnet Labs.

IIDS is also a partner in the above-mentioned interdisciplinary ALIAS project finalized in July 2003.

results ALIAS will be followed up in 2004 with an interdisciplinary cooperation (three new PhD students) between the participants of the original ALIAS project.

Research results have been presented at the following: AAMAS conference in Melbourne, CCGrid 2003, ASCI conference, LEA workshop (law and agents), Agent Link in Barcelona, and ACM Symposium on Applied Computing.

During 2003 IIDS has participated together with the Distributed Systems VU group in openNet proposals for the EU FP6 funding program.

Details of the work and publications can be obtained from http://www.iids.org.

NLnet contributed € 335.373 in 2003 (€ 307.199 in 2002) to support the IIDS group, in addition to the extra time (0.4 fte) invested by Brazier directly.

Stichting NLnet Labs
Internet software development

Stichting NLnet Labs was established in late 1999 with a mission to further develop Open Source software for the Internet and all other related scientific developments. The laboratory, a long-term development environment for up to six people, is fully financed by Stichting NLnet and was funded with € 360.000 in 2003 (€ 316.000 in 2002; the budget for 2004 is € 299.340); this excludes funding for separately described projects A-A-P and Atom-Based Routing, which were also under the umbrella of NLnet Labs.

NLnet Labs is situated in Amsterdam in one of the Matrix buildings of the ASP (Amsterdam Science Park). Ted Lindgreen is the executive director.

Governing Board At the end of 2003, the Governing Board consisted of Teus Hagen (Stichting NLnet, chair), Frances Brazier (secretary, Stichting NLnet), and Wytze van der Raay (treasurer, Stichting NLnet).

DNSSEC NLnet Labs continued its experiments with the deployment of DNSSEC for large domains in 2003. The experiment that started in 2001 with SIDN to set up a secured .nl domain (20.000 sub domains) and completed

in 2002, was followed up by a more ambitious collaboration with SIDN: the setup and management of a fully secure shadow registry for the .nl country top-level domain. This work was concluded in December 2003. SIDN paid for consultancy services by NLnet Labs during 2003 for this work.

As part of the DNSSEC work, NLnet Labs also worked on writing a secure aware resolver. In 2003 a Perl version has been made, but this is not enough.

NSD root server for DNS

In cooperation with RIPE, development work has been done to write a new DNS implementation, called NSD. This authoritative-only server is geared specifically to large and/or important authoritative name servers and does not contain any code from existing implementations. A rewrite of the NSD software was completed in 2003 and the NSD 2.0 release is expected in January 2004. On request of RIPE and ICANN an in-house DNS test lab has been configured.

IPv6

Three case studies of IPv6 enabled home networks were published. Several reports have been written (IPv6 glue in root zone presented at RIPE 46, IPv6 tunneling in unmanaged networks, draft for translations problems between IPv6 and IPv4, long term analysis of the 6bone routing table). The collaboration with SURFnet on the SOHO IPv6-enabled router was stopped.

See http://www.nlnetlabs.nl for more detailed information on the work and the availability of the software.

Stichting NLnet Labs publishes its own annual report.

cooperation

In 2003 NLnet Labs did cooperative work with CAIDA on Atom-Based Routing (discussed elsewhere in this report). NLnet Labs is providing the employment coverage for the A-A-P project (also discussed elsewhere in this report).
In 2003 NLnet Labs also cooperated with SIDN and CENTR on DNSsec for .nl and other ccTLDs.
There is a close relation and collaboration with RIPE-NCC on DNSSEC and NSD.
For FONKEY work there is cooperation with the IIDS group at the Vrije Universiteit in Amsterdam.

Stichting LogReport Foundation
log file analysis and reporting

Stichting LogReport Foundation was founded in 2000 as a formal entity to support the activities of a group of developers working to provide report generation software and support for network system administrative log data.

Governing Board	The members of Stichting LogReport's Governing Board are: Joost van Baal (chair, Tilburg University), Wytze van der Raay (treasurer, Stichting NLnet) and Jakob Schripsema (secretary, Atos Origin). Teus Hagen chaired the board up to July 2003.
international team	The sponsored work of Joost van Baal ended in February 2003 and of Wessel Dankers in June 2003. Francis Lacoste worked until May 2003 on an hourly basis for LogReport, and resumed his work in August 2003 with a fixed-price contract for the development of Lire 2.0, in cooperation with a new developer Wolfgang Sourdeau. This work will be completed in the summer of 2004.
results	There is an on-line Responder Service (usage increased from 25 per week to 50 per week in 2003) running on LogReport's own server http://www.logreport.org/ (hosted by NLnet Labs since August 2003), which also hosts the mailing lists and the web site. In 2003, five releases of Lire, including two main releases (release 1.3 in May: improved DLF (DNS, email, firewall) converters, new API and improved documentation and tutorial, and 1.4 in November: new report generator using SQLite database, and extensive platform testing) were made available from the LogReport web site (http://www.logreport.org) and through SourceForge (http://sourceforge.net/projects/logreport). Since March 2003, the download section of LogReport is hosted on a system made available by Guus Sliepen, to solve some immediate bandwidth problems.
	There was an average of 300 (RPM) software downloads monthly. From the LogReport server, there are about 1000 downloads on the average per month. Installation packages for Debian and RedHat are provided. A Lire 2.0 release is planned for the third quarter of 2004.
	Stichting LogReport Foundation is fully sponsored by NLnet. The total amount sponsored by NLnet in 2003 was € 43.259 (€ 92.480 in 2002). Paid employment in 2003 was approximately 0.8 fte during the year. After 2003, the financial support from NLnet for LogReport will end as the basic developments for the software will be finalized.
	Stichting LogReport Foundation publishes its own annual report.
Mail::Box *email handling*	The Mail::Box project started with phase 1 in May 2002 and ended with phase 2 in January 2004. The phase 2 development has resulted in support for new folder types

	(maildir, pop3, Outlook DBX, IMAP4), message construction tooling, Unicode, "Field Groups", web-based client tooling, and improvements for performance and documentation.
results	The software is made available via the standard Perl modules distribution channel CPAN.
	Project results were presented at the German Perl Workshop, YAPC::NA in Florida and YAPC::EU 2003 conference in Paris.
	Known applications of Mail::Box can be found in a Pen-Pal mailing system (Taiwan), the YMB antispam project, PerlWebmail and tkMail. A major cellular phone service provider is using the Mail::Box Perl modules.
	The project work was carried out by Mark Overmeer. The development cooperation from others was limited and has been disappointing. The e-mail list has about 118 (in 2002: 70) different users. For more details about Mail::Box, go to http://perl.overmeer.net/mailbox.
	NLnet sponsored the Mail::Box work in 2003 with € 22.252 in total. The manpower needed for this work took about 0.25 man-year and was underestimated. The total costs for this project has been € 44.149 (phase 1 € 25.324 and phase 2 € 18.825).
Open Sesame *web RDF querying framework*	Open Sesame is a project started by Aidministrator Nederland b.v. in March 2002 and was planned to end in December 2003. Aidministrator adopted Aduna as its new name in December 2003. The goal of the project is to develop a scalable, modular architecture for persistent storage and querying RDF and RDF Schema, the proposed W3C standard modelling languages for the Semantic Web. It builds upon the results of a European IST project On-To-Knowledge (EU-IST-1999-10132). Key features of Open Sesame are: open source, available under LGPL, scalability, a query engine for RQL, portability, repository independence, extensibility, and separating the communication from the actual functionality by the use of protocol handlers.
	The target audience for Sesame is the RDF/Semantic Web community, e.g. SWAP (Semantic Web and Peer-to-Peer), a European Union project.
results	In 2003 the Sesame project was finalized with an end report and Sesame 1.0 software release to be delivered in January 2004.

The software has been released via SourceForge (http://www.sourceforge.net/projects/sesame); the last release in 2003 was V0.97. The average number of software downloads was 400 (2002: 220) per month. There is a Sesame demo server available at http://sesame.aidministrator.nl/, which is used by 2500 (2002: 1300) visitors per month on average.

Technical contributions to the project have been received from a.o. OntoText (Bulgaria), University of Karlsruhe, Oracle (Germany), and Vrije Universiteit Amsterdam. In 2003 Sesame was presented at the PSSS workshop, ISWC conference, WWW12 workshop and WWW2004 conference.

The project of about 2.6 man-years is fully sponsored by NLnet. In 2003, NLnet contributed € 60.554 (in 2002: € 112.238). The deployment of Open Sesame is unknown and it is expected that its use and contributions can be increased significantly. In 2004 a follow-up project (called Sesame II) is planned to tackle this.

ReX
International research exchange

In the summer of 1999, a unique programme was started, together with USENIX, which supports international research and development: the Research Exchange Programme (ReX), http://www.NLnet.nl/project/rex/.

Two exchanges that were approved in 2001 have taken place in 2002 and continued in 2003:

1. *University of Pennsylvania and University of Leiden:* a nine-month exchange to jointly develop a prototype for an extensible packet monitor based on Intel's IXP1200 network processor. This exchange ended at the end of third quarter of 2003;

2. *Lund University (Sweden) and Indian Statistical Institute (India):* a two times nine-month vice versa visit to develop a software oriented stream cipher for secure communication over networks. This exchange actually started in February 2002 and will end after a long delay in the middle of 2004.

The total cost of the ReX program in 2003 was budgeted for US$ 60.650 (commitment in 2002). Stichting NLnet paid a total of € 16.832 in 2003. All costs are shared with USENIX on a 50/50 basis.

Due to economic limitations on the USENIX side, the ReX program was frozen in early 2002. The committed projects have been continued and were administered by NLnet. ReX will not be continued further.

schoolLAN *network infrastructure*	The schoolLAN project focuses on the development of a small, robust, and centralised network infrastructure targeted for primary schools. SchoolLAN initially started in 1999 as a technical concept and tools for configuration development by Stichting NLnet. A plan was developed to create support organisations for primary schools in five regions of the Netherlands, but succeeded only in two regions (Venlo and Arnhem). Support and help provided by technical schools failed in 2002.
Stichting schoolLAN	In order to boost the cooperative development efforts, NLnet decided in mid 2001 to create an interregional coordination centre: the Stichting schoolLAN, a foundation now employing three full-time technical employees and two trainees. Stichting schoolLAN is fully sponsored by Stichting NLnet. The foundation streamlines the schoolLAN developments, facilitates the distribution of the schoolLAN software with a CD-rom and extensive documentation, and supports the local schoolLAN initiatives. See http://www.schoollan.nl/ for more information (in Dutch!).
	In the second half of 2002, the foundation conducted a study to examine opportunities to intensify and increase the schoolLAN deployment in primary schools. It was concluded from the study that the foundation should act as knowledge center and make the foundation self-supporting by providing paid support to schools. Stichting schoolLAN is expected to become self-supporting in 2004 with a minimum of 150 – 200 supported primary schools. In the end of 2003 it became clear that there were not enough support contracts signed and cooperation with 5-7 educational service providers did not take off. A trial in July 2003 to initiate an end user council failed due to lack of interest to take part in the council. In the end of 2003 SchoolLan foundation has obtained an extra donation in order to start an intensive marketing campaign for the increase of schools for SchoolLan service via the foundation.
	SchoolLAN was presented at the School & Computer manifestation in November 2003. The interest was minimal.
Governing Board	The Governing Board of Stichting schoolLAN consists of Teus Hagen (chair, Stichting NLnet), Wytze van der Raay

(treasurer, Stichting NLnet), and Kees Keijzers (secretary, University of Nijmegen).

schoolLAN Arnhem	The one-year contract for technical support originally awarded to the ROC Rijn IJssel ICT College in Arnhem in 2001 (delayed to May 2003) was in 2003 taken over by the SchoolLan foundation at 1st of January 2004. Fluvius has 14 schools running with SchoolLAN.
schoolLAN Venlo	In the region Venlo the foundation Stichting Prisma provides support for schoolLAN at all primary schools of Stichting Prisma (18 schools) and an external school in that region. This is the only region where schools are self organizing the support and further developments.
Friesland	For the region Bolsward in the province of Friesland, Stichting schoolLAN contracted the educational service provider GCO Fryslân. This NLnet-funded initiative started in late 2002 in order to deploy schoolLAN at an anticipated 15 primary schools. In the end of 2003 4 schools used SchoolLan. There is a plan to extend that to 8 schools.
other regions	In other regions SchoolLan was used on single schools: Amsterdam, Bussum, Breukelen, Hoorn, Amstelveen, and and Tilburg.
too little progress	Progress in the regions is slow due to a lack of decision power and sufficient technical knowledge, low motivation, a non-commercial minded culture, and the top-down, regulated structure of the educational organisation.
	Stichting NLnet has registered the trademark schoolLAN in the Benelux to prevent misuse by other parties. NLnet subsidized Stichting schoolLAN in 2003 for € 222.171 (in 2002 € 239.206). NLnet expects to sponsor this foundation with a total of € 110.000 for 2004.
Stichting ThinkQuest *student web contests*	Stichting ThinkQuest Nederland (a non-profit organisation) was created at the end of 1999 to promote Internet use in education and to stimulate the development of educational Internet applications. ThinkQuest Nederland (http://www.thinkquest.nl/) participates in the international ThinkQuest programme. Frances Brazier chairs the board of the foundation.
Kennisnet	As of July 1st 2002, the operational aspects of all the web contests have been contracted out to Stichting Kennisnet (foundation), an Internet service and content provider exclusively for primary and secondary schools. The foundation overviews the contests carried out by Kennisnet.

3.2 Conferences

Hackathon OpenBSD OpenBSD is developed by volunteers. The project funds development and releases by selling CDs and T-shirts, as well as receiving donations. Organizations like USENIX and individuals donate and thus ensure that OpenBSD will continue to exist, and will remain free for everyone to use and reuse as they see fit. The POSSE program (Portable Open Source Security Elements) in cooperation with the University of Pennsylvania provided resources for core developers of the OpenBSD, OpenSSH and OpenSSL projects through a DARPA grant in the past.

This provided funding for a yearly meeting of most OpenBSD and OpenSSH developers in Calgary, an event known as Hackathon. The Hackathon is an essential event for people to meet and talk about what direction the next OpenBSD release will take. Very often, rough implementations are started at the Hackathon and later over a period of many months worked out and finished.

In 2003, the event was scheduled to take place in Calgary (Canada). In April of that year, DARPA suddenly and unexpectedly canceled funding for OpenBSD R&D and the hotel for the upcoming Hackathon, thus providing a huge cash flow problem.

The NLnet Foundation agreed to sponsor the Hackathon to cover the emerged gap, and thereby secured the financial health of organization. The event was successful, which can be read in the final report by the organization.

NLnet donated € 8.741 for this Hackathon.

3.3 Other activities in 2003

Stichting NLnet is continually in pursuit of new projects. To this purpose, NLnet maintains relations with organisations such as USENIX, NLUUG, RIPE, and SURFnet. Relations with universities are another potential source of projects.

Open Source and businessrelations with some small high-tech companies and the Ministry of Economic Affairs were established by Stichting NLnet. Teus Hagen takes part in an Open Source specialist panel for OASE, an Open Source stimulation project from Syntens (Ministry of Economic Affairs) for mid-size and small businesses.

Internet Software Consortium (ISC)

ISC governs the development of BIND V8 and V9, as well as DHCP software. These software packages implement the domain name server and dynamic host configuration protocols. ISC runs various research/development projects including DNSSEC, root server anycast, BIND V9 performance and DNS API.

ISC has initiated a BIND Forum for the DNS BIND V9 software distribution and support.

Teus Hagen is a member of ISC's Board of Directors.

4. Stichting NLnet organisation

	NLnet's history started in April 1982 with the announcement of a major initiative to develop and provide network services in Europe.
NLnet birth date	Stichting NLnet was formally established as a "stichting" (Dutch for foundation) on February 27, 1989 and is situated in Amerongen, the Netherlands. It is registered at the Chamber of Commerce, Amsterdam under number 41208365. Since 1999, Stichting NLnet has had a non-profit tax status (so-called Article 24 status, "algemeen nut status").
funding	In November 1994, NLnet Holding BV was formed by the foundation in order to create a commercial base for its Internet activities. The merging of NLnet's Internet Service Provider (ISP) activities with MCI (formerly WorldCom/UUnet) in 1997 provided Stichting NLnet with the means to actively stimulate the development of network technology and to make this freely available to the community in its broadest sense.
NLnet foundations	To be able to maintain a clear separation between Stichting NLnet's funding operations and the project technology related operations, Stichting NLnet has created separate legal entities for some of its more specialized projects, such as 2000's Stichting NLnet Labs and Stichting LogReport and 2001's Stichting schoolLAN. These foundations, directed in full or in part by Stichting NLnet, have obtained a full non-profit tax status.
Governing Board	The Governing Board of Stichting NLnet consists of: Chair: Teus Hagen teus@NLnet.nl Treasurer: Wytze van der Raay wytze@NLnet.nl Secretary: Frances Brazier frances@NLnet.nl Board members: Jos Alsters jos@NLnet.nl and Hans Onvlee hans@NLnet.nl .
operations	For daily operations, a Board of Directors has been selected from the Governing Board: General director: Teus Hagen Financial director: Wytze van der Raay Research director: Frances Brazier Frances Brazier holds a part-time position (two days per week) as full professor at the Vrije Universiteit (IIDS research group) in Amsterdam.

webmaster	NLnet's website www.nlnet.nl is maintained by Mark Overmeer (Markov Solutions) in close cooperation with the Board of Directors and the project leaders.
project planning / support	Upon examining the experiences with the NLnet projects, it was determined that there was a need for:

- more PR concerning the current activity of the projects;
- more propagation in the early stages of the projects;
- more guidance while the projects are in progress to enable better deployments;
- more follow-up work after the projects have ended.

This problem has been taken up in the policies and planning for new projects. Also the way in which projects are supported from NLnet has been changed accordingly. E.g. for CAcert project support another (trial) approach has been taken.

Advisory Board — An Advisory Board of three people supports the Governing Board of Stichting NLnet:

- *advisor on technology*: Paul De Bra, full professor, University of Eindhoven;
- *advisor on legal affairs*: Anne-Marie Kemna, director ICT/IE, KLegal Advocaten;
- *advisor on finances*: Erik Esseling, director, Esseling Beheer b.v..

For external (financial and legal) advice and consultancy, Stichting NLnet is supported by: CMS Derks Star Busmann Hanotiau (legal, tax and notary advice), PriceWaterhouseCoopers (accountancy and salary affairs), and Attica Vermogensbeheer (investment management).

5. Finances

Stichting NLnet finances its projects and activities from the revenues obtained from its invested capital. If possible, subsidies from the government and/or third parties will also be used for project activities, but to date this has not been the case.

5.1 Fiscal status

Stichting NLnet has not been running a commercial company since mid 1994 and does not plan to do so in the future. Therefore, the foundation is not subject to Value Added Tax (BTW in Dutch) or company tax (vennootschapsbelasting in Dutch).

As of March 9, 1999, Stichting NLnet has been classified, at its request, by the Dutch tax office (Department Registratie en Successie) as an entity with general benefit objectives within the meaning of the Successiewet 1956 (article 24 sub 4).

In addition to this, Stichting NLnet obtained a so-called place of residence declaration (woonplaatsverklaring) from the Dutch tax office for companies on June 8, 1999. This declaration enables the foundation to reclaim part of the foreign taxes withheld on foreign dividends. In September 2001, a request was filed with the tax office to be exempt for source tax withheld on USA dividends, according to article 36 of the Double Taxation Convention between the USA and the Netherlands. This request was granted on January 16, 2002.

5.2 Administration

The base currency for all accounts is the euro, since January 1, 1999. Current accounts in non-euro currency with a non-zero balance are subject to a currency adjustment at the end of each month, based on the end-of-month exchange rates supplies by the external investment manager and custody bank.

Salary administration has been contracted to the Financial Management Solutions group of PricewaterhouseCoopers in Amsterdam. Per January 1, 2004, a switch has been made to PricewaterhouseCoopers's FMS group in Rotterdam.

PricewaterhouseCoopers has been charged with compiling and auditing Stichting NLnet's Annual Accounts in 2003. The accountancy report is a separate document with this annual report.

5.3 Cost of activities in 2003 and budget for 2004

The cost of Stichting NLnet's activities in 2003 is summarised and compared with numbers for 2002 below:

	2003	2002
Cost of projects	1.287.286	1.565.384
Cost of staff	338.187	323.356
Depreciation of inventory & equipment	3.661	4.325
Other costs	45.833	61.894
Total	1.674.967	1.954.959

A specification of the "Cost of projects" item in relation to the original budget and to previous years follows:

Project	Cost 2003	Budget 2003	Cost 2002	Cost 2001	Total cost until 2003
A-A-P	50,454	55,000	52,247	0	102,701
AGFL	0	0	0	45,508	113,768
AHA!	40,613	53,000	83,402	45,963	169,978
ALIAS	7,102	8,000	103,204	48,016	158,322
Ambulant	50,000	0	0	0	50,000
Atom-Based Routing	50,051	60,000	15,533	0	65,584
CAcert.org	1,006	0	0	0	1,006
cp2pc	1,402	0	60,498	0	61,900
DLZ	12,505	16,000	32,813	1,115	46,433
EuroBSDCon	-30	0	2,842	0	2,812
FFII anti-software patents	5,000	0	0	0	5,000
Free Software Foundation	0	20,000	19,837	16,336	56,879
Hackathon OpenBSD	8,741	0	0	0	8,741
HAL2001	0	0	0	10,000	1,000
IIDS	335,373	400,000	307,199	208,157	1,074,726
ISC/BIND V9	0	0	0	199,362	347,562
LCC	0	0	45,791	0	45,791
LogReport	43,259	5,000	92,480	140,000	295,109
Mail::Box	22,252	0	21,897	0	44,149

Project	Cost 2003	Budget 2003	Cost 2002	Cost 2001	Total cost until 2003
MAPS	0	0	0	0	22,077
NILO	0	0	0	76	16,832
NLnet Labs	360,000	360,000	316,000	153,000	1,063,165
Open Sesame	60,554	70,000	112,238	0	172,792
ReX	16,832	25,000	5,197	25,967	57,982
SANE	0	0	5,000	0	5,000
SchoolLAN	222,171	268,000	239,206	190,343	660,310
SIRS	0	0	0	145,210	356,218
ThinkQuest	0	0	0	0	226,890
TimeWalker	0	0	50,000	100,000	150,000
Twinsite	0	0	0	0	4,538
YAPC::Europe 2001	0	0	0	1,990	1,990
Other	0	0	0	0	2,326
New projects	0	257,000	0	0	0
Total	1,287,286	1,600,000	1,563,384	1,331,043	5,401,032

The provisional budget for 2004, as approved by the board, is as follows:

	Budget 2004
Cost of projects	1,700,000
Cost of staff	346,000
Depreciation of inventory & equipment	3,500
Other costs	54,500
Total	2,104,000

The specification of the "Cost of projects" item.
Expanded with an extrapolation to 2005 for multi-year projects, is as follows:

Project	Budget 2004	Budget 2005
AHA!	p.m.	
Ambulant	50,000	
DLZ	7,500	
Free Software Foundation	12,500	12,500

| Project	Budget 2004	Budget 2005
FSF Europe	10,000	p.m.
IIDS	400,000	475,000
LogReport	0	
NLnet Labs	375,000	393,750
Open Sesame	130,000	
SANE 2004	p.m. (*)	
SchoolLAN	110,000	
New projects	605,000	941,500
Total	1,700,000	1,822,750

(*) guarantee provided of 40.000 euro

5.4 Investment policy

On January 1, 2003, Stichting NLnet had a capital of 24,0 million euro at its disposal. The majority of this capital, namely 21,4 million euro was invested under an investment management agreement with Attica Vermogensbeheer B.V., with funds held at Effectenbank Stroeve in Amsterdam as the custodian.

Attica Vermogensbeheer was selected as NLnet's second investment manager in July 2001, and has become NLnet's single investment manager in November 2002. They are following an alternative investment management strategy, based on alternative investments like market-neutral funds and long-short funds (also known by the more generic name hedge funds) and geared towards positive, low-volatility net returns. Attica is charged with obtaining a positive net investment result in absolute terms, where the quality of the results is measured by comparing both the return and the risk (expressed as volatility) with those of a composite benchmark. The composite benchmark consists of the weighted average of a number of financial indices:

Weight	Index
55%	MSCI Europe Index
15%	MSCI USA Index
20%	EFFAS EMU Government Bond Index (maturity > 1 year)
10%	EFFAS USA Government Bond Index (maturity > 1 year)

In 2003, the alternative investment management approach resulted in a satisfying absolute positive net return of +14% (in 2002: -8,3%), which also significantly exceeded the benchmark return of +9,4% (in 2002: -25,5%). Also, volatility of the benchmark was about 14,3% since October 1, 2001 (the start of the performance measurement period), while the Attica-managed portfolio experienced a volatility of only 7,9% during that period. A graphical representation of the investment performance is shown below:

Investment performance NLnet 2003
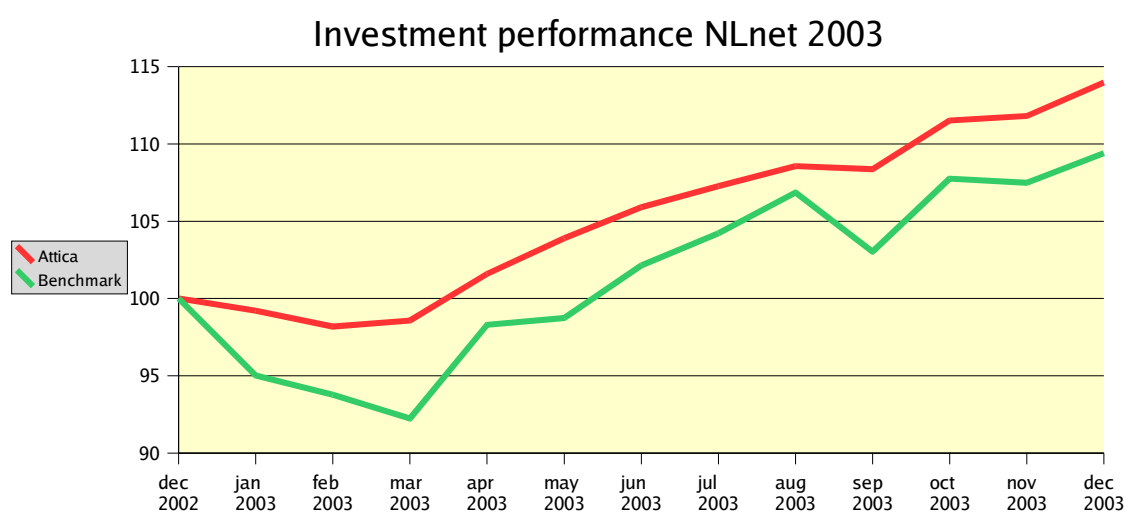
At the end of 2003, Stichting NLnet's capital had increased to 25,2 million euro, including unrealised investment results. 24,0 million euro of this end-of-year total was managed by Attica Vermogensbeheer. To cover the liquidity needs over the year 2004, an amount of 1,4 million euro has been withdrawn from the managed capital over the period December 2003 – March 2004.

5.5 Cost and revenue of investment management

The cost and revenue of managing the invested capital of Stichting NLnet in 2003 can be summarised and compared with numbers for 2002 as follows:

	2003	2002
Realised results from investment funds	-381,897	-287,065
Realised results from equities (incl. derivatives)	0	-4,727,532
Realised results from bonds	72,914	-9,373
Realised results from forward exchange contracts	1,167,354	628,847
Realised curreny differences in cash accounts	-150,141	-46,084
Investment revenue: interest on bonds and deposits	36,765	231,017
Investment revenue: dividends on equities and funds	63,130	233,550
Total realised result	808,126	-3,976,640
Delta in unrealised result on investment funds	2,122,508	-1,692,824
Delta in unrealised result on equities (incl. derivatives)	94,622	600,265
Delta in unrealised result on bonds	30,836	-62,655
Delta in unrealised result on forward exchange contracts	66,429	275,828
Delta in unrealised result on transactions in progress	2,314,395	-59,871
Adjustment to revaluation reserve	0	-172,308
Total delta in unrealised result	2,314,395	-1,111,565
Total result (realised + delta unrealised)	3,122,521	-5,088,205
Transaction costs	69,784	60,237
Custody charges	0	5,010
Derivatives costs	6,470	5,090
Dividend taxes	0	27,257
Cost of reclaiming dividend taxes	0	989
Investment management fees	231,499	101,678
Total cost of investments	307,753	200,261
Net capital gain / loss (-)	2,814,768	-5,288,466

The unrealised result of the investment portfolio at the end of 2003 and at the end of 2002 can be summarised as follows:

	2003	2002
Unrealised result on investment funds	1,014,060	-1,108,448
Unrealised result on equities (incl. derivatives)	98,954	4,332
Unrealised result on bonds	27,720	-3,116
Unrealised result on forward exchange contracts	221,748	155,319
Unrealised result charged to profit & loss account	0	1,111,565
Total revaluation reserve ultimo 2003 (2002)	1,362,482	159,651
Idem ultimo 2002 (2001)	159,651	-12,657
Increase / decrease (-) of revaluation reserve	1,202,831	172,308