

## 1. Overview

### ***NLnet stimulates network research and development in the domain of internet technology.***

#### *Open Source*

NLnet actively stimulates the development of open network-related technology and makes this technology freely available to the community in its broadest sense. The technology should support and contribute to a better exchange of information.

To this purpose, a wide range of internet and technology related projects are currently being funded for which Open Source licensing conditions, and usually the General Public License (also known as GPL or GNU license), hold.

#### *NLnet projects*

The projects undertaken by Stichting NLnet can be divided into:

- *agent technology research*: e.g. IIDS, a research group working on interactive intelligent distributed systems. Large scale, autonomous system management was the main focus in 2006. Application areas include distributed directory services and configuration services.
- *network technology development and engineering*: e.g. NLnet Labs, which in 2006 broadened its work significantly when the director was nominated chair of the Internet Architecture Board. Application areas include top-level domain services;
- *technology development, engineering and “productising”*: e.g. a generic framework for storing and querying RDF and RDF Scheme (Open Sesame), Open Source implementation of a SMIL2 multimedia player (Ambulant), adaptive web content replication (WinGlob), secure and private peer-to-peer communication (Turtle), Parrot virtual machine for the upcoming Perl6, the GPL license revision for version 3 by FSF, Virtual Protocol Stack implementation on FreeBSD and many more;
- *educational initiatives, hackathons and community building activities*: Open Source programming for high school

students (Code Yard,TQ.nl), privacy and digital rights (Bits of Freedom), launches and hackathons (BSP Marathon, OpenBGPD, OpenOSPF, OpenDocument Day of KDE aKademy 2006, OpenSync hackathon).

*Donations*

NLnet provides donations on a regular basis to a number of non-profit organisations whose activities are in line with the NLnet non-profit free use of software philosophy. Stichting NLnet donations in 2006 which fit into this category include:

- FSF US (free software distribution and usage) € 15.105
- FSF Europe (free software usage and distribution focussed on Europe) € 10.000
- FII (anti-software patents in Europe) € 10.000
- ISOC (Internet Society) € 4.138
- ISOC.nl € 2.500

•

More details on these and other NLnet sponsored activities in the annex.

*financing in 2006*

In 2006 Stichting NLnet financed projects to the sum of € 1.0640.36 (compared to € 1.156.060 in 2005). NLnet has budgeted € 1.750.000 for projects in 2007.

*non-profit policy*

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

**Projects new or extended in 2006**

*Decibel*

Decibel project started by basysKom GmbH, is a communicative platform in order to provide a generic infrastructure which integrates telephone communications protocols on the (KDE) desktop. The project starts in March 2006 and ends in April 2007. NLnet sponsors three persons half time of the project team.

*Open Sesame PR*

In order to increase the dissimilation of results of the finished Open Sesame project, Aduna is receiving sponsorship for the PR and community building around Open Sesame. The sponsoring ends in 2007.

*Virtual Protocol Stack*

The Virtual Protocol Stack project is started by the FreeBSD Foundation at the University of Zagreb, and is a technology implementation to offer the benefits of full system protocol implementation virtualisation. The



	project started in May 2006 and ends in summer of 2007. NLnet sponsors one full time person.
Wisper	Wisper is a concept of a public long distance wireless network. Wisper intends to stimulate concrete project proposals and cooperative initiatives focussed on creating a new mesh-type: solely based on wifi and IPv6 internet connections. A wiki has been started to enable discussions and to create new ideas and applications for technologies on this theme.
Jabber	In 2006 discussions have been started for a development of an open, standardized, secure, feature rich, widely-deployed, decentralized infrastructure for Jabber/XMPP technology Project. A total of US\$ 46.000 of funding has been requested. The project is intended to start in early 2007.

### Projects finalized in 2006

<i>Anti-Spam</i>	<i>Anti-Spam</i> was terminated at the request of Bits of Freedom,
<i>BoF E-Magazine</i>	As Bits of Freedom ended their operations. Bits of Freedom funding for their electronic news bulletin has been ended as well.
<i>LOAP</i>	Life of a Protocol ( <i>LOAP</i> ) project is a technopolitical analysis of the Internet from the viewpoint of the life of one protocol that attempts to provide some insight into both technology and politics, a new project by Carl Malamud. This resulted in a packaged "movie" issued to general audiences in 2006.
<i>OASE</i>	Open Aanbod Software Expertise – set up of a platform for the development of Open Source applications by small and medium Dutch enterprises. The project lead by Syntens and sponsored by Ministry of Economic Affairs was finished in March 2006.
<i>Open Sesame</i>	Sesame is a storage framework for RDF data, the proposed W3C standard modeling language for the Semantic WEB. The Open Sesame project was started in March 2002, the second part started in January 2004 and ended in November 2005, whereafter it was extended to February 2006 to incorporate a number of API and implementation improvements enabled by the release of the Java5 language.
<i>Open Taal</i>	NLnet contributed to the establishment of the OpenTaal foundation intended to produce an open (BSD license)

*SchoolLan*

dictionary of the Dutch language which was previously unavailable.

The Stichting SchoolLan has been formally ended in 2006 as foundation. SchoolLan was aimed at bringing an open source Internet infrastructure to Dutch primary schools. Children and teachers can get access to e-mail and websites with minimal effort. Despite serious interest from various organisations, long term continuation was not feasible.



## 2. Project policy

Stichting NLnet's primary goal is to stimulate new developments in network (internet) technology for managing and maintaining effective network operation, 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 knowledge exchange seminars and conferences in order to stimulate dissemination and deployment of results, knowledge and experience.

*Open Source*

*All results of projects are made freely available to the community, usually with GPL licensing, 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).

*project planning / support*

Examination of experiences with the NLnet projects identified a need for:

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

### 3. Stichting NLnet organisation

#### 3.1 History of Stichting NLnet

	<p>NLnet's history started in April 1982 with the announcement of a major initiative to develop and provide network services in Europe.</p>
<i>NLnet birth date</i>	<p>Stichting NLnet was formally established as a "stichting" (Dutch for foundation) on February 27, 1989 and was situated in Amerongen, the Netherlands until April 2007. In 2007 NLnet is located in Amsterdam. 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").</p>
<i>funding</i>	<p>In November 1994, NLnet Holding BV was formed by the foundation in order to create a commercial base for its internet activities. The sale of NLnet's Internet Service Provider (ISP) activities to WorldCom/UUnet (now part of Verizon) 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.</p>
<i>NLnet foundations</i>	<p>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 (closed in 2005) and 2001's Stichting SchoolAn (closed in 2006). These foundations, directed in full or in part by Stichting NLnet, have obtained a full non-profit tax status.</p>
<i>Governing Board</i>	<p>The Governing Board of Stichting NLnet consists of:</p> <ul style="list-style-type: none"><li>• <i>chair</i>: Teus Hagen (end of term December 31, 2006);</li><li>• <i>treasurer</i>: Wytze van der Raay (end of term 31 December 31, 2006);</li><li>• <i>secretary</i>: Frances Brazier (end of term December 31, 2006);</li><li>• <i>member</i>: Jos Alsters (end of term May 1, 2007);</li><li>• <i>member</i>: Hans Onvlee (end of term January 21, 2007).</li></ul>
<i>Advisory Board</i>	<p>An Advisory Board of three people supports the Governing Board of Stichting NLnet:</p> <ul style="list-style-type: none"><li>• <i>advisor on technology</i>: Paul De Bra, full professor, University of Eindhoven;</li></ul>



- *advisor on legal affairs*: Anne-Marie Kemna, lawyer, Van Diepen Van der Kroef Advocaten. End of term April 24, 2006;
- *advisor on finances*: Erik Esseling, director, Esseling Beheer b.v.

At October 17, 2006 the Advisory board has been ended due to the reorganisation of Stichting NLnet starting in Januari 2007.

For external (financial and legal) advice and consultancy, Stichting NLnet is supported by: Van Diepen van der Kroef (legal advice), PriceWaterhouseCoopers (accountancy and salary affairs), and Attica Vermogensbeheer (investment management).

*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.

The operations and thus the director functions have been terminated on December 31, 2006 due to the new NLnet organisation starting in Januari 1, 2007.

*webmaster*

NLnet's website [www.nlnet.nl](http://www.nlnet.nl) is maintained by Mark Overmeer (MARKOV Solutions) in close cooperation with the Board of Directors and the project leaders.

### **3.2 Reorganisation of Stichting NLnet**

Over the years the environment in which NLnet operates was changing. These changes include the ubiquitous integration of the Internet within society, the maturing of network technology and growing attention for organisations' transparency (Corporate Governance). Also the need was felt to raise the performance and impact of the NLnet foundation. In 2006 the Board has decided to align the organization with these new realities and to reorganize.

Although the mission of the foundation has not been changed, a new strategy has been developed to achieve the mission. The main strategic attention points are to enhance diffusion of the results, extension of scope from network technology to include all enhancements for "quality of life" of the users of the technology, increase the

volume of projects, and introduce an effective mechanism for acquiring projects.

It was decided that projects to be acquired through thematic programs focussing on a strategic issue (growing to 80% of the budget) and an open subscription that considers any project fulfilling the generic requirements (appr.20% of the budget).

In the frame of the new strategy the foundation will intend to explicitly involve the free software community in the vision creation process of the foundation by means of e.g. regular 'think tanks' to get acquainted with views of external parties. This will help to widen the view of the foundation on the trends and developments within society as a base for strategic choices.

The structure has been changed to create more transparency in the governance of the foundation and to facilitate the strategy change. An independent Supervisory Board has been installed. A lean NLnet project organisation (NLnet Bureau) was recruited to support operational activities of the foundation in the broader sense. These changes also implied personnel changes within the Board (all volunteers now). The Board intends to complement itself with additional board members possessing certain capabilities and drive necessary to bring the foundation to a new performance level.

The existing interests of the NLnet foundation in the IIDS research group located at VU University and the NLnet Labs engineering group have not been changed. For transparency reasons the commitments are being formalised and the NLnet Labs foundation has installed it's own foundation Board. After the reorganisation three organisations exist that are executing the NLnet vision: the research group IIDS, the operational organisation NLnet Bureau, and the engineering group NLnet Labs. These groups are supervised by the NLnet Board, which reports to the Supervisory Board.

For 2007 the Board intends to complete the reorganisation by installing new work processes in both the NLnet Board and the Supervisory Board, and in the operational organisation. More effort is planned to achieve





the vision creation in cooperation with the free software community.

## 4. Finances

Stichting NLnet finances its projects and activities primarily 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.

### 4.1 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 (ANBI) 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.

### 4.2 Administration

Salary administration has been contracted to the Financial Management Solutions group of PricewaterhouseCoopers in Rotterdam.

PricewaterhouseCoopers has been charged with compiling and auditing Stichting NLnet's Annual Accounts in 2006.

The accountancy report is a separate document. The figures are incorporated in this annual report over 2006.

### 4.3 Cost of activities in 2006 and budget for 2007

The cost of Stichting NLnet's activities in 2006 is summarised and compared with numbers for 2005 below:



	<b>2006</b>	<b>2005</b>
Cost of projects	1.064.036	1.156.060
Cost of staff	380.189	346.919
Depreciation of inventory & equipment	2.668	2.622
Other costs	263.811	57.740
<b>Total</b>	<b>1.710.709</b>	<b>1.563.341</b>

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

<b>Project</b>	<b>Cost 2006</b>	<b>Budget 2006</b>	<b>Cost 2005</b>	<b>Cost 2004</b>	<b>Total cost until 2006</b>
Ambulant	31.977	56.250	74.680	78.747	235.404
Anti-Spam	-5.000	0	5.000	0	0
Bits of Freedom	6.666	15.000	10.000	6.000	22.666
CAcert.org	1.102	p.m.	106	12.895	15.109
CodeYard	51.114	51.250	38.335	0	89.449
Debian BSP Marathon	2.217	0	0	0	2.217
Decibel (OpenCDI)	31.941	60.000	0	0	31.941
FFII anti-software patents	10.000	0	5.000	0	20.000
Firefox NL	4.000	0	0	0	4.000
Freedom Task Force	20.000	0	0	0	20.000
Free Software Foundation	15.104	15.000	13.887	12.044	93.364
FSF Europe	10.000	10.000	10.000	10.000	35.000
GPLv3	55.000	95.000	55.000	0	110.000
IIDS	376.803	450.000	367.737	371.654	2.190.920
ISOC	6.638	2.200	1.930	0	8.568
KDE-MMM	5.093	0	0	0	5.093
NLnet Labs	345.000	420.000	385.250	340.000	2.133.415
ODF Day	2.869	0	0	0	2.869
OpenBSD Hackathon	5.000	0	0	0	13.741
Open Sesame	13.821	5.000	81.035	49.124	316.772
OpenSync	2.293	0	0	0	2.293
OpenTaal	71	0	0	0	71
Parrot	0	30.000	27.017	0	27.017

<b>Project</b>	<b>Cost 2006</b>	<b>Budget 2006</b>	<b>Cost 2005</b>	<b>Cost 2004</b>	<b>Total cost until 2006</b>
SchoolLan	-271	0	683	117.783	778.507
Turtle	57.100	60.000	50.000	0	107.100
Virtual Network Stack	15.498	0	0	0	15.498
New projects	0	480.300	0	0	0
<b>Total</b>	<b>1.064.038</b>	<b>1.750.000</b>	<b>1.156.060</b>	<b>1.051.593</b>	<b>8.672.720</b>

The provisional budget for 2007, as approved by the board, is as follows:

	<b>Budget 2007</b>
Cost of projects	1.750.000
Cost of staff	583.547
Depreciation of inventory & equipment	7.500
Other costs	180.831
<b>Total</b>	<b>2.521.879</b>

The specification of the “Cost of projects” item is as follows:

<b>Project</b>	<b>Budget 2007</b>
Ambulant	61.000
CAcert.org	10.000
CodeYard	52.076
CPAN6	33.000
Decibel (OpenCDI)	24.000
FFII	10.000
Free Software Foundation	14.400
FSF Europe	10.000
GPLv3	40.000
ISOC	6.500
IIDS	502.048
NLnet Labs	441.000
Open Sesame	24.979
Parrot	28.000
Turtle	15.100



<b>Project</b>	<b>Budget 2007</b>
New projects	449.757
<b>Total</b>	<b>1.750.000</b>

#### 4.4 Cost and revenue of investment management

The cost and revenue of managing the invested capital of Stichting NLnet in 2006 can be summarised and compared with numbers for 2005 as follows:

	<b>2006</b>	<b>2005</b>
Realised results from investment funds	1.848.199	932.268
Realised results from forward exchange contracts	618.078	-803.215
Realised currency differences in cash accounts	-67.653	6.326
<i>Total realised result</i>	<i>2.398.624</i>	<i>135.378</i>
Delta in unrealised result on investment funds	1.600.220	4.033.602
Delta in unrealised result on forward exchange contracts	881.060	-1.236.250
<i>Total delta in unrealised result</i>	<i>2.481.280</i>	<i>2.797.352</i>
<i>Total result (realised + delta unrealised)</i>	<i>4.879.904</i>	<i>2.932.730</i>
Transaction costs and custody charges	51.679	60.672
Investment management fees	196.432	197.120
<i>Total cost of investments</i>	<i>248.111</i>	<i>257.792</i>
<i>Net capital gain / loss (-)</i>	<i>4.631.793</i>	<i>2.674.938</i>

The unrealised result of the investment portfolio at the end of 2006 and at the end of 2005 can be summarised as follows:

	<b>2006</b>	<b>2005</b>
Unrealised result on investment funds	7.378.655	5.778.437
Unrealised result on forward exchange contracts	316.304	-564.756
<i>Total revaluation reserve ultimo 2006 (2005)</i>	<i>7.694.959</i>	<i>5.213.682</i>
<i>Idem ultimo 2005 (2004)</i>	<i>5.213.682</i>	<i>2.416.330</i>
<i>Increase / decrease (-) of revaluation reserve</i>	<i>2.481.277</i>	<i>2.797.352</i>

July 2007

J. Onvlee  
Chair of the Board Stichting NLnet

31



## Annex: NLnet Projects in 2006

### I. network technology research

#### **Interactive Intelligent Distributed Systems (IIDS)**

*network/agent research*

In 1999, Stichting NLnet and the Faculty of Exact Sciences at the Vrije Universiteit Amsterdam (VU) agreed on a 10 year research contract in the field of Intelligent Interactive Distributed Systems (IIDS). Professor Frances Brazier heads the IIDS research group. The group's research focuses on management of large-scale interactive distributed systems, in particular on mobile agent systems. Self-management is the ultimate goal. The AgentScape framework, services, applications, and analyses of legal implications of the use of agent systems, are all means to increase the potential of such new technology. The research programme distinguishes three main lines of research: Middleware, Services, Applications, and Legal aspects.

*AgentScape Middleware*

The number of agents and resources in Internet-scale applications can grow to thousands, ten thousands, hundred thousands, and more. Agent platforms need to be able to support such large scale multi-agent systems. They need to provide efficient and effective means for life-cycle management, communication, resource management, security, fault-tolerance, etc. These basic principles are topics addressed within the design and implementation of the AgentScape platform.

*Services*

Software configuration services and directory services are the two types of services currently addressed by the group. Both types of services are not developed specifically for AgentScape - they are intended to be of use to other supportive environments for distributed applications. In essence, a service offers an interface and is usually associated with a specific location.

*Applications*

Within the AgentScape research programme, distributed applications are the proof of the pudding: they determine the requirements for AgentScape's middleware and services and also the means with which the former can be tested.

*Legal Aspects*

Agent characteristics - such as: autonomy, pro-activity, reasoning, learning, co-operation, negotiation, social and physical manifestation - are characteristics taken from humans. Notions such as anonymity and privacy will be redefined in the 'digital world'. In these projects the

research areas of Computer Science, Artificial Intelligence, and Law are combined to analyse legal possibilities and limitations of agent technology. The aim of these projects is to provide guidelines for both AI-researchers and Legal-researchers.

*Education*

Next to the research program IIDS spends resources on education. In 2006 *Service-Oriented Architectures/Computing* was included in the curriculum. IIDS also contributes the course on Proposal writing in the Top Masters Programme for Parallel and Distributed Systems.

*Results*

Year 2006 has been quite productive for IIDS. AgentScape software development resulted in two releases of AgentScape platform software. The AgentScape-0.8.1 release includes the WS-Agreements resource management framework, and the latest release, namely AgentScape-0.9.0beta1, includes the new AgentScape API. A special forum has been set up to announce new releases and help users with questions.

With respect to research much progress has been booked in collaboration with a number of academic/semi academic research groups. The Mini-Workshop *Autonomous Adaptation and Self-Organization in Decentralized Systems: Theory vs. Practice* was very successful in this respect. Colleague researchers from Australia, United Kingdom, Germany and the Netherlands presented and discussed their current work (and current collaboration), initiated new collaborative research and explored the potential for a European research proposal.

With respect to research it is worth to mention that although too many of the group's research vacancies have remained open due to VU politics, research has continued and has been quite successful. More could and would have been achieved if the positions had been fulfilled.

*Dissemination of results*

In September members of the group attended the *Autonomic and Trusted Computing 2006 Conference* in China and presented the paper. Benno Overeinder chaired a session at the conference.

During the conference some valuable contacts were made, in particular with prof. dr. Christian Mueller-Schloer and dr. Theo Ungerer from the Organic Computing initiative in Germany. IIDS was invited to participate with their activities, such as workshops and meetings.

Other contacts are the two organizers of the ATC06 conference are prof. dr. Laurence T. Yang and prof. dr. Jianhua Ma. They invited Benno Overeinder to become





one of the international liaison chairs of the ATC07 conference.

The Special Session on Service Level Agreements organized as a special session of the *High-Performance Computing and Communication Conference* in Munich, Germany was very successful. As a result of discussion, a new workpackage has been defined within the WS-Agreement working group of the Open Grid Forum.

The two day mini-workshop on *Autonomous Adaptation and Self-Organization in Decentralized Systems* was very successful. The workshop has brought together various projects with which IIDS shares similar interest and would like to collaborate with. One of the interesting discussions addressed the use of IIDS agents to contribute to and benefit from Grid systems work in Cardiff, both at the VU and in Cardiff. A demo of AgentScape was given during this event, resulting in discussions on other potential types of use. One of the results of this discussion, which continued during the next few days of their stay at the VU, was that during the following week an opinion paper "*Informed Matchmaking for Dynamic Coalitions*" was submitted to EUMAS on the use of monitoring information in service. Research-wise, IIDS is increasingly visible. IIDS has been asked to help organise or join the programme committees of a number of conferences or workshops, for example:

- EUMAS (European workshop on MA systems)
- International Conference on Autonomic Computing
- International Conference on Autonomic and Trusted Computing
- International Workshop on Self-Adaptive and Autonomic Computing Systems
- Special session on Organic Computing: An Approach to Controlled Emergence (CEC 2007)
- International Conference on High Performance Computing and Communication.

Nationally IIDS has been asked to organise the informal SAFE-NL event next year. IIDS has also been invited to join the CoreGRID Network of Excellence, specifically to contribute to the Service Level Agreement task recently defined, and to support IEEE FPA developments on mobile agents. Recognition has also resulted in an increasing number of requests for PhD committees, for journal reviews, and for collaboration in new European proposals. An invitation to IBM's Academic Event in Barcelona is another example of visibility.

Dissemination of results is an on-going activity – see the list of papers and presentations and the IIDS site.

Plans to pursue an Internet Institute at the VU, in which IIDS will participate, an initiative taken by Brazier, Oskamp and Tanenbaum are to be pursued in the coming year.

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

NLnet contributed € 476.802 in 2006 (€ 367.737 in 2005) to support the IIDS group, in addition to the extra time from Brazier (0.4 fte) invested directly.

## II. network technology development and engineering

### **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 € 345.000 in 2006 (€ 385.250 in 2005). NLnet Labs is situated in Amsterdam in one of the Matrix buildings of the ASP (Amsterdam Science Park). Olaf Kolkman is the managing director.

### *Governing Board*

At the end of 2006, the Governing Board consisted of Teus Hagen (chair, Stichting NLnet), Frances Brazier (secretary, Stichting NLnet), and Wytze van der Raay (treasurer, Stichting NLnet). Teus has ended his chair in end of December 2006.

### *DNSsec*

DNSSECbis (RFC2535bis) was published and prepared for deployment. Also there is significant need for key management and troubleshooting tools. Deployment is picking up slowly. This is partly due to lack of economic incentive and the expense of deployment. However NLnet Labs can make a difference by providing documentation, tools and expertise.

NLnet Labs plans to remain active in the IETF working groups that deal with DNSSEC deployment: dnsexp and dnsops. NLnet Labs will also participate in 'evanguingering' activities such as courses in ISOC context and dnssec-deployment.org, and the maintenance of the DNSSEC HOWTO.

### *DNS root server*

The root-server project, that started at the end of 2002, resulted in our own nameserver implementation: NSD. NSD is in production at two root-servers (K and H) and at least a dozen TLDs (e.g. .mil, .se, .fr, .de, .org and .nl). And the interest is still gaining momentum. Also the



	<p>ENUM community has become very interested in using NSD.</p>
	<p>The release of NSD 3 occurred in 2006. Some minor improvements are foreseen in the version 3 series. NLnet Labs is offering support contracts that include, at the highest level, 32 hours of complimentary "Labs Consultancy" per year. It is expected that not all organization will capitalize these 32 hours of "Labs Consultancy" however.</p>
<i>ENUM</i>	<p>NLnet Labs has been tracking the developments concerning ENUM. On national level the initiative by SIDN to host the tier I ENUM service in the Netherlands was supported. Within IETF context NLnet Labs contributed through co-authorship on a draft called "The Uniform Resource Identifier (URI) DNS Resource Record". The idea posted therein does not satisfy infrastructure ENUM requirements and will not be pursued.</p>
<i>Distel testlab</i>	<p>The DISTEL testlab is a key component for running regression and performance tests for NSD. The DISTEL testlab has been rewritten in 2006 to facilitate tests during the production of NSD 3.0 and is used for regression, performance and release tests for further development of NSD. It is also expected to play a role in the production of UNBOUND. Therefore the testlab will continue to be maintained and may even be expanded.</p>
<i>Unbound security aware resolver</i>	<p>In 2006 NLnet Labs started working on the design and architecture of "Unbound". This project involves porting an early JAVA based prototype to C and is a collaboration between NLnet Labs, Verisign, and Nominet. This software, to be released under BSD license, is targeted to be the second implementation of a full resolver that supports the DNSSECbis standard, including support for NSEC3 -- a method providing protection against zone enumeration.</p>
<i>Masterdont master-server-backend</i>	<p>The intent of the Masterdont project is to build a server that is optimized to maintain a consistent view of a zone in a backend database (either directory, or relational database) under a regime of dynamic updates. Masterdont updates high performance master servers that answer the queries. Together with NSD and Unbound, Masterdont will provide a piece that enables building a complete DNS architecture based on NLnet Labs software.</p>
<i>Consultancy</i>	<p>By working with professional organizations in the field NLnet Labs tries to understand the real day-to-day problems in Internet operations. It occasionally provides</p>

consultancy services in cases where staff is able to extend and apply its expertise to a particular problem. Guiding is that obtained expertise or results from the consultancy should be beneficial to general public.

The contract with ICANN, which includes consultancy for ENISA, is expected to continue. Also some unpaid consultancy takes place, f.i. with RIPE/RIPE-NCC, SSAC, CENTR, and KWINT.

In order to understand the needs within production environments NLnet Labs occasionally provides consultancy and maintains close contact with SIDN (the registry for .NL), NIC-SE (the registry for .SE), RIPE NCC and the root-server operator community.

NLnet Labs occasionally provides advice to (semi-) governmental institutions.

*LDNS*

NLnet Labs continues the maintenance of the LDNS library. It will be extended to support new RR types that appear in the IANA registry. LDNS will be used for analysis, test and support tools.

*DNS*

NLnet Labs continues the maintenance and development of the Net::DNS suite, a perl based resolver and function library with DNSSEC functionality.

*DNS quality*

Monitoring of DNS quality was formalized as a project in 2006. It has proved to be useful in addition to the warning systems that TLD and root DNS operators run themselves. The monitoring of services improves overall quality of the DNS system and provides NLnet Labs with good operational insight. Besides, it helps to establish NLnet Labs as a competent and reliable partner.

*SIP*

NLnet Labs has implemented an Asterisk server for basic SIP based voice over IP services. This system is not quite production ready.

*SHIMS6*

The IETF SHIM6 working group has been chartered to "produce specifications for an IPv6-based site multi-homing solution that inserts a new sub-layer (shim) into the IP stack of end-system hosts. It will enable hosts on multi-homed sites to use a set of provider-assigned IP address prefixes and switch between them without upsetting transport protocols or applications."

*Intelligent distr. Systems*

There are a number of avenues that are worth exploring where knowledge of agents and distributed systems are relevant within the Internet architecture. One can think of distributed hash tables or perhaps particular service discovery mechanism.



Stichting NLnet Labs publishes its own annual report. See <http://www.NLnetLabs.nl>

### III. “Productising” network, development and engineering

#### **Ambulant/NxG** *SMIL-3.0 standard*

The Ambulant Phase 2 project started in October 2004, as a follow-up to Ambulant I in cooperation with CWI in Amsterdam. The project is delayed and will run until December 2007. It aims to contribute to the development of the SMIL 2.1, Timed Text DFXP and SMIL 3.0 specifications within the W3C framework, and simultaneously provide a reference implementation of these standards in the freely available Ambulant player (released under LGPL): a multi-profile, multi-platform, fully SMIL-conforming player for mobile and desktop systems running under a UNIX or Windows based OS. At the end of 2006 the Ambulant 1.8 player has been released and runs on Linux desktop and the Linux-driven Nokia 770/800. The target community for the Ambulant Player are developers of multimedia protocols, networks and infrastructures. The Ambulant Player represents the first phase of a multi-year project aimed at improving network level support for multimedia information processing. As one of the results, the Ambulant team contributed considerably to the SMIL 3.0 specification.

More details about the project can be obtained via <http://www.AMBULANTplayer.org>

NLnet subsidizes the three year SMIL “next generation” project for a maximum of € 150.000, while CWI provides self-financing of € 85.000. More details about the project can be obtained via <http://www.AMBULANTplayer.org>. Together with Ambulant Phase I, which started in 2003, the total of Ambulant sponsoring by NLnet up to 2006 was € 235.404

#### **Anti-SPAM**

NLnet has tried in 2004 and 2005 to stimulate anti-spam initiatives in order to fight the enormous increase of SPAM in e-mail. An attempt to involve the Spamvrij.nl foundation in this work failed when Spamvrij.nl was shut down in late 2004. With Bits of Freedom (BoF) a plan for developing a “Best Practices” anti-spam policy document for Internet Service Providers in Holland, was made. Bits of Freedom was sponsored by NLnet to perform the necessary work. The projected sponsoring of NLnet is € 15.000. Due to financial constraints at Bits of Freedom foundation this project has been cancelled.

#### **Bits of Freedom**

Stichting Bits of Freedom is a non-profit foundation based

*watchdog digital rights  
and privacy*

in Amsterdam, the Netherlands. BoF supported the privacy and digital rights for the community:  
<http://www.BoF.nl> BoF had a close relationship to the European Digital Rights organisation:  
<http://www.EDRI.org..>

Due to lack of long term financial continuity BoF foundation ended its operations in 2006. NLnet funded the electronic newsletter of BoF for € 6.666 in 2006.

**CAcert**  
*free X.509 certificates*

CAcert.org is a community initiative to provide a free X.509 digital certificate service. X.509 is used in network protocols like SSL, HTTPS etc., e-mail readers and browsers and security devices. CAcert is a non-profit association based in Sydney, Australia. NLnet provides support and donations to CAcert on an ad-hoc basis.

In 2006 NLnet has supported CAcert with PR work and organisation of CAcert Assurer and PGP signing support for various events: NLUUG conferences, USENIX/LISA conferences in the USA, HCC "dagen" in Utrecht, The Netherlands and other developer meetings in The Netherlands. At the end of 2006, The Netherlands maintained its second place on the list of top countries for number of listed Assurers. NLnet supports together with HCC and NLUUG the [www.CAcert.nl](http://www.CAcert.nl) website.

At the end of 2006 a request has been made to move the operational servers out of Sidney Australia. NLnet together with HCC and NLUUG found sponsors for hardware, support and connectivity and started the Stichting Oophaga Foundation as responsible entity for a high level secure hosting of the free certificate services for CAcert. It is intended to be operational early 2007. NLnet will donate € 10.000 to Oophaga. More information is available at <http://www.oophaga.org> and <http://www.cacert.org> .

**CodeYard**

CodeYard enables high-school students to contribute to Open Source software projects written by themselves and their peers. CodeYard provides infrastructure in the form of a "digital schoolyard" where creativity and programming talent meets to work together on programming projects with other school students. Students can use the infrastructure and expertise of the CodeYard project to produce OSS, which can be passed on to future generations of students. Ultimately this leads to a wider use of OSS.



Students should find out that writing OSS is *fun*. In this respect the community-building aspect of CodeYard is more important than the code that might be written there. The intention is to attract students to OSS so that they stick around in the long term, and do not just use it briefly to fulfil their high school credits requirements. In this sense the CodeYard project is an idealistic one, and depends on the enthusiasm and cooperation of local high school students.

CodeYard is an initiative of the Computer Science Department of the Radboud University Nijmegen. NLnet is the primary sponsor for the project (in addition to internal funds from the RU).

After setting up the infrastructure and the initial publicity in the fall of 2005, a significant intake of participating high schools and students occurred in early 2006.

In June 2006 the first CodeYard Award sponsored by Capgemini has taken place. 25 schools and colleges, 76 students, 22 teachers representing 31 projects participated in this event.

For 2006 this amounted to € 51.114 Projected NLnet sponsoring for the full project is € 123.525

More details can be found at <http://www.CodeYard.org>

## FFII

### FII

The Foundation for a Free Information Infrastructure. FFII concentrates on the spreading of data processing literacy and supports development of public information products based on copyright, free competition, and open standards. In daily practice, FFII is the driving force of the movement which fights against the legalisation of software patents in the European legislation. In practice: this means active lobbying in the European administration in Brussels (in particular the European Parliament), distributing lots of information and press releases, and organising conferences and demonstrations (both physically and on the web).

Together with other organisations (iMatix, Open Society Institute, RedHat) NLnet sponsored lobby activities of FFII (parliamentary resolution, board meetings, consultations on patent policies, etc., as well as own conferences) towards the European Commission in Brussels and elsewhere in Europe.

## Free Software Foundation and GPLv3

The Free Software Foundation (FSF) 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 Version 2 (GNU GPL) and GNU Free Documentation License (GNU FDL) are used for many NLnet-sponsored projects. The Free Software Foundation Europe (FSFE) is concentrating on the European aspects of the FSF software philosophy.

FSF is the principal organizational sponsor of the GNU Project. FSF US concentrates on creation of the GPL version 3 license and anti-DRM (controversial Digital Rights Management) activities / initiatives. NLnet sponsored the GPLv3 drafting process which should lead to the release of GPL Version 3 (and derivatives) in 2007. NLnet sponsors FSF USA with € 100.000 for its GPLv3 activities, divided over three phases of preparation, comment/review and release of the GPLv3. FSF Europe is sponsored with € 50.000 divided over two phases for the European side of the GPLv3 drafting process.

Continuing its support in previous years, Stichting NLnet has also made a donation of € 15.104 to FSF USA and of € 10.000 to FSF Europe.

More details on FSF USA and FSF Europe can be found at <http://fsf.org> and <http://fsfeurope.org>.

**Freedom Task Force** Besides the above mentioned general support to FSF, NLnet separately sponsors the Freedom Task Force, a project of FSF Europe, which provides licensing services to individuals, projects and businesses involved with Free Software and works in alliance with [GPL-violations.org](http://GPL-violations.org) on resolving licensing issues. More details on FTF can be found at <http://fsfeurope.org/projects/ftf>

In 2006 NLnet has sponsored TTF with € 20.000

**LogReport**  
*log file analysis and*

Stichting LogReport Foundation has been dissolved on 30<sup>th</sup> of December 2004. Hosting of the LogReport server by NLnet Labs has been continued in 2006, with service support from volunteers. More information can be found at <http://www.LogReport.org>.

**Open Sesame**  
*web RDF querying*

Open Sesame is a project started by Aduna b.v. in March 2002 with the help of NLnet. The Open Sesame developments were supported until February 2006. The last part of the project puts emphasis on better usability of the software and wider deployment and cooperation with other development groups.





The main goal of Open Sesame 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. Key features of Open Sesame are: open source, available under LGPL, scalability, a query engine for RQL, portability, repository independence, extensibility, and separating communication from 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.

The Open Sesame project has been extended until February 2006 to incorporate a number of API and implementation improvements enabled by the release of the Java 5 language.

#### Results

Communication with the developer and user community is established via a web based forum at <http://www.openRDF.org>. The number of participants and contributions in the forum and the number of website visits all showed healthy growth trends.

A number of improved versions of the Open Sesame software have been released via SourceForge (<http://sesame.sourceforge.net>)

Technical contributions to the project have been received from a.o. OntoText (Bulgaria), University of Karlsruhe, Oracle (Germany), MIT and Vrije Universiteit Amsterdam. Both the Sesame I project (of about 2.6 person years) and the Sesame II project (of about 1.4 person years) are fully sponsored by NLnet.

In 2006, NLnet contributed € 13.821. Up to the end of 2006 NLnet sponsored Open Sesame with a total of € 316.772. In order to increase the dissemination of results to the development community NLnet provided a one year PR funding to Aduna, which is included in the total amount.

#### Parrot

The overall design for Perl 6 (for which the development *virtual machine for Perl 6 and other dynamic languages* started in 2000) is nearing completion. One of the essential components for a Perl 6 production release is the Parrot virtual machine. Parrot is designed to execute byte code for interpreted languages efficiently, and thus it will also be able to act as the run-time environment for many other dynamic languages, e.g. in internet browsers. The Perl Foundation defined a table of milestones

(<http://www.perlfoundation.org/gc/grants/2005-p6-proposal.html>) for the implementation efforts.

NLnet provided full sponsoring for Milestone 1 - complete the engine's parser, develop the core of the grammar engine and a Perl 6 grammar, test against example Perl 6 code, and Milestone 2 - extend the grammar engine to produce Parrot AST, complete the core features of the grammar engine.

The project progressed slower than, and deviated from, the original planning due to the complexity of the subject and lack of manpower at The Perl Foundation.

NLnet has agreed to provide full sponsoring for Parrot Milestone 1 (US\$ 35.000 for 2005) and Milestone 2 (US\$ 35.000). For 2006 there was no funding acquired.

## **SANE**

*OSS community forum*

Stichting SANE organizes once every two years a

conference targeted at system / network administrators and network engineers and until users. The conferences have been organized until now in close cooperation with NLUUG, the Dutch UNIX users group, and the USENIX Association in the USA.

*governing board*

The Stichting SANE governing board consists of Bob Eskes (chair; former NLUUG board member), Jos Alsters (secretary; NLnet board member and former NLUUG board member) and Wytze van der Raay (treasurer; NLnet board member).

The foundation publishes its own yearly report.

NLnet has provided a financial guarantee and an interest-free loan for every conference until now, and has provided organisational and administrative support.

*SANE2006 conference*

From 15-19 of May 2006, SANE 2006, the fifth Systems Administration and Network Conference in Europe, was held in Delft. The event had a three-day tutorial program, followed by a two-day technical program. In addition, a poster session and a Free Software Bazaar was held in conjunction. The conference was well attended and quite successful. The conference needed no funding.

Stichting NLnet supported SANE 2006 with a guarantee of € 40.000 and an interest-free loan of € 40.000 to Stichting SANE. The other sponsors of SANE 2006 were USENIX, SURFnet and NLUUG. Due to the lack of core organisational resources within SANE foundation and outside it, it is not sure whether and how SANE activities will be continued in the future.

## **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.

*foundation*

In order to boost the cooperative development efforts, NLnet decided in 2001 to create an interregional coordination centre: Stichting SchoolLan. Stichting SchoolLan has been fully sponsored by Stichting NLnet. Lack of market penetration, and thus lack of economic viability, forced the close of SchoolLan's development and support office in August 2004. At the end of 2004 efforts were started to raise interest from commercial organisations to continue development and support of this Open Source technology. In 2005 these activities have not proven to be successful enough for allowing continuation of SchoolLan on a long term base. There has been serious interest from Keigroep (a computer infrastructure support provider) and Stichting Prisma (a regional foundation for schools with its own SchoolLan service provision), but this was not enough for a long term continuation. The foundation was dissolved in the end of 2006. Copyrights have been transferred to NLnet.

*Governing Board*

The Governing Board of Stichting SchoolLan consisted of Teus Hagen (chair, Stichting NLnet), Wytze van der Raay (treasurer, Stichting NLnet), and Kees Keijzers (secretary, University of Nijmegen).

The trademark SchoolLan has been registered for the Benelux to prevent misuse by other parties.

The SchoolLan web and software development tree is hosted on the NLnet web server.

NLnet has sponsored SchoolLan with € 778.777 over a period of 8 years.

## **Turtle**

*P2P anonymous sharing*

Turtle aims at the creation of a Open Source software based peer-to-peer (P2P) infrastructure for easy and safe sharing of sensitive information while maintaining anonymity for both data sender and receiver. The project is done at the Vrije Universiteit in Amsterdam and is supervised by prof. Andy Tanenbaum. It started in February 2005 and is ending in March 2007. Half of 2006 the main developer of Turtle left the project. The project contract has been redefined in order to fund dissemination work of Turtle and to create a development

and user community. The redefinition had no influence on the funding total. NLnet is sponsoring one full time person for 2 years for a total of € 134.000 (in 2006 € 57.100). At the end of 2006 Turtle was approaching still it's first alpha release.

More information about Turtle can be found at <http://www.turtle4privacy.org>

### **VirtNet FreeBSD**

VirtNet project is intended to produce a Network Stack Virtualization Network extension to the FreeBSD kernel. In simple words, the idea behind the project is that clonable network stacks allow multiple independent network stack instances to coexist within one OS kernel simultaneously. From the perspective of network communications, it is possible to achieve highly efficient light or pseudo virtual machine functionality.

NLnet sponsors this project via the FreeBSD Foundation under which supervision the project is implemented by Marko Zec (one year full time) at the University of Zagreb. The project started in May 2006 and is supposed to end in May 2007. NLnet sponsors this project with € 55.000 (in 2006 NLnet sponsored € 19.872) and a special budget to disseminate results and to increase cooperation in the developments.

#### *Results*

In the end of 2006 the project had a delay of 3 months. Marko has reported intermediate results at various FreeBSD / UNIX conferences and workshops.

More information can be found at <http://www.tel.fer.hr/zec/BSD/vimage/>.

## **IV. Funding of other Open Source initiatives**

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

### **software development hackathons**

#### *BSP Marathon*

In Europe and outside a number of hackathons were organised to release the new Debian Linux ("Etch"). NLnet has co-sponsored travel costs for three of these hackathons (in Wien, Jülich and Utrecht). An overview of this BSP Marathon can be found here:

<http://wiki.debian.org/BSPMarathon>. Funding was € 2.217

- OpenBGPD & OpenOSPF* A mini-hackathon in June in Hamburg for OpenBGPD and OpenOSPF developers aimed to improve the routing support in OpenBSD. Funding was € 5.000
- OpenDocument Day* The KDE aKademy 2006 in Dublin was sponsored by NLnet, through financing of travel costs for 5 participants. Funding was € 5093
- OpenSync* The OpenSync hackathon (synchronisation software for PDA's, etc., implementation of the IPC mechanism, synchronisation demo with SyncML) has taken place in January at IBM headquarter in Amsterdam. The funding was € 2.293
- Firefox** Firefox is an OSS-based internet browser. A Dutch group of Firefox supporters initiated promotional activities to create more awareness of Firefox, in particular amongst Windows system end users. NLnet has agreed to contribute € 4.000 to a full-page Firefox advertisement in Spits! (a popular free newspaper), finally appeared in 2006. Ref.: <http://hirespdf.spitsnet.nl/2006-03-13/SPI20060313.pdf>.
- Blue Ribbon (LOAP)** Carl Malamud has received a sponsorship of US\$ 6.000 from NLnet for his efforts to initiate a book with reports of experts about "the future of DNS". In 2006 a movie of interviews with experts in the field of DNS was created. NLnet is one of the sponsors for this movie.
- OASE** Open Source and business relations 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. OASE was ended in 2006.
- TQ-NL** Stichting ThinkQuest Nederland's mission as a non-profit organisation is to increase innovative educational use of the Internet by supporting the development of new applications. In 2006 the foundation the programme for ICT and Education for the period 2006 – 2009 started in January 2006. All details can be found on the new website of TQ-NL: <http://www.stichtingTQ.nl>. Frances Brazier chairs the Board of Stichting ThinkQuest.
- donations** NLnet provides donations on a regular basis to a number of non-profit organisations whose activities are in line with the NLnet non-profit free use of software philosophy.

Stichting NLnet donations in 2006 which fit into this category include:

- FSF US (free software distribution and usage) € 15.105
- FSF Europe (free software usage and distribution focussed on Europe) € 10.000
- FII (anti-software patents in Europe) € 10.000
- ISOC (Internet Society) € 4.138
- ISOC.nl € 2.500