

**towards Open Source Software adoption and dissemination
tOSSad**

Contract N° 015981

**A Guideline for F/OSS Adoption in Public
Sector with special focus on target countries**

D23

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¹ <http://www.gnu.org/licenses/gpl.html>

² <http://creativecommons.org>

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Introduction

1. Introduction

F/OSS is not a nameless, faceless, or arcane venture. Nor is it charity, or solely a community effort. The impact of F/OSS technology is of importance to the software industry and to society as a whole. It is about to change the methods of ICT development in a profound way.

Worldwide, an increasing number of governments are looking into Free/Libre Open Source Software (F/OSS) and in many cases realising its functionality offers significant benefits, strong enough to start considering, and in some cases mandating, the use of F/OSS in governmental bodies.

So far, much has been written and said about the commercial benefits of F/OSS. There are also significant benefits to be derived from large-scale F/OSS adoption in Public Administration. These benefits are not necessarily the same benefits that are driving F/OSS adoption in commercial companies.

F/OSS may help schools to dramatically improve the informatics skills of their students. In fact there are a lot of schools in Europe that don't have an informatics laboratory because of, among other things, the prohibitive costs of software licences. An increasing number of software experts in Europe with superior F/OSS educational skills will result in an increasing number of software companies.

F/OSS may also determine positive effects in the quality of the services the public administrations give to the citizens. Personnel that use F/OSS for work are able to easily interact with the developers of that software in order to suggest new features or to indicate problems. This direct involvement in the design and production of software may lead to improvements in the quality of the services given to citizens.

For Public Administrations throughout Europe, F/OSS is becoming one of the most interesting software solutions on the information technology landscape. It allows for novel and proven development models, demonstrated to be especially well suited to efficiently take advantage of the work of the globally distributed software developer community.

This report aims to facilitate the first steps toward F/OSS adoption by giving advice on how to make sense of the information jungle. We depict ways of F/OSS adoption and promotion by describing scenarios that have been implemented successfully by local and regional administrations. In each example the main barriers that have been perceived are described as well as the key factors to successfully overcome them. Chapter 3 structures the various options of adoption and advice for planning a migration strategy. Chapter 4 illustrates common scenarios with successfully implemented examples.

Guide to Adoption

2. Guide to Adoption

There is a wealth of information available (collected by tOSSad or freely available on the Internet) on the benefits and barriers to F/OSS and there are many examples of successful migration projects. However, it is complicated to find the first step, once you have decided „let's give it a try“.

Migrating to F/OSS is not an all or nothing step. There are several levels of adoption and a non-aggressive migration strategy is possible and often advisable.

Public administrations can play different roles in using and promoting F/OSS. These roles may be put on different levels:

- 1. Connivance of FOSS:** There is no official, active strategy to use or promote F/OSS software, but there is no denial either. Some free software might be used on the server or desktop but without any special attitude or commitment.
- 2. User of FOSS (early adopter, power user):** Awareness to F/OSS has been raised. A strategic approach is chosen to try and introduce FOSS in preference to proprietary solutions. A non-aggressive approach might be to start using the Firefox web browser on the desktop before replacing vital system components like the operating system or office applications.
- 3. Provider of FOSS (developer, contributor):** When using software, improvements and customizations of software might be contributed back to the community. Own developments might be provided under a public licence enabling other administrations to collaborate and adopt a solution; e.g. the German Federal Office for Information Security BSI provides a Linux distribution with security software under a public licence.
- 4. Promoter (evangelist):** Besides using and providing FOSS, public administrations can take an active role in promoting FOSS by various means such as press campaigns, financial incentives, education and procurement regulations. For example the region of Extremadura clearly demonstrates the financial as well as social benefits when using and promoting FOSS for education, rural development and public awareness.

Unfortunately, FOSS adoption is often laden with strategic discussions on freedom of information, proprietary versus free software and vendor lock-in. Lobbyists of each party have many arguments ready to support their view and a normal user is easily lost in heated philosophical discussions. Hence, an objective approach is needed, F/OSS adoption should follow strict managerial best practices.

Actually, the introduction of FOSS software often does not significantly differ from any other infrastructure endeavour. Whether Firefox is used for Web browsing or Internet Explorer, it is just a decision among alternatives. FOSS differs from proprietary products only in two main points: you do not have a legal entity that provides liability and warranty (you cannot sue anybody in case of failure) and you might have to deal with a developer community instead of a single point of contact.

Guide to Adoption

Therefore, FOSS adoption should be handled like any other kind of software project. Most guidelines to FOSS adoption recommend³:

- before starting, have a clear understanding of the reasons to migrate;
- ensure that there is active support for the change from IT staff and users;
- make sure that there is a champion for change – the higher up in the organisation the better;
- build up expertise and relationships with the FOSS movement;
- start with non critical systems;
- ensure that each step in the migration is manageable.

2.1. Options of Adoption

The Guideline for Public Administrations on Partnering with Free Software Developers⁴ identifies three axis (type of software, the type of service and the type of partner) when using open source software and names three options each. The guide gives hints for legal partnerships for any combination of of the 3x3x3 cases.

- Software may be generic to purpose (e.g. operating system, office application), specialised purpose (e.g. content management, workflow system) or specific purpose (e.g. land record management)
- Services may develop solutions from scratch, improve existing solutions that have been developed externally (to reuse, adapt or integrate) or improve internally developed solutions
- Partners can be the “open source community” without any legal personality, an organised community (e.g. non-profit organisations of developers) or commercial partners.

Often a simpler distinction based on the implementation level is made:

- On the server
- On the desktop
- FOSS for office automation
- Free and open file formats

For server computing, FOSS is well understood and is extensively deployed. Migrating servers to OSS can generally be done without having any (negative) impact on end users. In many places, Apache web server, Linux and other kinds of free software such as MySQL are already in operation (“LAMP-stack”).

³ The IDA Open Source Migration Guidelines
(<http://ec.europa.eu/idabc/en/document/2623/5585#euopl>)

⁴ <http://ec.europa.eu/idabc/en/document/3879/471>

Guide to Adoption

Deploying OSS on the desktop, for most organisations, offers the largest cost savings. When migrating the desktop the new OSS applications will have to inter-operate with existing applications. In particular, the way in which group calendaring inter-operates in both OSS and proprietary desktops must be addressed.

When replacing proprietary office automation software templates must be checked to ensure that they produce the correct output. Macros (such as those in Microsoft Excel) need to be re-written. Applications for which there are no OSS equivalents can be run as thin clients. Over time desktop applications can be replaced with OSS equivalents.

Although many guidelines assume a complete change to OSS the likelihood is that such a heterogeneous environment will be built gradually, as a migration of thousands of desktops will take time. Mixtures of OSS and proprietary applications are also likely because replacement OSS applications may not always be available or suitable.

Migration to F/OSS supports the increased adoption of open standards for information and document exchange. It is important to make sure that decisions made now, even if they do not relate directly to a migration, should not further tie an Administration to proprietary file formats and protocols.

2.2. Get Informed

There are many Internet portals providing information on the various aspects of using and promoting FOSS in public administrations. We detail a few interesting, European related ones to give a first point of entry.

- European F/OSS-related research activities contains links to all European FOSS projects since 1998:
http://europa.eu.int/information_society/activities/opensource/european_activities/
- tOSSad – of course. <http://tossad.org/tossad/links> provides links to useful information resource in the Internet.
- IDABC (Interoperable Delivery of European eGovernment Services to public Administration, Businesses and Citizens) operates a web portal “Open Source Observatory” with references to FOSS in general as well as links to national FOSS programmes.
 - <http://ec.europa.eu/idabc>
 - <http://ec.europa.eu/idabc/en/document/1677/471>
- Free Software Foundation (<http://www.fsf.org>)
- OSS Watch (<http://www.oss-watch.ac.uk/>) is a portal mainly for educational institutes in UK that deals with F/OSS adoption issues. The portal aims to promote F/OSS adoption via providing information on OSS awareness and its legal, social, technical and economic matters.

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- Guideline for Public Administrations on Partnering with Free Software Developers (<http://ec.europa.eu/idabc/en/document/3879/471>)
 - Identify the “seed”, what will attract developers? Disseminate to reach the developer community to attract a community to solve a problem or to support a pre-existing software application
 - Cooperate and proactively provide feedback
 - Identify funding methods, if required
 - Involve other public administrations
- The German OSS Competence Center of the Federal Government Coordination and Advisory Agency⁵ provides plenty of information about German projects, FOSS alternatives of proprietary software but also economical and legal aspects of FOSS. Besides notes on patents and copyright, issues of liability/warranty and placing/procurement are discussed and guidance given.
- The Foundation for a Free Information Infrastructure (FFII) is a non-profit organisation dedicated to establishing a free market in information technology, by the removal of barriers to competition. <http://www.ffii.org>
- The national resource centre for FOSS contains many links to FOSS development initiatives, Public Administration initiatives in Europe and other parts of world (<http://www.au-kbc.org/nrcf/whatisfoss.htm>)

2.3. Migration Planning

Making Life Easy

- *Introduce new applications in a familiar environment*
- *Do the easy things first*
- *Think ahead*

Migrating to open source does not differ from any other information system related project. Hence, normal management principles apply. As the IDA Open Source Migration Guidelines recommends, any migration exercise should consist in general of:

- 1.** A data gathering and project definition phase including:
 - A description of the set of relevant initial conditions consisting of, for instance: systems architecture(s), applications and their associated data, protocols and standards used, hardware, the physical environment, such as network bandwidth, location, the social requirements such as language(s) and staff skill sets;
 - A set of target conditions in the same detail,
 - A description of how to get from the existing to the planned conditions;

⁵ http://www.kbst.bund.de/cIn_006/nn_837408/Content/Software/OSS_Kompetenzzentrum/oss.html__nnn=true

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2. A justification for the migration including the cost associated with it,
3. One or more pilot phases which are designed to test the plan and the justification. Data from these pilots can then be fed back into the cost model used in the plan,
4. Roll out of the plan,
5. Monitoring of the actual experience against the plan.

Migrating IT systems provides an opportunity to re-engineer them to meet the new demands placed on them.

The guidelines listed in the previous chapter provide insight into recommendations for FOSS oriented IT migration. These guidelines have been developed by national competence centres and may have particular relevance for public administrations. In the following chapter, we elaborate more on the level of involvement of administrations.

2.4. Policy Options for F/OSS

There are two general areas of policy implementation options to be considered by Governments, each with different public-sector, civil-society and private-sector dynamics. Each of these potential paths has constraints or obstacles that countries must be aware of when considering the various policy options available to them in adopting FOSS.

- Formal versus informal approaches: Formal approaches such as legislation or a government strategic plan may be weighed against more informal, flexible approaches, to letting FOSS use evolve without direct governmental patronage.
- Strategy and level of involvement: Strategy initiatives may be carried out at sub-national, national or regional levels, and they may also entail different degrees of involvement, from awareness building to procurement to funding of R&D.

These options are not mutually exclusive but rather represent a spectrum of possibilities along which Governments can choose to array specific policies or a more general approach to F/OSS use. The relationship between government, civil society and industry may also be varied, with initiatives coming in a mixture of strengths from any given stakeholder. There is no prescription or tried-and-tested scheme: policy makers will have to consider their national circumstances and ICT development priorities. Several options and examples of applications throughout the world are given below.

Formal involvement

A number of Governments have pursued formal approaches to the adoption of FOSS in the public sector, considering legislation to mandate the use of open-source solutions in government applications or at least seriously consider them as an alternative to proprietary software.

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The French Parliament proposed a bill concerned with both the use of open standards and the availability of source code for software used by the Government. An Italian bill under consideration mandates a preference for FOSS in all government offices, and a Spanish bill requires regional governments to prefer and promote open source products.

In April 2002, the administration of the Spanish district of Extremadura put in place a plan to switch all computer systems in government offices, businesses and homes to Linux and FOSS applications.

The Government of the United Kingdom has set out policy to consider open-source solutions alongside proprietary ones in IT procurement; to use products that support open standards and specifications in all future IT development; to consider obtaining full rights to bespoke and customized software code for proprietary software it procures; and to explore further the possibilities of using FOSS as the default exploitation route for government funded R&D software.

Other countries have taken slightly less formal steps towards using FOSS in government. France, in addition to considering legislation, has created an Agency for Technologies of Information and Communication in Administration (ATICA), which seeks, among other things, to encourage the use of free software and open standards.

Strategy and direct involvement

Governments are important consumers of ICT, their participation is crucial for the success of any open-source initiative. Government can be involved at the level of strategic policy, building awareness and promoting conscious and informed choice among its administration as well as industries and civil society. It may act as a procurer, and it may directly finance R&D.

A good example of high-level strategic thinking is the case of the Government of South Africa. A council to consider the use of FOSS was convened in early 2003. The council delivered an official recommendation promoting the use of open-source applications when proprietary alternatives did not offer a compelling advantage. The recommendations were formulated at a strategic level as listed below:

- Provision of information to key decision makers (bearing in mind the need to demonstrate convincingly the security measures and business principles of FOSS)
- Generation of expert advice on the suitability of FOSS solutions
- Trouble-shooting for newly implemented FOSS solutions
- Software development assistance
- Training for FOSS developers and users
- Development of a research programme to enable optimal understanding of and decision making regarding FOSS (built on the networking nature of the FOSS development model)

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- Creation of FOSS support structures (some institutional development will be necessary)

The advantage of a strategic approach lies in the nature of software provision. As a complex knowledge product, software requires a technological and social infrastructure to facilitate its provision. A strategic approach would allow Governments to work in collaboration with donors to map out potential areas for development assistance, in particular identifying potential human resource capacity-building and technical assistance needs.

The report recommends creating strong linkages with higher education institutions to build a national collaborative network that can be extended internationally. It also emphasizes building partnerships within the public and private sectors and civil society, as well as regionally within Africa and globally. The strategy emphasizes the importance of building support among key stakeholders, including the political level, senior management, IT professionals and government users.

Still at the strategic level but with the stakes raised to international collaboration, FOSS may have the potential to generate large economies of scale and positive spillover effects in regional capacity building and infrastructure development. A number of regions have taken steps toward collaborating on FOSS, and such cooperation has been most pronounced in Africa.

In early 2003, African countries from across the continent launched the Free and Open Source Software Foundation for Africa (FOSSFA), an organization aimed at promoting the use of FOSS throughout the continent.

FOSSFA anticipates that FOSS will provide opportunities to develop local programmes built by Africans for use in Africa. Regional organizations such as FOSSFA thus see the development value of open source in broad terms. An important aspect of such strategies is to emphasize the capacity-building dimension associated with open-source technology. Regional organizations have the potential to work with educators on a broad scale to introduce open source into schools where young people can learn to use, maintain and modify software. The vision for the future is one of a regional technical revolution of sorts, in which Governments and the private sector embrace FOSS and can rely on regionally developed software and expertise.

Some European Governments have begun shifting serious national-level support to open source. For example, France's ministries of Defense, Culture, and Economy have shifted to open-source operating systems. Germany's Federal Institute for Agriculture and Food has installed open-source operating systems on servers and workstations. In Britain, the National Health Service has adopted an open-source standard.

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Some developing countries have seen the private sector taking the initiative in cooperating with the Government in open-source software development. In India, for example, while government agencies have begun to explore the potential of FOSS applications, especially in education, private entrepreneurs have developed the Simputer, a FOSS-based handheld device. Collaboration between the public and private sectors is essential to a successful systematic adoption of FOSS solutions. The Simputer demonstrates that innovative private-sector FOSS solutions are possible. Yet even in this case, the developers anticipated needing government assistance to help disseminate the device. They realized that the Government would have to act as a major consumer in order to achieve the necessary critical mass for popularizing the product.

2.5. FOSS in national programmes

F/OSS adoption in regional/national programmes, in addition to its many other secondary advantages, is necessary in order to enable interoperability, reuse of products and solutions and optimization of resources while assuring a full knowledge of the data process treatments.

Regional/national programmes can significantly contribute and benefit from F/OSS, especially by

- introducing appropriate policies and legislation to enable and to promote F/OSS use within public bodies. Such regulations can lead to maximizing the return on ICT expenditures/investments by saving on license costs, and increasing efficiency gains by avoiding potential vendor lock-in, and allowing a wider choice regarding software solutions;
- stimulating the local software industry by enabling the creation of local capacity and skills necessary to satisfy Government's ICT needs; and contributing significantly to human resource development, especially in the area of ICT;
- lowering entry barriers for various kinds of new F/OSS based business models and players, such as new SMEs, into the ICT industry;
- preserving local languages and cultural specifics by the usage and availability of localized software versions of all software products;
- fostering innovation, security, interoperability and stability via availability of source code when it is compared to the "closed" world of proprietary applications which tends to inhibit innovation, as the development process is slow and in some cases barely takes into consideration governments' specific needs and requirements.

Full implementation of the F/OSS model implies that national programmes do not only concentrate on the procurement aspects of acquiring and using freely available software, but also contribute to development.

Scenarios

3. Scenarios

In the following sections we provide a list of common scenarios and interesting topics to give hands-on examples and indicate key success factors.

Each will provide a brief description of the scenario and the main benefits and barriers perceived from tOSSad project studies on FOSS. A real-world example will demonstrate that the scenario has already been successfully implemented and will name the main success factors and describe how the perceived barriers have been overcome.

At the end of each scenario we provide numerous references for further information.

3.1. Sectoral adoption: Health system

As information technology in the health care industry evolves from an administrative tool for billing and bookkeeping to a clinical tool for improving the quality and efficiency of health care, the scope of information sharing is expanding beyond the walls of individual institutions. Achieving this level of integration will require that software models overcome a host of technical obstacles, and that they are accessible, affordable, and widely supported.

Currently health care information systems are too fragmented to work efficiently. Many health care systems use several different information systems, thus wasting scarce resources on their maintenance. The quality of patient care could be improved through an increased integration of these systems and improved sharing and exchanging of data.

Conditions are now ripe for F/OSS solutions to take root in health care. F/OSS is well placed to become the standard for capturing, sharing, and managing patient information to support quality care.

Main barriers perceived

The first sizeable barrier for adaptation of F/OSS in health care is conservative attitudes towards new technologies and practises. Secondly, health care information systems often process critical information and there is no room for “beta-phase” solutions. Thirdly, open source projects often concentrate on developing small individual components rather than larger integrated solutions.⁶

One of the main obstacles in HCIS development is the rigid organisation structures and cultures apparent in the health care field. Enhancing management and the development of collaboration between health care organisations could provide significant benefits in terms of better and more cost effective health care.

⁶ Cited in Curing Health Care Information Systems with Open Source Software, <http://csrc.lse.ac.uk/asp/aspecis/20040143.pdf>

Scenarios

Examples

The JARA project, within the scope of the Extremadura Health System (Sistema Extremeño de Salud) – SES, is the most important free-software based promotion of e-health up to now. JARA includes all the social services offered in the health system, the 10 hospitals, the 104 Health Centres and more than 300 rural health centres in Extremadura. JARA has as -principle: “we cannot have a health policy that does not ensure that all users (this time the entire population) receive the same level of quality without penalising the inhabitants of rural areas”. JARA brings health services, limited up to now to large hospital centres, to all citizens JARA involves 12,800 health professionals who will share their knowledge to benefit the citizens, with tools such as tele-diagnosis and a single medical history for each citizen. It provides round-the-clock access to all kinds of health information to improve patient care, reduce paperwork and improve the security of patient records.

The JARA project uses a Linux-based computer network, believed to be the largest Linux deployment in Spain, comprised of multiple IBM xSeries servers and p5-570 servers with Power5 64-bit processors and incorporates IBM's Virtualization Engine technology and Simultaneous Multithreading capabilities. The servers, now in operation, run SUSE Linux Enterprise Server 8. Linux was chosen for the project to save money with license fees.

Further information

- <http://www.juntaex.es/consejerias/syc/ses/jara/jara.html>
- <http://www.euspirit.org/de/index.php>

3.2. Using F/OSS on the server

If you: are tired of constant upgrades, vendor lock-in or security issues, and

Want to: reduce costs while improving efficiency on your existing hardware...

Then you can: change server components without disturbing the desktop users.

Common Linux distributions come prepacked with all the components needed for setting up a server using F/OSS solutions. Operating as a server is natural to Linux since, in the past, this was its primary function. There are many configuration tools provided with the distribution, and all server functionality can be set out-of-the-box.

- **File Server**

One of the basic functions of the server is to provide seamless access to the files with the mechanisms to protect the files from unauthorized access. The F/OSS world has many solutions for providing file server functionality. LDAP with TLS can be used as a domain controller, while Samba provides access to files even to the MS Windows desktop. Automatic mounting can be used for easier handling of remote storage. These software usually come as a part of a Linux distribution and there are many tools that ease their configurations.

- **Mail Server**

Scenarios

One of the most popular mail servers for Linux is Procmail. In a larger organization, messages are distributed among different mail servers. For such a setup, MTA (Mail Transfer Agent) with SASL (Simple Authentication and Security Layer) can be used. In recent years, it has become very important to protect the users from spam. There are many F/OSS solutions for fighting spam, the most well known are SpamBayes and SpamAssassin. Besides normal access to mail by POP or IMAP protocols, web access is also desired. Again, the F/OSS world provides many powerful and flexible solutions, among them Horde and SquirrelMail. As for groupware, Kolab seems to be most feature complete.

- **Web Server**

F/OSS world is especially rich in this segment. Apache, known as one of the most efficient and secure web servers, is widely adopted, and is the undisputed king of web servers, holding by far the biggest market share, according to Netcraft statistics. It is also very flexible, there are many modules that extend Apache's basic functionality. For servlets, there is Tomcat, also, to develop J2EE applications, one can use Jboss.

A plethora of developer tools exist not only on the content providing side, but also on content creation side of F/OSS web servers. The most widely used are CGI and PHP, and in the recent time, Ruby on Rails has gained much popularity.

- **Database Server**

The two players in this segment are MySQL and PostgreSQL. They are well suited for SMEs and are good enough for most of the needs.

Main barriers perceived

The main barriers in adopting F/OSS on the server lie in the availability of trained administration staff and knowledgeable employees. If administrators are not trained on F/OSS products deployment, the solution is not optimal. Also, if the user specific applications are based on non-F/OSS server components, the cost of redeployment might be too high.

Examples

- Sirius IT, based in the United Kingdom but focusing on all of Europe, provides training, deployment and support for open source technology in the enterprise. Its clients include government entities and large corporations such as Pepsi, Pentax, Toyota, and the Make A Wish Foundation. Through Sirius, Taylor, CEO, focuses on providing what he calls a "complete enterprise stack," using open source software components, including Linux, Apache, MySQL, and Perl or Python (LAMP). In the business world, a stack is a collection of disparate programs that work together to accomplish a certain goal. In this case, it is to run all the office functions of an enterprise. The stack includes email, calendaring, shared mailboxes, anti-virus, anti-spam, and Intranet. Taylor still sees LAMP as the foundation for much of the currently available and utilized open source technology, but envisions a not-so-distant future where OpenLDAP will be the "axis upon which the whole open source enterprise stack revolves."

Scenarios

- BBC News Website uses MySQL to monitor reader interest. Millions of people visit the BBC News website for their daily fix of world news and analysis. Stories from hundreds of dedicated journalists in all time zones are constantly being fed to the site, which currently attracts 35 million unique users and receives over 800 million page impressions each month.
- Utel handles 10,000 Requests per Second using a Scale out Deployment of MySQL. Network Utel's aim is to develop France's biggest mobile phone-based chat community! In March 2003, the company launched "Fotochat", the first service to leverage the photo sharing capabilities of the new generation of handsets. This enabled users to get their pictures online in a matter of seconds via a simple e-mail or MMS. The system is based entirely on MySQL and processes an average of 3,000 queries per second and handles 10,000 queries per second at peak times!
- Somix Manages 20x More Data with Embedded MySQL. Somix Technologies is a Network Management company that provides products and services to some of the world's leading companies such as Disney Stores, Fannie Mae and AutoZone. To provide enterprise network managers with real-time decision making capabilities, Somix captures 20x more data than existing network management products. Somix relies on MySQL to manage these high-volumes of data.

Further reading

- LDAP: <http://www.ietf.org/rfc/rfc1777.txt>, <http://www.ietf.org/rfc/rfc2254.txt>
- OpenLDAP: <http://www.openldap.org/>
- PAM: <http://www.kernel.org/pub/linux/libs/pam/>
- unified login with PAM: <http://www.opengroup.org/tech/rfc/rfc86.0.html>
- system authentication using LDAP:
http://quark.humbug.org.au/publications/ldap/system_auth/sage-au/system_auth.html
- linux and active directory: <http://adminspotting.net/articles/windows/Linux-and-Active-Directory.html>
- Procmail: <http://www.procmail.org/>
- Linux mail server: http://www.hypexr.org/linux_mail_server.php
- SASL: <http://asg.web.cmu.edu/sasl/>
- Netcraft statistics:
http://news.netcraft.com/archives/web_server_survey.html
- Apache modules: <http://modules.apache.org/>

3.3. Using F/OSS on the desktop

If you: do not want to change your platform and important applications, but

Want to: reduce costs without losing efficiency in your daily office work...

Scenarios

Then you can: change only office and internet applications on your existing environment.

Internet

For internet related activities you will most frequently need:

- **Web browser**

Considered for several years as the best web browser, Mozilla Firefox is a perfect choice to replace Internet Explorer. Firefox is famous for its high security, reliability, add-ons, tabbed browsing and many other features (which most of the alternatives, including Internet Explorer lack). The installation is quick and the browser is localized in many languages. Firefox can be downloaded from www.getfirefox.com

Another alternative is the Opera web browser (which is free but not open source). It is famous for its minimal use of resources. www.opera.com

- **E-mail client**

The most popular F/OSS client is Mozilla Thunderbird. It has most of the features of Outlook Express. It is important to notice that Thunderbird is not equivalent to Microsoft Outlook – the F/OSS equivalent to this is Novell Evolution. Thunderbird has good spam and junk mail filters, allows rss feeds support, as well as other additional features which are considered to be better developed than in many proprietary equivalents.

- **Anti-virus software**

ClamWin is considered to be suitable F/OSS antivirus software. It is included, for several years, in the OpenCD and features high detection rates for viruses and spyware. Considered as one of the most popular F/OSS applications and suitable for most of the software platforms. ClamWin can be downloaded at <http://www.clamwin.com/>

- **Instant messaging software**

If you are using IM software like ICQ, you could migrate to F/OSS clients and protocols without losing your contact lists and data. Alternatives to ICQ client are GAIM, QIP and SIM. All of these are multiprotocol and support ICQ, Jabber, MSN Messenger, Yahoo messenger, AOL and, some of them, IRC. Therefore, they are a good choice in order to have multiple accounts, keeping them all at one place. GAIM can be downloaded from <http://gaim.sourceforge.net/> , QIP from <http://www.qip.ru/> and SIM from <http://sim-im.org>

- **Image processing program**

GIMP is F/OSS and is similar to Adobe Photoshop, but consumes less resources. Available at www.gimp.org

- **Office**

Scenarios

For office applications – such as textprocessing tools, spreadsheets, presentations, etc. - the most suitable package is OpenOffice.org which allows the opening and saving of documents in MS Office, Star Office and a number of other formats. You can also produce PDF documents without the need to install additional software. Available at: www.openoffice.org

3.4. Interoperability by enforcing open (document exchange) standards

Interoperability refers to the ability to efficiently transfer and use information uniformly across organizations, systems or components. It helps link systems, information and processes within and across enterprises. Open standards and formats provide the basis for interoperable ICT systems.

Among the reasons for adoption of open standards is the prevention of the often feared vendor lock-in (see chapter 4.9 on vendor lock-in) within an organization and the continued possibility for new service and business opportunities.

Open standards are publicly available and implementable standards⁷. This does not necessarily mean that no licenses to patent rights are needed to use the standard or that such licenses are available for free. Open standards which can be implemented by anyone, without royalties or other restrictions, are sometimes referred to as open formats. The primary goal of open formats is to guarantee long-term access to data without current or future uncertainty with regard to legal rights or technical specification. A common secondary goal of open formats is to enable competition, instead of allowing a vendor's control over a proprietary format to inhibit use of competing products.

Examples

- India is using open technologies to promote growth and innovation. Its eBiz project aims to create a framework for providing hundreds of Government to Business (G2B) services of federal, state and local agencies through a single portal. Initially, eBiz will establish a core infrastructure based on open standards to provide 25 G2B services in four states. By publishing the open standards and policies at the end of the pilot phase, the goal is to encourage entrepreneurs to design innovative solutions based on these standards in certain vertical and horizontal G2B services. Companies, responding to market demands, will develop solutions to plug into the core eBiz architecture. Thus, open technologies will create a level playing field for a wide market of services ripe for innovative entrepreneurs.
- According to a recent study by the United Kingdom's Department of Trade and Industry, standards contribute £2.5 billion annually to the national economy. Establishing a common language for businesses with standards increases growth, innovation and international trade. Standards have produced 13 percent increase in labour productivity.

⁷ source: <http://www.wikipedia.org>

Scenarios

Further reading

- Roadmap for Open ICT Ecosystems, Berkman Center for Internet & Society at Harvard Law School (<http://www.apdip.net/resources/policies-legislation/guide/Berkman-Roadmap4OpenICTEcosystems.pdf>)
- <http://www.openstandards.net>

3.5. Education (schools, universities, ...)

Much of the research to date on the potential of F/OSS in education or the public sector focuses primarily on F/OSS as a business model. There are comparatively few discussions of how FLOSS as an approach might have implications for educational approaches and philosophies. The FLOSS community itself provides a valuable, if partisan, source of information. This form of descriptive, anecdotal, case-based material has been invaluable in raising the profile of the community, addressing critical debates and influencing practitioners to adopt FLOSS.

Information and communication technologies (ICTs) have the potential to improve the quality of education. However, educational institutions are often faced with financial constraints. F/OSS has the potential to help lower the cost. The high costs of ICTs can be a major obstacle to providing ICT facilities in educational institutions. Total Cost of Ownership (TCO), accessibility of stored data; obsolescence of software; technical support; stability, uniformity, and user skill level are key issues when weighing the pros and cons of each operating system and its software options barriers by reducing the cost of software. Besides the cost benefits, there are numerous other advantages in using F/OSS in education, including pedagogical benefits.

The main reasons why individual schools and educational authorities have opted for the adoption of F/OSS are:

- **Lower Cost:** One of the main issues that policy-makers have to contend with in making decisions on the use of ICTs in education is the cost. The cost of providing communication infrastructure, computing and networking hardware, and the necessary software are a strain on the educational budgets.
- **Reliability, Performance and Security:** Lower cost is not the only reason, F/OSS is considered to have better reliability, performance and security. The administrators of educational institutions should take these into account when making decisions on the ICT infrastructure of their institutions. The development methodology of F/OSS tends to assure high quality of the software. Bugs are rapidly removed with the help of large numbers of developers, and the resulting software is more reliable. The comparisons suggest that F/OSS is often superior to proprietary software in terms of security.

Scenarios

- **Build Long-term Capacity:** There are clear indications that the use of FOSS in government, industry and other institutions is growing and that there will be a need for graduates familiar with FOSS. Efforts should be made to include FOSS in the curriculum of all students, and that they have the opportunity to learn and use a wide variety of applications, both FOSS and proprietary.

Within the field of education, key online communities and resources are:

- Schoolforge, the international resource, web forum and archive
- Schoolforge UK, which is similar to the international branch, runs an online wiki of resources, information, support and training for the FLOSS education community in the UK
- SIGOSSEE, a pan-European project which runs conferences and holds regular meetings, runs a comprehensive weblog and projects; key issues the group tends to focus on are standardisation and interoperability
- FLOSS Posse is a wiki focusing on EU and international discussions on FLOSS within education.

Example – The GNU/LINEX Desktop

The LinEx initiative is a direct derivative of the regional strategy. Its objective is to create a fully functional platform, based on FLOSS, providing universal access of IS tools to all citizens. While doing so, it aims to provide adaptability, economic benefits and security, without losing sight of actual feasibility. Early on in the project, it was decided that LinEx was not going to innovate the software itself, but rather concentrate on specific translation and customization of the software and take care of the distribution. To avoid technical problems during the initial phase of the project, a Spanish company was hired to take an existing set of Linux software from the web and customize it.

LinEx is specifically designed for use in regional administration and schools, where the use of LinEx is on a ratio of 1 PC per 2 students. The software is distributed for free. Besides its distribution in NKC's and Vivernet, there are examples of manufacturers preloading LinEx on the PCs they sell and of magazines copying the software on CD and distributing it to their readers for free.

The New Knowledge Centers (NKC's) aim to increase literacy amongst the population of rural areas and of the poorest neighbourhoods of big cities. There are 32 of these NKC's established, in cooperation with the municipalities.

Vivernet is the business incubator. Its objectives are to: encourage the entrepreneurial spirit in the ICT sector in Extremadura; support innovative business initiatives; train people capable of confronting the challenge of creating their own business using technological tools; and promoting business relations.

One of the tools to help teachers adapt to the changes is the Technical Education Network. It promotes the e-content developed by teachers and students, as well as the use of information technology in the classroom.

Scenarios

Training courses for ICT have been implemented all over the region, mostly by the personnel in the Teacher and Resource Centres – Centros de Profesores y Recursos (CPR). These courses, both live and “online”, since 1999 have reached all teachers in Extremadura. These were developed by those teachers that were very actively involved in the development of the LinEx application for the schools, the courses were given by these teachers, capable of understanding the day to day problems in schools, and capable of talking the same language.

In short, the foundations of this network have been training, generation of content by the teachers themselves, adaptation of the architecture of new centres built by the autonomous government and the creation of their own free operating system.

Effects and key factors

At the time of writing, LinEx has been installed on 70,000 computers in schools, providing ICT services to 140,000 students. The government has produced large numbers of installation discs and is providing them to everyone who is interested. It has even created some TV commercials to promote the benefits of FLOSS.

A cost benefit analysis realised after 40.000 installations, showed clear savings for the regional government and the educational system.

A very important characteristic to highlight is the educational value of using completely free computer programs like GNU/LinEx by the pupils, programs made through the Internet by people physically distant from one another, but with a great spirit of collaboration. This idea of a computer functioning thanks to people working and sharing knowledge has a great educational value in itself.

LinEx is a success due to an administrative and political decision to migrate in a concrete area (education), providing users with the technical support to migrate (including training). Likewise, FLOSS in general is successful if there is a concrete problem (not necessarily a small one) to solve and where proprietary software can not provide a sustainable solution.

Further information

- GNU/LINEX: <http://www.linex.org/>, www.rte-extremadura.org
- Education and general policy
 - Becta, Open Source Teaching: www.becta.org.uk/research/research.cfm?section=1&id=3197
 - UK Government policy and guidelines on FLOSS: www.ogc.gov.uk/index.asp?id=2190&
 - EU FLOSS forum: www.ossite.org
 - Samba: us1.samba.org/samba - an Australian-based open source software initiative providing interoperability between computers running Linux/UNIX and those running Windows

Scenarios

- eEurope 2005 Action plan: europa.eu.int/information_society/eeurope/2005/index_en.htm
- UK e-Government Interoperability Framework (e-GIF): www.govtalk.gov.uk/schemasstandards/egif.asp
- FOSS educational examples and resources
 - Schoolforge-UK: www.schoolforge.org.uk
 - Cardiff Schools: www.cardiffschools.net
 - Schools Interoperability Framework Association: www.sifinfo.org
 - SchoolTool: www.schooltool.org
 - The Association for Free Software: www.affs.org.uk/education
 - Linux in education: seul.org/edu
 - BBC resources: www.bbc.co.uk/opensource
 - MIT course projects for schools: ocw.mit.edu
- General information on best practice for schools: www.ict-register.net
- K-12 Linux Project: www.k12linux.org - large-scale US project, supporting the use of Linux in K-12
- KDE Edutainment Project: edu.kde.org - focusing on developing open source educational products for 3-18 year-olds

3.6. Means of communication (VoIP, IM, blogs, newspapers, wiki, ...)

To communicate and collaborate on-line, Desktop applications are nowadays frequently replaced by web applications. Email, for example can be used as a desktop application, like Mozilla Thunderbird, mentioned above, or can be accessed via a web interface. Online Communities have been around before the beginning of the Internet. In recent years a lot of new ways of communication and interaction have evolved, like Wikis, Weblogs, Real Time Editors, Instant Messaging, and lot's more. Thanks to a wide variety of free programming languages like php, perl, python, ruby and others there has been a rapid development and numerous web applications are available. Today it is possible to create a fully functional, feature-rich website, weblog, wiki-site (and more..) within minutes, thanks to the development of the free software community.

The latest generation of very interactive (AJAX) and user-centred (social software, user-generated content) web applications has been named, „Web 2.0“. Multimedia sites like Youtube, Flickr, Last.fm and social bookmarking sites like del.icio.us, digg and swik have their foundations in F/OSS.

Scenarios

Main barriers perceived

Many users still struggle with the use of e-mail and are not willing to change to another e-mail client. New methods of communication require some experience in order to be used effectively. It is generally the “digital natives” and early adopters who try out all the new and different ways of communication. For example if a workgroup needs to cooperate online, very often the question is raised on the means of communication to be used. When should a forum be used rather than a mailinglist, a (group-)weblog or a wiki?

In the VoIP market, demand for backup systems is decreasing as VoIP technology is getting more and more reliable. VoIP allows more flexibility and more efficient use of telephony. Free Software is widely available in this sector. Barriers are the cost for new hardware and hesitation in switching to a different system even when working alternatives are available.

Examples

For Voice over IP telephony, there is an open standard, SIP, which is implemented in server software (Asterisk, GNU Bayonne, SER) as well as on the client side: There is wide variety of Hardware Phones, which can be connected to a LAN by cable or even to a Wireless LAN, some of which use GNU/Linux based Firmware. These are compatible with numerous Soft-Phone clients available for several operating systems (Ekiga, Twinkle for Linux,..). Skype can also be considered VoIP, but since the free of charge client software is closed source and the protocol used by Skype is completely proprietary there is a great lack of interconnectivity. There is also a free alternative to Skype, which is as easy to set up but uses open standards and open source software, called Wengo-Phone. Instant Messaging is quite similar, as there are a number of commercial services (MSN, AOL's AIM, ICQ) which are not standardised and thus it's not possible for users of different services to get in touch with each other. With the XMPP/Jabber protocol, there is an Open Standard, which is used by GoogleTalk, Apples iChat and many more jabber services.

Wordpress is one of the many F/OSS Weblog content management systems available, it's state of the art in its field and is developed by a large community and new releases are published regularly. There are thousands of different designs and plugins available for Wordpress, so that even an inexperienced user, without programming skills, is able to build a weblog site with customized features without any cost and in a short time. At wordpress.com, it is even possible for anyone to get a free wordpress instance and start blogging immediately, although there is some limitations, e.g. features which have to be paid for.

Scenarios

Effects and key factors

In recent years, Wikipedia has become one of the most visited Websites on the web with a huge increase in content quantity as well as quality. The Blogosphere and sites with user-generated content like Youtube have influenced mainstream media. Free Software has been the basis for providing efficient Web Services at relatively low cost, in a market, where many projects start with very low budgets and where the search for business models is still going on. Thus it seems, that the Web 2.0 era has been widely influenced by the Free Software upon which it runs.

The idea of Free Licenses seems to work, not only on the server operating systems and software and at the level of interoperable standards and web applications, but also on the level of content, where the GNU Free Documentation Licence (GFDL) and Creative Commons licences are used.

Commercial Web 2.0 services may or may not be based on free software, but raise other issues regarding the freedom of the users, their self-created content, the rights granted to the service owner and privacy issues. It is recommended to thoroughly read the Terms of Service before clicking the „Accept“ Button on signing up.

As Tim Berners Lee, the inventor of the world-wide web said, “[..] I think Web 2.0 is of course a piece of jargon, nobody even knows what it means.”⁸ The Web 2.0 Era has also brought back venture capital to the Internet market and huge sales of on-line services like YouTube, which was acquired by Google, rather for the userbase and brand name, than for any highly sophisticated technology.

Further information (links)

- Wikis, blogs and other community tools in the enterprise:<http://www-128.ibm.com/developerworks/library/wa-wikiapps.html>
- Choosing a Wiki Engine: <http://www.wikimatrix.org/>
- Wiki or Won't He? A Tale of Public Sector Wikis: <http://www.ariadne.ac.uk/issue49/guy/>
- MediaWiki, used by the austrian federal Chancellery: <http://www.ag.bka.gv.at/index.php/Hauptseite>
- <http://en.wikipedia.org/wiki/Weblog>
- Wordpress: <http://wordpress.org/> and <http://wordpress.com/>
- http://de.wikipedia.org/wiki/Social_Bookmarks
- Social Bookmarking Tools (I) A General Review: <http://www.dlib.org/dlib/april05/hammond/04hammond.html>

⁸ <http://www-128.ibm.com/developerworks/podcast/dwi/cm-int082206.txt>,
http://www.theregister.co.uk/2006/08/30/web_20_berniers_lee/

Scenarios

- Social Bookmarking: <http://swik.net/SWiK>, <http://del.icio.us/>, <http://digg.com/> and many more: <http://3spots.blogspot.com/2006/05/delicious-digg-clones-and-open-source.html>
- <http://en.wikipedia.org/wiki/VoIP>, <http://www.asterisk.org/>

3.7. eGovernment

If you: are implementing e-government programs/strategies/policy

And want: cost-effective upgradable software solutions or be more friendly to the public

You can: use the open source approaches for development of applications

What does it mean?

F/OSS is a very good opportunity to demonstrate that e-government initiatives can be more efficient and implemented at less cost by using open source, instead of proprietary software. So, supporting development of local software applications based on free and open source software can generate positive attitudes from localised populations and ensure increased employment for local workers.

Software, designed using the LAMP approach (Linux+Apache+MySQL+PHP) has proven its qualities as to its sustainability and efficiency. Its potential for easy localization makes it affordable and customizable.

In many cases, the current systems used by administrations for e-governance require the citizens and the end-users to install specific proprietary software in order to use the governmental services. It is often necessary to have the latest versions of this proprietary software in order to send electronic documents to the institutions.

An open approach, or part of “open source policy” might be implemented if:

- Governments support the usage of OSS software at all levels of the administration
- Governments consider proprietary software and Open Source Software, equally
- Governments stimulate usage of open standards
- Governments stimulate the production of local open content
- Governments release texts of laws under free licenses (e.g. Creative Commons).

Allow 2-way communication with citizens through:

- Options to download/upload files in different file formats, including open ones (e.g. Open Document)
- Options to get information from e-gov and .gov websites via standard XML or RSS feeds

Scenarios

- Include options for volunteer contributions to source code of e-government applications and upgrades
- Include options to put regional specifics in different e-gov applications
- Communicate with the open-source community regarding good solutions for local software.
- All other means to ensure open and transparent two-way communication using information technologies.

Example

Improving Government-Citizen Interaction through F/OSS in Bulgaria - The initiative may be considered as a pilot project to lay down the groundwork for further and wider implementation of FOSS at other levels, both in public administration (including the central and regional administrations) and in businesses. The project is also unique in the sense that it uses the public-private partnership model to benefit the local economies and preserve/create local skills and capacities as the project will provide business and employment opportunities in the participating municipalities.

Further reading

- C. Apikul, "Improving Government-Citizen Interaction - eGov Balkan, Bulgaria", IOSN, UNDP, <http://www.iosn.net/government/case-studies/egovbalkan/?searchterm=balkans>

3.8. Budget planning: reducing the cost

For a successful migration to F/OSS, it is necessary to plan the budget carefully. Although F/OSS can save significant amounts of both money and human resources, this does not mean that quality budget planning can be avoided.

An example budget should include an estimation of the cost of initial training of the employees, time needed to get used to the new solutions, cost for the migration itself and the cost for further maintenance. It is important to include realistic estimates of the costs for support, particularly when the governmental staff do not possess the highest skills and capacity in maintaining the new systems.

Main barriers perceived

The major barriers with the budget planning are:

- Difficulty in making initial estimates of the Total Cost of Ownership and the Return on Investment.
- One year budget cycles of the public administrations. The savings from F/OSS may appear in the "long term", but the administrations plan their budgets with respect to one year, i.e. "short term".

Scenarios

- Difficulty in establishing Interoperability costs and the costs related to establishing Open format standards.
- High costs related to marketing and increasing public awareness of OSS.
- High initial training costs required.

Examples

A good example for the support of local businesses and effective budget planning is exhibited by the Spanish province Extremadura.

Initial costs	
Software development	€ 71.530,06
Deployment costs	
Software technical support	€ 11.000,00
LinEx server	€ 77.089,65
Local servers	€ 33.943,13
Total	€ 193.562,84

Note: Deployment costs cover the use of LinEx from the start of the project in 2002 up until June 2003.

Illustration 1: Source: van Leeuwen, Velkova, Ozelel; "How to Avoid the Transformation of Barriers to OSS Adoption in Public Administration into Barriers for Regional Development", eChallenges 2006.

After high initial deployment costs five years ago, the current savings generated can be observed, now, through the improving IT and economic situation in the region.

Effects and key factors

- Budget planning should be with respect to more than the one year budget cycle. The financial benefits from F/OSS arise after 2 or more years and this must be considered.
- It is of vital importance to calculate carefully any training-related costs. Not doing this may result in resistance to use of the software, refusal to work with the software and finally – loss of time, productivity and resources. Higher level government officials should not be omitted from the overall training and should serve as a positive example to the rest staff.
- Consider local companies. This will result in many benefits – lower cost for training and deployment and long-term support for the local businesses.

Further information

- M. van Leeuwen, J. Velkova, B. Özel, "How to Avoid the Transformation of Barriers to OSS Adoption in Public Administration into Barriers for Regional Development"

Scenarios

- R.A. Ghosh, UNU-MERIT, NL “Final Report. Study on the Economic impact of open source software on innovation and the competitiveness of the Information and Communication Technologies (ICT) sector in the EU. Final Report. Nov. 20, 2006. “
- By: Rivenbark, William C. , Strategic planning and the budget process: a survey of municipal government.

3.9. Vendor lock-in

Relevant to FOSS adoption is the fact that open source software reduces the dependence on a single supplier, also known as vendor lock-in.

Proprietary software vendors make money from the sale of licenses, and are imposing increasingly complex mechanisms on consumers to manage these licenses. Consequently organisations must keep careful track of license purchases. This means that organisations must impose strict software license tracking processes, purchase costly tracking programmes, and pay employees to keep track of these licenses and perform occasional audits.

Hence software suppliers purposely attempt to achieve the highest degree of customer lock-in with the purpose of extending the purchasing lifetime of a customer by securing his repeated use of their products over a longer period of time.⁹ Open source, however, reduces the reliance upon a single vendor by having open standards and spreading any form of software reliance on the open source community.

A related issue is the high level of software piracy, especially with certain proprietary desktop applications, which also prevents for wider OSS adoption. This is a common problem, not limited to a specific region or country but it is significant because users do not actually care about the cost of the software, until they are not 'punished' for illegal software usage.

On a similar note, open standards give users flexibility and freedom to change between different software packages, platforms and vendors. Standards by proprietary software lock Government into using software only from one vendor and makes it dependent on the vendor at a stage when all their data are in the vendor's proprietary format, and the costs of converting them to an open standard is prohibitive. Using OSS to avoid vendor lock-in is possible since they almost always use open standards and the source code is available.

⁹ Gillen, Al, and Dan Kusnetzky, “Linux Overview: Understanding the Linux Market Model,” IDC, (February 2000).

Scenarios

Closed source software depends on monopoly support, one company that provides support and “holds all the cards” (i.e., access to the code) for a piece of software. This gives users the choice of either withstanding whatever support the original authors provide or switching to different software. Since the cost of switching can be substantial, users are forced to accept monopoly support. In contrast, the publicly available source code for open source products enables many vendors to learn the platform and provide support. Because vendors compete against one another to provide support, the quality of support increases while the end-user cost of receiving the support decreases.¹⁰

Open source is often regarded as the only real solution to vendor lock-in and monopolistic practices.¹¹ OSS does not impose license management costs and avoids nearly all licensing litigation risks.

Examples

- In May 2004, the Telematics between Administrations Committee (TAC) of the European Commission issued a set of recommendations, in particular noting that, "Because of its specific role in society, the public sector must avoid [a situation where] a specific product is forced on anyone interacting with it electronically. Conversely, any document format that does not discriminate against market actors and that can be implemented across platforms should be encouraged. Likewise, the public sector should avoid any format that does not safeguard equal opportunities to market actors to implement format-processing applications, especially where this might impose product selection on the side of citizens or businesses. In this respect standardisation initiatives will ensure not only a fair and competitive market but will also help safeguard the interoperability of implementing solutions whilst preserving competition and innovation."¹²
- BECTA (British Education Communication Technology Agency) is the UK agency in charge of defining information technology (IT) policy for all schools in the United Kingdom, including standards for all the schools' infrastructure. In 2005 they published a comprehensive document describing the policy for infrastructure in schools.

10 Jordan, Peter, “Nibbling Away at UNIX,” VARBusiness, (January 14, 2000).

11 Borenstein Severin, MacKie-Mason K. Jeffrey and Netz S. Janet ; "The Economics of Customer Lock-In and Market Power in Services". (September 1993) Retrieved 10/11/2004
<http://econwpa.wustl.edu:8089/eps/io/papers/9401/9401001.pdf>

12 <http://europa.eu.int/idabc/en/document/2592/5588>

Scenarios

This document highly recommends the use of OpenDocument and a few other formats for office document data. BECTA explains this as follows: "Any office application used by institutions must be able to be saved to (and so viewed by others) using a commonly agreed format that ensures an institution is not locked into using specific software. The main aim is for all office based applications to provide functionality to meet the specifications described here (whether licensed software, open source or unlicensed freeware) and thus many application providers could supply the educational institution ICT market."¹³

- A memorandum on the use of open standards for creating and exchanging office documents was approved by Belgium's Council of Ministers on June 23, 2006. OpenDocument was proposed as the standard for exchanging office documents such as texts, spreadsheets, presentations within the civil service.¹⁴ From September 2007 on every federal government department must be able to read OpenDocument documents.

3.10. Security

One of the most important issues for Government information and technology infrastructures remains security. Governments need to make sure that software they are using does not have any backdoor or malicious codes that would allow unauthorized access to sensitive data. This can only be done properly by looking at the source code which is usually only possible with OSS.

Because proprietary software is normally distributed as a binary, it is difficult to look at how the programme works. While this offers limited protection to the intellectual property of the software maker, it also creates a sense of mistrust and suspicion due to security concerns.

This kind of mistrust has been cited as one of China's reasons for its adoption of OSS and one of the reasons other Governments are considering OSS. Since the 9/11 disaster in New York companies and Governments are increasingly concerned about security and using software that is dependent specifically on US companies.

Another concern for Governments in terms of security is surely computer viruses. Viruses are increasing and can easily disable a large organisation like Governmental offices, thus impacting the economy. The threat of worms and viruses across proprietary products has, in many cases, provided a need to develop and implement open source applications.

Although open source software is not immune to worms and viruses, the open source community has not experienced the severity of exploits as that suffered by competitive proprietary products.

¹³http://industry.becta.org.uk/content_files/industry/resources/Specification_key_docs/techspec_institutional_infrastructure.pdf

¹⁴<http://presscenter.org/archive/20060623/432d0130470a88df1105dda38d1282b0/?lang=nl&pLang=en>

Scenarios

Supporters of open source contend that open source systems are less vulnerable to attack by computer worms and viruses because of an in-built set of technical characteristics that make it relatively more difficult to distribute and propagate fast-spreading worms and viruses across open source applications¹⁵.

Consequently OSS applications require fewer administrative resources in order to deal with security holes, viruses and worms; and organisations tend to benefit from less downtime from virus-induced system crashes. However it is only fair to indicate that the 'added security' of OSS is also due to the fact that they are not as big a target as proprietary software and the situation could change in the future as hackers and virus developers start attacking open source software.

¹⁵Wheeler A. David ; "Secure Programming for Linux and Unix HOWTO"; Retrieved on 18/04/2004 <http://www.dwheeler.com/secure-programs/Secure-Programs-HOWTO/open-source-security.html>