



The Free Software and Open Source
Foundation for Africa

THE STATE OF FREE AND OPEN SOURCE SOFTWARE IN AFRICA & PROPOSED ACTION PLAN

Presented by:

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(FOSSFA)

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2 FOSSFA- THE OVERVIEW

2.1 INTRODUCTION

In the face of rapidly changing technological advancement, and the exorbitant cost of proprietary hardware and software solutions, which discriminate against Africa in attempting to participate in (Information and Communications Technologies) ICTs for development, the need for open source solutions has emerged. There is a global trend toward open source solutions, which have become viable, cost effective and sustainable options for Africa's participation in ICTs for development.

It is from this dimension that the Free Software and Open Source Foundation for Africa (FOSSFA) was formed. We believe that African countries are extremely well placed to compete in the global software development market. Creating software is best done with a relatively inexpensive but well trained labour force. Software development is, and will continue to be, a knowledge and people intensive activity. Open software is both an opportunity and an important resource. Africa now has the opportunity to participate in, and benefit from, the open software movement.

Open Source Software (OSS) is raising considerable interest worldwide. It is an essential tool to leapfrog development in Africa. There are numerous favourable reports and for some IT applications OSS has a significant following. Like in many other countries, the Governments in Africa should investigate its usability. The initial finding is that it may have significant potential, resulting in this proposed strategy for OSS use in Africa. UK, Germany, France, China, Peru, South Africa and parts of the USA are some of the countries that have adopted OSS in government primarily because of cost and promotion of programming industries in their countries.

Studies have shown that an OSS server which can be a normal computer can serve 30 - 40 other desk top computers and be able to facilitate email, internet and e-fax alongside normal operations at 40% the cost of proprietary software.

FOSSFA is determined to develop local capacity and create jobs in Africa by developing an OSS market that will initially target the public sector in government, health and education through;

- Encouraging change of policies in African governments to adopt its use;
- Research and Development;
- Product Development uniformly across Africa;
- Local Capacity Building, which will translate into jobs creation.

Our success will rest solely in teamwork across the continent through sharing of experiences and resources and promoting specific regional standards.

This action plan has been collated from the views of the Africa Linux Users Group (AFLUG) who have been debating the way forward since February 2003.

The third meeting of the committee on development information (CODI) held in May 2003 in Addis Ababa, Ethiopia endorsed FOSSFA and the action plan proposed for 2003 – 2005. The draft report E/ECA/DISD/CODI.3/L adopted by the member states recommended that FOSSFA should work with all stakeholders to ensure that open source is available as a platform to engineer solutions that meet the needs of Africans at affordable costs. The report further recommended that Africa Governments should support FOSSFA to ensure Africa becomes a regional hub for open source software development. CODI is one of the seven units of the Economic Commission for Africa and is comprised of 53 member states and in essence FOSSFA was recognised for the role it will be playing in developing open source solutions in the continent.

2.2 FOSSFA-THE HISTORY

FOSSFA has its origin in the ICT Policy and Civil Society Workshop in Addis Ababa, Ethiopia held between 6th and 8th November 2002. It is here that the need for developing a framework for open source solutions emerged strongly. Consequently, the working group on Information Security, Applications Development (Open Source), unanimously resolved to create itself into an interim civil society task force on open source to be called 'Open Source Task Force for Africa - OSTA'

The overall goal of the taskforce was to bring together individuals and organizations working on open source in Africa and consequently seek mandate to establish the 'Open Source Foundation for Africa' during the WSIS PrepCom meeting in February 2003.

As an interim taskforce, its mandate was to put in place mechanisms and activities that will lead to;

- i. Advocacy for the use and implementation of open source solutions at the regional, national and local levels;
- ii. Advocacy to donor governments that have already embraced open source at national levels (such as Germany, Sweden, Norway and France);
- iii. Creation of a clearinghouse or knowledge factory – resources, database of local expertise on 'Who is doing What', website, CD-ROM, brochures etc.;
- iv. Definition of minimum standards, guidelines and advisory parameters for the foundation;
- v. Building Localized/Africanised capacity to work on software development;
- vi. Ensuring a discourse on open source during the National Information and Communication Infrastructure (NICI) policy processes and addendum for the NICI processes that have already been completed;

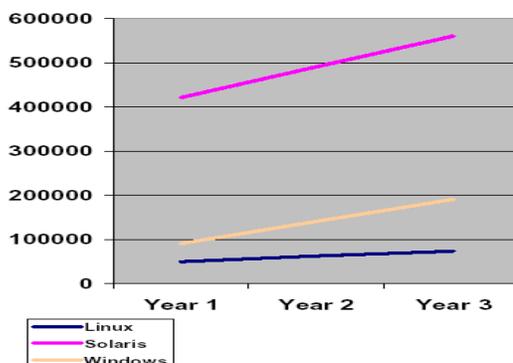
On February 21st 2003, the Free Software and Open Source Foundation for Africa (FOSSFA) was launched in Geneva, Switzerland during the second preparatory meeting of the World Summit on the Information Society (WSIS).

Since then a council for the foundation has been formed of which is the key decision organ of the same and its secretariat established in Nairobi, Kenya. The Foundation is currently undergoing registration and at this point has established an elaborate structure and a two-year action plan. 2003-2005.

2.3 FOSSFA-THE FUTURE

Since Linus Torvalds developed an operating system known as Linux, there has been a shift from proprietary software to what is now commonly referred to as 'open source'. The forcing factor behind the shift has primarily been the cost of proprietary software coupled with other benefits such as access to the code and the right to modify the programs to fit one's needs. Africa has also witnessed this shift albeit still nascent.

The slow economic growth in Africa highlights the importance of producing African goods and services to substitute increasingly expensive imports and to generate exports at relatively low cost. While this applies to practically everything, the goal of this document is to focus on open source software use and development.



Licenses on imported software (not to mention other imports) are prohibitively expensive and therefore makes sense to minimise risk through avoidance, where possible, of dollar-based software license fees and through vigorous encouragement and support of local software development efforts.

Needless to say, lowering software costs by violating proprietary license conditions is not an option. Happily, there are often legal alternatives to proprietary software: non-proprietary “open software”¹ attracting no license fees at all. Furthermore, open software may be freely probed, customised and modified. This is the cheapest way of generating software suited to the country’s needs. It is also an ideal jumpstart for entering the software development arena.

A study by Robert Frances Group (RFG) world-renowned business advisors to IT Executives, which tried to compare the Total Cost of Ownership of Linux, Windows and Solaris Operating Systems over a period of 3 years, revealed that Linux had the lowest cost of ownership and that it was the least expensive platform to deploy and operate. The graph above summarises their findings.

Like governments in many countries (developed and developing), it is time for African States to promote open software and open standards. However, government’s action cannot be the sole objective. Various people and institutions in Africa, including small and large companies, are already using open software products (notably Linux and associated software tools) precisely because they already have the freedom to do so rather than because they have been prompted by government policy. The bare minimum is to ensure that this freedom is not curtailed by introduction of inappropriate policy.

That said, governments have a key role to play in accelerating universal access and providing leadership for the African continent as a whole. Furthermore, government is the largest procurer of Information and Communication Technology (ICT) in the country, accounting for some 70% of total spend. Given this level of clout, government action is bound to stimulate industry in various ways, such as the provision of open software training and support.

Open software is both an opportunity and an important resource. Africa now has the opportunity to participate in, and benefit from, the open software movement. African companies and developers are already a driving force in many open software projects. If open software is able to change the rules in the information technology industry, the country and the companies that better understand it and are more advanced in its use and knowledge will have a clear competitive advantage. This document proposes recommendations designed to help the country to benefit as much as possible from open software, and to remove the barriers to future open software development projects.

Many governments are now developing national policies to promote the use of open software – examples include South Africa, Kenya, China, Thailand, Brazil, Argentina, Germany, France and the United Kingdom.

A related issue is the adoption of open standards, which make it possible for open and proprietary software conforming to these standards to inter-operate and exchange data. This is essential for seamless inter-government and government-to-citizen communication. The Internet owes its explosive growth and impact to its foundation on open standards and open software. Open software has reached a critical mass that has allowed it to enter the mainstream software market and its impact is becoming noticeable in the software industry and in society as a whole. Companies like IBM, SAP, Sun, Intel, Hewlett-Packard and Silicon Graphics are committed to using open software as a core part of their business and are investing significantly in enhancing its already impressive capabilities.

Open software is an especially useful tool to allow developing countries to leapfrog into the information age. It encourages novel development models that have been demonstrated to be particularly well suited to take advantage of the work of developers collaborating across the Internet. In general, it also has a positive impact as an enabler for the creation of new markets and business opportunities.

In summary, the major benefits of open software and open standards include:

- ❑ Reduced costs and less dependency on imported technology and skills
- ❑ Affordable software for individuals, enterprise and government

- ❑ Universal access through mass software rollout without costly licensing implications
- ❑ Access to government data without barrier of proprietary software and data formats
- ❑ Ability to customise software to local languages and cultures
- ❑ Lowered barriers to entry for software businesses
- ❑ Participation in global network of software development

The potential of Open Source will improve productivity and quality of life in developing countries including Africa. The process of transformation into information societies requires the full participation of the governments. There is therefore an urgent need to investigate how to leverage the opportunities presented by the emergence of Open Source Software in the context of limited financial resources and expertise in Africa.

The Governments, Inter-governmental organizations, Civil Societies, Private Sector and other stakeholders in partnership with global, regional and national open source forums should spearhead initiatives that build skills through education and empowerment of women and youth. Education, Health and Government sectors should be given high priority.

FOSSFA will work with all stakeholders to ensure that Open Source is available as a platform to engineer solutions that meet the needs of Africans at affordable prices. FOSSFA will also work closely with the NEPAD ICT component in spearheading ICT development in Africa. On the other hand African governments should support the Free Software and Open Source Foundation for Africa (FOSSFA) to ensure Africa becomes a hub for open source software development.

In summary the FOSSFA's vision is to:

- ❑ Create Awareness of Open Source software.
- ❑ Build Capacity in Open Source software;
- ❑ Develop a Knowledge Warehouse of expertise in the countries/continent.
- ❑ Development of national and regional Open Source Portals.
- ❑ Ensure that technical experts in Africa have full opportunity to participate in the development of open source software.

FOSSFA Intends to achieve this by:

- ❑ Urging key government organs to support open source development in Africa
- ❑ Leveraging various free and open source capacities and resources in Africa.
- ❑ Urging donor governments and other institutions to consider funding open source software in their developmental activities.
- ❑ Urging the government to adopt free and open source software.
- ❑ Promoting open source capacity and skill development in Africa through education with emphasis on women and youth.

2.4 FOSSFA-THE STRUCTURE

The Free Software and Open Source Foundation (FOSSFA) has adopted the following structure. We believe that this structure will enable it to work independently and openly towards promoting use and development of open source solutions and building on already existing open source structures across the continent.

1. The Secretariat

The secretariat is based in Nairobi, Kenya, and is composed of;

- ❑ Bidad Kagai – bill@circuitspackets.com (Kenya)
- ❑ Milton Aineruhanga – Milton@wougnet.org (Uganda)

- Shafika Isaacs – shafika@schoolnet.org.za (South Africa)

2. Focal Points

The focal points are the contact nodes established within the foundation to cater for the diverse groupings. Their key role is to ensure that information reaches their counterparts and should preferably be translated to help narrow the Anglo-Franco divide. FOSSFA considers this divide critical and should be addressed conclusively to ensure language barrier does not hinder people from participating in the FOSSFA work. It is comprised of;

- Francophone Focal Point - Pierre Ouedraogo – pierre.ouedraogo@francophonie.org (France)
- Anglophone Focal Point – Eric Osiakwan – eric.osiakwan@netplux.com (Ghana)
- United Nations Focal Point – Makane Faye – mfaye@uneca.org (Ethiopia)
- Youth Focal Point – Gbenga Sesan - me@gbengasesan.com (Nigeria)

3. The council

The council is comprised of the active open source task force members and resource persons who have been identified. This is the overall decision-making body and is comprised about 40 members.

The Council guides the secretariat mostly online but all efforts should be put in place to ensure the council meets twice a year. The council will also be undertaking the mantle of coordinating open source forums organized by FOSSFA. All council members are members of specialised committees undertaking specific objectives of the foundation.

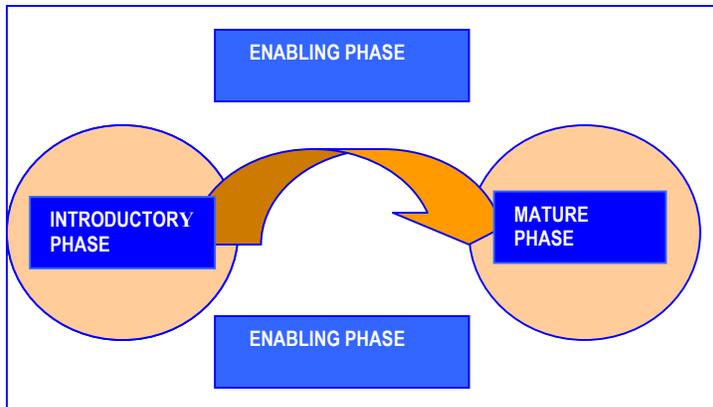
4. The Committees

The foundation has six specialized committees that are independent and are coordinated by (volunteer/rotating) chairs for effective distribution of products to be delivered through the foundation. The specialized committees are autonomous and within them decide which projects they wish to undertake.

THE COMMITTEES	THE MEMBERS
Open Source in Education Committee	<ul style="list-style-type: none"> <input type="checkbox"/> Mr. Lawase Akpolou - lawase@schoolnet africa.org.za (Team Leader) <input type="checkbox"/> Prof. Derek Keats - dkeats@uwc.ac.za <input type="checkbox"/> Mr. Joris Komen - joris@schoolnet.na <input type="checkbox"/> Mr. Edward Holcroft - edward@netday.org.za <input type="checkbox"/> Mr. Dennis Brandjes – denis@direqlearn.org <input type="checkbox"/> Dr. Victor Kyalo – vkyalo@uonbi.ac.ke <input type="checkbox"/> Fatimata Seye Sylla – fsylla@sentoo.sn
Open Source in Health Committee	<ul style="list-style-type: none"> <input type="checkbox"/> Dr. Ousmane Ly - ousouly@keneya.org.ml (Team Leader) <input type="checkbox"/> Mr. Kurt Brauchli - kurt.brauchli@unibas.ch <input type="checkbox"/> Mr. Xavier Dutoit - dutoit@free.fr <input type="checkbox"/> Mr. Tunji Lardner – tlardner@mail.wangonet.org
Open Source in Government	<ul style="list-style-type: none"> <input type="checkbox"/> Mr. Imraan Patel - Imraan.Patel@sita.co.za (Team Leader) <input type="checkbox"/> Dr. Paul Kotchsky - pauljk@sevenc.co.za <input type="checkbox"/> Mr. Guido Sohne - guido@sohne.net <input type="checkbox"/> Dr. Yassin Mshana - ysshana@avu.org <input type="checkbox"/> Ms. Annie Davies - sikidavies@yahoo.com <input type="checkbox"/> Mr. Philipp Schmidt - philipp@bridges.org <input type="checkbox"/> Leopold Rweyemamu - it_vision@yahoo.com itvision@costech.or.tz <input type="checkbox"/> Majed Khalfallah – mkhalfallah@ttnet.tn
Open Source Training/Capacity Building Committee	<ul style="list-style-type: none"> <input type="checkbox"/> Mr. Gideon Hayford Chonia - gideon.chonia@zi.unizh.ch (Team Leader) <input type="checkbox"/> Mr. Kwindla Kramer - kwindla@allafrica.com <input type="checkbox"/> Ms. Claire Sibthorpe - claire@apc.org <input type="checkbox"/> Mr. Marek Tuszynski - montauk@artnet.org <input type="checkbox"/> Mr. James Wire Lunglhabo - lunghabo@linuxsolutions.co.ug <input type="checkbox"/> Mr. Leonard Ngowo - ldngowo@hotmail.com <input type="checkbox"/> Nicholas Kimolo – Nicholas@circuitspackets.com <input type="checkbox"/> Dr. Timothy Waema – tim.waema@uonbi.ac.ke <input type="checkbox"/> Hichame Jeffali – jeffali@action.ma
Media and Publicity Committee	<ul style="list-style-type: none"> <input type="checkbox"/> Mr. Eric Osiakwan - eric.osiakwan@netplux.com (Team Leader) <input type="checkbox"/> Ms. Akwe Amosu - akwe@allafrica.com <input type="checkbox"/> Mr. Pierre Ouedraogo - pierre.ouedraogo@francophonie.org <input type="checkbox"/> Mr. Alastair Otter - alastair@tectonic.co.za <input type="checkbox"/> Mr. Sean Moroney – sean@aitecafrica.com <input type="checkbox"/> Mr. James Nguo – james@alin.or.ke
Fundraising Committee	<ul style="list-style-type: none"> <input type="checkbox"/> Mr. Milton Aineruhanga – Milton@wougnnet.org (Team Leader) <input type="checkbox"/> Mr. Bildad Kagai – bill@circuitspackets.com <input type="checkbox"/> Ms. Shafika Isaacs - shafika@schoolnet africa.org.za <input type="checkbox"/> Mr. Emmanuel Njenga - njenga@apc.org <input type="checkbox"/> Mr. Pierre Ouedraogo - pierre.ouedraogo@francophonie.org <input type="checkbox"/> Mr. Elijah Agevi – Elijah.agevi@itdg.or.ke <input type="checkbox"/> Jacqueline Ahounsou – ajacqueline@avu.org

3 PLAN OF ACTION

The plan of action revolves around a phased approach, moving from an introductory phase to an enabling phase onto a mature phase. The specialized committees will engage in activities related to their fields in the framework of action provided by this plan of action.



Our plan of action revolves around the 3 components. The components have been discussed below.

3.1 INTRODUCTORY PHASE

This phase will involve the following sub-processes which can be executed concurrently”

- ❑ Information Dissemination
- ❑ Trial Development and Use
- ❑ Consultation
- ❑ Research

Information dissemination: Because the level of knowledge and understanding of OSS within Africa is still relatively low, information dissemination is an important feature of the initial phase. This includes briefing sessions, publishing information through appropriate media, maintaining an OSS website and presentations to relevant interest groups.

Trial development and use: Encourage use of OSS on a trial basis. Developing enhancements to software by using the OSS model will be promoted.

Consultation: Create opportunities to consult with users, developers and researchers. The National FOSSFA Chapters should be established to involve all stakeholders.

Research: The research agenda should be based on the following objectives:

- a. Develop a consistent picture of the needs and expectations of Africa with regard to OSS.
- b. Develop policies and legislation relevant to the use of OSS in Governments.
- c. Develop research and evaluation instruments to assist decision makers in the identification and evaluation of opportunities and areas for the appropriate use of OSS.

- d. Develop a definition of the roles of the various sections of Governments in the area of OSS, including the roles of the National Communications Secretariats (NCS) and Government Information Technology Services departments.
- e. Identify opportunities and pilot applications for the use of OSS in Government.
- f. Define a clear longer-term research agenda to support the OSS strategy.

More specifically the secretariat will perform the following as its immediate short –term roles to kick start the process:

- ❑ **Creation of a Resources Database:** This database also referred to as the knowledge factory will contain resources – human, technical and financial – with regard to ‘who is doing what’ in open source and will be disseminated widely on CD Rom and through the internet. It will enable starters get start-up tool kits and access to best practices and lessons learned with regard to open source thus ensuring initiatives getting started with minimal assistance.
- ❑ **Design and Develop an Open Source Website:** The website will be a dynamic and interactive platform for all interested in open source in Africa. Discussion forums on the website will provide quick and easy access to ‘Question and Answer’ facilities for the solution providers and programmers to facilitate assistance online not to mention other resources that will be posted continuously by the members.
- ❑ **Support the creation of Open Source Foundation for Africa National Chapters:** This is the nirvana of the project where all African countries will have national chapters of the foundation to move the process at local levels. In a nutshell, the foundation will act as facilitator of open source resources in Africa. The foundation will also be in a position to lobby on behalf of its members and raise their concerns at the international fora. National Chapters should build on existing open source initiatives existing in some countries across Africa.

3.2 ENABLING PHASE

This phase will include the performance of the following:

- ❑ Consolidate Support Capacity
- ❑ Development of OSS utilisation Policy
- ❑ Creation of a Level Playing Field
- ❑ Communication

Consolidate support capacity

Ensure proper mobilising of existing capacity, plan further expansion and build the necessary capacity where successful trial implementations can be replicated.

Including OSS utilisation in short and medium-term plans

Planning to convert to OSS should be clearly indicated in IT plans of National and Provincial Government departments.

Level playing fields

Avoid any bias against OSS solutions in Government procurement procedures.

Communication

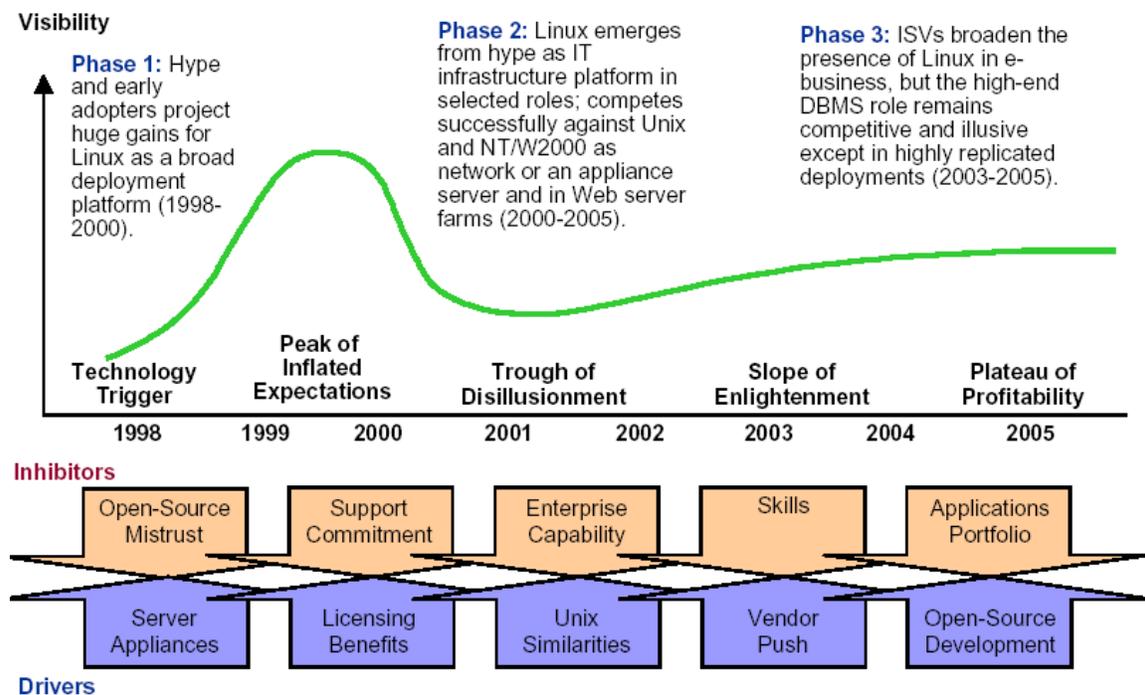
Develop a comprehensive OSS communication strategy that will ensure optimal knowledge and understanding of, and commitment to OSS. The strategy is to target the political level, departmental management, IT professionals and computer users in general.

3.3 MATURE PHASE

This phase will see the culmination of efforts and achievement of objectives. Open Solutions will be used in most of critical business processes both in the private and in the public sector. This phase would include the Implementation of plans compiled during the previous phases. This phase will involve the putting in motion of plans to:

- ❑ Improve the availability of expert guidance;
- ❑ Make training more accessible;
- ❑ Strengthen software development assistance; and
- ❑ Uphold non-discriminatory procurement criteria.

Gartner research summarizes the evolution of Linux and other open source solutions using the chart below. This model predicts that Linux has now attained enterprise capability and its development has stabilized. This model is in line with the prediction of our growth and is in line with our strategy. Our observations and recommendations for the government and other agencies willing to promote the use of OSS have been summarized in the next section.



Source: Gartner Research

4 AFRICAN GOVERNMENTS & THEIR ROLES

Governments being the major consumers of ICTs should take the initiative to promote the use of Open Source Software in the region. Many Governments and their agencies are adopting the use of open source solutions, for example in Germany, the Bundestag is closing in on a decision to require all agencies to use open-source software. Several German state governments are doing the same. In France, the government issued a decree creating a new agency, one of whose missions was "to encourage administrations to use free software and open standards." In Italy, the Florence city government passed a motion urging the administration to give preference to free software. Portugal's council of ministers jumped on the bandwagon with a resolution promoting the use of open-source software in public administration. The United States Department of Defence (DOD) 25,000 Desktops are on Linux, The Central Scotland Yard 1,000 desktops are on Linux and Ford Europe is using Linux on its 300,000 desktops. This is an indicator of the power of Linux on mission critical applications. This coupled with the fact that Linux is freely available makes Linux the Operating System of choice for Governments intending to reduce over-reliance on selected software vendors as part of their Risk Management Policies.

By promoting OSS development Governments can make a huge contribution to the OSS community. However, this activity should be tackled with knowledge of where and how OSS will be beneficial. Governments, in partnership with industry and society, have a key role to play in promoting OSS. Governments are the largest procurer of ICT. By acknowledging the potential benefits of OSS and Open Standards, Governments can contribute and benefit significantly, especially in the following areas:

- ❑ Introducing appropriate policies and legislation that can lead to maximizing the return on ICT expenditure through saving on dollar-based license costs and efficiency gains through avoidance of potential lock-in and allowing wider choice.
- ❑ Stimulating the local software industry. This will lead to better export potential and better capacity locally to satisfy Government's ICT needs. It will also contribute significantly to human resource development, especially in the area of ICT.
- ❑ Lowering entry barriers for various kinds of new businesses into the IT industry.

4.1 THE GOVERNMENT APPROACH

We believe that the government can adopt any of the following strategies in the OSS development. These include:

- ❑ The Neutral Approach
- ❑ The Enabling Approach
- ❑ The Aggressive Approach

4.1.1 THE NEUTRAL APPROACH

The government can adopt an initial neutral approach that will ensure that choice is supported and discrimination against OSS is eliminated. The government should:

- ❑ Adopt policies to ensure that OSS is carefully considered in IT procurement processes. Implement criteria for evaluating open source products, and procedures to adopt and maintain open standards.
- ❑ Allow open software to compete on an equal basis with proprietary alternatives.
- ❑ Initiate communication to enhance knowledge and the understanding of OSS.

4.1.2 THE ENABLING APPROACH

The government can adopt an **Enabling approach** where policies are geared towards the creation of the capacity to implement and maintain the use of Open source. Communities. The government should:

- ❑ Develop the capability to give guidance on selecting and implementing OSS.
- ❑ Promote education and training in OSS products.
- ❑ Support the establishment of partnerships and developer
- ❑ Adopt policies to ensure that OSS is carefully considered in IT procurement processes. Implement criteria for evaluating open source products, and procedures to adopt and maintain open standards.
- ❑ Allow open software to compete on an equal basis with proprietary alternatives.
- ❑ Initiate communication to enhance knowledge and the understanding of OSS.

4.1.3 THE AGGRESSIVE APPROACH

The government can adopt Aggressive approach where it actively encourages the development of OSS under appropriate conditions through legislation and policy. The government should ensure:

- ❑ Active involvement of Governments in supporting OSS developer communities and development projects.
- ❑ The Adoption of strategies to increase commitment to open source products.
- ❑ Regular auditing of the impact of OSS on service delivery.
- ❑ Active participation in programs that can minimize risks associated with OSS.
- ❑ Standardizing on OSS where analysis shows it to be the best alternative.

4.2 OUR RECOMMENDATIONS

We recommend that the government adopt a hybrid of the three approaches. Most of the following recommendations call for government intervention. Where appropriate however, initiatives may involve government agencies, public institutions, non-governmental organizations, the private sector or public-private partnerships (PPP). More Specifically, the governments should adopt the following recommendations:

4.2.1 Make Open Standards a non-negotiable base for ICT in the Public Sector.

ICT standards need to be open (available without restriction to any developer or user) to ensure inter-operability (seamless sharing of data and information) between applications and between users. The Internet and World Wide Web are founded on Open Standards. A closely related issue is the adoption of neutral (non-proprietary) data formats for document exchange in the Public Sector.

Benefits:

- Promote inter-operability within government agencies as well as between government and the public.
- Promote universal access to online government services without prohibitive costs, license restrictions or similar barriers.
- Minimise the risk of lock-in to specific vendors of ICT products and services.
- Lower barriers to entry for local developers seeking to offer ICT solutions for use in the Public Sector.

4.2.2 Encourage government agencies and public institutions to use Open Software whenever feasible

Open Software is available to anyone (usually at little or no cost), it does not require proprietary license fees and it may be freely re-distributed. There is an intimate link between Open Software and Open Standards. Governments should set up public sector pilot programmes on the use of Open Software on the desktop.

Benefits:

- All the benefits of the Open Software model, such as direct access to software without proprietary license obligations.
- Cost effective transfer of software technology across national borders.
- Stimulate an indigenous software industry based on Open Software.

4.2.3 Allow Open Software to compete on a “level playing field” with proprietary alternatives in government software procurement.

Tenders and Requests for Proposals from government agencies should include provisions explicitly allowing the desired objective to be carried out using Open Software. This must be supported by a capability to evaluate Open Software offerings (see below).

Benefits: As above

4.2.4 Promote documentation, translation and localisation of software, especially for use in the Public Sector

Availability of key ICT applications and services in Africa’s official languages is absolutely fundamental to the notion of universal access. Proprietary solutions restrict the freedom to conduct the necessary localisation. An Open Software base may be the only way forward. The same may hold for other localisation needs.

Benefits:

- Promote universal access.
- Support for industry, particularly small and medium enterprises.

4.2.5 Promote Open Software in pre-commercial research and development projects financed with public funds.

This is particularly important for software developed to serve a national interest. The outcome would be available without restriction to a broader community, for further development and use in both non-commercial and commercial products and services.

Government should seek full rights to bespoke software and consider releasing it under an Open Software license where appropriate.

Benefits: As above, as well as Education and training

4.2.6 Establish an Open Software Development Initiative

This would likely need to be a hybrid of a central funded agency and a “bazaar” of distributed developers in Africa and beyond, focusing on software development that addresses African needs.

Benefits: Potentially, virtually everything listed thus far, as well as

- Encourage growth of critical mass of human resources related to Open Software development. This can stimulate commercial enterprise and benefits to society.

4.2.7 Establish a national capability for testing, evaluation, verification and accreditation of Open Software

This is an important complement to development efforts. The responsible agency could also be a repository of Open Software and Open Standards and provide guidance and advice on available solutions. It would need to be actively involved in global standards setting bodies.

Benefits:

- Open Software evaluation service for government software procurement.

4.2.8 Promote education and training on Open Software products

One aspect of this is a general education that lays emphasis on principles rather than specific software products. Hidden details of implementation and other proprietary restrictions can be a hindrance to understanding. Hence Open Software should be given preference over proprietary offerings.

The other aspect is the shortage of trained people to use and support Open Software solutions. It requires, amongst other initiatives, formally accreditation training in key Open Software products (such as Linux certification). Some training might be provided by specified agencies, but if the recommendations above are implemented they would stimulate a groundswell of reputable training and certification centres.

Benefits:

- Build capacity and stimulate SMEs founded on Open Software development.

4.2.9 Provide incentives for Open Software training and development

Possible incentives might include credits to companies and their employees for enrolment in Open Software training programmes and development projects.

There may be access to funds from the IT training levy, the Universal Service Fund which is tasked with improving ICT access *etc.*

Benefits: As above.

4.2.10 Oppose patenting of standards, software and algorithms

Open Software makes use of copyright law and distribution licenses. However, broadly defined patents on software threaten software development and Open Software in particular. The developing world is particularly vulnerable in this regard.

5 APPENDICES

5.1 RELEVANT CASE STUDIES

5.1.1 MINISTRY OF THE OFFICE OF THE PRESIDENT (OOP), KENYA

Contact: Mr. J.E.W. Muriuki (Project Chairman)

The Ministry of the Office of the President in Kenya comprises several government departments like the Police, General Service Unit, National Registration, Immigration, Civil Registration, The Cabinet, Inspectorate of State Corporations, Disaster Response Departments among others. It is the largest ministry in Kenya in terms of government spending. In the year 2002, The Office of the President, contracted a world leading consulting firm (Ernst & Young) to develop an ICT strategy that will:

- ❑ Provide a point of reference for the harmonious development of an ICT strategy within the various departments of the OOP
- ❑ Defining the details of the ICT infrastructure base for the OOP
- ❑ Establishing a standardised approach to ICT for OOP
- ❑ Positioning ICT to be a major force for various aspects of OOP development contributing towards the ministry's participation in better governance
- ❑ Aiding OOP movement towards e-government
- ❑ Setting the stage for effective ministerial information flow and access
- ❑ Supporting ICT skill development and enhance the existing knowledge base
- ❑ Setting the stage for improved customer service

After a detailed study of the ministry's business processes, the consulting firm settled on an open source solution for the whole ministry. They proposed the use of Linux up to the desktop environment. Linux and other open source solutions will also play a great role in the server environment and generally in government networks. This is a great step in the adoption of open source technology in Kenya. This will provide the necessary impetus to push open source through out the region. It is believed due to the success of the project other government ministries will follow suit.

5.1.2 OSS AT UGANDA MARTYRS UNIVERSITY:

Contact: Victor van Reijswoud

Email: victor@umu.ac.ug

At Uganda Martyrs University two projects were initiated last year (2002). The first, also the most ambitious one, aims at replacing all proprietary software at the university campus. We aim at replacing both the backend (server side) and front end (user side). At the moment the first objectives are reached and at the server side 95% of the proprietary software is replaced, and over the summer break all public computers will be transferred to OSS. In the second project we aim to revive old 386 computers in order to distribute them to local schools. Old computers are not, as most of the people in the industry think, useless and they are available in plenty. Mechanically they are still working in most of the cases, but they are outclassed by the software industry. New software requires too much capacity of the computer and the older software that is needed to get some performance is no longer available. On the basis of the work of the developers of IBM (<http://www-106.ibm.com/developerworks/linux>), the ICT team of the university, together with the University of Nijmegen in the Netherlands and a small German consulting firm, are trying to implement a lightweight Linux version. When successful, a new standard distribution for primary and secondary schools can be prepared that can be used on donated computers.

5.1.3 LINUX IN SCHOOLNET NAMIBIA

Contact: Joris Komen
Email: info@schoolnet.na

SchoolNet Namibia is a nonprofit provider of [internet service](#), hardware and [training](#) to the nation's schools. Since February 2000, close to 250 schools have received free hardware, free training on the Linux operating system and subsidized telephone service to help get the nation's young people online. It's all part of the plan to empower youth through Internet access.

Through a number of ambitious strategies such as its adoption of a Linux Terminal Server thin-client networks, its dedication to the open source movement and its fledgling wireless and solar plans, the prize-winning operation has begun to realize a vision of Namibia where all students have not just access to the internet, but the skills to participate in the digital revolution.

5.1.4 STATE OF OSS IN UGANDA:

Contact: Lunghabo James
Email: lunghabo@linuxsolutions.co.ug

Open Source s/w use in Uganda began in the early 90's with the introduction of Linux and FreeBSD by techies who used to travel in and out of the country. These people started off by playing with it on personal computers and later on realising its potential at the server end, started deploying it. In many cases the bosses didn't get to know till later when it became politically correct to be associated with OSS. The springing up of ISPs also helped create a growth in OSS usage. Proprietary systems are far too expensive for the average ISP to deploy in its server rooms. Thus when the OSS option came up, it was embraced by many ISPs as a cost cutting yet reliable solution. Over time, these open source systems especially Linux and FreeBSD have crept into many organisations i.e. Government Academic, Private companies and NGOs. Initially it was to offer firewalling/Mailserver/proxy solutions but due to the ever-increasing reliability, more mission critical applications are being run on Linux. This quick growth and acceptance of Linux by the main stream organisations can be directly attributed to the ISPs which in a bid to offer cost effective yet reliable solutions always opted for open source systems when recommending internet firewalls for their clients.

Having spread like the way it has, another problem arose, and that was support. Initially, the ISPs would render the support for these systems but due to the ever-increasing clients that they got, reliability was poor and this started becoming a bone of contention for those that had Linux systems. This led to these organisations beginning to rely on individuals for support but like you may know, individuals have their limitations and reliability is usually not guaranteed. Having identified the need in this area, some companies came up to offer specialised solutions in this area and they include Linux Solutions (www.linuxsolutions.co.ug), Kym Net and Computer Frontiers among others.

Late last year, a Linux User Group was set up in Uganda to try and bring together Linux and Open Source enthusiasts. It now has a mailing list running and there are plans of organising monthly meetings for OSS enthusiasts and also as a way of attracting new members. Through I-Network, an organisation of IT Professionals in Uganda, Open Source has also been taken up as an avenue for promoting ICTs in the country. On the side of Government, there is need for it to realise that the way forward for a third world country like Uganda is in embracing Open Source. A policy is required to embrace this new wave of software development.

5.1.5 OBSIDIAN SOLUTIONS IN SOUTH AFRICA

Source. Obsidian Website www.obsidian.co.za

Whilst pursuing their postgraduate studies in 1994, the founding members of Obsidian Systems identified the power and flexibility of the Linux operating system and built a company around servicing the operating system.

The use of Linux had grown substantially in the academic arena and had become the operating system of choice for tertiary education institutions due to its reliable and robust nature. As a result the members contemplated the possible financial reward of introducing Linux based systems into the commercial sector of the South African market. With this mind Obsidian Systems was born in February 1995. Obsidian Systems grew from strength to strength, financing its own growth over the next few years. A welcomed cash injection in 1999, from an equity investment by Archway Venture Partners (www.archway.co.za), allowed the company to grow both strategically and physically.

Apart from upgrading our head office and growing to a staff complement of 30, the expansion included opening a branch in Cape Town and offer Linux training nationwide and through Southern Africa. Obsidian Systems is currently Southern Africa's leading and most experienced Linux-based solution provider. Our goal is to track both local and global market trends, capitalising on the IT industry's need for flexible, low cost, operating environments.

Although we are "Linux Distribution agnostic", we prefer rolling out Red Hat Linux solutions to our customers. From our own experience and successes we found Red Hat Linux to be the best suited for the business and enterprise environment in SA. Red Hat Linux is the worlds most widely supported and installed Linux distribution, and most closely follows the Open Source model (from which Linux is born) of all the commercial distributions available. Red Hat Inc. has the most successful business model of all commercial distributions available with proven partnerships with trusted international vendors, DELL, IBM and Hewlett Packard.

5.1.6 NETDAY SOUTH AFRICA:

Contact: Edward Holcroft
Email: edward@netday.org.za

NetDay South Africa is a non-profit organisation that is putting Linux thin client labs into the most disadvantaged of schools all over South Africa. At this time our activities are funded primarily by UniForum SA, the administrators of the .co.za domain. NetDay SA takes a multifaceted approach to these deployments.

Firstly NetDay operates as a skills development centre for out of school youth who are interested in getting into the technical side of the IT sector as a career, but do not have the means to gain qualifications or experience. These youth are our technicians who are paid to do the actual deployments. Older mentors who are just about ready to move on to "real" employment train new interns. We see the skills development approach to our activities as underpinning our organisational thinking in a country beset with skills shortages.

Secondly we refurbish donated PC's - 486's and P1's - which we then deploy as thin clients. We program EPROM's and use bootable network cards in order to provide a completely diskless (read: low maintenance) solution.

Thirdly we install the network. Being a typically cash-strapped NGO, we sometimes install networks in local businesses to earn extra income.

Fourthly we provide a Linux server with LTSP, laser printer, Internet access and all the usual free stuff that Linux distros include. We use Mandrake 9 as the base.

Finally we train the teachers on the use and maintenance of the equipment and how to integrate it into their day-to-day work.

We believe that given appropriate conditions, the NetDay model can be replicated all over Africa. Mozambique has already started. Namibia has extensive experience with their own unique model for NetDay Namibia.

Another project that NetDay is currently involved in is the development of an OS school management system. It is an approach to OS development with a difference. There is a list for the project at <http://lists.school.za/mailman/listinfo/ossms>.

5.1.7 VIM IN UGANDA:

Contact: Wayne Marshall.

Website: <http://www.linuxjournal.com/article.php?sid=4657>

There are instances of Linux and open source helping to solve problems in Africa. One of the most inspiring and hopeful and involves no computers at all is the Kibaale Children's Centre. The emergence and spread of AIDS has been devastating to Sub-Saharan Africa. Sure, you are probably tired of hearing about it. For one thing, it is so hard to come to grips with the scale of the problem. In the short time since AIDS emerged as an issue in Botswana life expectancy has plummeted, from nearly 60 years to barely 40. It is now estimated that as many as 40% of the adults in Zimbabwe are HIV positive. This has been a debilitating setback to the emerging countries of the region, where public health efforts had previously been making remarkable gains. One of the biggest problems is the large numbers of children left without parents. In a society where children are traditionally treasured and raised with the supportive assistance of extended families, there are simply too few adults left to care for growing numbers of orphans. Bram Moolenaar is the author of Vim, one of the most popular open-source text editors, with ports available for just about any platform in existence. Bram had already started Vim when he first went to Uganda in 1994, volunteering to work as a water and sanitation engineer for the Kibaale Children's Centre (KCC). The center, located in a rural village of southern Uganda, provides food, medical care and education to about 600 children, most of whom have been orphaned by AIDS. The conditions are austere: one book for ten children, a tiny blackboard and a roof with holes. Bram found that his skills could help at Kibaale, his help made a difference. After a year spent working with the Centre, he wanted to find ways he could continue helping the project while also letting other people know of its existence. That's when Bram hit on the idea of "charityware" for Vim. The license for Vim says simply: "Vim is Charityware. You can use and copy it as much as you like, but you are encouraged to make a donation to orphans in Uganda. Please read the file doc/uganda.txt for details." While using Vim, type :help uganda to get the complete text of the license and a description of the Kibaale Children's Centre. Beyond this, though, Bram is fairly modest about the project. Although he asks for copies of CD distributions that include Vim, he doesn't appeal to distribution vendors directly for any additional financial support. Bram prefers to remain low key rather than risk annoying people and turning them away from supporting the Uganda project. Knowing that Linux distributions in use are now in the billions, one may wonder how successful the charityware license has been as a fund-raising method for the Centre. Vim users are asked to make contributions to the International Child Care Fund that Bram and his colleagues have set up specifically

to support the KCC project, and the ICCF web site provides annual financial reports. For 1999, donation income totaled about \$7,000 US (17,800 Dutch Guilders), up from about \$3,500 US in 1998. These figures may seem rather underwhelming and suggest that the conscience of open-source users and vendors is not as evolved as one may like to think. But the bottom line for Bram is, even at such a modest level, these contributions make a huge difference in what the KCC can accomplish. The funds raised by Vim donors are used to keep the Centre running, maintain and improve the facilities and recently purchased rainwater tanks so that more people have access to clean water. This experience gives Bram a thorough grounding in the realities of life in Africa, as well as an understanding of the means of effecting meaningful change. When I asked for his opinions about the digital divide, he said, "I'm afraid I don't know what the digital divide is. Is it about bringing computer-related stuff to Third World countries? Well, the area around Kibaale first needs a good water supply and a phone." In the end, Bram is doing what the Open Source movement has been all about from the beginning: working with personal conviction, making a difference where one can and sharing the work one loves with others. These are the ideals of a world seeking connections, the values that can link Linux and the Internet with an orphanage in Uganda. The human connections of these efforts empower people, improve lives and build the solid bridges of understanding among diverse global communities, digital and otherwise.

5.1.8 CIRCUITS AND PACKETS COMMUNICATIONS LTD IN KENYA

Contact: Bildad Kagai
Email: bill@circuitspackets.com

Of late, Linux has been increasingly acknowledged as the operating system of the future. That belief has been our credo since the beginning. Linux is a UNIX operating system. This means that Linux is built on a mature (30 year) design that has evolved and has its roots in the foundation of the Internet. But the Open Source nature of Linux allows improvements at a fast pace and only nine years of Open Source development has made it full-featured and stable for high-available servers and embedded systems.

Linux is already the leading platform for Web servers. Its numerous programming tools and highly efficient single solutions all conspire to make Linux the most significant and flexible server platform in the world. In addition, ever-growing numbers of leading companies and government offices are testing Linux and choosing to implement it, not least because its unrivalled Internet and server functionality make Linux as easy to use as it is indispensable.

In short, with Linux, you can confidently look forward to reduced costs, the highest possible standards of security, speed, and functionality in network operations, and unparalleled reliability in both e-commerce and cutting-edge database systems.

Circuits & Packets Communication has developed several solutions for its demanding customers.

- Web servers and database servers (SSL-enabled, server-side scripting and fail-over setups)
- Secure mail solution (combination of secure Mail gateway with conventional Mail server)
- File- and print servers (interoperate with Windows, Macintosh and Netware clients/servers)
- Firewalls, routers and VPNs
- Directory services (centralized administration and authentication for large size companies)
- Backup services (scheduled client-server network backups)
- Other specific services like DHCP, DNS, FTP, Proxy servers, etc

These solutions contain a window front-end for ease of administration and can be delivered with additional training, support and operational management. Various private sector companies and NGOs in Kenya are already using Circuits and Packets solutions for their day-to-day businesses.

5.1.8 RADIO E-MAIL IN WEST AFRICA:

by Wayne Marshall

<http://www.linuxjournal.com/article.php?sid=6299>

Remote networking with high-frequency (HF) radio and Dan Bernstein's qmail. Deep inside the warm green interior of Guinea, centered in the frontal lobe of West Africa, field personnel in the widely scattered village-towns of Dabola, Kissidougou and Nzerekore now enjoy access to regular internet e-mail, directly from their desktops. Here we have bridged the digital divide, and there isn't a telephone line or satellite dish in sight. Instead we are moving the mail over distances of hundreds of miles--over jungle covered mountains and high palmy savannahs--through wavelengths of high-frequency (HF) radio. Our project is called Radio E-mail, and here is its story.

As far as African countries go, Guinea is a calm pocket of peace and stability, and it generally doesn't attract a lot of attention from beyond its own borders. But Guinea has quietly played a heroic role in the theater of world events in recent years. It provides a safe and welcome refuge for as many as half a million people displaced by brutal wars and civil upheavals in the neighboring countries of Sierra Leone and Liberia. The International Rescue Committee (IRC) has one of their largest operations in Guinea, providing services and support to a population of up to 200,000 refugees quartered in many camps established throughout the country. Traveling outside the capital city of Conakry, one immediately finds that Guinea has little infrastructure, especially in the way of electrical grid and telecommunication systems--to say nothing of broadband access to the Internet. So IRC field offices must provide their own infrastructure: diesel generators for electricity and high-frequency (HF), two-way radio sets to communicate with other offices and mobile units, up to hundreds of miles apart.

Expecting this isolation and general lack of connectivity, I was quite astonished when we arrived in Kissi. Here I found the radio operator using his equipment to make a binary file transfer from his desktop PC to another field office, wirelessly! On top of the operator's radio set, connected to the serial port of his PC, sat a dingy black box simply labeled 9002 HF Data Modem. I noticed the operator used a proprietary, MS-DOS program to make his file transfers, but I immediately began wondering: if this device is truly some kind of modem, moving binary data over the ether of radio, why couldn't we set it up with Linux and network with PPP connections as well?

After a little research and testing, I soon confirmed this equipment could indeed form the basis of a wide area network, providing full access to Internet e-mail via the Conakry office for all personnel in each of the three field offices. Moreover, since IRC owned most of the equipment already--and since we would be using Linux and other freely available, open-source software--the system could be implemented at negligible cost, with no increase in operating expenses. For the price of some network cards and category 5 cable, we could connect our bush offices to the rest of the world. The project we call Radio E-mail has been continuously operational since January 2002.

The current result of our own Radio E-mail project is that we are now serving mail to over 50 desktops and 150 staff in four offices throughout Guinea. The entire wide area network is serviced behind a single public IP address, at a total ISP cost of \$150(USD) per month. Based mostly on existing hardware, the Radio E-mail project has leaped boundaries and opened dialogs for its users that were previously not possible. Best of all, the system has deployed standard network and internet technologies throughout the organization and throughout Guinea utilizing the freely available, best of breed, borderless open-source technologies that underlie all global connectivity. Not only does this plant grass-roots networking infrastructure where there is yet no Internet, it helps build the core competencies and capabilities essential for Africa's connected future.

5.2 LINUX USER GROUPS

COUNTRY	GROUPS
Botswana	Botswana Linux User Group. (BLUG) Email: lug@rpcdata.com
Ghana	Linux in Ghana Website: http://www.linuxinghana.net/
Kenya	Kenya Linux Group (KLUG) Nakuru Linux Group (Nakuru LUG)
Namibia	LUGN Linux User Group of Namibia
South Africa	CLUG Cape Linux Users Group ELUG East Rand Linux User Group GLUG Gauteng Linux Users group LEAD Durban Linux Group LEG UCT Linux Enthusiasts Group LPA Linux Professionals Association MLUG Mpumalanga Linux User Group PLUG Pretoria Linux Users Group SULUG Stellenbosch Linux Users Group TLUG Tuks Linux Users Group
Zimbabwe	ZWLUG Zimbabwe Linux User Group



6.3 LINUX AND OPEN SOURCE SOLUTIONS FOR THE GOVERNMENT

Linux desktop applications are moving into more government desktop computers

Vendor	Product name	Type	Key features	Linux distributions supported*	Other OS supported	Price
IBM Corp. Armonk, N.Y. 900-426-4968 www.ibm.com	DB/2 Universal Database Personal Edition 7.2	Database	Connectivity and data warehouse tools, SQLJ, Web support, wizards	Caldera OpenLinux 2.4; Debian; Mandrake 7.2; Red Hat 6.2, 7.1; SUSE 6.2, 6.3, 7.0; TurboLinux 6.0	AIX, AS/400, HP-UX, NUMA-Q, OS/2, OS/390, Solaris, Windows	\$361
MandrakeSoft Inc. Alhambra, Calif. 626-292-6220 www.mandrakesoft.com	Mandrake Linux 9.2 PowerPack Edition	Linux distribution with bundled third-party applications	Browser, graphics, office suite, open-source development tools, personal finance	Mandrake Linux 9.2	None	\$149
The MathWorks Inc. Natick, Mass. 508-647-7000 www.mathworks.com	Matlab 6J	Scientific and engineering computation	Data acquisition and analysis, modeling, simulation, visualization	2.2.x and 2.4x kernels	AIX 4.3.3; HP-UX 10.20-11.0; IRIX and IRIX 64 6.5.3-6.5.12; Solaris 2.6, 2.7, 2.8; Tru64 4.0f, 5.0, 5.1	\$1900
The Mozilla Organization www.mozilla.org	Mozilla 1.0 Release Candidate 1	Web browser	Browser, chat, e-mail, newsgroups, Web page composer	Debian 2.1, Red Hat 6.x, SUSE 6.2	Mac OS 8.5 and later, OpenVMS Alpha 7.2-1 or later, Solaris 8, Windows 95 and later	Free
Message Communications Corp. Mountain View, Calif. 650-254-1600 www.messages.com	Message 6.2	Web browser	Browser, e-mail, instant messaging, spell check, Web page composer	Red Hat 6.0, 6.1, 6.2, 7.0 with X11 RB	Mac OS 8.6, 8.8, 9.x; OS X; Windows 95 and later	Free
Opera Software ASA Oslo, Norway +47 24 16 40 00 www.opera.com	Opera 6.0 for Linux	Web browser	Browser only	Debian, Mandrake 9, Red Hat 7.1, SUSE 7x	BeOS, Mac OS, OS/2, QNX, Solaris, Symbian, Windows	\$39
Lycoris (formerly Richmond Linux) Richmond, Wash. 805-587-9655 www.lycoris.com	Lycoris Desktop LX	Linux distribution with bundled third-party applications	Browser, CD burners, graphics, multimedia readers, office suite	Desktop LX	None	\$29.95; \$39.95 with developer tools
Red Hat Inc. Raleigh, N.C. 888-733-4281 www.redhat.com	Red Hat Database	Database	SQL, ODBC and JDBC APIs, locking, transactions	Red Hat 7.1	None	\$2,295
	Red Hat Linux 7.2	Linux distribution with bundled third-party applications	E-mail, word processing, StarOffice 5.2, utilities	Red Hat 7.2	None	\$169
Sun Microsystems Inc. Santa Clara, Calif. 800-555-9788 www.sun.com	StarOffice 6.0	Office suite	Graphics, presentation, spreadsheet, word processor	Linux kernel 2.0x and later	Solaris 2.6, 7, 8; Windows 95 and later	\$76
ThinkFree Corp. Cupertino, Calif. 408-861-9494 www.thinkfree.com	ThinkFree Office 2.0	Office suite	Cyberdrive online storage, file manager, presentation, spreadsheet, word processor	Red Hat 6.0, 6.2, 7.1, 7.2	Mac OS X (10.1); Solaris 2.6, 7, 8; client-based Windows version	\$49 per User/year
VistaSource Inc. Westboro, Mass. 800-927-6379 www.vistasource.com	Anywhere Office 2.2 (formerly Applixware Office 5.0)	Office suite	E-mail, graphics, presentation, spreadsheet, word processor	Caldera 2.3, 2.4; Corel lx; Debian 2.1; Mandrake 7x; Red Hat 5.x, 6.x, 7x; Slackware 7x; SUSE 5.3, 6.x, 7x	None	\$99
Ximian Inc. Boston 617-375-3600 www.ximian.com	Ximian Desktop Professional Edition 1J	Desktop software with e-mail, personal information manager and third-party office apps	E-mail client, personal information manager, application bundle includes Web browser	Debian GNU/Linux 2.2; Mandrake 9.0, 9.1; Red Hat 6.2, 7.0, 7.1, 7.2; SUSE 7.1, 7.2, 7.3	Solaris 8	Free (\$49 on CD); Standard Edition (minus StarOffice) \$29.95

Note: Only the latest versions of applications are shown; some vendors also sell older versions for Linux.
* For Intel x86 systems