



Free/Open Source Software in CUSAT: A Success Story

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Abstract

Free/Open Source Software (FOSS) concept is very important in the academic community. The open philosophy of FOSS is consistent with academic freedom and the open dissemination of knowledge and information in academia. FOSS can lower the barriers to access of ICTs by reducing the cost of the software.

This article discusses the success story of CUSAT's adoption of Free/Open Source Software.

Introduction

FOSS is the preferred method of software business of the day. This may not be a surprising statement if we see major industry players like IBM, HP, Novell, and Sun Microsystems have rebuilt their business models around FOSS. Internet giant Google has built massively scalable infrastructures primarily on FOSS technologies. Recently Google has announced a mobile platform, Android. It is the first free, open source, and fully customizable end-to-end software platform for your mobile phones. The best news is anyone can contribute to Android and influence the future of mobile devices as a whole.

Open source rhymes well with the Internet's focus on standardization, more so now than ever before. Penguin is the most popular server animal on the Internet. LAMP (Linux, Apache, MySQL and PHP) is by far the most common set-up of the web sites on the Internet. Interestingly, lots of alternatives are coming up but most are Free/Open Source solutions.

Free Vs Open

Free (as in freedom/liberty) software and open source software are often treated as the same thing. However, there are differences between them with regards to the licenses assigned to the respective software. Free software generally appears licensed with the GNU General Public License (GPL), while OSS may use either the GPL or some other license that allows for the integration of software that may not be

free software. Free software, according to free software advocates like Richard M. Stallman and the Free Software Foundation, can be seen as a social movement, whereas OSS is just a software development methodology. The hallmark of free software and most OSS is that the source code is available for remote access, open to study and modification, and available for redistribution to other with few constraints, except the right to insure these freedoms. OSS sometimes adds or removes similar freedoms or copyright privileges depending on which OSS copyright and end-user license agreement is associated with a particular OSS code base. More simply, free software is always available as OSS, but OSS is not always free software.

CUSAT Network & Web Presence

We have a campus wide Local Area Network (LAN) having Internet connectivity bandwidth of 10Mbps. The services offered to the academic community are managed by Centre for Information Resource Management (CIRM) with the support of Department of Computer Science.

The URL <http://cusat.ac.in> is the web presence of CUSAT. This web site is hosted in Apache web server 2.2.3 fully running in GNU/Linux (Debian Etch) with 2.6.kernel. The visitor count crosses 65, 00,000 user clicks as of now.

CUSAT extensively uses the LAMP solution stack to support its application servers. The applications services are engineered to have 24x7 uptime. The combination of Linux/Apache/MySQL/PHP has become popular because of its low acquisition rate and because of the ubiquity of its components.

Our transformation to Free/Open source paradigm started day back in 2001. CUSAT were using proprietary solutions to manage its web services. The philosophy of *hosting and maintaining every service by our own* was not possible by these proprietary





technologies. It was also evident that cost spent to update the licences was huge. Now we have Freedom as well as Cost effectiveness in managing these services.

E-Mail service truly has become the primary communications medium for most organizations and it is the communications tool that users can least afford to be without. Internet's mail transfer agent (MTA) of choice qmail is used in CUSAT. A large community consisting of 1500 users including administrative staffs, teachers, researchers and students use this service. <http://mail.cusat.ac.in> is the site and it uses SquirrelMail as the web interface client. Apache SpamAssassin 3.0 is used along with mail service to filter out possible spam mails. ClamAV 0.87 supports anti-virus service. All these software available under GNU Public Licence (GPL)

We have a hierarchical star topology network. Departments are grouped and put into subnets. These subnets are managed by dynamic IP addressing with the help of a DHCP (Dynamic Host Configuration Protocol) server configured in GNU/Linux. A machine in any department just to plug in its network interface card into point-of-presence and it will be internet ready. Internet browsing requires a Domain Name System (DNS) to translate web addresses (URL) to IP addresses. DNS servers (primary and secondary) are also configured in Debian Linux.

While other Universities in Kerala heavily depend on out-side agencies to design, run and maintain their web based services, we manage all web services by our own. They can adopt Free/Open source model and we welcome them to share our expertise with.

Departments: The FOSS Dimension

Free/open source is an excellent choice for learning science and technology subjects. Tonnes of software are already available or being created. Almost any counter part for proprietary software is available in the Internet. The choice is then given to the academic staff and students. Learning proprietary tools or technologies that does not provide the software code and the freedom to modify or derive other software from it, limits the potential of academicians and students to fully understand the software, thereby seriously curtailing the creativity of the great minds and the learning process.

Most Linux distributions are used and made available in the CUSAT campus. Ubuntu, Fedora,

Debian, Mandrake are some of them. Mozilla Firefox has become the default browser of most students as well as teachers. Software expertise in tools like Scilab (replacement for Matlab), Weka (Datamining and Machine learning tool), Grass (GIS system), PSP (Statistical analysis tool), NS2 (Network Simulation) is available within the campus. Office computing is done through Open Office.

It is true that some departments use licensed proprietary software. Being an academic institution, students are also given freedom to learn such proprietary technologies as well. It is to be noted that for teaching, it is better to use free software. Interestingly, use of Free/Open software discourages piracy.

Library: Ready for a better Service

Severe budget cuts, increased demand for services and lack of adequate staffing are the major challenges faced by any library system. Free/Open source has been a buzzword in the library community for several years now. Till now, library software vendors have built their businesses around a proprietary software development model, and, as a result, libraries have been slow to adopt open source. There is a vibrant community of FOSS who creates and distributes software for libraries. CUSAT library system has already realized the concept and value of FOSS. Most of the departments use Koha integrated library system for managing most of the library functions. The users can check the availability of an item, its status; reservation of documents, and easy transactions of library items.

The availability of FOSS for Digital libraries/Repositories is another major advantage for libraries. DSpace is an open source platform for accessing, managing and preserving scholarly works. CUSAT is an early adopter of this ground breaking technology. The URL <http://dspace.cusat.ac.in>, running under GNU/Linux is having 2000 digital documents in it and is growing steadily. It has been accessed from all over globe having 70 to 80 hits per day.

Students: Opportunities ahead

It is good news that educational institutions are beginning to integrate open source into their classes. Most are merely introducing students to open source tools; others are providing courses that integrate





students deeply into the open source development experience.

Institutions struggle to find the balance between producing valuable intellectual property and contributing to the public good. There are still huge problems in the software world that need to be solved. The free/open source software model is poised to unlock tremendous value, and despite the obvious challenges, There is no reason in the world that educational institutions shouldn't be at the forefront of the continuing free/open source revolution. CUSAT is always in the forefront of this revolution.

Increasingly, students are looking for opportunities to participate directly in open source projects. Some students are looking for experience; some are looking for personally satisfying work; some foresee greater earning capacity.

Spreading the wave to Society

CUSAT have taken strong steps to disseminate the concept of intellectual freedom to the society.

IT@School Project of Kerala is a prestigious effort to impart ICT enabled education to school children of Kerala. We have conducted effective workshops to enable school teachers to work with GNU/Linux.

Trainings are also given to Vocational Higher Secondary school students. Workshops in Free/Open Software like DSpace, Koha and GNU/Linux operating system have been given to library professionals.

Conclusion

CUSAT is an early adopter of Free/Open Source revolution. Apart from freakish exception to economic principles we can see lots of reasons to the success of this revolution. Intellectual property law has allowed to companies to control knowledge at the expense of industry-wide cooperation. An academic institution like CUSAT has to ensure the free distribution of knowledge that can empower a more effective process for building intellectual products.