Linux for Schools – An Introduction.

LESSONS IN LINUX

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Linux – and Free Software in General – is not just a cheap ICT solution for cash-strapped schools but a chance to improve the creative learning process. This article examines the state of Linux use in the UK and its prospects for employment in the classroom environment.

Whilst many readers use Linux at work, at least on their servers, and the majority choose it as their home desktop OS; how many of you are sending your children out to benefit from Free Software at school? Unfortunately the answer is not many.

"Point 'n' drool" proprietary software is the norm in our schools. Children leave the education system with little idea of what a computer can really do or even how to use one to get anything achieved. Unless students take a science subject at university they may never see powerful applications like Tex running on a free (or even a proprietary) Unix. This compares very badly with the situation twenty years ago when, despite a shortage of machines in schools, we were taught the basics of programming and learnt the "underlying

principles" of computing. Schools and the birth of home computing produced a generation of innovative coders whilst the government funded Free software for the BBC B Microcomputer.

The dumbing down of ICT in schools is causing a severe skills shortage in the UK. Linux start-ups, and established companies venturing into the Free Software world, are fighting for the few who haven't gone the easy MSCE route to riches. Andy Roffe of Cheshire-based iTS-LiNUX is one who has had to work hard to find capable staff. He is a keen supporter of Linux Users Groups (LUGs), and their role in Linux advocacy in schools and the business community, a sentiment shared in a recent editorial of this magazine. "We have offered our time, free, to schools and trade associations," says Roffe, "to

try and make a case for Linux, but so far with no takers. The Open Source model and my experiences in Germany have taught me that many more people are learning to code on the Linux platform, due to the inclusion of all the development tools."

However this is no cause for gloom, change takes time. Two years ago few were backing Linux for success on the desktop, now rapid growth there looks certain. Similarly in schools, Linux use is patchy and unsupported by those in power, but change is coming.

First the bad news

Policy on IT use is governed by the Department for Education and the Environment (DfEE) and implemented by the Local Education Authorities (LEAs). Guidance comes from Becta (the British Educational and Technology Agency) the government-funded agency which supports ICT in curriculum subjects. Becta have recently given the DfEE a briefing sheet on Open Source Software (OSS) which should lead to all tender documents no longer specifying particular closed source solutions.

Under the National Grid for Learning (NGfL), schools have been encouraged to take up Managed Services. Goods and services are provided by Certified Solutions Providers (certified by Becta), the school just delivers curriculum content, which can reduce the skills-base in the school. The barriers to becoming a Provider are more financial than technical, though the documents have not been phrased to prevent Linux implementation in schools. Nevertheless Becta have not been wholly succesful in explaining Free Software to schools or government, and many industry players are unhappy with the new competition that it brings. A planned conference on Open Source Software was called off because of pressure from a large software publisher, and other attempts to flag up Open Source Solutions have met with a similar fate. ICT teachers and technicians look to Becta for a lead and find no officially backed alternative to expensive closed source software. As we go to press Becta were planning on publishing a Technology Information Sheet on Open Source Software on their Web site.

There is an impression that those in government circles really do not "get" Open Source or Free Software, seeing it as a rival commodity rather than a better way of doing things with strong educational advantages.

Linux growth

Recent announcements on Linux support from IBM and Sun are excellent news. However Linux has become popular because of grassroots enthusiasm – from coders and developers initially, but lately from users too. The government may show little understanding of what free software is, not to mention its benefits, but in

schools Linux is slowly appearing, server side first, as it did in the corporate space.

One looks with encouragement at the Powys example. The county IT strategists suggested a look at Linux "principally on cost grounds," says Dr Martin Williams, the co-ordinator of ICT services for Powys LEA, who installed servers in two schools as a trial. "It worked so well that not only did we put it in all our schools but Linux is now always the platform of choice for County servers." Powys, as a large rural county, has provided "telecottages" where the community can take advantage of IT resources. Here and elsewhere in the county Linux powers the servers, leveraged by cost and native ease with network protocols.

Normal service will be resumed

Of course Linux power on the server side does not just mean Apache or files served by Samba. Individual schools around the world are putting Linux servers to many imaginative uses. Holding a disk image for an MS Windows installation which is transferred to the workstation each time it is booted up, giving a clean installation (no matter what damage the previous user did) is one prime example. Of course all work is saved centrally to the Linux file server.

The Linux Terminal Server Project (ltsp) enables redundant old PCs to be recycled as diskless workstations booting from a central network server. Other similar projects exist. One modern PC with, say, 256MB of RAM, can serve several dozen clients running X - though the number drops if spreadsheets on Star Office are involved!

Like many developers, Phil Jones met considerable resistance when trying to give away his Linux for Schools Project (lfsp) software to schools. Most schools didn't even reply and we wouldn't have heard about it if it hadn't been taken up so enthusiastically by Nigel Pauli of St. John's school in North London. The Linux for Schools Project (lfsp) introduces pupils to the Unix Command Line Prompt from the "safety" of their WinTel box, teaching them the benefits of a multi user, multi tasking networked environment. See the lesson plan on their Web site.

Applications over the net are the next big thing apparently, with Microsoft trumpeting their .Net strategy. Several Linux-based remote solutions, such as Schoolmation, are being developed and the desktops can be any platform at all. The natural objections to this on security and privacy grounds can be overcome, but locally-run applications will always have their place on the desktop.

Many of the projects mentioned above show the advantages of a mult-user, multi-tasking OS. However each machine served by the Linux box still costs the school big money as Microsoft collect a site license for every Mac or Pentium in most schools, regardless of what it's running, as it has the

Pupils at St. John's school in North London, accessing GNU tools through their MS Windows workstations.

potential to run Windows or Office. Such cost considerations are going to affect schools in the same way that they have in the business sector – particularly at upgrade time.

Totally free

Debian Junior is a project to make Debian GNU/Linux appealing and interesting to children "aged 2 to 80". Though at first they will be concentrating on the two to eight age group. Debian is a coalition of 500 developers – many are parents, and interested in adapting Linux for younger children. "Debian Jr. has avoided directly addressing the Linux in the schools problem, preferring to leave that to SEUL/edu and others," says project leader and Debian developer Ben Armstrong. "Debian Jr. is a developer-driven project. Therefore, we focus on Linux in the home, which holds a personal interest for us because many of us are parents as well. By working first with what we know, we manage to keep what we produce very relevant. We hope that this will supplement the work that is being done by those who are interested in deploying Linux in the schools."

Armstrong does hope that Debian Jr's responsiveness to its user base could lead to schools use, but "it needs to be a user-driven project, with the teachers and administrators

communicating with us (Debian – not necessarily Debian Jr.) about what they need. In turn, we would then draw from the more general resources we have at our disposal, such as SEUL/edu, and build on their success to make Debian easier to implement in schools."

SEUL/edu is a USA-based discussion group for Linux in education, part of the Simple End User Linux (SEUL) project.

Although Red Hat are said to be planning support for education in Europe, the only commercial distributor to be actively promoting schools use of Linux in this country is SuSE. In Germany SuSE are developing KNLinux for schools and have just published a book "Linux in der Schule", by Dr Karl Sarnow. Roger Whittaker, SuSE UK's Training Consultant and himself a former teacher, has offered SuSE's professional edition to high schools at half-price in a mail-out and several hundred have taken him up on the offer. This includes the full support package. Whittaker also maintains a mailing list for those using Linux in schools. Here much of the traffic revolves around setting up Squid and Samba, and the needs of new users on the Server side can be quickly gauged. But what of the desktop?

Desktop

The value of the International Centre for Digital Content (ICDC) Schools Linux project lies not so much in gathering together a "distribution" – anyone can do this with the resources and applications currently available. The project's value lies rather in leveraging their experience with schools, and their strength in the visual curriculum, to produce a study of what schools need to make Linux work for them in the classroom. Then in using this to show the benefits of using free software from an educational, as well as a financial and technical viewpoint. Laurie Peake of ICDC, sees many other advantages in breaking away from the current straitjacket of "rote learning of standardised procedures via proprietary software." Peake sees a role for free software in more creative learning processes. "It is clear from our research at ICDC that a new set of skills is required for the [emergent] knowledge economy and that the current education system is not providing these. The system itself must seriously consider how it can provide the workforce of the future with the skills it needs."

So Linux is getting ready for the classroom. Can our education system get ready for Linux?

Resources

We hope you will be hearing far more of Linux in schools this year. More information on the projects mentioned can be found at the sites listed below. All the Open Source projects listed welcome any help that you can give.

Info

Open source in Education: http://www.ose.org.uk.
British Educational and Technology Agency: http://www.becta.org.uk/
National Grid for Learning: http://www.ngfl.gov.uk/
SuSE: http://www.suse.de/uk/schools/index.html
Debian: http://www.debian.org/devel/debian-jr/
A new forum on KDE in the classroom:
http://master.kde.org/mailman/listinfo/kde-edu
K-12 Linux in Schools: An American project: http://www.riverdale.k12.or.us/.
US-based discussion group for Linux in education: http://www.seul.org/edu/
Linux for Schools Project: http://www.lfsp.org/
Linux Terminal Server Project: http://www.ltsp.org/.
Day-to-day info on the ICDC Schools Linux project:
http://www.sc.lug.org.uk/schools