



## OS Project Closure Report

### Executive Summary

The Community IT Academy (CITA) undertook a pilot project during the later half of 2006, looking into the impact of Open Source (OS) IT solutions in the Voluntary Sector in the Newcastle upon Tyne area.

Open Source refers to software that can be downloaded and used, normally but not exclusively, at no cost. Many Open Source solutions have a subscription element for support.

The main motivation of the project was to address previously identified weaknesses and needs within the sector – the need for low cost IT solutions and the need for reliable backing up of computer data.

The Community IT Academy's key findings are;

All the systems seemed to run reliably and are comparable in performance to a Microsoft equivalent.

The servers perform all the tasks for which they were chosen bar one, print sharing.

The Internet Filtering system (Censornet server) has the same operational issues as do other comparable systems in terms of increased management overhead, training requirement (for both managers and users) and user "frustration" ("I cannot get to anything").

The desktop systems performed well and performed all the functions for which they were chosen.

We concluded;

The financial "rug" has been pulled from under the OS "feet" by the availability of cheap Microsoft software products.

At times working with OS can be frustrating, Microsoft experts are ten a penny and any help can be easily and quickly obtained. This is not necessarily the case with OS.

There is a general lack of awareness of OS and its capabilities.

There must be a will within the organization to go down the OS route, within the staff, management and ethos.

One possible barrier is that it is difficult to value something that is free.



The issues and reasons surrounding the installation of an OS server are the same as those for a Microsoft server. However greater skill and experience is required to make an OS system “better” than a Microsoft equivalent.



## Introduction

Open Source (OS) does the job, so why doesn't everybody use it? Nobody seems to know about OS or what it can do, and if they do they are suspicious of the geeky image it still cannot seem to shake off.

We launched the project at the ICT National Hub conference in April 2006. We had been invited to do a talk around OS and its potential in the voluntary sector. From an attendance at the event of over 100 voluntary organisations we expected to be beating people back from our door, all wanting to be a part of the project. Alas things were not going to be that easy...

The project idea stemmed from work we had done for Change Up, both within Newcastle and regionally, looking into the needs of the voluntary sector in terms of ICT and performing "Healthchecks" (a kind of IT audit that looks at more than the hardware – training needs, strategy, procedures, etc). As a part of this work we identified many needs and thought perhaps OS might provide some of the answers.

OS refers to "free" software that is readily available via the internet and aims to perform the same function as Microsoft products such as Office, Server 2003, etc. I have shown the word free in quotes as the software might be at zero cost but the whole solution for OS can have installation, support, training and maintenance overheads attached, as would any other IT solution. Some OS does attract an element of cost via subscription services.

Specifically we sought to address the need for organisations to backup their data more effectively, secure their access to data and systems, reduce costs and explore the potential of OS within the sector.

With funding secured from Awards for All and some additional Change Up funding we were off! The project team consisted of a dedicated OS "non-techy" (me, Lewis Atkinson) and an experienced technician and keen OS "officianado" (Peter Hill).

## Early Days

At first we sought to contact like minded groups nationally and locally in order to try to tap into existing expertise and networks. Locally we found no networks, a few individuals were working in the OS arena, largely unsupported but doing specific and specialist work, not the kind of general technical knowledge we required. Nationally there were a few we had previously identified by visiting a conference in London. The National ICT Hub were in the process of setting up the National Computing Centre (NCC) in Manchester to front a national OS project.

Having had little response from our activities at the Newcastle conference we set about a wider advertising campaign to generate some interest. Eventually



by a mixture of brow beating, cajolery and tapping up existing clients we were able to have a field of organisations to select from.

We visited each in turn, performing a healthcheck (if we hadn't already done so) and a return visit. We had originally outlined some rough criteria but had to settle largely for what we had. We chose a total of four organisations to join the project; two organisations to host a Fileserver and two to host a new desktop system. We later added another two, one a 2<sup>nd</sup> user OS desktop system and a further organisation to trial an Internet filtering server setup. The groups chosen range from small (fewer than 5 PCs or staff) to medium sized (5-20 PCs or staff), to larger organisations that had expressed an interest would, in our opinion, have the resources to explore OS independently.

Two projects assisted us in setting up, the Midlands OS Technologies project (MOST) and the Cambridge Free and OS Software (FOSS) project, their help and technical support from FOSS proved invaluable in helping us set up the project. The Cambridge FOSS had direct experience with setting up servers (although of a higher specification) and desktop systems within the voluntary sector.

With the advice of FOSS we opted to use Ubuntu for the desktop systems and Fedora for the file servers. We made the decision fairly early on to build the servers as Windows Workgroups servers, the aim to provide simple file sharing and associated security, a means to provide a centralised backup and shared printing if required. The use of Fedora was to provide a Graphical User Interface (GUI) environment that would, we hoped, be friendlier for a user (and technician) not familiar with OS.

The aim of the Ubuntu desktop systems was to provide basic Office applications (word processing, spreadsheets, e-mail, Internet etc).

#### Unto the Breach

The desktop systems were easily built and required little explanation at the point of installation. Some technical issues surfaced (see appendix 1).

After some training and advice from the FOSS project we set about building and installing the servers. Care was taken to seek requirements in terms of user names and required access rights.

#### Up and Running

The training requirement for the servers was not too onerous and as with these things other non-related issues on the local PCs cropped up as a "result" of the server installation. An interesting dichotomy developed between the two server installations (see case studies) with one organisation dominating in terms of the level of need for technical support.



After developing monitoring sheets and asking for monthly evaluations we thought we'd sit back and see what happened. A planned series of "courtesy" visits soon went by the way side and the usual "fire fighting" ensued.

One good early point in favour of the Ubuntu system is the ease of updating and installing new packages, although changing repositories and manually downloading brings the inexpert down to a bump quite quickly.

### The Empire Strikes Back

During the course of the project the Charities Technology Exchange ([www.ctxchange.org/](http://www.ctxchange.org/)) came to our attention. Here the voluntary sector can buy limited numbers of licences for Microsoft products such as Office 2003 and Small Business Server 2003 at very low prices (under £20).

Another development is the enhanced Google desktop that includes office applications.

### Key Findings

All the systems seemed to run reliably and only crashed as a result of user intervention.

The servers perform all the tasks for which they were chose bar one, print sharing. However for the increased security of files, a central point for backups and file sharing are comparable in performance and reliability to a Microsoft equivalent.

The Censornet server, although under experimental use performs the job well. It has the same operational issues as do other comparable systems in terms of increased management overhead, training requirement (for both managers and users) and user "frustration" ("I cannot get to anything"). The long term and developed use is the key here, the balance between security and management of the resource is an interesting issue for the host organisation to address.

The desktop systems performed well and performed all the functions for which they were chosen. Their use gathered momentum after a reserved start by users but the longer term adoption still remains a sticking point, even for OS converts – here they key is "killer" applications such as finance packages, databases, the perceived training needs and emotional ties when using a "different" system.

Any placement or working arrangement needs to take account of the management and social ethos of the client organisation as much as the technical and IT requirements.



When an OS or other server is installed in an organisation it is desirable or even essential that it appears invisible. This requires a significant level of both skill and experience on behalf of the installer.

### Conclusions

The financial “rug” has been pulled from under the OS “feet” by the availability of Microsoft software products from CTX but this could only be a short term blip, once Vista is launched everyone will want that and will Microsoft “give” that away?

At times working with OS can be frustrating, Microsoft experts are ten a penny and any help can be easily and quickly obtained. This is not necessarily the case with OS, if the issue is not covered by the “Official” website then searching the web, joining fora and bulletin boards is neither quick nor in many cases helpful at all. I was mostly met with a roaring silence with my attempts at pleas for help and if answers were given they were often either puerile or an excuse for some tech head to show off a galactic intellect (or should that be ego).

The notion of a “community” is not my experience, most of those working in the OS arena that we have encountered seem to be working “an angle” and seeking a commercial return for their efforts. Many of the OS resources now seem to come with a price attached.

There is a lack of knowledge of OS and its capabilities within the wider IT community and the voluntary sector. It seems that Microsoft have our hearts and minds. There is a real need to promote the use of OS. We tried but failed to attract or identify an audience, everyone seems happy with their Microsoft lot. The OS community needs to come up with some “killer applications” of its own, perhaps a Customer Relations Database or Financial Package aimed at the sector – these are perhaps where the commercial “opportunities” lie.

Another contributing factor could be that it is difficult to value something that is free, an organisation that pays a high premium for a resource tends to back it with appropriate training and long term support. In simple terms you get what you pay for and in the voluntary sector everything has to be done on the cheap.

The issues and reasons surrounding the installation of an OS server are the same as those for a Microsoft server. Managing an OS server is not too far removed from that of a Microsoft server, the training needs are similar but the processes are different. How transferable the skills would be to a “non-techy” would be difficult to assess but experience counts for a lot with IT, as the essential principles remain the same.

Many of the issues surrounding these solutions would be the same as if a Microsoft solution were to be adopted, notably many voluntary sector groups



need to address the management of their IT before any real progress can be made. IT is subject to an organisation's priorities and all too often remains unplanned and reactive.

I have often heard the term "immature market" with regard to OS. It has been around for a long time but does not seem to be maturing very quickly at all. I would prefer the term "niche market" as it seems to take the will of an organisation to adopt its use and only a limited number of service providers are out there.

The development of new skills and a steep "learning curve" has been a positive outcome from a personal perspective and indeed it seems that expertise in OS is a good thing to have in your portfolio, as it provides an alternative path, but it also seems to be a dead end in terms of long term, high volume and sustained use in the local voluntary sector.

It is vital that the top manager and the contact person within a client organisation are on board at the outset of a project and kept informed and on board throughout. Ideally all those affected should be on board and informed and asked for feedback.

#### What Next

There are many possible developments to the work undertaken in this project, some more attainable than others. The lack of knowledge regarding OS is a real barrier to its development, a combination of canny practice by Microsoft and other proprietary vendors and the "geeky" image of OS definitely stands against it, even within the ranks of the converted.

Some kind of promotion, advocacy and/or education project is necessary but may be an up hill struggle. I shy away from the phrase "evangelise" as preaching by the converted can often "over egg" the pudding, I think a more considered evaluative approach would be of the most benefit but it needs to be delivered to a wider audience, not just the IT staff.

The technical aspects of OS are not too difficult if you come from an IT background but there is a lack of credibility within the operational environment both in terms of image and professional qualifications. NCC is trying to address this issue through the provision of branded OS training.

There are one or two interesting technological avenues that may be worth exploring such as the "Thin Client" solutions – taking a "modern PC" and utilising it to server desktop and applications to "older" PCs attached to it in a network – a dumb terminal. Certainly anything web based is mostly driven by OS, content managed websites are the latest vogue and seem to offer the biggest commercial opportunity. Bespoke authored developments such as Databases, a Customer Relations Management system and especially a sector friendly finance package would also meet specific needs.



## Technical Issues

## Appendix 1

### Desktop Installation

Ubuntu seems to “remember” past DNS servers when connecting to a new network causing Internet access to be very slow, once identified the solution is to delete all past DNS server IP Addresses from the list and the access speed is fine.

We “dual booted” our PCs between Windows XP and Ubuntu with varied levels of success – the process seems to be rather “flaky”

We had heard rumours that OS didn’t like wireless networking and issues relating to wireless appeared to surface but it turned out not to be an Ubuntu issue – someone had disabled it in the BIOS! We have deliberately avoided digital cameras, scanners and such

### Server Installation

The first Fedora server built crashed (and “killed” the server) when the first update was attempted, this to fix a known issue with CUPS (Print server system – Common Unix Printer Server).

When entering the name of the Windows workgroup use the CAPS LOCK, otherwise the server will not join the workgroup.

Once built at the workshops both desktop and server systems could not easily change monitor display modes (an XWindows issue) causing a blank screen. The only solution seemed to be a re-build, this caused us to adopt the policy of building systems “in situ” or with the same monitor as would be used on site. We supplied the servers without monitors and planned to use remote access via VNC to manage the systems, we later modified this approach and supplied a KVM switch to share monitor, mouse, etc.

The Internet filtering system used was Censornet by Adelix. We made use of a 2<sup>nd</sup> user system (1 GHz processor), installing additional RAM (512 MB) and a larger Hard Drive (40 GB). Integration into the Windows Server 2003 environment proved a challenge as the security policies invoked on the domain were quite tight. Setting the server to run in “Bridging Mode” (using a single Network card) rather than “Proxy” mode (using two Network cards) solved the problem. The technical issues with this installation were not due to the Censornet server, rather the set up of the Windows system and individual PCs. Once levels of access and desktop environments were agreed each PC had to have some reconfiguration to secure the link through the Censornet server.

It became apparent that we needed to have mirror systems at the workshop to experiment with and evaluate alongside the systems deployed in the field. To



that end we “recycled” some systems and built a mixed server and Microsoft environment as a test bed.

Censornet generated the biggest need in terms of training and skills development for the in-house managers but is supported by some good documentation.

### Servers General

One of the server installations reported the server running slowly and people could not access files. After some re-negotiation of who required access to which files, eventually after three or four visits, the access rights issue was rectified. Although originally dead against the use of the command line interface (which was the main reason for adopting Fedora) we had to develop ways to force ownership and access rights to specified files and folders using commands like CHMOD and CHOWN.

With all the access rights sorted one Windows PC in particular was misbehaving – not applying the correct owner and attributes when saving a file. After many tries, e-mail pleas for help and messages on fora I finally tried making the server a “Master Browser”. This cured the problem but made little impact on the speed of the remaining PCs. We came to the conclusion that the installation of an anti-virus solution at the same time as the server installation had probably caused the PCs to noticeably slow (the PCs being of an older “spec”). Care needs to be taken with this solution as the server can sometimes be “thrown off” the network and as I found to my expense needs to have the workgroup reset to get back on.

Developing a reliable backup script (see appendix 3) was a challenge as the Ubuntu system spoke a different language to the Fedora system in terms of the text editor and the scheduling package. The servers make use of CRON and were a little tricky when trying to get them to mount the USB hard drives we provided as the vehicle for the back ups. Although not a technical issue, perfecting the remaining backup procedure (i.e. checking the backups, taking them off site and copying them) also proved a challenge. This highlighted one of the frustrations with OS, there is not a “one size fits all” solution as per Microsoft – each distribution has its own foibles.

CUPS caused problems, making printing extremely slow (in some cases up to 10 minutes). Different printer drivers and remote printing systems were tried but to no avail, printing continues to be performed via a Windows workgroup share. This remains work in progress.

We found one or two ways to kill servers – do not uninstall CUPS – your server will not like it and you will lose the ability to log into it! I have become quite adept in building servers.



Remote access into the Censornet server proved another challenge – the laptop I was trying to use simply would not “play ball”. Downloading PuTTY and connecting through SSH solved the problem but the interface from the browser based control panel proved unreliable. Adelix proved to be very helpful with technical assistance. Remote access into the other servers was easily performed using VNC once (as per Windows) remote access was granted and minor changes were made to the Windows firewall.



## Case Studies

## Appendix 2

### Case Study 1 - Server

A medium sized organisation based in the centre of the town. A mixture of 7 full and part time staff each mostly with an older (refurbished PCs – typically 400 MHz, 128 MB, Windows 2000). The organisation also has a training area for “public” use with 4 similar older PC systems.

As a result of a healthcheck we identified potential improvements could be made to file security and backing up.

The “super user” is the full time “office manager”.

Other issues (not relating to the OS project) included to need for licence compliant software, training and a need to review policy and procedures. There was also a need to review website, e-mail and ISP arrangements.

The original network was a peer to peer workgroup linking all the 11 systems to one “master” PC, sharing files and an Internet connection. Printers were also shared within the workgroup, the two “main” printers being a photocopier and colour laser, the former being the more reliable link.

The server simply replaced the master PC in the workgroup but lead to some problems with the “Master Browser” issue highlighted above.

After some considerable time spent getting access levels working the network system is functional but suffers a slow response time, this due to the low spec of the PC systems on the network. By coincidence the anti-virus solution was upgraded at the same time and we believe has had a major impact on the performance of their PCs, this from the experience of the other group not reporting any reduction in performance (see case study 2). We have been working with this group to seek funding to upgrade the systems.

I think it is fair to say that the major issue that remains is that of the time to manage the current level of IT resources, to check and update anti-virus and anti-spyware, to perform the backing up procedure.

Key members of staff need also to be made aware of the potential improvements to communications that e-mail offers rather than simple file transfer within the networked environment. This needs to be combined with an understanding of the implications for security, data integrity, archiving and privacy that granting varying levels of access in networked systems generate.

Interestingly this group concluded that they would not like to continue to use the OS server and would prefer (given the chance) to migrate to a Microsoft Server, this they felt, they would have a better understanding of as a result of being familiar with the Microsoft environment on their desktop systems.



## Case Study 2 – Server & Desktop

A small organisation in terms of PCs again with predominantly older PC systems (refurbished as per case study 1, with a similar spec). They have 5 full and part time staff operating a workgroup to share printers, a database and Internet access.

This organisation was keen to be a part of the OS project from the start having a very committed and capable member of staff to drive the work.

We chose to place both a desktop PC and server into this organisation as the result of a healthcheck and discussion. The primary reason for the server was a more reliable backing up system and the desktop was to have a “live” system available to interface between Microsoft and OS environments.

A limited number of usernames were used (and shared) between PCs and members of staff.

Other issues included the need to review policy and procedures relating to IT.

As the first group to have a server installed many of the problems were first encountered here.

The Desktop system mostly operated well, although initially it had trouble mounting network shares. This issue was solved by changing user id number at the server.

Printing (using CUPS – see Appendix 1) remains an issue with the printers still being shared from one of the networked PCs as does the limited number of usernames used.

Reports that the users have not noticed any difference is comforting but there is an additional management overhead for the system(s) in place. There was very little training requirement for this installation.

The organisation is keen to continue to develop OS solutions and would like to explore the potential of Thin Client technology. It is my belief that moving the server to a domain would be a better interim measure.

They had mixed feelings regarding the Ubuntu desktop system, however, this did not allow them to make use of their in-house developed MS Access database without the loss of many of the reports, query screens and macros. They concluded that Ubuntu itself made no real difference apart from the fact that they had a nice new PC system to function in their office.



### Case Study 3 - Desktop

A large organisation by the standards of the local voluntary sector, allied to a larger national organisation. This organisation has in excess of 20 staff and PCs, but split into separate project areas. The sub-project chosen to host the OS desktop system is a cyber café help desk, where volunteers support “public” use of four PC systems with shared Internet access and a printer.

From an early reluctance to use the OS (Ubuntu) desktop its use developed during the period of the pilot.

The ease of use was good and no additional training requirements were identified.

The system proved very reliable, having no issues once installed. The DNS issue highlighted above occurred at the point of installation.

Although the project manager is very keen on OS the users were less so, although the PC has been well used but not for much more than Internet and Web Based e-mail access. As a matter of preference the support staff would refer new users to the Windows based PC systems in the café rather than the Ubuntu system. Users did concede that cost benefits would drive them to use the OS environment.

More exposure to the applications available and perhaps a “killer app” (e.g. Gimp) would also be an incentive for the users to actively promote the Ubuntu system.

### Case Study 4 – Censornet Internet Filtering

This was another large organisation by local sector standards. Primarily a training organisation consisting of around 15 staff split over two sites but a part of a larger organisation with outlying offices in other parts of the country. Although this was not one of the first wave of choices for the OS project we had been working with this organisation on another project and we felt that this would meet an need that had been identified.

The network setup was split into a training area and admin PCs, this mirrored between the two sites but with no direct connection. The network operated a Windows 2003 server with a domain, associated security and user profiles. Of the admin PCs most do not connect to the internet via this server and rely on independent access. The server also runs an Intranet.

Two full time staff are responsible for the training suite, a training manager and an IT technician. The IT technician also is responsible for the maintenance of the admin PC systems.



The need was to track and limit the use of the Internet by the training clients. This requirement had been identified as a result of a policy review, the organisation needing to develop an “acceptable use” policy for its IT systems.

Other issues relating to shared Internet access, security, staff development, anti-virus procedures and developing better internal communications between sites are on-going. Backing up of individual systems, e-mail and Internet access is also an issue but should be resolved as a result of addressing the above. Backing up of the server requires staff and policy development.

The difficulty in implementing the OS (Censornet) solution was more of a result of not being able to fully identify the original network configuration rather than the fault of Censornet. Once installed and configured the system was not implemented fully until further visits and training were provided.

It was decided to roll out the implantation, limiting it to 1 PC system, then 6, before altering all the PCs in the training room to access the Internet via the Censornet server.

Minor configurations of the local PCs caused irritations at first then, as expected, irritations caused by the need to configure the Censornet database gave users frustrations when trying to access web sites. Additional training was provided to assist in the migration process of users from open Internet access to access via the Censornet system.

Remote access via the Censornet admin interface proved unreliable (see above).

The additional management and training overheads with any filtering system such as this are an issue.

This group came to very positive conclusions regarding Censornet, even to the point of considering subscribing to the Banned List Update (BLUD) system and expanding its use across the entire network – i.e. to add staff use to the filter.

#### Case Study 5 - 2<sup>nd</sup> User System – Ubuntu Desktop

This group quickly fell behind in the trial, limited feedback indicated a reluctance to use it on the basis of limited interoperability with MS Excel.

This group decided not to continue with the use of the Ubuntu system.



## Automated Backup Script for Fedora

## Appendix 3

- 1) Open a terminal, write gedit.
- 2) Enter the following....

```
#!/bin/bash
```

```
#hashes are remarks – you can leave them out
```

```
#NB care with case
```

```
# create backup folder in main file system
```

```
#create USB folder in /media
```

```
find /home -mtime -1 \!type d print > /backup/filelist.txt
```

```
# change 1 to 7 for weekly backup
```

```
curdate=`date +d%-m%-d%`
```

```
#set variable for today's date.
```

```
#please note the ` (back quote) to get it press Alt Gr & # keys together.
```

```
tar -zcv -T /backup/filelist.txt -f /backup/"backup "$curdate".tar.gz"
```

```
#creates tar file and calls it backup <today's date>
```

```
mount -t vfat /dev/sda1 /media/USB
```

```
#mounts the USB drive
```

```
cp /backup/"backup "$curdate".tar.gz" /media/USB/"backup "$curdate".tar.gz"
```

```
# copies file to USB drive
```

```
# could not get a variable to work here!
```

```
umount /media/USB
```

---

3) Save the file as "script" in the /backup folder

4) Make sure to chmod the file i.e. chmod 770 /backup/script

5) Create a crontab for the file .....

crontab -e – this takes you in to the VI editor, press I to enter insert mode

```
0 0 * * * mon-fri /backup/script
```

This will run the script at midnight Monday – Friday

Press ESCAPE to enter command mode then :x to save the crontab and exit

To test the script type ./backup/script



6) Remove the drive and copy each of the files to another media or system.

7) A monthly full backup is also recommended ....