ICFOSS

Hand Book on

Migration of Desktops to Free Software Platforms

Draft Version 0.3, June 2014

International Centre for Free and Open Source Software
(An Autonomous Institution of the Government of Kerala)
VII Floor, Thejaswini, Technopark, Trivandrum.
Web: http://icfoss.in Email: info@icfoss.in

Desktop Migration to Free Software Platforms

Draft Handbook[1] [2]

1 Introduction

The Government of Kerala, in its Order no. 109/2014/ITD dated 17 May 2014, made a strong recommendation for migrating desktop machines of all Departments, Institutions and PSUs, to Free Software (FS) platforms in the backdrop of the withdrawal of support to Windows XP.

This document has been created to support the process of migration of machines currently using proprietary platforms over to Free Software platforms, with minimal disruption to work. It can also be used to support commissioning of new desktop computers in Free Software platforms. However, this document discusses only the migration of Desktop machines and not back-end applications or services.

2 Can it be done?

A basic question that is often posed is that while migration to Free Software platforms for the individual or small groups is possible and easy, whether the same can be said of large institutions, particularly the Government. The answer to this question is that such migration can indeed be done, provided a structured and systematic approach is followed. The following points illustrate this further:

First, the Government of Kerala embarked on its policy of migration to FS platforms several years back, and many departments have already carried out this transition successfully. In fact, the Government of Kerala is credited as the first Government in the world to announce affirmative support for FS platforms in its state IT policy. (See: `https://en.wikipedia.org/wiki/List_of_Linux_adopters`)

Secondly, some of the projects in Kerala have demonstrated large-scale movement to GNU/Linux. For example, the IT@School project is considered widely as the largest single-purpose deployment of FS platforms globally. Initiatives such as KSEB, Calicut University and many others in Kerala are considered as significant achievements.

Thirdly, there are some very successful large-scale migrations in other parts of the world. A good example is **LiMux** (https://en.wikipedia.org/wiki/LiMux), a project by the city of Munich to migrate their software systems from closed-source, proprietary platforms to Free Software. The projectinvolving migrating 15,000 personal computers and laptops of employees, to the GNU/Linux distribution LiMux (an Ubuntu derivative) as the operating system, and LibreOffice as the primary productivity software, was successfully

[1] Prepared by ICFOSS as a guideline for desktop migration to Free Software platforms for use primarily for the Government departments, institutions and PSUs of the Government of Kerala. This document is work in progress that will be continually upgraded.

[2] Comments are invited on this document from readers to further enhance it. Kindly send your comments to `info@icfoss.in`

completed in late 2013. Notably, this migration saved the city of Munich a sum of 11 million Euros (approximately Rs 88 crores)[3].

Any large-scale migration of this kind carries with it risks which need to be carefully evaluated and mitigated. Migration to a FS platform is not a "fit-and-forget" process, but requires evaluation of each installation, identification of problematic areas (legacy hardware, desktop applications, training & capacity development requirements etc), developing a migration plan, and determining mitigation measures.

3 Migration Strategy

The broad strategy for migration is summarized in the following steps:

1. Equip internal IT teams to plan the migration (in case there is no internal IT team, identify a service provider or technology partner who would provide assistance for the entire process).

2. Inventory the installation (number and configuration of PCs, devices and applications) and create an initial plan for migration.

3. Back up all user data (including application data, email, documents etc) on existing machines to back-end, offline media or the Cloud.

4. Choose an appropriate GNU/Linux Distribution keeping in mind the requirements of the organization.

5. Enumerate the legacy hardware (old desktops, printers, scanners etc) and determine which have compatibility issues with the chosen distribution.

6. Enumerate the legacy software applications and identify which of them cannot be used on the GNU/Linux distribution directly or indirectly. This may include local applications (eg., browsers, office suites) and networked applications (file/print sharing, browser-based applications, client-server applications and networked applications).

7. Map the Windows desktop applications used in the system to available FOSS equivalents (See Section 4, Item 5 on Page 4). Consider piloting alternatives before finalizing.

8. Categorize the installation into three groups: (a) the desktops that can be immediately migrated; (b) those that require low-effort porting; and (c) those that cannot be moved immediately due to various reasons.

9. Plan and implement the installation of the chosen distribution and the capacity building and training programmes for users as well as IT staff in a synchronized fashion. In particular, equip users to handle immediate and routine tasks such as browsing, printing, booting, and handling documents. Another priority area is to equip users to know the differences between FS office applications (LibreOffice, OpenOffice) and proprietary applications (such as MS Office) for routine tasks.

[3]Please see IT World report available at: `http://www.itworld.com/operating-systems/321474/switching-linux-saves-munich-over-11-million`

10. Set up a Helpdesk (internal or external) for hand-holding new users.

11. Review progress periodically and if there are significant issues, seek external resolution.

4 Possible Issues and Mitigation Measures

While the vast majority of general purpose PCs (ie., those that use only browsers and office suites) should be easily migrated to FS platforms, issues may arise in the context of specific installations on account of the kind of hardware, devices and applications used. These issues are summarized below (this is not an exhaustive list):

1. *PCs with obsolete hardware configurations*: These use old motherboards & CPUs and have limited amount of RAM and hard-disk space, which makes it difficult to install some of the latest FS desktop distributions. It is best that these machines are retired. However, if these machines cannot be replaced, then there are special-purpose low-resource GNU/Linux distributions that could be used.

2. *Older hardware devices*: These include some of the older printers, scanners, and some incompatible internal devices such as network cards and sound cards. Some of these devices do not work with any FS platform because there are no FOSS drivers available for them. Drivers may be available for other devices that may that provide partial functionality as a workaround (see the note below on buying new machines and devices).

3. *Browser-based custom applications*: Most browser-based custom applications should work without any modifications after desktop migration. However, there may be minor incompatibilities on account of JavaScript implementations, particularly on browsers such as IE 6.0 (which has been declared as obsolete, but are still used by some).

4. *Custom Client-Server Applications*: Some custom client-server applications (such as those built on Visual Basic/SQL Server) may work on FS platforms on Wine (Windows Emulator); similarly, many MS-DOS applications would work on DOS Emulators (such as Dosbox). However, the use of emulators is recommended only as a transitional measure as the may impair performance. It may be worth porting such applications to 3-tier/web-based application as this architectural pattern is already obsolete.

5. *Desktop Applications*: Most or all desktop applications may need to be changed, although some may work on Wine. The good news, however, is that almost 90% of applications have FS equivalents which may be downloaded and installed with little effort. Lists of FS applications are available online[4].

[4]Pls see `https://en.wikipedia.org/wiki/List_of_free_and_open_source_software_packages` for a list. Several others are available on sites such as SourceForge and FreshMeat. For those interested, a list of "liberated" applications (originally proprietary, but later relicensed under a FOSS license) is available at `https://en.wikipedia.org/wiki/List_of_liberated_software`

6. *LibreOffice/OpenOffice vs MS Office*: LibreOffice (LO) and OpenOffice (OO) are both considered as equivalents to the MS Office suite. While LibreOffice is maintained by the community, OpenOffice is maintained presently by Apache Software Foundation. Both applications can open, edit and save documents in the proprietary format used by MS Office. However, the native formats of LO/OO follow Open Standards, which makes it much more sensible to start exchanging documents in these formats rather than the proprietary format of MS Office. There are some incompatibilities (formatting, fonts) when converting between MS Office formats and these. If the document contents are final, it may better use PDFs when exchanging files with others.

7. *PDF creation*: FS platforms provide built-in tools for creation of PDF files from LO/OO (or any other) documents, and no third-party software is required.

8. *Malayalam Computing*: A full stack for Malayalam computing (entering text, editing, formatting, printing) is available on LO/OO as well as more advanced applications (Scribus, Lyx, LaTeX). More details are available on request.

9. *Anti-Virus Software*: So far, there is no evidence of 'viruses' or other malware of the types found on proprietary platforms on GNU/Linux. Further, if GNU/Linux desktops are used with the usual precautions (for instance, never work as superuser but only as an ordinary user), it is exceedingly unlikely that any malware can penetrate a GNU/Linux system. Consequently, GNU/Linux desktops do not require anti-virus software at this time[5].

10. *Buying new PCs/Devices*: When buying new PCs, it would be prudent to first check if they are supported on FS platforms by drivers. Several manufacturers make these available, while other drivers are developed by third-parties. Please also note that some new laptops (especially those that use the very latest, first-generation technologies) may not be fully supported by FS platforms as the community has not had sufficient time to develop drivers. In these cases, drivers will be available eventually, but will take time. There are also cases where hardware manufacturers have released FS drivers even before the hardware itself is released (these are companies that proactively support Free Software). Further, some of the local vendors also provide services to determine device and hardware compatibility which could also be used. Finally, efforts by Governments can persuade manufacturers to provide FS drivers for their products[6].

11. *Choice of Distributions*: There are several general purpose distributions available for free download, such as Debian, SUSE, Fedora, Mandriva, Ubuntu, Chakra, Arch and Mint. The choice of a distribution is usually made considering factors such as licensing policies, ease of use, style of graphical interface, support policies, presence & size of local communities, and predominant purpose, as applied to each user organization. Rather than recommend a particular distribution, this document leaves the choice to the implementing organization, which can choose one based on its specific requirements.

[5] There have been some root kits available for GNU/Linux, but if the usual precautions are taken this should not have any impact. However, any email-embedded virus can be propagated by a FS desktop if the user forwards the mail to others, as the desktop does not scan any attachments. Further, GNU/Linux gateway servers do have virus scanning enabled, but this for protecting their Windows desktops in the local network

[6] The Government of India, in its draft policy on the Use of FOSS for eGovernance, mandates that all hardware used for e-Governance require that they are provided with FOSS-based drivers by their manufacturers

5 Further Work

This document is meant to be evolved over a period of time while remaining useful at any instant. Comments are invited from the community as well as anyone else who would like to contribute so that these guidelines may be improved (comments may be sent by email to `info@icfoss.in`). Comments received would be vetted and those considered useful would be incorporated into the document.