Chapter

2

Presenting the Case Study

Contents

In the context of this book, you are the system administrator of a growing small business. The time has come for you to redefine the information systems master plan for the coming year in collaboration with your directors. You choose to progressively migrate to Debian, both for practical and economical reasons. Let's see in more detail what's in store for you...

We have envisioned this case study to approach all modern information system services currently used in a medium sized company. After reading this book, you will have all of the elements necessary to install Debian on your servers and fly on your own wings. You will also learn how to efficiently find information in the event of difficulties.

2.1. Fast Growing IT Needs

Falcot Corp is a manufacturer of high quality audio equipment. The company is growing strongly, and has two facilities, one in Saint-Étienne, and another in Montpellier. The former has around 150 employees; it hosts a factory for the manufacturing of speakers, a design lab, and all administrative office. The Montpellier site is smaller, with only about 50 workers, and produces amplifiers.

NOTE **Fictional company created for case study**

The Falcot Corp company used as an example here is completely fictional. Any resemblance to an existing company is purely coincidental. Likewise, some example data throughout this book may be fictional.

The computer system has had difficulty keeping up with the company's growth, so they are now determined to completely redefine it to meet various goals established by management:

- modern, easily scalable infrastructure;
- reducing cost of software licenses thanks to use of Open Source software;
- installation of an e-commerce website, possibly B2B (business to business, i.e. linking of information systems between different companies, such as a supplier and its clients);
- significant improvement in security to better protect trade secrets related to new products.

The entire information system will be overhauled with these goals in mind.

2.2. Master Plan

With your collaboration, IT management has conducted a slightly more extensive study, identifying some constraints and defining a plan for migration to the chosen Open Source system, Debian.

A significant constraint identified is that the accounting department uses specific software, which only runs on Microsoft Windows™. The laboratory, for its part, uses computer aided design software that runs on OS X™.

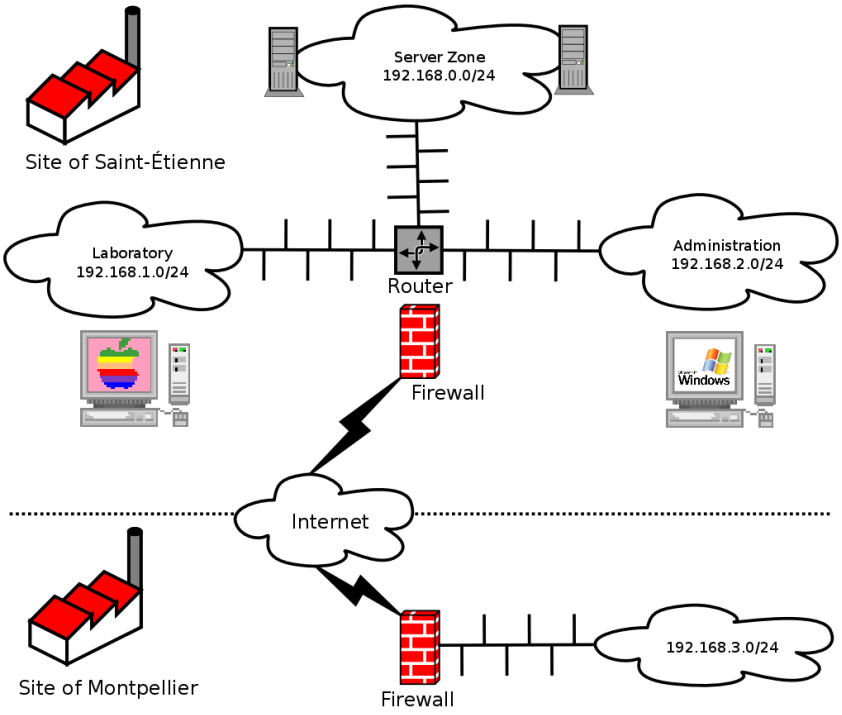

Figure 2.1 *Overview of the Falcot Corp network*

The switch to Debian will be gradual; a small business, with limited means, cannot reasonably change everything overnight. For starters, the IT staff must be trained in Debian administration. The servers will then be converted, starting with the network infrastructure (routers, firewalls, etc.) followed by the user services (file sharing, Web, SMTP, etc.). Then the office computers will be gradually migrated to Debian, for each department to be trained (internally) during the deployment of the new system.

2.3. Why a GNU/Linux Distribution?

BACK TO BASICS

Linux or GNU/Linux?

Linux, as you already know, is only a kernel. The expressions, "Linux distribution" and "Linux system" are, thus, incorrect: they are, in reality, distributions or systems *based on* Linux. These expressions fail to mention the software that always completes this kernel, among which are the programs developed by the GNU Project. Dr. Richard Stallman, founder of this project, insists that the expression "GNU/Linux" be systematically used, in order to better recognize the important contributions made by the GNU Project and the principles of freedom upon which they are founded.

Debian has chosen to follow this recommendation, and, thus, name its distributions accordingly (thus, the latest stable release is Debian GNU/Linux 8).

Several factors have dictated this choice. The system administrator, who was familiar with this distribution, ensured it was listed among the candidates for the computer system overhaul. Difficult economic conditions and ferocious competition have limited the budget for this operation, despite its critical importance for the future of the company. This is why Open Source solutions were swiftly chosen: several recent studies indicate they are less expensive than proprietary solutions while providing equal or better quality of service so long as qualified personnel are available to run them.

IN PRACTICE

Total cost of ownership (TCO)

The Total Cost of Ownership is the total of all money expended for the possession or acquisition of an item, in this case referring to the operating system. This price includes any possible license fee, costs for training personnel to work with the new software, replacement of machines that are too slow, additional repairs, etc. Everything arising directly from the initial choice is taken into account.

This TCO, which varies according to the criteria chosen in the assessment thereof, is rarely significant when taken in isolation. However, it is very interesting to compare TCOs for different options if they are calculated according to the same rules. This assessment table is, thus, of paramount importance, and it is easy to manipulate it in order to draw a predefined conclusion. Thus, the TCO for a single machine doesn't make sense, since the cost of an administrator is also reflected in the total number of machines they manage, a number which obviously depends on the operating system and tools proposed.

Among free operating systems, the IT department looked at the free BSD systems (OpenBSD, FreeBSD, and NetBSD), GNU Hurd, and Linux distributions. GNU Hurd, which has not yet released a stable version, was immediately rejected. The choice is simpler between BSD and Linux. The former have many merits, especially on servers. Pragmatism, however, led to choosing a Linux system, since its installed base and popularity are both very significant and have many positive consequences. One of these consequences is that it is easier to find qualified personnel to administer Linux machines than technicians experienced with BSD. Furthermore, Linux adapts to newer hardware faster than BSD (although they are often neck and neck in this race). Finally, Linux distributions are often more adapted to user-friendly graphical user interfaces, indispensable for beginners during migration of all office machines to a new system.

ALTERNATIVE

Debian GNU/kFreeBSD

Since Debian *Squeeze*, it is possible to use Debian with a FreeBSD kernel on 32 and 64 bit computers; this is what the `kfreebsd-i386` and `kfreebsd-amd64` architectures mean. While these architectures are not "official release architectures", about 90 % of the software packaged by Debian is available for them.

These architectures may be an appropriate choice for Falcot Corp administrators, especially for a firewall (the kernel supports three different firewalls: IPF, IPFW, PF) or for a NAS (network attached storage system, for which the ZFS filesystem has been tested and approved).

2.4. Why the Debian Distribution?

Once the Linux family has been selected, a more specific option must be chosen. Again, there are plenty of criteria to consider. The chosen distribution must be able to operate for several years, since the migration from one to another would entail additional costs (although less than if the migration were between two totally different operating systems, such as Windows or OS X).

Sustainability is, thus, essential, and it must guarantee regular updates and security patches over several years. The timing of updates is also significant, since, with so many machines to manage, Falcot Corp can not handle this complex operation too frequently. The IT department, therefore, insists on running the latest stable version of the distribution, benefiting from the best technical assistance, and guaranteed security patches. In effect, security updates are generally only guaranteed for a limited duration on older versions of a distribution.

Finally, for reasons of homogeneity and ease of administration, the same distribution must run on all the servers (some of which are Sparc machines, currently running Solaris) and office computers.

2.4.1. Commercial and Community Driven Distributions

There are two main categories of Linux distributions: commercial and community driven. The former, developed by companies, are sold with commercial support services. The latter are developed according to the same open development model as the free software of which they are comprised.

A commercial distribution will have, thus, a tendency to release new versions more frequently, in order to better market updates and associated services. Their future is directly connected to the commercial success of their company, and many have already disappeared (Caldera Linux, StormLinux, etc.).

A community distribution doesn't follow any schedule but its own. Like the Linux kernel, new versions are released when they are stable, never before. Its survival is guaranteed, as long as it has enough individual developers or third party companies to support it.

A comparison of various Linux distributions led to the choice of Debian for various reasons:

- It is a community distribution, with development ensured independently from any commercial constraints; its objectives are, thus, essentially of a technical nature, which seem to favor the overall quality of the product.
- Of all community distributions, it is the most significant from many perspectives: in number of contributors, number of software packages available, and years of continuous existence. The size of its community is an incontestable witness to its continuity.
- Statistically, new versions are released every 18 to 24 months, and they are supported for 5 years, a schedule which is agreeable to administrators.
- A survey of several French service companies specialized in free software has shown that all of them provide technical assistance for Debian; it is also, for many of them, their

chosen distribution, internally. This diversity of potential providers is a major asset for Falcot Corp's independence.

- Finally, Debian is available on a multitude of architectures, including ppc64el for OpenPOWER processors; it will, thus, be possible to install it on Falcot Corp's latest IBM servers.

IN PRACTICE

Debian Long Term Support

The Debian Long Term Support (LTS) project started in 2014 and aims to provide 5 years of security support to all stable Debian releases. As LTS is of primary importance to organizations with large deployments, the project tries to pool resources from Debian-using companies.

➨ https://wiki.debian.org/LTS

Falcot Corp is not big enough to let one member of its IT staff contribute to the LTS project, so the company opted to subscribe to Freexian's Debian LTS contract and provides financial support. Thanks to this, the Falcot administrators know that the packages they use will be handled in priority and they have a direct contact with the LTS team in case of problems.

➨ https://wiki.debian.org/LTS/Funding

➨ http://www.freexian.com/services/debian-lts.html

Once Debian has been chosen, the matter of which version to use must be decided. Let us see why the administrators have picked Debian Jessie.

2.5. Why Debian Jessie?

Every Debian release starts its life as a continuously changing distribution, also known as "*Testing*". But at the time we write those lines, Debian Jessie is the latest "*Stable*" version of Debian.

The choice of Debian Jessie is well justified based on the fact that any administrator concerned about the quality of their servers will naturally gravitate towards the stable version of Debian. Even if the previous stable release might still be supported for a while, Falcot administrators aren't considering it because its support period will not last long enough and because the latest version brings new interesting features that they care about.

Keywords

Existing Setup
Reuse
Migration