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Training period report

*Second year training period ENSIMAG
From july 1st 2004 to september 15th 2004*

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september 15th 2004

Training period subject:

Development of X terminals. Development of the MILLE-XTERM project.
Development of the Free Software OSCAR.

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Contents

1	Training period context	1
1.1	Second year ENSIMAG training period.....	1
1.2	... in Quebec ...	1
1.3	... with Révolution Linux.	1
2	Révolution Linux	3
2.1	Goal	3
2.2	Free Software	3
2.3	People	4
2.4	Economic model	4
2.5	Products	4
2.5.1	A Linux Distribution: Édulinux	4
2.5.2	Clustering: OSCAR	4
2.5.3	X Terminals	5
3	My work	7
3.1	Presentation of the MILLE-XTERM project	7
3.2	My work	8
3.3	Some examples	8
3.3.1	Printing	8
3.3.2	The booting process of a X terminal	8
3.3.3	Installation and packaging	9
3.3.4	OSCAR	9
3.4	Participation in the life of the company	9
3.4.1	Team activity: Arbre aventure	9
3.4.2	The Midi-Révolutions	9
3.4.3	Selling courses	9
3.4.4	Strategic reflexion	10
3.5	Training period calendar	10
4	Working organization	11
4.1	Hierarchy	11
4.2	Meetings	11

4.3	Language	11
4.4	Links with the Open Source community	11
4.4.1	Software patching	11
4.4.2	Sourceforge	12
4.5	Software used	12
4.5.1	SubVersion	12
4.5.2	eGroupWare	12
5	Assessment	13
5.1	Objectives of the training period	13
5.2	Positive aspects of the training period	13
5.3	Competences requested by the training period	14
6	Conclusion	15
	Appendix	17
	Glossary	17
	MILLE-XTERM schema	18
	Adresses	21
	Bibliography	23

Chapter 1

Training period context

1.1 Second year ENSIMAG training period...

At the end of my second year of studies at ENSIMAG, I had to do a training period for 8 weeks. My first year training period was in Grenoble, so I wanted to change, to discover new things, to go to a foreign country.

All my second year at ENSIMAG, I had a Quebecer friend who had passed one student year in France. It is without any doubts why I choose Quebec.

As I am interested by the world of the Free Software, I searched a training period in this sector in Quebec with the help of one of many LUG (Linux User Group). It was february when Benoît des Ligneris reply to one of my messages and propose me a training period at Révolution Linux.

1.2 ... in Quebec ...

So I had found a training period in Quebec. I had to prepare it. I would like to thank the Office Franco-Québécois pour la Jeunesse (OFQJ). Thanks to this organism, the preparation became a lot easier. Indeed, the OFQJ dealt with the plane tickets, insurances and the work permit. In addition to that, it welcomes us at the Montréal airport and then answer all questions about Quebec. Thanks to the OFQJ!

I would also like to thank the Conseil Général of Isère that gives me a grant to do a training period in a foreign country.

1.3 ... with Révolution Linux.

I have done a training period with Révolution Linux, in Sherbrooke from july 1st 2004 to September 15th 2004. I had one week of vacation in the end of august, so that I could visit the Quebec.

Chapter 2

Révolution Linux

2.1 Goal

Révolution Linux was created in July 2003. Its founders are Benoît des Ligneris, Jean-Michel Dault and Francis Giraldeau. The first goal of Révolution Linux is to develop the whole potential of the Free Software in Quebec.

2.2 Free Software

Révolution Linux is a Free Software Services Company ; its values come from the community of the Free Software. The definition of a Free Software recognized by the Free Software Foundation gives the 4 following freedoms:

1. The freedom to run the program, for any purpose.
2. The freedom to study how the program works, and adapt it to your needs. Access to the source code is a precondition for this.
3. The freedom to redistribute copies so you can help your neighbor.
4. The freedom to improve the program, and release your improvements to the public, so that the whole community benefits. Access to the source code is a precondition for this.

Note: "Free Software" means several things in English: free as in "free beer" and Free as in Freedom. I use a capital letter when I mean Freedom, and a small letter when I mean free of costs. It is better to use the French words: "Logiciel Libre".

Contrary to Free Software, proprietary software can have a limited right to use, use a secret file format, deny the access to the source code, limit compatibility.

2.3 People

There is approximately 7 people in Révolution Linux, 3 of which are trainee (Francis Giraldeau, Nicolas Dufresne and myself). The high number of trainee come from links between Révolution Linux and the Sherbrooke University, where a lot of student study in cooperation with enterprises.

People of Révolution Linux are active members of the Free Software Community. For example, Francis Giraldeau is the president of the Groupe des Utilisateurs de Linux de l'Université de Sherbrooke (GULUS). Benoît des Ligneris is the president of the Open Cluster Group. Jean-Michel Dault is very active in the Linux Mandrake distribution and he is the leader of the ADVX project. Révolution Linux and the Groupe des Utilisateurs de Linux de l'Université de Sherbrooke (GULUS) are cooperating often: they have for example designed Édulinux together.

2.4 Economic model

It is more difficult to sell Free Software than to sell proprietary software, because Free Software are freely downloadable on the internet. But Révolution Linux is not a software editor company but a services company.

Révolution Linux has strong a background in a lot of technologies. Its customers are schools districts, the government of Canada and Quebec and small business. Révolution Linux is currently working to center its activities.

2.5 Products

2.5.1 A Linux Distribution: Édulinux

Édulinux is a Linux distribution designed for desktop and educational usage, adapted for the Quebec. As many Linux distribution, Édulinux can be freely and legally redistributed without a fee.

Édulinux has been made by several actors: the Université de Sherbrooke, Révolution Linux, MandrakeSoft Canada and the GULUS (Groupe des Utilisateurs de Linux de l'Université de Sherbrooke).

When I came, Édulinux 2004 was finished and I was able to install it on my working computer.

2.5.2 Clustering: OSCAR

A cluster ("grappe" in french) is a set of computers grouped in order to offer a high-performance computing. OSCAR is a software suite made for administrating and exploiting a cluster.

2.5.3 X Terminals

A X terminal is a light computer linked to a terminal server. The terminal server owns a high-performance computing for executing all users' programs. The X terminal has not to be powerfull: all is done on the server.

X terminals give a second live to old computers that can't run new softwares anymore but are powerfull enough to make a X terminal.

Chapter 3

My work

My main work is the MILLE-XTERM project. I work a little bit on the OSCAR project though.

3.1 Presentation of the MILLE-XTERM project

It is about a computer infrastructure based on light clients and a cluster of servers. The principle is to centralized programs on servers. Programs are remotely displayed on X terminals but all computer power is on servers.

The pro of this modele is to increase the life time of computers: obsolete computers can still be used for X terminals since all computer power is on servers.

This model should reduce the total costs of ownership (TCO) as well as developpement costs. The maintenance is also easier because of the centralization of the administration on servers.

Révolution Linux has been chosen by the CRIM to realize the following sub projects: MILLE-XTERM (X terminals) and Colibris (a distribution of Free Software for schools for Windows and Mac).

		2004											
		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
MILLE-XTERM	Contract definition												
	Signature												
	Developpement												
	First show												
	Implantation												

When I came at the beginning of july, the contract has been already signed and the features needed defined. I was here during the phase of developpement (july and august). But I leaved before implantation in schools (september and october).

3.2 My work

My work was almost the MILLE-XTERM project.

It consists of integrating projects. We have a set of features needed by customers. For a lot of them, a Free Software already exists. All I had to do is to test the several solutions and integrate them into MILLE-XTERM.

Sometimes a solution already exists. Then I had to check whether this can be used for our needs, and integrate it to the project. Sometimes some features are missing: I had to add them and make them work with the whole project.

3.3 Some examples

3.3.1 Printing

This part consists of manage printing inside the MILLE-XTERM project. The needs are:

- Access from all X terminals
- Access Control List (ACL)
- Preferences: which printers are available from which X terminals
- Quota and accounting
- Printing from Windows workstations

In order to fill these needs, I had to test several softwares: CUPS, SAMBA, kprinter, PyKota, printbill, p910nd. Then I integrated some of them that fill the needs of the project and wrote a twenty pages documentation in english.

3.3.2 The booting process of a X terminal

The needs for booting a X terminal are:

- Ability to choose a few loaded application server (load balancing)
- Ability to update the X terminal remotely
- Provide multimedia features for the user (sound)

I worked on a subset of these problems. In particular, I wrote a patch for the software GDM (GNOME Display Manager) and Grub (a boot manager) in order to add missing features.

3.3.3 Installation and packaging

We need a easy method for installing MILLE-XTERM. The way to do this is to make packages that automatically install themselves. So I learned who to make RPM (Red Hat Package Manager). This is a well known method in the GNU/Linux world.

3.3.4 OSCAR

OSCAR is currently working in the following Linux distributions:

1. Red Hat
2. Mandrake
3. Fedora
4. Suse

OSCAR is working on the i386 and IA64 architecture computer.

The aim is to make OSCAR working on as much Linux distribution as possible, and on as architecture computer as possible. This year, Progeny has ported OSCAR on Debian GNU/Linux (another Linux distribution) on Itanium (a computer architecture made by Intel). EDF (Électricité De France) is also interested to make OSCAR working on Debian.

I tested the Progeny port on Debian Itanium, I could learn how OSCAR is cooked.

Unfortunately, I didn't have the time to go on.

3.4 Participation in the life of the company

3.4.1 Team activity: Arbre aventure

August 27th, the Révolution Linux team went to Arbre Aventure (tree venture). It is jump, slide, and climb among the treetops via suspended bridges and zip lines.

3.4.2 The Midi-Révolutions

In order to share our respective experiences in the team, we do sometimes a "Midi-Révolution". One person at a time, we made a one hour presentation on a technical subject. I could have a presentation of Java, Kolab, Nagios and security. And I have made a presentation of Fud Forum and Jabber.

3.4.3 Selling courses

I have assisted to some selling courses given to the Révolution Linux team.

Chapter 4

Working organization

4.1 Hierarchy

There is no strong hierarchy as in a big company. But a contract team has been adopted. It defines how we take decisions: Révolution Linux seeks the consensus.

4.2 Meetings

The team contract also defines the good way to communicate in the team, in particular in meetings and in electronic communication (mail, subversion, file formats...).

4.3 Language

The working language is the french at Révolution Linux. In the same way, customers speak french. Internal documents are in french.

However, technical documents are written in both french and english. English is usefull for make our projects known outside the Quebec.

It takes time to translate our documentation from french to english or from english to french. It was planned to sub-contract the translation with a specialized company so that the English level will be better. Finally, that was not done.

4.4 Links with the Open Source community

4.4.1 Software patching

When we add a new feature or solving a bug on a software, we send the patch to the organization who maintain the software and we try to make it simple to integrate it to the software.

Our interest is easy to understand: if the maintainer accepts to use the patch, it will be better distributed, we will have more returns on the problems than that can occur or the bugs that we did not see. We save time if other people are working on the same projects as us.

But if the maintener refuses to use our patch, we will have to pack up the new versions of the software with our patch ourselves and to check if it always works with the changes of the third parties... That represents additional work.

4.4.2 Sourceforge

Sourceforge is a set of services for project management. Révolution Linux uses this service to avoid managing itself the mailing lists, the managers of bug reports (bugzilla) and the files management (subversion). But also to allow other developers (external to the company) to take part in the project.

For the period of development, we try to release a version once per week in order to allow other people to test what we do and to oblige us to have something which works permanently.

4.5 Software used

4.5.1 SubVersion

Révolution Linux uses SubVersion to store all the files related to the company. That makes it possible to preserve all versions of the documents and to know who modified them. Subversion can contain private data (like contracts for example).

We use also SubVersion for public data, for example MILLE-XTERM project files.

4.5.2 eGroupWare

eGroupWare is a groupware. It mainly makes it possible to share appointments on a calendar, but has also other functionalities (mail, wiki, address book, etc).

Chapter 5

Assessment

5.1 Objectives of the training period

My starting objectives were:

- Entrepreneurship: I wanted to discover an economic model based on the Free Software. This objective is achieved because Révolution Linux uses and made Free Software.
- Technological: I wanted to learn technologies related to the clustering. Unfortunately, I did not have time to work as much as I wanted on OSCAR. But I cannot do everything in a training period with a limited duration.
- Technological: I wanted to make computer system on GNU/Linux. It is a success: I learned much thanks to the MILLE-XTERM project.
- Cultural: I wanted to visit Quebec. I could visit Quebec, in particular at the time of my week of holidays.

5.2 Positive aspects of the training period

A positive aspect of the training period is the diversity of the tasks which I could carry out. The MILLE-XTERM project includes several quite different sub-projects, and that enabled me to see several fields of computer science: database, networking, system, programming, integration.

I faced interesting technical challenges which gave me a permanent motivation to come to work. The members of the Révolution Linux team are all very qualified and I could benefit from it.

5.3 Competences requested by the training period

Competence requested	Background
Team work	We are six people that are working on the MILLE-XTERM project. That implies to know to share work in several independent parts, then to know how to communicate to make works the whole.
Written communication	I wrote documentations of what I did both in French and English. These documentations will be used by Révolution Linux but also by its customers.
Oral communication	I was at work meetings, and I made presentations of the software FUDForum and Jabber.
Autonomy	To fill the needed features, I sought alone several solutions and test them.
Technical skills	I needed to use C, PHP, Makefile, RPM, Sub-Version, etc. I could learn what I didn't know.

Chapter 6

Conclusion

To conclude it was a good training period and I thank all the Révolution Linux team.

Appendix

Glossary

Technical vocabulary

ACL : Access Control List. File containing the list of users granted to access a computer resource.

DiskOnChip : A DiskOnChip, as a normal hard disk, permit the storage of data on the computer. Differences are:

- no mechanical part: more reliable, longer lifetime
- no heat
- no noise

Of course, there is also cons: it is a lot slower, and the storage capacity is about 16 MB. But is okay for a X terminal because we don't need more.

RPM : Red Hat Package Manager. RPM is a file format for packaging software, making it easy to install it. RPM are a lot used in GNU/Linux.

X Terminal : Computer that has only one task: displays the programs' windows.

Not technical vocabulary

CRIM : Centre de Recherche d'Informatique de Montréal

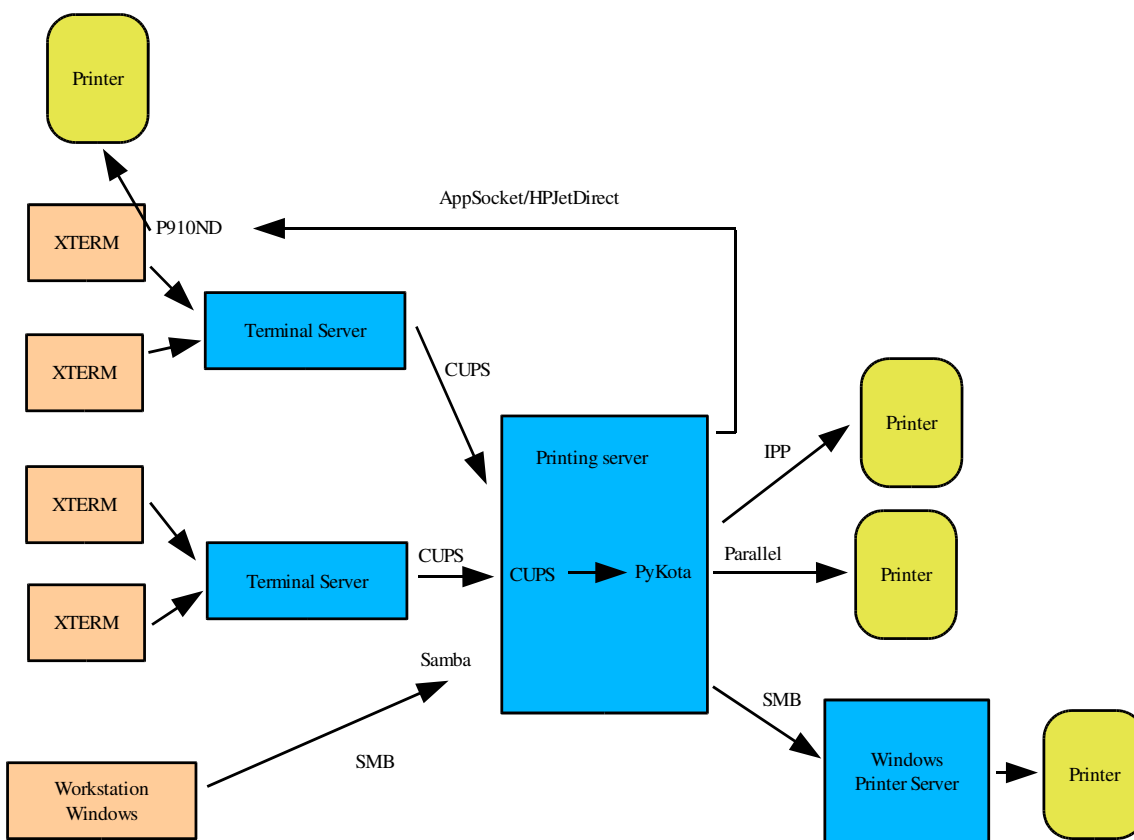
Linux distribution : Set of software around Linux that form a complete operating system.

LUG : Linux User Group. There is LUG in several towns. The Sherbrooke LUG is the GULUS and the Grenoble LUG is the GUILDE.

MILLE : Modèle d'Infrastructure de Logiciel Libre en Éducation. <http://mille.ca/>

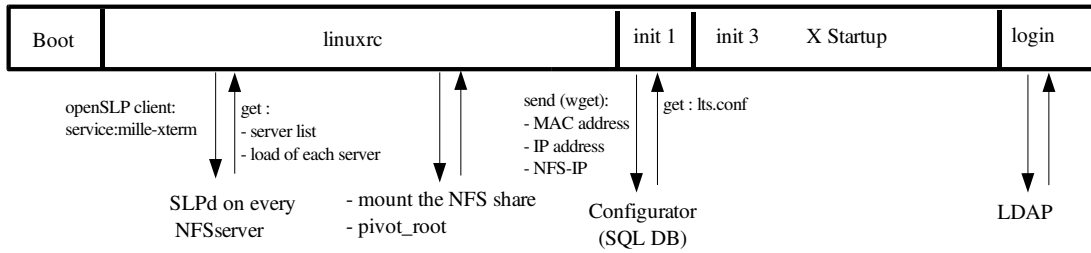
MILLE-XTERM schema

Printers network

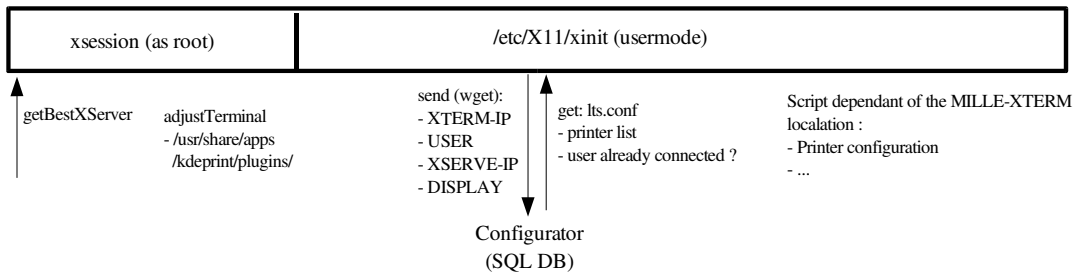


MILLE-XTERM Boot Sequence

Executed on the MILLE-XTERM



Executed on the MILLE-X-SERVER



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