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A Proposal For Google's Summer of Code 2007

Ubuntu Install CD Customization : "OS A La Carte"
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`http://osalcproject.sourceforge.net`

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Draft version

Mentoring Organization :
Ubuntu.

Table of Content

1 Project Presentation **2**
1.1 Main Idea . . . 2
1.2 Why this project ? . . . 2
1.3 Existing Projects . . . 2
1.4 Target . . . 2
1.5 Project Name . . . 3
1.6 Use Cases . . . 3
1.7 OS customization . . . 4
1.8 Security Concerns . . . 5
1.9 Free Software Philosophy Conflict . . . 5

2 How I plan to do it **6**
2.1 Ubuntu Install Process . . . 6
2.2 Programming Language and Tools . . . 7
2.3 Development Methodology . . . 7
2.4 Modules Description . . . 10
2.5 Schedule . . . 11

3 Things that are already done **12**

4 My Profile **12**
4.1 My School . . . 12
4.2 My OpenSource Background . . . 12
4.3 Contact me . . . 12

5 About this document **13**

6 Conclusion **13**

A Bibiliography **14**

1 Project Presentation

1.1 Main Idea

This project aims to customize an Operating System Install CD/DVD from a web page.

1.2 Why this project ?

I have installed many **Ubuntu Linux OS** on different kind of computers, and each time, it took me a lot of time to install, download necessary files and configure.

I find this idea very interesting because the "base" configuration doesn't fit with users' expectations. Indeed, he has to **install** many third part and non-free applications, and he has to **configure** them.

So the basic idea is to build a **customized Install CD/DVD** (based on the "alternate" version). In order to choose which option or package have to be added, I'll make a poll within the community using the forum or the mailing list. But I already have some ideas which are explicated in the second part called "How I plan to do it".

The main goal is to **grab OS market share**, from Windows of course (see bug #1 [1]) and even other Linux distributions.

I think this project will benefit for many people. For example with Linux User Group (LUG) organisation, especially when they do "install party". They can use this kind of software to **promote** Ubuntu Linux . They ask the users what they want to do with his computer and they build the customized Install CD/DVD and then install Ubuntu.

1.3 Existing Projects

Before starting this project, I've made some investigations and found some interesting projects but none of them were satisfying that growing need.

First, this project is quite similar to **Automatix** [2], which main goal is to install and setup third part application (mainly non free). I can gather some ideas from it, for example which ones are the most popular packages.

Then, according to **Ubuntu Ultimate Edition** website [3], they have made their own customized Install CD/DVD with a lot of **pre-added applications** available for download. This ISO image was downloaded 50 0000 times within only 3 days, that's why I think my project is a reel need.

1.4 Target

With this project, I will focus on **end user**, organizations, such as **LUGs**, that want to spread Ubuntu.

1.5 Project Name

This project is called "OS A La Carte", "A La Carte" is a french expression used in the restaurant context, where people choose elements (food) that makes their lunch.

1.6 Use Cases

In order to have a customized OS, the user has to follow these steps :

- The user connects on the website ;
- Chooses options, application profiles;
- Waits the building process termination ;
- Downloads ISO image file;
- Burns it;
- Installs his own customized Operating System.

1.7 OS customization

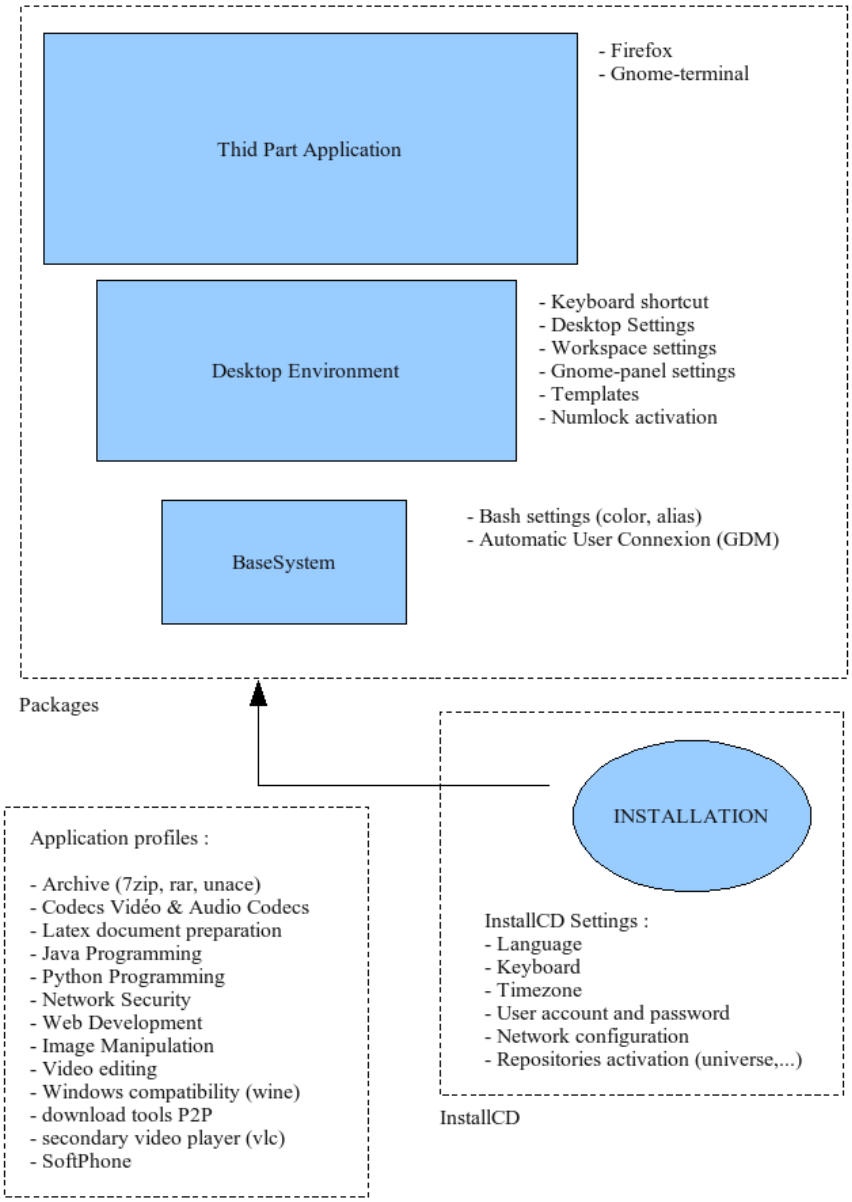

Figure 1: Schema – All choices available.

The OS customization will occur at 3 levels :

- **Core OS** : At this level, I'll modify the core of the Operating System, such as user account, password. These modifications are made with the **preseed file**, which controls the install process (debian-installer) ;
- **Third part software** : I'll customize some programs such as Firefox (add extra add-ons) or Metacity (configure shortcut, configure viewport,...) ;
- **Extra applications** : This level deals with a group of applications that are necessary to reach specific objectives (programming, video edition, ...), I'll also use the expression **"Application profiles"**.

1.8 Security Concerns

It's important to build Install CD/DVD without **outdated** packages (they can have security holes) that's why the CD/DVD will be up-to-date (synced with repositories).

Besides, it's important not to modify or delete **metapackages** (ubuntu-minimal, ubuntu-desktop) otherwise the distribution upgrade process won't work.

1.9 Free Software Philosophy Conflict

By using and installing proprietary sofware or modules such as Flash Player, Video Codecs, Nvidia/ATI drivers, I know this project is **against all free** software philosophy.

But it can be seen as a **tool** where user choose **himself** to build a personnalized Install CD/DVD with or without non free software.

In that way, the user **pick up** elements in order to get the OS that fits the best **his expectations**.

2 How I plan to do it

All the job will be based on the documentation available on the Wiki [4].

2.1 Ubuntu Install Process

With some investigations and analysis of Ubuntu Install method, I've managed to design the following schema :

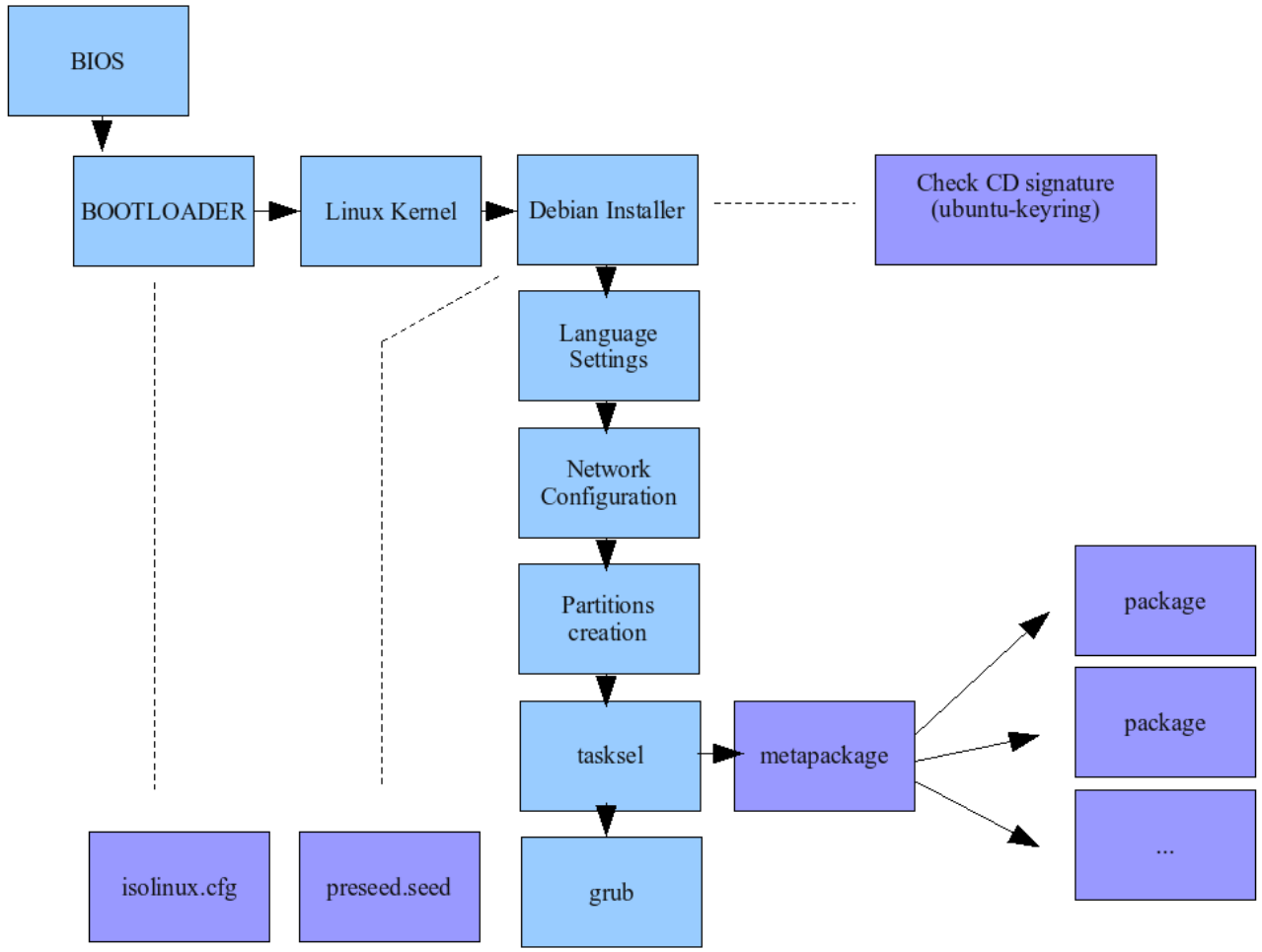

Figure 2: Schema – Ubuntu Install Process.

So basically, my work will consist in modifying isolinux.cfg, building a custom preseed file, creating a meta package and adding selected packages.

2.2 Programming Language and Tools

In order to make this project, I'll use **Ubuntu Linux** Feisty Fawn 7.04 "alternate version".

To code the **web interface**, I'll use PHP scripts, Mysql database and Apache webserver.

To remasterize the ISO image of Ubuntu Install CD/DVD, I'll use Python.

I'll look at **debian-installer** program, in order to find information towards preseed files, I'll use **dpkg-deb** tools to rebuild existing packages, **lintian** to test them and **mkisofs** to generate new ISO image file.

Furthermore, I'll use the following Python modules (non-exhaustive list):

- **os**, to interact with files and directories ;
- **sys**, to handle arguments (at OS level) ;
- **commands**, to launch external programs ;
- **tarfile**, to manipulate TAR archive file ;
- **mysqldb**, to connect to Mysql database and interact with it ;
- **httplib**, to handle HTTP protocol ;
- **urllib**, to handle URL objects ;
- **re**, to use Regular Expression.

2.3 Development Methodology

All along this project, I'll use **eXtreme Programming** methodology which is **non-regression tests** oriented. So each time I'll add new functionnalities, I will test all the code from the very beginning to the very end.

This project is quite **ambitious**, indeed GSoc time frame is only 3 months. In order to succeed, I 'll use a Extreme Programming methodology. Indeed, this software engineering methodology allows **ongoing changes**, so I can adapt my code to Ubuntu mentor's expectations.

I'll start by defining regression tests and then I 'll code the different modules.

Since it's been my school project, I already have done many analysis on this project. These schemas define the **"two steps"** of testing the whole project from the very beginning to the very end :

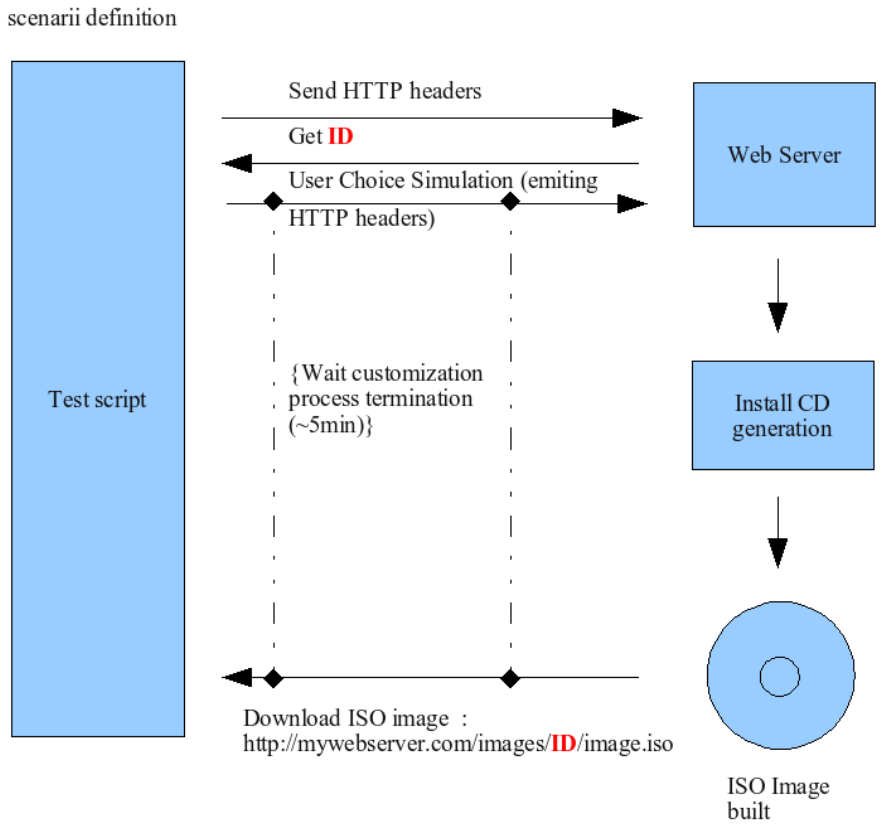

Figure 3: Schema – Regression Tests step 1.

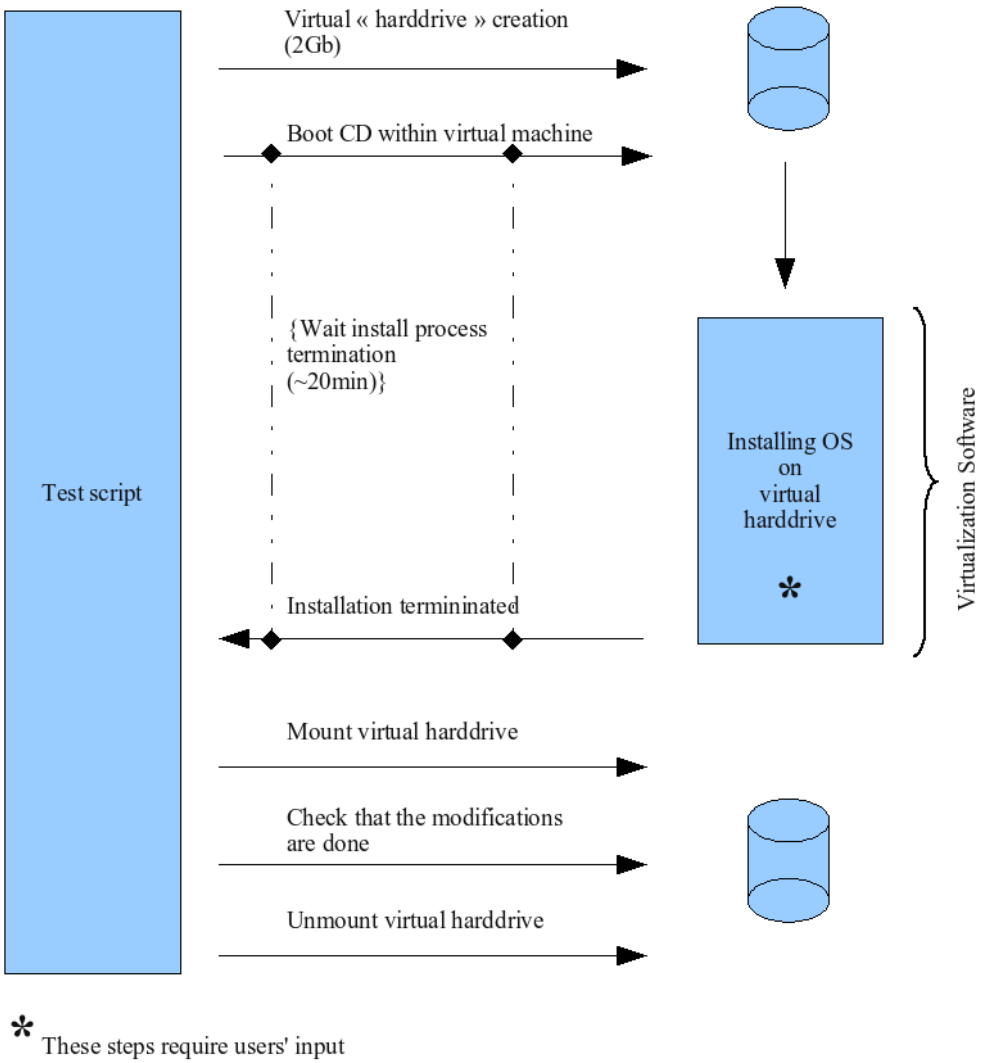

Figure 4: Schema – Regression Tests step 2.

I'll use **scenarii** to simulate user's choices, these scenarii will be text files (plain text), I'll parse them with Python, and then emit and receive **HTTP headers** using httplib and urllib Python modules, then I'll download the ISO image and install it on a virtual machine.

These tests require virtualization software, so I'll use **Qemu** (version 0.9) and its kernel module **KQemu** (version 1.3.0). Moreover, to mount the virtual disk I'll use the **mount** command.

2.4 Modules Description

I've decided to divide the application into the **6** following modules:

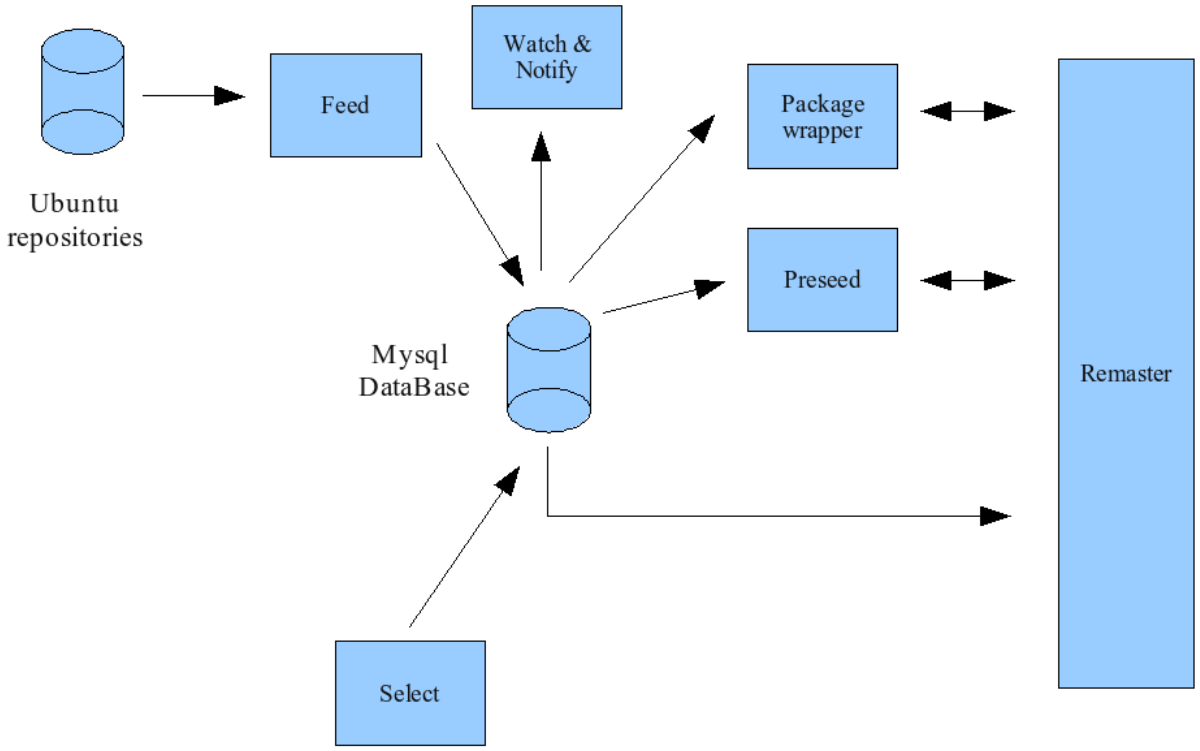

Figure 5: Schema – "OS A La Carte" modules.

Here is a description of each modules :

- **"Feed"** will take care of Ubuntu updates available from Ubuntu repositories (security, backport, proposed) ;
- **"Watch and Notify"** is a secondary tool which main goal is to display last updates available on a web page * ;
- **"Package wrapper"** will custom Ubuntu packages (such as Firefox or Metacity), it will open, edit and regenerate debian packages ;
- **"Preseed"** will build a preseed file that will control install process ;
- **"Remaster"** will regroup all gathered information and generate the new ISO image ;
- **"Select"** will be the selection interface where the user will made his choice.

* Notice : Unlike the `http://packages.ubuntu.com` website (which exists but doesn't display the last update in an easy and simple way) the new tool will be made so we can see the last updated packages list like Gentoo's : `http://gentoo-portage.com`.

2.5 Schedule

This project will be fully operational on **"Feisty +1 (7.10)"** release date, on **October 2007**.

March 21 : Project Proposal submission.

May 14 : I'll do a survey, to define the best packages to customize, and define "Application Profiles".

May 28 : Non regression tests definition and coding.

June 11 : Start coding modules.

July 9 : Mentors' mid-term evaluations.

August 20 : Students' final program evaluations.

3 Things that are already done

This project was created during my Master's degree in Project Management. I'have done a good part of **analysis**, building **tests**, and even **coding** core modules.

My **final report**, unfortunately written in French, is available at `http://osalcproject.sourceforge.net/doc/final-report.pdf` and sourcecode available at `http://osalcproject.sourceforge.net/sourcecode/osalcproject-code.tar.gz` .

In order to learn how the comunnity tools work (mailing list, bugreport and subversion), I've booked a project space on sourceforge [5].

This project was made with another student Badiss Mohammed, but he has decided to give up this project. As we have decided to put our job under the **GPL Licence**, I can use our work for the Google Summer of Code.

I've chosen that the application **front-end** will be a **web page**, but it can also be a GTK application or whatever you want.

4 My Profile

4.1 My School

I'm in the 4th-year of my Master Degree (**"International Project Manager in IT and networks"**) at ISAIP-ESAIP Group [6], in France.

4.2 My OpenSource Background

I discovered GNU/Linux through **Mandriva 7.2** (former Mandrake) in 2000, by this time I was willing to share my Internet connection, and surprisingly it worked very well. Thus I decided to install a few servers such as web server (apache), database server (Mysql) and gameserver (mainly counter-strike and quake3).

In 2002, I changed for **Gentoo** *. I decided to remove my windows partition and to replace all my windows program with their Linux equivalent.
Notice : I used the nickname **Prodigy44** (view my contributions on the gentoo's forum [7]).

In 2005, as I was fed up with compiling my whole system every week, I definitely changed for **Ubuntu** "Breezy Badger" which is still my favourite Operating System.

4.3 Contact me

I'am available for more information on **IRC**, on freenode and slashnet with bsheep nickname, I'am also available on **Jabber** instant messaging, my JabberID is thebsheep@gmail.com. You can send me an **e-mail** at thebsheep@gmail.com.

5 About this document

This document was written with **LaTeX** document preparation system and is available under **GFDL** Licence.

The source of this document is available at `http://osalcproject.sourceforge.net/sourcedoc/`.

6 Conclusion

I think, this project is **ambitious**, but I already have started to work on it, made some analysis, defined some tests and begun to code.

In my opinion, this project is responding to a **real need** and can help Ubuntu grabing some OS market share parts that's why I hope that this project will be accepted by Google and Ubuntu Team.

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