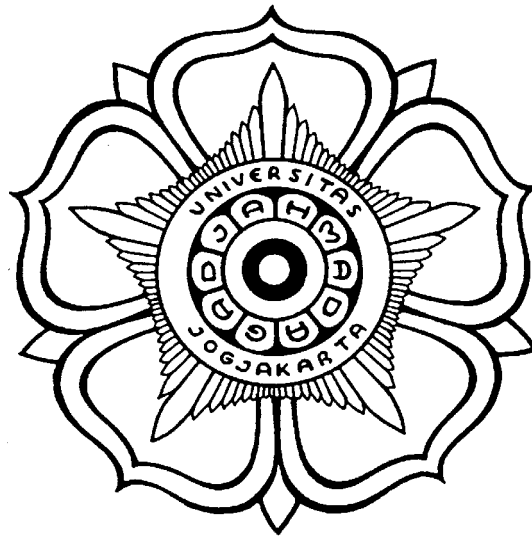


INTERNSHIP REPORT

EASYPC LINUX PROTOTYPING

AT PLASTIC SOLDIER FACTORY PTE LTD

SINGAPORE



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APPROVAL PAGE

Internship Report

**EASYPC LINUX PROTOTYPING
AT PLASTIC SOLDIER FACTORY PTE LTD
SINGAPORE**

Approved at Yogyakarta, 21st June 2005 by:

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PREFACE

Great thanks to God for giving me great opportunity to do internship and finish this internship report. This internship report is titled “*EasyPC Linux Prototyping At Plastic Soldier Factory Pte Ltd, Singapore*”.

I have done an internship during the period 7th April 2005 to 6th May 2005 at Yogyakarta, with Plastic Soldier Factory Pte Ltd, which is located in Singapore. My online supervisor in work was Benjamin. My main activity in company was to create prototype of Linux distribution, called easyPC, over the internet.

I am very grateful to Audrey Koh & Budi Wijaya, as Directors of Plastic Soldier Factory Pte Ltd, for giving me the opportunity to do internship with the company I am also very grateful to Dr. Ir. Tumiran M.Eng, as Head of Electrical Engineering Department, for giving me permission to do internship, and also to my lecturer, Sri Suning Kusumawardani, ST, MT for assisting me during the period.

I aware that I am not perfect, so all suggestions from readers will be appreciated to ensure a better publication next time. I hope this internship report will be helpful to everyone, especially open source software developer network and Linux user groups.

Yogyakarta, May 2005

Wahyu Wijanarko

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CHAPTER I

INTRODUCTION

1.1 Background

Open source means when sources of information, pictures, maps, authors, code, and everything related are all publicly viewable and openly modifiable by everyone.

Linux is one example of implementation of open source software. With open source, we can learn the code inside a software, redevelop to meet the user requirement.

Linux is dominantly used as part of a Linux distribution (distro). Individuals, teams, and various professional organizations compile these. Examples of big distro that are built by professionals include Redhat, Mandrake, Suse, Debian and Unbuntu.

They include any number of additional system software and application programs, as well as certain processes to install these systems on a computer. Distributions are created for many different purposes, including localization (e.g Winbi Linux in Indonesian language), architecture support (Linux for x86, AMD-64, PowerPC), real-time applications, and embedded systems, and there are some which deliberately include only free software. Many Linux distros are created based on a parent or predecessor distro. For example, Ubuntu Linux was developed based on Debian Linux, first Mandrake release on RedHat Linux, and so forth.

Plastic Soldier Factory Pte Ltd, Singapore, as an IT and Multimedia company aimed to create a simple operating system based on Linux that can easily used by everyone, especially the senior people who are not too familiar with computer technology.

1.2 Place and Date

The internship dated 7th April 2005 to 6th May 2005, with Plastic Soldier Factory Pte Ltd as a remote internship. The writer worked as an intern in Yogyakarta via online and telephone communication with the supervisor in Singapore.

1.3 Objective

The objective of this report is to describe development process of designing an easy-to-use interface Linux distro for senior citizens who are first-time computer users, covering especially the development processes at Plastic Soldier Factory Pte. Ltd, Singapore.

1.4 Scope and Limitations

This report presents a broad overview of enabling Linux technologies to meet the requirements as described in the objective. For more a detailed discussion on these topics, the reader is encouraged to follow the references.

1.5 Research Methodology

The Internet has been a valuable resource for obtaining information about this topic. Much of the material referenced in this report is available on the Internet. In the reference section, URLs (Uniform Resource Locators) have been included that are current at the time of publication. Due to the changing nature of the Internet and especially the World Wide Web, there is no guarantee that this information will continue to be available at these locations.

1.6 Organization of the Report

The organization of the report is described below:

Chapter I : Introduction

This chapter discusses the background, place and date, objective, scope, limitations, and organization of the report.

Chapter II : Company Profile

This chapter discusses the company profile of Plastic Soldier Factory Pte Ltd, Singapore.

Chapter III : Linux Operating System

This chapter discusses the Linux operating system, including a brief history of Linux, Linux distribution, and software in Linux.

Chapter IV : System Design

This chapter discusses the easyPC Linux design, and software packages inside it.

Chapter V : System Implementation

This chapter discusses the implementation, analysis, and problems occurred on easyPC Linux design.

Chapter VI : Conclusions

This chapter discusses conclusions drawn from the project and gives recommendations for future work.

CHAPTER II COMPANY PROFILE

2.1 Plasticity of Ideas

Combining strong concepts and a rigorous regime, Plastic Soldier Factory Pte Ltd (PSF) aim to produce only premier Identity and Interactive Solutions, Print Media, Illustrations, and Animations. An in-house professional recording suite provides the audio support for PSF range of projects.

Headquartered in Singapore and with a unit in Indonesia, PSF's aim is to keep this creative factory small. They believe that a tight core team, flanked by associates that are the best in their fields, is a desirable solution for their clients. Each project is given their personal and full attention, making possible their commitment to deliver only the really good. In turn, PSF clients get quality work of international standards without having to pay for the cost structure that comes with bigger set-ups.

2.2 The Soldiers

Plastic Soldier Factory is lead by Creative Captain Budi Wijaya and Business Officer Audrey Koh.

2.2.1 Creative Captain Budi

With the graffiti genre as his foundation, Budi explored other artistic terrains - penciling, charcoal, pastels, oil painting and so on. He draws his inspiration from philosophy, architecture, and amorphous cultural identity.

In 2000, Budi passed out of the Architectural School (UNSW), pinned with a Castle-Mountain Scholarship medal. Armed with guts, (hopefully) talent, and a strong tolerance for painful hard work, Budi dug the trenches to found Plastic Soldier Factory in the same year. He is a firm believer of strong concepts

coming way before pretty visuals and pledges to faithfully guard the quality of work that marches out of the firm.

Budi's personal artistic projects include:

30 Plays in 30 Nights (2001, Singapore)

A festival of 30 plays in 30 nights organized by TheatreWorks. Budi designed the set for 10 plays.

Fascination in Singapore Art Museum (2002, Singapore)

An exhibition exploring the theme of 'Fascination' held during the National Month of Photography. Budi contributed with a series of computer generated digital stills.

Tidal Vectors in Museum of Sydney (2000, Sydney, Australia)

A 3D animation exhibition commissioned by the Sydney Arts Council, exploring the Sydney Harbour terrains. Budi contributed with a series of 3D digital animations.

2.2.2 Business Officer Audrey

Audrey was resident journalist for now defunct The Golf Times, a freelance copywriter, Walt Disney compere, clown, and bunny (for the kids). Obviously, she was not too acquainted with the law. Hence, although she was called to the Singapore bar and practiced for 1 year, it was a responsible decision for Audrey to stop practice to co-found JuzLAW in 2001.

JuzLAW provides IT consultancy to law firms, servicing clients in Singapore, Malaysia, Hong Kong, Philippines and Australia. Singapore listed company Panpac Media is a majority stakeholder. As general manager of JuzLAW, Audrey managed a consulting team that co-delivered million-dollar technology

solutions in the Asia-Pacific region. She also negotiated with partners from the United Kingdom and the United States, securing exclusive distributorships in this region. In January 2004, Audrey joined the ranks of Plastic Soldier Factory as Business Director while retaining her minority ownership of JuzLAW.

2.3 Factory Works

PSF happy clients include Singapore government agencies and ministries, organizations from the creative industry, and international corporations from Dubai, India, Malaysia, China, and Indonesia.

Append below PSF selected works:

1. Asia Pacific Breweries

Service : Identity

Deliverables : Design of intranet portal APB.net

2. Berjaya Berhad (Malaysia)

Service : Interactive

Deliverables : Design of The Great Mall of China e-presentation

3. Celia Loe

Service : Identity

Deliverables : Design of logos for new fashion labels - LoveonEarth and circa1972; product accessories (cloth labels, hang tags, hanger graphics, shoe tags); and 30th Anniversary press kit for Singapore FashionWeek 2002.

4. Chuo Senko

Service : Interactive

Deliverables : Design of corporate website.

5. Civil Aviation Authority of Singapore (Changi Airport)

Service : Interactive

Deliverables : Design of e-Feedback form using Flash and Tablet PC technology

6. Cush Cush (Indonesia)

Service : Interactive

Deliverables : Design of official website.

7. Dick Lee

Service : Interactive

Deliverables : Design of official website, translated into Japanese version.

8. Discovery Channel Asia (with Reelocco)

Service : Interactive

Deliverables : Design of 3D animation for ‘Many Roads, One Discovery’
launch

9. DP Architects

Service : Interactive

Deliverables : Design of corporate website; Production of 20 minute animated
presentation with voice over and sound design.

10. Emaar Properties (Dubai)

Service : Print, Interactive, Video

Deliverables : Creation of marketing materials for Dubai Mall, world’s largest
mall.

11. Far East Organisation

Service : Print

Deliverables : Creation of brochure and newspaper advertisements for New Age Office at Central project.

12. Hyla Architects

Service : Interactive

Deliverables : Design of template for official website.

13. Hwa Chong Junior College

Service : Animation

Deliverables : Development of HCJC 30th Anniversary video with 2D character animation and video clips.

14. Mad Chinaman Pte Ltd (Dick Lee)

Service : Identity

Deliverables : Design of corporate collaterals and merchandise.

15. Ministry of Law (with JuzLAW Solutions)

Service : Interactive

Deliverables : Design of Chief Information Officers' Office (CIOO) website.

16. Mitsubishi (with Chuo Senko)

Service : Interactive

Deliverables : Re-creation of flash animated web banner.

17. Music and Movement

Service : Identity (Packaging)

Deliverables : Design of Dick Lee's Rice and Life Story album CD cover

18. National Arts Council

Service : Interactive

Deliverables : Design of Singapore Writers' Festival 2003 and SENI 2004 website.

19. National Heritage Board (Singapore Art Museum)

Service : Interactive

Deliverables : Design of official website for Interrupt Exhibition, our website itself serving as an exhibit.

20. National Library Board

Service : Interactive

Deliverables : Design of animated presentation illustrating a part of the IT infrastructure workflow within NLB.

21. Raffles-the-Plaza together with Chinese Women Association

Service : Identity

Deliverables : Design of logo and collateral for Raffles-the-Plaza 2004 Charity Ball attended by Singapore President SR Nathan.

22. RMZ Corp (India)

Service : Environment

Deliverables : Design of building signages for MNC office developments.

23. Singapore Development Society

Service : Creative

Deliverables : Conceptualisation and design of 'Dare to Date' gameset.

24. Singapore Development Unit (Romancing Singapore)

Service : Print

Deliverables : Design of 'A Romancing Singapore' poster and postcards.

25. Singapore Ministry of Manpower (Contact Singapore)

Service : Identity

Deliverables : Design of official presentation graphics and video to be used as a template by all overseas offices in promoting Singapore

26. Slangg International

Service : Illustration and Animation

Deliverables : Character design and Flash animation for 2001 LAN Gaming Event.

27. Starhub-MTV Asia (Chuo Senko)

Service : Illustration

Deliverables : Creation of characters used in MTV Asia Awards party.

28. StyleAsia

Service : Identity; Interactive; Illustration

Deliverables : Design of corporate logo and merchandise (T-shirt) and website; Creation of characters used in StyleAsia's 2004 launch party in Zouk.

29. Typhoon Studio (Malaysia)

Service : Identity; Interactive

Deliverables : Design of corporate logo, collaterals and website.

30. The Singapore Repertory Theatre

Service : Identity

Deliverables : Design of 'Stage 2' logo and 'The Good Citizen' poster.

31. TheatreWorks

Service : Print

Deliverables : Design of Education & Outreach 2005 brochure, Writers' Lab
2004 newspaper ad and flyers.

CHAPTER III

LINUX OPERATING SYSTEM

3.1 What is Linux

Linux is a free operating system (OS). It is a UNIX work-alike designed for Intel processors on PC architecture machines. Linux is not UNIX, as UNIX is a copyrighted piece of software that demands license fees when any part of its source code is used. Linux was written from scratch to avoid license fees entirely, although the operation of the Linux operating system is based entirely on UNIX. It shares UNIX's command set and look-and-feel.

Linux supports a wide range of software, from TeX (a text formatting language) to X (a graphical user interface) to the GNU C/C++ compilers to TCP/IP networking. Linux is also compliant with the POSIX.1 standard, so porting applications between Linux and UNIX systems is easy (Wikipedia, www.wikipedia.org).

3.2 Brief History of Linux

To know more about Linux, we should know the history before the first Linux operating system was created. The history began in 1985, when Richard Stallman published his famous "GNU Manifesto", one of the first documents of the open-source revolution. Stallman began working on the GNU (GNU stands for "GNU is Not Unix.") operating system in 1983, largely because he wanted to create an open source version of UNIX. Stallman's Free Software Foundation later created the GNU General Public License (GPL), a widely adopted, fully legal "anticopyright" or "copyleft" treatise that allows Linux and other software with GPL license to remain completely free. The GPL license (General Public License) governs the development and redistribution of software. This license provides everyone with the right to copy,

distribute, examine, modify and improve the system as long as the results of these modifications are returned to the community.

The story continued when in 1987, Professor Andrew S. Tanenbaum invents Minix, an open-source operating system that was similar and worked like UNIX. Linus Torvalds was a computer science student in Finland at that time. He was introduced to Minix and he planned to develop Linux based on Minix. Dissatisfied with UNIX because it could not run on his PC with Intel 386 processor, Linus proceeded to rewrite UNIX from scratch. Already a computer scientist in 1991, Linus Torvalds introduced Linux as a UNIX clone. The Linux code was based on Minix. Though it was not uncommon to write freeware at that time Linux really broke the ice of free software foundation. The ability to see the source code, to improve it and share it with others to gain satisfaction inspired many programmers to dedicate their brain and time, and work on it. With support of programmers around the world, Linux became even better than many commercial UNIX packages.

Later Linux was distributed on GPL license. This license allowed everyone even to sell Linux and applications inside it for profit, with the condition that the full source code should be supplied without any restrictions to use it. It is this development model that allows Linux to collect the best ideas from developers & users across the globe to result in a rich variety of techniques and solution. That also threw Linux into heated discussions about freedom, responsibility and other politicized issues not elaborated here. In August 1999, Red Hat completed its initial public offering, making it the first Linux-oriented company to successfully go public. In December, Andover.net, a consortium of website resources largely devoted Linux, and VA Linux, a manufacturer of Linux hardware had wildly successful IPOs. Linuxcare, a

leading Linux service provider announced alliances with industry giants such as IBM, Dell, Motorola and Informix (CNN, <http://www.cnn.com/>).

3.3 Linux Distribution

There are many distributions because Linux distribution supplied the source code, making it possible for programmers to easily change it and recompile to suit their needs. A typical general-purpose distribution includes the Linux kernel, the GNU libraries and tools, command-line shells, and thousands of application software packages, from office suites and the graphical X Window System to compilers, text editors, and scientific tools.

3.3.1 Slackware Linux

Slackware is the oldest Linux distribution that is still actively maintained and supported. It was released in 1993 shortly after its parent Linux SLS which according to many, is the first real public Linux distribution. Led by Patrick Volkerding, Slackware is a milestone in the world of Linux.

Slackware Linux is a complete 32-bit multitasking "UNIX-like" system. It's currently based around the 2.4 Linux kernel series and the GNU C Library version 2.3.4 (libc6). It contains an easy to use installation program, extensive online documentation, and a menu-driven package system. A full installation gives users the X Window System, C/C++ development environments, Perl, networking utilities, a mail server, a news server, a web server, an ftp server, the GNU Image Manipulation Program, Netscape Communicator, plus many more programs. Slackware Linux can run on 486 systems all the way up to the

latest x86 machines (but uses `-mcpu=i686` optimization for best performance on i686-class machines like the P3, P4, and Duron/Athlon).

It has a devoted supporting base, both for its age and its no frills logic, which somehow is a glimpse of its ancient origins. Slackware is one of the few distros that features BDS-like init scripts (SysV is still supported), an essential and somewhat primitive packaging system (tgz), a text-based semi-manual installation procedure and few custom configuration tools. Many love Slackware because they know and appreciate its essential structure while others simply find it too difficult compared to other popular distros, thus avoid it. (Openskills Linux Distribution Overview, <http://www.openskills.info/>).

3.3.2 Fedora/Red Hat Linux

Red Hat is the biggest and best known company whose business is entirely based on Linux. It is the first distribution maker that has quoted its shares at Nasdaq and one of the few companies that built a successful Linux business model.

Originally founded by Marc Ewing, Redhat Inc was purchased by Bob Young's ACC Bookstores in 1995. Subsequent versions of Red Hat Linux gained reputation as a distro that is good for servers (even if by far not the best) with easy installation and configuration tools.

The first public release of Red Hat Linux (version 1.0) was in 1994 – after the older historic distro like Slackware, but before the big Linux boost in years that followed.

Red Hat Linux now has two descendants – Red Hat Enterprise Linux and The Fedora Project. The Fedora Project is an openly developed project designed by

Red Hat, open for general participation, led by a meritocracy, following a set of project objectives.

The goal of The Fedora Project is to work with the Linux community to build a complete, general-purpose operating system exclusively from open source software. Development will be done in a public forum. The project will produce time-based releases of Fedora Core two to three times a year, with a public release schedule. The Red Hat engineering team will continue to participate in building Fedora Core and will invite and encourage more external participation than in past releases.

Red Hat retains editorial control over The Fedora Project but explicitly include external developers in the process of making technical decisions that align with the project objectives. This is an evolutionary, not revolutionary change; by depending on and contributing to Open Source software since the inception of Red Hat Linux, Red Hat has always shared control over the software with external developers. Red Hat now more explicitly share control for packaging with external developers in their new project: The Fedora Project (Fedora website, <http://fedora.redhat.com/>).

3.3.3 Debian Linux

Debian was started in August 1993 by Ian Murdock as a new distribution which would be made openly in the spirit of Linux and GNU. Debian was meant to be carefully and conscientiously put-together, and to be maintained and supported with similar care. It started as a small, tightly knit group of Free Software hackers, and gradually grew to become a large and well-organized community of developers and users. See the detailed history.

Since many people have asked, Debian is pronounced */de.bi.ən/*. It comes from the names of the creator of Debian, Ian Murdock, and his wife, Debra.

The Debian Project is an association of individuals who have made common cause to create a free operating system. This operating system that they have created is called Debian GNU/Linux, or simply Debian for short.

Debian systems currently use the Linux kernel. Linux is a piece of software started by Linus Torvalds and supported by thousands of programmers worldwide.

However, work is in progress to provide Debian for other kernels, primarily for the Hurd. The Hurd is a collection of servers that run on top of a microkernel (such as Mach) to implement different features. The Hurd is a free software produced by the GNU project.

A large part of the basic tools that fill out the operating system comes from the GNU project; hence the names: GNU/Linux and GNU/Hurd. These tools are also free.

Of course, what people sought after is an application software: programs to help them get what they want to do done, from editing documents, running a business, playing games to writing more softwares. Debian comes with over 8710 packages (precompiled software that is bundled up in a nice format for easy installation) — all of it free (Debian, www.debian.org).

3.3.4 Mandriva Linux

Mandriva Linux (formerly known as Mandrake Linux) was created in 1998 with the goal of making Linux easier to use for everyone. At that time, Linux was already well-known as a powerful and stable operating system that

demanded strong technical knowledge and extensive use of the "command line". Mandriva saw this as an opportunity to integrate the best graphical desktop environments and contribute its own graphical configuration utilities. It quickly became famous for setting the standard in ease-of-use and functionality.

With this innovative approach, Mandriva offers all the power and stability of Linux to both individuals and professional users in an easy-to-use and pleasant environment. Thousands of new users are discovering Linux each and every day and finding it a complete replacement for their previous operating system. Linux as a server or workstation has no reason to be jealous of any other more established operating systems.

Differences between Mandriva Linux and common Linux operating systems:

1. With a graphical installation process recognized by many as the best available, Mandriva Linux offers the most advanced and efficient hardware detection.
2. A graphical approach to system administration in addition to the command line makes Mandriva Linux the operating system which takes integration and management of a user interface the furthest to dispel the image Linux system managed only via command line or text mode.
3. Friendly and integrated environments
Perfect integration of user-friendly graphical environments such as KDE and GNOME provide comfort and ease-of-use.
4. Several pre-configured security levels

Mandriva Linux offers several pre-configured levels of security. A user can therefore choose a desired degree of security specifically for their computer.

5. Centralized configuration system

Thanks to the Mandriva Linux Control Center, a user can resort to a single panel to administer the entire system (Mandriva, <http://www.mandriva.com/>).

3.3.6 Ubuntu Linux

Ubuntu is Linux distro sponsored by Canonical. "Ubuntu" is an ancient African word, meaning "humanity to others". Ubuntu also means "I am what I am because of who we all are". Ubuntu is a complete Linux-based operating system, freely available with both community and professional support.

The Ubuntu community is built on the ideas enshrined in the Ubuntu Manifesto: that software should be available free of charge, that software tools should be usable by people in their local language and despite any disabilities, and that people should have the freedom to customise and alter their software in whichever way they see fit.

These freedoms make Ubuntu fundamentally different from traditional proprietary software: not only are the tools you need available free of charge, users have the right to modify the software until it works the way they want it to. The team behind Ubuntu makes the following public commitment to its users:

1. Ubuntu will always be free of charge, and there is no extra fee for the "enterprise edition", they make their very best work available to everyone on the same Free terms.

2. Ubuntu includes the very best translations and accessibility infrastructure that the Free Software community has to offer, to make Ubuntu usable by as many people as possible.
3. Ubuntu is released regularly and predictably; a new release is made every six months. You can use the current stable release or the current development release. Each release is supported with security updates for at least 18 months.
4. Ubuntu is entirely committed to the principles of free and open source software development; encouraging people to use free and open source software, improve it and pass it on.

Ubuntu is suitable for both desktop and server use. The current (2005) Ubuntu release supports Intel x86 (IBM-compatible PC), AMD64 (Hammer) and PowerPC (Apple iBook and Powerbook, G4 and G5) architectures.

Ubuntu includes more than 1,000 pieces of software, starting with the Linux kernel version 2.6 and Gnome 2.10, and covering every standard desktop application from word processing and spreadsheet applications to internet access applications, web server software, email software, programming languages and tools and games (Ubuntu Website, <http://www.ubuntulinux.org/>).

CHAPTER IV

SYSTEM DESIGN

4.1 System Design

The easyPC Project aims to create simple and easy-to-use operating system, especially for senior folks (45 years old or above, or computer shy), who not familiar with computer technology. It will contain desktop environment, web browser, email client, and text editor.

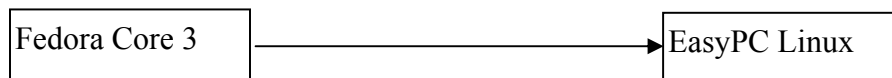
4.1.1 Scope of Application

1. Create desktop application/environment based on Linux.
2. Skin the existing application or create a new application
3. Remove some of the functions that senior folks are unlikely to use.
4. The software must be very simple to use and configure.

4.1.2 Features Needed

1. Main applications are text editor, web browser, and email client.
2. Additional applications: games, calculator
3. Auto start when PC boot
4. Easy support (Remote Assistance, Auto Update)

After the packages selection process, the easyPC developer team decided to use Fedora Linux as predecessor of easyPC Linux. Modifications are done by removing unused packages, and modifying each package to make them compact.



4.2 Packages

The packages used are Anaconda Installer, Gnome Desktop, Mozilla Firefox, Mozilla Thunderbird, Gnome Editor, and OpenOffice.Org office suite.

4.2.1 Anaconda Installer

Anaconda is a software to manage installation process especially for Red Hat distributions. During installation, Anaconda identifies the characteristics and kind of hardware system before configuration. It then creates and select the appropriate file systems for the system architecture. After the file system is created, the user can either allow the installation of the operating system software on the current system or choose to upgrade and replace the existing installations. During installation, Anaconda identifies the characteristic and kind of system's hardware and then configured, and then Anaconda created and select appropriate file systems for the system's architecture. After file system created, user allowed installing the operating system software on the system. Optionally, it can upgrade and replace existing installations. Anaconda can run in text or graphical, which makes deploying so many of systems very easy.

Anaconda is written in Python and C and distributed under the GPL. The graphical front-end is written with PyGtk. Using a scripting Python scripting language for majority of the code, it allows for easily distribution of updates and the quick development of new features (Fedora, <http://fedora.redhat.com/>).

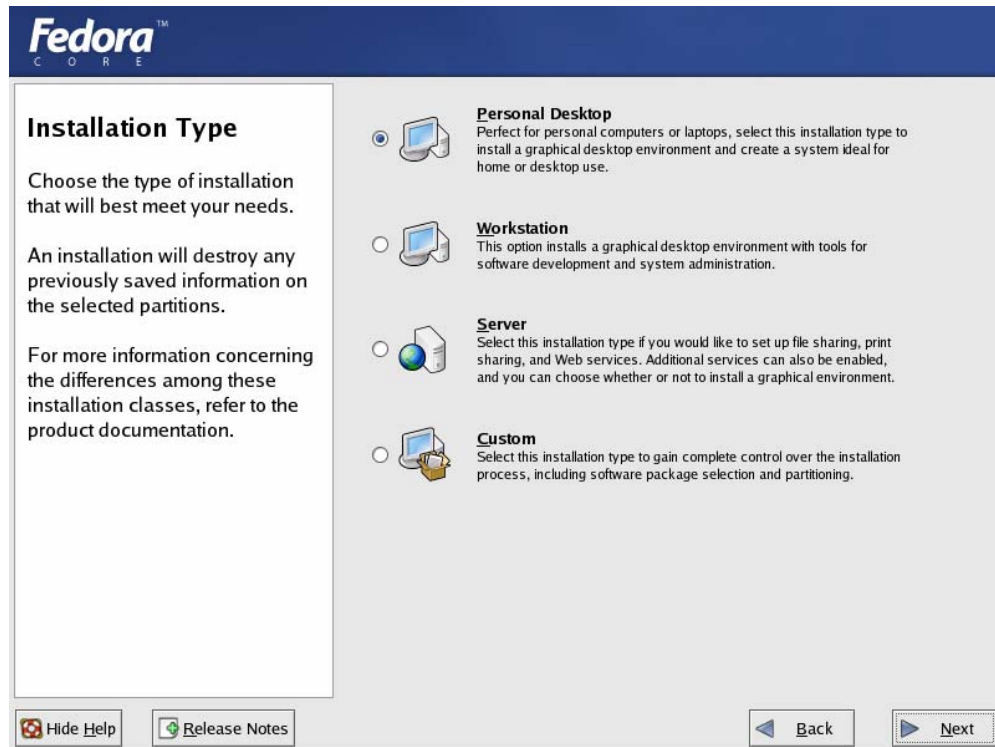


Figure 1 Anaconda Installer Screenshot

4.2.2 Gnome Desktop System

GNOME stands for the GNU Network Object Model Environment (GNOME). GNOME is part of the larger GNU project that started in 1984. GNOME is an implementation of user-friendly graphical desktop environment that runs on a number of UNIX-like operating systems, including Linux, Solaris, and FreeBSD.

GNOME includes a desktop where data and applications can be placed, a panel for starting applications and displaying status, a set of standard desktop tools and applications, and a set of conventions that makes it easy for applications to cooperate and be consistent with each other (GNOME, <http://www.gnome.org>).

4.2.3 Mozilla Firefox

Mozilla Firefox is a free, cross-platform, graphical web browser developed by the Mozilla Foundation and hundreds of volunteers. Mozilla Firefox is originally known as "Phoenix" and known briefly as "Mozilla Firebird". With over 25 million downloads in the 99 days after its release, Firefox became one of the most-used free and open source applications, especially among home users. The 50 millionth download of Firefox occurred on April 29, 2005 (about 6 months after the 1.0 release).

Today, the goal of the Firefox project is to deliver the best possible browsing experience to the widest possible set of people. They aim to do this in parts by:

1. Delivering the right set of features - not too many or too few (the goal is to create a useful but not minimal browser)
2. Making as few compromises as possible where the user experience is concerned. We will not compromise the main line UI to placate an element of the community. Usability is a large area consisting not only of things one typically considers related to the user experience such as the design of dialog boxes and windows, but also others such as interaction design (looking at how users try and accomplish a task, noting the paths they take and attempting to optimize those paths) and performance (reaction speed from a piece of software is important so as not to annoy the user - perceived speed is often more important than actual speed).
3. Develop and maintain an extension system to allow for research into new areas without affecting the core and to allow for techies, early adopters, web developers and other specific communities to customize their browsers

to suit their specific needs without affecting usability or download size for the mass market.

4. Retaining a tight command and control hierarchy. UI design is not a committee driven process. Application design must be nimble and testing is better than discussion, so:
5. Make changes quickly and then get them to people so that we can refine them based on observation of user interactions.
6. Deliver software for Windows, Mac OS X and Linux, with the goal of integrating as sleekly as possible into each of those systems.
7. Be, if possible, a vehicle for emerging Mozilla platform APIs including XULRunner, allowing application developers a means to deploy useful software to people that is not necessarily tied to a particular operating system.
8. Keeping the download size down - to less than 5.0MB on Windows for the installer.

(Mozilla, <http://www.mozilla.org/>)

4.2.4 Mozilla Thunderbird

Mozilla Thunderbird is a free, cross-platform email and news client developed by the Mozilla Foundation. The project strategy is modeled after Mozilla Firefox, a project aimed at creating a smaller and faster web browser. Just as Firefox aims to redefine the web browser, Thunderbird is a refinement of the mail and news interface. Users often use them both together. On December 7, 2004, version 1.0 was released, and received over 500,000 downloads in its first three days of release and 1,000,000 in 10 days.

Mozilla Thunderbird was originally launched as Minotaur Phoenix release, but the project failed to gain momentum. With the success of the latter, however, demand increased for a mail client to go with it, and the work on Minotaur was revived under the new name, and migrated to the new toolkit developed by the Firefox team.

Significant work on Thunderbird restarted with the announcement that from version 1.5 onwards, the main Mozilla suite would be designed around separate applications using this new toolkit. This contrasts with the previous all-in-one approach, and will hopefully lead to more efficient and maintainable code, as well as allowing users to mix and match the Mozilla applications with alternatives. Although this statement has since been retracted, the Mozilla Suite will continue to be released as one application while Firefox and Thunderbird are alternatives, it has continued to grow. The original Thunderbird logo is just a modified Firebird logo: with a simple shifting of hue value from red to blue. In 2004, together with the change of Firefox's visual identity by Jon Hicks, a more professional logo that is currently in use was introduced in version 0.6 (Mozilla, <http://www.mozilla.org/>).

4.2.5 Gnome Editor (gEdit)

gEdit is a small but powerful text editor designed specifically for the GNOME GUI desktop. gEdit includes a plug-in API (which supports extensibility while keeping the core binary small), support for editing multiple documents using notebook tabs, and standard text editor functions.

While aiming at simplicity and ease of use, gedit is a powerful general purpose text editor. Currently it features:

- Full support for internationalized text (UTF-8)
- Configurable syntax highlighting for various languages (C, C++, Java, HTML, XML, Python, Perl, etc.)
- Undo/Redo, with configurable levels
- Loading files from remote locations
- File reverting
- Print and print preview support
- Clipboard support (cut/copy/paste)
- Search and replace
- Go to specific line
- Auto indentation
- Text wrapping
- Line numbers
- Right margin
- Current line highlighting
- Bracket matching
- Backup files
- Configurable fonts and colors
- A complete online user manual

gEdit also features a flexible plugin system which can be used to dynamically add new advanced features to gEdit itself. See the plugins page for more info on the existing plugins (gEdit, <http://www.gnome.org/projects/gedit/>).

4.2.6 OpenOffice.Org

OpenOffice.org is a multi-platform office productivity suite. It includes desktop applications, such as a word processor, spreadsheet, presentation manager, and drawing program, and with a user interface and feature set similar to other office suites. Some users said that OpenOffice.Org is similar to Microsoft Office. OpenOffice.org also works transparently with a variety of file formats, including files of Microsoft Office. Transparently means it can read and write or convert file into variety of office file formats. It makes OpenOffice.Org sophisticated and flexible compared with other office software.

OpenOffice.org runs on Solaris, Linux (including PPC Linux), Windows, Mac OS X (X11), and numerous other platforms with packages that are available in over 45 supported languages with more being constantly added by the community around the world..

Written in C++ and with documented APIs licensed under the LGPL and SISSL Open Source licenses, OpenOffice.org allows any knowledgeable developer to benefit from the source. And because the file format for OpenOffice.org is XML, interoperability is easy, making future development and adoption more certain.

According to its mission statement, the OpenOffice.org project aims "To create, as a community, the leading international office suite that will run on all major platforms and provide access to all functionality and data through open-component based APIs and an XML-based file format."

The project aims to compete with Microsoft Office and emulate its look and feel where suitable. It can also read and write most of the file formats found in Microsoft Office, and many other applications. The ability to read and write Microsoft Office documents is an essential feature of the suite for many users.

The primary development platforms are Microsoft Windows, GNU/Linux, and Sun Microsystems's Solaris. There are also ports available or in progress for Macintosh OS X, OS/2, and many Unix-like operating systems.

OpenOffice.org is a collection of different applications that work together closely to provide features expected of a modern office suite. Many of the components are designed to mirror those available in Microsoft Office. The components available include:

- **Writer** — a word processor that is similar to Microsoft Word in terms of functions and tools. This software can be used as HTML editor, creating and editing HTML web pages. OpenOffice.Org Writer also has tools to convert a document and save it as PDF (Portable Document Format), without additional software.
- **Calc** — a spreadsheet similar to Microsoft Excel with a roughly equivalent range of features. Calc provides a number of features not present in Excel, including a system which automatically defines series for graphing based on the layout of the user's data. Calc is also capable of writing spreadsheets directly as a PDF file.
- **Impress** — a presentation program similar to Microsoft PowerPoint. In addition to common features for preparing presentations, it can export them to Macromedia Flash (SWF) files allowing them to be played on any

computer with the Flash player installed. Impress does, however, suffer from a lack of ready-made presentation designs, relying instead on third-party templates. It also suffers from slow performance and poor smoothness of animations.

- **Draw** — a vector graphics editor comparable in features to CorelDRAW. It features versatile "connectors" between shapes, which are available in a range of line styles, and facilitate building flowcharts.
- **Base** — a database program similar to Microsoft Access. Base allows the creation and manipulation of databases, and the building of forms and reports to provide easy access to data for end-users. As with Access, Base is able to work as a front-end to a variety of database systems, including Access databases (JET), ODBC data sources and MySQL/Postgresql. Base is not available in the 1.x versions of OpenOffice.org, becoming part of the suite starting with version 2.0.
- **The macro recorder** — is used to record user actions and replay them later to help with automating tasks. It is available throughout the office suite and is based on StarOffice BASIC.
- **Math** — a tool for creating and editing mathematical formulae, which can then be embedded in other OpenOffice.org documents, such as those created by Writer. It supports multiple fonts and can exported to PDF.
- **Quickstarter** — a small program that runs when the computer starts for the first time. It loads the core files and libraries for OpenOffice.org during the computer startup and allows the suite applications to start more quickly when selected later. The amount of time it takes to open OpenOffice.org

applications was a common complaint in version 1.0 of the suite, and Quickstarter was a solution of sorts. Substantial improvements are expected in this area for version 2.0.

(OpenOffice.Org, <http://www.openoffice.org/>)

4.3 Linux easyPC Development

4.3.1 Configuration

Configuration was done by removing unused packages declared in a file named *comps.xml*, in the setup directory. The configuration of Fedora 3 as easyPC predecessor is slightly different from the previous compilation configuration.

Before the compilation is done, the files needed for easyPC distro compilation is copied from Fedora Core 3 installation CD and source. In this case, the programmer copies all contents of Fedora Core 3 CD to folder **/home/fc3/i386/**.

After the copying of files is done, the folder **Fedora** in **/home/fc3/i386/** is renamed to **easyPC** to match the name of new distro.

4.3.2 Compilation

After all the files are copied into **/home/fc3/i386/**, the next step was to set the path that was needed for the installation processes:

```
# cd /home/  
  
# export PYTHONPATH=/usr/lib/anaconda  
  
# export PATH="$PATH:/usr/lib/anaconda-runtime"
```

```
# export FCBASE=`pwd`
```

Unnecessary files are removed from the installation directory. The files are

TRANS.TBL and boot.cat:

```
#find $FCBASE/fc3 -name TRANS.TBL -exec rm -f {} \;  
#find $FCBASE/fc3 -name boot.cat -exec rm -f {} \;
```

After files are cleaned up, we got the list of files based on configuration in file
comps.xml:

```
# genhdlist --productpath=easyPC $FCBASE/fc3/i386
```

Duplicate packages will be reported in a genhdlist command. To order the
packages by importance, run pkgorder:

```
# pkgorder $FCBASE/fc3/i386 i386 easyPC | \  
tee $FCBASE/fc3/pkgfile
```

To compile packages into a Linux system that is ready to install, run
buildinstall command:

```
# buildinstall --pkgorder $FCBASE/fc3/pkgfile \  
--version 1 --product "easyPC" \  
--release "easyPC 1" --proddir easyPC \  
$FCBASE/fc3/i386
```

Remove if there any files in previous compilation:

```
# rm -fr $FCBASE/fc3/i386-disc[1-9]
```

easyPC comes with 4 CDs, with 1655 packages, so the packages will need to split into 4 CDs:

```
# splittree.py --arch=i386 --total-discs=8 --bin-discs=4 \  
    --src-discs=4 --release-string="easyPC 1" \  
    --pkgorderfile=$FCBASE/fc3/pkgfile \  
    --distdir=$FCBASE/fc3/i386 \  
    --srcdir=$FCBASE/fc3/i386/SRPMS \  
    --productpath=easyPC  
  
# rm -f $FCBASE/fc3/i386-disc1/easyPC/base/hdlist  
  
# genhdlist --productpath=easyPC --withnumbers \  
    --fileorder $FCBASE/fc3/pkgfile \  
    $FCBASE/fc3/i386-disc[1234]
```

Before the packages are ready to be distributed, we should convert all CDs into ISO images to make it easy to download and burn into CD:

```
# cd $FCBASE/fc3  
  
# mkisofs -R -J -T -v -no-emul-boot -boot-load-size 4\  
    -boot-info-table -V "easyPC 1 beta" \  
    -b isolinux/isolinux.bin -c isolinux/boot.cat \  
    -x "lost+found" -o Easy-i386-disc1.iso i386-disc1  
  
# mkisofs -R -J -T -v -V "easyPC 1 beta" \  
    -x "lost+found" -o Easy-i386-disc2.iso i386-disc2  
  
# mkisofs -R -J -T -v -V "easyPC 1 beta" \  
    -x "lost+found" -o Easy-i386-disc3.iso i386-disc3  
  
# mkisofs -R -J -T -v -V "easyPC 1 beta" \  
    -x "lost+found" -o Easy-i386-disc4.iso i386-disc4
```

CHAPTER V SYSTEM IMPLEMENTATION

5.1 Implementation

In the design, easyPC Linux comes with the hardware. The programmer changed the desktop appearance by removing unused icons and the top panel, making its interface more similar to the old Windows desktop, so that user who is already familiar with Windows can easily switch to easyPC.

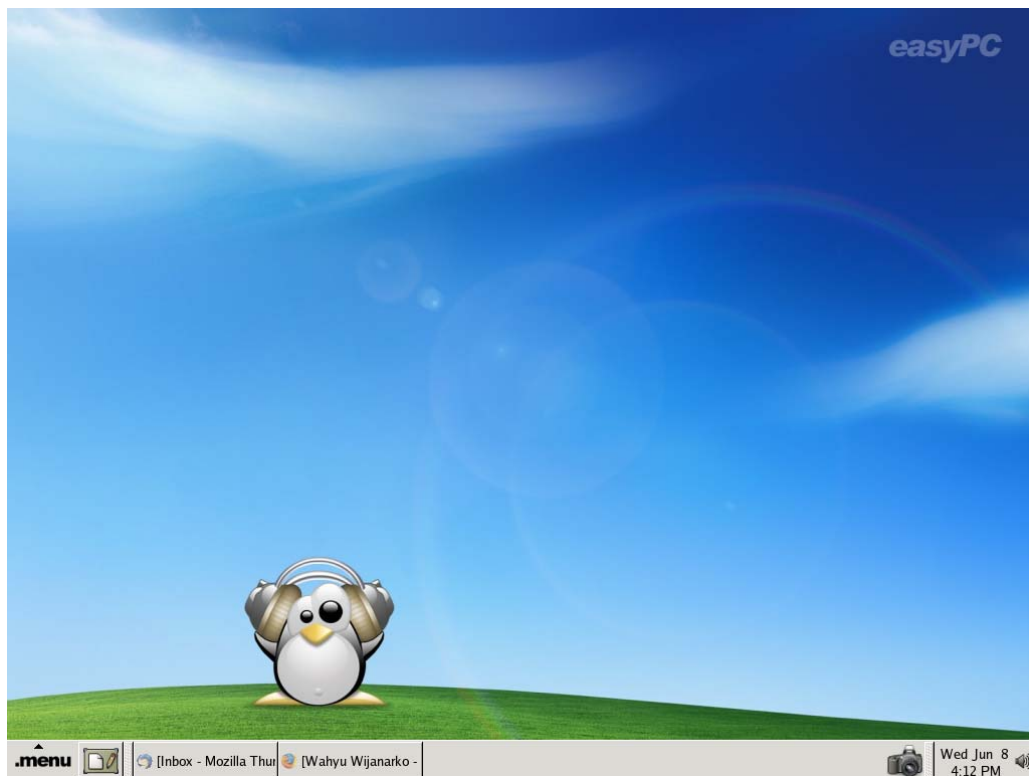


Figure 2 Desktop screenshot

The Gnome footprint, as a logo of Gnome start menu, is changed to text “menu”. The changes aimed at giving easyPC its own characteristics, differing it from other distros.

EasyPC uses Mozilla Firefox as the default browser. The Linux uses new RPM packages that are built from scratch, and with the newer version (1.0.3), the

developer team hopes that it will achieve better results than using older package. In new version of easyPC (beta-6), changes were made on the Bookmarks and default homepage setting.

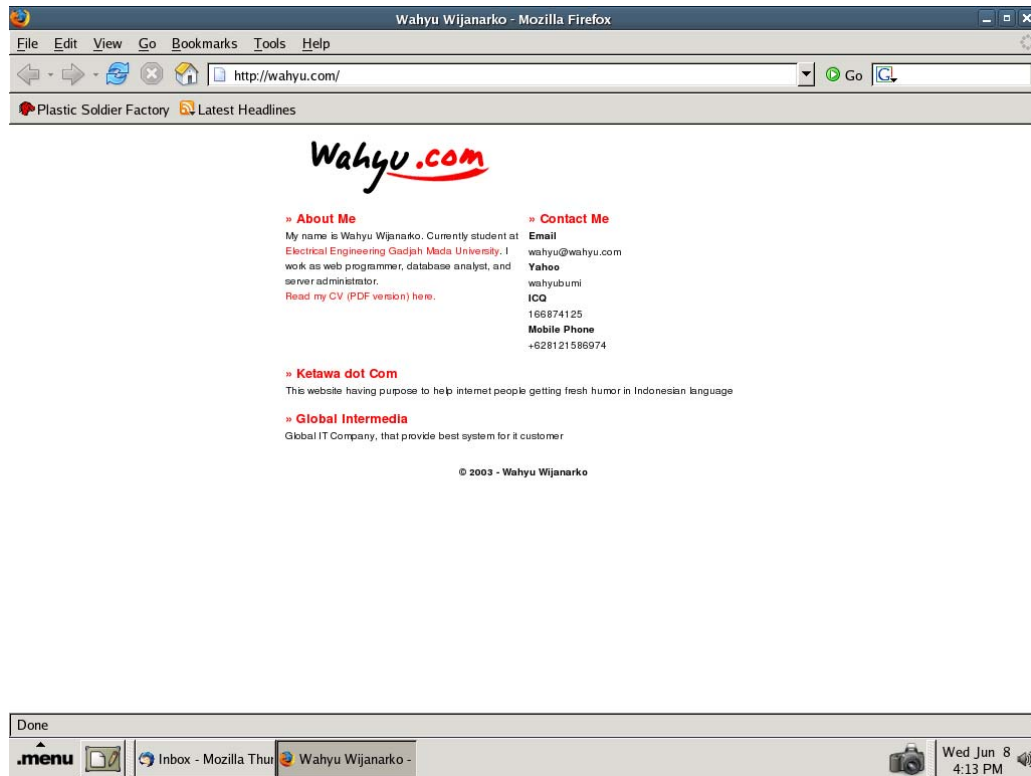


Figure 3 Mozilla Firefox on easyPC

In new version of Mozilla Firefox, users can easily and automatically add plug-ins and themes by directly download from official Firefox website.

Mozilla Thunderbird, as an email client, is also upgraded to version 1.0.2. This email client besides supporting RSS feeds also supports reading contents from news servers.

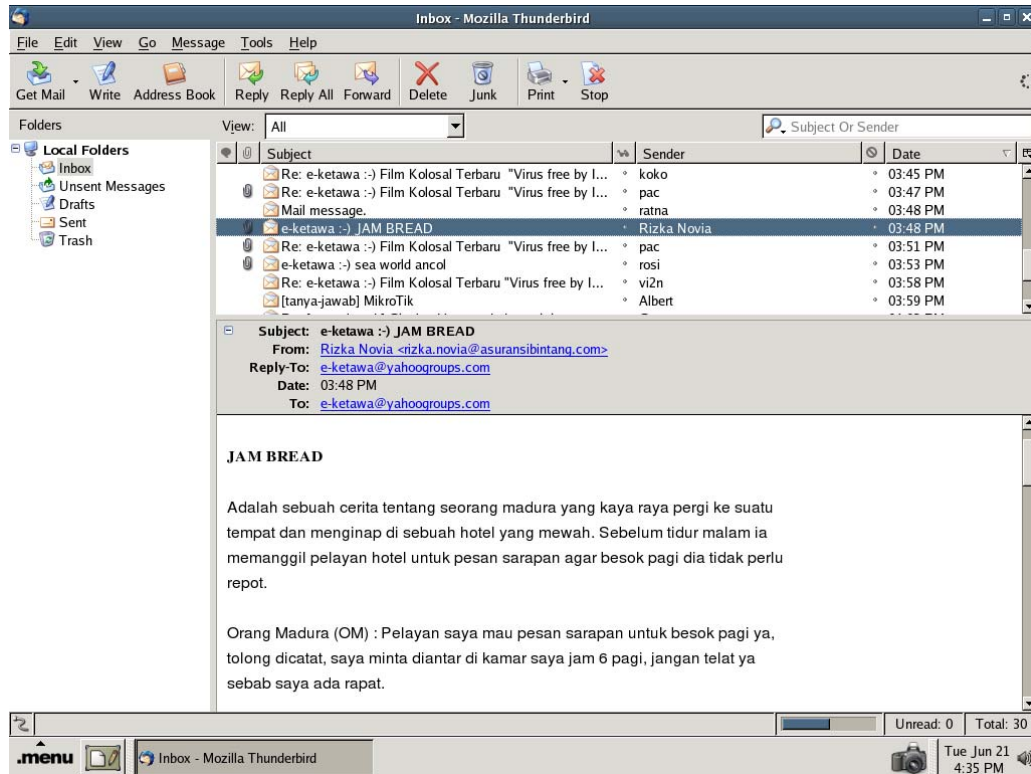


Figure 4 Thunderbird Email on easyPC

There are no changes in Thunderbird original packages but the developers managed to change the navigation of Thunderbird so it becomes simpler and easy to use. The changes are done by removing unnecessary menu or icons at the main panel of Thunderbird. In the future plan, all users will be given easyPC email account, so when the easyPC Linux is delivered to the customers, it already has an easyPC email account for each user.

For text editor, developers of easyPC chose gEdit as the default package. This is the default editor for Gnome desktop and is usually included with Gnome. No changes were made since the navigation is already simple. Beside that, the size of packages is not too big (2,2 MB) compared to another GUI text editor that runs on Linux desktop.

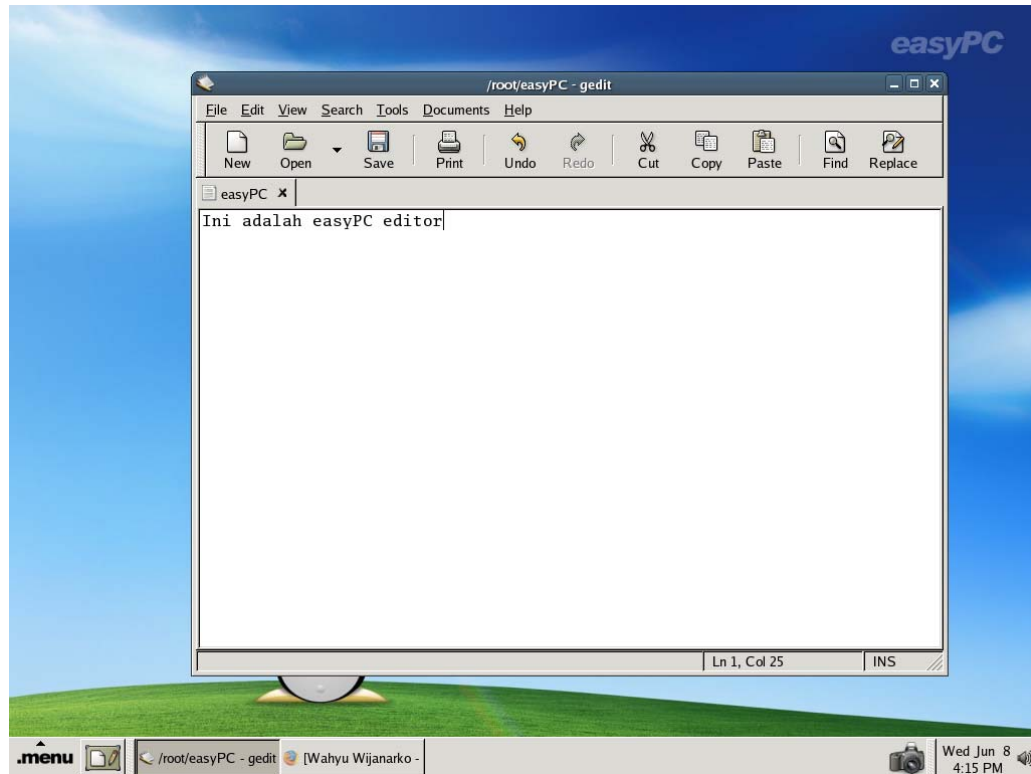


Figure 5 Text editor (gEdit) on easyPC

OpenOffice.Org prepared on easyPC a document processor. In the design, OpenOffice.Org will cater to for advanced users. An advanced user is one who is already familiar with office software and the desktop PC before using easyPC.

OpenOffice.Org in easyPC comes with Calc, Draw, Impress, Math, and Writer. The combination of office suite in OpenOffice.Org packages will make it easy for users to manage or create word document, spreadsheet, work presentation, and images.

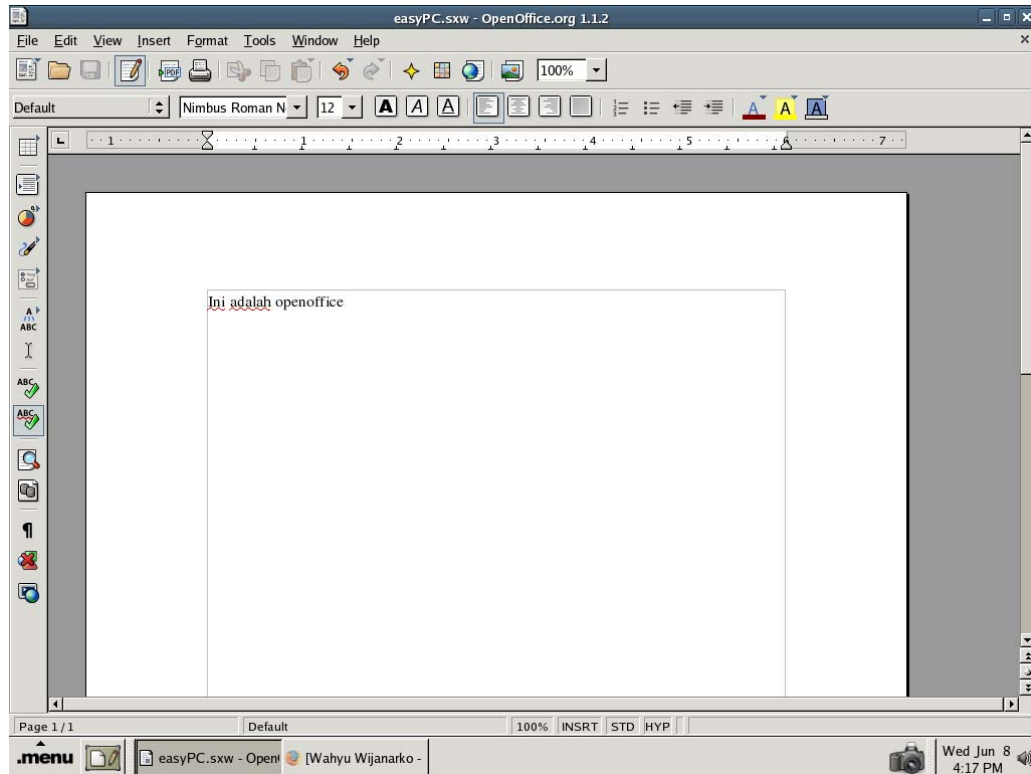


Figure 6 Word Processor (OpenOffice.Org) on easyPC

5.2 Analysis

The prototype of easyPC is an implementation of using free and open source software to meet the user's needs. The development process of easyPC continues while this report written, to improve the software. The development process, goes on with the message that information technology is not only for some, but all people in the world including old folks who perhaps in their youth did not have access to computer technology. The project also hopes to reach out to users who are already familiar with console systems such as UNIX or MS DOS but are strangers to or shy away from GUI (Graphical User Interface)

The directors of PSF are aware that people who are advanced in computer technology should share their knowledge. One of the ways is to create a computer

system that is easy to use. It is planned that in 3 months' time, a programmer team be formed to build an easyPC prototype.

In general, the research and development division in PSF have yet to know the result of implementing easyPC on end users. The company decides to complete the prototype before inviting testers to sample the computer to gain feedback for an improved version in future.

5.3 Problems

Some of the obstacles faced during the development of easyPC are as below: -

1. Limited human resources - with a very small team (less than 3 persons) to re-develop the wide size and packages on a Linux Operating System caused the development progress to be slower than a common Linux development. Common Linux development usually needs 3-6 months to create new version of Linux.
2. Communication problem - The easyPC is built with a team comprising of Indonesian and Singaporean with much of the communication done via Internet messaging. As such, the discussion is frequently interrupted and delayed by Internet disconnections.
3. Linux comes with a variety of packages that sometimes have dependencies with one another, so when a package encounters a fault in the setup, it will affect the rest. For example, Gnome-desktop is required by the Gnome-panel So when the Gnome-desktop is wrongly configured, the Gnome-panel will be affected too

CHAPTER VI CONCLUSIONS

6.1 Conclusions Drawn from the Project

Basing on system design, implementation and analysis, writer concludes this report with the point below: -

1. Linux is an implementation of open source software, allowing users and developers around the world to easily use and change the code in it for their own purposes.
2. Although Linux comes with wonderful free features, users will incur costs when getting the installation disk, support and maintenance.
3. The easyPC Linux aimed to create an information technology awareness among people who are not familiar with computers through using a easy-to-use PC
4. The easyPC is created based on Fedora Core 3, with modification in its packages.
5. The easyPC Linux contains a desktop system, web browser, email client, text editor, and word processor.

6.2 Recommendations for Future Work

1. For readers, I hope this internship report can contribute new knowledge about Linux, and the development of Linux distribution.
2. For software developers, I hope easyPC Linux can be improved in order to realize the aim of easyPC Linux becoming an operating system that is easy to use, banishing people's phobia of using a computer and information technology.

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APPENDICES

Installation Configuration of easyPC (comps.xml)

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE comps PUBLIC "-//Red Hat, Inc.//DTD Comps info//EN" "comps.dtd">
<comps>
  <group>
    <id>admin-tools</id>
    <name>Administration Tools</name>
    <description>This group is a collection of graphical administration tools
for the system, such as for managing user accounts and configuring system
hardware.</description>
    <default>false</default>
    <uservisibile>true</uservisibile>
    <packagelist>
      <packagereq type="default">authconfig-gtk</packagereq>
      <packagereq type="default">system-config-date</packagereq>
      <packagereq type="default">system-config-keyboard</packagereq>
      <packagereq type="default">system-config-language</packagereq>
      <packagereq type="default">system-config-network</packagereq>
      <packagereq type="default">system-config-packages</packagereq>
      <packagereq type="default">system-config-rootpassword</packagereq>
      <packagereq type="default">system-config-soundcard</packagereq>
      <packagereq type="default">system-config-users</packagereq>
      <packagereq type="default">system-logviewer</packagereq>
    </packagelist>
  </group>
  <group>
    <id>base</id>
    <name>Base</name>
    <description>This group includes a minimal set of packages. Useful for
creating small router/firewall boxes, for example.</description>
    <default>true</default>
    <uservisibile>false</uservisibile>
    <grouplist>
      <groupreq>core</groupreq>
      <groupreq>dialup</groupreq>
    </grouplist>
    <packagelist>
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      <packagereq type="mandatory">attr</packagereq>
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      <packagereq type="mandatory">crontabs</packagereq>
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```



```

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<packagereq type="default">nss_ldap</packagereq>
<packagereq type="mandatory">ntsysv</packagereq>
<packagereq type="default">numactl</packagereq>
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<packagereq type="default">pam_smb</packagereq>
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<packagereq type="mandatory">pciutils</packagereq>
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```

```

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<packagereq type="default">yplib</packagereq>
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</packagelist>
</group>

```

```

<group>
  <id>compat-arch-support</id>
  <name>Compatibility Arch Support</name>
  <default>true</default>
  <uservisible>true</uservisible>
  <packagelist>
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  </packagelist>
</group>

```

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  <name>Core</name>
  <description>Smallest possible installation</description>
  <default>true</default>
  <uservisible>>false</uservisible>
  <packagelist>
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    <packagereq type="default">ash</packagereq>
    <packagereq type="default">audit</packagereq>
    <packagereq type="mandatory">authconfig</packagereq>
    <packagereq type="mandatory">basesystem</packagereq>
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    <packagereq type="mandatory">coreutils</packagereq>
    <packagereq type="mandatory">cpio</packagereq>
    <packagereq type="mandatory">dmraid</packagereq>
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    <packagereq type="mandatory">glibc</packagereq>
    <packagereq type="mandatory" basearchonly="true">grub</packagereq>
    <packagereq type="mandatory">hdparm</packagereq>
    <packagereq type="mandatory">hotplug</packagereq>
    <packagereq type="mandatory">indexhtml</packagereq>
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    <packagereq type="mandatory">iprutils</packagereq>
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    <packagereq type="mandatory">shadow-utils</packagereq>
    <packagereq type="mandatory">sysklogd</packagereq>
    <packagereq type="mandatory">system-config-mouse</packagereq>
    <packagereq type="mandatory">termcap</packagereq>
    <packagereq type="mandatory">util-linux</packagereq>
    <packagereq type="mandatory">vim-minimal</packagereq>
    <packagereq type="mandatory">yaboot</packagereq>
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<group>
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  <name>Dialup Networking Support</name>
  <description/>
  <default>true</default>
  <uservisible>>false</uservisible>
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    <packagereq type="default">lrzsz</packagereq>
    <packagereq type="default">minicom</packagereq>
    <packagereq type="mandatory">ppp</packagereq>
    <packagereq type="default">statserial</packagereq>
    <packagereq type="default">wvdial</packagereq>
  </packagelist>
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<group>
  <id>editors</id>
  <name>Editors</name>

```

```

    <description>Sometimes called text editors, these are programs that allow
you to create and edit files. These include Emacs and Vi.</description>
    <default>false</default>
    <uservisible>true</uservisible>
    <grouplist>
      <groupreq>base</groupreq>
    </grouplist>
    <packagelist>
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    </packagelist>
  </group>

  <group>
    <id>gnome-desktop</id>
    <name>GNOME Desktop Environment</name>
    <description>GNOME is a powerful, graphical user interface which includes a
panel, desktop, system icons, and a graphical file manager.</description>
    <default>true</default>
    <uservisible>true</uservisible>
    <grouplist>
      <groupreq>base-x</groupreq>
    </grouplist>
    <packagelist>
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      <packagereq type="mandatory">control-center</packagereq>
      <packagereq type="mandatory">desktop-file-utils</packagereq>
      <packagereq type="mandatory">desktop-printing</packagereq>
      <packagereq type="default">file-roller</packagereq>
      <packagereq type="default">gconf-editor</packagereq>
      <packagereq type="default">gedit</packagereq>
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      <packagereq type="default">gnome-media</packagereq>
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      <packagereq type="mandatory">nautilus-media</packagereq>
      <packagereq type="default">vino</packagereq>
      <packagereq type="mandatory">yelp</packagereq>
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  <group>
    <id>graphical-internet</id>
    <name>Graphical Internet</name>

```



```

    <description>This group includes graphical email, Web, and chat
clients.</description>
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    <uservisible>true</uservisible>
    <packagelist>
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        <packagereq type="default">firefox</packagereq>
        <packagereq type="default">thunderbird</packagereq>
    </packagelist>
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<group>
    <id>graphics</id>
    <name>Graphics</name>
    <description>This group includes packages to help you manipulate and scan
images.</description>
    <default>true</default>
    <uservisible>true</uservisible>
    <grouplist>
        <groupreq>base</groupreq>
        <groupreq>base-x</groupreq>
    </grouplist>
    <packagelist>
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        <packagereq type="default">sane-frontends</packagereq>
        <packagereq type="default">xsane</packagereq>
    </packagelist>
</group>

<group>
    <id>office</id>
    <name>Office/Productivity</name>
    <description>The applications include office suites, PDF viewers, and
more.</description>
    <default>true</default>
    <uservisible>true</uservisible>
    <grouplist>
        <groupreq>base-x</groupreq>
    </grouplist>
    <packagelist>
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        <packagereq type="default">AdobeReader</packagereq>
        <packagereq type="default">openoffice.org</packagereq>
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<group>
    <id>printing</id>
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        <packagereq type="default">cups</packagereq>
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    </packagelist>
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  <group>
    <id>sound-and-video</id>
    <name>Sound and Video</name>
    <description>From CD recording to playing audio CDs and multimedia files,
this package group allows you to work with sound and video on the
system.</description>
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    <uservisible>true</uservisible>
    <grouplist>
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      <groupreq>base-x</groupreq>
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      <packagereq type="default">cdrecord</packagereq>
      <packagereq type="default">mkisofs</packagereq>
      <packagereq type="default">rhythmbox</packagereq>
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    <description>Workstation Common</description>
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      <groupreq>base</groupreq>
      <groupreq>base-x</groupreq>
      <groupreq>dialup</groupreq>
      <groupreq>editors</groupreq>
      <groupreq>graphical-internet</groupreq>
      <groupreq>graphics</groupreq>
      <groupreq>office</groupreq>
      <groupreq>printing</groupreq>
      <groupreq>sound-and-video</groupreq>
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  <group>
    <id>base-x</id>
    <name>X Window System</name>
    <description>Install this group of packages to use the base graphical (X)
user interface.</description>
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    <uservisible>true</uservisible>
    <grouplist>
      <groupreq>printing</groupreq>
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      <packagereq type="mandatory">desktop-backgrounds-basic</packagereq>
      <packagereq type="default">firstboot</packagereq>

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<packagereq type="default">rhgb</packagereq>
<packagereq type="default">switchdesk</packagereq>
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      <subcategory>sound-and-video</subcategory>
      <subcategory>graphics</subcategory>
    </subcategories>
  </category>

  <category>
    <name>System</name>
    <subcategories>
      <subcategory>admin-tools</subcategory>
      <subcategory>system-tools</subcategory>
      <subcategory>printing</subcategory>
      <subcategory>compat-arch-support</subcategory>
      <subcategory>x86-compat-libs</subcategory>
    </subcategories>
  </category>
</grouphierarchy>
</comps>

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