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Development of an Integrated ISO Framework for College Libraries' Functions and Activities

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Abstract

ISO file creation is an important task in library automation and digitization activities. This paper discusses the creation of integrated ISO framework in Ubuntu operating system and, Remastersys, an open source software. The paper demonstrates development of six domain specific clusters in a single window based interface for functions like content creation, housekeeping operations, information retrieval system, digital media archiving, federated search system, community communication interaction. These six functions are merged into a single ISO file of size 4.7 G.B. The ISO file helps to achieve the objectives of installation and configuration of target college libraries. After creation of the file it's required to write on DVD by using the brasero to create the Ubuntu Live DVD. This framework helps college librarians to manage their library operations and manage the users. The software tool can easily be accessed from this single window for easy management of college library functions and activities.

Keywords: Integrated Framework, ISO File, Ubuntu Live DVD and Open Source Tools

1. Introduction

"Of all the inventions of humans, the computer is going to rank near or at the top as history unfolds and we look back. It is the most awesome tool that we have ever invented. I feel incredibly lucky to be at exactly the right place in Silicon Valley, at exactly the right time, historically, where this invention has taken form."

– Steve Jobs, 1995. From the documentary, Steve Jobs: The Lost Interview.

College libraries play an important role in catering to the needs of learners to enhance their academic programmes as well as developing their personal knowledge base. For long libraries collected only printed materials and these materials were identified, collected, organized and disseminated through manual library techniques. But in this digital era all the libraries have been collecting the digital resources also and are automating their functions and activities. These changes have affected library activities and the present time needs to implement automated library management system which allows them to function through user-friendly integrated library management software. For this an effective ISO image file is to be generated, maintained and updated from time to time that will be very helpful to the librarians to manage their all library functions and activities. This ISO image file will help them to search, collect, organize and disseminate all relevant library information in a single window based interface. This ISO image file can be burnt on a DVD and can be used whenever needed. The advantage with this ISO image file is that librarians do not have to search for different software for different library activities. All the different software can be obtained readily from this ISO archive file and one can easily utilize the various software for various library functions using a PC or laptop. The whole integrated framework can be developed through Ubuntu Operating System[4]. The ISO image system is not only used for routine library activities but also used for library networks[6]. For searching library resources mobile devices can be used also[7].

1.1 Tools Required

This work considered two open source tools, viz., PinguyBuilder[9] and Remastersys[10] to create the ISO file. These are simple tools for creating ISO files. Remastersys is an easy means for creating customized live DVD version in Ubuntu.

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1.2 Methodology to Create the ISO File

F12 key can be used for boot code for majority of the computers and F9 key can be used as boot code for HP computers[5]. After booting function the next function is the installation of Ubuntu from the live DVD[3]. This is an important task in any operating systems and this is very difficult to generation of ISO file, but this work solved the problem. Although there are many tools those are used for installation of ISO image file system, yet in this work only the Remastersys have been taken granted for its user-friendliness. Now, the steps to create the ISO file for the college libraries are described in the following ways:

Step – I: Install Ubuntu in a PC or inside a Virtual Box application

Install Ubuntu in a PC or inside a Virtual Box application. Upgrade the system by installing latest packages, apply the following commands, sudo su; apt-get update; apt-get upgrade; Install the additional applications (e.g. Gimp) for Live CD/DVD.

Step – II: Remove Unnecessary Packages to reduce the size of final ISO file

This is the second step to create the ISO image file from the Ubuntu. It is consists of many files and directories with domain specific software and the supporting software. In this case reduce the size of the file by using the bleachbit open source tool and here install the bleachbit software through terminal. Then open the bleachbit from the system files on Ubuntu and here write the admin password to run this software[1]. Thereafter select the unnecessary files like firefox, adobe flash, autoclean, autoremove, deep scan, temporary files, thumbs, cache, clipboard, localizations, recent document lists and trust to manage the files in Ubuntu. The Figure 1 is represents the bleachbit option in Ubuntu which can helps to reduce the junk files because it is easily create live DVD for the target college libraries.

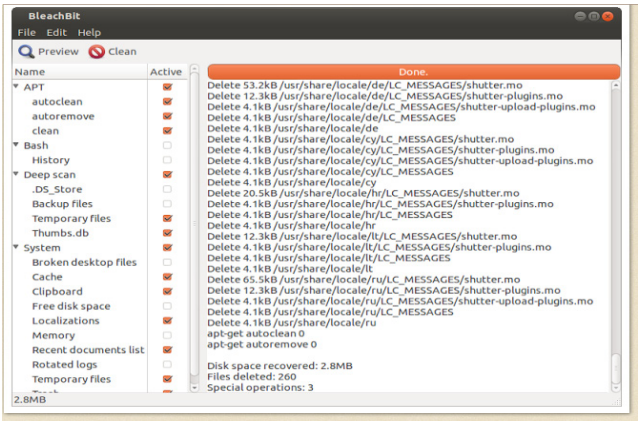

Figure 1. BleachBit on Ubuntu to reduced the file size.

Step – III: Installation of Remastersys in Ubuntu

Remastersys is a tool which can be used to create a custom live Ubuntu / Debian CD. It can also be used to clone the current installation for sharing it with other colleges to create the Ubuntu based operating system. There are two things that Remastersys can do:

- A full system backup, including all installed applications, their settings and user data, to a live CD or DVD which can be used to restore the system or to install it on another computer, and
- Create a custom distributable copy of both system files and domain specific cluster software's in the current system and share it with the other target college libraries.

It requires little configuration and creates the distributable ISO image file for back up. Remastersys works only in Ubuntu and its derivatives such as Linux Mint. Remastersys will appear in Applications > System Tools > Administration. The main screen shot (Figure 2) of Remastersys is as below.

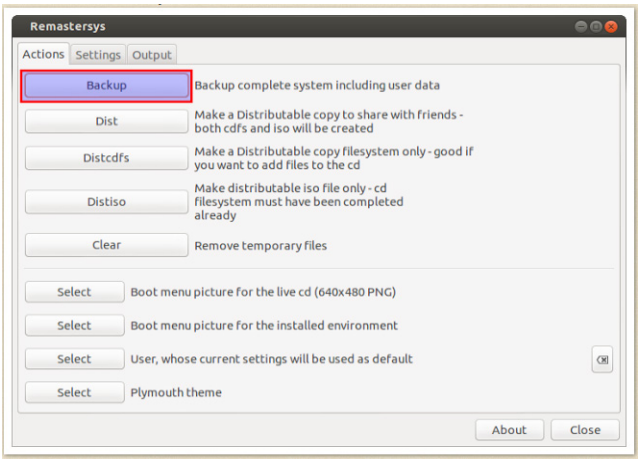

Figure 2. Remastersys backup on Ubuntu.

The Live CD username (it must be in lowercase!), the Live CD title, filename and so on are set and when finished with customizing these settings (Alternatively, the default values could be used), select "Go back to the main menu" and select what you want to do: Backup the full system (including user data), make a distributable copy and so on and then wait for your ISO (Figure 3) to be built and here assign a name for Live DVD.

Here to setup the export user settings to Live DVD, an inbuilt user name and password for DVD could be assigned. Now, click on appropriate buttons to build Live DVD (Internet connection is needed to run Remastersys as certain packages need to be installed from Internet to build the Live DVD). The output will be in .iso format,

you can locate it from /home/remastersys. Burn the .iso file on a DVD and boot from computer. Remastersys is a powerful, yet simple to use application. College libraries simply load it and select the option. It is ideal for backing up the full system so that the system can be restored in the event club (ISO file name) system crashes. This live DVD allows creating customized distribution of Ubuntu. The final ISO integrated framework is represented in the Figure 4.

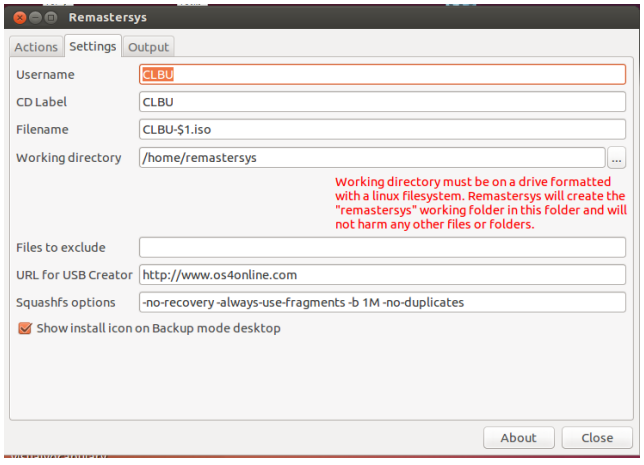

Figure 3. Remastersys settings on Ubuntu.

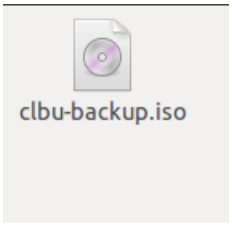

Figure 4. Final ISO file for college libraries.

After the creation of ISO file, it is required to write it on a DVD (Figure 5) for installation and configuration of domain specific clusters in a single window based interface for college libraries.

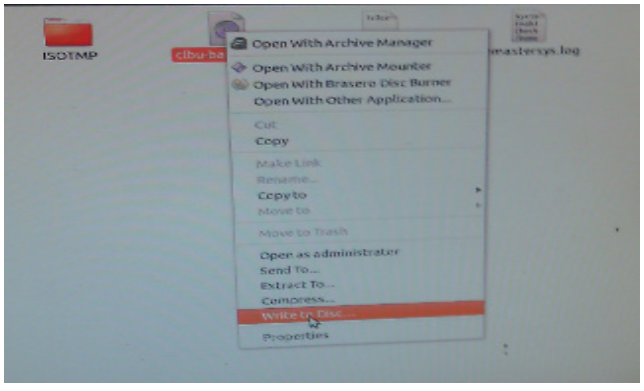

Figure 5. ISO file writing in a DVD.

1.3 Testing

This is a crucial task for the integrated library management and retrieval system. After creation of all tasks in ISO file and the file will be stored under the directory of home Remastersys folder in Ubuntu. The ISO file for the generation of live CD should be burnt on a DVD as the file size is 4.2 GB.

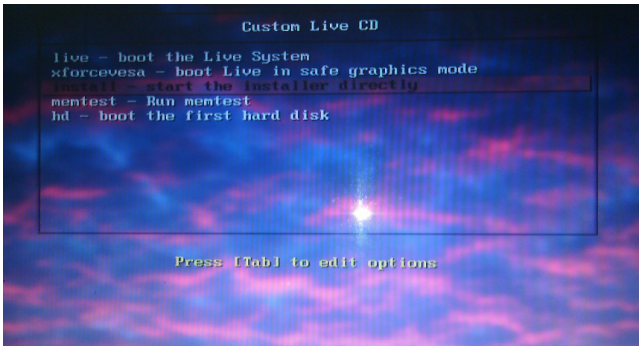

Figure 6. Testing interface (LiveDVD mode) on Ubuntu.

1.4 Results

Graphical user interface appears on desktop in Ubuntu and also USB disk creator display for the installation of live dvd. This is the final product for installation and configuration of software for use in different college libraries. The seamless integration of six domain specific cluster systems (Figure 7), such as integrated library system cluster, digital media archiving cluster, federated search system cluster, community communication and interaction cluster, content related on management system and learning content management system and the nature and number of users are important. The retrieval system can perform searches at a satisfactory level only if the requirements of the users are kept in mind right from the beginning of the design stage. In a typical library environment there are two broad categories of users, the library or information personnel, and the end-users. Library and information personnel often act as intermediaries, but may also act as end-users seek information from the system.

"Library users have grown accustomed to using the Internet as a research tool and do not always appreciate the difference in quality of information available through a library's specialized collections, especially when compared to what can be located through an Internet search engine. Thus, libraries with substantial collections of information often find those collections under-utilized if the user interface is not designed to make it easy to locate the required information[2]".

Integrated Library Systems (ILS) is the current trend in the field of library automation. An ILS combines

several activities of the library into one integrated system, allowing the library staff to perform all their functions online. These activities include simple housekeeping activities like acquisition, cataloguing to user services, and inter-library loan activities.

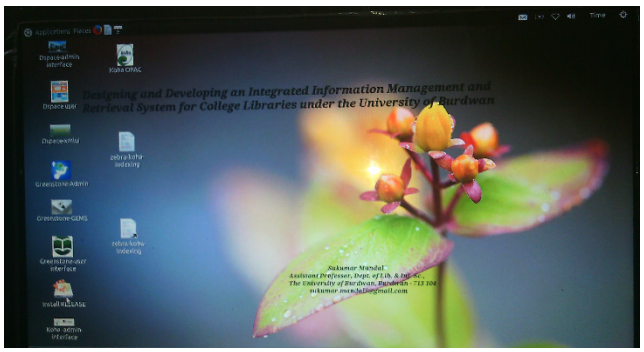

Figure 7. Domain specific cluster interface (Live DVD mode).

1.5 Findings

- It is possible to create the ISO file on Ubuntu operating system using the open source tools Remastersys for easy installation and configuration in college libraries,
- This live DVD is usable in all the colleges on a Desktop or Laptop, and
- Installation of Ubuntu and testing of ISO file is a simple and straightforward task.

Web 2.0 features are also available on this live DVD such as amazon cover images, google book cover, Z90.50 server, etc which fully support the Unicode based multilingual standards. Regional languages, such as Bengali can be supported through the Bengali keyboard both in OPAC and other interfaces.

"There's innovation in Linux. There are some really good technical features that I'm proud of. There are capabilities in Linux that aren't in other operating systems".

– Linus Torvalds

2. References

1. Anwari M. (2013). GNOME 3 application development Beginner's Guide. Birmingham: Packt Pub.
2. Pasquinelli, Art (2003). Information technology advances in libraries. Accessed on July 8, 2014. Available from: http://www.sun.com/products-nsolutions/edu/whitepapers/pdf/it_ advances.pdf.
3. Petersen R. (2008). Linux: The complete reference. New York: McGraw-Hill.
4. Sarpong D, Bi J, Amankwah-Amoah J. (2016). On the nurturing of strategic foresight: The Ubuntu perspective, Futures, 75:14–23. http://doi.org/http://dx.D oi.org/ 10.1016/j.futures. 2015.10.007. https://doi.org/10.1016/j.futures.2015.10.007.
5. Shariati M, Dehghantanha A, Martini B, Choo K-K R. (2015). Chapter 19 - Ubuntu one investigation: Detecting evidences on client machines. In: The Cloud Security Ecosystem, Boston: Syngress; edited by K-K. R. Choo, pp. 429–46. Retrieved from: http://www. sciencedirect.com/science/article/pii/ B978012 80159 57000197.
6. Wang H, Chen Z, Xiao G, Zheng Z. (2016). Network of networks in Linux operating system, Physica A: Statistical Mechanics and Its Applications. 447:520–26. http://doi.org/http://dx.doi.org/10.1016/j.physa.2015.12.084. https://doi.org/10.1016/j.physa.2015.12.084.
7. Wessel S, Huber M, Stumpf F, Eckert C. (2015). Improving mobile device security with operating system-level virtualization. Computers and Security. http://doi.org/http://dx.doi.org/10.1016/j.cose.2015.02.005. https://doi.org/10.1016/j.cose.2015.02.005
8. Winkler Vic JR. (2011). Chapter 10 - operating a cloud. In: Securing the Cloud, Boston: Syngress, edited by Vic. JR. Winkler, pp. 253–77. Retrieved from: http://www .science direct.Co m/science/article/pii/B9781597495929000105.
9. PinguyBuilder (2017). About PinguyBuilder. Accessed on Oct 28, 2017. Retrieved from: https://www.Maketechea sier.com/pinguy-builder/.
10. Remastersys (2017). About Remastersys. Accessed on Oct 28, 2017. Retrieved from: http://remastersys.org/.