




Individual Assessment Cover Sheet

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Introduction

The purpose of this report is to conduct a comparative research between two types of operating systems for a small financial business in order to select the appropriate type of OS to be installed in the computer systems in the company. The most commonly used operating systems at home and at work is Windows 7 which is manufactured by Microsoft and was made available to the public on 22nd October 2009 to work as a closed source software. The prevalent operating system is Ubuntu 12.04, which is an easy-to-use version of Linux, created by a small team of developers selected by Mark Shuttleworth. Ubuntu 12.04 had been released on the 23rd August 2012, designed to work as an opens source software.

Terms of reference

The report was requested by Dimitrios Liarokapis who is a Unix System tutor currently employed by the Bahrain polytechnic.

Method

The researched was conducted using a wide range of websites from the internet, interviews from peers, books and from the library and articles online.

1. Open and closed source

Introduction

The first section of this report will discuss about what open and closed source operating systems are, as well as the differences and cons of using open source operating systems for the end-users and administrators.

1.1 Definition

There are two types of software currently available. Open source and closed source software. (Open source software)OSS provides limited restrictions to create, modify or delete software code e.g. Ubuntu 12.04. Whereas closed source software such as windows 7 is a licensed product restricting the user to alter the software codes by encrypting into a form, which can only be accessed and modified by a highly qualified team of professionals.

1.1.1. Differences between open source and closed source system

Online Support

If a closed source software were to breakdown or encounter a system failure this would be an issue as the internet does not provide many solutions as to how this problem could be resolved. Windows possess its private online help lines in case of these situations (<https://support.microsoft.com/en-us/product/windows/windows-7>).

On the other hand, for OSS users there are a lot of information and resources available as well as online discussions related to the problems on any Linux related website or blog as it is an OSS.

License agreement

Closed source software (Windows 7) is a licensed product manufactured by Microsoft and should be purchased legally. As for OSS (Ubuntu 12.04) which can be easily downloaded and installed directly from the Ubuntu website (<http://www.ubuntu.com/download>) it has no license agreement to term and conditions.

Updating the system

Upgrading and updating an OSS is more direct and faster than that of a closed source. In order to upgrade an open source operating system, the end user would simply have to download the update from the Ubuntu website which releases newer versions of the system every six months approximately. As for CSS (windows7) an update would be detected automatically through the windows update program built in the operating system or can be manually downloaded from the Microsoft website, which releases new updates on the fourth Tuesday of every month.

Control

A CSS would not grant to you access to the software codes which means the user will not be able to entirely control the system internally. Meanwhile OSS allows access to the source codes which would benefit the use as he/she will be able to read and modify the software codes according to their needs.

Price

In order to use a CSS the user must first purchase the license agreement and furthermore in order to install the most basic safety features (e.g. firewall) the user must purchase the product either directly from the Microsoft website or from an electronic store worth which is highly expensive. As for OSS, firewall and many more features are available for free download on the internet just like the OS.

1.1.2. The consequences of using open source system for an end-user

- Allows the users to download numerous applications from the internet without having to pay any additional charges.
- The users are stopped from developing and improving the current state of the software.
- The OSS charges would not be applied for its use.
- The user may face difficulty to work on OSS such as Ubuntu if he/she is a regular closed source software user.

1.1.3. The consequences of using open source system for an administrator

- The admin will have the liberty to install as many programs as he/she requires without any issues concerning the cost as the company would pay for all the additional purchases made.
- The administrator is responsible for any modification or action committed to the system.
- The administrator would be given the liberty to develop and modify the current software provided by the business and be able to modify to support the business needs.

1.1.4. The consequences of using closed source software for an end-user

- Software codes are encrypted and can only be viewed and modified by a team of qualified developers.
- The user may not need to gain knowledge of coding or editing software codes.
- In order to use the system applications and software the user would have purchase the commercial license for the specific system.
- The user would be restricted to modifying or editing the default software source codes.

1.1.5. Consequences of using closed source software for an administrator

- The administrator has the ability to decide which employees are granted permission to view certain aspects.
- Closed system software administrators should upgrade the system software frequently so as to rank higher than OSS companies.
- The administrator would not be permitted to change the source code depending on the requirements of the company.

Justification

Taking the advantages and disadvantages into consideration, both operating systems contain their benefits aiding the user and administrator in their own ways. In my opinion, OSS would be the better option for small business as final cost would be less compared to installing closed system software into the computer systems.

2.1 : Software Availability

This section of the report will discuss the availability of different types of software for the two operating systems: Windows 7 and Ubuntu 12.04. As well as their functions and descriptions of the software available for each operating system.

2.1.1 Accounting Software

An accounting software is capable of carrying out most basic tasks required to manage transactions of a small or big business. The financial data can be stored in an SQL database using any database application (e.g. MySQL). Thereby, giving the user the freedom to generate reports and numerous types of graphs. An example of this type of software application is 'GnuCash' which is available for Ubuntu 12.04. A similar and popular type of application available on windows 7 is called 'TurboCASH' capable of:

- Generating transactions
- Payrolls
- Invoices
- Importing and exporting XML files
- Generating account charts

The screenshot displays the TurboCASH invoicing software interface. The window title is "Invoicing Mr Mike Davies". The interface is organized into several sections:

- Header Section:** Contains fields for "Documents" (set to "Invoice"), "Debtor" (set to "ODA-VIE"), "Invoice No." (set to "IN000001"), "Date" (set to "13/11/2003"), and "Your Reference". A "Details" button is located to the right.
- Salesperson Section:** A dropdown menu is set to "Russell".
- Document Groups:** Two fields labeled "Document Group1" and "Document Group2" with ellipsis buttons.
- Printing Options:** "Paper Type" is set to "Plain A4", "Send Report To" is set to "Screen", and "Copies" is set to "1". A "Printer Setup" button is present.
- Addresses:** Two sections for "Postal Address" and "Delivery Address". The postal address is "P O Box 333, Halfway House, 1685".
- Financial Summary:** A section with "Current Balance" (1995.00), "Available" (8005.00), and "Credit Limit" (10000.00).
- Message:** A text field containing "30 Days Nett".
- Bottom Right:** "Print" and "Close" buttons.

Figure 1 TurboCASH generating invoice

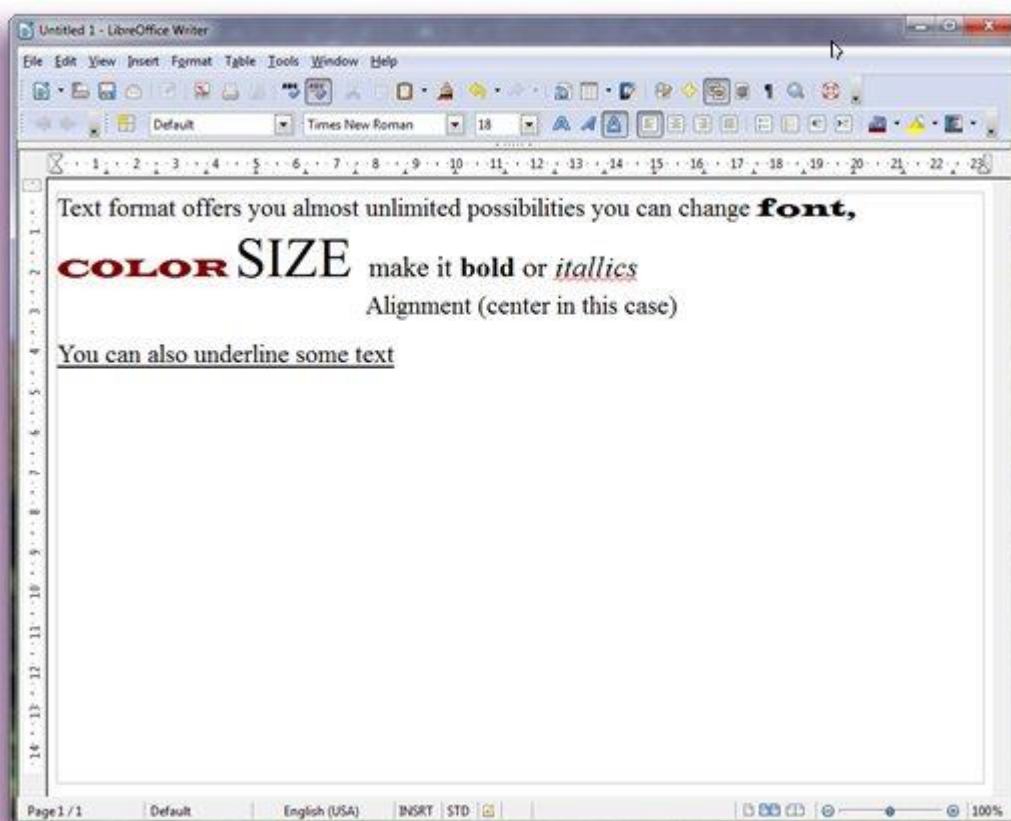
2.1.2 Word Processors

Word processor software is a software which allows the user to generate reports, type articles etc. An example of a word processor is 'Microsoft Word'. Word processors are well equipped with numerous fonts and font colors allowing the user to create tables and insert images.

However, Ubuntu contains a word processor application which can do the exact same actions but with a different name which is 'Libre office writer'.

The image below represents the applications Libre office writer has to offer which are:

- Allowing the user to use different colored fonts, sizes and text styles
- Enter graphical art
- Insert tables, structures and shapes
- Carry out mathematical calculations



○

Figure 2 Libre office writer features

2.1.3. Programming Software

A programming software is a type of developer software which can be used to generate, retain, debug and run small applications. An example of programming software is 'Java net beans' which allows the user to develop small applications from modular set software mechanisms, also known as modules. Ubuntu on the other hand, also contains many programming applications that are available. 'Brackets' is an application consistent of supporting languages such as java scripts/HTML and CSS.

2.1.4. Media Software

Media software are used to play multimedia files such as audio or video files. Most media players have the ability to play both audio and video together. Many operating systems come with their own unique media players. For example: windows comes with 'windows media player' which requires further add-on extensions in order to play different type of multimedia files and Ubuntu uses 'VLC media player' which is a freeware application also available on windows 7.

2.1.5. Database management Software

Database software is a database management system, which are used to produce entities, filing data entry along with updating and deletion of data. An example of this software is 'Oracle SQL Developer', which is an application, used to generate, edit and delete databases from a management system. This software application is capable of:

- Generating entities
- Inserting data into the database
- Creating attributes
- Deleing/dropping tables
- Updating tables

Ubuntu also contains database management software capable of carrying out similar features to 'Oracle SQL Developer' known by the name of 'MySQL'. It has high performance data entries and a high performance query engine. It has been made especially for open source OS such as Ubuntu 12.04.

The software availability between the operating systems: windows 7 & and Ubuntu 12.04 differ slightly. As both systems are able to run specific software types such as defensive software. However, there may be a few types of software that are not capable of running on an Ubuntu 12.04 OS, but would run successfully on windows 7. Software such as a word processor may be able to run on both operating systems however using different application names (e.g. MS Word and Libre Office writer). Third party software however, is made available in both systems consisting of the most common applications for example 'Skype'.

Justification

In my opinion, windows 7 would offer a much better and a wider range of software availability compared to Ubuntu 12.04 however few software application's cost may vary as windows 7 is a closed source licensed OS.

3 Chapter 3 Multiuser and Single user System

Introduction

An operating system may fall into many categories. Two of these categories are multi-user and single-user. This section of the report will compare a multi-user and a single-user system as well the advantages and disadvantages each system holds to its specified use.

3.1 Definition of multi-user and Single-user System

Single user operating systems are intended to provide services which can be used by one person at one computer at a time. An example of a single user OS would be a mobile phone, as only one user can be permitted to use the device at one time. However windows 7 is an exception as it was initially built to work as a single user OS but can support multi-user OS as well the whole network would be run by the administrator

Whereas, Multi-user operating systems offer a concurrent access to multiple users on one computer at the same time. Batch processing systems which mainly are used by mainframe computers often are multi-user systems. An example of a multi user system would be the UNIX (Ubuntu 12.04) server which allows multiple users to gain access to their respected UNIX accounts via the same terminal connected to any PC.

3.1.1 Advantages of Multi-user system

- Multiple users would be given access to their terminals as they are all connected to one central processor. The central processor can control the actions of the other terminals through a process called time sharing.
- Computer hardware can be expensive to buy for each PC. Multiuser OS's allow numerous computers to share one piece of hardware, resulting in reduced overall cost.
- If one computer in the terminal breaks down, other computers would be affected by the result of the crash.
- Each user would be allowed to share its screen with other users.
- Reduction in the amount of electricity consumption as amount of hardware used is decreased.

3.1.2 Advantages of Single-user Systems

- Only one user will be allowed to access the data contained on a single-user OS device making the data more secure and under the responsibility of the end user. (e.g. A cell phone)
- The risk of someone else able to interfere, read, or edit a person's work is highly reduced as only one user is be able to access the data.

- The overall speed of the system would be dramatically increased, as the memory space is not being shared with another PC.
- A multi-user OS shares the main system's memory among other processors whereas a single user operating system does not share memory with other computers. Therefore, containing more memory space than a multi-user OS.
- In multi-user a OS, if the main processor fails or crashes it would affect all the other computers connected in that terminal. But if a single user system crashes no other systems would be harmed.

3.1.3 Feaures of Multi-user and Single-user system

- Multiuser OS's shares resources with other computers in the terminal so if one computer fails to respond the work of other computers would not be affected. However, if the computer crashes on the single user OS the entire work could be lost or corrupted due to the crash.
- Windows 7 is built to work as a single user system by default but is capable to working as a multi user system as it allows the creation of multiple user accounts on one system. Ubuntu however is created to perform as a multiuser system as more than one user will allowed to use the machine at a time and a much better hierarchal structure to maintain organizational structure and data.
- A single user system can be broken down into two types, single task and multi-task. Multi task feature allows the user to run more than one type off a program on the system (e.g. web browser and text editor) whereas a single task allows the user to just run one software at a time.

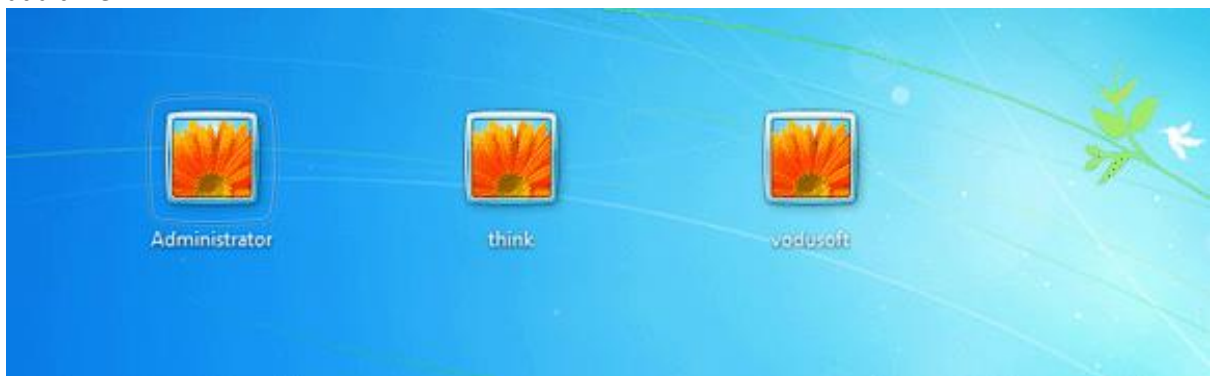


Figure 3 only one user can login at a time in windows

- A multiuser system (Ubuntu) is capable of performing file sharing among other PC's connected in the terminal. File sharing would allow users to share a file among each other at the same time. Whereas a single user system would support file sharing as only one person would be allowed to access the file, one user a t a time (e.g. a cell phone or windows 7)

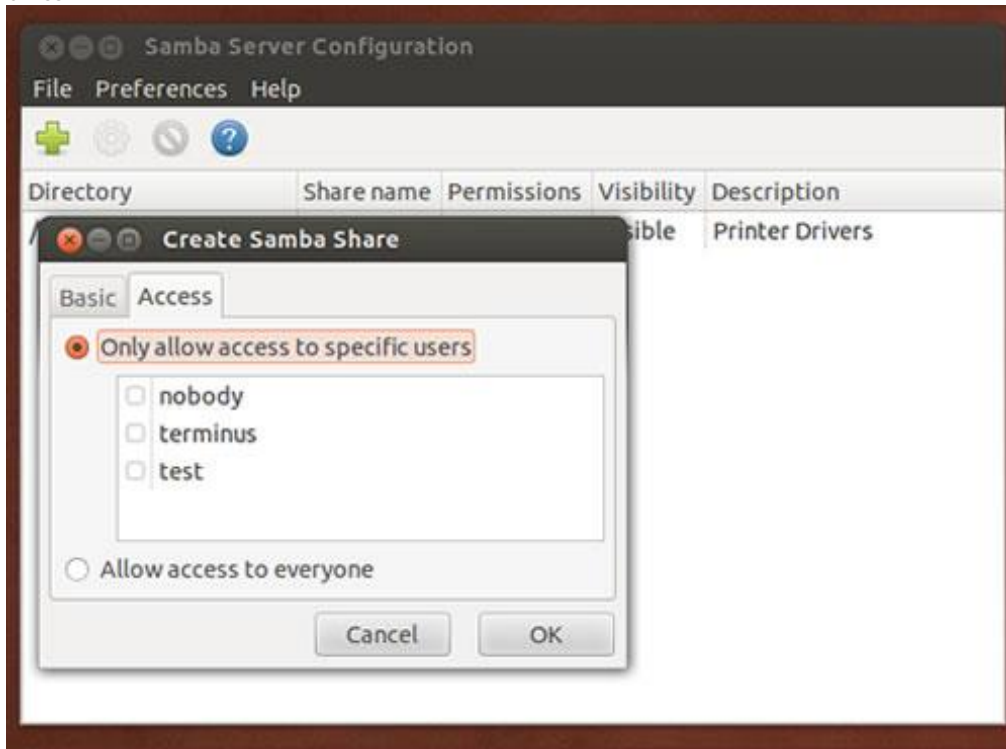


Figure 4 ubuntu allows file sharing between other users

- Multi-user systems' are built in a way to share the resources among other computers. A system called 'Time sharing' can be sued to share one central processor among a group on computers connected in a network. Whereas a single user system is not capable of sharing one CPU among other computers.

Conclusion

To conclude, windows 7 professional and Ubuntu 12.04 are both good operating systems based on their requirements for a small financial business.

In order to run a small financial business the concept of an open source would better suit the business, as they would not be able to afford the expenses. Ubuntu 12.04 OS offers many financial applications that work similarly to the application available in windows 7. The most popular financial application available in windows is 'TurboCASH' which works similar to 'GnuCash' available in Ubuntu 12.04. In order to generate reports and large text files windows offers 'Microsoft office' where as Ubuntu offers similar applications called 'Libre office'. The best option of OS for a small financial business would be Ubuntu 12.04 as it will reduce the overall cost of implementation but also reduce power intake as it works as a multi-user OS.

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