

# The Power of Free and Open Source Software

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# **2 Scenarios**

# 1<sup>st</sup> Scenario

You need to upgrade the software for your desktop at an Adventist institution

You have heard MS Windows Vista Business and MS Office Small Business 2007 are your best options

\$200 MS Windows Vista + \$350 MS Office 2007 = **\$550**



# 1<sup>st</sup> Scenario (Cont.)

Is there any other option?



# 1<sup>st</sup> Scenario (Cont.)

Is there any other option?

TCO

Performance

Scalability

Market

Security

Reliability



## 2<sup>nd</sup> Scenario

### Software Component



## 2<sup>nd</sup> Scenario (Cont.)

**Modular**



**Substitution**

**Provided and Used  
Interfaces**

# Reuse



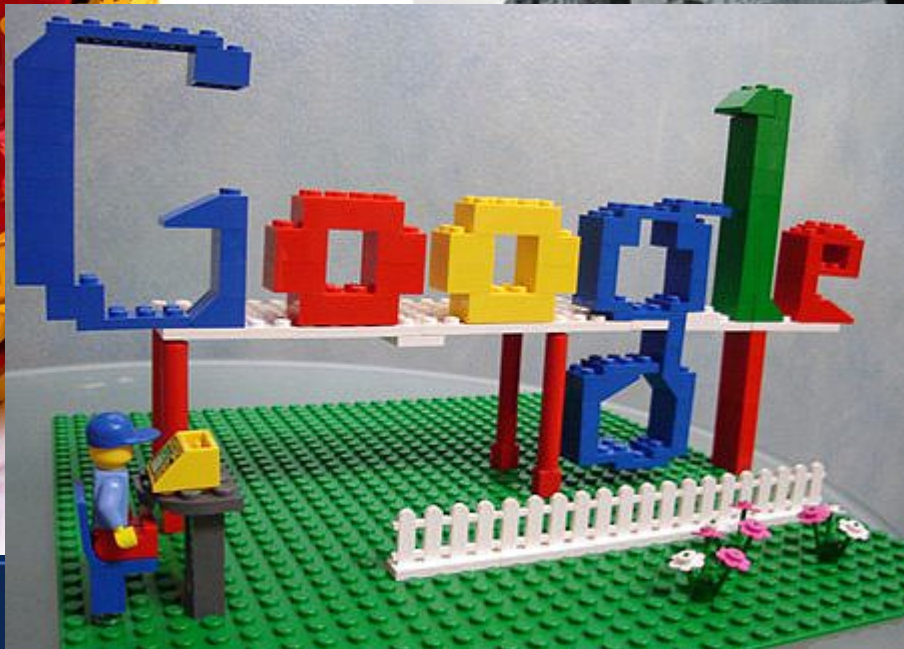
# Reuse



LEGO



# Reuse



# Reuse

**Lower development cost!**

**Higher Quality!**

**Shorter development time!**



Repository of Common  
Components (Commonalities)



Security



Data  
Access



Report  
Generation

Repository of Common  
Components (Commonalities)



Security



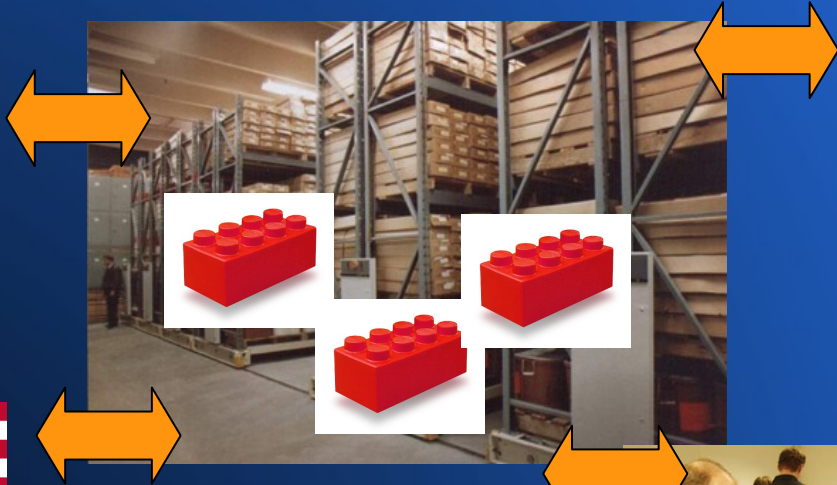
Data  
Access



Report  
Generation

Repository of Common  
Components (Commonalities)

Free and Open Source!!!



**Shareware**

**Freeware**

**Free software**

**Open Source software**

**Proprietary software**

**FLOSS**

# Free Software

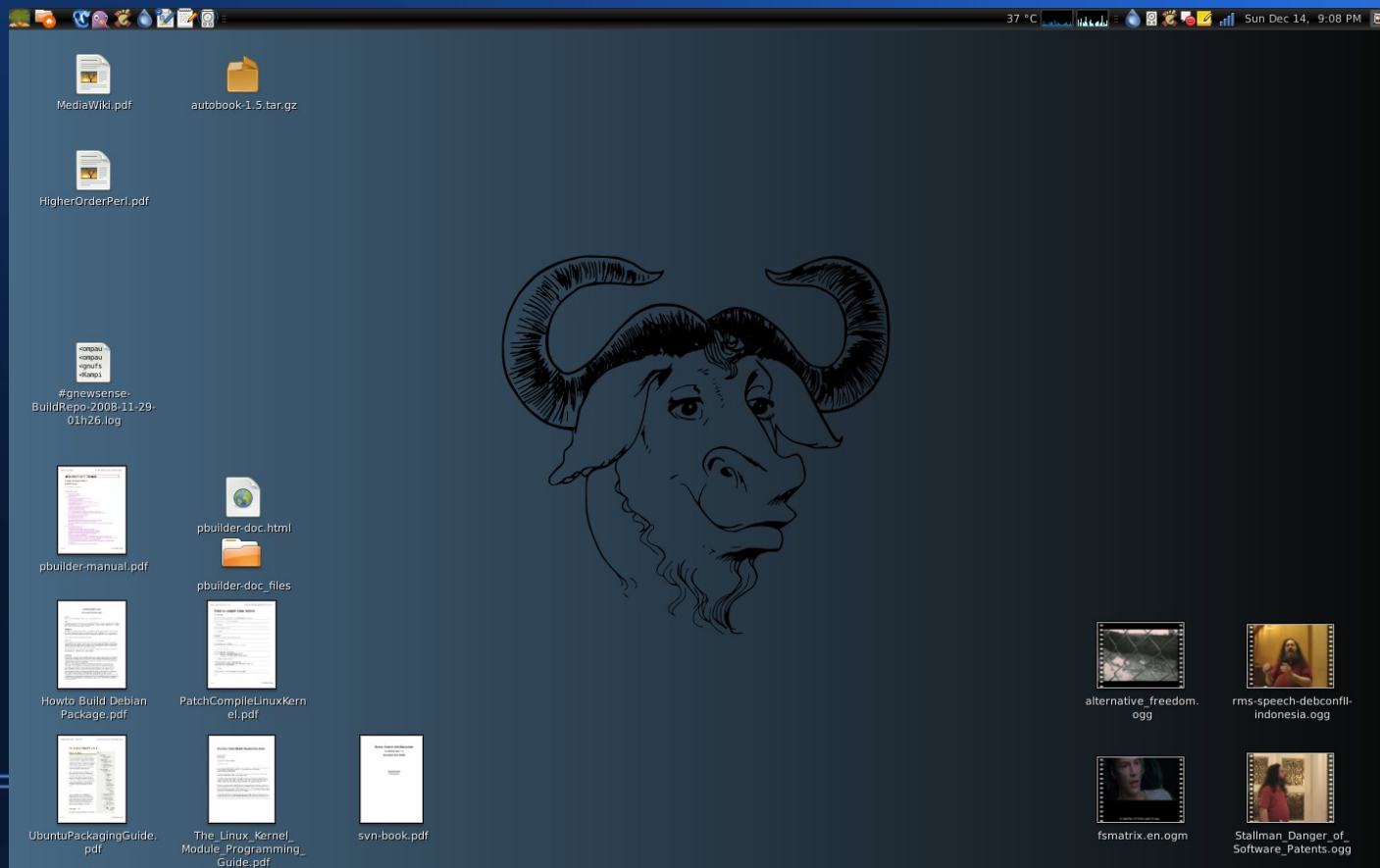
"**Free software**" is a matter of **liberty**, not price

The program's users have the **four essential freedoms**:

- The freedom to **run the program**, for any purpose
- The freedom to **study how the program works**, and **change it** to make it do what you wish
- The freedom to **redistribute** copies so you can help your neighbor
- The freedom to **improve the program**, and release your improvements to the public, so that the whole community benefits

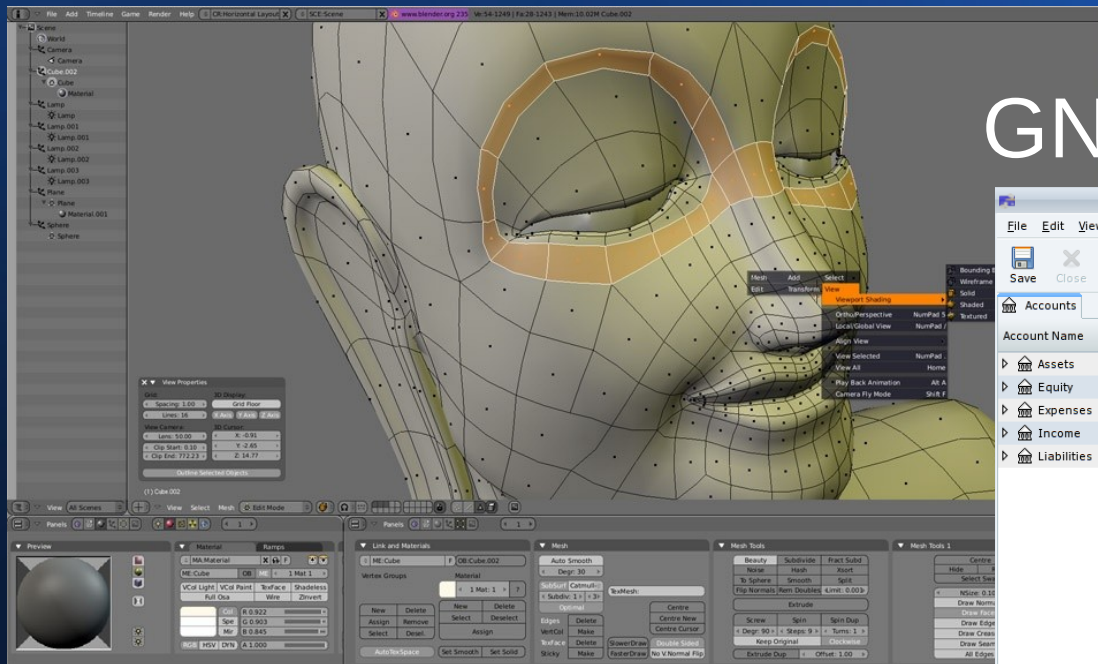
# Free Software (Cont.)

## GnewSense (GNU/Linux)

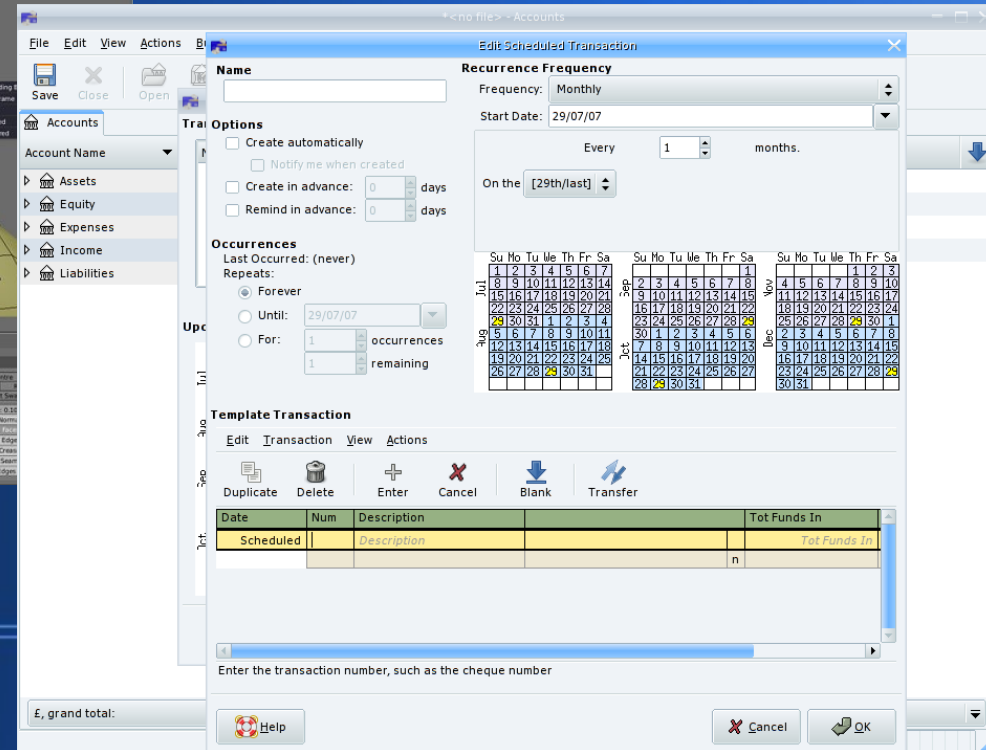


# Free Software (Cont.)

## Blender

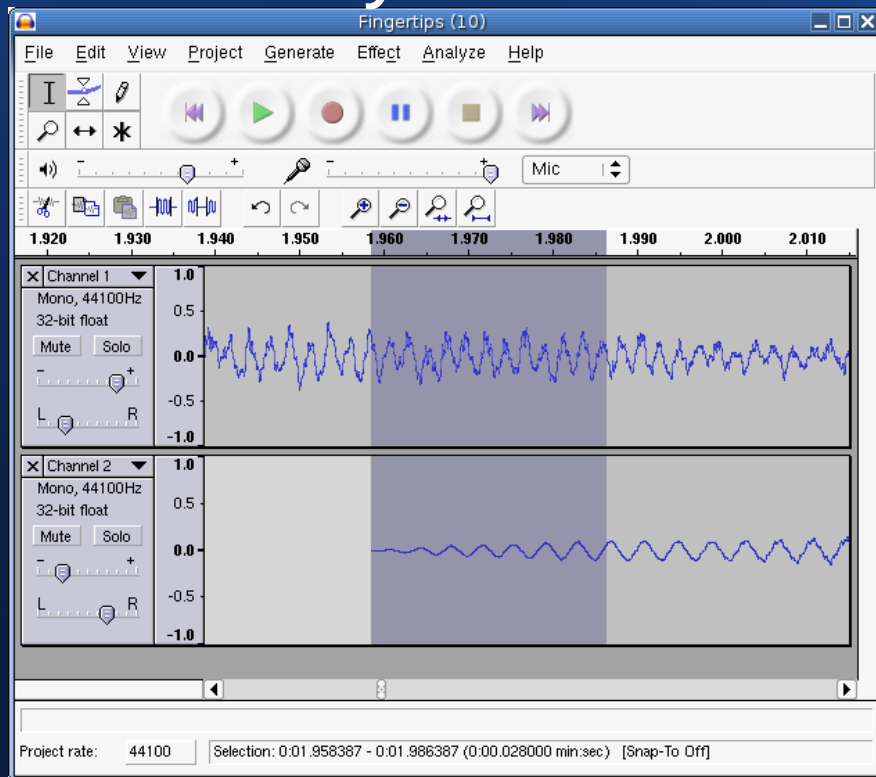


## GNUCash



# Free Software (Cont.)

## Audacity



## Cinelerra



# Open Source Software

A **development method** for software that harnesses the power of **distributed peer review** and **transparency of process**

The promise of open source is **better quality, higher reliability, more flexibility, lower cost**

(Open Source Initiative, n.d.)

# Open Source Software (Cont.)

## OpenOffice

The screenshot displays three OpenOffice 2.0 applications running simultaneously:

- Sample OpenOffice document.odt - OpenOffice.org Writer:** Shows a document with the following text:

This is an example OpenOffice.org 2.0.2 document. The style tab is located on the right text pane, making it easy to change the current section style.

**This is heading 1**

Nice, isn't it?

**And this is heading 2**

And this is some regular text again. Oh, I would forget. The on-the-fly spellcheck is available as well.
- Web Site Stats - OpenOffice.org Calc:** Displays a spreadsheet with data for website statistics. The 'Daily Avg' section includes a line graph titled 'Site Stats' showing trends for Hits, Files, Pages, and Visits from March 05 to October 04. The 'Monthly Totals' section includes a table for the 'Top 20 of 20 Total Countries'.
- OOo 2.0 Launch - OpenOffice.org Impress:** Shows a presentation slide titled 'Version 2 Launch Programme'. The slide content includes:

Welcome to the OpenOffice.org 2 Launch  
Edinburgh International Conference Centre  
Edinburgh, Scotland

**OpenOffice.org**

Free Software	Open Source Software
<p>The term free software emphasizes the <b>ideological aspects</b> of software, including the <b>ethical</b> or <b>moral</b> aspects</p>	<p>The term open source tend to place more emphasis on the <b>business advantages</b> of the software.</p> <p><b>Technical excellence</b> as the primary goal, and sharing of the source code is seen as a means of achieving that goal</p>

Comparison of Free Software with Open Source Software

# Free and Open Source Software (F/OSS, FOSS, or FLOSS)

Has been proposed as a means of overcoming the problems with the terms **free software** and **open source software**

(FreeOpenSourceSoftware.com, 2009)

# Proprietary Software

Software that is **not free or semi-free**

Its **use, redistribution** or **modification** is **prohibited**, or requires you to ask for **permission**, or is **restricted** so much that you effectively can't do it freely

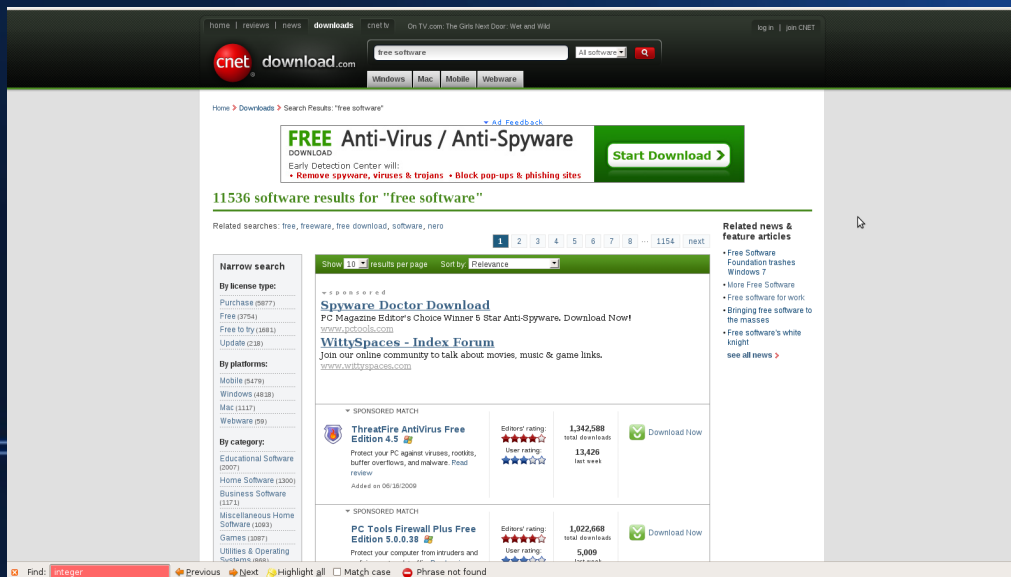


(Free Software Foundation, 2009a)

# Freeware

Commonly used for packages which permit **redistribution** but **not modification** (and their **source code is not available**)

**Don't use “freeware” to refer to free software**



(Free Software Foundation, 2009a)

# Shareware

Software which comes with permission for people to **redistribute copies**, but says that anyone who **continues** to use a copy is required to **pay a license fee**

**Shareware is not free software, or even semi-free:**

- For most shareware, source code is not available
- Shareware does not come with permission to make a copy and install it without paying a license fee

(Free Software Foundation, 2009a)

# Why Free and Open Source Software for the Adventist Church?

Facts in 6 areas:

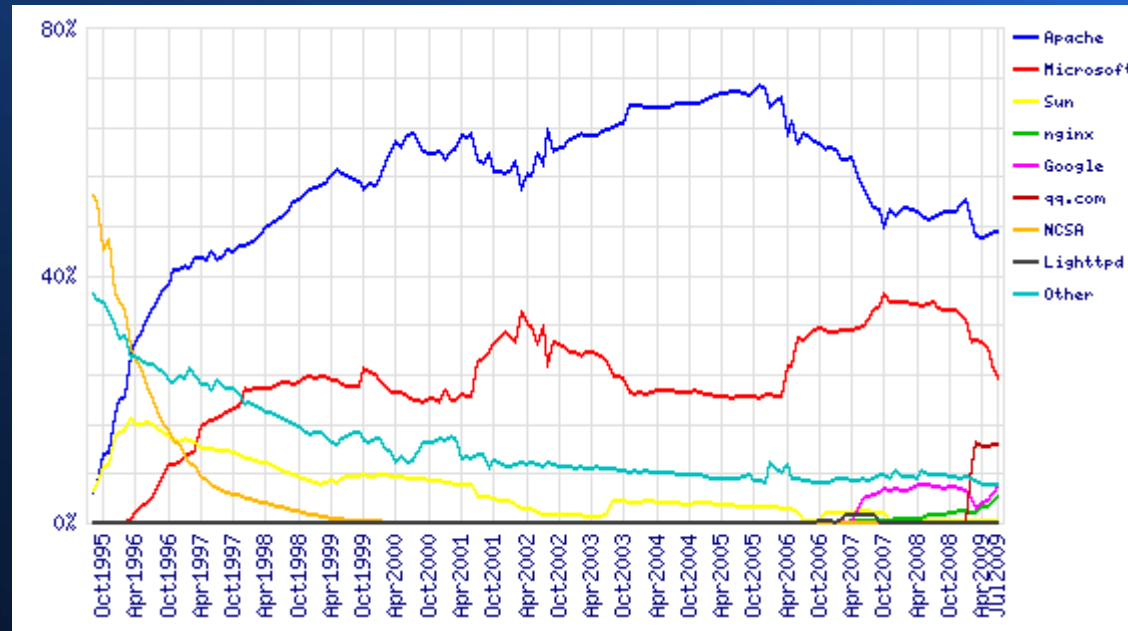
1. Market share
2. Reliability
3. Performance
4. Scalability
5. Security
6. Total Cost of Ownership (TCO)



# 1. Market Share

FLOSS dominates web serving.

August 1995 - July 2009: **Apache 47.17%, IIS 23.34%**



(Netcraft, 2009)

# 1. Market Share (Cont.)

- An IBM-sponsored study on Linux suggested that **GNU/Linux** has “won” the server war as of 2006, as **83% were using GNU/Linux** to deploy new systems versus **only 23% for Windows**

(Blankenhorn, D., 2006)

- **Half of all mission-critical business applications** are expected to run on **GNU/Linux by 2012**

(Betts, B., 2007)

# 1. Market Share (Cont.)

- A 2004 InformationWeek survey found that **67% of companies use OSS/FS products**, with another **16% expecting to use it in 2005**; **only 17%** have no near-term plans to support OSS/FS products

(D'Antoni, H., 2004)

- In a survey of business users by Forrester Research Inc., **52%** said they are now **replacing Windows servers with Linux**

(Hamm, S., 2005)

- A survey in May 2004 found that **over 75% of all DNS domains** are serviced by an **OSS/FS program**

(Moore, D., 2004)

# 1. Market Share (Cont.)

- **MySQL's** market share is **growing faster than Windows**

(LaMonica, M., 2004)

- **Internet Explorer has been losing marketshare** to OSS/FS web browsers (such as Mozilla Firefox) since mid-2004

(McMillan, R., 2004)

# 1. Market Share (Cont.)

- InformationWeek's February 2005 survey reported significant use of GNU/Linux, and that **90% of companies anticipate a jump in server licenses for GNU/Linux**

(InformationWeek Research, 2005)

- Optaros, a consulting firm, reports that **87% of organizations are now using open-source software**; BusinessWeek claims that this demonstrates that OSS/FS has greatly expanded into businesses

(Lacy, S., 2005)

# 1. Market Share (Cont.)

- IDC's Spring 2006 survey found that **developers around the world are increasing their use of OSS/FS**
  - IDC surveyed over **5,000 developers** from **116 countries** in the **spring of 2006**. They found that **OSS/FS is “being used by 71% of the developers in the world and is in production at 54 percent of their organizations. In addition, half of the global developers claim that the use of open source is increasing in their organizations.”**

(Vaughan-Nichols, S.J., 2006)

## 2. Reliability

- IBM ran a series of **extremely stressful tests for 30 and 60 days**, and found that the GNU/Linux kernel and other core OS components operated consistently and completed all the expected durations of runs with **zero critical system failures**

(Ge, L., Scott, L., & VanderWiele, M., 2003)

- A study by Coverity found that the **Linux kernel** had far **fewer defects than the industry's average**

(Lemos, R., 2004)

## 2. Reliability (Cont.)

- **80% of the top ten most reliable hosting providers ran OSS/FS**, according to Netcraft's May 2004 survey

(NetCraft, 2004)

- An in-depth analysis (published in the Communications of the **ACM**) found good evidence that **OSS/FS code quality appears to be at least equal and sometimes better than proprietary software**

(Samoladas, I., et. al., 2004)

- A detailed study of two large programs (the **Linux kernel and the Mozilla web browser**) found evidence that **OSS/FS development processes produce more modular designs**

(MacCormack, A., Rusnak, J., & Baldwin, C., 2004)

# 3. Performance

- **GNU/Linux** has produced **better SPEC values than Windows/IIS** in several cases, even when given inferior configurations

(Standard Performance Evaluation Corporation SPEC, 2009)

- eWeek found in its tests that the OSS/FS program **MySQL** was **quite comparable to the proprietary Oracle database program**, and the pair outperformed other proprietary programs

(Dyck, T., 2002)

### 3. Performance (Cont.)

- Benchmarks comparing **Sun Solaris x86** and **GNU/Linux** found many similarities, but **GNU/Linux had double the performance in web operations**

(Bourke, T., 2003)

- Anandtech's August 2005 comparison of **Mac OS X** and GNU/Linux found that the **Linux-based system ran five to eight times faster on server tasks** (specifically using MySQL)

(De Gelas, J., 2005)

# 4. Scalability

- GNU/Linux is used in 78% of the world's 500 fastest supercomputers, most of the world's ten fastest supercomputers... including the world's most powerful supercomputer

(Lyons, D., 2005)

# 5. Security

- Summaries as of August 2005 suggest **Internet Explorer is still more dangerous than the OSS/FS Firefox**

(Hammond, D., 2005)

- **78% (284/365) of the time in 2006 Internet Explorer was vulnerable to dangerous known attacks**, for which no patch to fix them was available, compared to 2% (9/365) for Mozilla Firefox

(Krebs, B., 2006)

# 6. Total Cost of Ownership (TCO)

	Microsoft Windows 2000	Red Hat Linux
Operating System	\$1510 (25 client)	\$29 (standard), \$76 deluxe, \$156 professional (all unlimited)
Email Server	\$1300 (10 client)	included (unlimited)
RDBMS Server	\$2100 (10 CALs)	included (unlimited)
C++ Development	\$500	included

TCO for MS Windows 2000 vs. TCO for Red Hat Linux (Wheeler, D., 2007)

	Microsoft Solution	OSS/FS (GNU/Linux) Solution	Savings by using GNU/Linux
Company A (50 users)	\$69,987	\$80	\$69,907
Company B (100 users)	\$136,734	\$80	\$136,654
Company C (250 users)	\$282,974	\$80	\$282,894

TCO for MS Windows 2000 vs. TCO for Red Hat Linux (Wheeler, D., 2007)

## 6. Total Cost of Ownership (TCO) (Cont.)

- Forrester Research found that **the average savings on TCO when using OSS/FS database management systems (DBMSs) is 50%**

(Sanders, T., 2006)

- In August 2005, Robert Frances Group (RFG) found **Linux on x86 had a significantly lower TCO than Windows (40% less) or Solaris (54% less) as an application server**

(Robert Frances Group, 2005)

# Examples

- A **NASA** technical report describes in detail an approach for NASA to **release some of its software as open source software**  
(NASA, 2008)
- Some states, such as **Massachusetts**, have a **formal policy encouraging the use of open standards**  
(Commonwealth of Massachusetts, 2009)

# Examples (Cont.)

- **Munich, Germany** (the third largest German city) has decided to **migrate all of its 14,000 computers in public administration to GNU/Linux and other OSS/FS office applications**, dropping Microsoft's Windows in the process

(Ocohido, B., 2003)

- In July 2002, **UK Government published a policy on the use of Open Source Software**. Including: UK Government will consider OSS solutions alongside proprietary ones in IT procurements. Contracts will be awarded on a value for money basis

(OGC, 2002)

# Examples (Cont.)

- **Brazil's government is planning to switch 300,000 computers to Linux** says a January 2005 story

(Goldmark, A., 2005)

# Where to Start?

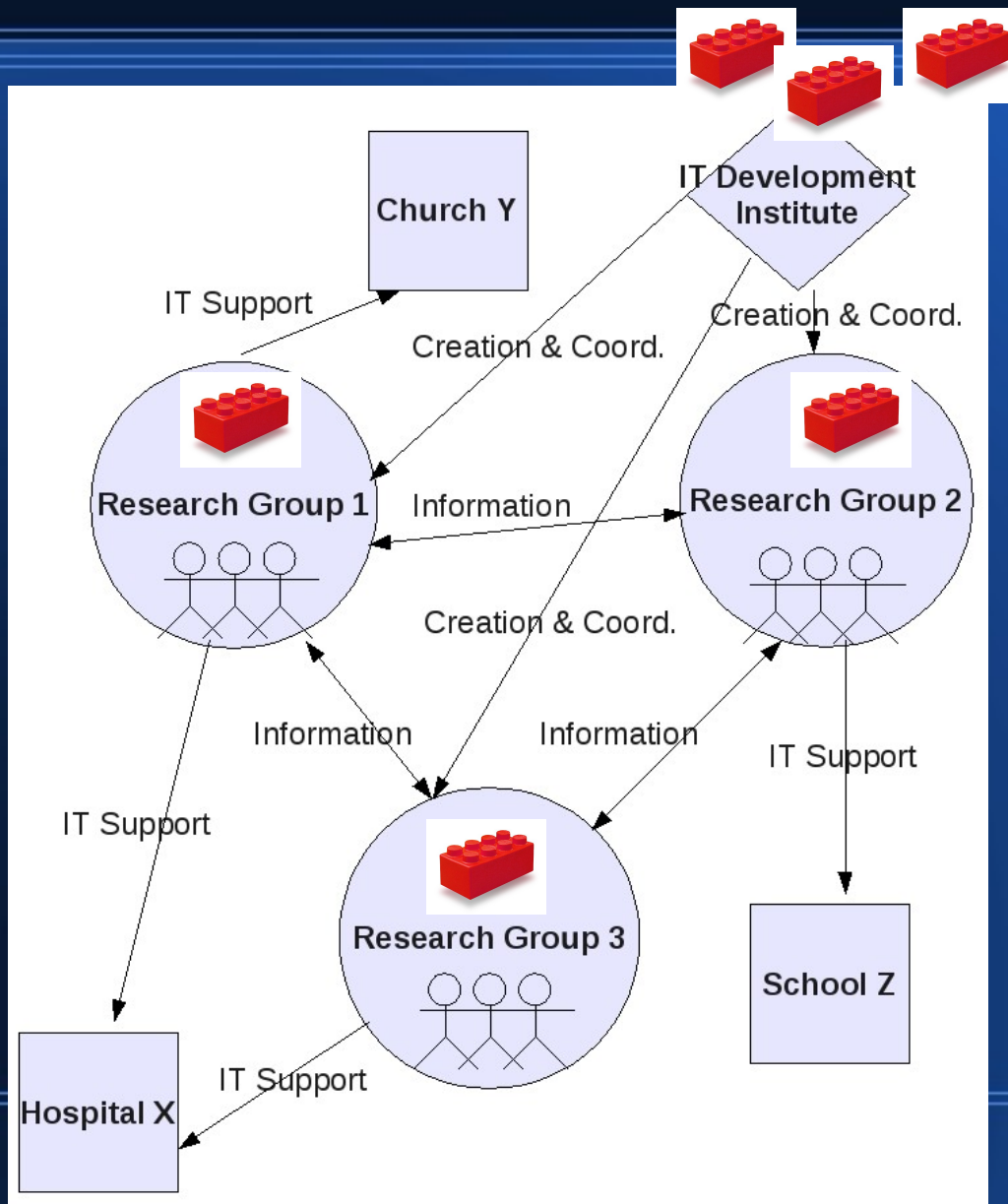
2 levels to start with free and open source software:

1. Implementation

2. Usage



# Where to Start? (Cont.)



## 1. Implementation of Free and Open Source Software

Organization for the IT Integration Framework (Alferez, G.H., 2009a)

# Where to Start? (Cont.)

## 1. Implementation of Free and Open Source Software



<http://fit.um.edu.mx/openadventist/>

# Where to Start? (Cont.)

## 2. Using Free and Open Source Software

Free Software Directory (<http://directory.fsf.org/>)

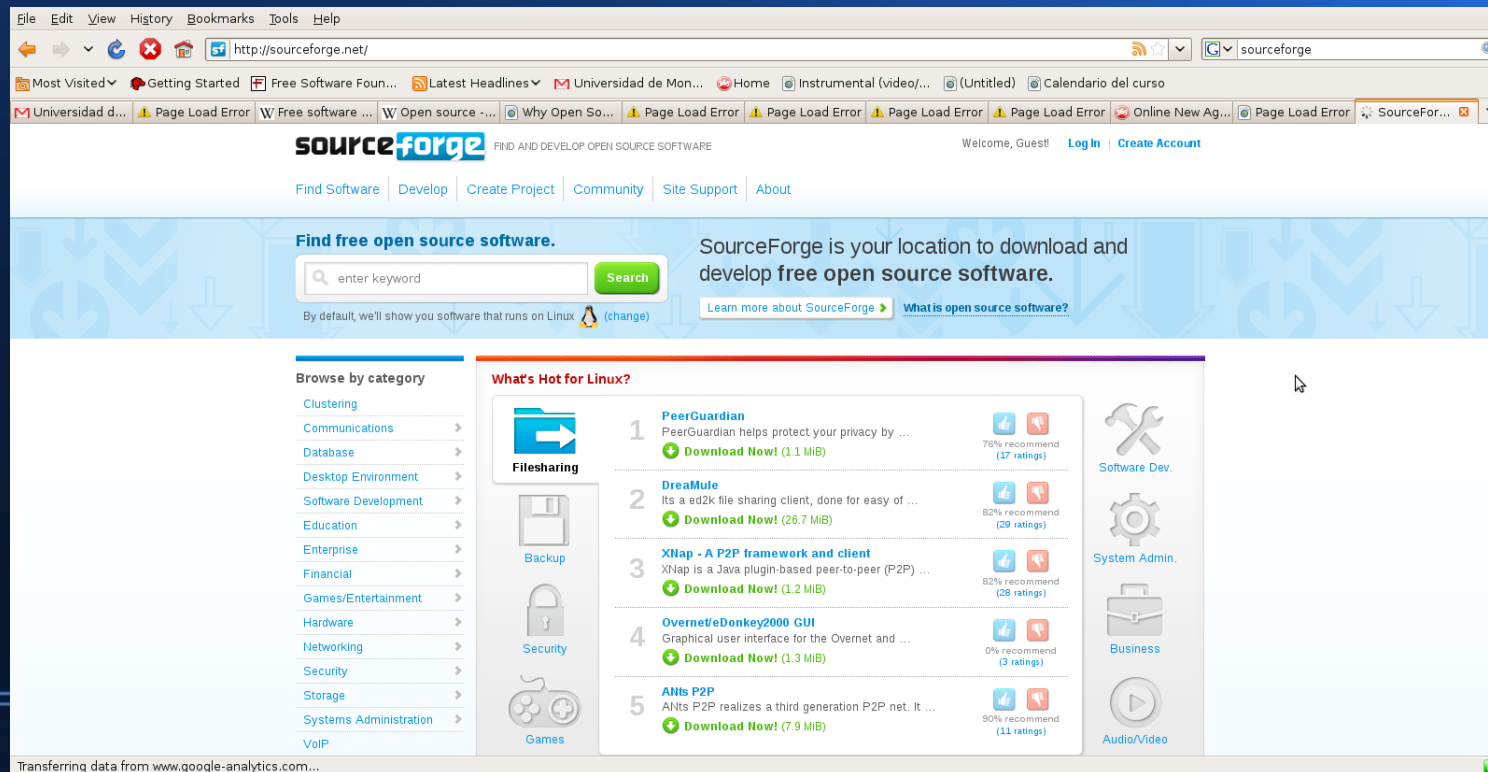
- ✓ Business and productivity
- ✓ Database
- ✓ Education
- ✓ Mathematics
- ✓ Science
- ✓ Video
- ✓ Audio
- ✓ And much more!!!



# Where to Find Free and Open Source Software (Cont.)

## 2. Using Free and Open Source Software

SourceForge (<http://sourceforge.net/>)



# Conclusions

- Free and Open Source Software are excellent options for Adventist institutions: Cost, quality, time to market!
- We need to integrate in order to build more FOSS
- No piracy!
- **“Freely you have received, freely give.” Matthew 10:8**

# More Researches

[\*\*http://fit.um.edu.mx/harvey/\*\*](http://fit.um.edu.mx/harvey/)

**Thank You!**

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