

Free Software Use for Government, Business and Education



by

Jon "maddog" Hall
Board Chair, Linux Professional Institute
Executive Director
Linux® International®

Who Am I?



- Half Electrical Engineer, Half Business, Half Computer Software
- In the computer industry since 1969
 - Mainframes 5 years
 - Unix since 1980
 - Linux since 1994
- Companies (mostly large): Aetna Life and Casualty, Bell Labs, Digital Equipment Corporation, SGI, IBM, Linux Professional Institute
- Programmer, Systems Administrator, Systems Engineer, Product Manager, Technical Marketing Manager, Educator, Author
- *Extremely* large systems to *extremely* small ones
- Pragmatic

Software Libre!



- Free as in *freedom*, not free as in *beer*.
 - Free to read the source code
 - Free to make changes to the source code
 - Free to redistribute those changes
 - *Free to use the software for any purpose*
 - You can not limit another's freedoms

Richard Stallman has *never* said you should not make money writing software.

Once “All” Software was “Free and Open Source”

- Software written to specification
 - Inputs, outputs and steps to be taken were specified
 - contract was written
- Criteria for acceptance
 - Bug rate
 - Documentation
 - On time
 - Other...



Software Owned By Customer

If changes needed, could select vendor

- Bugs fixed
- Extensions



The Death of Middle Earth

1980-1983



- Commercialization of Unix
 - Sun Microsystems - 1981
- PC happens
 - Low price hardware and software
 - Microsoft, Apple and others
 - Growth of the Computer Store

RMS Objects



- Richard Stallman forms GNU project
- Later forms Free Software Foundation

Software for the 21st Century



The planets aligned....

- Hardware prices for *significant* systems dropped
- Large number of books, articles on software
- The Internet happened
- Massive amounts of free code were available
 - GNU software
 - Xfree86
 - Sendmail
- Linus Torvalds turned 21

Importance To Country



- Local jobs
 - Brain Drain
 - High Tech
- Security of country
 - Economic
 - Balance of Trade
 - Embargo
 - Military
 - Longevity
 - Document formats

More Hidden Values



- Better balance of trade
 - High paying local jobs
 - Money stays in local economy
- Better stability in times of
 - mergers/bankruptcies
 - Big companies
 - war, embargo and terrorism

Ground Zero: Redmond Washington



Importance To A Company



- Control
 - Cost control
 - Timeline control
 - Method Control
 - What processor/system
 - How many used
 - Privacy, Security, Legal control
- Longevity

Sometimes I Speak To Hundreds Of Business people....

- Who has ever had a problem with closed source programs?
- Who has turned in a problem report?
- Who has gotten a good answer back?
- Who has had to change their business?



Today There Are 2,500,000,000 General Purpose Computers

But there are 7.3 Billion people

Proprietary companies can not meet the needs of everyone
Nor will they even try....it is not profitable!

Binary-Only Software

What Else Is Wrong?

- Can not see how software works
- Can not learn from existing software
- Hard to do research
 - Hard to exchange research efforts
 - Hard (or impossible) to get research out to consumers
- Companies go out of business
 - Companies drop product lines

Value of Software

- Does solution meet your needs?
 - Do you have to change the way you do business to meet the needs of the software?
 - Does the solution either save you money or allow you to serve your customers better?
- Can you sell the solution?

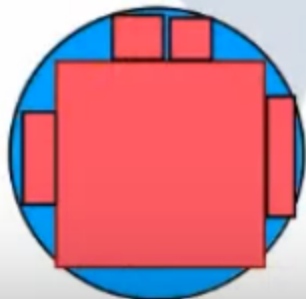
Imagine Trying to Fill a Round Hole

- Proprietary software is a square peg
- No matter how many square pegs you use, you can never really fill the hole



Imagine Trying to Fill a Round Hole

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- No matter how many square pegs you use, you can never really fill the hole
- Source Code allows you to sand the corners of the square peg



Importance To a University: What Are Goals of Education?

- Create a:
 - Thinking Electorate
 - Thinking Workforce
 - Lifetime knowledge
- Research
 - Public Research with Public money
 - Private Research with Private money
 - But how much is “private”?

A Complete Computer Science Curriculum



- Operating Systems Design
 - Kernels
 - Linux
 - *BSD
 - FreeDOS
 - TinyOS
 - CMU MACH
 - Hurd

Operating System Design (Cont.)



- Security aspects
 - Kerberos
 - SELinux
- Graphics
 - X Window System
 - OpenGL
- Clustered systems (HPC and HA)

FOSS Not Just “An Operating System”



- Compilers
 - “C”, C++, Fortran, Pascal, Lisp, BASIC, etc.
- Interpreters
 - Python, Perl, Ruby, Tcl/Tk
- Database engines
- Office Systems
- Multimedia tools
- VoIP



GitHub

430K+ projects

3.4M+ developers

A New Old Model of Developing Software



When software is free....

- You pay for *service*
 - *Service* in copying and distributing
 - *Service* in getting features in your time frame
 - *Service* in integrating
 - *Service* in training
- Worst Case: You pay for the software one time
- Best Case: You never pay for the software again

Do Not Be Afraid Of The Word *Service*

- More than “just installing software”
- This is Brain Surgery
- This is like being a lawyer

Things to Teach In New Model

- How to do distributed development
- How to license software
- How to develop formal standards
- How to write code to standards
- How to motivate software developers
- How to locate and engage the community of users and developers
- How to innovate, everywhere, always

How to evaluate and size customer needs

A “Portfolio” of Projects



- Students work on real-world projects
- Students develop a “portfolio” of projects, source code and mailing list

More Than Just Software



- Free And Open Standards
 - www.freestandards.org
- Linux Professional Institute
 - www.lpi.org
- Open Hardware
 - Beagleboard
 - Open Telephony
 - Arduino
 - Raspberry Pi
 - Caninos Loucos (IoT)

Creative Commons Freedom of Culture

- Control over your
 - music
 - pictures
 - art
 - presentations
- Blender.org
 - Movies
 - Games
 - 3D-CAD

