

**Free Software and Linux**  
**What, Why and How?**  
**March 13, 2013**  
**Per Scholas, Bronx, NY**

# Ethics, Legal Philosophy and Technology

Ask me about

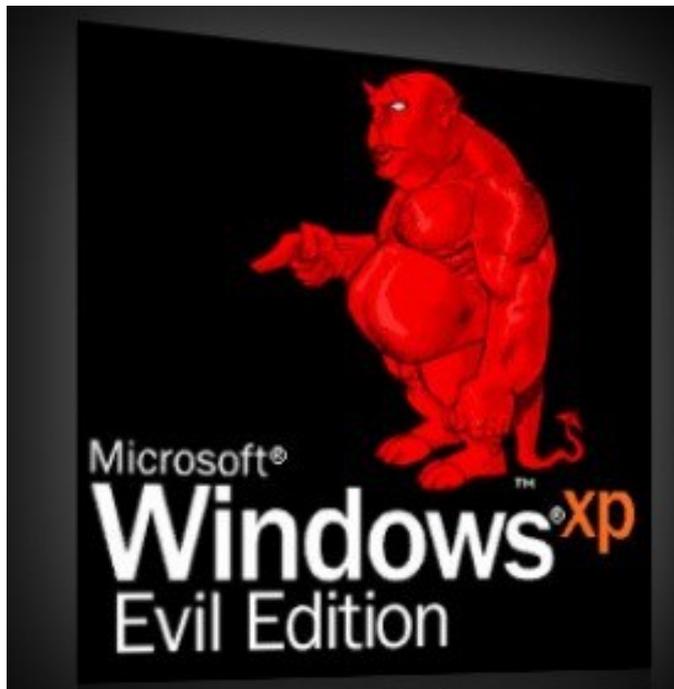
# Free Software



It's all about freedom.

# The Kyle Story

## Microsoft's End User License Agreement aka "EULA"



# Free Software Foundation's “General Public License”



***Free as in Freedom***

# **Free Software can be defined by the “Four Freedoms”**

- **Freedom 0: Freedom to run the program for any purpose**
- **Freedom 1: Freedom to study and change the program; access to underlying source code**
- **Freedom 2: Freedom to share copies to help your neighbor**
- **Freedom 3: Freedom to distribute copies of modified versions for others**

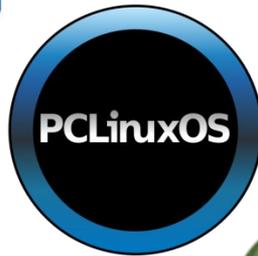
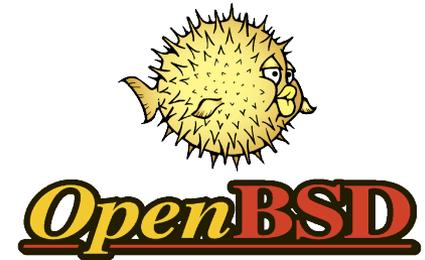
# **Quotes from Richard Stallman, the founder of the Free Software Foundation**

**Anything that prevents you from being friendly, a good neighbour, is a terror tactic.”**

**“Free software is software that respects your freedom and the social solidarity of your community. So it's free as in freedom.”**

**“Control over the use of one's ideas really constitutes control over other people's lives; and it is usually used to make their lives more difficult.”**

# Linux: Over 300 distributions!



# ClearOS Community



clearOS™  
community

- **Excellent for small business installations**
- **Directory Server (Samba/LDAP)**
- **Database Server (MySQL)**
- **Print Server**
- **File Server**
- **Web server (Apache)**
- **Firewall/DMZ**
- **DHCP/DNS Server**
- **Virtual Private Network (OpenVPN)**
- **Content filter/proxy/intrusion detection**
- **Windows Networking**

# Video: BackTrack Linux



<http://vimeo.com/23347352>

# Free Software for Windows (also available on Linux)



mozilla  
**Firefox**<sup>®</sup>



VLC Media Player  
Free But Powerful



**LibreOffice**  
The Document Foundation



**Audacity**<sup>®</sup>



Notepad++

MySQL



**CLAMWIN**  
FREE ANTIVIRUS  
open source security for your PC

FileZilla

perl 

python<sup>™</sup>

blender

AbiWord  
Word Processing for Everyone

# Why Linux?

- **Free for download; no licensing issues or costs**
- **Freedom to share with your neighbor**
- **Impervious to viruses**
- **Full suite of software applications**
- **Low resource use on hardware side**
- **Ported to a large number of hardware platforms: x86, x64, ARM, PowerPC, MIPS, S/390, Super H, AMD x86-64, VAX**
- **Easy to use**
- **Available in almost any language**
- **Flexible: can be run on everything from watches to supercomputers**

# The famous Linux post of 1991

From: torvalds@klaava.Helsinki.FI (Linus Benedict Torvalds)

Newsgroups: comp.os.minix

Subject: What would you like to see most in minix?

Summary: small poll for my new operating system

Message-ID: <1991Aug25.205708.9541@klaava.Helsinki.FI>

Date: 25 Aug 91 20:57:08 GMT

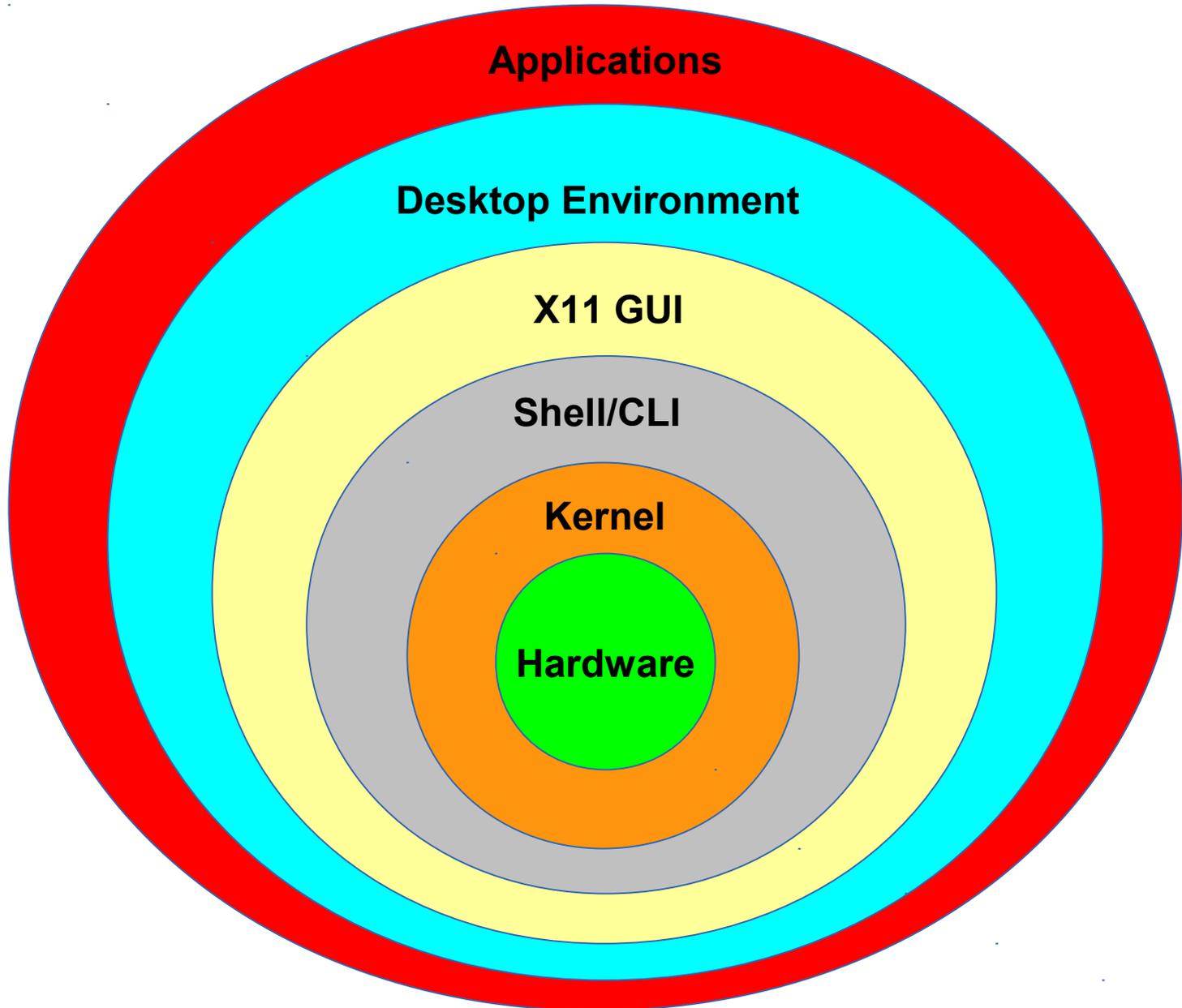
Organization: University of Helsinki

Hello everybody out there using minix -

I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since april, and is starting to get ready. I'd like any feedback on things people like/dislike in minix, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) among other things).

I've currently ported bash(1.08) and gcc(1.40), and things seem to work.

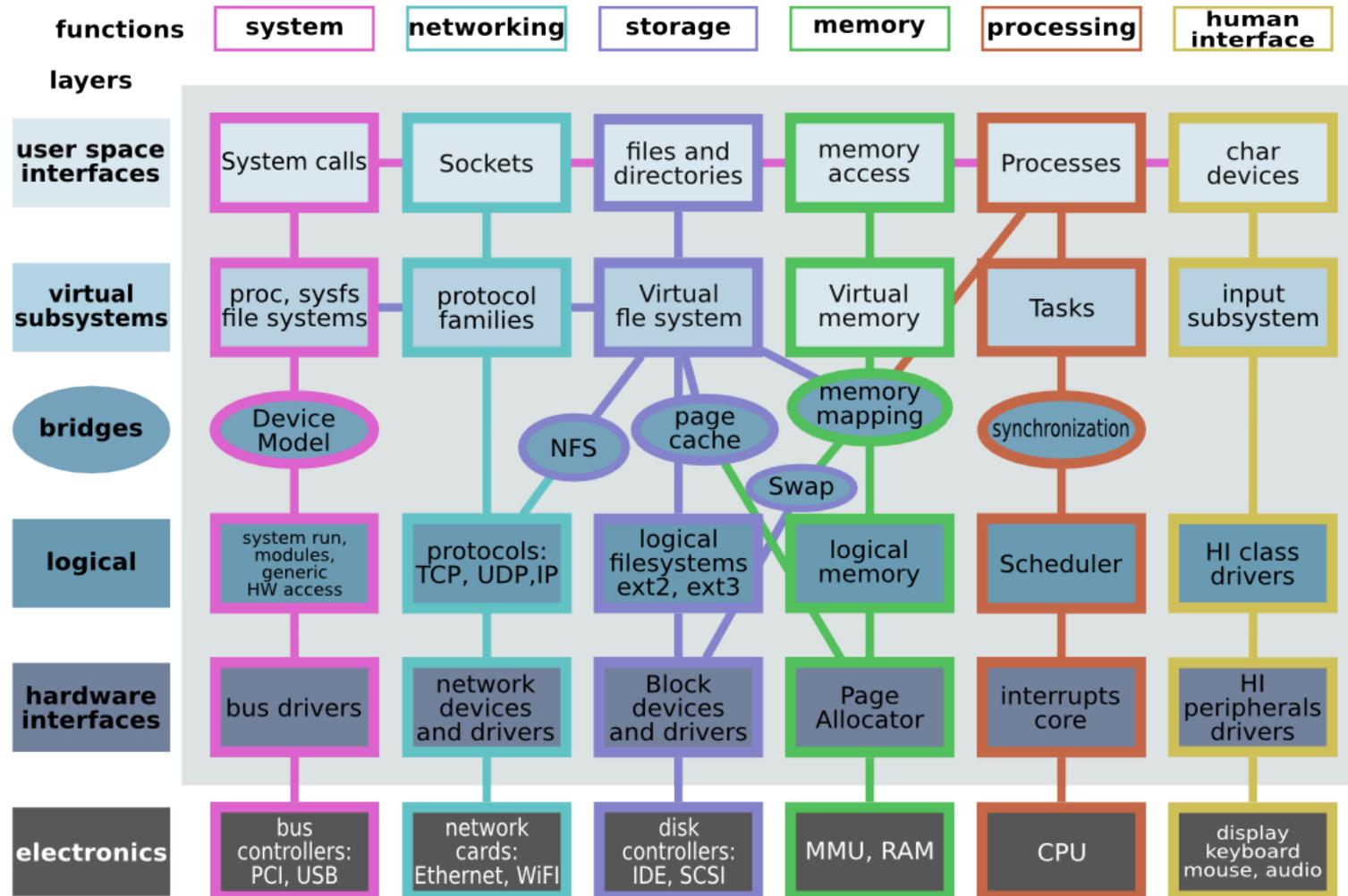
# Full Linux System Diagram



# Linux Kernel

## The heart of the system

Linux kernel diagram



# Where is Linux?



**Watches**



**Embedded  
Devices**



**Raspberry  
Pi**



**Tablets**



**Servers**



**Desktops**



**Supercomputer  
Clusters**



**Mainframes**

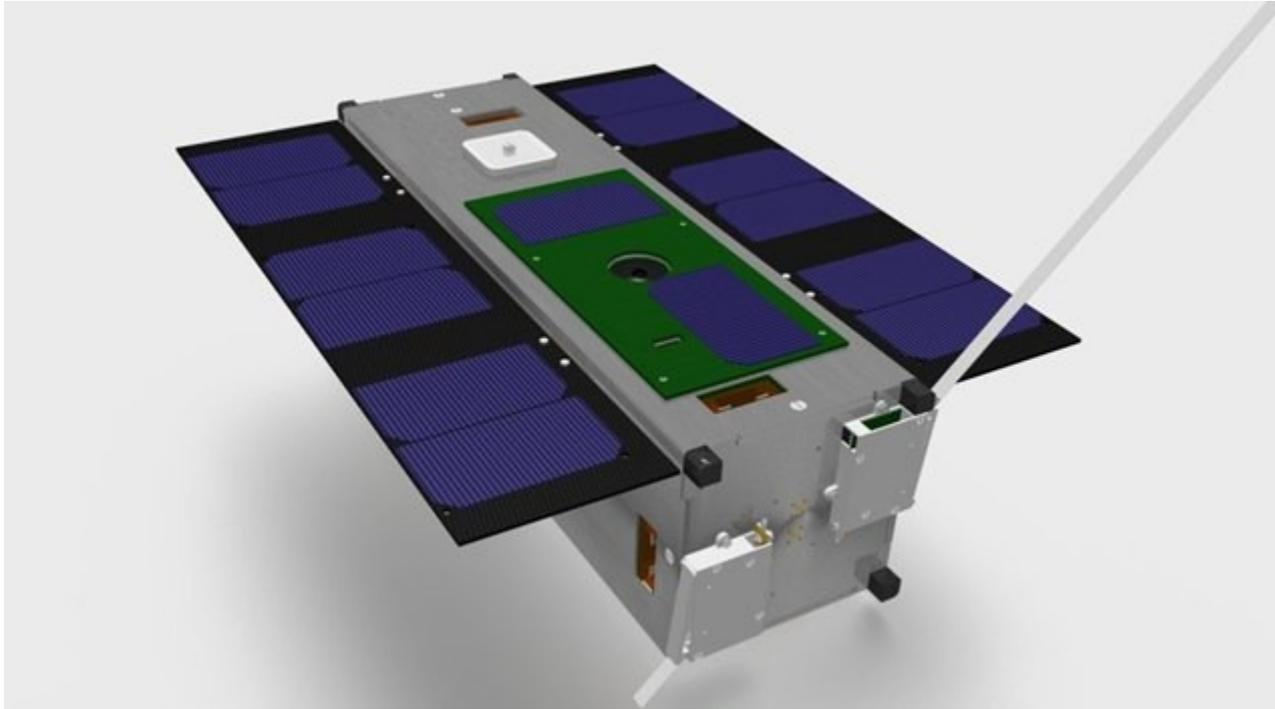
**Laptops**



**Phones**



# Outer Space!



**STRAND-1 Satellite powered by a Nexus One  
phone running Android Linux  
Launched for the UK Space Agency by the  
Indian Space Agency on Feb 25, 2013**

# The Top 10 Supercomputers in the World Powered by Linux



**Sequoia**



**K**



**Mira**



**Juqueen**



**Supermuc**



**Stampede**



**Tianhe-1A**



**Fermi**

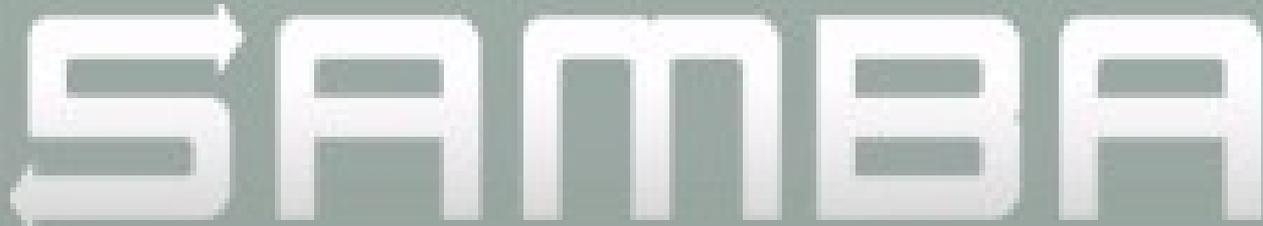


**Titan**



**Power 775**

# The SAMBA Project

The logo for the Samba project, featuring the word "Samba" in a stylized, white, blocky font with a slight shadow effect, set against a dark green background.

opening windows to a wider world

**Can serve as an Active Directory  
Domain Controller, Windows file  
and print server**

# One Laptop Per Child Project (OLPC)

## A low-cost, low-power Linux laptop

Geared for students around the world

**CPU: AMD LX-Geode CPU @ 700 Mhz**

**RAM: 256 MB**

**Hard drive: 1 GB flash**

**Screen: LCD monochrome/color**

**Wireless: Built-in**

**ROM: 1 MB LinuxBIOS/CoreBoot**

**Operating System: Sugar, based on Fedora Core Linux**

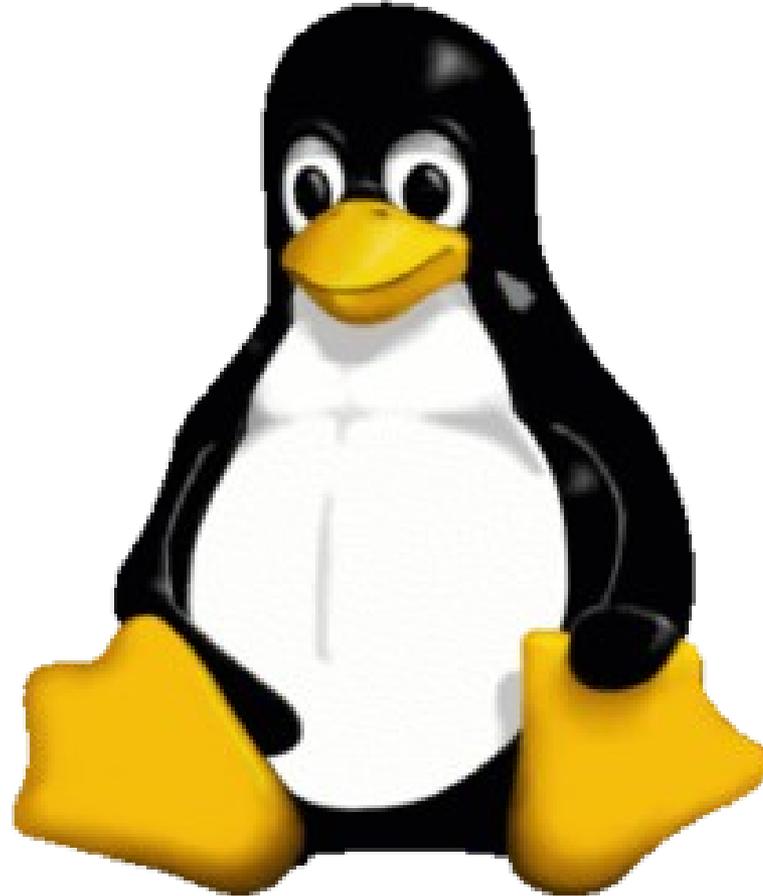


# **OLPC Experiment in Ethiopia**

- In 2 remote villages, children had never previously seen books, newspapers, road signs, or even packaging that had words on them. Their villages had no schools or teachers.**
- In early 2012, OLPC workers dropped off closed boxes containing Motorola Xoom tablets with Android and OLPC applications, taped shut, with no instructions or computer instructors.**
- Within four minutes, one child opened the box, found the on-off switch and powered it up**
- Within five days, they were using 47 apps per child, per day**
- Within two weeks, they were singing ABC songs in English**
- Within five months, they had hacked Android**
- “Some idiot...in the Media Lab had disabled the camera, and they figured out the camera, and had hacked Android.” – Nicholas Negroponte, Founder of OLPC**
- Implications for education and the ability of students to teach themselves without a traditional educational infrastructure**



# **Linux Mascot**



**Tux the Penguin**

# Is Linux profitable? Show me the money!



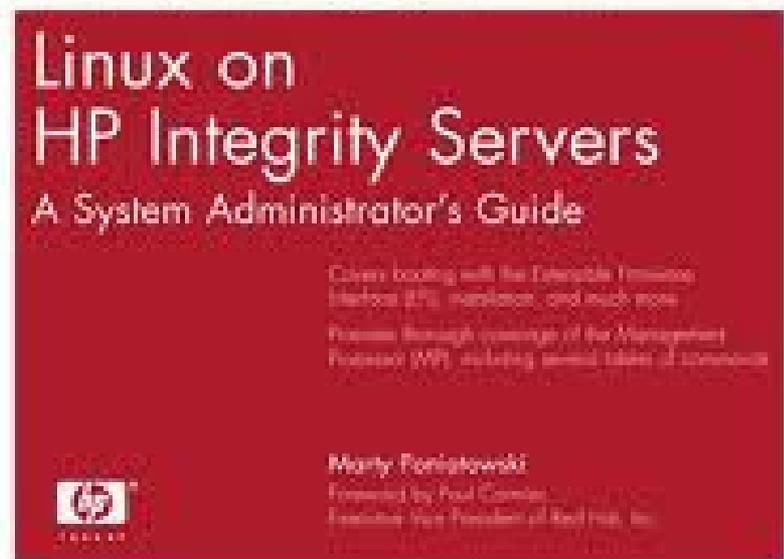
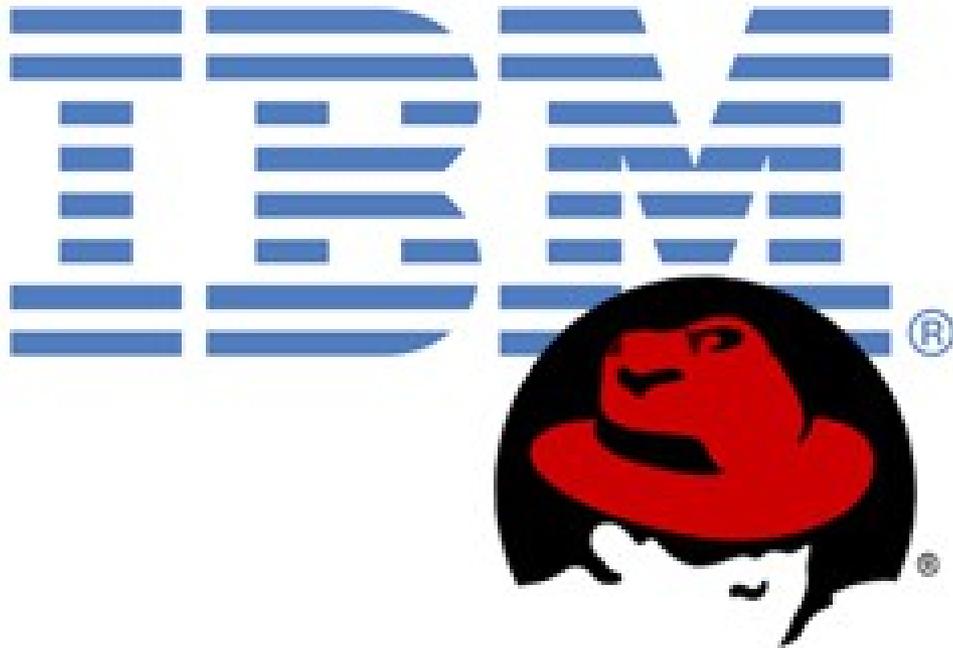
redhat®

March, 2012

Red Hat: The first billion dollar  
Linux company has arrived

***Summary:** Red Hat didn't just break a billion dollars in annual earnings, it smashed its way past a billion bucks with a fiscal year gross revenue of \$1.13 billion, up 25% year-over-year.*

# IBM and HP have Linux-based revenues in the billions



# Multitudes of profitable Linux companies



# What situations can Linux be deployed?

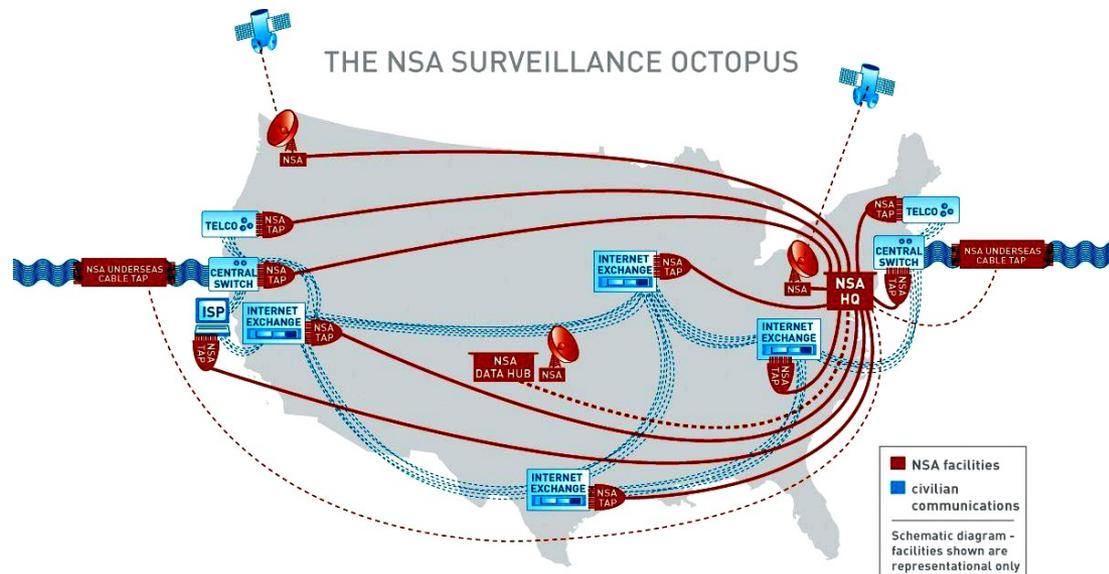
**Schools:** labs, administrative depts, instruction, on donated computers

**Business:** desktop, server, guest terminals

**Recovery:** recover data, use live version for temporary system

**Public use Internet terminals:** in waiting rooms, lounges, and breakrooms.

**Privacy Paranoia:** Using live versions of Linux leave no traces on your hard drive to thwart the NSA surveillance



# What about certs?



**Linux  
Professional  
Institute**



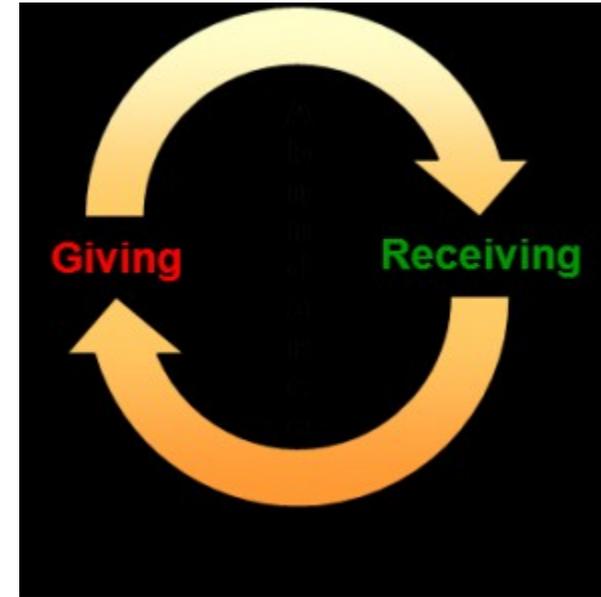
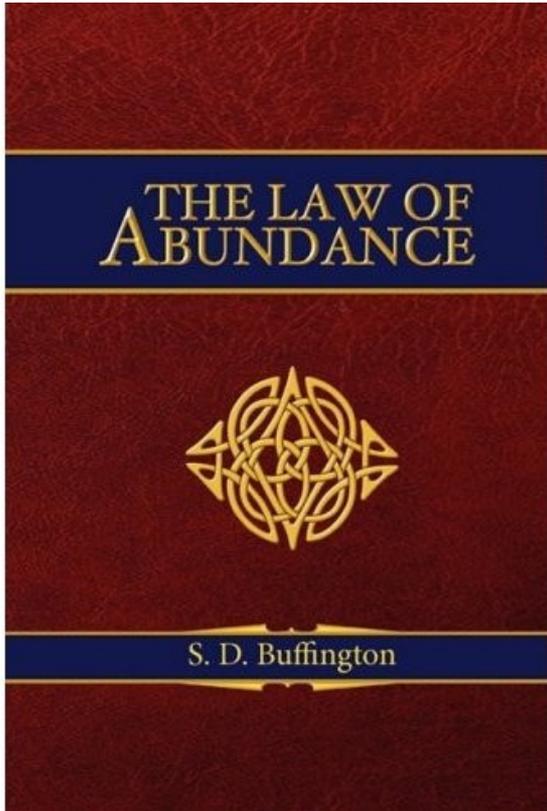
POWERED BY



**Linux  
Professional  
Institute**



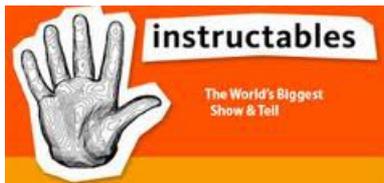
# The Free Software World is a World of Abundance



***Massive Shift of Worldview***

# What are the implications of Free Software and Linux?

- People in all fields are beginning to freely share their knowledge
- New licenses/projects based on the GPL: Creative Commons & Open Hardware
- Many industries that have a vested interest in controlling and profiting from the restriction of knowledge are very afraid of the implications; ie: pharmaceutical



open hardware

# Linux Has Very Modest Goals



WORLD DOMINATION  
THROUGH  
WORLD COOPERATION

# **Video: How Linux is Built by The Linux Foundation**

**Based on the annual report "Who Writes Linux," this is a powerful and inspiring story of how Linux has become a community-driven phenomenon**



**<http://youtu.be/yVpbFMhOAwE>**

# Join the Free Software Foundation

[www.fsf.org](http://www.fsf.org)



**FREE SOFTWARE**  
FOUNDATION

# Project Proposal: Per Scholas Linux Supercomputer Cluster

- Built, funded, operated and maintained entirely by Per Scholas students and alumni
- To be used for non-military research purposes, ie: molecular biology, cancer research, protein folding
- Each class will purchase parts and build a computer to be a new node of the cluster
- Head node will be named “Frank”
- Proposed location: area across from Lab that is currently not being used



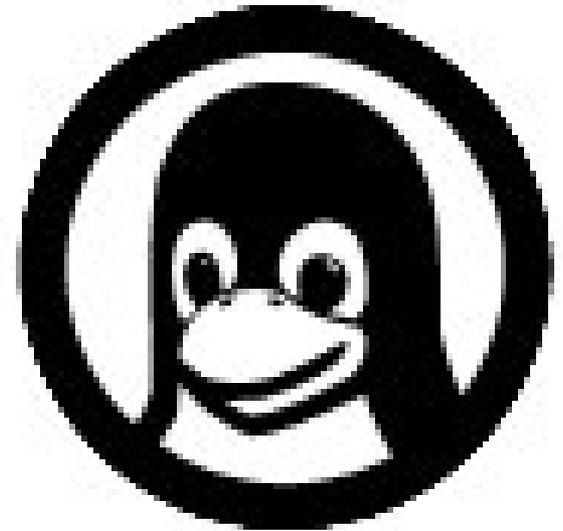
Open-Source Toolkit  
for Real and Virtual Clusters



Scientific Linux



**I wish you...**



**PEACE**

**LOVE**

**LINUX**