Software Freedom and Open Source in Business, Government and Education

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Trademarks

- Linux is a trademark of Linus Torvalds
- Unix is a trademark of X/Open

Those Who Were Really Intelligent

“If I have seen further, it is by standing on the shoulders of giants.”
- Sir Isaac Newton

Remember

- Free Software is more than Linux
- Free Software is not necessarily gratis
  - Freedom to see source
  - Freedom to change source
  - Freedom to redistribute source changes

Not “communism”, but “cooperativism”

Open Source Is Not New

- 1943 – 1980 - At one time, ALL software was “Open Source”
  - Hardware large and expensive
  - Communication was hard or non-existent
  - “Shrink wrap” software did not exist
  - Software written on contract basis
    - Does not work?
    - Late?
    - Buggy?
    - Poor Documentation?

1969

I was a university student=No Money

- DECUS
- Unix
- A birth

Why Do People Write Free Software?

- Why do amateur painters paint?
- Why do amateur athletes compete?
- An amplifier

I give so little and I get back so much

"Shrink Wrap" Has Not Been Around "Forever"

- 1977-1980 Hardware prices dropped
- 1980 – 2000 - Economies of scale made “shrink wrap” software practical
  - 100 engineers
  - 1000 customers
  - 1000 USD per customer = 1MUSD
  - 2 x 1000 problems/requests back

1984

The Year of George Orwell

- 1984 – GNU and GPL
  - Emacs
  - GCC
  - Libraries
  - Command interpreters
- 1980s and 1990s
  - Sendmail, BIND, Postgres (nee Ingres)
- 1991 – Linux Kernel was started

Definitions

- Unix is a Linux-like operating system
- Open Source are licenses that allow source code distribution of software
  - Artistic license
  - BSD license
- Free Software – GNU, FSF
  - GPL license
  - LGPL license

Now It Is the Twenty-First Century

Same proprietary company

- 200 programmers
- 45 million customers
- 2 x 45 million pieces of paper

Do you see the problem?

More Global Economics

If we lose 5 USD/day/system in productivity……

……we lose 2.5 Billion USD/day

What if we could reduce it to just 3 USD/day/system lost?

What happens when there are 6 billion computers?

1000 Business People In A Room...

- How many have had a bug in proprietary software? How much did that cost?
  - Lost time
  - Lost effort
- How many have had to change the way they did business? How much did that cost?
  - Retraining
  - Loss of sales
  - Customer dissatisfaction

  Software Freedom allows Business Decisions

Why Is This Apparent Now?

- Drop in prices of hardware
  - Brings computers to use of many more diverse cultures than before
  - Amplifies losses for a given company as computers are used for different purposes
- Software prices
  - Have not fallen unilaterally
  - Are still out of range in the third world

Linux In Government

- Military
  - Would you trust your weapons.....
- Government
  - Would you trust your email system....
- Not just war
  - Companies bankrupt
  - Companies drop support
  - Balance of trade

Linux Is The Only Major Operating System In Use Today

.....started outside the United States

A Balance of Trade

Software Freedom means...

- Less money leaves your country for packaged software
- More money can be spent **locally** on tailoring Open Source, which..
  - Creates **local** jobs
    - Who eat **local** food, buy **local** housing, pay **local** taxes
      - Which creates more **local** businesses
        - Who need more tailoring of software
          - Which creates more **local** jobs...

Open Source and Culture

- How many languages are “fiscally sound”?
  - India has 18 official languages, two character sets
    - India has 5000 unofficial languages
- Can you make a computer affordable and usable by the illiterate?
  - What if the software company sees “no profit” in doing that?
  - What if your country is called “India”?

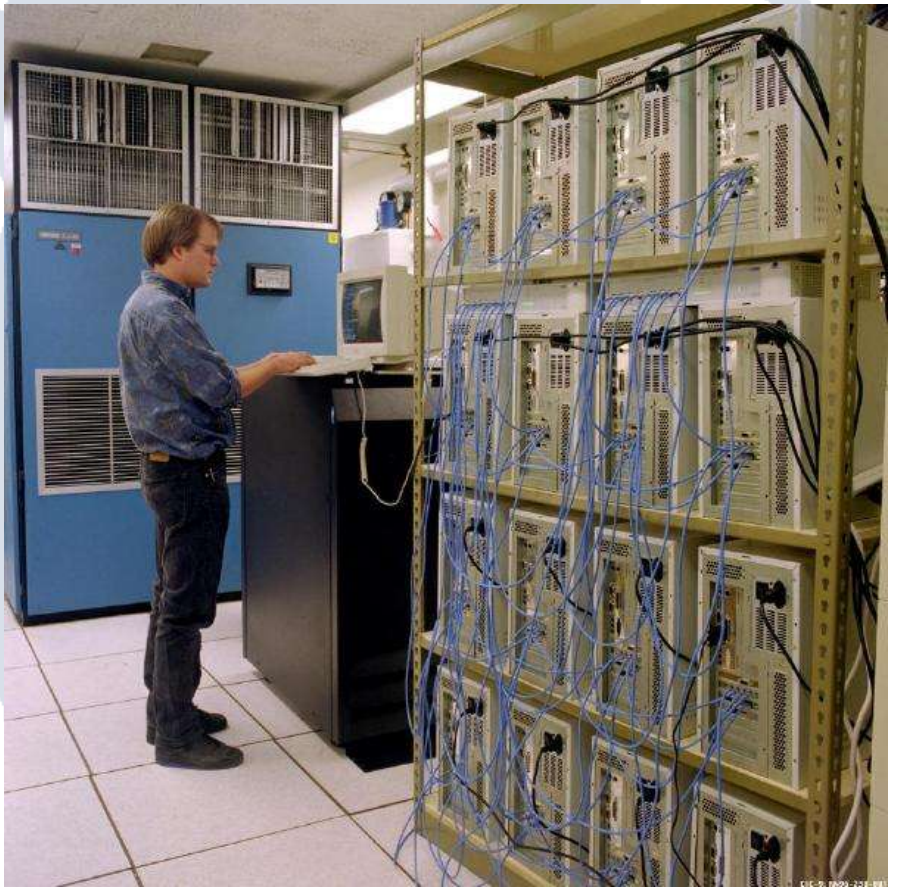
In one way or another, aren't we all “Indian”?

Robots In New Hampshire

- RWI, Jaffrey, NH
- Robots use 1, 2 or three Linux systems (depending on size) to control them

Supercomputers 1994/95

- NASA
  - Dr. Thomas Sterling
  - Dr. Donald Becker
- Beowulf
  - COTS systems
  - High speed networking

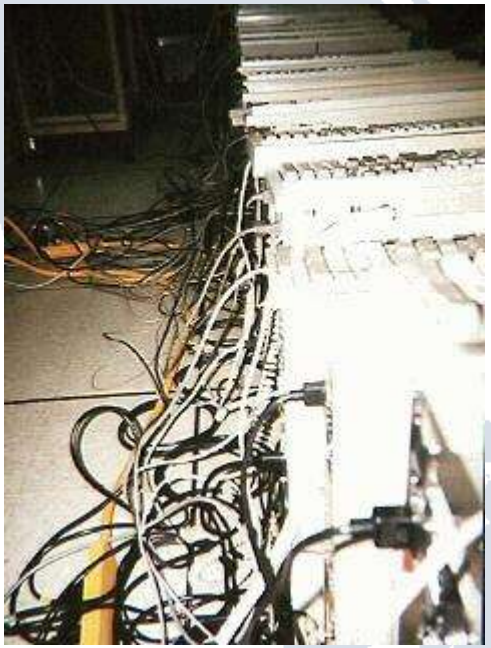


Supercomputers Today

- Beowulf Clusters
  - Thousands of nodes
  - Even more processors
- NUMA machines
- The GRID

...to Workstation Farms....

- Lots of COTS
- Tied together with high-speed networking



Barriers to Entry

In the past hardware was expensive….how expensive is it now…

- …to hire someone who speaks English?
- …to purchase one “seat” for a design engineer?

  ….or 10 seats?
- …to buy all the software you need to start your business?
- …to negotiate all the software contracts you need?

“We are waiting for the letter of authorization…”

Rio de Janeiro

- Company of 18 people
- Investigating new products from Rain Forest
- Software needed was breathtakingly expensive
- Duplicated software with PostgreSQL, Perl, GNUplot, grace, ordpack, Apache
- And in Portuguese, and local jobs

St. Petersburg Turbine Test Bed

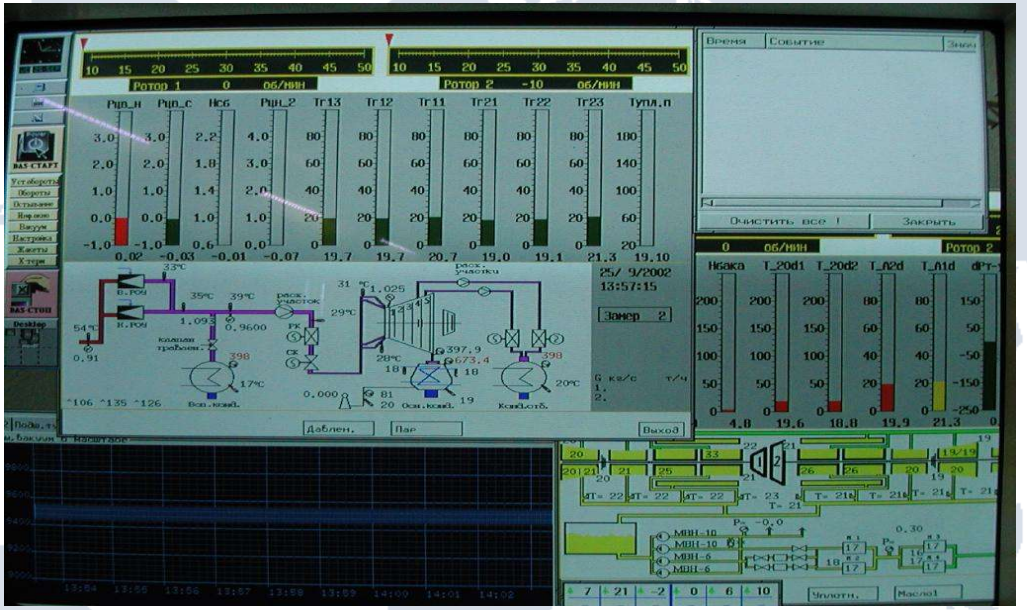
Software needs

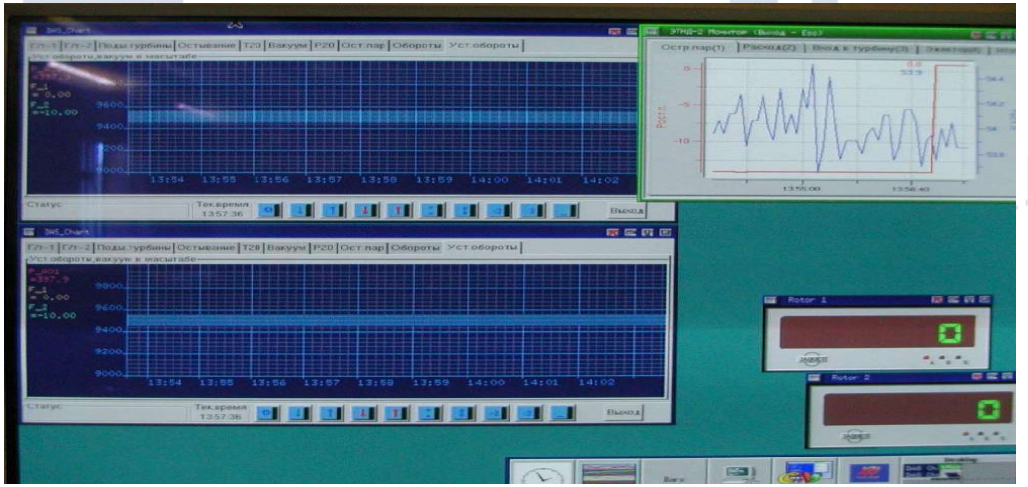
- Low cost
- Flexible

St. Petersburg Turbine Test Bed

Answer:

- Linux
- MySQL
- GNUplot
- Apache
- Tcl/TK
- Python





Helsinki – June 1997

- Kiosks
- Linux Ideal for Embedded
  - Secure
  - Stable
  - Multi-tasking
  - Multi-architecture
  - Royalty-free
- How many kiosks will you need?

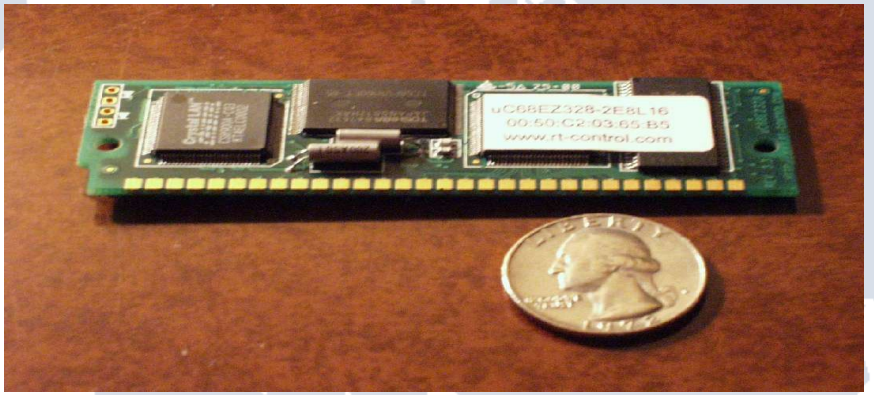
How many will your customers need?

Universities

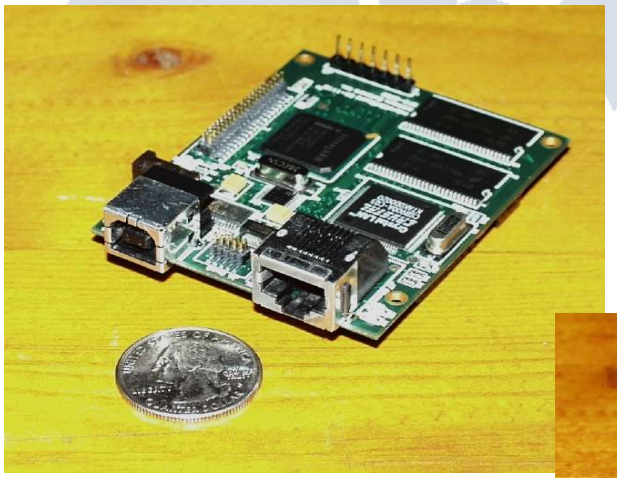
- Microsoft
  - In courseware
  - In research
- Free Software
  - collaboration
  - readily useful
- Jobs

....Other Embedded Systems...

- Imagine Alabama building products with these
- Imagine Alabama designing these

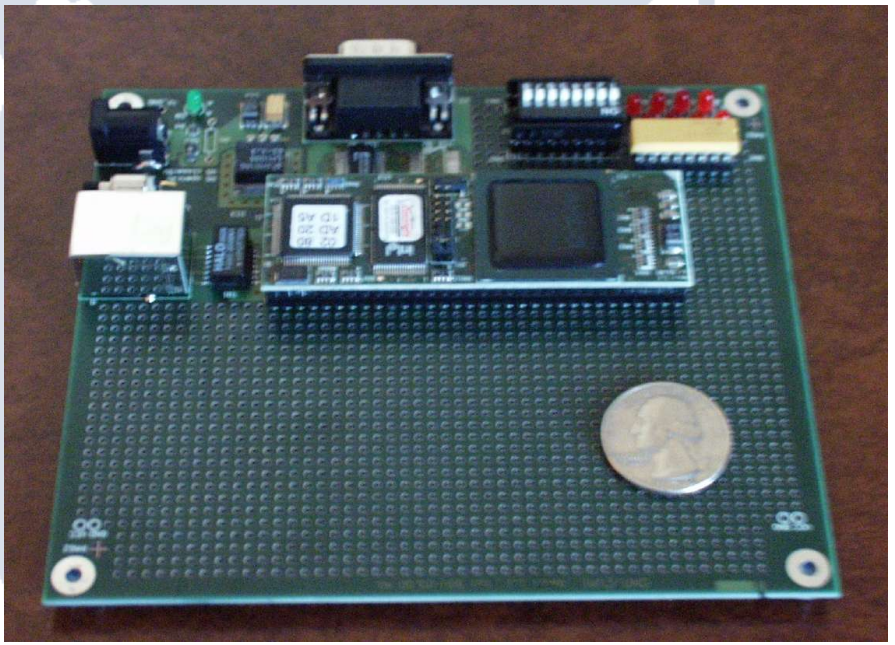


IBM/Citizen Watch WatchPad



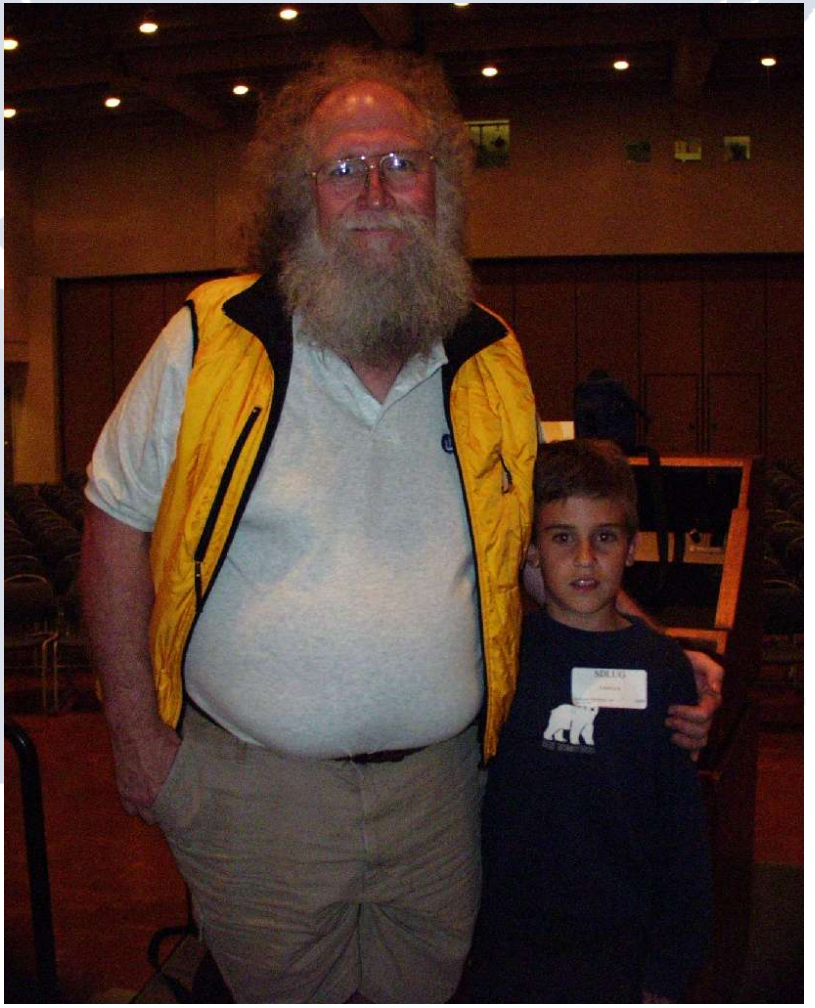
Start Embedded Systems Projects

- Buy tools for Universities
- Encourage Students to develop projects
- Encourage manufacturers to produce new projects



More Importantly

- A 15 year old kernel developer
- A 14 year old distribution developer
- A 13 year old systems admin
- An 11 year old programmer of supercomputers



Do Not Be Afraid Of The Word Service

- This is not Venezuela
- 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

Capabilities of Linux Today

Easier to talk about where it is not...

- Single System Image Clusters still need some work
- Scheduler for soft real time needs work
- Home support system not set up
- Applications still need to be ported
- Not supported by every peripheral

“Every place but largest database...”

- Jonathan Eunice, Illuminata

You Will Be Told...

- Linux does not scale
  - False: 10240 processors on SGI
  - False: thousands of processors on NUMA
- Linux is hard to use
  - False: Linux is different
  - New installations find it no harder
    - Thailand
    - KDE study
    - Ball Music

You Will Be Told...

Some company's code is "open"

- To all countries?
- To all universities, colleges, grade schools?
- To all companies, competitors or not?

If it is not completely open....it is worse than being completely closed.

You Will Be Told....

Proprietary companies "innovate"...

- Look at www.sourceforge.net
  - 90K+ projects
  - 1000K+ registered developers
- Do proprietary companies distribute innovations when those innovations do not make business sense for **their** current business?

How To Implement Linux

- Firewalls and DNS servers
- File and Print Servers
- Intra and Internet web servers
- Thin clients
- Free Software on MS systems
  - Open Office
  - Mozilla
- Fat clients

Examples

- Germany has switched its parliament to Linux Servers
  - Munich – 14000 desktops
- China has made Linux “Operating System of Choice”
  - No “BSA” for them
  - 700 USD functionality for 70 USD
- Brazil has blended government, industry and the Software Livre! Community to work together on various projects

Projects large and small, all over the world

Interesting Opportunities

- Cheap Hardware accelerators
  - Engage engineering
  - Recover in volume sales
- Service and Integration
- Secondary investments
  - Business amplifiers
    - Better products
    - Less expensive products
    - Faster innovation

Remember

- Free Software is more than Linux
- Free Software is inevitable.

I Would Like to Thank

- Linux International
- Linux International member companies
- IBM (for this really cool laptop)

Thanks to The Linux Community on behalf of:

- The Bore hole Project in Africa (allows clean water for 7000 additional families)
- Creation of low-cost community computers for India bringing Internet capabilities ($200 for a sharable computer)
- The Royal Navy Air and Rescue Force (allows faster rescues)
- The Genome project (allows easier sharing of data)
- Faster Detection of Cancer (20 hours to 10 minutes)
- For the hundreds of students at the University of the South Pacific in Fiji (to study and learn)
- 1600 doctors in Cuba who use it (to spread information)
- Scientists at Fermilab looking for the smallest bit

Questions?