

Linux and Open Source

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<http://www.lugod.org/>

Presented to the Mission Oaks Computer Club

December 11, 2003

What is “Linux?”

- A UNIX-like Operating System, created from scratch by developers around the world.
- Began as a hobby project by a Finnish University Student in 1991. Now a multi-billion-dollar per year industry.
- Capable of running on tiny embedded systems (PDAs, robots, DSL routers) as well as the largest mainframes.

What is “Open Source?”

- “Open Source” is a kind of software license (a kind of “End User License Agreement”)
- There are a number of different licenses which are certified as “Open Source” (by the non-profit “Open Source Initiative”)
<http://www.opensource.org/>

What is “Open Source?”

- It doesn't *just* mean “Access to the source-code”
- The license must **not restrict** anyone from **selling** or **giving away** the software
- The program **must include** the **source code**, and allow distribution
- The license **must allow** for **derived works** and other modifications to be released under the same license
- The license **must not discriminate** against **persons or groups**
- The license **must not discriminate** against **fields of endeavor** (e.g., it cannot say “For educational use only”)

Why choose Open Source?

- **Open Source is Flexible**
 - The source code is available, so it can be altered to suit your needs.
 - A program can change in ways the author never intended or dreamed of!
- **Open Source is Inexpensive**
 - Up front costs for the software are nil!
 - Because the source is available, anyone can learn how software works, so support can become competitive; and therefore *cheap!*

Why choose Open Source?

- **Open Source developers are motivated**
 - Most developers of Open Source are doing it because they have a need or a want to; they are not simply programmer drones at a huge corporation!
- **Better Security, and fewer bugs!**
 - Accidental (or malicious) bugs are found quickly, since anyone and everyone can examine the code.
 - Viruses, “spyware,” etc. are almost non-existent!
 - Actual bugs are fixed quickly, and in the open.

Why choose Open Source?

- **The code will survive!**
 - While the loss of a major corporate contributor may be a deterrent, it will never mean the *death* of a piece of Open Source software.
 - The code will always be out there, since it can always be passed along!
- **You can contribute!**
 - Even if you cannot help write the software, you can contribute with bug reports, feature requests, etc.
 - When was the last time you e-mailed someone at Microsoft who works on OfficeXP!?

Why Switch to Linux?

- Many are frustrated with **bugs**, **viruses**, and **crashes**.
- Others are sick of **spyware**, **pop-up ads**, and having their computers **hijacked** to attack others or send spam.
- Some are tired of **recurring costs** (both new versions of software, and new hardware just to run it!)
- Finally, many have major concerns with new **licensing** that takes away their **rights** and invades their **privacy!**

Other Reasons to Use Linux

- Linux is a powerful **multitasking, multi-user** operating system
- The underlying OS and tools are separate from the graphical environment (GUI), so it is more well suited as a server. (It can run powerful servers on less powerful hardware.)
- It runs web servers, databases, email, print servers, file shares...

Where does Linux run?

- **Embedded systems**
 - TiVo & entertainment systems
 - Robots
 - PDAs / hand held computers
 - Cellphones
 - Gateways, server appliances, wireless access points
 - Point-of-sale systems (cash registers)

Licensing cost for the Linux OS itself is \$0.

Compared that to commercial embedded OSes!
(Every dollar counts in this arena!)

For more, see: <http://www.linuxdevices.com/>

Where does Linux run?

- **Variety of CPU architectures**
 - “IBM Compatible” PCs
 - 386, 486, 586, Pentium
 - Next generation PCs
 - Itanium, AMD64/Opteron
 - Motorola 68000 / PowerPC
 - Apple Macintosh, Atari ST, Amiga, etc.
 - Alpha
 - ARM
 - IBM S/390
 - MIPS
 - PA-RISC
 - Sparc

<http://www.xs4all.nl/~paulvand/linuxweb/docs/architectures.htm>

Where does Linux run?

- **Giant Mainframes & Clusters**
 - IBM, HP and others sell Linux-based systems
 - Some make their own large systems out of hundreds, or thousands of commodity systems (clusters)
 - Users include:
 - Google (search engine)
 - Amazon (e-commerce site)
 - Dreamworks (animated motion pictures)
 - NASA
 - National weather service
 - Other government & military

Where does Linux run?

- **Thin Clients (and servers)**
 - Linux servers store and run applications, and store all user data
 - Extremely low-end Linux clients display the applications
 - Used in K-12 schools and colleges, and some small businesses

Microsoft software seems *particularly* insecure

November 2002

Internet Explorer bug allowed malicious websites and emails to control PCs.
(Example site demonstrated simple “FORMAT A:” command
by simply visiting a web page!)

<http://www.jmu.edu/computing/security/info/iehot.shtml>

January 2003, Davis-Besse Nuclear Power Plant, Ohio

Safety monitoring system disabled for *5 hours* due to “Slammer” worm

<http://securityfocus.com/news/6767>

June 2003, Harvard University

Personal correspondence between administrators and the Dean of Faculty at
Harvard accidentally leaked due to Windows virus

<http://www.thecrimson.com/article.aspx?ref=348459>

Microsoft is one of many who 'spy' on its own customers

September 2000

Internet Explorer 5.5 tracked default bookmarks by redirecting via an MS server

<http://slashdot.org/articles/00/09/13/0023213.shtml>

April 2002

Windows XP Search Assistant silently connects to a server at Microsoft

<http://www.theregister.co.uk/content/4/24815.html>

February 2003

Microsoft Media Player logs users' DVD picks to server at Microsoft

<http://www.itworld.com/AppDev/1471/IDG020221mediaplayer/>

Windows XP Update extracts info. about PCs and sends it to an MS server

<http://www.theinquirer.net/?article=7980>

Governments Switching to Linux and Open Source!

(Just the *latest* news...)

- Britain's National Health Service considering
(December 2003; <http://observer.guardian.co.uk/business/story/0,6903,1101344,00.html>)
- Brazil leaning away from Microsoft
(November 2003; <http://apnews.excite.com/article/20031116/D7URSKHO0.html>)
- “Vietnam embracing open-source products”
(October 2003; <http://www.bayarea.com/mld/mercurynews/business/7139304.htm>)
- Massachusetts mandates open source; locks horns with Microsoft
(October 2003; http://www.boston.com/business/articles/2003/10/19/in_open_source_gain_bay_state_locks_horns_with_microsoft/)
- “Israel slams the door on Microsoft”
(October 2003; <http://www.theregister.co.uk/content/4/33365.html>)
- UK Office of Government Commerce
(October 2003; <http://news.bbc.co.uk/1/hi/technology/3181108.stm>)
- “Japan, China, Korea may develop Windows replacement”
(August 2003; <http://www.reuters.com/locales/newsArticle.jsp?type=technologyNews&storyID=3363256>)
- “City [of Toronto Children's Services Division] rolls out Linux desktop”
(July 2003; http://www.itworldcanada.com/index.cfm/ci_id/46194.htm)
- Linux reaches Afghanistan
(July 2003; <http://news.bbc.co.uk/2/hi/technology/3067871.stm>)

Not ready for Linux? Use Open Source anyway!

- Countless applications have been released as Open Source
- Much is developed specifically for Linux
- However, much is either designed with other platforms in mind, or gets 'ported' later!
- Some major commercial applications were later released as Open Source software!

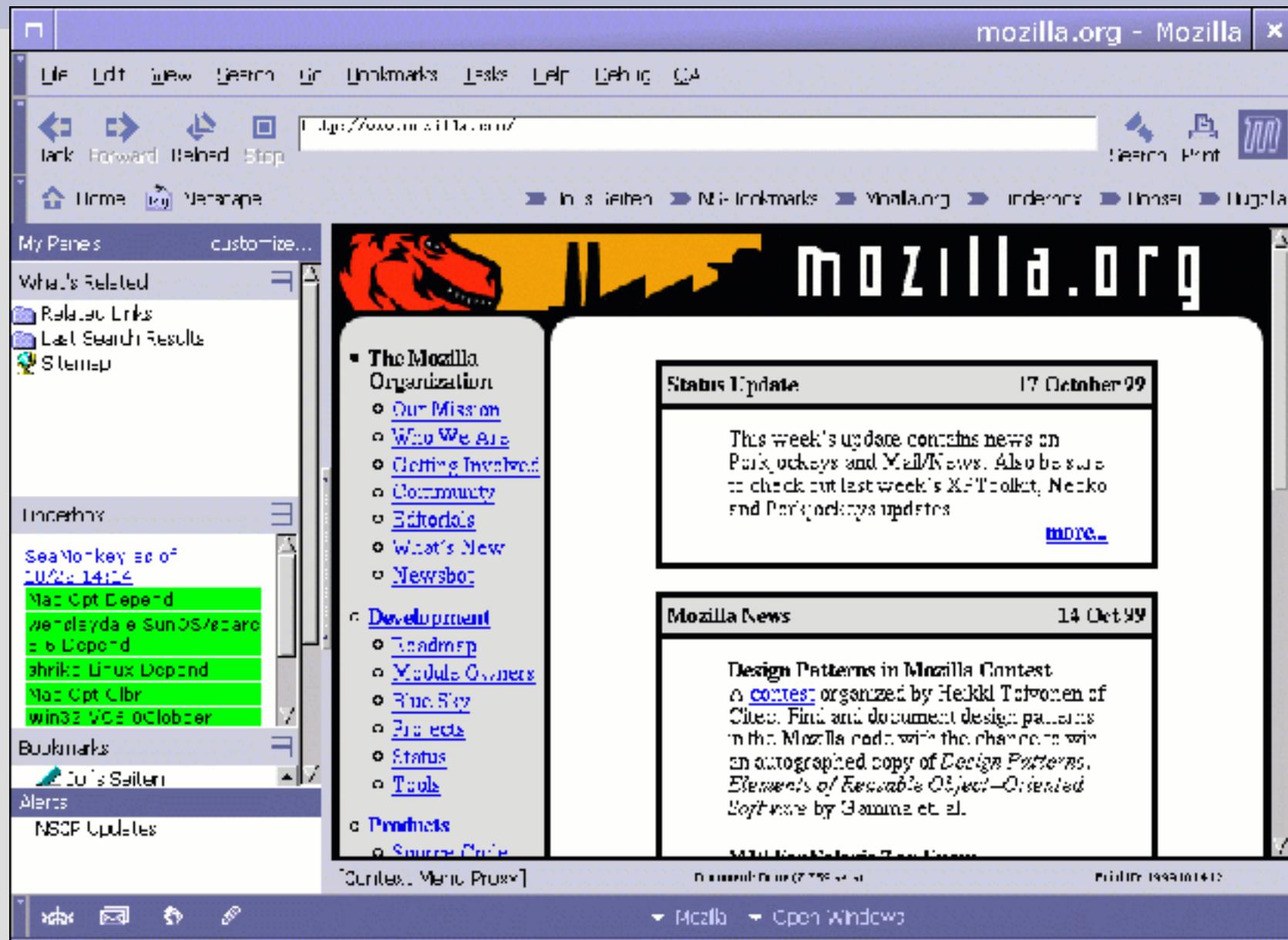
Examples of Open Source software you can use TODAY

- **Mozilla – Web Browser**
 - Netscape code base was released “into the wild”
 - It is now one of the most standards-compliant browsers
 - Developers design it to be **user-oriented**, rather than creating yet another means to serve **advertising**
 - AOL now uses Open Source Mozilla project as a basis for commercial Netscape releases!!!

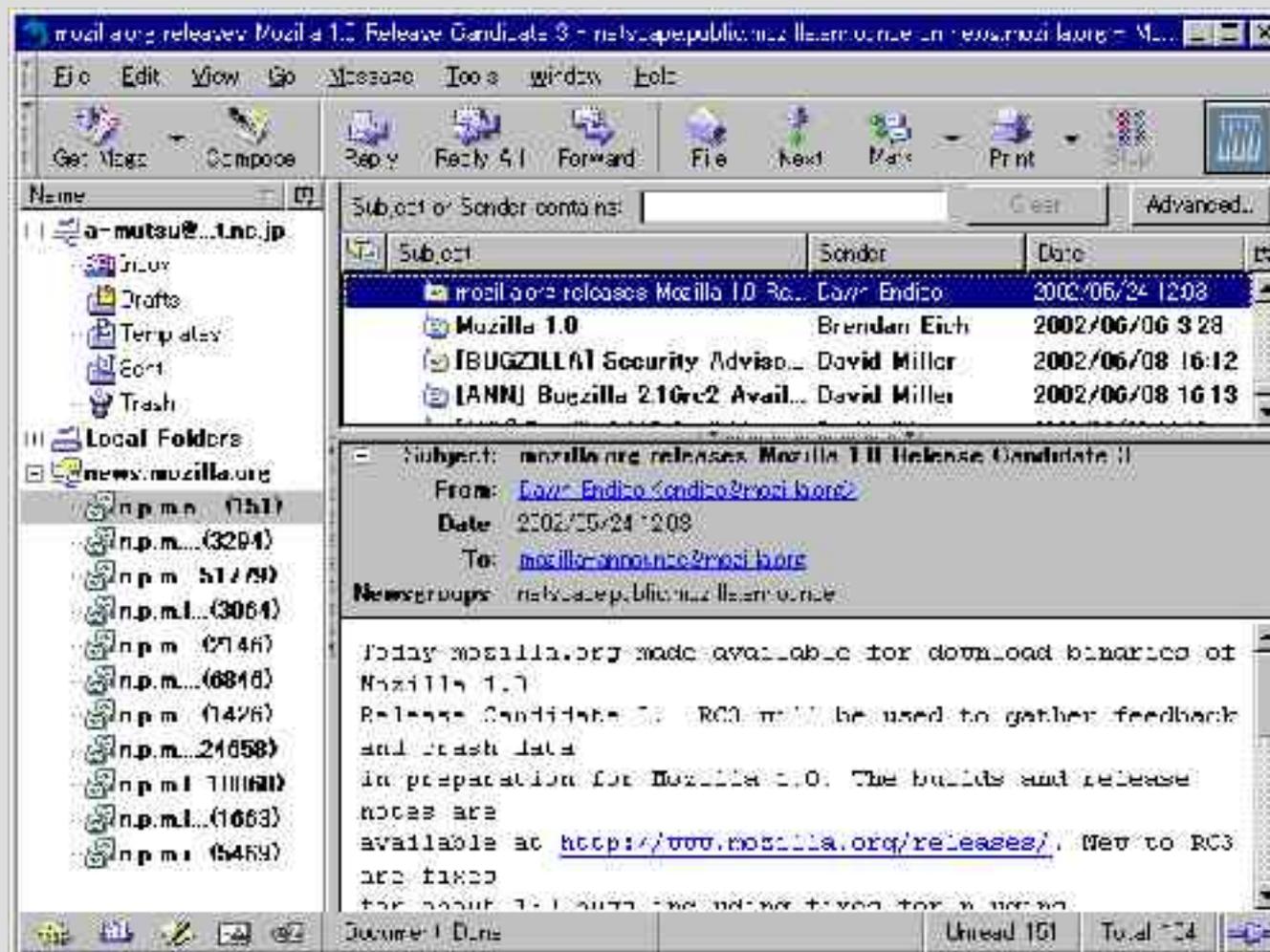
<http://www.mozilla.org/>



Mozilla Browser



Mozilla Mail and Usenet News reader



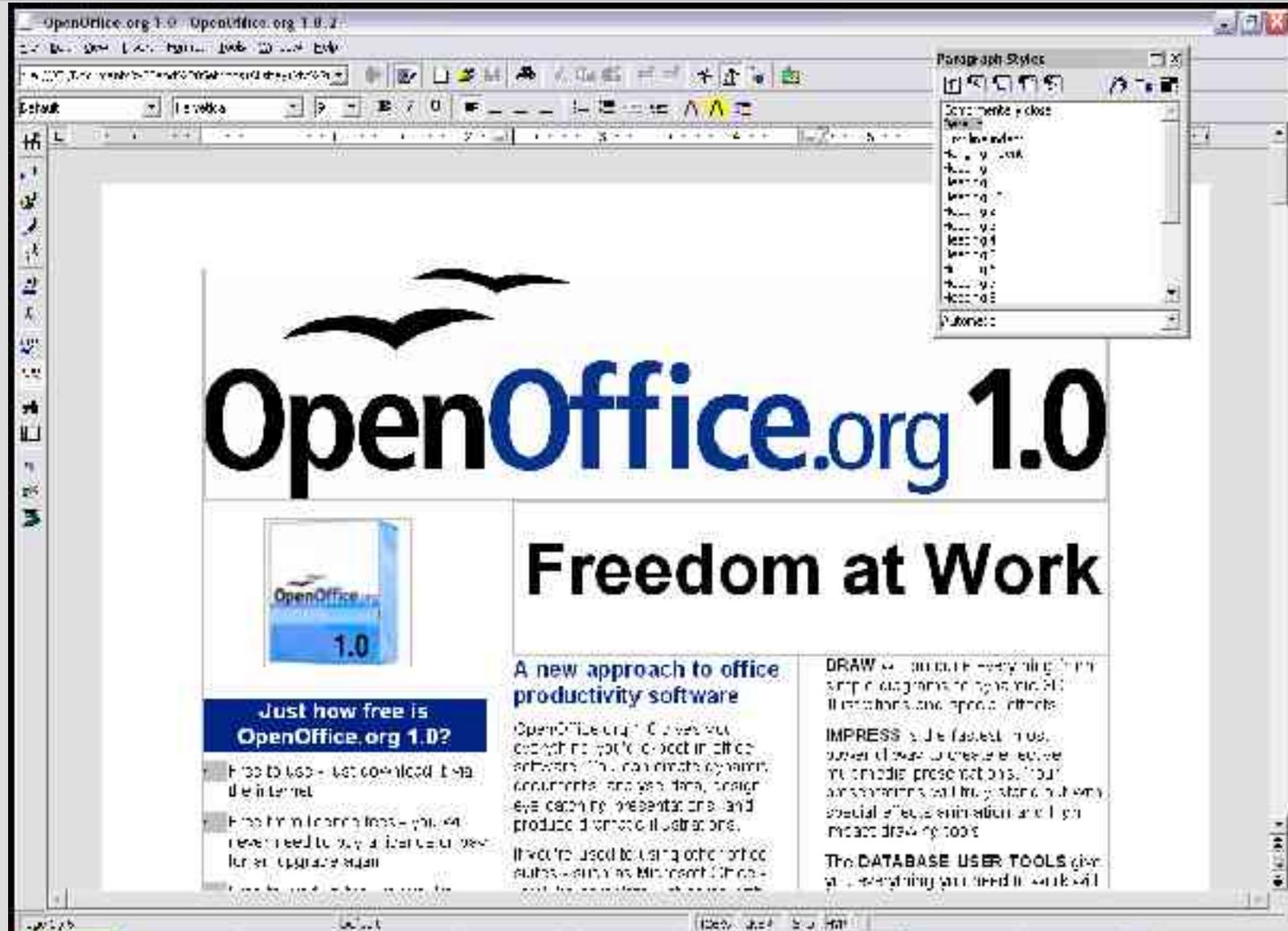
Examples of Open Source software you can use TODAY

- **OpenOffice.org** – Office productivity suite
 - German “StarOffice” suite was purchased by Sun Microsystems and released as Open Source
 - Has a high degree of Microsoft Office compatibility
 - Can export directly to PDF
 - Includes integrated **Word Processor**, **Spreadsheet**, **Presentation**, and **Drawing** apps
 - Like AOL/Netscape does with “Mozilla,” Sun now uses OpenOffice.org as a basis for their commercial “StarOffice” product

<http://www.openoffice.org/>



OpenOffice.org Writer



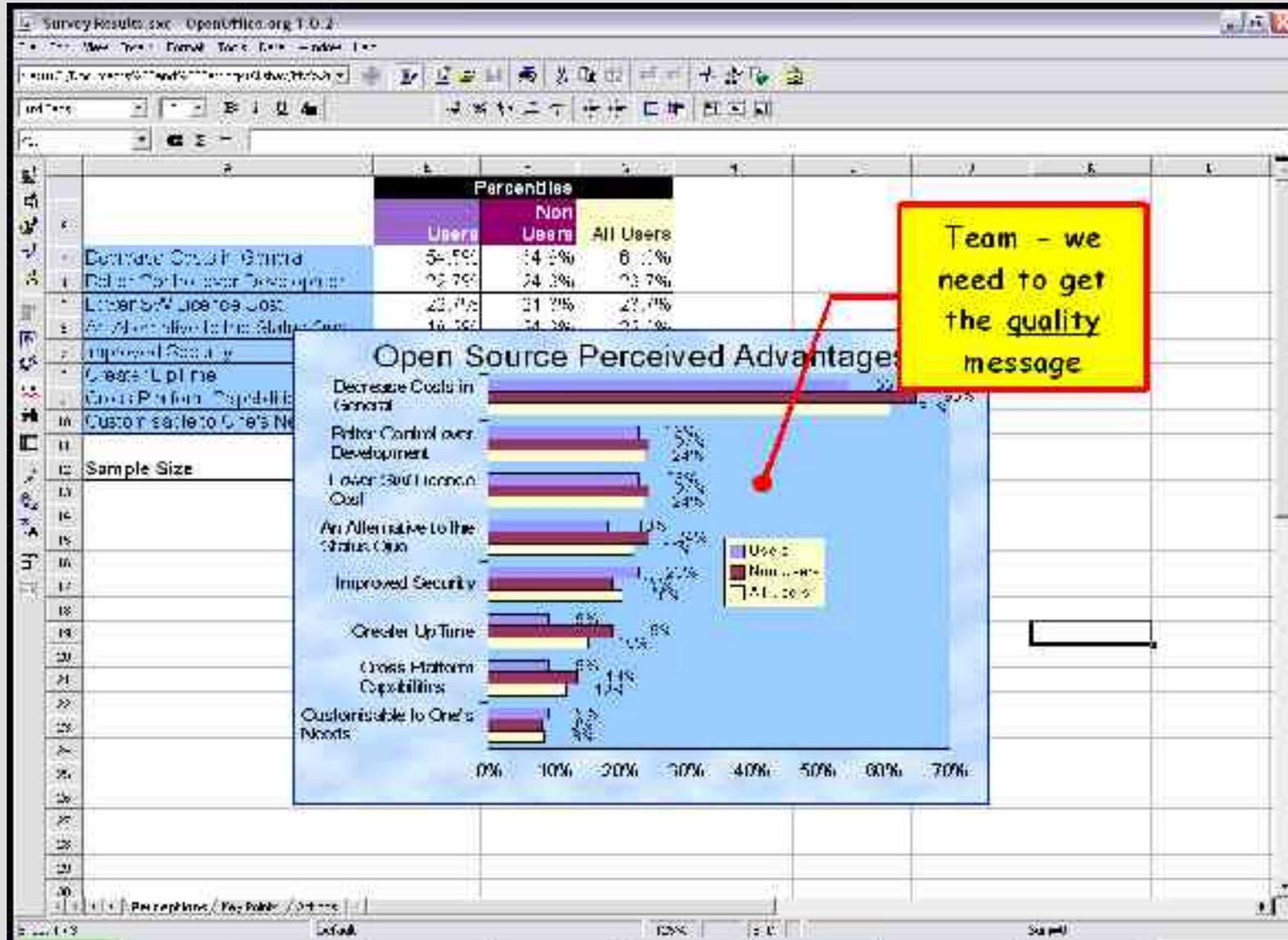
The screenshot shows the OpenOffice.org 1.0 Writer application window. The title bar reads "OpenOffice.org 1.0 - OpenOffice.org 1.0.2". The menu bar includes "File", "Edit", "Format", "Tools", "Window", and "Help". The toolbar contains various icons for file operations and editing. The main editing area displays a promotional page for OpenOffice.org 1.0. The page features the OpenOffice.org logo (two birds) and the text "OpenOffice.org 1.0" in a large blue font. Below this, the heading "Freedom at Work" is prominently displayed. The page is divided into several sections:

- Just how free is OpenOffice.org 1.0?**
 - Free to use - Get downloaded & installed from the internet.
 - Free from license fees - you will never need to pay a license fee or buy an upgrade again.
 - Free to modify & improve - you can
- A new approach to office productivity software**

OpenOffice.org 1.0 was not designed to be a direct office software. It is a complete dynamic documents and graphics design eye-catching presentations and produced dynamic illustrations.

If you're used to using other office suites - such as Microsoft Office - you'll be surprised at how easy
- DRAW** - produce every thing from simple diagrams to highly detailed illustrations and spreadsheets.
- IMPRESS** - the fastest, most powerful way to create effective multimedia presentations. Your presentations will truly stand out with special effects, animation and high impact drawing tools.
- The DATABASE USER TOOLS** give you everything you need to work with

OpenOffice.org Calc



Examples of Open Source software you can use TODAY

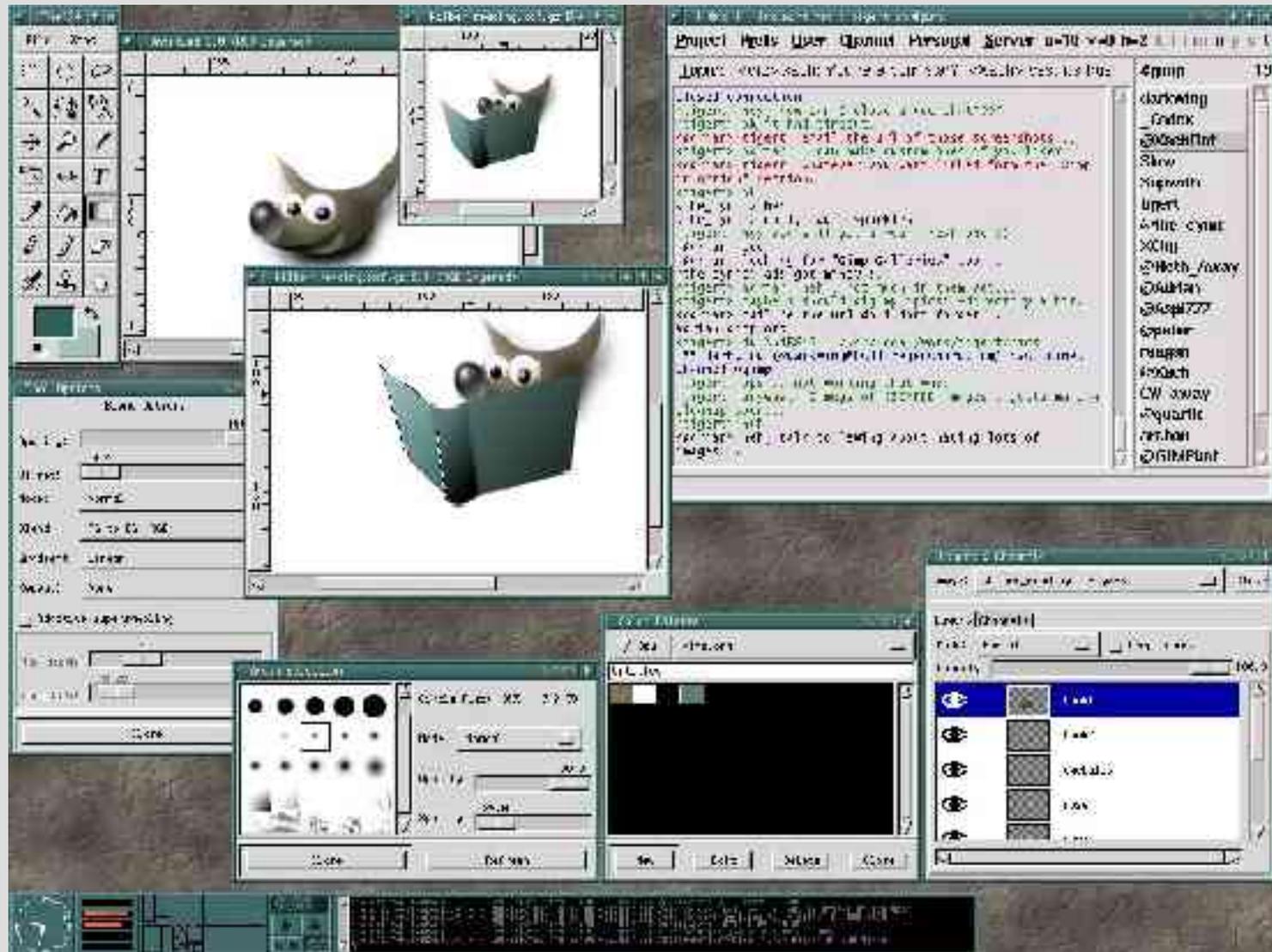
- **The Gimp** – Graphics manipulation software
 - Originally developed for Linux and Unix by students at UC Berkeley
 - Handles photo retouching, image composition, image authoring, and file format conversion
 - Includes layers, filters, full script-ability, batch processing capabilities, and much more!
 - Often dubbed “a free replacement for PhotoShop”

<http://www.gimp.org/>

<http://www2.arnes.si/~sopjsimo/gimp/> (For Windows)



The Gimp



Examples of Open Source software you can use TODAY

- **Flight Gear** – Flight simulator
 - Goals include:
 - Creating a sophisticated simulation framework for research and academic environments
 - For development and pursuit of other simulation ideas
 - And, of course, as an end-user application

<http://www.flightgear.org/>



Examples of Open Source software you can use TODAY

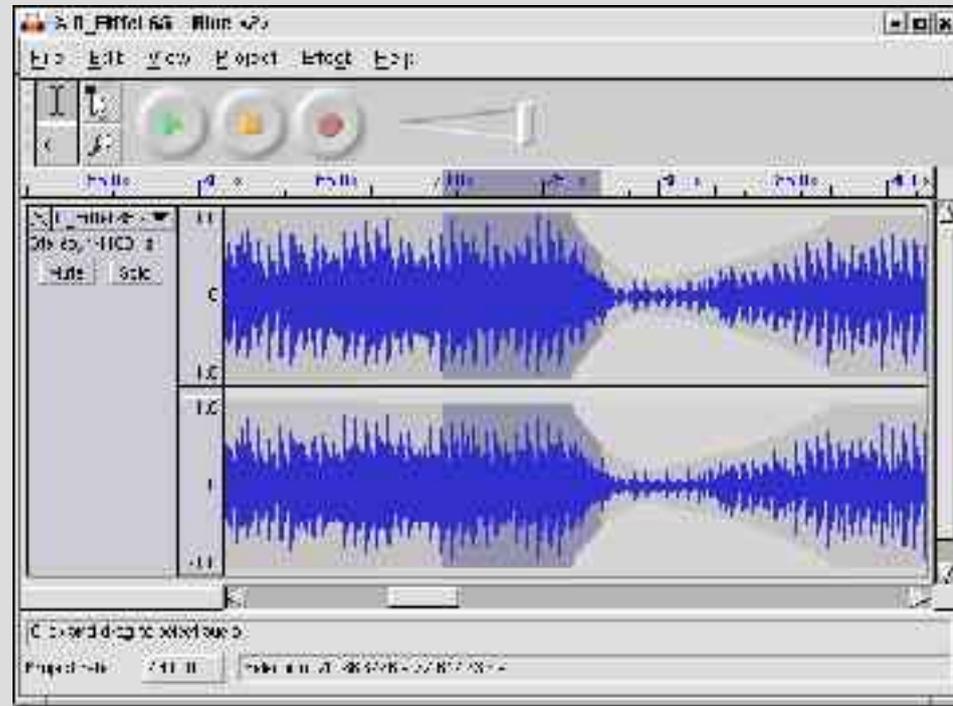
- **GCC** – The GNU C Compiler
 - Famous Open Source compilers for C, C++, Java and Fortran
 - Ported to countless CPU architectures
 - Capable of cross-compiling between architectures

<http://www.mingw.org/> (GCC for Windows)

Examples of Open Source software you can use TODAY

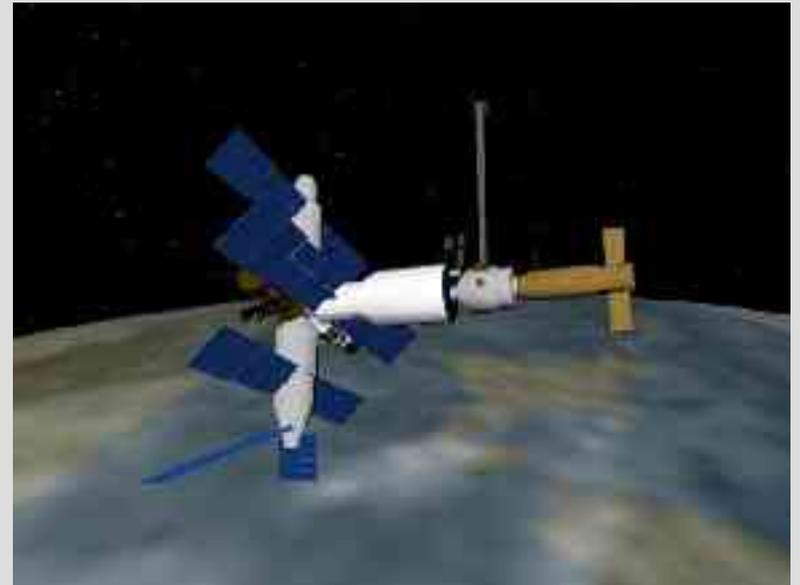
- **Audacity** – Audio editor
 - Sound record and playback
 - Import and export, WAV, MP3, AIFF and more
 - Edit, mix and apply effects to sounds
 - Additional effects can be added via plug-ins

<http://audacity.sf.net/>



Examples of Open Source software you can use TODAY

- **Celestia** – Real-time space simulation
 - Full 3D graphics
 - Visit the Solar System
 - Visit hundreds of thousands of stars



<http://www.shatters.net/celestia/>

Examples of Open Source software you can use TODAY

- **Tux Paint** – Drawing for young children
 - Easy enough for 3-year-olds
 - Can be 'locked down' (full-screen display, disable “Quit” and “Print” buttons, etc.)
 - Translated into over 30 languages



<http://www.newbreedsoftware.com/tuxpaint/>

Get Open Source Software!

- **GNU Win II**

A free software compilation for Windows.

Download any/all programs from the website.

Purchase a CDROM with select titles

<http://gnuwin.epfl.ch/>



Get Open Source Software!

- **The Open CD**

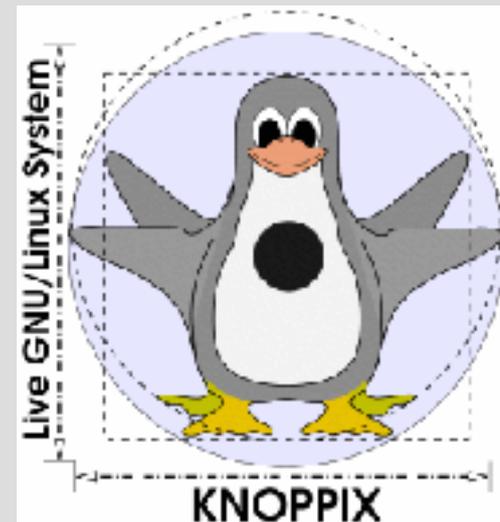
Another free software compilation for Windows. Includes only software for a broad audience, which has been thoroughly tested.



<http://www.theopencd.org/>

Get Linux (*No-commitment!*)

- **Knoppix** - “Live CD” of Linux
 - NOT an install disc.
 - Doesn't place Linux on your hard disk...
 - Runs completely from CDROM!
 - When you're done, shut down and remove the disc; reboot and you're back in Windows!
 - Known for it's ability to detect most hardware peripherals without any configuration!
 - Sometimes used as an “emergency” boot disc to recover a dead Linux or Windows system! (Even for forensics!)



<http://www.knoppix.org/>