Linux and Open Source

Bill Kendrick
bill@newbreedsoftware.com

Linux Users' Group of Davis
http://www.lugod.org/

Presented to the Mission Oaks Computer Club
December 11, 2003
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/](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

June 2003, Harvard University
Personal correspondence between administrators and the Dean of Faculty at Harvard accidentally leaked due to Windows virus
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”
- “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 Calc

Team - we need to get the quality message.
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

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/