

Survey of Linux and Open Source Technologies and their Business Functions

An Introduction for Information Technology Professionals

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Philadelphia Area Network Technologies User Group

<http://www.CJFearnley.com/pantug.july.2006.presentation.pdf>

An Introduction to Linux and Open Source

Outline

1 Intro to The World of Linux

- My Path With Linux
- Definitions and History
- The Revolution
- Linux Distributions

2 Linux Market Trends

- The Business Case for Linux
- Significant Linux Trends

3 OSS Applications

- Development Tools
- Web Services
- E-Mail
- Open Source on the Desktop
- Miscellaneous

4 Summary

- Outlook for Information Technology Professionals

Notable Quotable

Dare to be Naïve!

— Buckminster Fuller



My “World in Linux”

1989 BA in Mathematics and Philosophy, Binghamton University

1993 Installed and started using Linux “full-time”

1993–1997 Unix SIG Leader, Philadelphia Area Computer Society (PACS),
<http://www.pacsnet.org/>

1995–Present Co-Founder, Meeting Facilitator, Philadelphia Linux User
Group (PLUG), <http://www.phillylinux.org/>

1996–Present Co-Founder LinuxForce, Inc., <http://www.linuxforce.net/>

2003–Present President & CEO, LinuxForce, Inc.

2006 Named to Philadelphia Business Journal’s “40 Under 40” List

Website: <http://www.CJFearnley.com>



Tux: The Linux Mascot



Linux Kernel The very low-level software that manages your computer hardware and provides a library (POSIX) interface for user-level software. The Linux kernel runs on many platforms (Intel x86, IA-64, AMD64, Alpha, MIPS, HP PA-RISC, PowerPC, IBM S/390, SPARC, Motorola 680x0, etc.).



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GNU/Linux OS The Linux kernel plus utility software to provide a useful working environment.



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GNU/Linux OS The Linux kernel plus utility software to provide a useful working environment.

Linux Distributions The packaging of the Linux Kernel, the GNU/Linux OS and lots of other software to make Linux easy to install, configure, and use (at least for the target audience).



Linux Historical Timeline

- 1969 Ken Thompson develops UNIX at AT&T
- 1983 The GNU Project launched by Richard Stallman
- 1991 Linus Torvalds releases Linux 0.02
- 1994 Linus Torvalds releases Linux 1.0
- 1997 The Debian Free Software Guidelines
- 1998 Open Source Definition
- 2006 A Promising Future ...



Notable Quotable

There is only one revolution tolerable to all men, all societies, all political systems: revolution by design and invention.

— R. Buckminster Fuller



The “Free” Software Movement

The GNU Project: www.gnu.org

A libertarian social movement: non-free software is a social problem and free software is the solution.

The “Free” Software Definition (“The Four Freedoms”)

- The freedom to run the program, for any purpose.
- The freedom to study how the program works, and adapt it to your needs.
- The freedom to **redistribute** copies so you can help your neighbor.
- The freedom to improve the program, and release your improvements to the public, so that the whole community benefits.

The **GPL**: The GNU Public License



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Notable Quotable

You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.

— R. Buckminster Fuller



The Open Source Initiative

OSI: www.opensource.org

A new perspective on “Free” software: A pragmatic business and engineering initiative (non-free software is a tolerable engineering/business strategy that one may need from time-to-time).

The Open Source Definition



The Debian Free Software Guidelines (DFSG)



- Free **redistribution**, Include Source code, Allow derived works
- Proviso to protect the integrity of original author
- No discrimination against persons, groups, or fields of endeavor
- Rights must transfer upon redistribution
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Notable Quotable

I'm still not very philosophical about open source. To me, its pretty pragmatic. [I have] a very strong belief that cooperation and open sharing of knowledge ends up resulting in better development. [...]



<http://www.crn.com/>

I guess you could call the belief in sharing of knowledge a philosophy, but I just think it's a fact. It's what differentiates science from alchemy or witchcraft. Anybody who doesn't believe in it is just wearing some serious blinders.

— Linus Torvalds



Benefits of Free, GNU, and Open Source Software

- Humanity's cultural heritage (as software) is significantly enhanced by FOSS (Free and Open Source Software)
- Transparency (vs. binary only software)
- Auditability
- Easy access to the software: download source or binaries
- Open Source tends to be both high quality and economical
- Strong communities for development and support:
Engineering is best when members work together to positively address all constituents' concerns.
- Developers, Developers, Developers!
- Code, Code, Code!



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Notable Quotable

You can't better the world by simply talking to it.
Philosophy to be effective must be mechanically applied.

— Buckminster Fuller



Linux Distributions

A **Linux Distribution** is a collection of software based around the Linux kernel designed to ease installation, administration, and use. There are hundreds of Linux Distributions available.

Debian Large (> 1200 developers), community developed distribution. Strong policy. 15K packages, growing by 20% annually. Most cosmopolitan. Largest(?)

Knoppix Bootable "test drive" CD and for system rescue.

Ubuntu Aimed for desktop users.

Xandros Originally Corel Linux aimed for desktop users.

Red Hat Early star. Now, aimed at the Enterprise.

Fedora Red-Hat-sponsored and community-supported.

Mandrake Another Popular Red Hat derivative.

SuSE Novell acquisition. Quality German engineering.

Slackware Old, but still popular.



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Notable Quotable

The most important fact about Spaceship Earth:

— Buckminster Fuller



Notable Quotable

The most important fact about Spaceship Earth:
an instruction manual didn't come with it.

— Buckminster Fuller



Linux On The Rise

Evidence for Linux and FOSS growth:

- Worldwide Linux servers posted their fifteenth consecutive quarter of double-digit growth, with year-over-year revenue growth of 17.0 percent and unit shipments up 14.4 percent in the first quarter of 2006, according to IDC's Worldwide Quarterly Server Tracker.

Source: <http://www.dbta.com/linuxexecutivereport/archives/5-31-06.html#5>

- Linux growth 'to outstrip Windows by a factor of 3: Oracle predicts annual growth of 12 percent for the open source OS

Source: <http://uk.builder.com/programming/unix/0,39026612,39305138,00.htm>

- Shipments of Linux-based point-of-sale (POS) systems in North America grew 5% in 2005 to \$540 million in the \$6 billion market.

Source: <http://www.linuxdevices.com/news/NS7190640662.html>

- Linux Growth in Developing Countries Soaring Past Microsoft

Source: <http://lxer.com/module/newswire/view/52776/>



The Business Case for Linux

- UN: FOSS General Introduction Primer

<http://www.iosn.net/foss/foss-general-primer/>

- Baseline “Open source comes of age”

<http://insight.zdnet.co.uk/software/linuxunix/0,39020472,39257067,00.htm>

- Baseline “A New Program For The Enterprise”

<http://www.baselinemag.com/article2/0,1397,1630445,00.asp>

- CIO Magazine's “The Myths of Open Source”

<http://www.cio.com/archive/030104/open.html>

- BusinessWeek's “The Penguin's New Desktop Habitat”

http://www.businessweek.com/technology/content/nov2003/tc2003114_2722_tc134.htm

- MITRE Report: A Business Case Study of Open Source Software

http://www.mitre.org/work/tech_papers/tech_papers_01/kenwood_software/index.html

- OS Monoculture is a Threat to Enterprise and National Security

<http://www.crn.com/sections/BreakingNews/dailyarchives.asp?ArticleID=44741>



Significant Linux Trends

- IBM, HP, Oracle, Sun, and Novell are committed to Linux.
- Linux is used by 12 of the Fortune 100 including Disney, GM, Merck, Verizon, and American Express for web hosting.
- Red Hat is losing market share to Debian and SuSE for web hosting.
- Dreamworks' animated film Sinbad: *Legend of the Seven Seas* was created entirely on Linux workstations and rendering machines.
- Disney also uses Linux.
- DoD report on Open Technology Development "combines salient advances" in four key areas:
 - Open Standards and Interfaces
 - Open Source Software and Designs
 - Collaborative/Distributive culture and online support tools
 - Technological Agility

<http://trends.newsforge.com/trends/06/07/07/233257.shtml?tid=138&tid=136>



Notable Quotable

Premature optimization is the root of all evil.

— Sir Charles Antony Richard Hoare



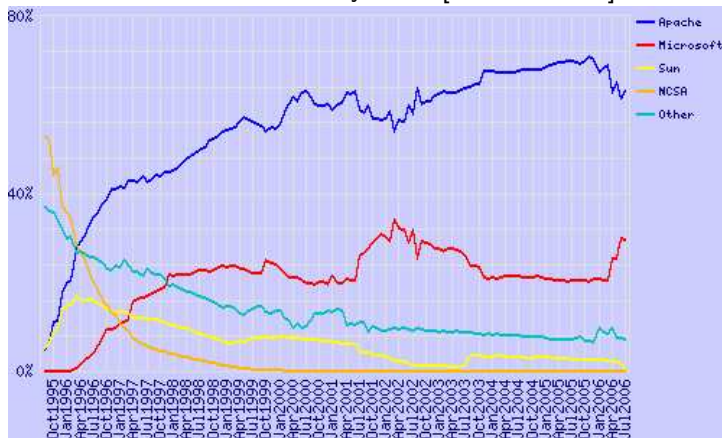
Linux for Software Development

- gcc, g++, gobjc, g77 (fortran), gpc (pascal), assembler, haskell, smalltalk, lisp, scheme, bash, awk, tcl/tk, perl, python, ruby
- Java: gcj, jikes, kaffe, kjc,
- IDEs: eclipse, motor, kdevelop, idle, emacs
- QA: rats, flawfinder, gdb, fitnesse, junit, phpunit, gprof, oprofile
- DotGNU Portable.NET: build a suite of free software tools to build and execute .NET applications, including a C# compiler, assembler, disassembler, and runtime engine
- Code management: cvs, rcs, subversion, arch, gforge



Apache is the leading web server software

Totals for Active Servers Across All Domains
October 1995 - July 2006 [Netcraft.com]



Other Open Source Web Services

- Web development: Apache2, mod_security, PHP, Perl, Python, Ruby on Rails, Java, tomcat, etc.
- Content management: Bricolage, Plone, OpenCMS, Typo3, Drupal, eGroupWare, Diogenes, Textpattern, etc.
- Document management: owl, KnowledgeTree, etc.
- Wikis: MediaWiki (Wikipedia.org), Twiki, MoinMoin, etc.
- Blogs: WordPress, bloxom, tdiar, etc.
- Libraries galore: SOAP, XML, XSLT, java, libcommons, etc.
- E-Commerce: OSCommerce (PHP), CRE Loaded, Interchange (Perl), etc.
- Application Servers: Mason (Perl), jboss (Java), PHP, etc.



E-Mail: Linux at the Cutting Edge

- E-mail services (Osterman Research report finds that most CIOs would consider switching to Linux messaging)
- MTA (Mail Transport Agents): Exim, postfix, sendmail (industry standard), and qmail (open source, but not free)
- Anti-virus: Clam Anti-Virus plus MTA hacks
- Anti-spam: spamassassin plus MTA hacks
- Webmail: squirrelmail, imp
- POP and IMAP servers: courier (for Maildir), qpopper, UW (University of Washington) ipopd and imapd, popa3d, poppassd



Open Source on the Desktop

- Web browsing: Firefox (also Mozilla, Konqueror, etc.)
 - Security: pop-up blocker, ability to block malicious code execution, etc.
 - Usability: tabbed interface, ability to search from the toolbar and bookmark management, live bookmarks allowing access to RSS news feeds and blog headlines using XML, tools to import all of IE's (and other browser's) settings, favorites, and cookies making the switch painless.
- Balsa, Evolution, Thunderbird for pop3/imap mail
- Desktop Office Suite: OpenOffice.org
- Desktop Publishing: Scribus
- GNU favorites: vim, emacs, xemacs, X11



Other Open Source Applications

- Databases: MySQL (speed), PostgreSQL (features — Oxford University is migrating all data center operations to PostgreSQL)
- System virtualization: Xen, VServer, bochs, dosemu, wine, etc.
- Image Manipulation: gimp, imagemagick, Netpbm
- Accounting: sql-ledger, gnucash, kmoney
- CRM (Customer Relationship Management) / Sales Force Automation: SugarCRM, xrms, CiviCRM
- Mathematics: Maxima, Axiom, GAP, PARI/GP, Yacas, scilab



Summary

- FOSS (Free and Open Source Software) licenses guarantee rights to freely use, modify, and redistribute software
- The revolution is underway: Linux and FOSS initiatives are growing rapidly world-around
- Several FOSS packages are already market leaders: **Apache**, **PHP**, **MySQL**, **Sendmail**, **bind**.
- Many more FOSS packages are significant: **Samba**, **PostgreSQL**, **Spamassassin**, **OpenOffice.org**, **jboss**, **sql-ledger**.



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Summary

- Outlook for Information Technology Professionals
 - A FOSS package is probably already good enough to replace some or all of the commercial or lock-in software you use.
 - FOSS communities provide support, knowledge databases, ways to demonstrate competence, news and trends.
 - FOSS, as a growing part of Humanity's cultural heritage, is becoming an increasingly established resource for more and more of the IT infrastructure at more and more organizations.



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Any Questions?

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