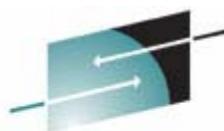




| Linux and Open Source at IBM

An Introduction to Linux and Open Source



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Jim Elliott
Consulting Sales Specialist – System z New Workloads
IBM Canada Ltd.

IBM Systems
Simplify your IT.

9200 – An Introduction to Linux and Open Source

- **Linux and Open Source continue to see substantial growth around the world**
- **This session will provide an overview of Open Source and an introduction to Linux (including concepts and terminology)**
- **Jim will also provide an overview of Novell's SUSE Linux Enterprise (SLE) and Red Hat Enterprise Linux (RHEL)**

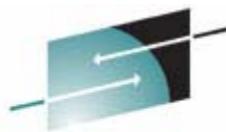
Topics

- **Introduction to Open Source**
- **Introduction to Linux**
- **Novell SUSE Linux Enterprise**
- **Red Hat Enterprise Linux**
- **Linux and Open Source on the Web at IBM**



| Linux and Open Source at IBM

Introduction to Open Source



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<http://ibm.com/developerworks/opensource>

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What is Open Source technology?

<http://www.opensource.org>



- In a word, Open Source is collaboration – more specifically, it's public collaboration on a software project
- According to the Open Source Initiative (OSI), it can be defined this way:
 - “Open source promotes software reliability and quality by supporting independent peer review and rapid evolution of source code. To be OSI certified, the software must be distributed under a license that guarantees the right to read, redistribute, modify, and use the software freely.”
- Open source can also apply to the popular movement of individuals, organizations, and companies that seek to put such software into mainstream usage

What guides Open Source licensing?

<http://opensource.org/licenses>

- According to the Open Source Initiative, Open Source consists of 10 points, which are reproduced below
 - 1. Free redistribution
 - 2. Source code
 - 3. Derived works
 - 4. Integrity of the author's source code
 - 5. No discrimination against persons or groups
 - 6. No discrimination against fields of endeavor
 - 7. Distribution of license
 - 8. License must not be specific to a product
 - 9. License must not restrict other software
 - 10. License must be technology-neutral



Why is Open Source technology important?

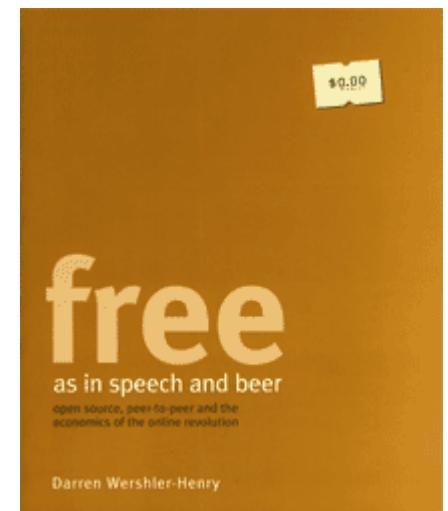
- **Can be a major source of innovation**
 - Innovation can happen anywhere – any time
 - Development through “open communities” leads to potentially broad ideas and creativity
- **Community Approach**
 - The Internet has changed how we address technical innovation
 - Shapes technical leaders thinking and approach to broad collaboration
- **Good approach to developing emerging standards**
 - Popular Open Source projects can become de facto / open standards
 - Wide distribution/deployment
- **Enterprise customers are asking for it**
 - Increase choice and flexibility – adoption/use of Open Source can reduce time to market

What is FOSS?

- **FOSS stands for Free and Open Source Software**
 - Sometimes referred to as FLOSS (Free/Libre and Open Source Software)
- **This term is used for software that satisfies either the definition in free or the definition in Open Source, when there is no need to make a distinction**
- **For an excellent study of Open Source Software and Free Software see David Wheeler's paper**
 - http://www.dwheeler.com/oss_fs_why.html

What does Open Source have to do with “free beer” and “free speech”?

- The English word “free” is tricky in that it can mean either freedom or gratis, as in no-cost to the taker
- When Open Source proponents speak, they often have to preface their remarks so the listener knows if the speaker is referring to “free” as in “free speech,” which is a matter of policy, or “free” as in “free beer”
- As any college student can report, someone needs to bear the cost of creating the beer (or software) while others consume the beer (or software) and enjoy it with no out-of-pocket costs



<http://freeasinspeechandbeer.com>

How may I get started with Open Source?

- The decision to start developing Open Source software is a political and licensing decision and less so one of technology
- See the OSI list of approved Open Source licenses and make your selection according to your needs and plans for your project
- “*Open source licensing, Part 1: The intent*”
 - <http://ibm.com/developerworks/opensource/library/os-license/>
- “*Open source licensing, Part 2: Academic v. reciprocal*”
 - <http://ibm.com/developerworks/opensource/library/os-license2/>
- You may want to consult with an attorney specializing in intellectual property if you find the terms of the existing licenses confusing or if you have questions

What is LAMP?

<http://ibm.com/developerworks/edu/wa-dw-wa-lamp-i.html>

- **LAMP stands for Linux, Apache, MySQL, and PHP**
 - However, depending on who you talk to, the P can stand for Perl or Python, but in general, P is assumed to be PHP
- **LAMP has a bigger meaning, too**
 - LAMP represents a nonproprietary, flexible way to create a server-based application
 - Each of the programs comprising the term can be replaced with an alternative that best suits the needs of the application
 - Each component can be upgraded independently, although this is usually done with care and planning
 - Best of all, each program in LAMP is free, or almost free in both meanings of the word

What language is Open Source written in?

<http://gcc.gnu.org/>

- All of them
- The technology behind Open Source is not the most important element of Open Source
- The important element is the decision of the author or authors to release the software as Open Source and use one of the many Open Source licenses
- Also, there are a great many Open Source compilers or languages
 - The GNU Compiler Collection includes front ends for C, C++, Objective-C, Fortran, Java, and Ada
 - PHP, Perl, Python
 - Many, many more (just Google this subject!)

Is Open Source software legal?

<http://www.llrx.com/features/opensource.htm>

- **Yes, and almost everyone who uses e-mail or surfs the Web is an Open Source software user**
 - Most e-mail passes through an Open Source server during its travels across the Internet
 - Most Web servers rely on Open Source software
 - Google is based on Open Source
 - As OSI points out, the running gears of the Internet, including the mail transports, Web and FTP servers, are virtually all Open Source-based
- **Open source software is not warez, which is software distributed without permission of the copyright holders or a proper license**
- **There have been many discussions about Open Source violating patents or copyrights, but this is almost certainly true (if unintentionally so) of most “private source” software**
 - Talk to an Intellectual Property Lawyer if you have concerns

What are IBM's Open Source efforts?

<http://ibm.com/developerworks/views/opensource/projects.jsp>

- **In a nutshell, IBM is a significant force supporting Open Source innovation and collaboration**
 - The company participates in more than 175 collaborative projects contributed to the Open Source community, including Eclipse, Derby, Geronimo, and Globus
 - IBM contributed 500 patents into a “patent commons” for development and innovation
 - IBM has invested more than \$1 billion in Linux development
 - IBM has Open Source licenses – the Common Public License and the IBM Public License
 - IBM also releases under many other licenses, including GPL

9+ years of community innovation with IBM

1999 – 2001	2002 – 2003	2004 – 2005	2006 – 2008
<ul style="list-style-type: none">▪ IBM forms Linux Technology Center▪ Leads Apache projects Xerces (XML4J), Xalan, SOAP▪ Creates OSI-approved IBM Public License▪ Strategic participation in Mozilla▪ IBM becomes founding member of OSDL▪ Founder of Eclipse.org and Eclipse Consortium▪ Creates internal bazaar using OSS methodology	<ul style="list-style-type: none">▪ Linux contributions to scalability (8-way+), reliability (stress testing, defect mgmt, doc)▪ Leads Apache projects: Web Services (WSIF and WSIL), Pluto (Portlet API) and WSRP4J (Remote Portal)▪ Leads Eclipse projects GEF (editing), EMF (modeling), XSD (XML Schema), Hyades (testing), Visual Editor, AspectJ, Equinox rich client▪ Globus Toolkit contributions for OGSA, OGSI	<ul style="list-style-type: none">▪ IBM and Novell/SUSE achieve security milestone (EAL4+ and COE compliance)▪ Eclipse becomes independent as Eclipse Foundation, Inc. – IBM contributes UML2, Voice Tools, Aperi, COSMOS, Ajax Tools Platform▪ Globus Toolkit 4 is WS-I compliant▪ Pledged 500 patents to open source▪ Partner with Zend PHP▪ IBM enhances Apache partnership	<ul style="list-style-type: none">▪ IBM contributes accessibility code to Firefox▪ IBM becomes founding member of Eclipse Aperi project▪ Leads Open AJAX initiative▪ Leads Apache Tuscany project and Perl PHP SOA▪ IBM donates code for user-centric security management to Eclipse Higgins▪ IBM donates code for medical record management to Eclipse Open Healthcare Framework (OHF)▪ IBM announces support for Eclipse.org version of Eclipse▪ IBM contributes to Apache Lucene project and announces OmniFind Yahoo! Edition
More than 1000 IBM developers involved in OSS projects		IBM leads 80+ OSS projects	
		IBM contributes to 175+ OSS projects	



Linux and Open Source at IBM

Introduction to Linux



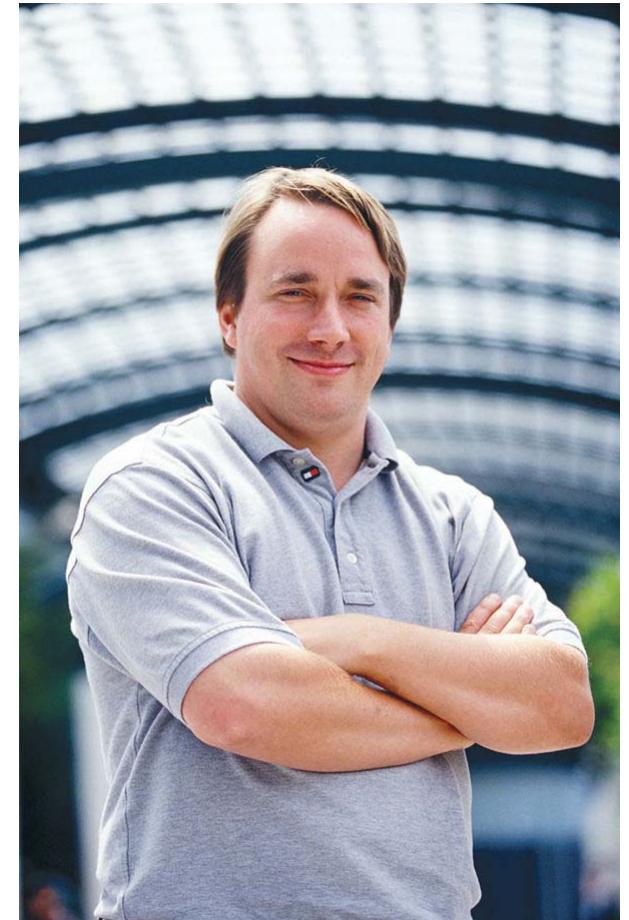
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<http://ibm.com/developerworks/linux>

IBM Systems
Simplify your IT.

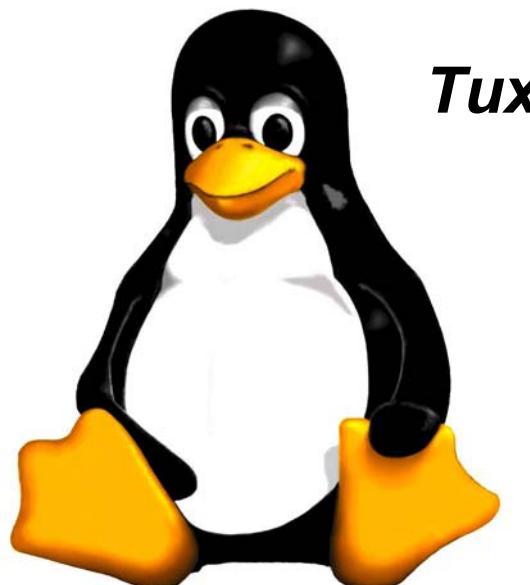
So, what is Linux, anyway?

- In the simplest terms, Linux is an operating system
- It was created in October 1991 by a University of Helsinki student named Linus Torvalds (Linux stands for Linus's UNIX)
- Linux itself is actually just the kernel; it implements multitasking and multiuser functionality, manages hardware, allocates memory, and enables applications to run



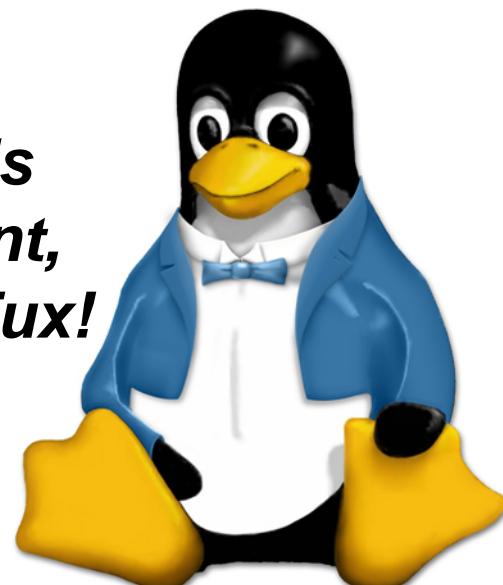
Tux?

- When asked what he envisioned for a mascot, Linus Torvalds replied, “You should be imagining a slightly overweight penguin, sitting down after having gorged itself, and having just burped. It’s sitting there with a beatific smile – the world is a good place to be when you have just eaten a few gallons of raw fish and you can feel another burp coming.”



Tux

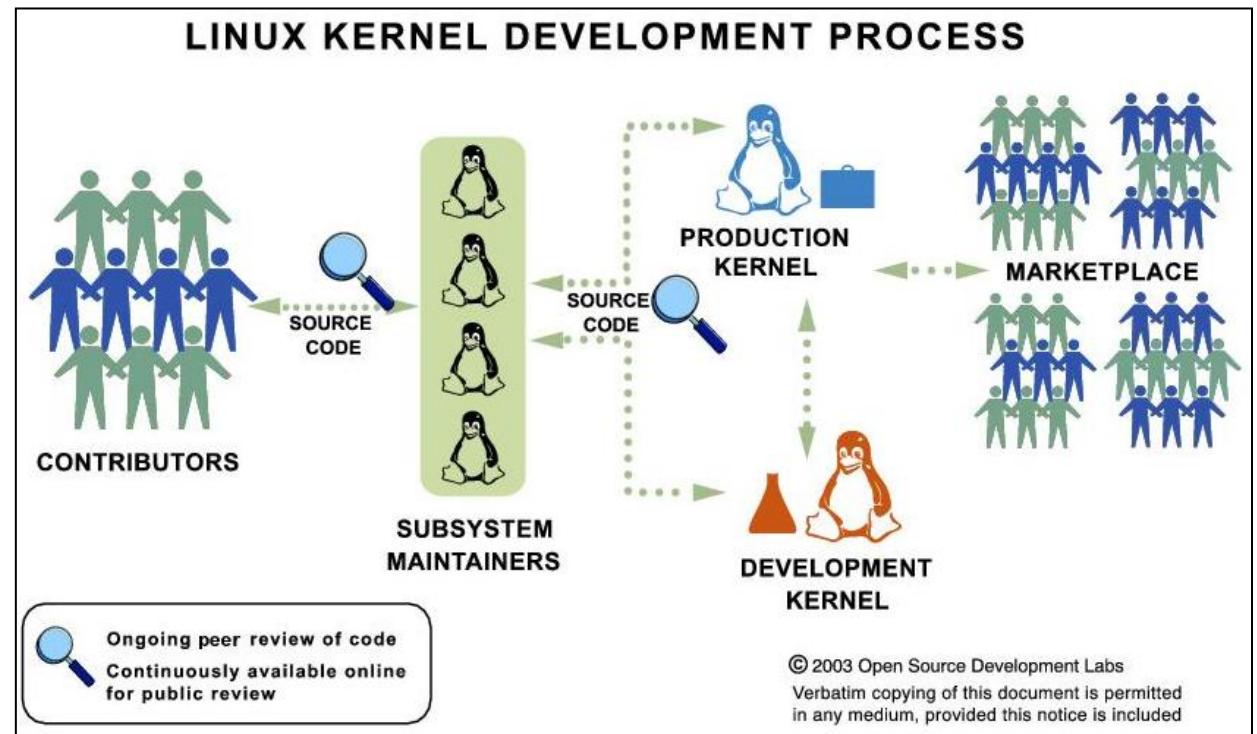
*IBM's
variant,
Blue Tux!*



Do I care about the Linux kernel?

<http://ibm.com/developerworks/linux/library/l-linux-kernel/>

- The average user will never be interested enough in any operating system to want to know about things like kernel internals
- Only the truly dedicated – those who have no personal lives, or those who are being paid to do this kind of work – are going to want to explore these intricacies

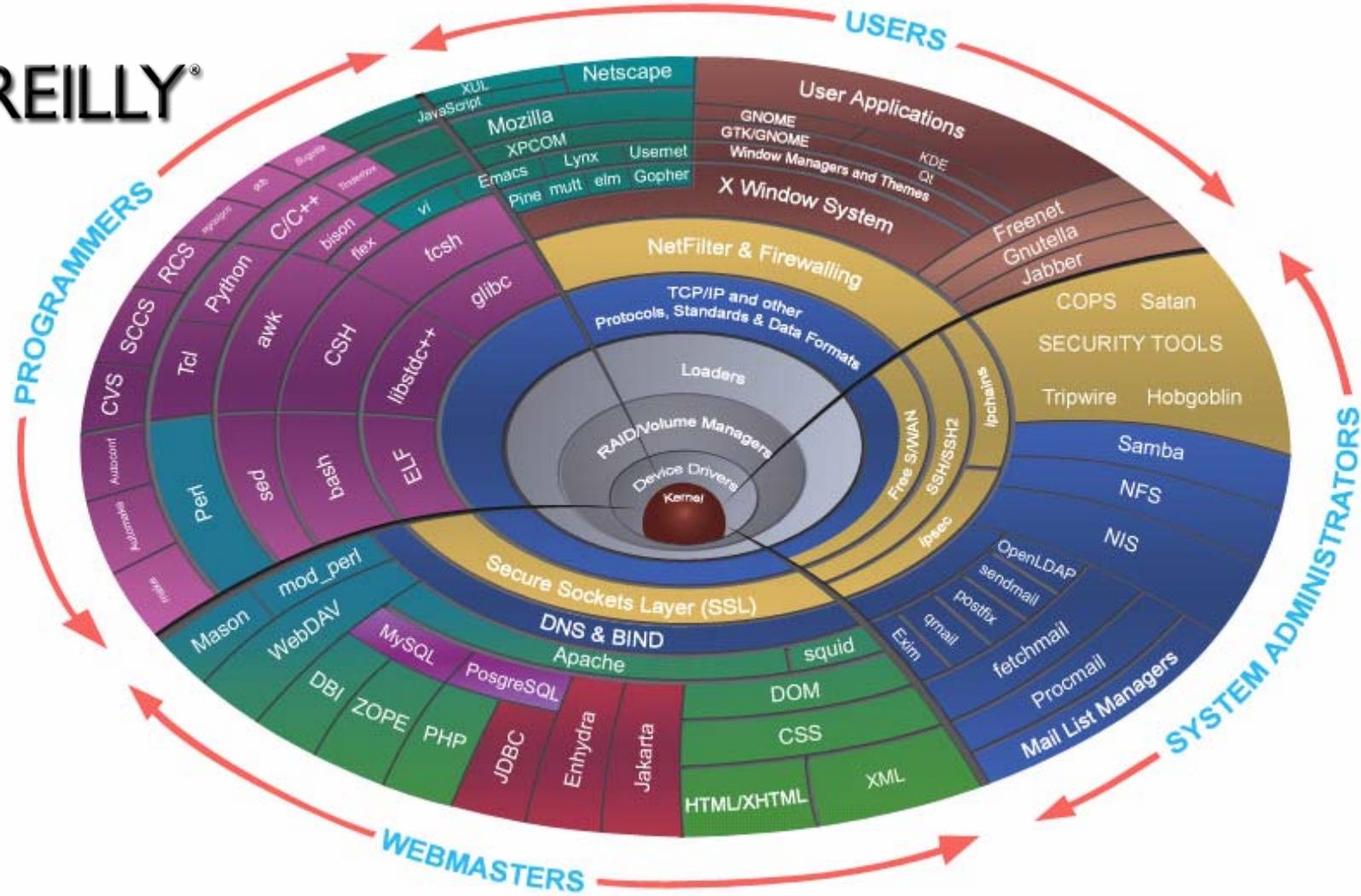


Linux distributions and GNU

- A typical Linux distribution includes the Linux kernel, but it also contains many application programs and tools
- Many system- and user-level tools found in a Linux distribution come from the Free Software Foundation's GNU project (GNU standing for "GNU's Not UNIX")
 - <http://www.gnu.org/>
- Both the Linux kernel and the GNU tools suite are released under the GNU General Public License, or GNU GPL
 - The GNU GPL is a way of setting computer code free so that the people who use that code may meddle and experiment with it to their hearts' content

What is in a Linux distribution?

O'REILLY®



What is the difference between UNIX and Linux?

- Invented at AT&T Bell Labs in 1969, UNIX (the name is a play on the earlier “Multics” operating system) is a robust, flexible, and developer-friendly computing environment
- Written originally for the Digital Equipment Corporation (DEC) family of PDP microcomputers, UNIX has taken over roles in all areas of computing
- Some twenty-odd years into its history, UNIX began to be eclipsed – in some of its roles, anyway – by Linux
 - Linux is not UNIX; it is merely very UNIX-like
 - For some jobs, you want Linux – for others, you still want UNIX
- **UNIX and Linux play very well together, and well-written programs are extremely easy to port between the two systems**

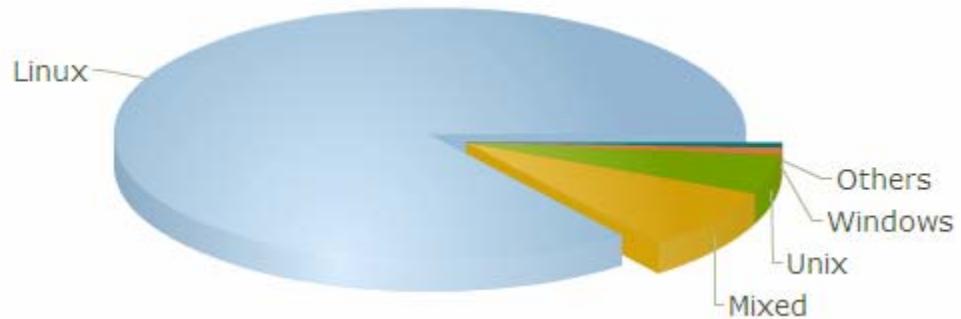
Why is Linux important?

- Because it is free software, licensed under the GNU General Public License, Linux obviates the need for programmers to keep reinventing the operations layer with each new project
- The GNU family of tools provide royalty-free bricks and mortar with which to begin building independent projects
- Critics of free software often voice fears that the freedoms and low cost of free software will lead to economic disaster for the computing sector
- However, it is just as likely – if not more likely – that free software will do for the world of computing what Gutenberg's printing press did for the world of Letters

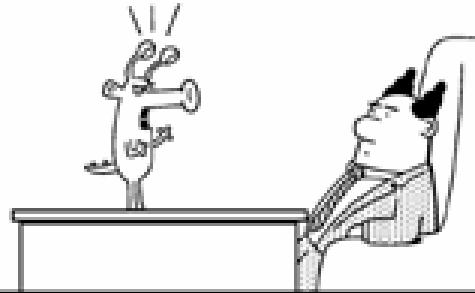
Linux dominates in super computing

Top500.org as of June 2008

Operating system Family	Count	Share %	Rmax Sum (GF)	Rpeak Sum (GF)	Processor Sum
Linux	427	85.40%	8465100	1.3E+07	1408054
Windows	5	1.00%	159264	211320	25472
Unix	25	5.00%	619912	874185	73174
BSD Based	1	0.20%	35860	40960	5120
Mixed	40	8.00%	2391451	2941095	897127
Mac OS	2	0.40%	28430	44816	5272
Totals	500	100%	11700017	17445380	2414219

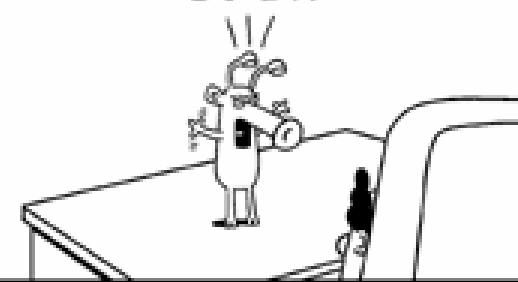


I CAME FROM A
DISTANT PLANET TO
BRING YOU ADVANCED
TECHNOLOGY, BUT NO
ONE HERE WILL LISTEN!



www.dilbert.com scottadams@soi.com

I AM A SUPERIOR
BEING, YOU MORON!
LISTEN TO WHAT I
TELL YOU AND THEN
DO IT!



i-25-07 © 2007 Scott Adams, Inc./Dist. by UFS, Inc.

I FIRED HIM
BEFORE HE STARTED
YAMMERING ABOUT
LINUX.



EASY COME,
EASY GO.

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What can I do with Linux?

- **What you want out of your Linux system will determine which Linux system you want and how many layers of complexity you need to understand before you begin to work with it**
- **Linux is an excellent learning platform to do kernel hacking, to learn UNIX, or to learn programming; many tools and applications are available to play games, to do desktop publishing, or just to hang out doing e-mail and Web browsing**
- **Linux is a popular platform for everything from middleware to embedded computing and clusters, to mainframes, supercomputers and gadgets**

How do I get started with Linux? ...

<http://ibm.com/developerworks/linux/newto/>

- If you are completely new to Linux, or if you are using Linux as a desktop operating system, you need to learn at least some basics about system administration and security
- Linux does not promise to hold your hand or to clean up after you: you have to take care of the system yourself
 - Luckily, basic maintenance and basic security are pretty easy
- In many ways, Linux and UNIX administration is today much easier than administration for popular commercial personal operating systems because it is much more transparent

... How do I get started with Linux?

<http://ibm.com/developerworks/linux/newto/>

- While Linux does have several windowing environments that allow you to perform administration, the most straightforward way to control the system is at the command line
 - Built in to the structure of the command-line environment are dozens of commands and several text-based help systems.
- There are a great many resources on the Web and in the real world to help you get started with Linux
 - There are Web sites, articles, and books devoted to the subject, and Linux User Groups (also known as LUGs) meet in cities and countries around the world – and are well-known for being very friendly even to very new users

How can I use Linux in application development?

- **Linux includes the GNU Project's suite of programming and debugging tools – absolutely free**
- **The Eclipse foundation's very large set of development tools are available for Linux**
 - <http://www.eclipse.org/>
- **Many commercial programming packages are also available**
- **If you are using Linux as a development platform, do not skip first learning administration and security**
- **Linux is by nature standards compliant**
 - Linux developers as a rule place very high importance on keeping the operations layer, as well as those built atop it, open, interoperable, and standards friendly

What programming languages can I use on Linux?

- In addition to steadfast stalwarts like Fortran and C/C++, many scripting and other computer languages are at home on (or were even designed to work best with) Linux
 - The most popular include Perl, Python, and PHP
- Technologies such as Java and XML run great on Linux, as do any number of more esoteric programming languages, from Logo and Rebol to Smalltalk and many more

How can I continue to improve my Linux skills?

<http://ibm.com/developerworks/linux/> then click on Training

- If you want to use Linux as a platform for a very advanced application or application set, you will be interested in aspects of the system such as kernel hacking, the differences between various filesystems, and other nitty-gritty details
- Another skill set that is often needed for high-end applications (or games) is fine-tuning a Linux machine, cluster, or network for optimum performance – this includes expertise in things such as multiprocessing, threading, clusters, and other arcane but sophisticated points of system administration
- Understanding these aspects of Linux aren't quite as gritty as actual kernel hacking, but can nonetheless get pretty hairy

What IBM tools are available for Linux?

- **Linux is a superior operating system on which to run standard applications – from office applications such as word processors and spreadsheets; to database systems; to Web publishing and serving environments**
- **IBM software products such as DB2, Lotus, Tivoli, Rational and WebSphere all run on Linux, and IBM is not the only industry leader to recognize that Linux is an excellent platform for middleware**
- **Though misunderstood and very often maligned – at least, among the self-proclaimed digerati – middleware is an essential (and for many computer users, the essential) reason for having computers around in the first place**
- **The open nature of Linux allows middleware vendors to fine-tune solutions to meet users' needs in ways that no closed system allows**

What do the analysts say about Linux?

■ Reports from :

- Gartner
- Deutsche Bank
- Forrester
- IDC
- DH Brown
- Goldman Sachs
- Bloor Research
- Wall Street
- IBM

■ Articles in :

- Business Week
- Financial Times

Technology: Infrastructure Software United States

The Penguin. Linux-on-Intel appears likely to emerge as a major platform in corporate data centers. This paradigm shift has significant implications for a broad range of enterprise IT vendors. Our handbook highlights key themes and an initial framework for investing in Linux's emergence.

By Ted Schadler
With Charles Rattoz

WholeView™ TechStrategy™ RESEARCH

Linux: Questions And Answers For Execs

Linux will go mainstream in the datacenter in 2003. Why? Because the open source OS delivers Unix reliability at Intel prices and has strong support from vendors like HP, IBM, Oracle, and SAP. But execs still wonder about the right Linux strategy...

Bloor Research - North America Independent Technology Research & Analysis

Research Brief

IBM Corporation
Route 109
Somers, NY 10589
<http://www.IBM.com>

Linux Is Ready: IBM's Strategy

Preface

In 1999, Bloor Research took a very close look at the "enterprise readiness" of Linux. We started side-by-side with Windows NT — comparing the two operating environments as if it were a database, application, and middleware servers. And we concluded that:

As the server market grows, Linux comes out on top, particularly for large organizations with various where remote management is an important option. The same goes for Web and mail servers. Linux is also well positioned for the desktop, especially in the enterprise environment. In fact, in the server environment, there is little or no difference between the two... it really depends on the choice of the database and the vendor's choice. The scale tips in favor of Linux when it comes to enterprise databases, and in favor of Windows NT for the platform. If Linux is catching up. And for web servers, the application will determine the ultimate choice, but a Linux-based web server can compete with Windows NT in almost every aspect (Web server, print server, etc.), then Bloor Research says: by all means, go for Linux. *But not yet to the enterprise!*

Now, almost three years later, we've been asked by IBM to reassess our Linux position provide our thoughts on Linux "enterprise readiness" for mission-critical computing. What wants to know is:

1. Is Linux enterprise ready? How is Linux faring from reliability, availability, scalability, security, manageability, and server consolidation perspective toward being enterprise ready?); and,
2. How is IBM doing from a strategic product/services/applications perspective with products and services?

This Research Brief represents the result of our analysis.

Helping Business Thrive On Technology Change

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WholeView™ TechStrategy™ RESEARCH

March 2003

The Linux Tipping Point

still Lynch is one of the few firms actively deploying Linux on the mainframe. The BSM office maintains deployment is in its early stages, but it is growing rapidly, and allows the organization to serve premium customers who have a fidelity to improved Linux performance and management.

"The goal here is to set up with the same stability as a storage area network," says McKinley. "We're putting a layer of storage between the application and the server it's running on." This allows the system to move application processing power depending on the needs of the workload, he explains.

Currently, Lynch is using virtualization technology to run multiple instances of Linux on the mainframe and using VMWare client-based computing software to keep together servers on a single processing farm. Lynch is preparing for reality this environment because unlike other companies that have virtualized their desktops, Lynch-based applications now run on an available processor without concern for user's architecture.

"The goal here is to set up with the same stability as a storage area network," says McKinley. "We're in Chapter One of the beta of using both approaches, but we're moving to Chapter Two. Both approaches understanding the need for a new set of estimates due through their integration. Merrill Lynch has more than 40 percent to 50 percent our revenue. "We are able to move more application processing power to the PC for the desktop, which is changing the organization's profile," says McKinley. "With us as operating under, that number is huge."

also improving the speed of processing, enabling more efficient use of capital expenditures and allowing more flexible service levels.

FORRESTER

Deutsche Bank

Emerging Themes

Boiling Linux?

that IBM or Dell should Linux, and to take a further step toward Linux adoption. From these conversations, we are over more new Unix workloads in the datacenter over the Intel-based servers (see the March 2003 Forrester Report). But executives have lots of questions about how to make

Enter the penguin

waters

November 2002

Lynch, Morgan Stanley and Lehman Brothers, Linux is up to risk applications, equity options calculators and mainframe.

By Robert Daly

Helping Business Thrive On Technology Change

FORRESTER

wholeview

March 2003

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Analyst reports abound – pick wisely!



What lies ahead for Linux?

http://apcmag.com/7012/linus_torvalds_talks_about

- Linux's openness and flexibility lend its use to work in laboratories and other research facilities on the bleeding edge of revolutionary technological change
- Linux can easily be clustered or customized for highly original experiments or prototypes, simulations, or tests; and the vast array of free software tools that Linux was created to work with can be used in the same creative way
- Even with all of the exciting new technologies that are being developed today – from Grid computing and wireless voice applications to artificial intelligence and Quantum computing – the potential and promise of the computing age in which we live is still largely untapped
- Linux's robust and open flexibility means that it will remain at the forefront of the development frontier for years to come



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<http://www.novell.com/products/server/>

IBM Systems
Simplify your IT.

SUSE Linux Enterprise Server 10 SP2

New features: General

- **Security patches/bug fixes**
- **Updated version of virt-manager**
- **libvirt library updated to version 4.0, contains NUMA**
- **virt-viewer is added**
- **AppArmor updated to latest version**
- **Subscription Management Tool (SMT)**

SUSE Linux Enterprise Server 10 SP2

New features: General

- Heartbeat adds failover functionality
- HPI STONITH module of Heartbeat enabled
- IPv6 enhancements
- Support for network and storage drivers, new audio/graphics devices
- Download SP2 10 Features:
 - www.novell.com/linux/sp2highlights.html

ISV Applications Update

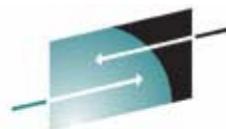
- Novell® ISV certifications program team
- Targeted ISV application list — most important at all times
- Novell ISV catalog online
- Certified ISV applications growing at double digit rates



| Linux and Open Source at IBM



redhat.



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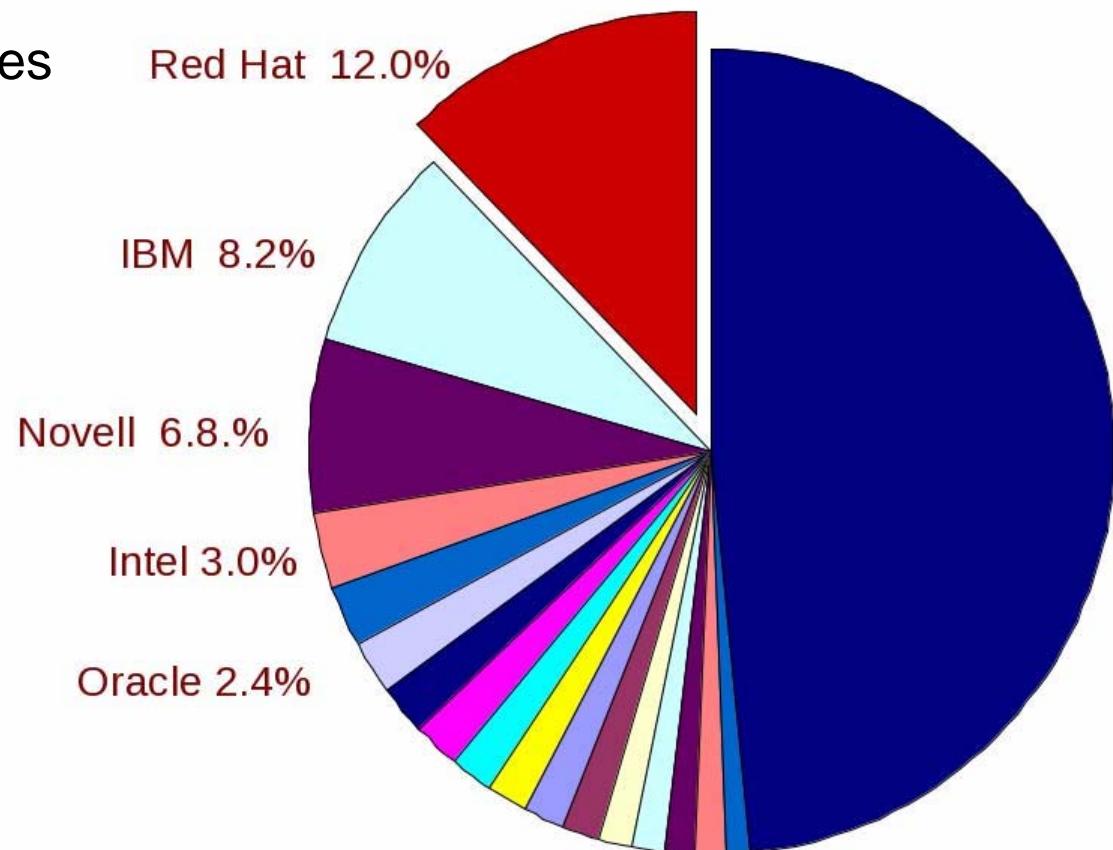
<http://www.redhat.com/rhel/server/>

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Red Hat development model

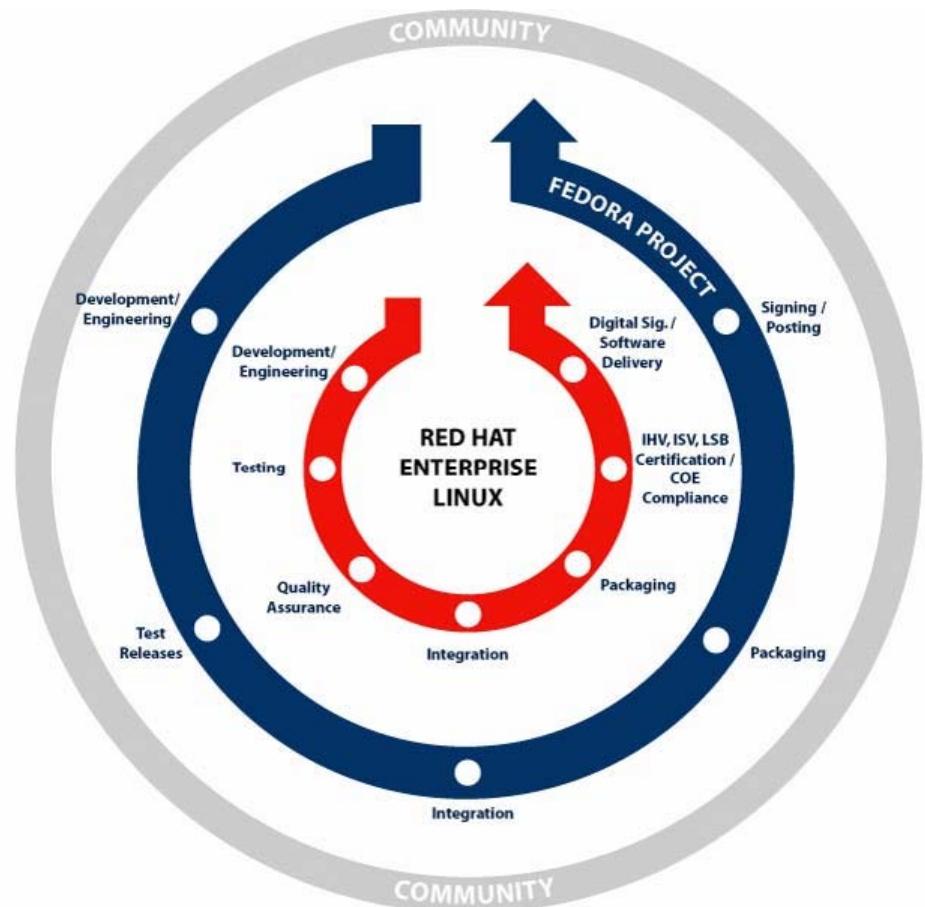
■ Community

- Development with “upstream” communities
- Kernel, glibc, etc
- Collaboration with partners, IBM, open source contributors



Red Hat development model

- **Fedora**
 - Rapid innovation
 - Latest technologies
 - Community supported
 - Released ~6mo cycles
- **Red Hat Enterprise Linux**
 - Stable, mature, commercial product
 - Extensive Q&A, performance testing
 - Hardware & Software Certifications
 - 7yr maintenance
 - Core ABI compatibility guarantee
 - Major releases 2-3yr cycle



Extended product lifecycle

	Years 1-4	Year 5	Years 6-7
Security patches	X	X	X
Bug fixes	X	X	X
Hardware enablement	Full	Partial	None
Software enhancements	X		

Red Hat Enterprise Linux 4.7

Announced Thursday, July 24 2008

- **2.6.9-78 Kernel Stream**
- **Added AIDE**
- **Ability to generate SHA-256 and SHA-512 password hashes**
- **Updated zFCP driver to include bugfixes**
- **Updated qdio driver to fix zFCP/SCSI write to IO stagnates on LPAR**
- **/proc/sys/vm/nfs-writeback-lowmem-only param to fix NFS read performance**
- **/proc/sys/vm/write-mapped to help select faster NFS read performance**
- **autofs5**
- **N_PIV is waiting development acceptance for 4.8 (Already in RHEL5)**
- **https://rhn.redhat.com/network/software/download_isos_full.pxt**

Systems management – Red Hat Network

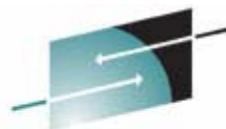
- A systems management platform designed to provide complete life cycle management of the operating system and applications
 - Provision/re-provision machines without touching them
 - Manage 1,000 systems as easily as 1
 - Ensure security fixes / config changes applied consistently across enterprise
- **9290 Managing Your Red Hat Enterprise Linux Guests with RHN Satellite**
 - Thu, 3:00pm, Convention Center, Concourse Level, Room D





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The screenshot shows the IBM developerWorks for Open Source homepage. The left sidebar has a red arrow pointing to the 'Open source' link under the 'AIX and UNIX' section. The main content area features a 'Top story' about configuring menu items in Eclipse V3.3. Below it are several news items and links to various developer resources like SOA and Web services, XML, and downloads. The right sidebar includes sections for 'My developerWorks', 'Top project resources', 'developerWorks spaces', 'Spotlight', and 'Editor's picks'.

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developerWorks > **Open source**

Resources for open source development and implementation

Updated 19 Feb 2008

Top story

Configuring and adding menu items in Eclipse V3.3

Before now, adding commands to a menu, pop-up menu, or toolbar was tricky. No more! Now there's a mechanism that's easier than ever. Find out how to use the new menus extension point. [More >](#)

PHP frameworks, Part 5: Integrate external tasks with PHP frameworks and create a simple task that can be called using a scheduler such as cron.

Plug-in development 101, Part 1: Plug-in development in Eclipse is somewhat of an art form. Learn basic plug-in development skills and best practices.

PHP frameworks, Part 4: When it comes to supporting Ajax, not all PHP frameworks are created equal. Examine how each framework behaves when handling native code and third-party libraries.

Mastering Grails: GORM: Funny name, serious technology: Understand the basics of databases and Grails. Create relationships between tables, enforce data validation rules, and change relational databases in your Grails applications.

Execute business processes with Eclipse: What if there was a way to create an executable process using a graphical editor that can be executed on an appropriate engine? There is! Find out how.

Develop iPhone Web applications with Eclipse: Get a hands-on look at developing Web applications using Eclipse and the Aptana iPhone Development Plug-in.

More content

View all previous columns:

The Geronimo renegade (Sanche)

Downloads and CDs

- IBM WebSphere Application Server Community Edition
- IBM Development Package for Eclipse
- IBM Cloudscape
- IBM Software Evaluation Kit (SEK) for Linux
- Linux on Power Architecture: Developer's corner
- Download STEM open source software
- Eclipse Europa bundles and related software
- alphaWorks (alpha technologies)
- CodeRuler
- Development Tool for Java-COM Bridge
- Memory Interceptor Library
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- Tutorials
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Top project resources

- Apache Derby
- Apache Geronimo
- Eclipse
- PHP

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Spotlight

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- Create iPhone apps with no-cost tools now

IBM developerWorks for Linux

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The screenshot shows the IBM developerWorks for Linux homepage. The left sidebar has a red arrow pointing to the 'Linux' link under the 'Architecture' section. The main content area features a 'Top story' about 'Explore Ubuntu Mobile and Embedded (UME)'. Below it are several news items: 'Role-based access control in SELinux', 'SNMP-based monitoring for GPFS clusters', 'Multiprocessing with the Completely Fair Scheduler', 'Networking scalability on high-performance servers', 'Application development for the OLPC laptop', and 'LPI exam 301 prep: Installation and development'. There are also sections for 'Build on Linux with IBM', 'Downloads and CDs', and 'Special offers'.

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• Linux certification-prep tutorials
• Top 10: Readers' favorite Linux articles

Editor's picks
• Linux on board: Auto-uploading Nokia N800 photos, Part 3
• Software development for the OpenMoko Linux phone

Special offers
 Learn Linux fast with the LPI exam 201 prep series
 LPI Exam 201 preparation: Linux filesystem
 Developing for the OpenMoko Linux phone

developerWorks

Updated 17 Feb 2008

Linux

Top story

Explore Ubuntu Mobile and Embedded (UME)
Streamline development for handheld and mobile devices using UME. Tour the UME architecture and desktop, and get started building a functional development environment. [More >](#)

Role-based access control in SELinux: Learn how to work with RBAC in SELinux, and see how the SELinux policy, kernel, and userspace work together to enforce the RBAC and tie users to a type enforcement policy.

SNMP-based monitoring for GPFS clusters: Check the health of your General Parallel File System cluster by remotely analyzing Simple Network Management Protocol (SNMP) data. Set it up, step by step.

Multiprocessing with the Completely Fair Scheduler: Meet CFS, a new addition to the Linux kernel that attempts to act with complete equity -- that is, by running multiple tasks at equal speeds.

Networking scalability on high-performance servers: Learn how to optimize networking performance in multi-node, high-performance Linux environments to give you all the scalability you're paying for.

Application development for the OLPC laptop: Get started building applications for the XO-1, the innovative, inexpensive hardware platform designed for kids everywhere by the One Laptop Per Child initiative.

LPI exam 301 prep: Installation and development: Prepare for the Linux Professional Institute's LPIC-3 Senior Level Linux Professional core exam by learning how to install and configure an LDAP server and access the data using Perl.

developerWorks forum - Using Chipopper tools: Need to port your Linux apps from x86 to POWER Architecture? IBM's Chipopper program offers tools and support to help you make the jump. Talk with developers and get answers here.

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- Finding IBM software for Linux
- Developing for Linux with Rational
- Developing for Linux on Intel
- Developing for Linux on IBM Systems
- Developing for Linux on Power (IBM System p)
- Developing for Linux on IBM System z

Downloads and CDs

- IBM Software Evaluation Kit (SEK) for Linux
- IBM Developer Kit for Linux, Java 2 Technology Edition
- IBM SDK for Java Version 6 Early Release Program
- alphaWorks (alpha technologies)
 - Binary Prober
 - Interactive Ray Tracer for Cell Broadband Engine
 - Expert System for Tuning Optimizations (ESTO)

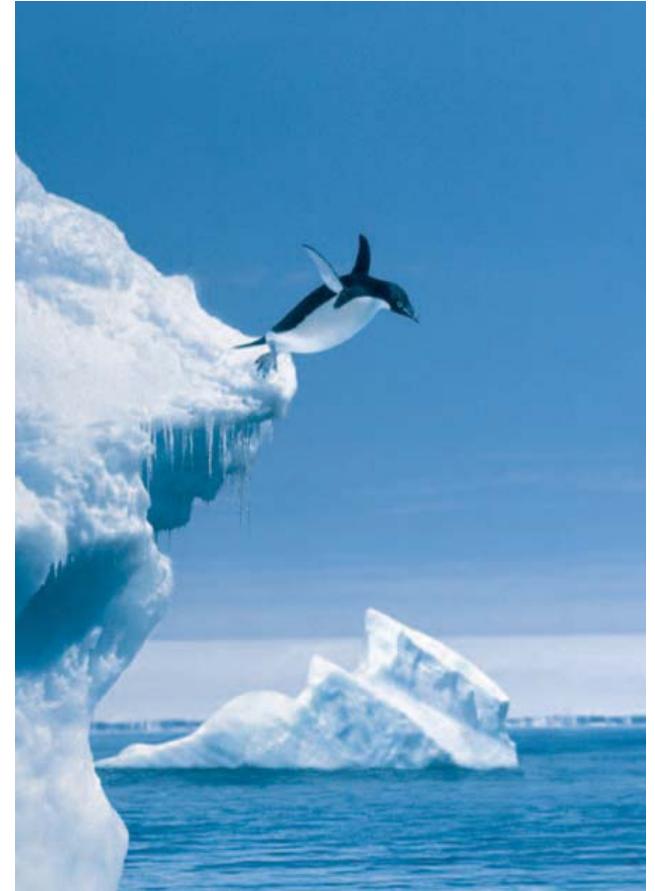
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The screenshot shows the IBM Redbooks Linux website. The top navigation bar includes links for Home, Solutions, Services, Products, Support & downloads, and My IBM. A search bar is also present. The main content area features a banner for 'Linux and IBM Redbooks' with a green checkered graphic. On the left, a sidebar lists various Redbooks categories like Drafts, Redbooks, Redpapers, Technotes, and specific Redbooks Domains such as Application Development, BladeCenter, Information Mgmt software, IBM System i, IBM System p, IBM System x, IBM System z, and IBM System Storage. The 'Residencies' link in this sidebar is highlighted with a red arrow. The main content area also includes sections for Latest Drafts, New Technotes, Skills Development, and What's New, along with links for RSS feeds and training.

What next?

- Familiarize yourself with the facts
- Establish an Open Policy
- Align to Open Standards
- View Open Source and Linux as valid alternatives for IT systems
- Make decisions based on business value; not hype and hope!
- Be prepared for change!



Thank you

Jim Elliott

Consulting Sales Specialist – System z New Workloads

IBM Canada Ltd.

jim_elliott@ca.ibm.com

905-316-5813

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