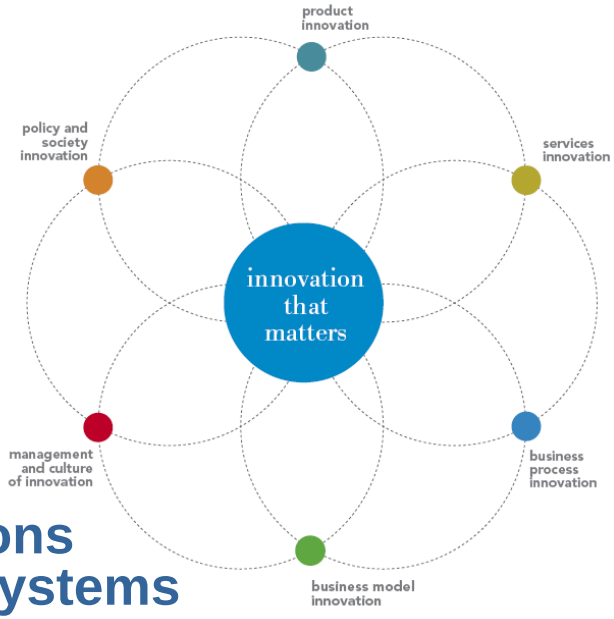
Open Computing @ IBM

Open Computing and Linux



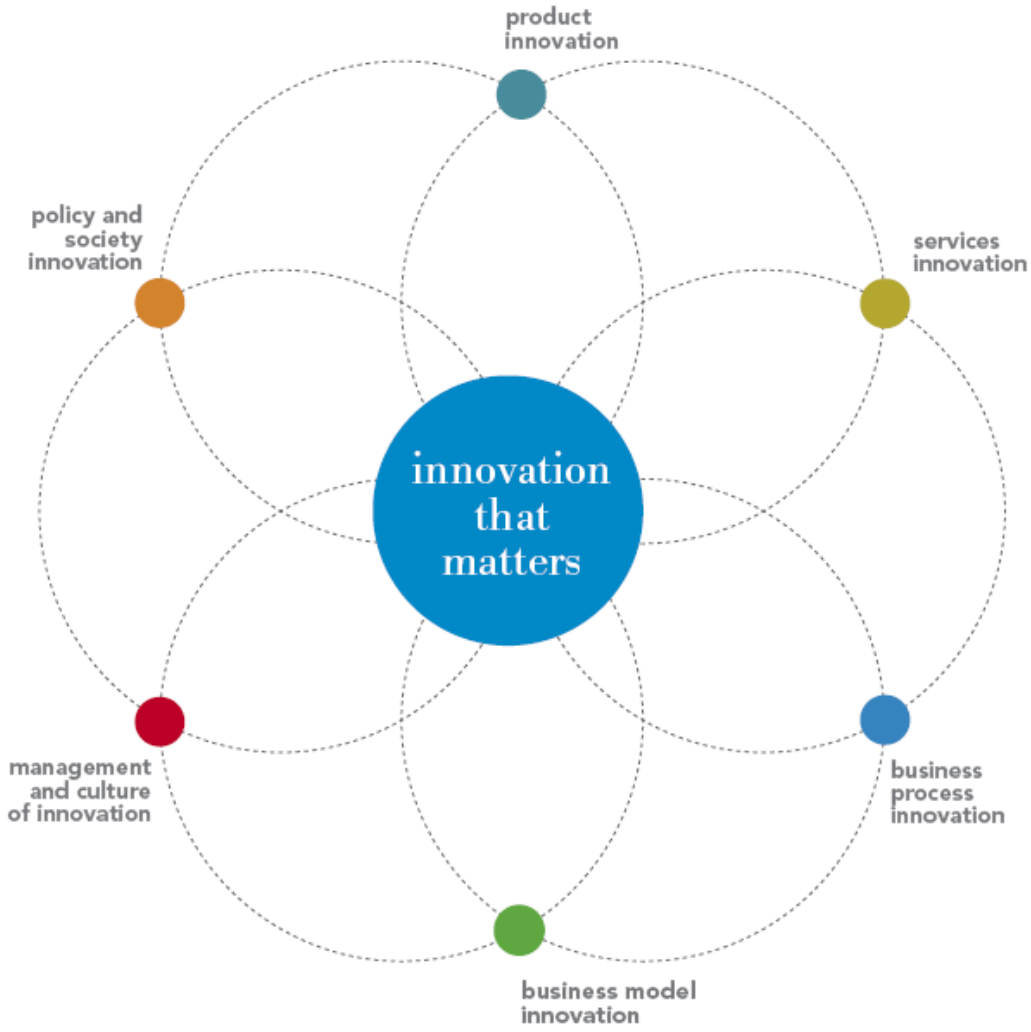
SHARE
Technology · Connections · Results

Jim Elliott
Advocate – Infrastructure Solutions
Manager – System z Operating Systems
IBM Canada Ltd.

ON DEMAND BUSINESS™

Agenda

- **Open Computing**
- **Linux**
- **Linux and Open Computing @ IBM**



Open Computing

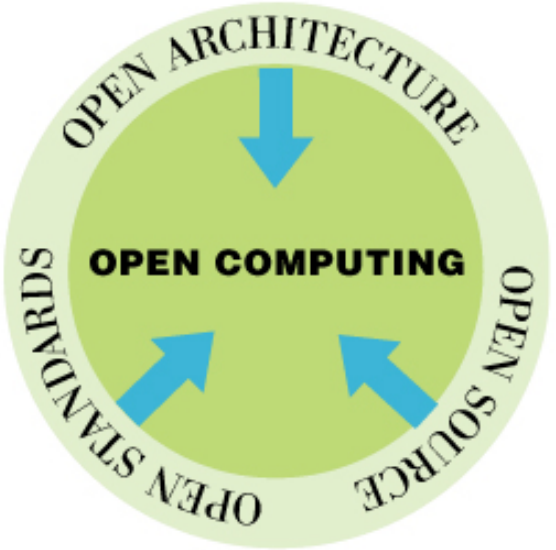
ON DEMAND BUSINESS™

Open Computing Goals

- Ensure flexibility
- Ensure interoperability
- Avoid vendor lock-in
- Drive cost effectiveness
- Ensure future access to information
- Ensure a level playing field for competition
- Maximize freedom of action

The Principles of Open Computing

- **Open standards:**
  - Promoting interoperability by using open published specifications for APIs, protocols and data and file formats
- **Open architecture:**
  - Building loosely coupled, flexible, reconfigurable solutions
- **Open source software:**
  - Promotes standards
  - Leverages community development and collaborative innovation



Open Source Software

www.opensource.org

- **Software whose source code is published and made available to the public**
  - Community develops, debugs, maintains
  - "Survival of the fittest" – peer review
  - Generally high quality, high performance software
  - Superior security – on par with other UNIXes
- **Often built by community**
- **Redistribution rights**
- **May be a reference implementation of an open specification**

- **Examples of Open Source Software:**
  - Apache – web server
  - Eclipse – application development
  - Gnome – desktop environment
  - Mozilla – browser, mail, calendar
  - OpenOffice.org – productivity suite
  - Perl – language
  - Samba – file/print
  - SendMail – mail server
  - TCP/IP – networking

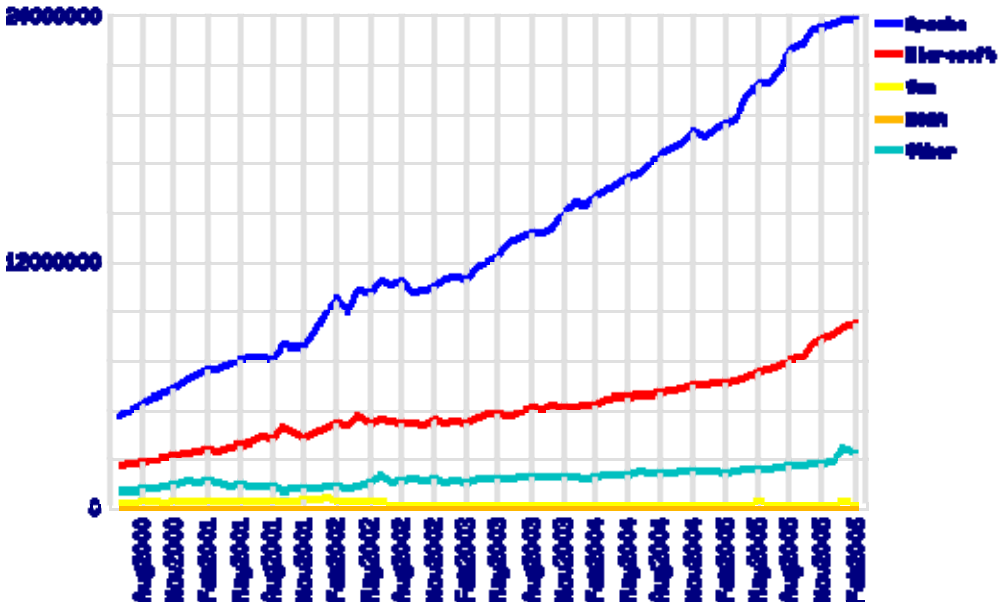
Why does IBM consider Open Source important?

- **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**
  - Internet has changed how enterprises address technical innovation
  - Shapes IBM 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

Apache has become the *standard* Web server

news.netcraft.com

- **Totals for active servers across all domains**
- **As of February 1, 2006**
  - Apache
    - Sites: 23,748,079
    - Share: 67%
  - Microsoft IIS
    - Sites: 8,949,268
    - Share: 25%



The Apache Software Foundation
http://www.apache.org/

Linux

SHARE
Technology · Connections · Results

ON DEMAND BUSINESS™

What is Linux?

- **A "UNIX-like" Operating System that is community developed with the source code being readily available**
  - Robust functionality and scalability
  - Solid stability and security
  - Lightweight and modular
- **Operates on virtually any platform – server or client**
- **Generally acquired on a support subscription basis from Linux Distribution Partner (LDP)**
  - Novell or Red Hat dominant in NA
- **Development managed by OSDL**

redhat

suse Novell.

OSDL

Why is Linux is important to customers

- **Linux is about choice and flexibility**
- **Linux is secure**
- **Linux is reliable**
- **Linux drives business goals:**
  - Reduce costs
  - Simplification
  - Improve application service levels
  - Promotes innovation
  - Internally change business process
    and drive contribution to business
  - Generate revenue

- **Drivers to use Linux Today**
  - Attractive hardware acquisition costs
  - Availability of low-cost, Open Source software
  - Linux runs across all hardware platforms
    - x86, x86-64, RISC and CISC (including mainframes)
  - Interest in alternatives to Windows and UNIX, offering customers choice in software platforms
  - Expectations of improved price/performance
  - Re-use of existing UNIX skills in enterprise, HPC computing

IDC Analyze the Future

Source: IDC Directions 2005

Cost, reliability, performance and security continue to drive Linux server adoption

Server Drivers

What are the primary reasons that your organization is using Linux in some of its servers?

	2005	2004	2003
Relatively low cost or no licensing fee	77%	79%	86%
Reliability	74%	75%	76%
Performance	73%	76%	71%
Windows security issues	65%	-	-
Needs an alternative to Windows	59%	58%	59%
Recommendations by our technical staff	59%	58%	53%
Development tools widely available through the internet	46%	45%	38%
Ability to modify source code to meet our needs	45%	38%	32%
Fast software patches and bug fixes	41%	39%	37%
Fulfills company requirements or standards	40%	39%	40%
Measurable ROI	47%	-	-
Company has an Open Source philosophy	33%	25%	27%
Need an alternative to UNIX	26%	28%	25%

Multiple responses allowed. Base of 246 sites in 2005, 290 sites in 2004, 272 sites in 2003.
Information Week Research – Linux/Open Source Survey of 439 business technology professionals.

Linux is an industry-wide initiative

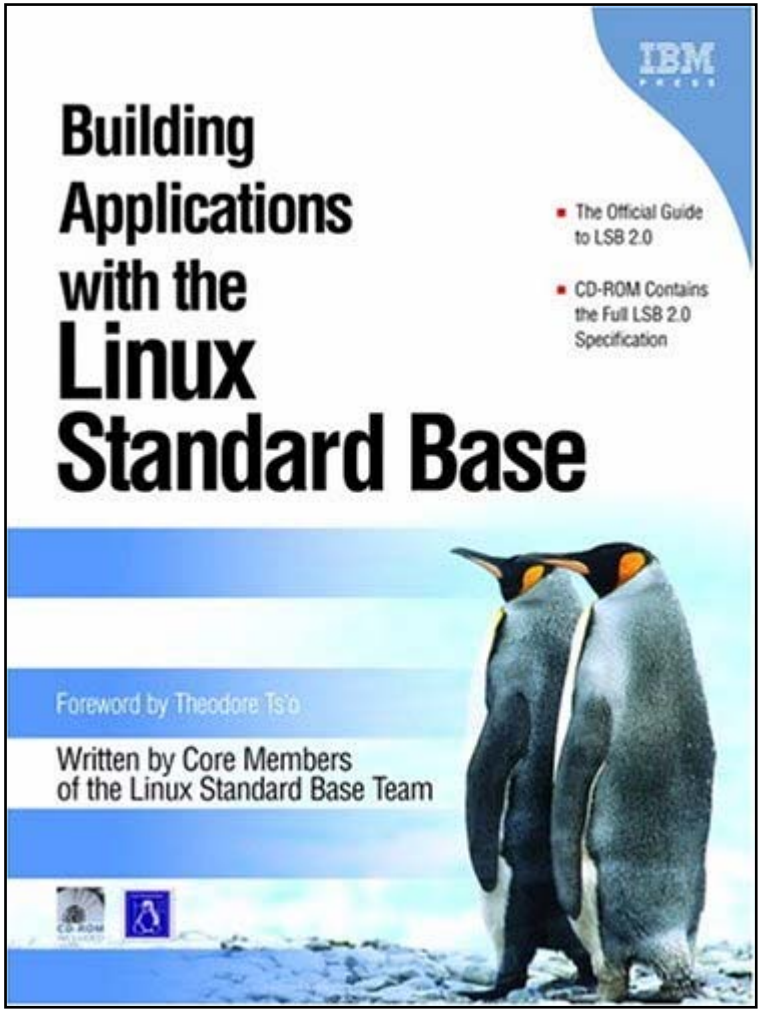
www.osdl.org

- 10art-ni
- ActiveGrid
- Aduva
- Alcatel
- AMD
- BakBone
- Beijing Software Testing Center
- Berry OS Japan
- Black Duck Software
- BT Global Services
- Bull
- Cassatt
- CCIA
- Cisco
- Co-Create
- Computer Associates
- Comverse
- Cyclades Corporation
- EMC
- Ericsson
- ETRI
- Fujitsu
- Good-day
- Google
- Haansoft
- Hitachi
- HP
- IBM
- Intel
- IP Telecom
- Kobe Institute of Computing
- Korea IT Industry Promotion Agency
- Levanta
- Lynuxworks
- Marist College
- Microcost
- Miracle Linux
- Mitsubishi Electric
- MontaVista Software
- National University of Defense Technology
- NEC
- Network Appliance
- Nokia
- Novell
- NTT Corporation
- NTT Data Intellilink
- Open Country
- Open Source Japan
- Open Technologies Corporation
- Oregon State University
- Pacific Crest Securities
- Pixelworks
- Portland State University
- Radisys
- Red Flag Software
- Red Hat
- Scalix Corporation
- Search Cacher
- Siemens
- SpikeSource
- Stanford University
- Stratus Technologies
- Sun Microsystems
- Timesys
- Tokyo University of Technology
- Toshiba Solutions
- Transmeta
- Trolltech
- TurboLinux
- Unilever
- Unisys
- University of Helsinki
- Virtual Iron Software
- Voyager Capital
- Waseda University
- Wind River
- Wyse

Linux Standard Base

www.freestandards.org

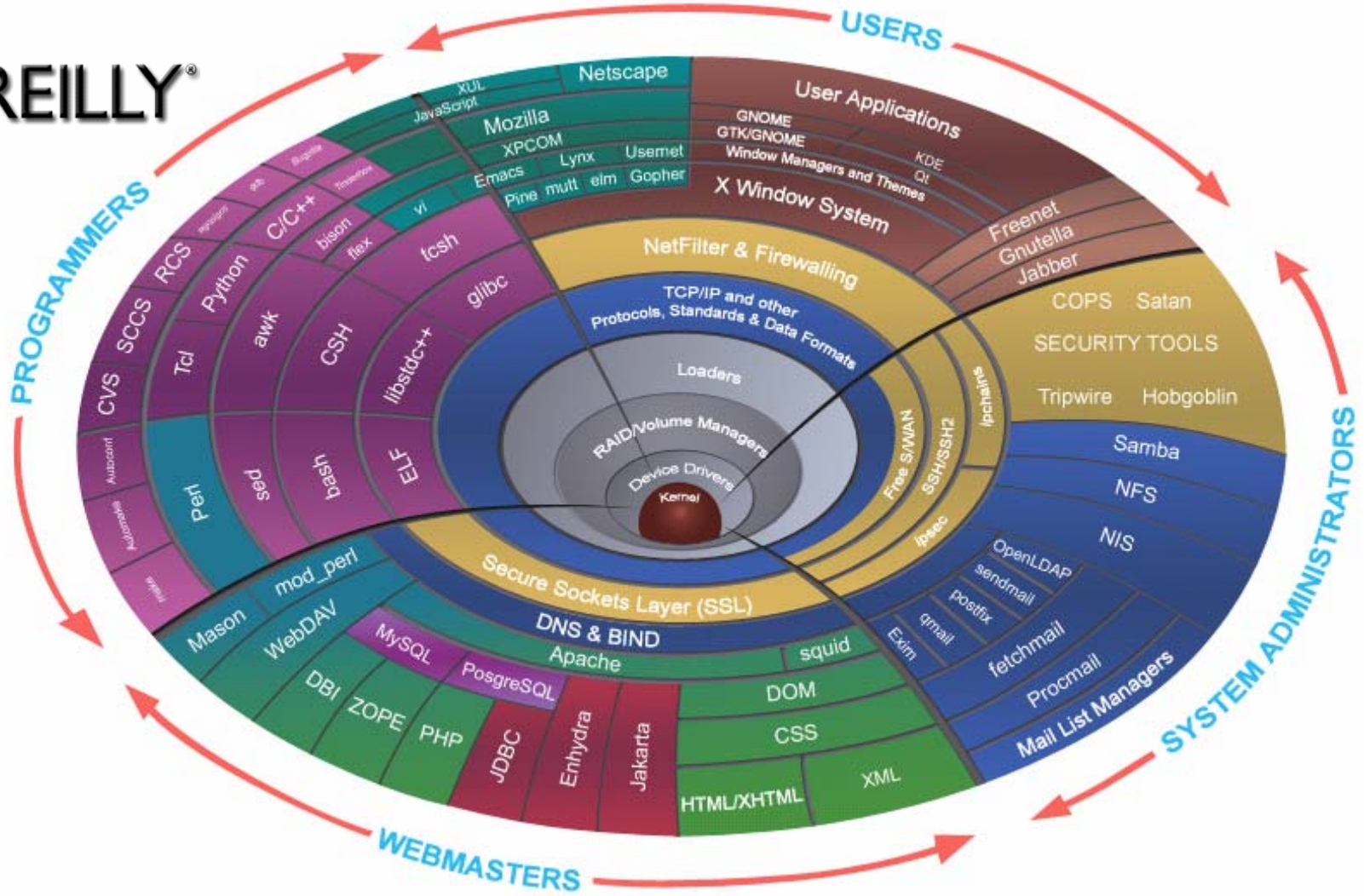
- **LSB supporters include AMD, Dell, HP, IBM, Intel, Novell's SUSE LINUX, and Red Hat**
- **This groundswell of support is significant as it promises to keep Linux from forking and going the way of proprietary systems in the past**
- **Because of the reduced costs for software vendors writing to the Linux, adoption of the LSB will also result in an increase in the number of applications written to the operating system**



***ibm.com*/ibmpress**

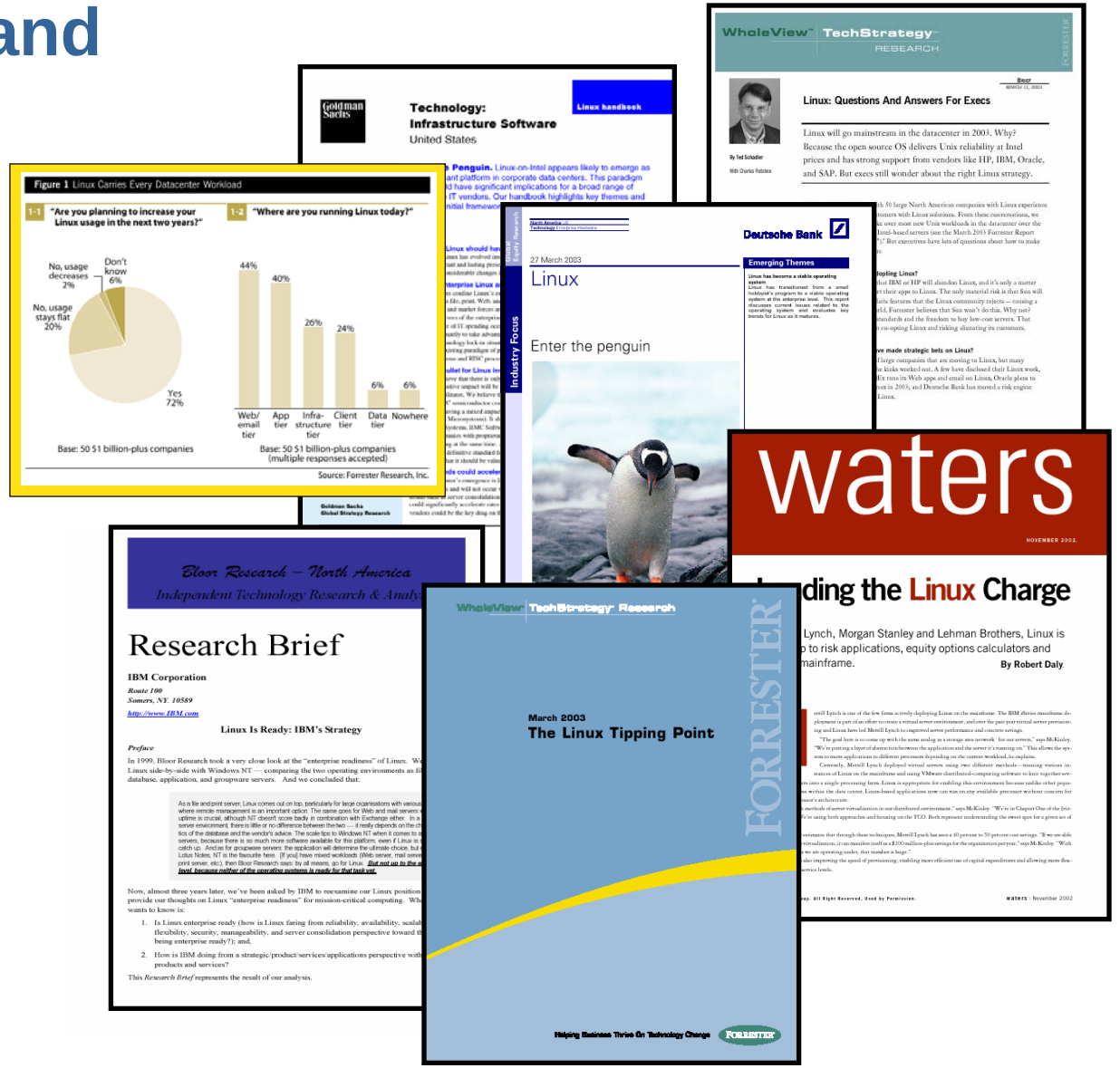
What is a Linux distribution?

O'REILLY®



Linux adoption and acceptance

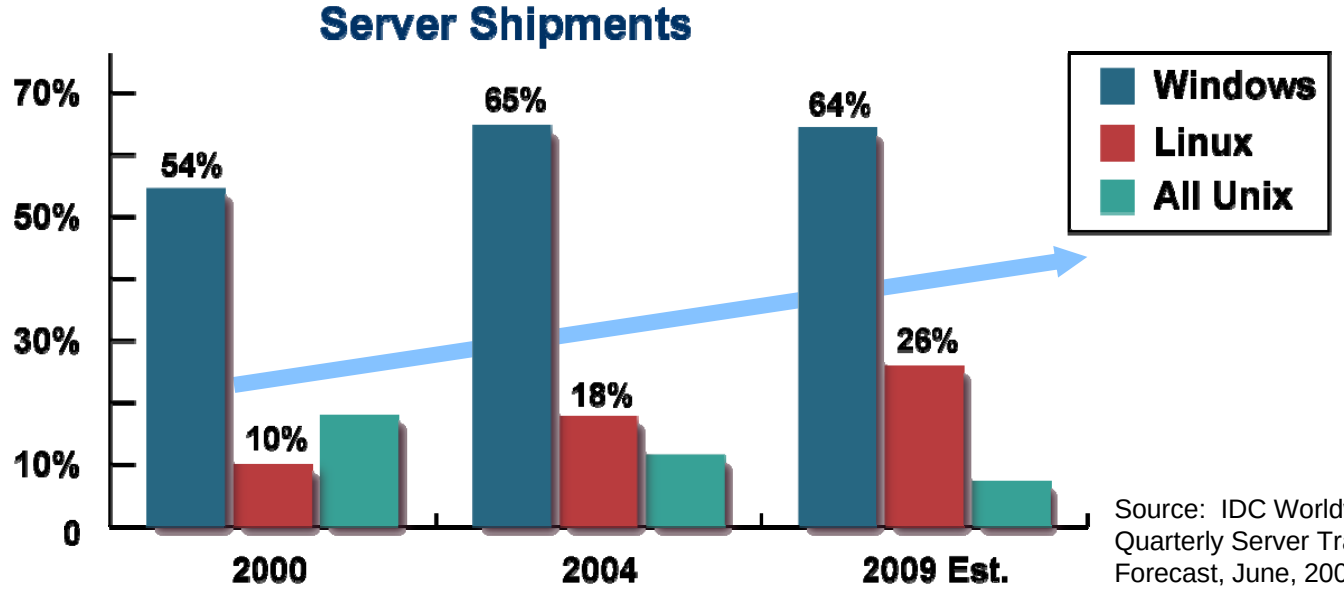
- **Reports from :**
  - Gartner
  - Deutsche Bank
  - Forrester
  - IDC
  - DH Brown
  - Goldman Sachs
  - Bloor Research
  - Wall Street
  - IBM
- **Articles in :**
  - Business Week
  - Financial Times



Cost studies abound – Pick wisely!

Linux server market continues to grow

- **11th consecutive quarter (1Q05) of year-to-year double-digit growth**
  - Linux server revenue exceeded $1.2B in quarterly revenue, 10.3% of overall quarterly server revenue – an all-time high
  - Year-to-year revenue growth of 35.2% and unit shipments up 31.1%

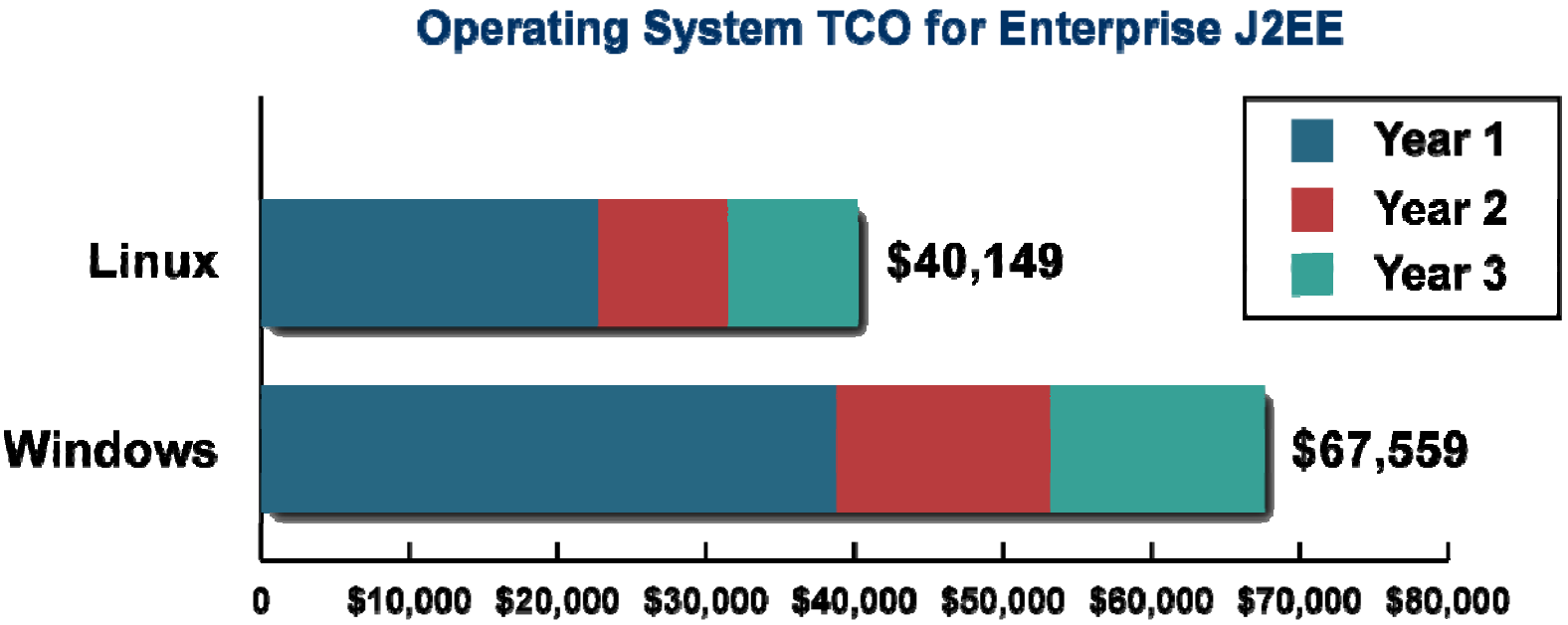


Source: IDC Worldwide Quarterly Server Tracker and Forecast, June, 2005

Linux continues to deliver cost benefits

- **Linux is 40% less expensive than a comparable x86 based Windows solution**
  - Based on a 3-year period of ownership for a system supporting 100,000 operations per second on the SPECjbb benchmark

Robert Frances Group
Business Advisors to IT Executives



Source: Robert Frances Group: TCO for Application Servers Study, August, 2005

Key accelerators for Linux growth

Gartner

"Accelerators outweigh the inhibitors of Linux's increasing acceptance in enterprises. Enterprises must adopt sound business practices to achieve the promised benefits if they use Linux."

Accelerators	Force and influence in decision process
Cost pressures and platform standardization/consolidation	Very strong
Security and reliability concerns of Microsoft platforms	Very strong
Openness and low-cost availability	Very strong
Negotiation and platform flexibility	Strong
Peer acceptance, skills pool and development	Strong
Concerns with Microsoft licensing and business practices	Very strong
Platform vendor enthusiasm	Moderately strong

Gartner Research Note: Linux Accelerators Outstrip the Inhibitors Technology, T-21-0334

Linux capabilities have evolved and expanded

Linux is free
- Better TCO than Unix
- Better TCO than Windows
- Migrate to commodity hardware
- Use as a bargaining chip
- Pluck the low hanging fruit

Linux is mature
- Drives innovation
- Provides choices
- Enables consolidation
- Facilitates simplification
- Reduces IT costs
- Results in business advantage

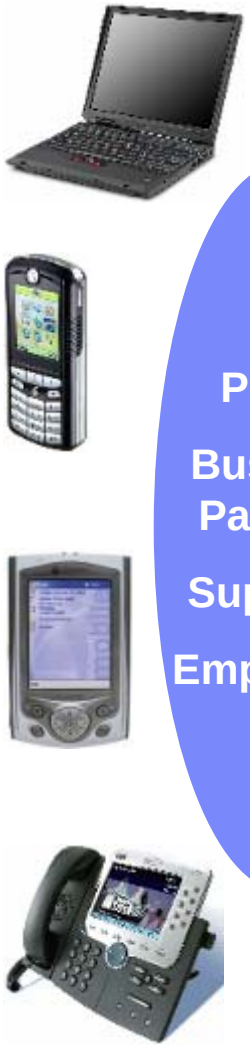
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

Linux runs on x86
- Works but not enterprise ready
- Used in non-critical areas
- Good infrastructure solution

Linux runs on multiple architectures
- Up to 16 way SMP support
- Unix-like features and enhancements
- Proven reliability, availability and stability
- Used for mission critical applications
- Runs ERP applications and databases

- **Linux is not implemented because it is cool nor as a religious experience**
- **Linux is a facilitator of business solutions and / or IT initiatives**

“Traditional” view of Linux fit is outdated



Public

Business Partners

Suppliers

Employees

Network

Middleware

Directory and Security Servers

Web Presentation Servers

Web Application Servers

Transaction Servers

Data Servers

Quality of Service

Storage

Linux fits everywhere!

Public

Business Partners

Suppliers

Employees

Network

Middleware

Directory and Security Servers

Transaction Servers

Web Presentation Servers

Web Application Servers

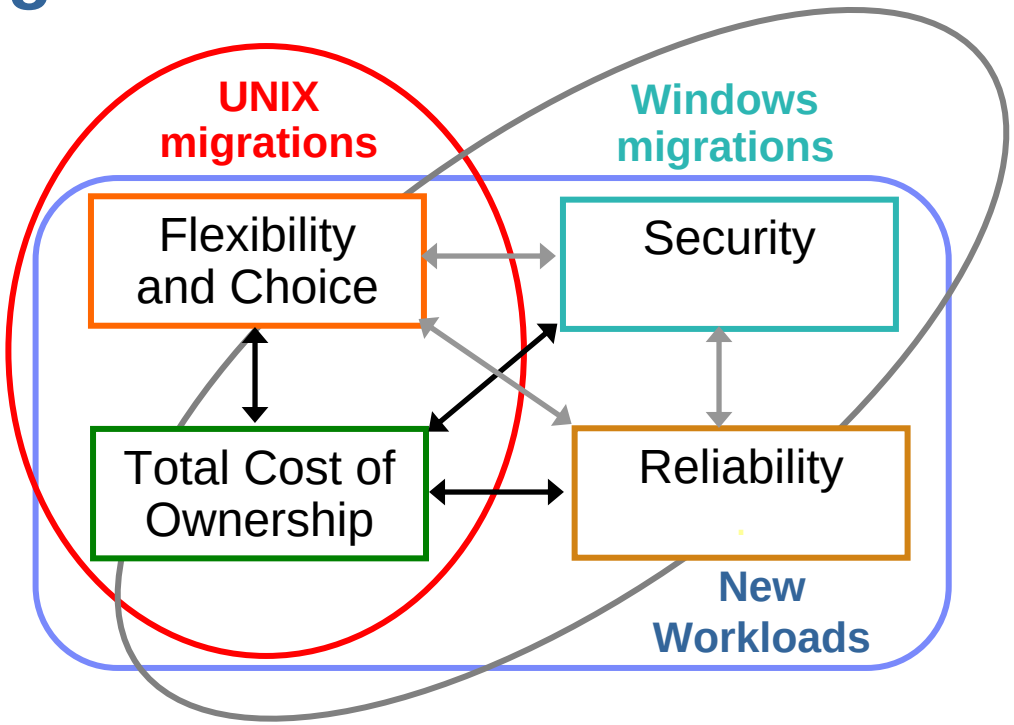
Data Servers

Quality of Service

Storage

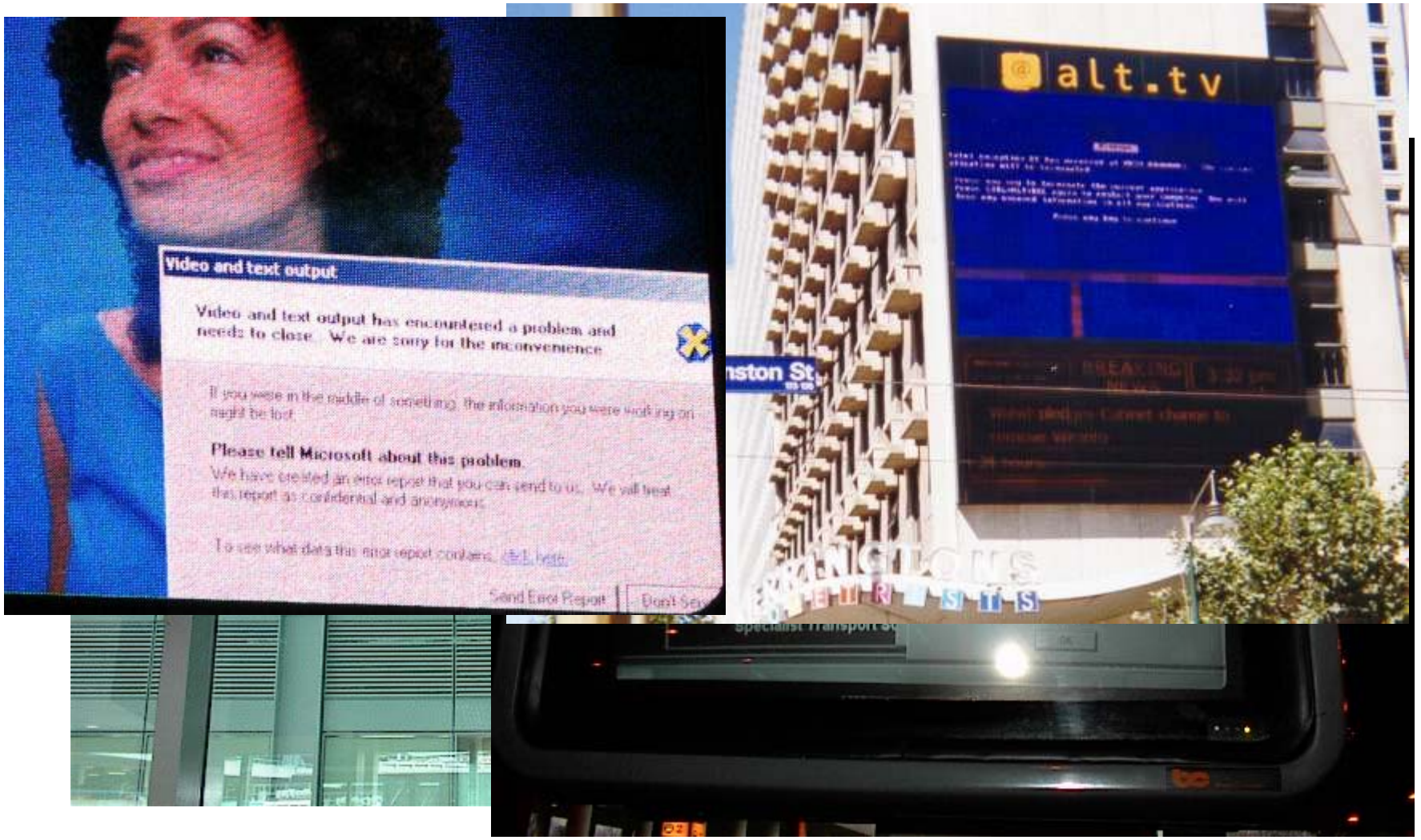
Customers are adopting Linux

- **New workloads are being added to gain the full benefits of platform and vendor flexibility, low cost of ownership, solid security, and solid reliability**



- **Linux is replacing proprietary UNIX as Linux offers UNIX-like features and platform independence with lower cost of ownership**
- **Linux is replacing Microsoft servers due to choice, attractive cost of ownership, and enhanced security**

Customers want to avoid…

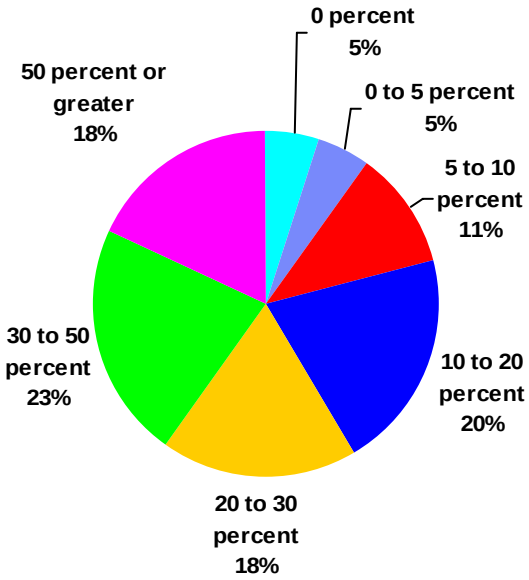


Can Linux and Windows coexist peacefully?

- **Linux is here, Windows is not going away, and heterogeneity is the order of the day**
  - Corporate users must address interoperability and integration issues *before* deployment
  - Microsoft, LDPs, and ISVs must deliver interoperability to ensure peaceful coexistence
  - Linux now accounts for 20% of the worldwide installed base of server operating systems (15% in North America)[1]
  - The majority of corporate networks are heterogeneous environments with multiple operating systems
  - Windows and Linux constitute the bulk of those server installations

Linux is Complementary to Windows

Estimate Linux's share in your environment as a complementary server alongside Windows



YANKEE GROUP

Source: Yankee Group, *Heterogeneous Linux, Windows Networks Heighten Integration Challenges*, May 19, 2005

Source: [1] Yankee Group *2005 North American Linux TCO Survey*

Linux and Sun Solaris

"There was a low barrier to exit from Solaris over the last 5 years to Linux. And in fact you can talk to any customer and they were able to move very smoothly and without hardly breaking a sweat in getting to the Linux environment."

Scott McNealy, Chairman and CEO, Sun

Source: Sun Q2 FY06 Quarterly Earnings Call 2006-01-24 at 50:30 to 50:47. Available at http://wcdata.sun.com/webcast/archives/VIP-2238/

Linux and Oracle

- **Linux will pass Sun Solaris as the leading Oracle deployment platforms according to a groundbreaking study**
  - This survey of more than 800 enterprises using Oracle database technology revealed that while 49 percent of the respondents currently run Oracle on a Solaris platform, that number should slip to 43 percent next year
  - At the same time, 39 percent of the respondents currently run Oracle on Linux, a figure that should climb to 44 percent by next year, making Linux the top Oracle deployment platform

March 2, 2006 – Full report located at http://www.ioug.org/Research.pdf

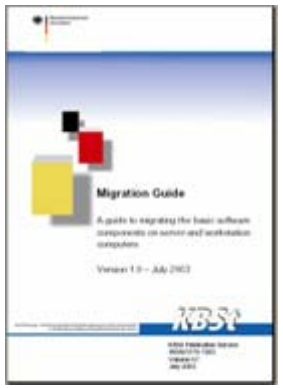
And then there is the SCO Group

"Since day one, the IBM strategy in the SCO Group lawsuit has been to defend against the SCO Group's unfounded claims vigorously in court. Our belief is that the best way to deal with the SCO Group campaign is where it can truly be resolved – in court."

Bob Samson – IBM

Open Source in the public sector

- **European Commission**
  - The IDA Open Source Observatory
    europa.eu.int/idabc/en/chapter/452
- **German Federal Ministry of the Interior**
  - Migration Guide
    www.kbst.bund.de/Anlage303807/pdf_datei.pdf



- **Denmark Board of Technology**
  - Open-source software in e-government
    www.tekno.dk/pdf/projekter/p03_opensource_paper_english.pdf
- **Defense R&D Canada**
  - Free and Open Source Software
    cradpdf.drdc.gc.ca/PDFS/unc35/p522804.pdf
- **Commonwealth of Massachusetts**
  - Click on “Open Initiatives”
    www.mass.gov/?pageID=itdhomepage&L=1&L0=Home&sid=Aitd

Insuring success for Open Source software implementations

- **Secure executive sponsorship**
  - Critical to secure appropriate program support and funding
    - Design, quality assurance, implementation, migration, training, support
  - Identify valid pilots for initial programs
    - Server based, problem solving, TCO based
- **Develop education and certification programs for open source software**
  - Sponsor workshops for contractors, ISVs, innovators
  - Leverage existing Linux certification programs
- **Establish open source and Linux pilot projects**
  - Focus on server implementations
- **Develop partnership with implementation partner for service, migration, and support**

Linux and Open Computing @ IBM
ibm.com/linux

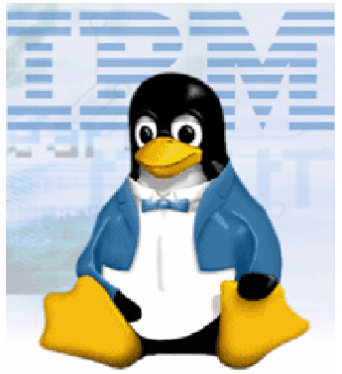
SHARE
Technology · Connections · Results

ON DEMAND BUSINESS™

Linux @ IBM Investments

Ready for IBM @server with Linux

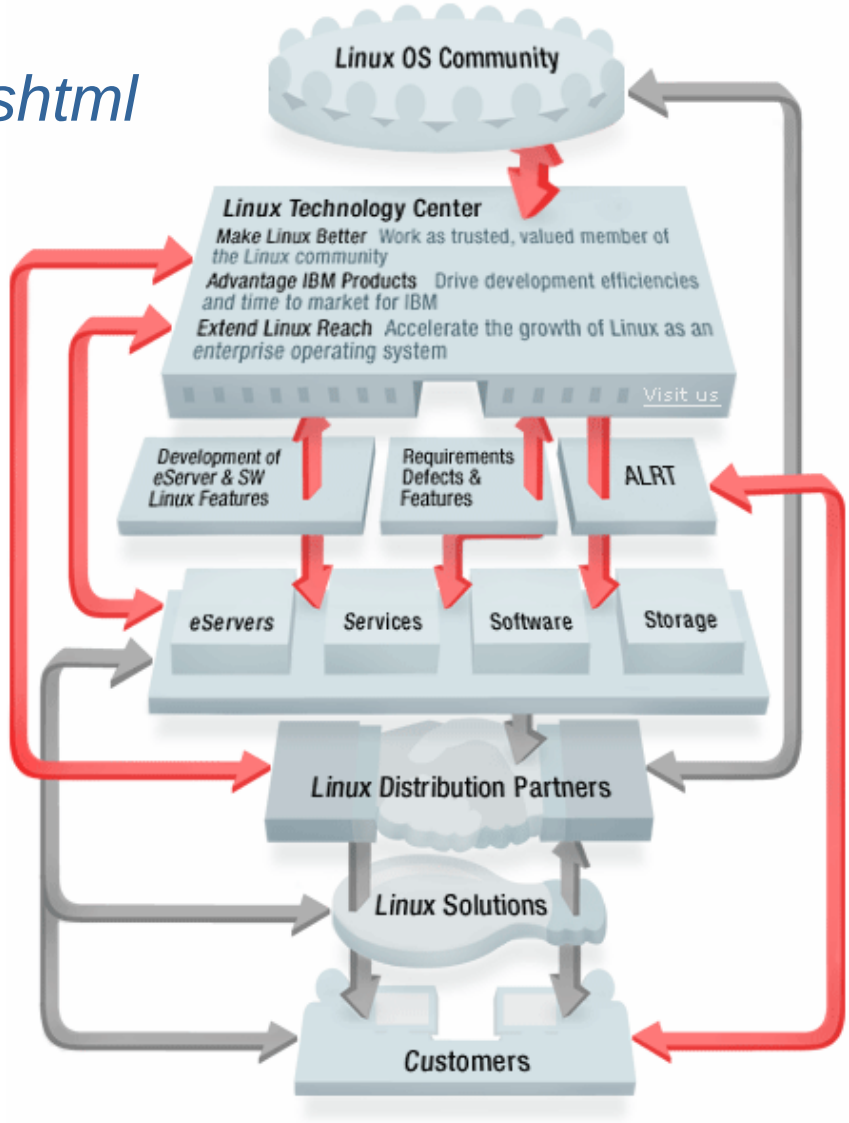
- **Systems**
  - xSeries **1998**
  - zSeries **1999**
  - Cluster and POWER **2001**
  - BladeCenter **2002**
  - OpenPower / BlueGene **2004**
- **Software**
  - DB2 **1999**
  - WebSphere **2000**
  - Tivoli **2001**
  - Lotus **2001**
  - Rational **2003**
- **Linux Services**
  - **1999**
- **Linux Technology Center**
  - **1999**
- **Chiphopper**
  - **2005**
- **Open Source Contributions**
  - **1998 to 2006**
- **Patent Commons**
  - **2005**
- **Open Source Development Lab**
  - **2000**
- **Linux Partners**
  - EAL2 **2003**
  - EAL3 **2004**
  - EAL4 **2005**



Linux Technology Center

www-1.ibm.com/linux/ltc/mission.shtml

- **LTC development mission:**
  - Help make Linux better
  - Assist the IBM Hardware, Software, and Services brands win with Linux
  - Expand the reach of Linux
  - Remain trusted, valued members of the Linux community
- **IBM participates in over 160 Open Source projects**
  - LTC members participate in over 90 Open Source projects



Note: Red denotes scope of LTC mission

IBM alliances with Linux distribution partners

- **Novell**
  - SUSE Linux Enterprise Server
    www.novell.com/products/linuxenterpriseserver/
  - Common Criteria CAPP/EAL4+ on 23 Feb 2005
- **Red Hat**
  - Red Hat Enterprise Linux
    www.redhat.com/software/rhel/
  - Common Criteria CAPP/EAL4+ on 14 Feb 2006
- **Support for all IBM server products**
- **Service available from IBM or distributors**

IBM Open Standards leadership






1998 / 1999	2000	2001	2002	2003	2004
▪ Java, XML and ebXML ▪ Co-founder and lead architect for RosettaNet ▪ Author of XML4J ▪ Chair OMG XML Metadata Interch. Format ▪ Co-author W3C Document Object Model ▪ FounderXML.org ▪ Elected to Board of Directors in OASIS	▪ Web Services and UDDI ▪ Co-author of SOAP 1.1 and submission to W3C ▪ Cofounder of UDDI.org and author of original UDDI specification ▪ Co-author of WSDL ▪ IBM contributes SOAP4J to Apache	▪ Web Services and Tools ▪ Led submission of WSDL to the W3C ▪ Co-chaired W3 Web Services Workshop ▪ Founder of Eclipse.org ▪ Co-author of W3C XML Schema standard ▪ Chair of Web Services Interactive Applications TC	▪ Web Services and Security ▪ Founder and chair, WS-I Organization ▪ Co-author of web services bus process specification (BPEL, WS-TX, WS-TC) ▪ Co-author for Web Services Security roadmap and specification	▪ Web Services Interoperability ▪ Submission of BPEL to OASIS and co-chair WSBPELTC ▪ Submission of Common Base Events and WS-Manageability to OASIS ▪ Co-chair WSDM TC in OASIS ▪ Led workgroup responsible for finalization of SOAP 1.2	▪ Web Services Management ▪ Chair of workgroup responsible for WS-I Basic Profile 1.1 ▪ Co-chair of working group responsible for OASIS WS-Security 1.0 ▪ Co-chair of OASIS WS-Notification TC ▪ Eclipse becomes independent organization ▪ More than 1,000 developers devoted to XML and more than 1,500 focused on Linux.

Over 160 business integration technology patents

First Web Services Gateway

First integrated private UDDI directory




IBM Open Source leadership

eclipse

The Apache Software Foundation

the globus project™ www.globus.org

1999 - 2001	2002	2003	2004	2005
▪ IBM forms Linux Technology Center – contributions to serviceability, performance ▪ Leads Apache XML projects Xalan Xerces, SOAP ▪ Forms Open Source Steering Committee ▪ Creates OSI-approved IBM & Common Public Licenses ▪ Participation in Mozilla ▪ Founder of Eclipse	▪ Linux contributions to scalability (8-way+), reliability (stress testing, defect mgmt, doc) ▪ Leads Apache Web Services projects WSIF and WSIL ▪ Leads Eclipse projects GEF (editing), EMF (modeling), XSD (XML Schema) ▪ IBM contributes eServer support for Globus Toolkit 2x	▪ IBM and SUSE achieve EAL2+ Common Criteria security cert ▪ Leads Apache projects Pluto (Portlet API) and WSRP4J (Remote Portal) ▪ Leads Eclipse projects Hyades (testing), Visual Editor, AspectJ, Equinox rich client ▪ Globus Toolkit 3 contributions for OGSA, OGSI	▪ IBM and Novell/SUSE achieve EAL3+ and Common Operating Environment compliance ▪ Linux additional RAS ▪ Incubates Apache project Derby (Cloudscape Java database) ▪ Dialog components to Apache Jakarta taglibs ▪ Eclipse becomes independent org – IBM contributes UML2, Web Tools, Voice Tools ▪ Globus Toolkit 4 to be WS-I compliant ▪ IBM contributes voice recognition technology to Apache and Eclipse	▪ Contributions to Xen hypervisor, Linux accessibility ▪ Contributions to Apache WSDL4J 2.0 (Woden), Web Services Security ▪ Database extensions to PHP ▪ Redeploy 30+ developerWorks projects on SourceForge.net ▪ IBM pledges 500 patents to OSS

More than 1000 developers involved in OSS projects | **IBM leads 80+ OSS projects** | **IBM contributes to 150+ OSS projects**

Linux – Transforming IBM's IT infrastructure

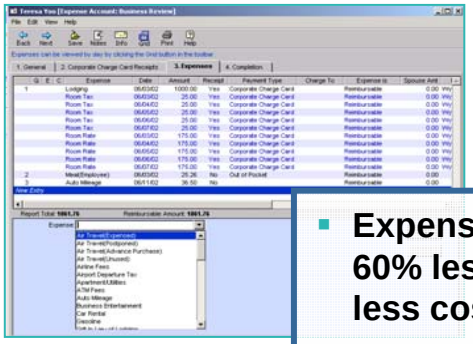
Providing key business solutions

- **3,000+ production servers worldwide**
  - 25,000+ clients
- **ibm.com/linux and w3.ibm.com/linux**
  - Supports 320,000+ employees worldwide
- **IBM's special events infrastructure – Wimbledon, the Ryder Cup, the US Open**
  - Linux clusters in Raleigh, Boulder, and St. Louis.
- **IGS Internet vulnerability security scanning**
  - Scanning 30k IP addresses/ week
- **Web fountain data mining service**
  - A development environment of over 300 Linux servers
  - A production environment of over 500 Linux servers
- **IBM global e-mail anti-virus management**
  - Scans incoming/outgoing mail for viruses
- **300mm wafer manufacturing automation and equipment control**
  - 200+ production Linux servers

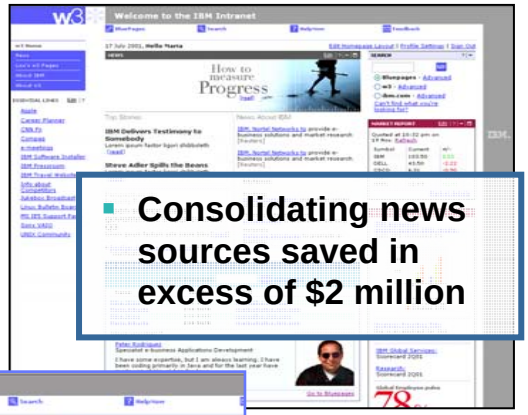
Powered by

Intranet – "On Demand Workplace" at IBM

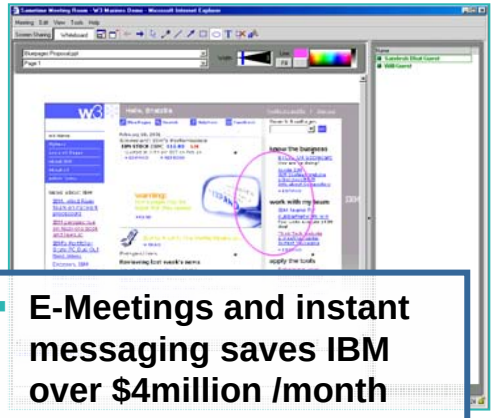
Powered by



- Expense reports take 60% less time, 80% less cost

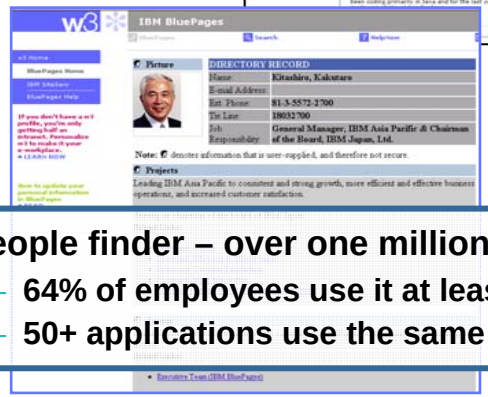


- Consolidating news sources saved in excess of $2 million

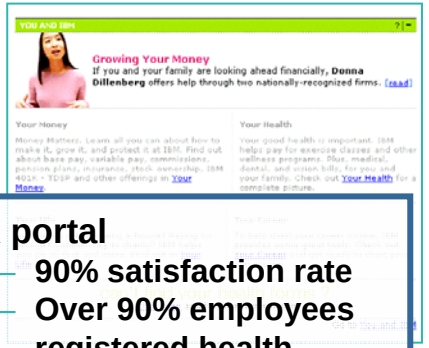


- E-Meetings and instant messaging saves IBM over $4million /month

- Worldjams, jukeboxes, personalized news, discussion forums



- People finder – over one million hits a day
  - 64% of employees use it at least once a week
  - 50+ applications use the same directory



- HR portal
  - 90% satisfaction rate
  - Over 90% employees registered health benefits here last year, saving IBM over $1 million

w3 search engines run on Linux on xSeries

- IBM realized over $400 million in cost avoidance in 2002 with over 40% of classes moved online

Workplace application development runs on Linux on zSeries

IBM forums run on Linux on zSeries

IBM Linux portal

ibm.com/linux

Powered by

IBM developerWorks for Linux

ibm.com/developerworks/linux

Powered by

IBM Redbooks

ibm.com/redbooks/linux

Linux on IBM hardware

ibm.com/eserver/linux

eServer xSeries	**Intel EM64T**
eServer e326	**AMD AMD64**
System p, System i	**IBM POWER**
BladeCenter	**Intel EM64T, AMD AMD64, IBM POWER**
eServer Clusters	**Intel EM64T, AMD AMD64, IBM POWER**
System z	**IBM z/Architecture**
System Storage and TotalStorage	
Intellistation	**Intel EM64T, AMD AMD64, IBM POWER**
Point-of-Sale, Kiosks	**Intel Pentium**

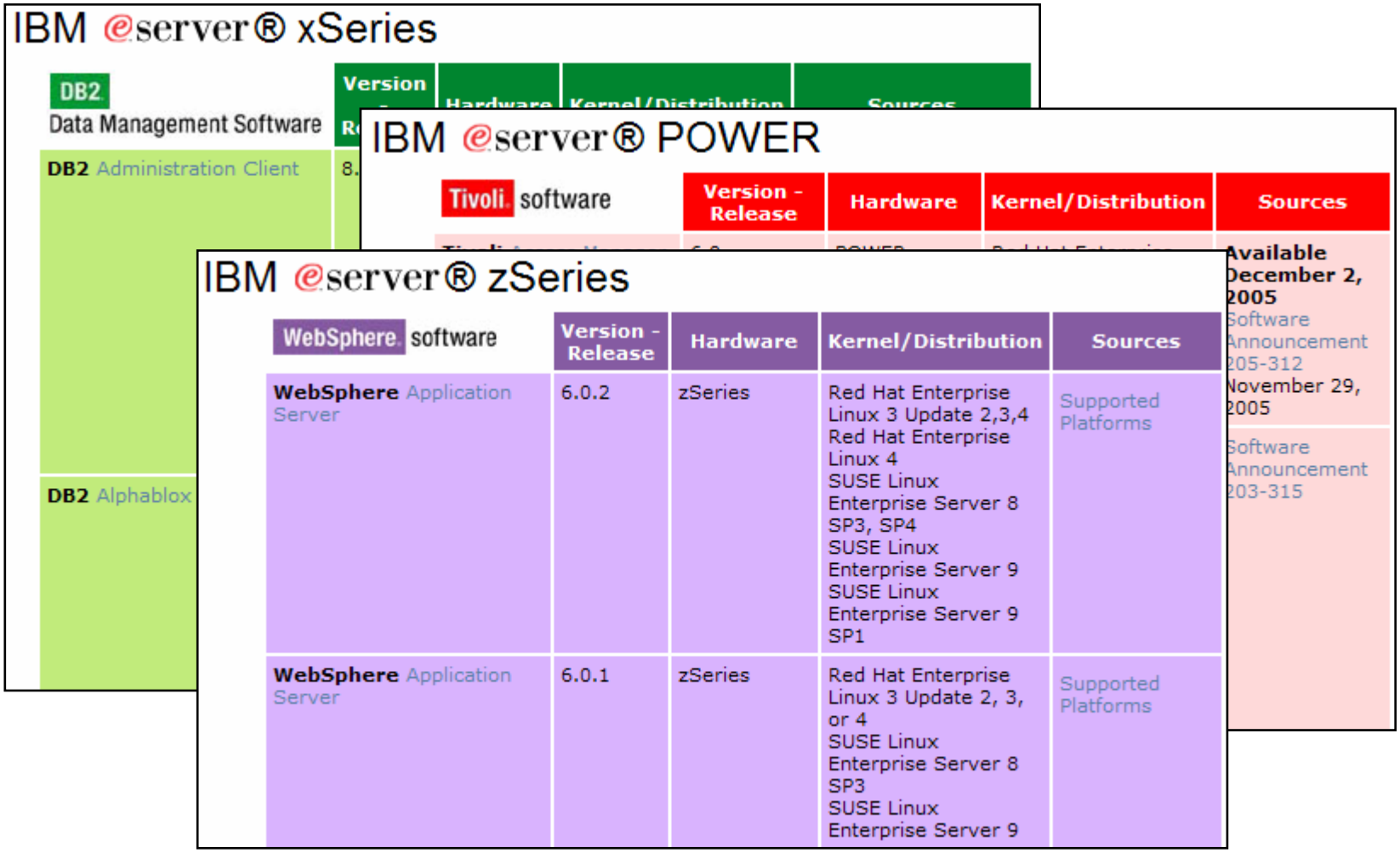
IBM software and Linux

ibm.com/software/linux

- **Solutions available across all product lines**
  - WebSphere – middleware, application server, e-business, and infrastructure software
  - DB2 – database software
  - Lotus – collaboration and messaging software
  - Tivoli – system and storage management software
  - Rational – software development tools
- **Over 500 IBM software products available today on Linux**
- **Linux editions of software products are available the same day as all other platforms**
- **Primary software solutions to be available on Linux**

IBM software product availability matrix

ibm.com/linux/matrix



IBM @server® xSeries

DB2 Data Management Software

	Version	Hardware	Kernel/Distribution	Sources
DB2 Administration Client	8.			
DB2 Alphablox				

IBM @server® POWER

Tivoli software

	Version - Release	Hardware	Kernel/Distribution	Sources
				Available December 2, 2005 Software Announcement 205-312 November 29, 2005
				Software Announcement 203-315

IBM @server® zSeries

WebSphere software

	Version - Release	Hardware	Kernel/Distribution	Sources
WebSphere Application Server	6.0.2	zSeries	Red Hat Enterprise Linux 3 Update 2,3,4 Red Hat Enterprise Linux 4 SUSE Linux Enterprise Server 8 SP3, SP4 SUSE Linux Enterprise Server 9 SUSE Linux Enterprise Server 9 SP1	Supported Platforms
WebSphere Application Server	6.0.1	zSeries	Red Hat Enterprise Linux 3 Update 2, 3, or 4 SUSE Linux Enterprise Server 8 SP3 SUSE Linux Enterprise Server 9	Supported Platforms

IBM Global Services and Linux

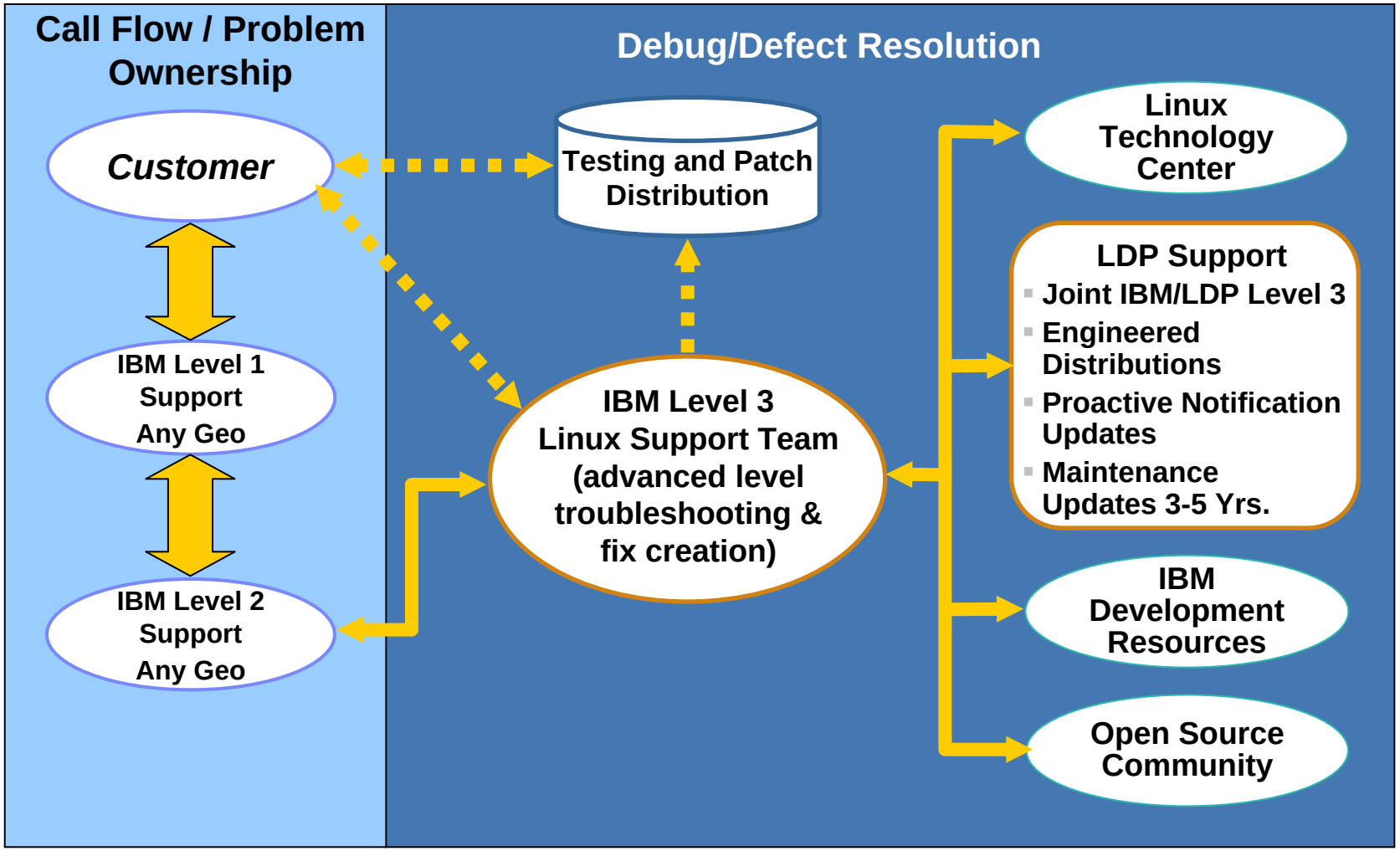
- **High performance cluster integration services**
- **Enhance your e-business with Linux solutions**
- **SupportLine for Linux – unmatched 24x7 remote support**
  - Fast and accurate problem resolution
  - Helpful, skilled IBM services specialists to supplement your internal staff
  - Electronic support and problem submission that saves you time and allows you to track open support issues
- **Middleware enablement services for Linux**
- **IBM e-business Hosting**
- **IBM Technical Training**

IBM SupportLine for Linux

- **Essential support for day to day activities**
- **Provides remote, integrated technical support solutions for your Linux environment**
- **Supplements your staff's knowledge with extensive Linux expertise – helps you launch Linux with confidence**
- **Support for major distributions of Linux: Novell and Red Hat**
- **Businesses that require comprehensive Linux technical and defect support**

IBM IGS – Linux support structure

Providing enterprise support for mission critical workloads



IBM Training for Linux in the US

ibm.com/training

Course title	Delivery type	Course code
Advanced Solutions for Linux on zSeries	Classroom	ZL150
DB2 Universal Database Administration Workshop for Linux	Classroom	CF201
Linux and Bourne Again Shell Programming	Classroom	QLX23
Linux and Perl Programming	Classroom	QLX22
Linux as a Firewall	Classroom	QLX24
Linux Basics - A zSeries Perspective	Classroom	HLX13
Linux Basics and Installation	Classroom	QLX02
Linux e-business with Apache	Classroom	QLX25
Linux Implementation for zSeries	Classroom	ZL100

Course title	Delivery type	Course code
Linux Integration with Windows (Samba)	Classroom	QLX86
Linux Internals Overview	Classroom	QLX95
Linux Jumpstart for UNIX System Administrators	Classroom	QLX15
Linux Kernel Debugging	Classroom	QLX92
Linux LPI Level 1 Certification Preparation Workshop	Classroom	QLX37
Linux on IBM eServer iSeries i5	Classroom	AS560
Linux on p5 Performance Management	Classroom	QTL40
Linux System Administration	Classroom	QLX03
Linux TCP/IP Administration	Classroom	QLX07

IBM Training for Linux in the US

ibm.com/training

Course title	Delivery type	Course code
Perl Programming for Linux Open Systems and the World Wide Web	Classroom	QLX28
Supporting Enterprise Linux on p5	Classroom	QTL15
Supporting Enterprise Linux on p5 eServers	Classroom	QPL15
Supporting Linux on POWER	Classroom	QTL10
Supporting Linux on POWER Servers	Classroom	QPL10
Writing Linux Device Drivers	Classroom	QLX90
z/VM and Linux Connectivity and Management	Classroom	ZV100
Linux Basics	Shipped Media	QL3S0
Linux Basics and Installation	Shipped Media	QL2S0

Course title	Delivery type	Course code
Linux Basics: A zSeries Perspective	Shipped Media	H13S0
Linux e-business with Apache	Shipped Media	QL5S0
Linux Implementation for zSeries	Shipped Media	Z00S0
Linux Integration with Windows (Samba)	Shipped Media	QL6S0
Linux Introduction: What is it? Who's using it? And why?	Shipped Media	QL0S1
Linux Overview for Managers	Shipped Media	X57S0
Linux System Administration	Shipped Media	QL4S1
Linux TCP/IP Administration	Shipped Media	QL7S0
VM Basics for Linux ILS	Shipped Media	Z50S0

Summary

ON DEMAND BUSINESS™

Three pillars of a successful Linux solution

- **On Demand Business**
  - Responsive
  - Variable
  - Focused
  - Resilient

- **IBM**
  - End-to-end
  - Hardware, software and services
  - Value-net of partners

- **Linux**
  - Freedom of choice
  - Cost effective
  - Secure
  - Innovative

ON DEMAND BUSINESS™

What next?

- **Familiarize yourself with the facts**
- **Establish an Open Policy**
  - It should be inclusive, not exclusive!
- **Align to Open Standards**
  - Insist on them!
- **View Open Source and Linux as valid alternatives for IT systems**
- **Make decisions based on business value; not hype and hope!**
  - Be pragmatic
- **Be prepared for change!**

Thank you

Jim Elliott
Advocate – Infrastructure Solutions
Manager – System z Operating Systems
IBM Canada Ltd.
jim_elliott@ca.ibm.com
905-316-5813

ibm.com/linux

ibm.com/systems/systemz9

ibm.com/vm/devpages/jelliott

linux.ca/drupal/blog/58

Notices

This document contains words and/or phrases that are trademarks or registered trademarks of the International Business Machines Corporation in the United States and/or other countries. For information on IBM trademarks go to http://www.ibm.com/legal/copytrade.shtml.

The following are trademarks or registered trademarks of other companies.

Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.

Red Hat, the Red Hat "Shadow Man" logo, and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc., in the United States and other countries.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

All other products may be trademarks or registered trademarks of their respective companies.

Notes:

This publication was produced in Canada. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.