The IBM Linux Strategy

WAVV 2004, Chattanooga, TN

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Agenda

- **WHAT** is Linux ?
- **WHY** should you consider Linux ?
- **WHERE** is IBM's Linux Investment going ?
- **WHO** are IBM's Linux Customers ?

Business Week

The Linux Uprising, March 3, 2003

LINUX CUTS BOTH WAYS

THE WINNERS

IBM Big Blue is selling twice as many Linux servers as any other company and is well-liked by Linux developers

INTEL The processor giant is riding Linux into the world of high-powered computing in corporate data centers

DELL The thriftiness of Linux appeals to Dell, which can sell Linux servers cheaper than other major computer companies

RED HAT The leading seller of Linux has lined up distribution deals with just about every big computer company

THE LOSERS

SUN MICROSYSTEMS Customers are abandoning its Solaris software for Linux, which performs similar tasks

MICROSOFT Linux wins the price war and is luring corporate customers leery of getting locked into Microsoft

LINUX STARTUPS Other than Red Hat, there's not much room for these small fry

LINUX PURISTS Linux developers who don't like the idea of working with capitalists had better get used to it

USA Today

Linux wins in Munich, July 14, 2003

THE NATION'S NEWSPAPER

Special e-print Edition

USA TODAY

NO. 1 IN THE USA

As seen in USA TODAY Money

July 14, 2003

Linux took on Microsoft and won big in Munich

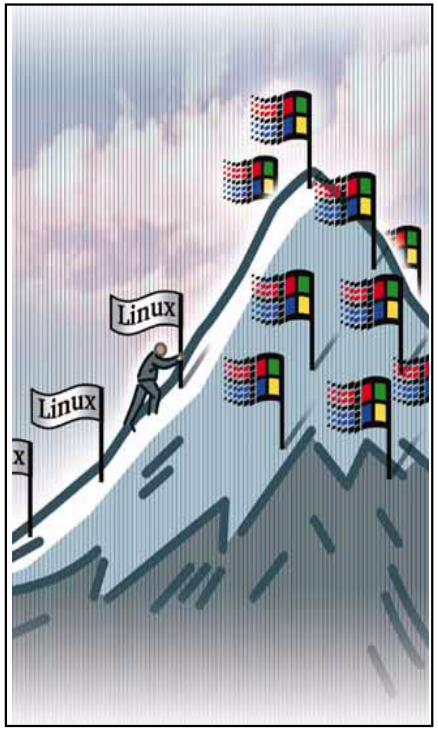
Victory could be a huge step in climb by up-and-comer

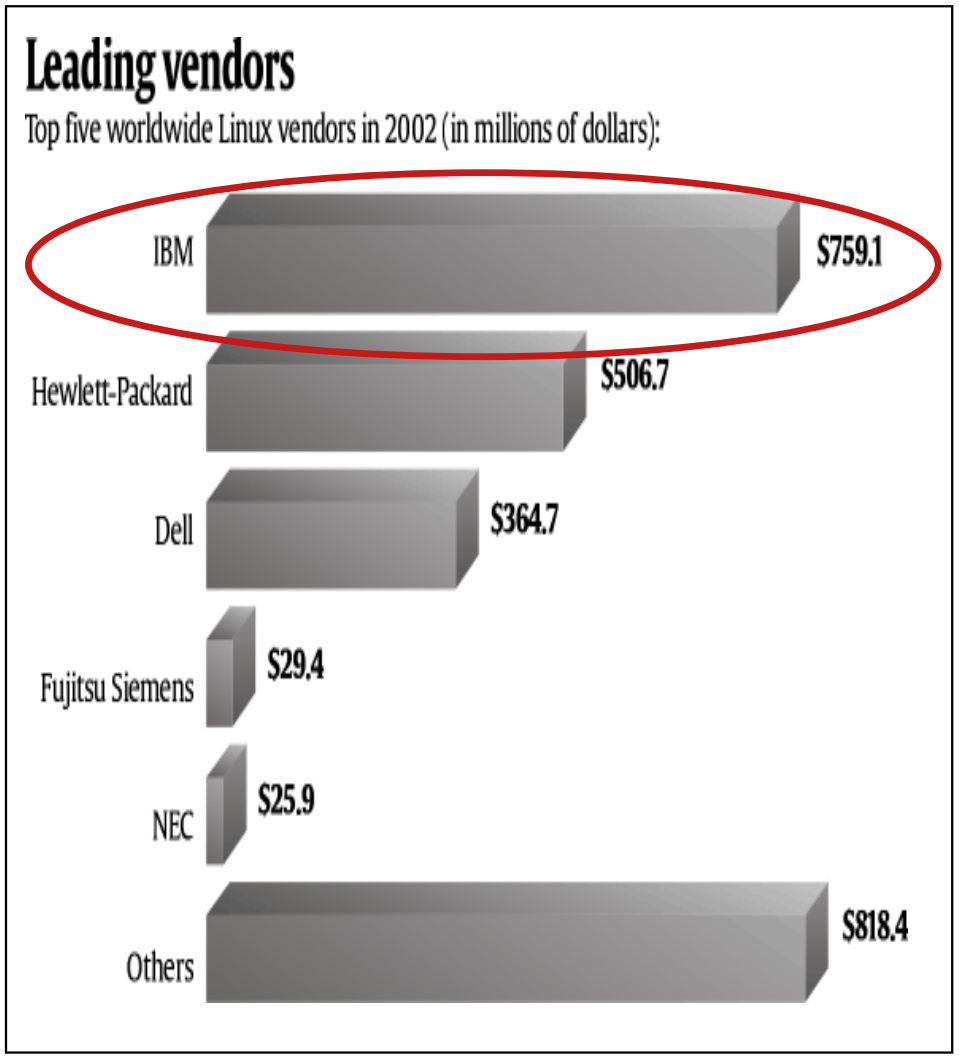
Cover Story

By Brian Achido
USA Today

On the brink of losing a pivotal account to an ascending rival, Microsoft last March dispatched CEO Steve Ballmer to the rescue.

The German city of Munich was balking at a $36.6 million proposal from Microsoft to upgrade 14,000 desktop PCs to the latest versions of Windows and Office.





Source: Gartner Dataquest, March 2003
By Robert W. Ahrens, USA TODAY

Market Pressures

Business Efficiency
- Process Integration
- Cost
- IT Asset Utilization

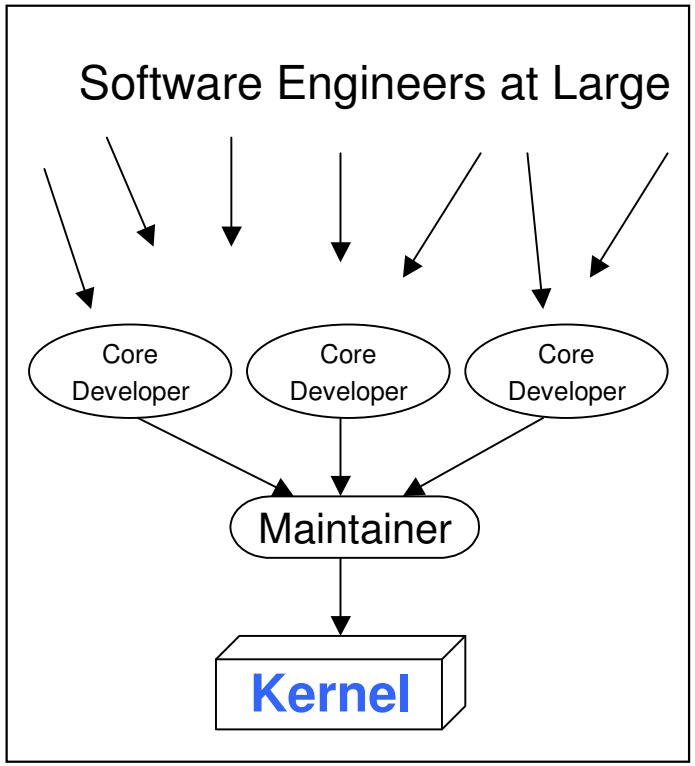
Business Continuity
- Reliability
- Performance
- Security
- Disaster Recovery

Open Movement
- Fexibility
- Innovation
- Standards

Technology Substitution
- Commoditization
- Blades
- Virtualization
- Clusters & Grids

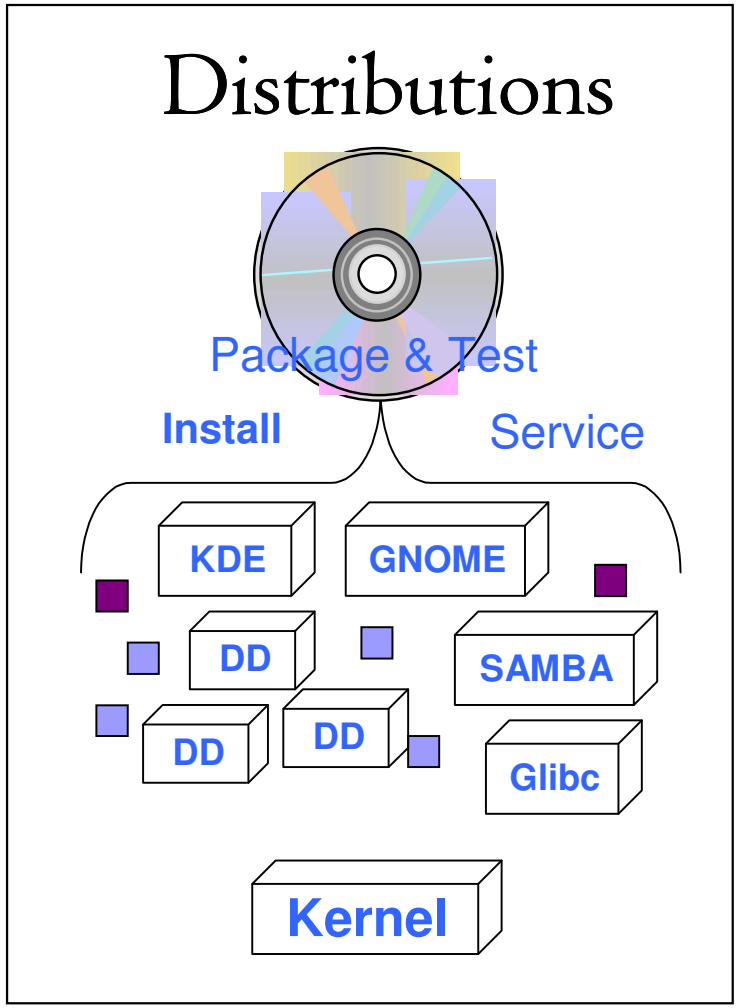
What is Open Source?

- Community develops, debugs, maintains
- Generally high quality, high performance software
- Superior security - on par with UNIX, superior to Windows
- Peer code reviews are Darwinian -- structured/disciplined
- More information: www.opensource.org
- Examples of Open Source Software:
  - Apache web server
  - Eclipse app development
  - Gnome desktop environment
  - Mozilla (Netscape) browser
  - Open Office (Star Office) productivity suite
  - Perl language
  - Samba file/print
  - SendMail mail server
  - Tomcat application server



What is Linux?

- UNIX-like operating system
- Developed/tested by the Open Source community
- Packaged and shipped by distributors
  - Red Hat
  - SUSE (Novell), Turbolinux, Conectiva
  - Other (Debian, Red Flag, Mandrake, etc...)
- Why Linux?
  - One operating system only (PDA-->Desktop-->Mainframes)
  - Basis for innovation

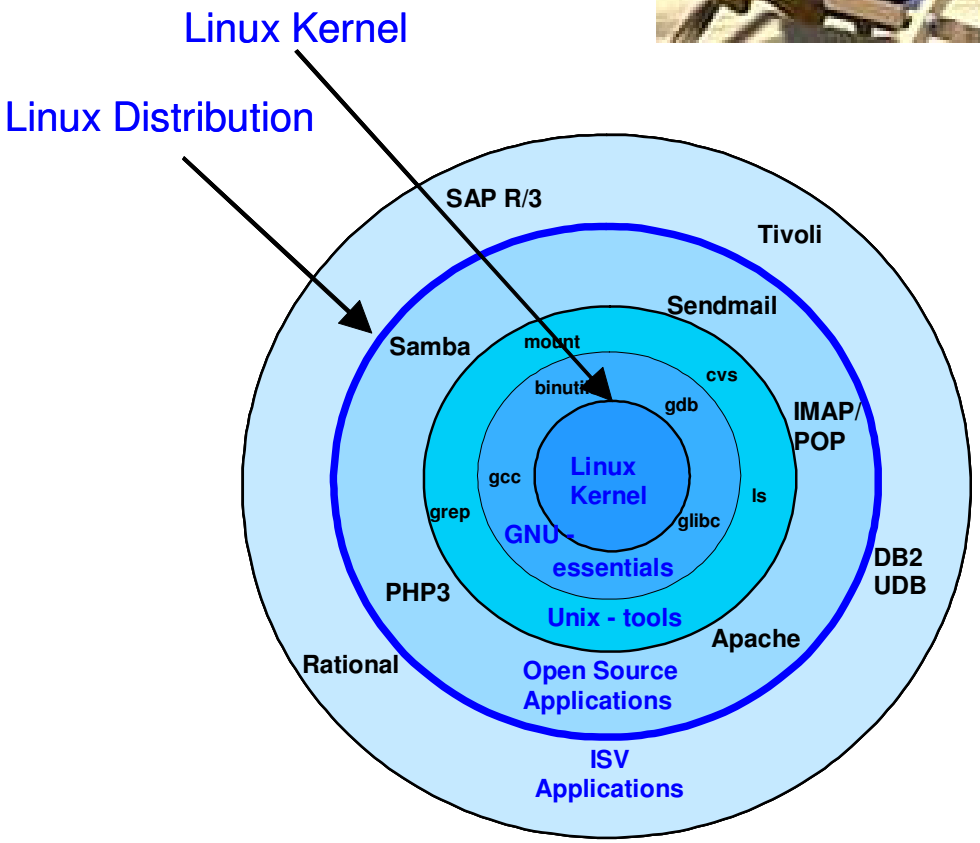


"Hello everybody... I'm doing a (free) operating system (just a hobby, won't be big and professional...)."

Linus Torvalds, creator of Linux, from the first Internet announcement on August 25, 1991. Even he initially underestimated its potential.

What makes up a Linux System?

- Kernel
  - Device drivers
  - File systems
  - Network, etc.
- Systems and Tools Set
  - Command Line Interpreter (Shell)
  - Compiler, debugger, runtime library
  - File and system operations (incl. documentation), etc.
- Graphical User Interface
  - KDE
  - GNOME
- Applications (ISVs, Open Source)
  - Enterprise software
  - Internet browser
  - Office suite, etc.



Independent Software Vendors

http://www.ibm.com/software/solutions/isv

ABK-Systeme
Informix
Pentaprise
Halcyon
Acucorp
Sendmail
ABAS
SEFAS
Innovation
Lattwein
linuxlink
Logics
Trustix
Linux Business Accounting Systems
SAP
Aeonware
Oracle
ACTS
KAI
Beans
AT&T
Eontec
View22
BEA
Workstation Group
Q-Link
Soliton
Tachyon
TIBCO
OwnMail
BMC
Green Light Advantage
Bynari
Compuflex
Macro4
zGuard
Software AG
Merant
Uneclipse
Rational
CIB
Velocity
Cybermation
Candle
Bunker Hill
SecureAgent
RTS
OpenConnect
Roguewave
Grey Zone
Dignus
Stalker
Computer Associates
GT
Iona
Sanchez
Saimaan
Dimensional Insight
LegacyJ

Your search found 6000 matching solutions.

Count current as of December 2003

Linux... Lowers Costs

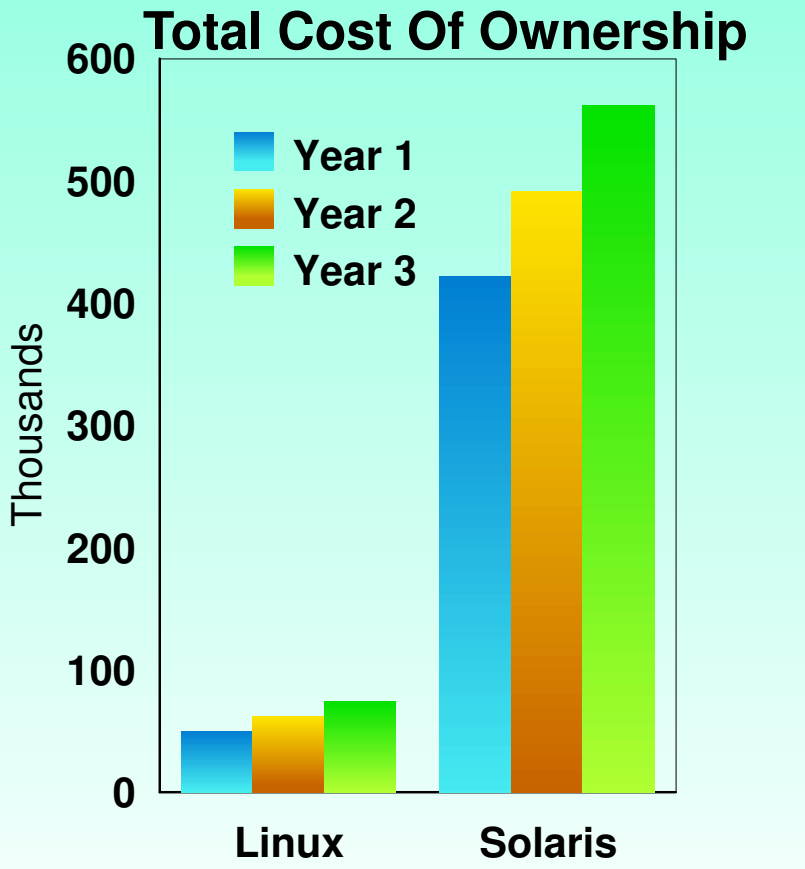
"Bynari Insight Server (on zSeries running Linux) gave us a more cost-effective alternative to Microsoft Exchange..."
Dave Ennen, Technical Support Manager -- Winnebago

"It's going to be almost 30 times cheaper to run and maintain" (than Sun systems)
Josh Levine, Chief Administrative Officer and President - - e*Trade Technologies

"Consolidating our European systems onto iSeries and xSeries will bring significant cost savings and improved administration." (speaking of Linux application)
Tim Evans, IT Manager -- Banco do Brasil

"Linux was our first choice to run these new applications... it is easy to manage and costs less than other operation systems to implement"
Mr. Makoto Takayama, Managing Director -- Lawson, Inc.

Linux... It All Started With Cost Benefits



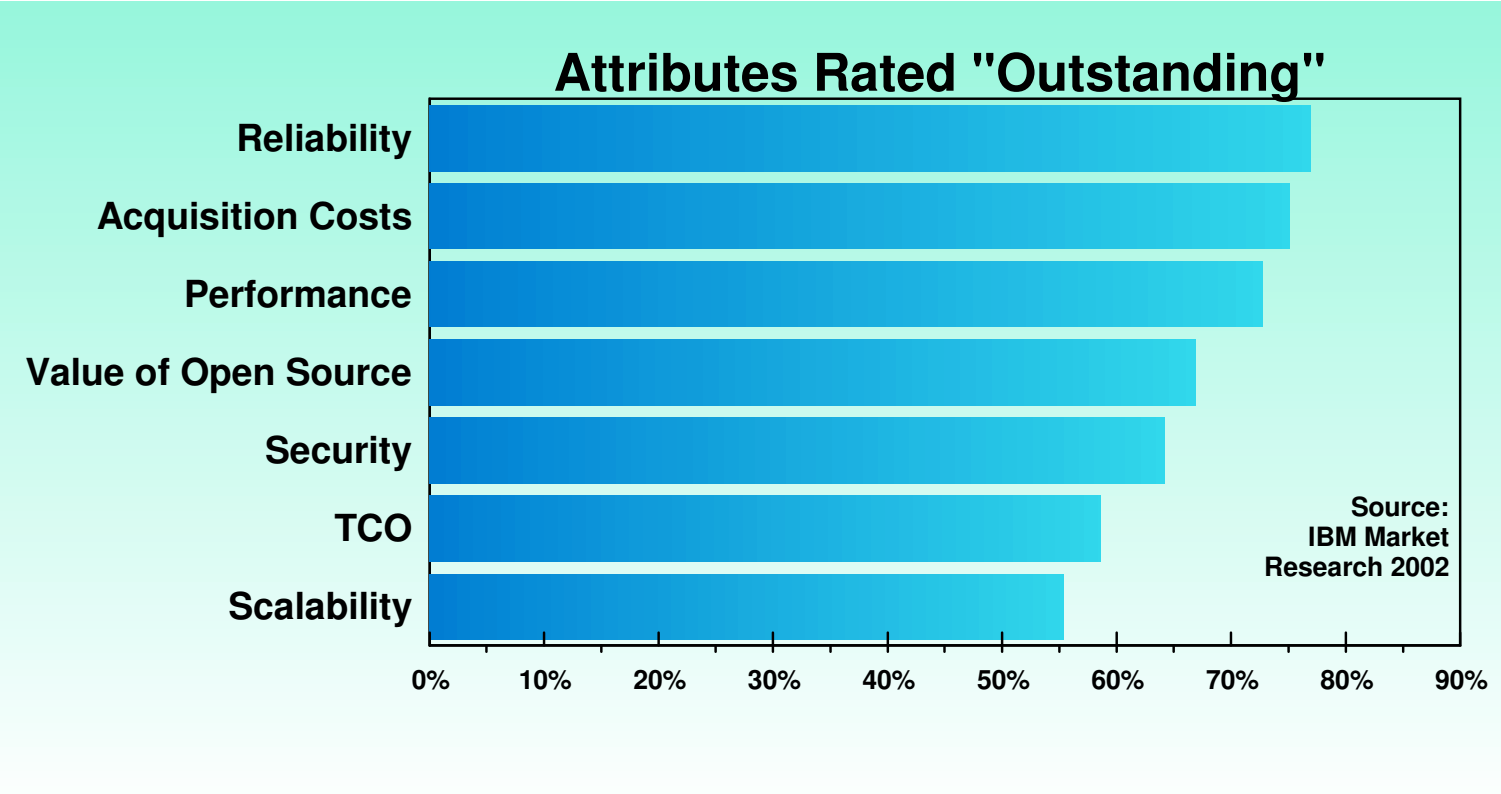
Based on Web deployment experiences of 14 customers

TCO (excludes middleware, application, services)
1) OS Purchase Prices
2) HW Purchase / Maintenance
3) Upgrade Prices
4) Admin costs

Source - Robert Frances Group - July 2002
www-1.ibm.com/linux/RFG-LinuxTCO-vFINAL-Jul2002.pdf

Linux... More than Just Cost

Question: Based on what you have seen or heard so far with Linux, how would you rate Linux on the following aspects?



Note: Includes responses from 500 Linux users

Linux... Reliable, Robust, Fast

"We need a rugged, reliable technology solution for the time-sensitive, high-volume traffic in our concession stands..."

Todd King, Vice President of Technical Information Services - - Regal Entertainment Group

"We chose to deploy Linux on zSeries servers because it provides a robust platform that meets our expected growth in mission-critical applications."

Harry Roberts, Chief Information Office, Boscov's Department Stores, LLC

"...Cars+ actually runs faster on Linux, as well as being more stable. It screams along..."

Mr. Newman Emanouel, CFO - - Thrifty Car Rental Australia

"Sendmail running on Linux for S/390 provided improved performance and reliability."

Donna Lamberth, Senior Manager for IS - - L.L. Bean

A Consistent Environment

Linux runs on virtually everything

Embedded Linux

Linux is virtually everywhere

Ericsson Bluetooth "blip"

Nokia Media Terminal

Sony CoCoon PVR

NEC AX10 A/V Server

TiVO Personal TV

Sony Video Network Station

Motorola DCT5000 STB

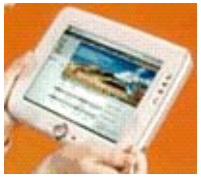
Ericsson HS210 Cordless Screen Phone

Hitachi FLORA-ie 55mi Wireless Web Pad

Toshiba Wireless Mobility Server

HP Digital Entertainment Center

Linksys Wireless Gateway



LG Electronics Digital iPAD

DaimlerChrysler UMTS TestCar

Sharp Zaurus Linux PDA

Fujitsu HOAP-1 Humanoid Robot

Square D Power Mgmt Device

Wincor Nixdorf POS

Citizen and IBM Linux WatchPad

Linux started to take over on consumer electronics!

http://www.embedded-linux.org

Linux Market Broadening

Market

- Increased industry focus
- Standardization increasing
- Growing ISV support
- Analysts endorsement strengthening

Customers

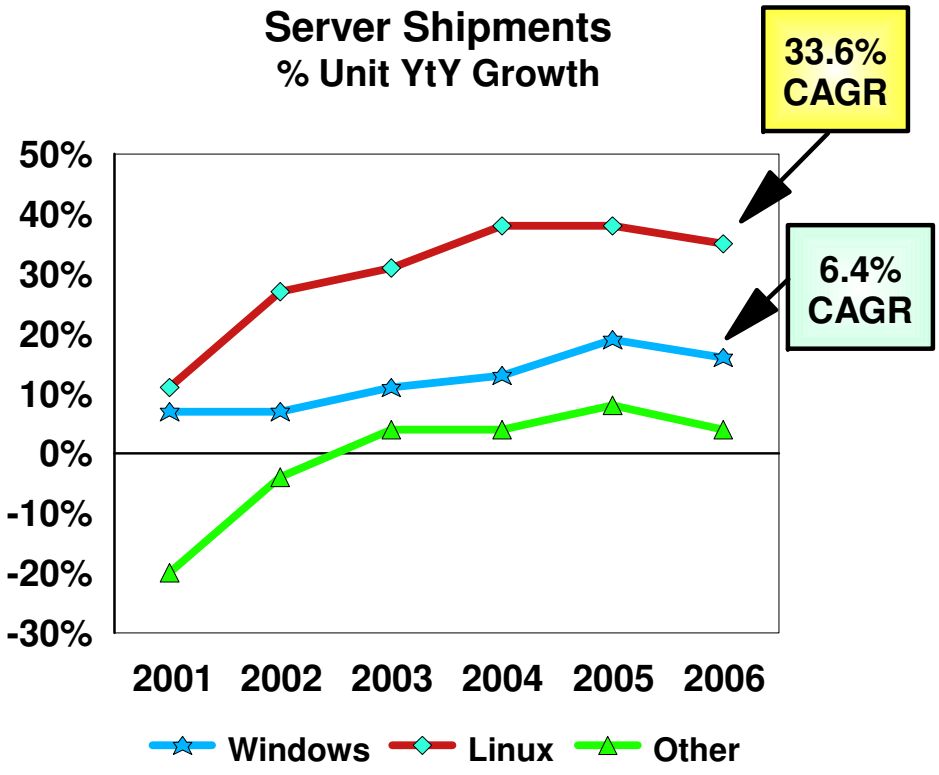
- Industry adoption expanding
- Workload usage maturing
- Governments endorsing Linux

Technology

- 2-way ⟶ 8-way
- Blade acceleration
- "Carrier-grade"
- 2.6 Kernel due 1H 2004 (16-way)
- Client functionality

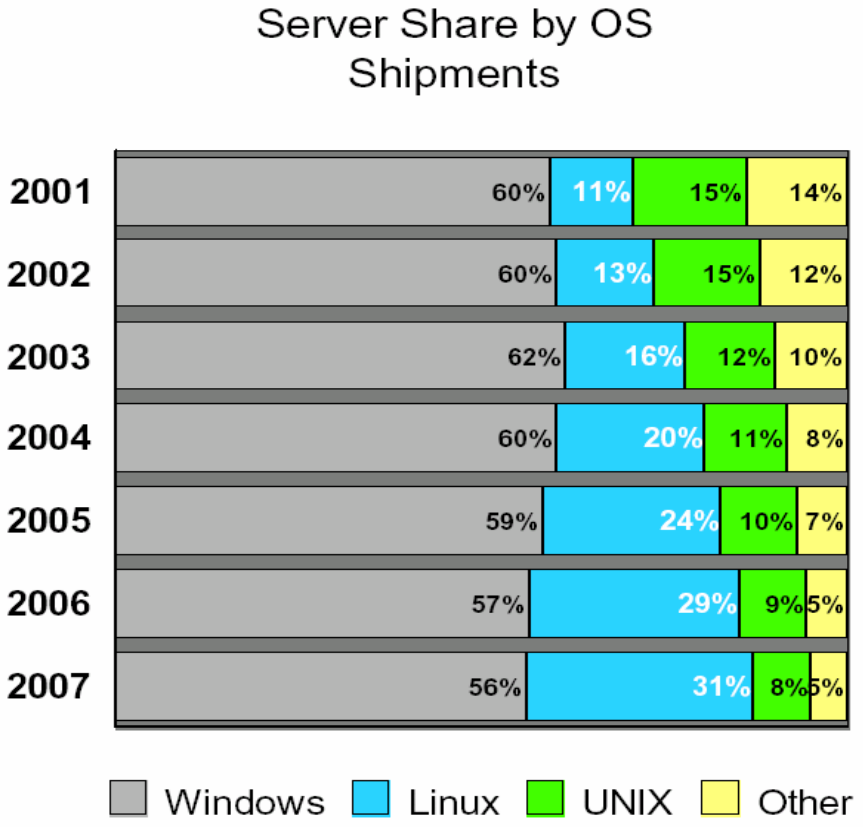
Linux is gaining Enterprise Acceptance

Greater than 5X growth of Windows & represents 25% of total server shipments by 2006



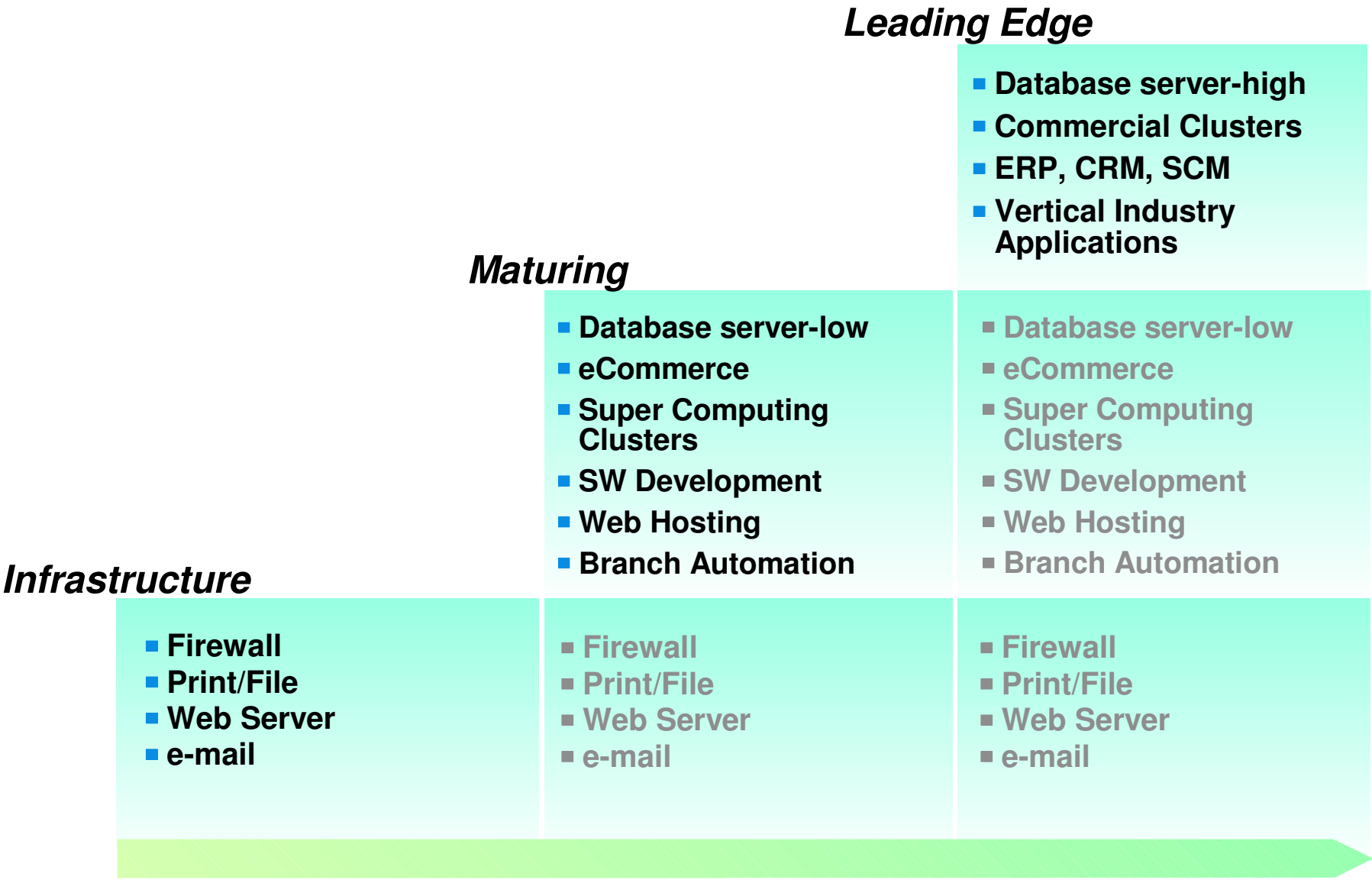
Source: IDC Server Market Quarterly Forecast (September 2002)

Linux has substantially grown market share



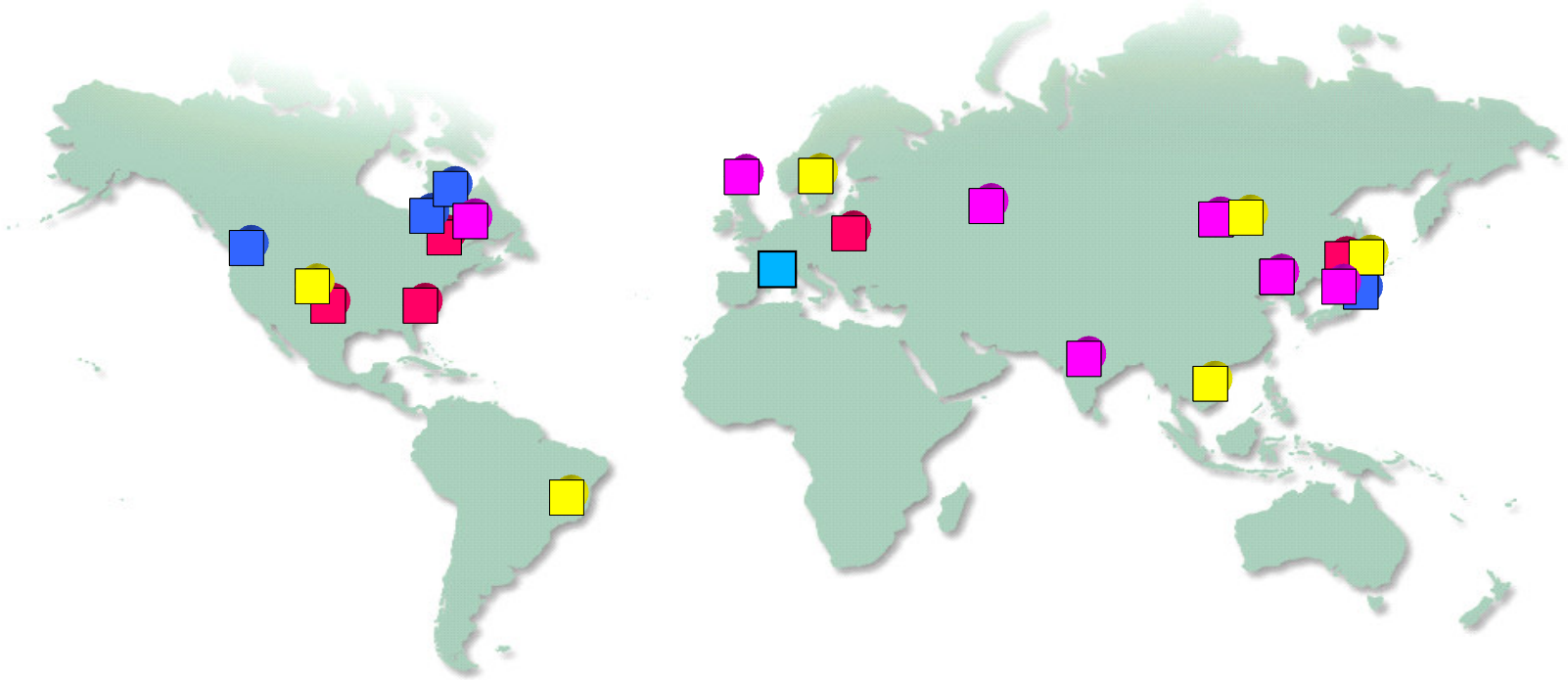
Source: IDC Server forecaster September 2003

IBM's Perspective on Linux Deployment



IBM Linux Support Centers

Around the World



Briefing Centers
- Austin
- Raleigh
- Poughkeepsie
- Boeblingen
- Tokyo
- Montpellier

Centers of Competency
- Beijing
- Moscow
- Seoul
- Bangalore
- New York
- Southampton, England
- Boeblingen

Linux Design Centers
- Poughkeepsie
- Silicon Valley
- Montpellier
- Makahari

Linux Integration Centers
- Austin
- Boeblingen
- Tokyo
- Beijing
- Sao Paulo
- Singapore

Comprehensive IBM Linux Investments

Application Development

- Eclipse
  - Open source IDE framework
- WebSphere Studio
- Speedstart
- developerWorks
- Linux hubs in US, Korea, and Germany

Porting & Prototyping

- Executive Briefing Centers
- Linux Server Dev. Labs
- Linux Integration Centers
- Linux Porting Centers
- Linux Centers of Competency
  - some dedicated to Finance Sector
- Linux for Service Providers Lab
- Linux Design & Solutions Center

Enterprise Linux

- Linux Technology Center
  - "Help make Linux better"
  - "Expand Linux Reach"
  - "Advantage IBM Products"
- Open Source Development Lab
  - Enabling Linux and Linux-based applications for data center and carrier-class deployment

Comprehensive Product Enablement

- eServer Platforms
- IBM Middleware
- IGS Services
- on demand Linux services

IBM @server

@server zSeries

- I/O intensive application
- Application needs "mainframe features"
- Large number of parallel servers (horizontal)
- Most advanced workload management

Linux Virtual Services

- on demand capacity
- Fast deployment
- No capital expense
- Pay for what you use

@server xSeries

- Leading low- to mid-range price/performance
- Cluster scalability
- Linux and Windows environments

@server pSeries

- 64-bit performance (e.g. floating point, large memory)
- Single server multiple applications
- Linux and AIX configurations

@server iSeries

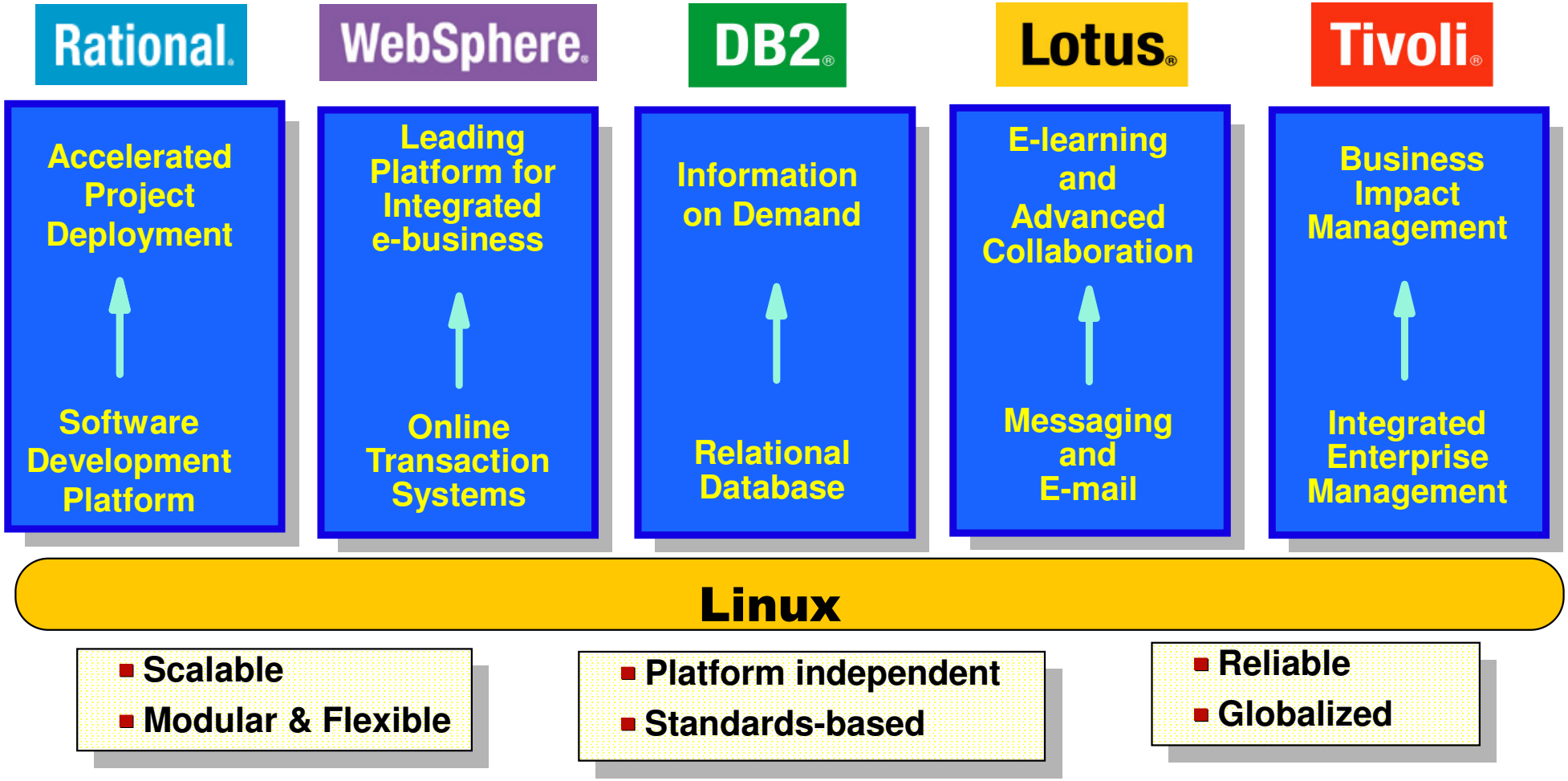
- Small or medium business
- Fully integrated solution (hardware, software, networking)
- Infrastructure consolidation
- Easy administration / operation

@server BladeCenter

- Scale out and clustered solutions
- Shared infrastructure with no single point of failure
- Flexible architecture supports range of servers - Intel, PowerPC
- Integrated management

IBM Software

Delivering Business Capabilities via Leadership Brands



IGS Linux Services

Technical Support
- 24/7 Support Line
- Advanced Support
- Red Hat & SUSE support
- All eServers including clusters & blades

Training
- 5 languages; 20 countries
- all eServers
- Web-based & classroom
- Certifications

Application Solutions
- Application Strategy Workshop
- DB2
- WebSphere Advance Server
- MQSeries
- ISVs
- QuickStarts
- Application development

Clusters
- Cluster Strategy Workshop
- x1350 Installations
- OEM Procurement
- Hardware Setup
- Software Installation
- "Roll Your Own"
- Infrastructure Design Services

Distributed Enterprise
- POS
- In store systems
- Kiosks
- ATM's

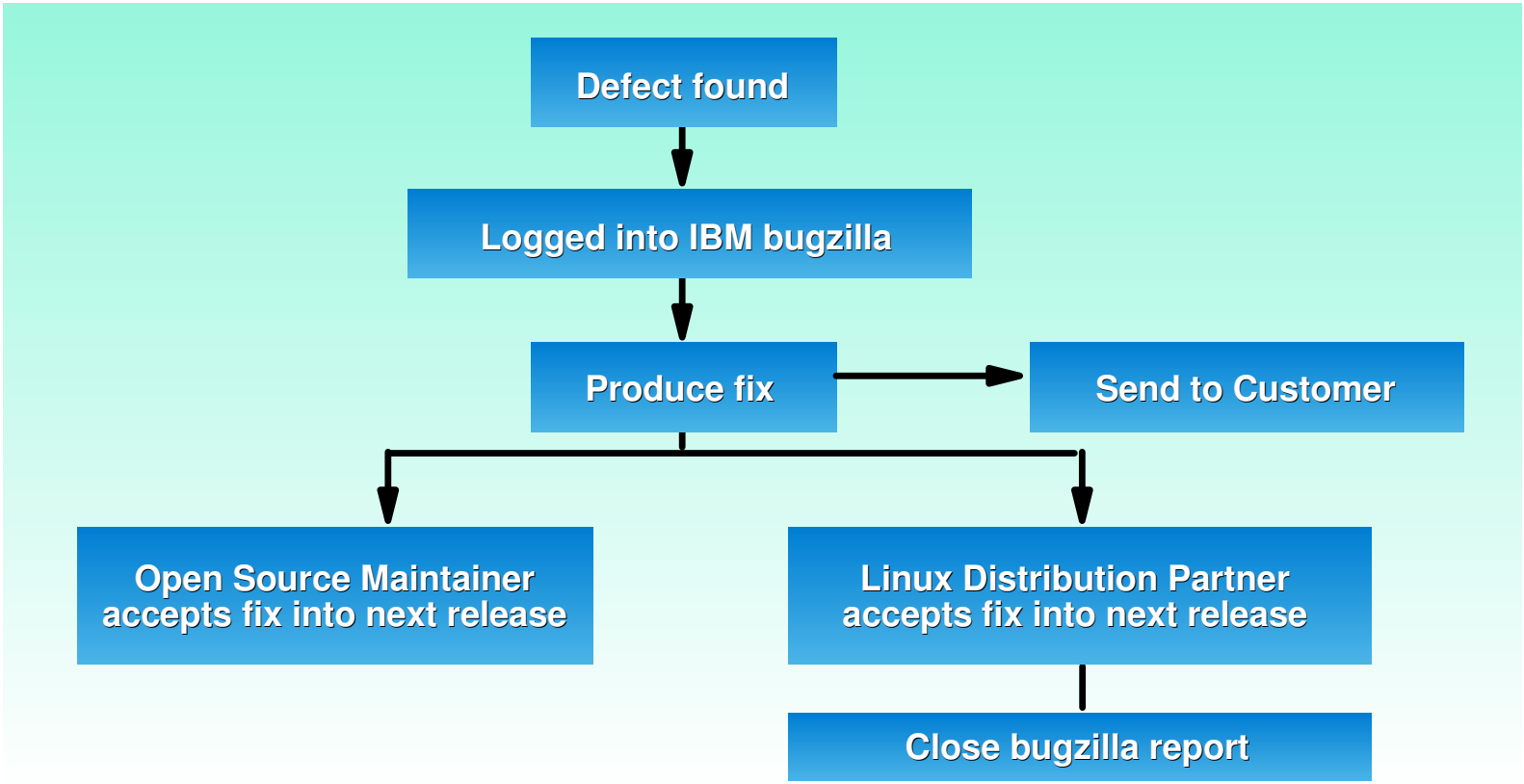
Infrastructure Solutions
- Linux Infrastructure Workshop
- Linux Hosting & Out Sourcing
- e-Sourcing
- Linux Virtual Services

Workload Consolidation
- Workload Consolidaiton on Linux Workshop
- File/Print, Webserving
- Application Porting
- Server Consolidation
- MS Exchange Consolidation

IBM Level 1-2-3 Linux Support

Open Source Involvement Benefits Our Customers

- LTC and IGS teams have experts in every key Linux subsystem and can respond to any problem
- IBM works directly with the code owners to integrate fixes into the base quickly and efficiently



IBM Uses Linux

Transforming IBM's IT infrastructure - $10M+ in Savings

- 2,100+ Production Servers WW
  - excludes research and development !
- www.ibm.com/linux & w3.ibm.com/linux
  - redundant xSeries Linux servers
- Intranet search engine
  - xSeries servers; Inktomi search engine
- IGS Internet Vulnerability Security Scanning
  - 100 xSeries scanning 30,000+ IP addresses/week
- Performance monitoring
  - 75% fewer Linux servers than NT servers for same workload
- IBM Global e-Mail Anti-virus Management
  - xSeries scans incoming/outgoing mail for viruses
- Microelectronics 300mm Wafer Manufacturing
  - Much more reliable than Windows
- Workstation Asset Management Applications
  - 4 Linux zVM Guests on zSeries server
  - Variable workload / on demand capacity

IBM's 300mm Wafer Facility

- Background:
  - US $2.9B 140,000 sq foot facility
  - Largest single investment in IBM's history
  - Largest private investment in NY state's history
- Challenge:
  - 60 x 60 x 24 x 365 automation
  - 300 machines in constant communication
  - Ten fold more complex than normal manufacturing
- The evaluation:
  - 90 day test
  - Windows - performance degradation in 6-7 days and outages in 10 days
  - Linux - no issues left it running for 5 months
- The proof:
  - Not one single failure to date (18 months)

Perry Hartswick, IBM Manager of 300mm Systems

➡ "....just for fun, we kept the Linux experiment running to see what would happen. We finally shut it off after 5 months, and it was still running like a clock."

IBM Customers Running Linux

Charles Schwab

Wealth Management on GRID and Linux

Challenge

- Utilize existing server "white space" for real-time portfolio analysis
- Solution must be Linux enabled for Open Standards
- No new hardware!

Solution

- GRID computing infrastructure exploiting Linux & DataSynapse

Benefits

- Wealth Management application processing time reduced by 90%
  - from 4 Minutes to 15 Seconds
- Improved real-time portfolio analysis for Charles Schwab financial advisors
  - Can respond while customers are on the phone!

charles SCHWAB

E*TRADE

Sun Migration Increases Performance Twofold

Challenge

- Reduce cost, improve performance, guarantee scalability
- With 10,000 concurrent users and four million accounts, E*Trade Financial's success depends on its ability to provide superb customer service

Solution

- IBM @server xSeries 330 servers running Linux
- Apache webserver
- IGS prototyping and porting services

Benefits

- 50% in cost savings
  - Millions of dollars

Our new IBM @server xSeries servers are four times faster than the ones we replaced.

Josh Levine
CIO, E*TRADE GROUP, Inc.

HSBC Trinkaus & Burkhardt

New Front-end Access to Legacy Data

HSBC

- **Challenge**
  - Implementing new system for securities execution and settlement
  - Needed Web access to ISV application DB on OS/390 for master account data administration

- **Solution**
  - WebSphere on Linux on zSeries hosting Java Servlets
  - DB2 Connect access over HiperSockets to OS/390 DB2 Stored Procedure
  - Looking at Samba File and Print and ISV applications for Linux on zSeries
- **Benefits**
  - The solution provides cost efficiency, manageability, scalability and ease of system integration
  - The IBM mainframe strengths of reliability, availability and security combined with Linux on zSeries has solidified zSeries as the platform of choice
  - HSBC is now positioned to take advantage of Open Source software, providing additional savings in the future

Deutsche Bank (Global Markets UK)

Linux Cluster Dramatically Improves Responsiveness

Challenge

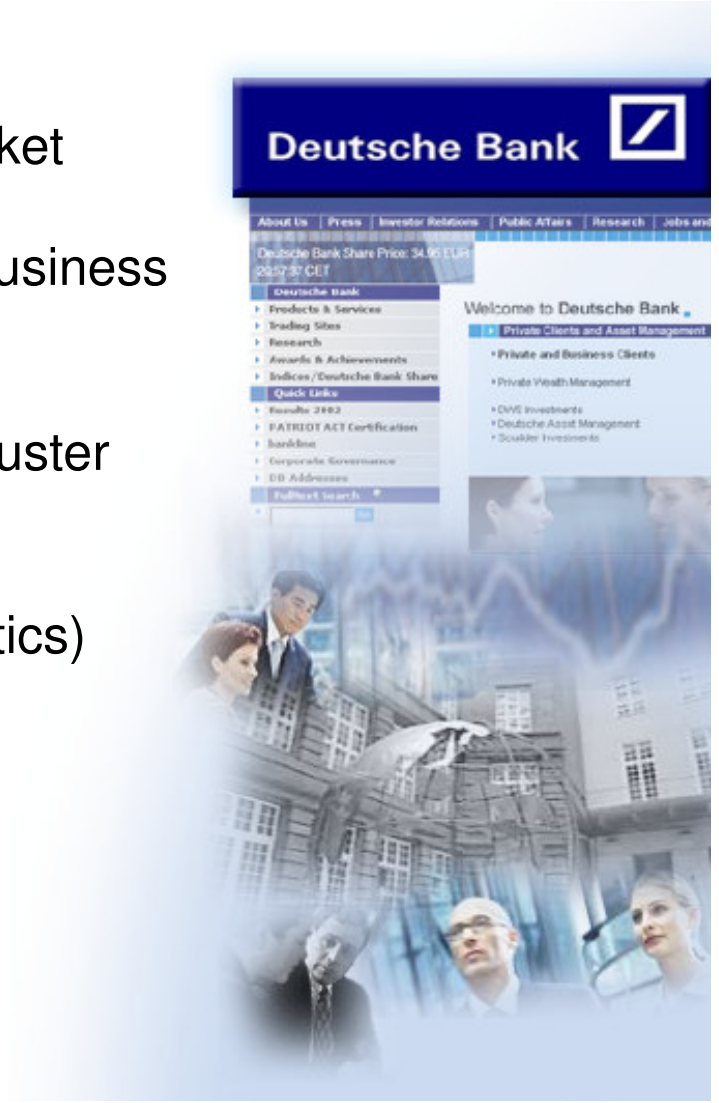
- Reduce time to calculate Profit and Loss, and Market Value at Risk
- Long job times potentially impact following day's business

Solution

- IBM @server xSeries Linux High-Performance-Cluster
  - 40 xSeries 330 Servers
  - 224 blade servers
- Ported home grown banking application (DBAnalytics)

Benefits

- Reduced batch time from 8+ hours to 20 minutes
- P&L calculation now occurs during same workday, increasing responsiveness
- Significant cost savings



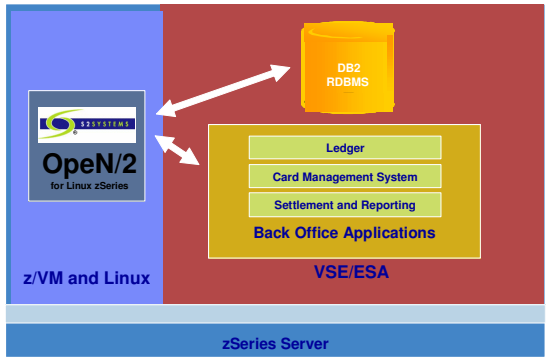
America First Credit Union

Challenge

- Legislation in Utah has prevented credit unions from establishing new branches to facilitate growth
- To surmount this obstacle, AFCU developed a wide range of online services
- They foresaw vigorous growth in both, number of applications and member volumes

Solution

- AFCU created an on demand infrastructure
- Application Suite from S2 Systems on z800 running z/VM, Linux, and VSE/ESA to host the teller and loan system
- Storage support is provided by a SAN based on ESS



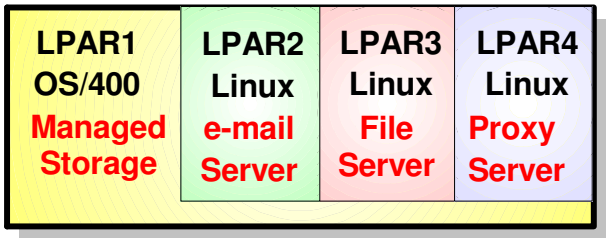
Benefits

- Open Standards allow AFCU to more efficiently deploy new applications in response to customer demands - without investing in new hardware
- zSeries virtualization enables on-the-fly creation of virtual Linux servers

Elektro-Material AG

Challenge

- Consolidate IT environment
  - 10x AS/400
  - several Dell
- Improve processes and response times
  - Business to Business
  - internal
- Introduce a customer portal
  - Business to Consumer
  - external



Solution

- IBM iSeries 820 and OS/400 for standard applications
- Consolidation of Linux Intel servers in LPARs for proxy servers, e-mail servers, and file/print servers

Benefits

- Significant savings with administration, floor space, energy consumption

Eberspächer

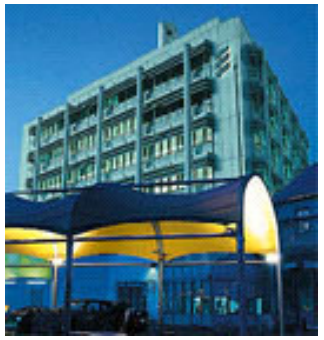
Technology overhaul drives more efficient collaboration

Challenge

- Optimize IT infrastructure
- Reduce TCO in SAP environment
- Very high reliability, especially when used globally

Solution

- IBM @server zSeries z900-103 with 3 Linux processors
- SAP R/3 Application Server on Linux for zSeries and DB2 on z/OS.e
- Inclusion of Samba as file server and for authentification (Primary Domain Controller)



Benefits

- 40% savings in license costs due to Linux
- Improved response times and higher stability
- Linux on zSeries used as boot server for 120 Thin Clients

Schwäbisch Hall

From Microsoft to Linux Clients

Why?

- Dramatic decline in the city's tax income
- Old hardware, not suitable for Windows XP
- Need to upgrade NT clients and exchange servers
- Heterogeneous IT environments with mail servers, file servers, firewalls, application servers, etc.

Roadmap

- Oct. 2002: Meeting at LinuxWorld Expo
- Nov. 2002: Project kick-off
- Dec. 2002: Project plan available
- Jan. 2003: Start server installations as well as profiling clients
- xxx. 2004: Linux client for each end-user

Schwäbisch Hall (cntd.)

From Microsoft to Linux Clients

What about costs?

Microsoft			OpenSource	
Produkt (*)	**Einmalkosten**	**SW Assurance**	**Einmalkosten**	**Produkt**
Win 2000	1.428,64	2.142,97	899,00	SuSE SLES (**)
Exchange 2000	2.446,92	3.670,49	0,00	Postfix / ImapD
Summe Server	**3.875,56**	**5.813,46**	**899,00**	
Windows XP	113,79	179,83	77,50	SuSE 8.1 (***)
Office XP Pro	277,93	548,13	5,00	OpenOffice
CAL Win 2000	17,74	26,60	0,00	---
Exchange Client	40,01	60,01	0,00	e.g. Kmail
Summe Clients	**449,47**	**814,57**	**82,50**	
Summe 300 Cl.	**134.841,00**	**244.371,00**	**24.750,00**	
Gesamtsumme	**138.716,56**	**250.184,46**	**25.649,00**	

(*) MS-Preise laut BMI Rahmenvertrag MS-Select – ohne Rabattstaffel-;
(**) SLES = Suse Linux Enterprise Server (Stand 10/02)
(***) Zum Einsatz kommen wird der SuSE Linux Enterprise Client (beinhaltet Wartung)
Alle Preise netto zzgl. Mwst.

Savings of more than €113.000 in its first year!

Linux Web Portal

ibm.com/linux

Summary: The IBM Linux Strategy

- Fully *participate in the evolution of Linux* through open source submission of IBM developed technologies and by partnering with the OSC to enhance Linux
- Create a *pervasive application development and deployment environment* built on Linux

- Produce an *industry-leading product line* built to run Linux and Linux applications optimally
- Ensure that all *IBM operating environments have Linux affinity* that fully supports Linux, coexistence with Linux or compatibility with Linux interfaces
- Create *bundled offerings* including hardware, software, and services built on Linux

Questions ?

Thank You !