



IBM, Linux and You:

*Real Experience, Real Solutions . . .
for Real Business*

Agenda



- **What is Linux Anyway?**
- **Linux Acceptance and Growth**
- **How Customers are Deploying Linux**
- **IBM Linux Investments/Contributions**
- **Linux Myths/Realities**



What are Linux and Open Source?

■ What is Linux?

- ▶ UNIX-like operating system
- ▶ Packaged and shipped by distributors such as Red Hat, SuSE, Turbolinux, ..
- ▶ UnitedLinux = open industry consortium providing a binary-compatible Linux distribution

"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 is Open Source?

- ▶ Community develops, debugs, maintains
- ▶ Generally high quality, high performance software
- ▶ Superior security - on par with other UNIX, superior to Windows



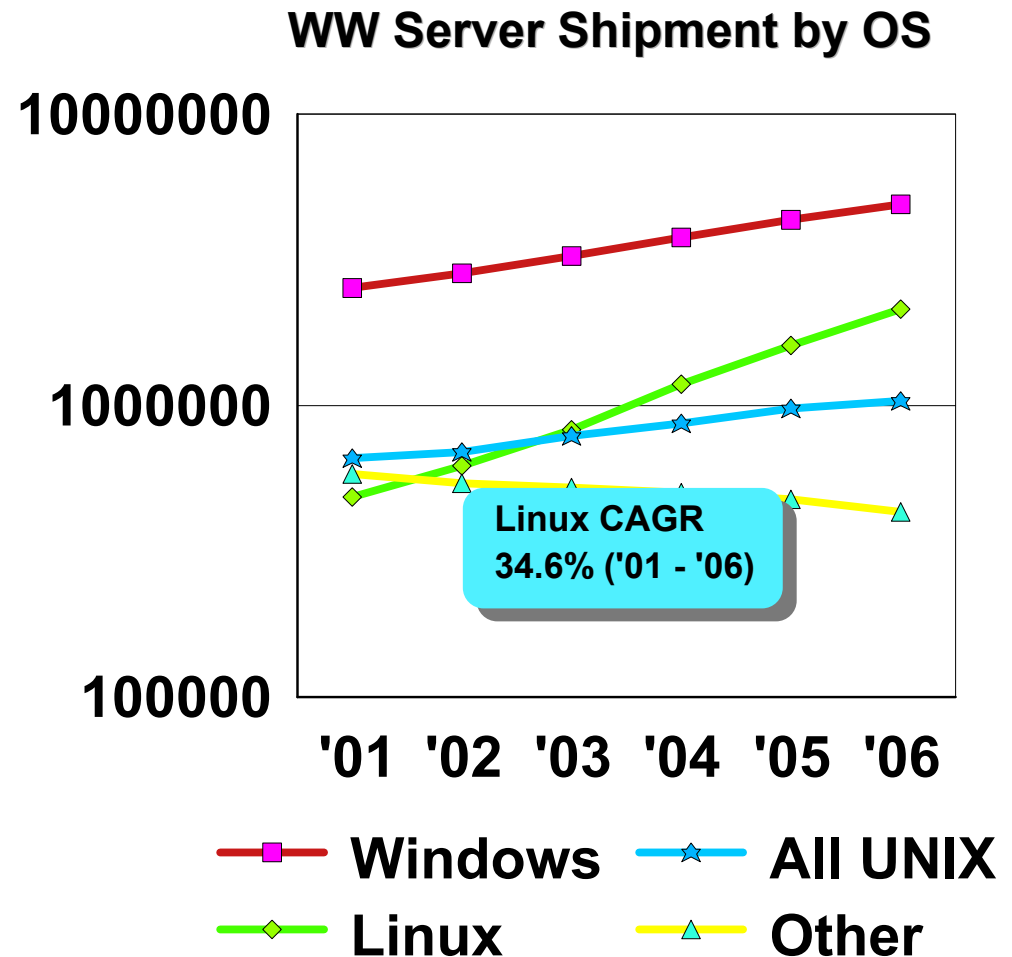
Why Does Linux "Work"?

- UNIX was a pre-write of Linux
- Development tools used are becoming industry standards
- Supported on 70 different system architectures
- Straight forward code design
- Source code is freely available
- Thousands of interested and talented developers around the globe
- A free exchange of design innovations
- Quick response to design problems
- Brutal design and code reviews



Linux Momentum

- Linux is the fastest growing operating system!
- Linux worldwide server shipments are expected to grow by 35% CAGR in 2001-06 compared to 14% CAGR for Windows (reference: whole market projected to grow by 15%)
- Linux server revenue is expected to grow by 32% CAGR in 2001-06 compared to 9% CAGR for Windows (reference: whole market projected to grow by 5%)



IDC Worldwide Server
Market Forecast 2002

Source: IDC, 2002

IBM



Linux Market Broadening

Market

- Increased competitive focus
- RedHat dominance, UnitedLinux momentum
- Standardization increasing
- Growing ISV support
- Analysts endorsement strengthening



Customers

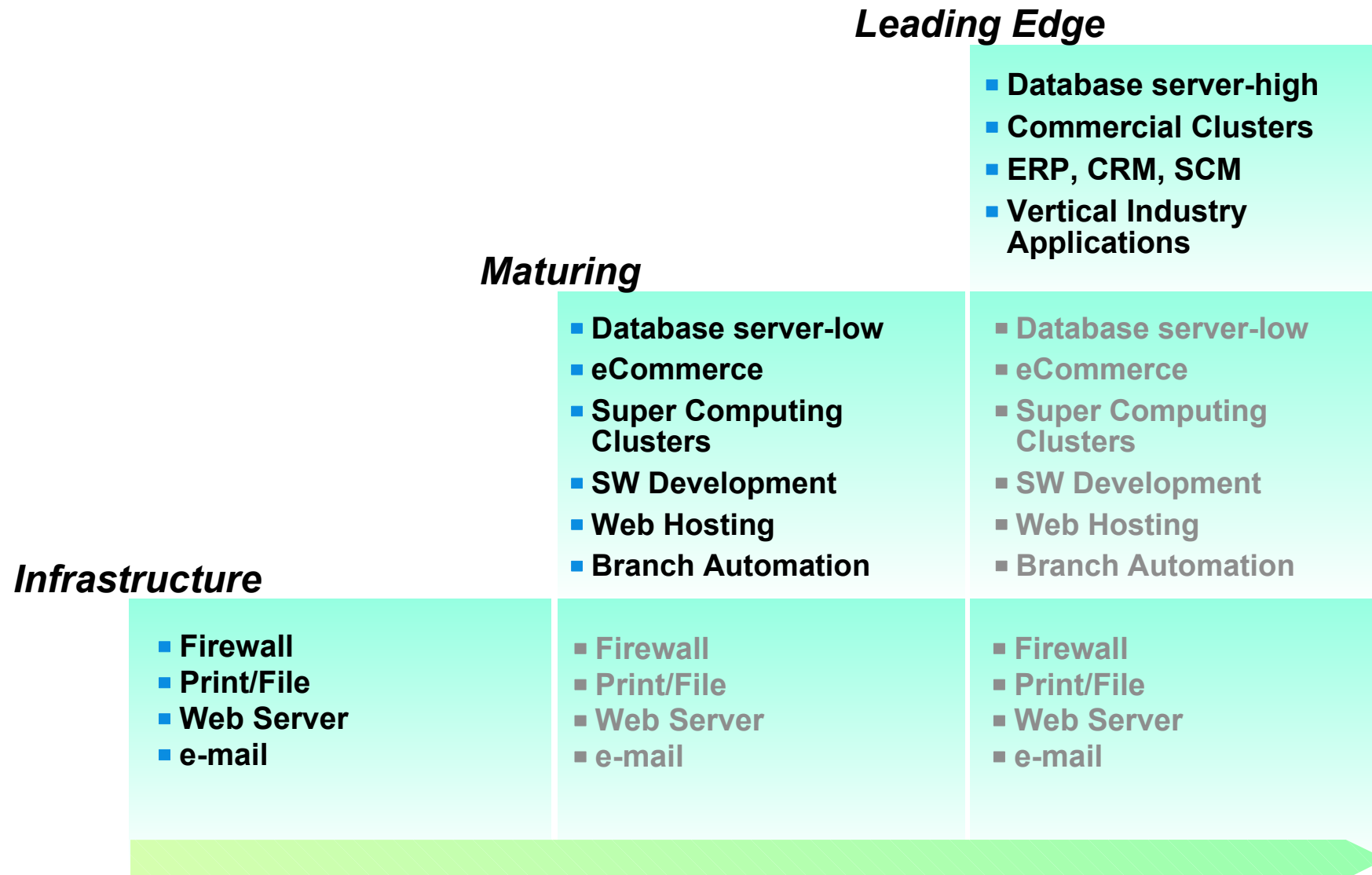
- Industry adoption expanding
- Workload usage maturing
- Governments endorsing Linux

Technology

- 2-way → 8-way
- Blade acceleration
- "Carrier-grade"
- 2.6 Kernel due 4Q'03 (16-way)
- Client functionality



IBM's Perspective on Linux Deployment



Linux... It all Started with Lower 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"

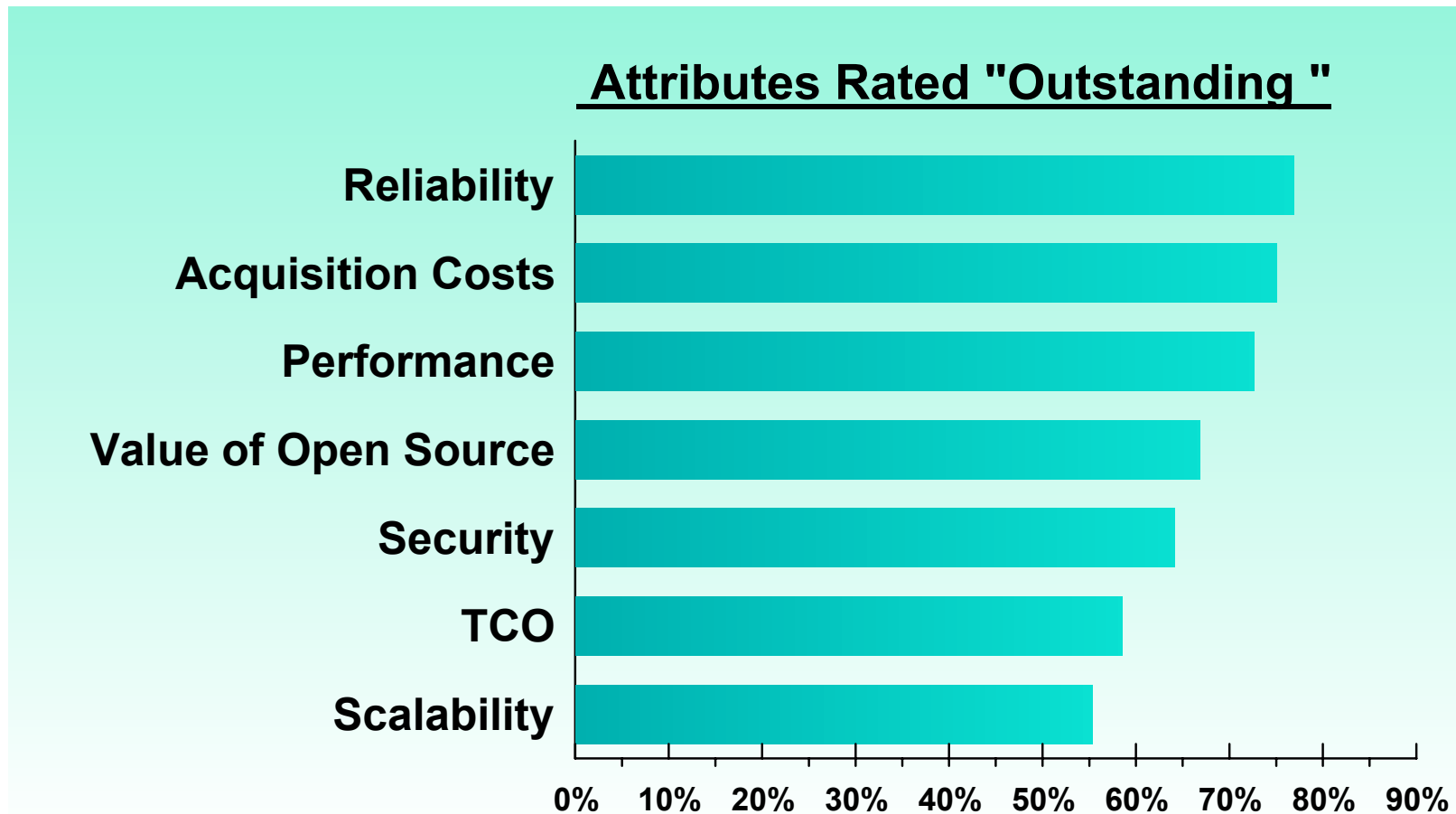
Mr. Makoto Takayama, Managing Director -- Lawson, Inc.

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Linux Value ... More than Cost Savings

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

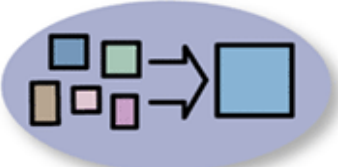



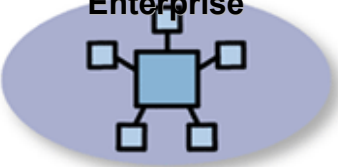



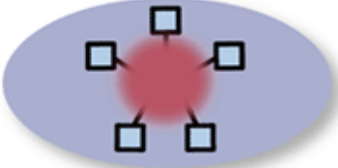



Source: IBM Market Research, 2002,
Based on responses from 500 Linux Customers

IBM



How Customers are Deploying Linux

	Recent Customers	Value
Workload Consolidation 		<ul style="list-style-type: none"> Reduce cost Improve performance Speed deployment Dramatically improve TCO
Linux Clusters 		<ul style="list-style-type: none"> Price/performance Improved performance Improve uptime Rapid setup and install
Distributed Enterprise 		<ul style="list-style-type: none"> Lower cost Small footprint servers Easily replicated High reliability and stability
Application Solutions 		<ul style="list-style-type: none"> Solution assurance Optimized Reduced implementation time Flexible
Infrastructure Solutions 		<ul style="list-style-type: none"> Low cost Easy to setup Turnkey Easy to expand



IBM eServer Family Supports Linux

zSeries:

- zSeries 800 for Linux
- Many Linux servers on a single HW platform (thousands)
- Unmatched scalability
- Large applications portfolio
- Simplified Systems Management
- Runs native, in an LPAR or on VM
- zSeries - 64 bit & 31-bit
- Reduced cost of ownership



iSeries:

- On Demand Virtualization
- Up to 10 LPAR partitions/processor
- Dynamic Resource Movement
- Up to 31 Linux partitions
- Integration with OS/400 applications and data
- Virtual or Direct I/O Flexibility
- 64-bit PowerPC
- Quick, low-cost consolidations

xSeries

- X-architecture innovation
- OS freedom of choice
- Affordable, Scalable, Reliable
- Appliances
- Rack-optimized servers
- Clusters (1300):
 - ▶ Integration and testing of IBM & OEM
 - ▶ Speed to market
 - ▶ xSeries rack optimized servers

pSeries:

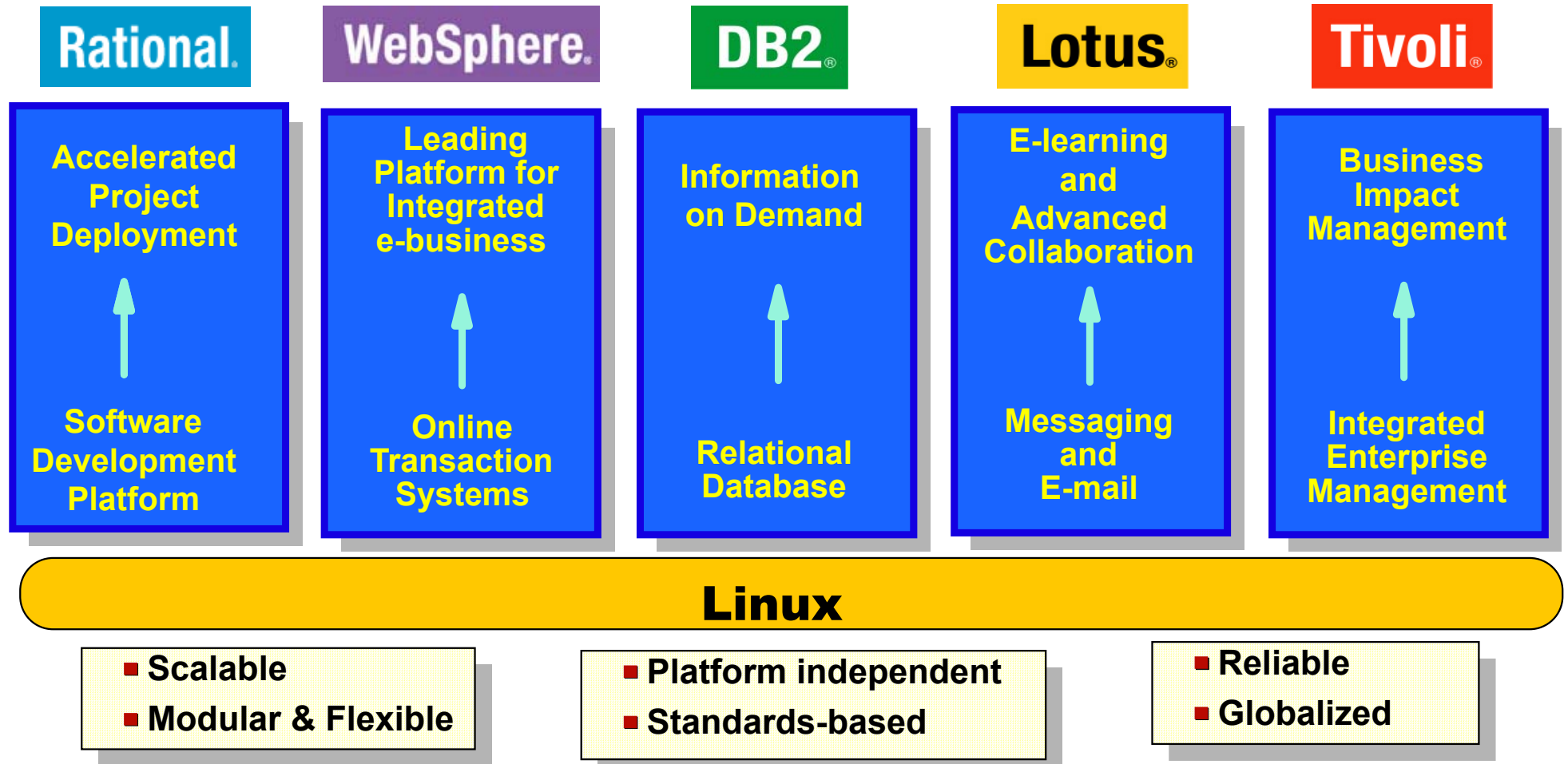
- Native Linux 32-bit & 64-bit
- Linux Ready p650
- High Performance
- Linux affinity on AIX 5L
- I/O Bandwidth and RAS
- Multiplatform flexibility

The IBM logo, consisting of the letters "IBM" in a stylized, bold, sans-serif font with horizontal stripes.



IBM Middleware is Ready Today!

Delivering Business Capabilities via Leadership Brands



IBM Services for Linux

Grid

-  Grid Computing Workshop
-  Consulting
-  Design/Architecture
-  Deployment

Managed Operations

-  Linux Virtual Services

Training

- 5 languages; 20 countries
- All eServers
- Web-based and classroom
- Cluster workshops - New!

Clusters

-  Support Line
- x1350 Installations
- OEM Procurement
- Hardware Setup
- Software Installation

Web Hosting

- xSeries
- zSeries Linux
-  e-Sourcing

Middleware Enablement

- DB2
- WAS
- MQSeries
- ISV's
- QuickStarts

Workload Consolidation

- File/Print, Webserving
- Bynari, Sendmail coming '02
- Linux Solution for e-business
- Application Porting
- Solaris to Linux Migration



Technical Support

- Support Line
- Account advocate
- Advanced Support
- All eServers including clusters
- 24/7

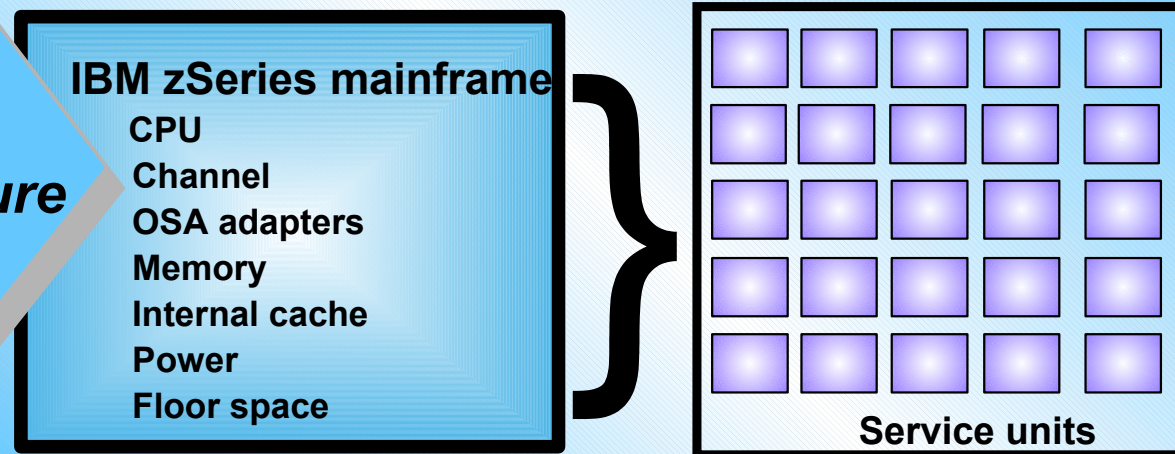


IBM Managed Hosting: Linux virtual services

Linux computing as a utility

Replace server sprawl with "virtual servers" running Linux on IBM eServer zSeries in a secure hosting environment.

IBM zSeries™ mainframe running Linux splits computing capacity into "service units."



Pricing and packaging:

- Service units sized based on **average** workload over 24 hour period
 - ▶Instead of a traditional model sized to peak loads
 - ▶ 10% additional "burst" capacity included at no extra charge
- Service units include server, floorspace, power, and management services

Total cost of ownership:

- Customer savings can range from 20% to 55% on typical workloads

Early adopters:

- Customers experiencing sudden or unpredictable growth

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IBM's Contribution to Linux

- 250+ developers worldwide
- 70+ active projects; 80% acceptance rate
- **Critical contributions to current and in-progress versions of Linux:**
 - Scalability
 - System Performance
 - Security
 - Serviceability
 - Internationalization
 - Availability
 - Cluster Management
 - System Management
 - Stress Testing
 - Networking
 - Standards and Documentation
 - Reliability
- **Trusted, valued members of the Linux Community**
 - Linux Standards Base
 - Free Standards Group
 - Linux Internationalization
 - Kernel Summit
 - Linux Weekly News
 - Open Source Development Lab
 - USAGI (IPV6) Project
 - GNOME Foundation
 - KDE League
 - OSDL Carrier Grade
 - OSDL Data Center



Linux @ IBM

A Commitment to Linux across the Entire Business

- **Linux Technology Center**
 - *"Help make Linux better"*
 - 250+ developers, 21 sites working within the open source community
 - 70+ active projects
- **Linux Integration Center**
 - Technical consulting, proof of concepts, benchmarks
- **Open Source Development Lab**
 - Enabling Linux and Linux-based applications for data center and carrier-class deployment
- **Linux Porting Centers**
- **Linux Center of Competency for Finance - NYC, London**
- **Linux for Service Providers Lab**
- **2,000+ Linux skilled IGS professionals**



Industry Leaders Work as Team

Maximize the advantages of Linux

- **Product Certification and Support**
 - ▶ Red Hat/Suse and IBM will certify the Linux distribution across the entire eServer product line - xSeries, pSeries, iSeries, zSeries
 - ▶ IBM to make key software products available on Advanced Server; MQSeries, DB2, etc.
 - ▶ Weekly calls to address issues and direction
- **Linux Technology Center collaboration**
 - ▶ Linux kernel direction and functionality
 - ▶ Linux enhancements
- **Support Line**
 - ▶ IBM will provide a single point of contact for Red Hat/Suse Services and Support
 - ▶ End-to-end support to customers with Linux technical knowledge and engineering resources offered through Support Line for Linux
 - ▶ Tighter controls to resolve customer issues

The IBM logo, consisting of the letters 'IBM' in a stylized, striped font.

IBM Linux Operational Support Line Services

- **How to/usage questions/ defects/ fixes/ patch**
 - 800 number or electronic access
 - Defect support by IBM team, “down to the source code”
 - Response time: 2 hours Primeshift, 2-4 hours Offshift
 - Available on all IBM eServers, zSeries, xSeries, iSeries, pSeries
 - 9x5, 7x24

- **Advanced Support**
 - Customized Service Solution
 - Focused Support Team
 - Accelerated Response
 - Customized Reporting

- **Proactive Recommendations/support**

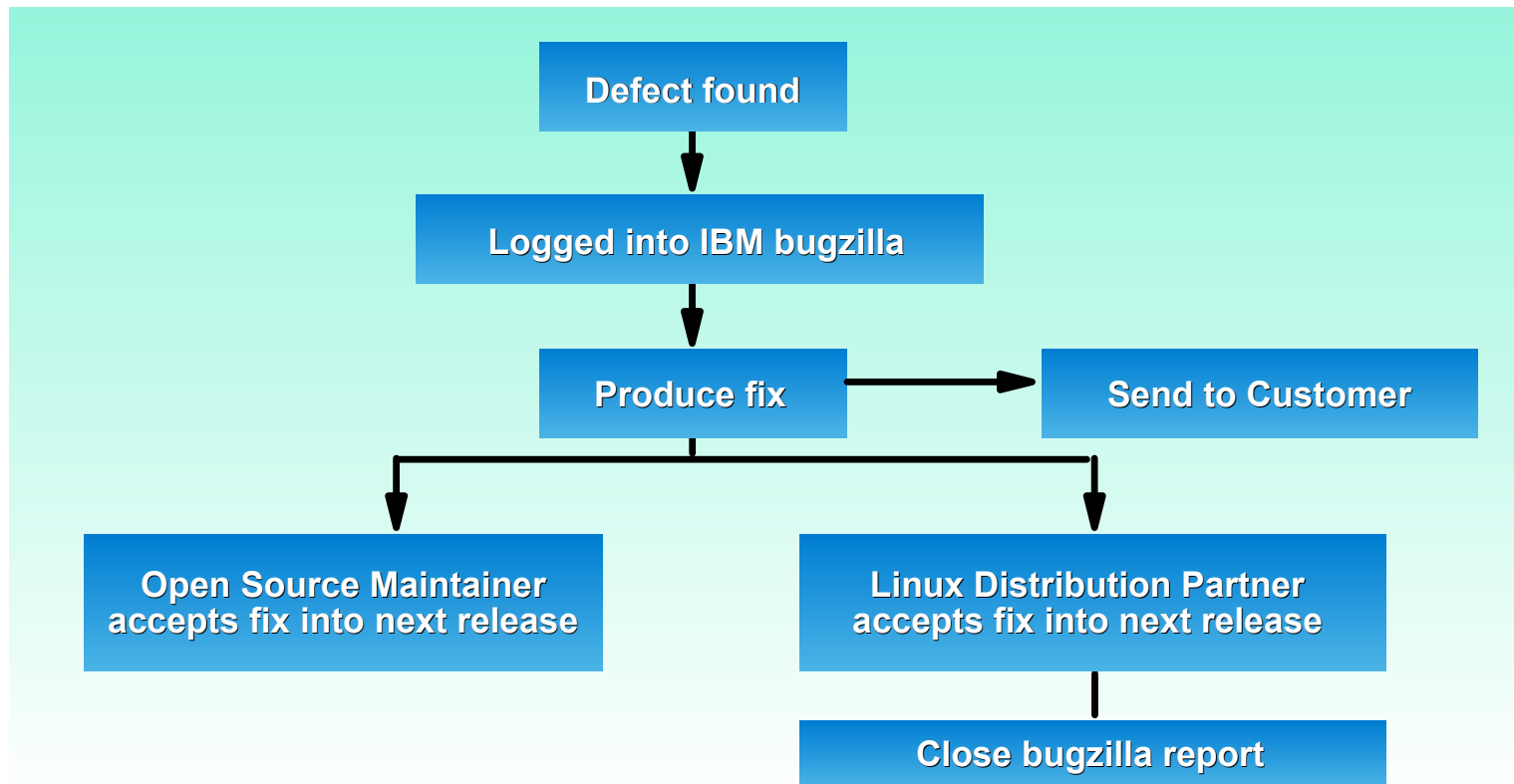
- **Account Advocate** (Assigned Technical Specialist/Team)
 - Track, review, and escalate problems as required



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



Is It Real?

The Myths of Linux

- **Linux isn't ready for the enterprise**
- **Linux porting is difficult**
- **Linux lacks business applications**
- **Linux isn't secure**



Fact: Linux is Rock Solid

- **Google™ Runs on Linux**
 - 100+ million queries per day
 - Average response times less than half a second

- **Wall Street Leans Towards Linux¹**
 - "...Linux is quickly gaining ground on Unix and Windows as a mission-critical operating system within the securities industry."

- **IBM Service / Support**
 - Level 1-2-3 support for all eServer platforms running Linux



Fact: Porting to Linux is Easy

- **Porting Solaris Applications to Linux¹**
 - 80+% of APIs are identical
 - < 15% require simple translations or masks
 - < 5% of APIs may require workD.H. Brown²

- **"Migrating Unix web servers to Linux is one of the easiest migration scenarios in the industry."**

- **SoundView Technology Group²**
 - "Several large projects of moving UNIX-based applications from 100 kloc to 600 kloc have been completed. Most were completed in about 2 months and only required a small percentage (1% or so) of the code to be modified in any way."

1: IBM Canada, 2002

2: "Migrating Mail and Web Servers to Linux", August, 2002



Fact: ISVs are Adopting Linux

- 4,200+ Linux applications in IBM Global Solutions Directory¹
 - 34,000 Windows and Intel developers are now working with IBM software to build Linux applications



- Gartner Dataquest²
 - "As an open source OS, Linux has captured the mindshare of end-users, vendors and independent software vendors."

1. IBM press release, Nov 11, 2002
2. Gartner Dataquest "Linux Server Applications Today and Tomorrow", J. Hewitt, Oct 2002

Fact: Linux is Secure

- The Open Source Development Process
 - Darwinian -- structured / disciplined
 - Exposed vs. hidden

- Associated Press¹
 - "Chinese, French and German governments ... adopting Linux over Microsoft Windows "
 - "Security experts ... agree computers are less prone to hacking and viruses when running open-source software like Linux"

- Gartner Group²
 - "Gartner recommends that enterprises continue to weigh open source review as a positive factor in the security of software."

1. "World Governments Choosing Linux", Dec 1, 2001

2. "Microsoft Sends Mixed Signals About Software Security", May 13, 2002



IBM Uses Linux

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

- **1100+ Production Servers WW**
- **Internal Linux Projects:**
 - ▶ **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**
 - 61 xSeries scanning 30k IP addresses/ week
 - ▶ **Performance monitoring**
 - 24 xSeries servers
 - 75% fewer Linux servers than NT servers for same workload
 - ▶ **IBM Global e-Mail Anti-virus Management**
 - xSeries scans incoming/outgoing mail for viruses
 - ▶ **300mm Wafer Manufacturing Equip. Control**
 - Much more reliable than Win2000
 - 159 xSeries; 300-400 by year end

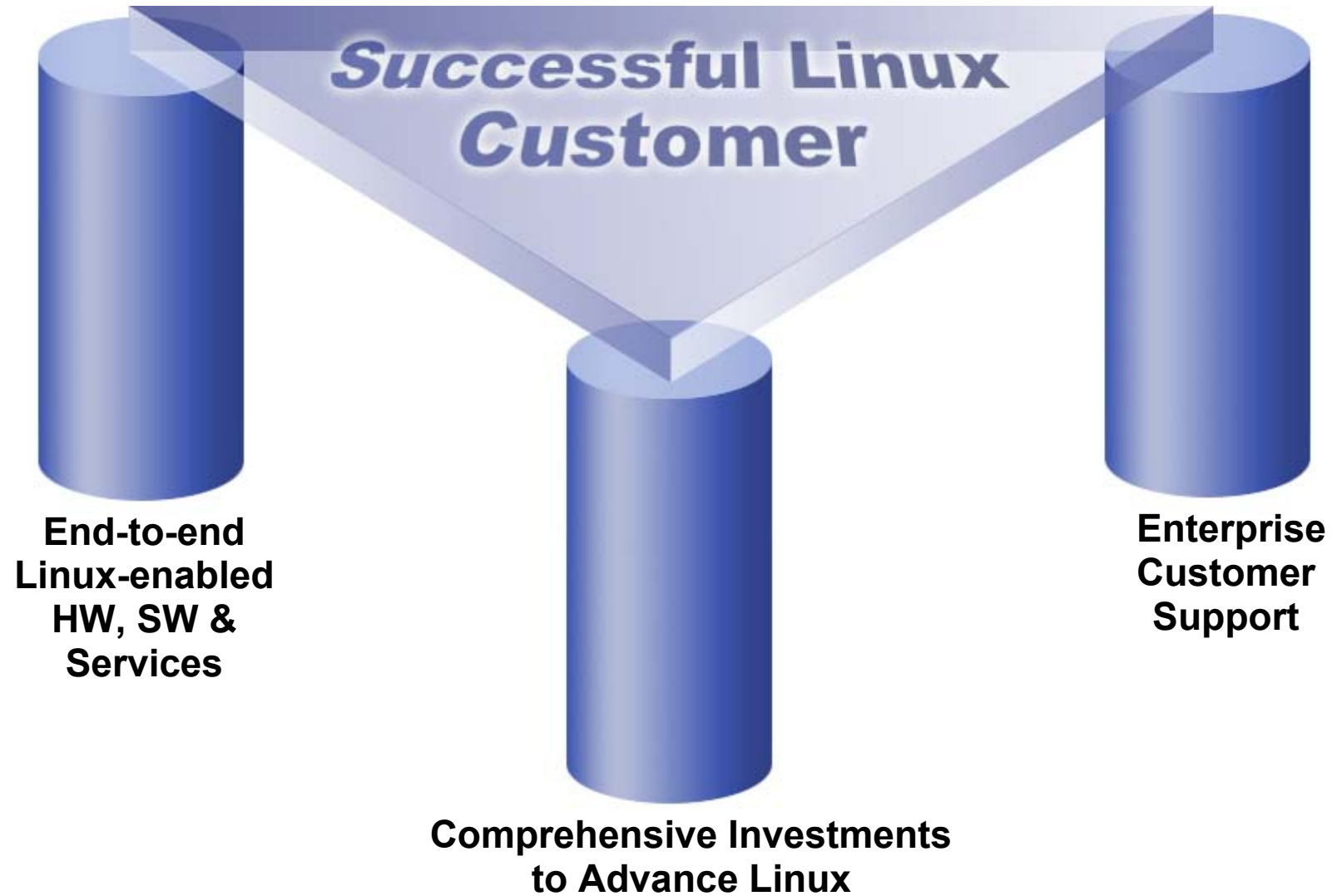


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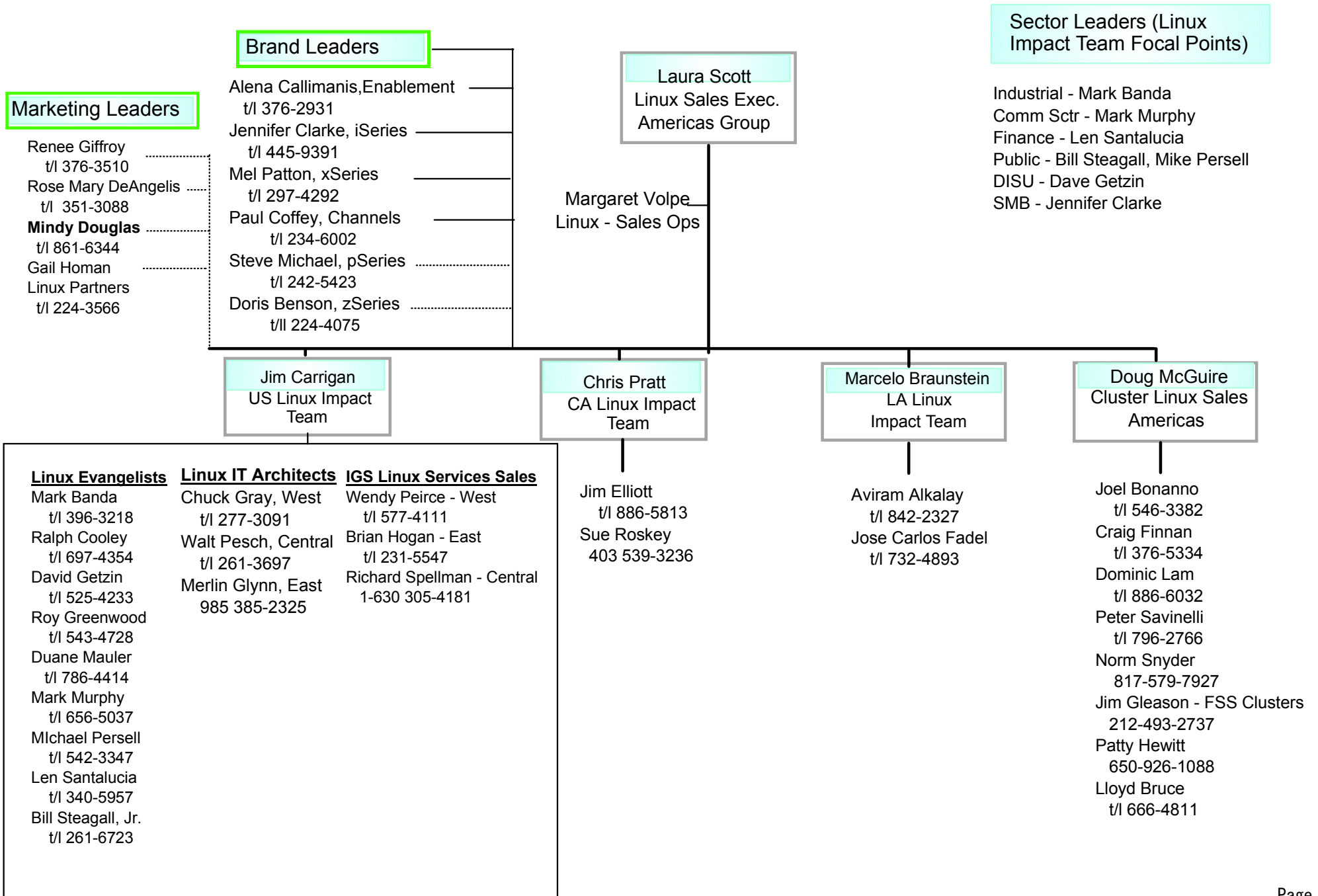


Summary: IBM's Linux Value

Making IBM Your Best Choice for Linux



Linux Impact Team Resources



Americas IGS Linux Services Practice fosters, supports and drives maximum Linux Services across all IGS Lines of Business

Canada

Focal Point

Bill Rios / Toronto

d 905/413--2997

t/l 969-2997

c 647/290-8100



Latin America Focal Point

Jeff Gibbs / San Jose

d 623/556-9431

t/l 539-9759

c 623/910-6514

IBM Global Services Linux Services Executive, Americas

Sam Docknevich / Waltham

d 781/895-2569

t/l 362-2569

c 508/380-6803

Sector Focal Points

▪ Distribution/Communications

Sandra Rose / Beaverton

d 503/578-5612

t/l 775-5612

c 503/807-7673

▪ Industrial

Peter Kastrinelis / Waltham

d 781/895-2357

t/l 362-2357

c 617/974-8999

▪ Public

Bill Rios / Toronto

d 905/413-2997

t/l 969-2997

c 647/290-8100

▪ Financial

Jeff Gibbs / San Jose

d 623/556-9431

t/l 539-9759

c 623/910-6514

Linux Impact Team Members Focused on IGS Linux Services Sales

Wendy Peirce - West

t/l 577-4111

Brian Hogan - East

t/l 231-5547

Richard Spellman - Central

1-630 305-4181

d = direct t/l = tie line c = cellular

Americas Linux Software Sales Team

Americas Linux SW Sales Mgr

Dave DiCarlo

315-424-2133 (T/L 234)
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Central Linux SW Sales Rep

Jim Crowley

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Canada Linux SW Sales Rep

Blayde Watkin

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bawatkin@ca.ibm.com

West Linux SW Sales Rep

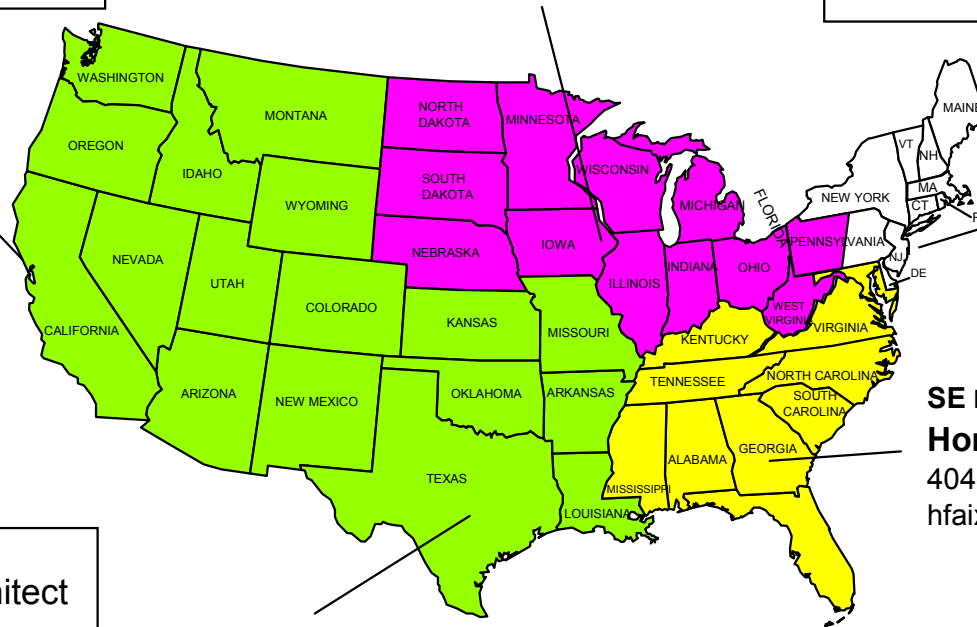
Heidi Hill

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NE Linux SW Sales Rep

John Matthews

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SE Linux Software Sales Rep

Honora Faix

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Americas Linux SW IT Architect

Fred Pycko

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Latin America Linux SW Sales Rep

Mark Kahle

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mkahle@us.ibm.com

Sector Linux Virtual Teams

Sector/Org (Management Sponsor)	Sector (Sector VP)	WW Linux (John Sarsgard)	AG Linux Impact Team (Laura Scott)	SWG Linux (Manny Arino)	IGS Linux/ Grid Services (Sam Dockneovich)
FSS	GFM: John Vitkus Bnkg: Blake Lasky Ins: Rob Spencer	Joyce Sciarrillo	Len Santalucia	Jim West	Jeff Gibbs
Comm	Scott Degeer	Terry Yoshida	Mark Murphy	Kevin Maier	Sandra Rose
Industrial	Ralph Warmack	Sach Takayasu	Mark Banda	not assigned	Peter Kastrinelis
Public/Fed	Karen Davis	Mary Ann Fisher	Bill Steagall Bill Persell	Fred Logan	Bill Rios
Dist	Susan Confort	Janet Sprance	Dave Getzin	Bruce Bogart	Sandra Rose

Tools you can leverage

- **ibm.com/linux and w3.ibm.com/linux**
- **<http://w3.linux.ibm.com/linux/links.shtml> - one stop for all the links for IBM Linux products**
- **Other questions: IBMLinux@us.ibm.com**
- **Linux Centers of Competency**
 - ▶ **Financial Sector (Wall Street) - contact linuxcoc@us.ibm.com**
 - ▶ **Telco/Service Providers: Linux Solution Provider Lab - contact lsplinfo@us.ibm.com**
 - ▶ **Linux Integration Center: For Linux Middleware opportunities - <http://lic.austin.ibm.com/americas>**
- **IGS Linux Strategy Workshop or IGS UNIX to Linux Porting Offering**
 - ▶ **Contact Linux Impact Team Global Services Sales**
 - Wendy Peirce - West
 - Brian Hogan - East
 - Richard Spellman - Central