



Linux @ IBM

ON DEMAND BUSINESS™

Linux and Open Source: The View From IBM



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Strategic Growth Businesses
IBM Canada Ltd.
ibm.com/vm/devpages/jelliott

Linux



Linux and Open Source: The View from IBM

Session 9200

- **Linux and Open Source are game-changing technologies. Jim will provide a review of Linux and Open Source from IBM's point of view covering:**
 - Overview, Value and Marketplace: A brief update on Linux and Open Source and the value to customers
 - Usage: How Linux and Open Source are being used by customers today and our view of the future
 - IBM and Open Source: How IBM is using Open Source software internally and IBM involvement in the Open Source community





Linux @ IBM

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Linux Overview, Value, and Marketplace



*“Linux will do for applications what
the Internet did for networks.”*

Irving Wladawsky-Berger, IBM
LinuxWorld, January 2000



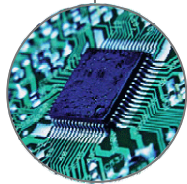
Advancing Technology

What if ...

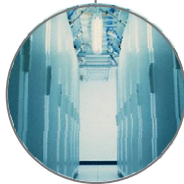
... everything is connected and intelligent?
... networking and transactions are inexpensive?
... computing power is unlimited?



↑ Adoption of open standards



↑ Processor speed



↑ Storage



↑ Bandwidth



↑ Number of networked devices



↓ Interaction costs



The road to On Demand is via Open Computing



Open Source Software

www.opensource.org



- **What is Open Source?**
 - Community develops, debugs, maintains
 - “Survival of the fittest” – peer review
 - Generally high quality, high performance software
 - Superior security – on par with other UNIXes
- **Why does IBM consider Open Source important?**
 - Can be a major source of innovation
 - Community approach
 - Good approach to developing emerging standards
 - Enterprise customers are asking for it



Freedom of Choice

- ***“Free software is a matter of liberty, not price. To understand the concept, you should think of free as in free speech, not as in free beer.”***
 - Richard Stallman, Free Software Foundation
- ***“It is not about Free. It's about Freedom. The freedom to collaborate. The freedom to innovate.”***
 - Nick Donofrio, IBM
- ***“Free software is only free if your time is worth nothing”***
 - Chris Pratt, IBM Canada

Open Source



What is Linux?

- **UNIX-like operating system**
 - Supported by a global community
 - Unprecedented flexibility
- **Why Linux?**
 - Single operating system
 - Attracting the best technical talent
 - Basis for innovation
- **Packaged and shipped by distributors**
 - World-wide distributors such as Novell, Red Hat

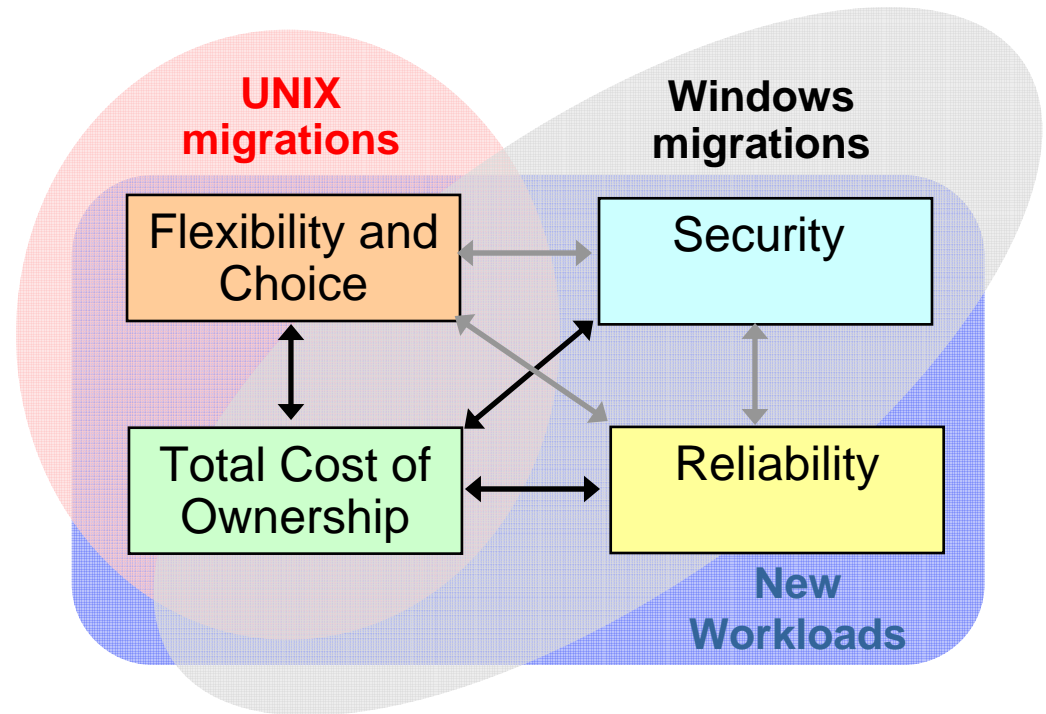


Novell.



Why Linux is Important to You

- **Linux is flexible**
- **Linux is secure**
- **Linux is reliable**
- **Linux drives business goals**
 - Reduce costs
 - Improve application service levels
 - Internally change business process and drive contribution to business
 - Generate revenue
- **Linux is an excellent path to On Demand**



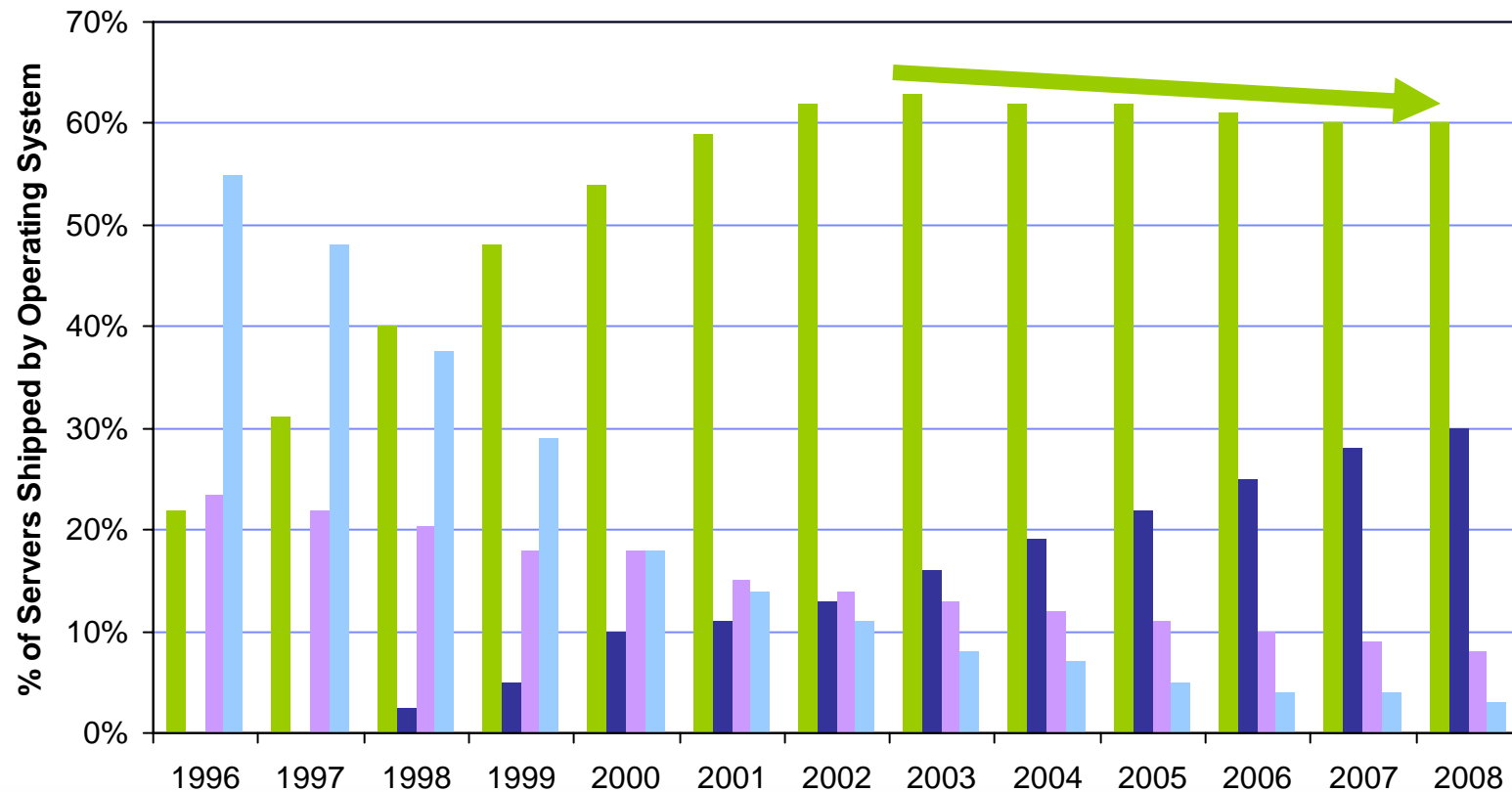
Linux is an industry-wide initiative

www.osdl.org



Linux changes the server shipment trend

Linux is fastest growing server operating system since 1999

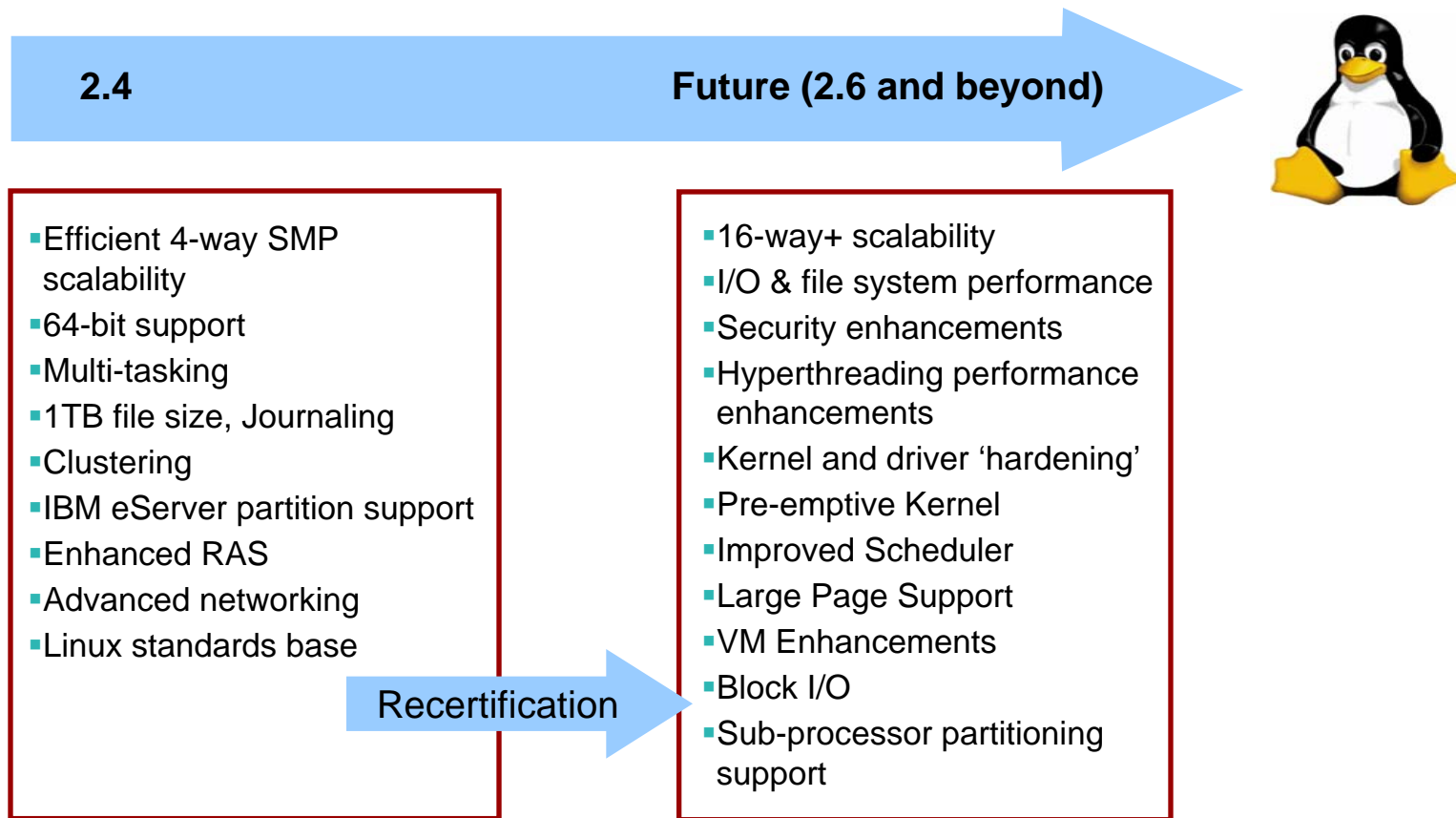


Source: IDC Server Market Forecast, 1Q2004
 Note: 2004-2008 data is forecast

■ Windows ■ Linux ■ UNIX ■ Other



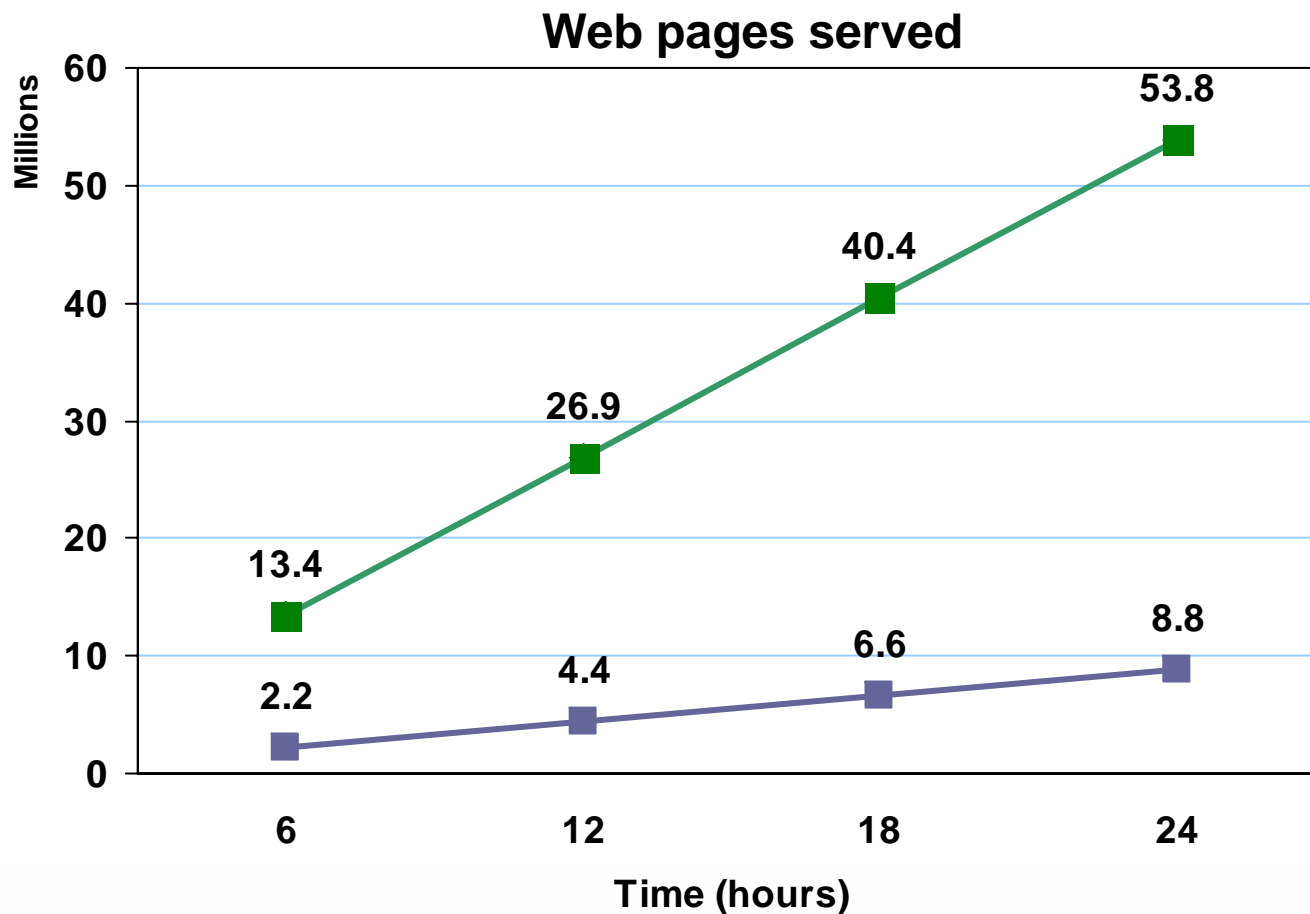
Linux Technology Evolution



This represents a combination of current open source community priorities and IBM LTC project plans. Open source communities do not publish schedules or commit to specific dates or functions.

Performance improvements

Web serving on 2.4 and 2.6



**Six times
performance
improvement!**

■ 2.6.0
■ 2.4.18

IBM xSeries Netfinity 8500R 8681-7RY with 8 Pentium III-700MHz





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Linux Usage



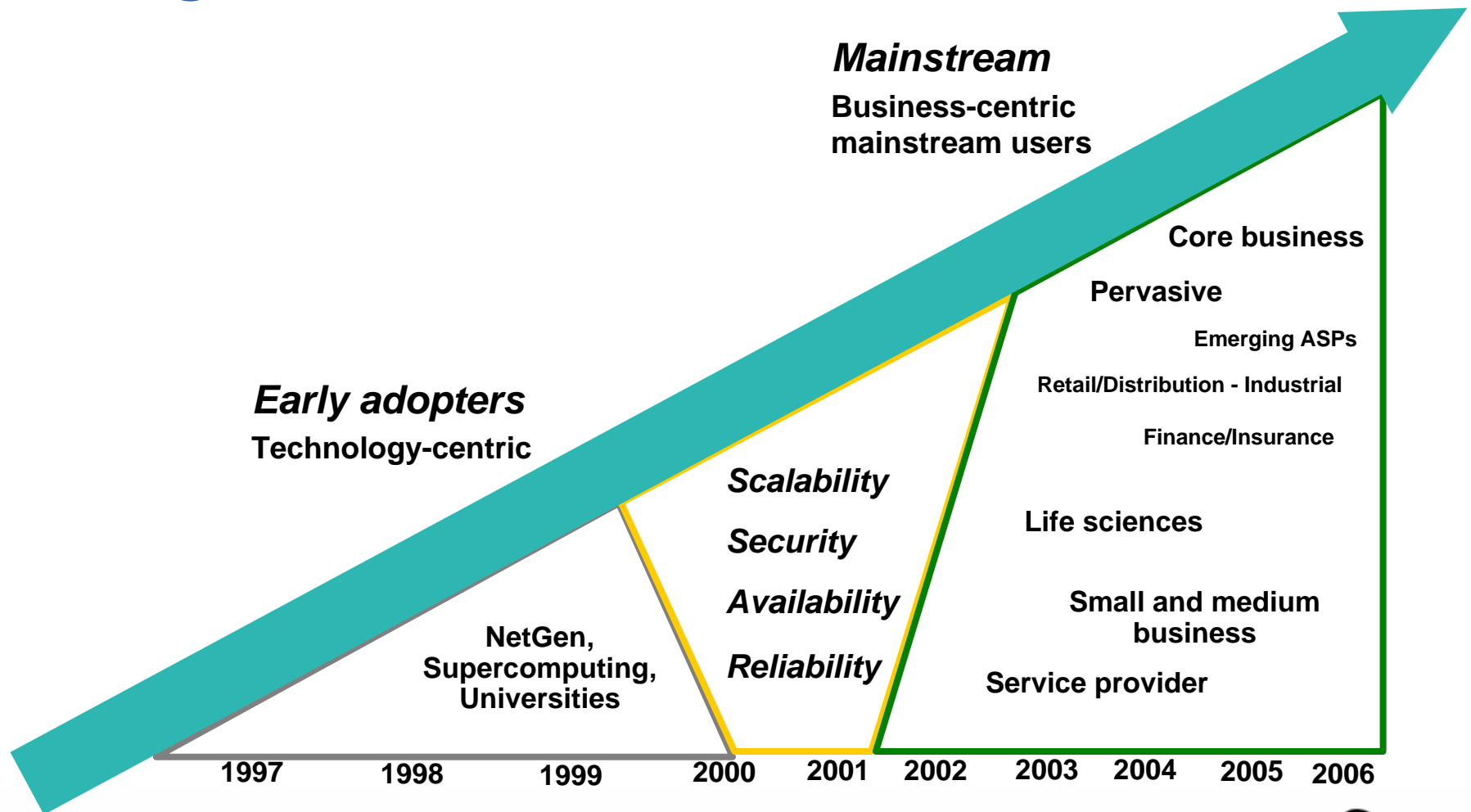
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Taking Linux Mainstream



How organizations are using Linux

Infrastructure

Firewall
File and Print
Web Server
e-mail

- Inexpensive, internally developed solutions
- Basic network infrastructure
- Common first Linux experience
- Business hardened solutions since 1996



How organizations are using Linux

Infrastructure

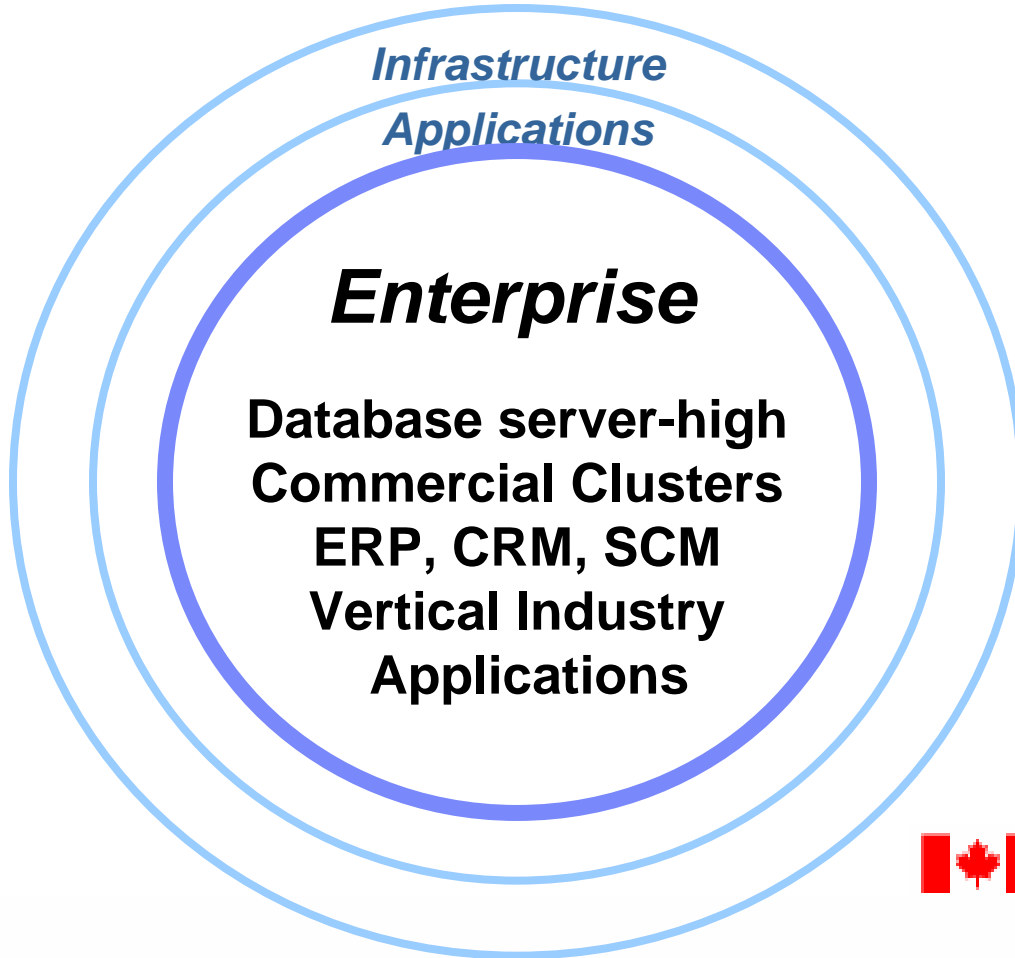
Applications

Database server-low
eCommerce
Super Computing Clusters
Software Development
Web Hosting
Branch Automation

- Basic IT services
- Common next-step in Linux strategy roll out
- Business hardened solutions since 2001



How organizations are using Linux



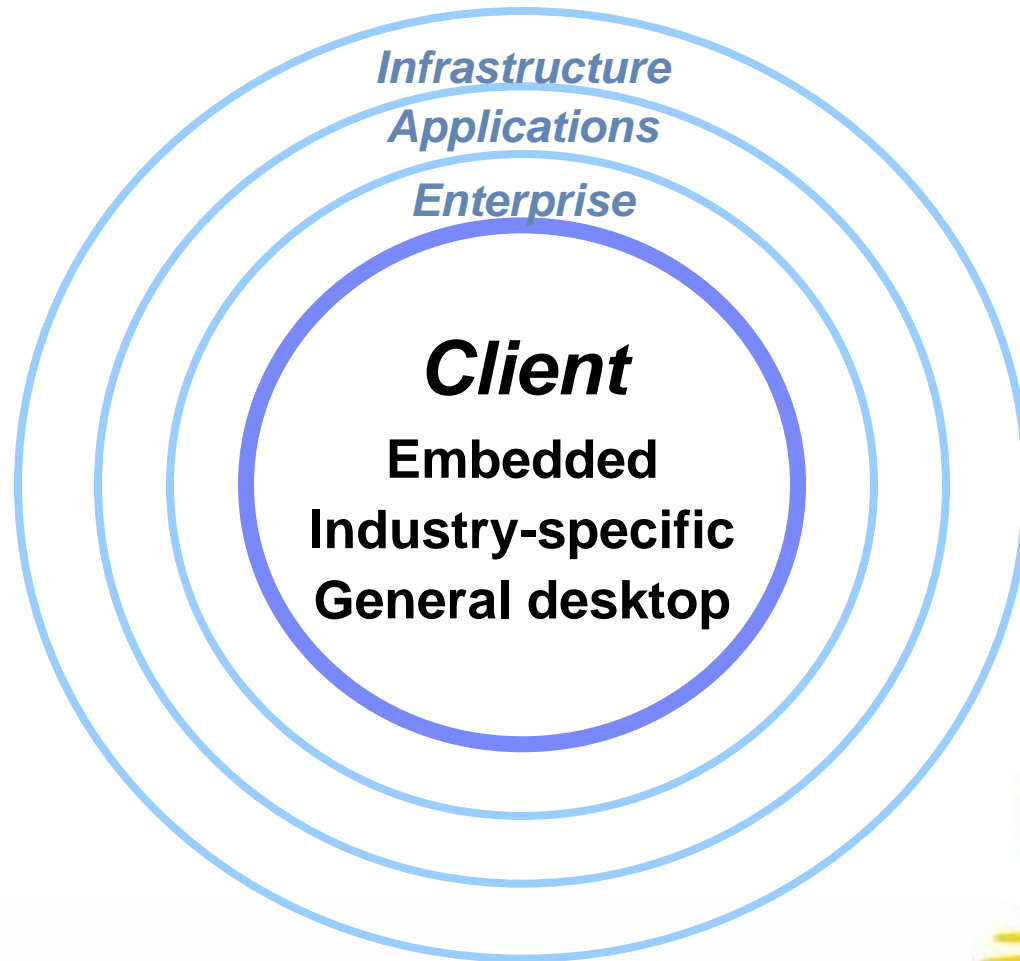
- Line-of-business enterprise IT services
- Advanced stage of Linux strategy deployment
- Business hardened solutions since 2004



National Research
Council Canada



How organizations are using Linux



- **Selected use in IT – industry specific**
 - Kiosks, POS, Desktop, Embedded systems
- **Business hardening currently on-going**





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IBM and Linux



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Linux



IBM Linux Investments



Linux Partners

- EAL2 **2003**
- EAL3 **2004**
- EAL4 **2005**



Patents **2005**



Open Source Contributions **1998 to 2004 2005**



Chiphopper **2005**

Linux Technology Center **1999**

Software

- DB2 **1999**
- WebSphere **2000**
- Tivoli **2001**
- Lotus **2001**
- Rational **2003**



Linux White Papers and RedBooks

Open Source Development Lab **2000**



Servers

- xSeries **1998**
- zSeries **1999**
- Cluster and Power **2001**
- BladeCenter **2002**
- OpenPower and BlueGene/L **2004**



Business Partners



Linux Services **1999**



ibm.com/linux



IBM eServer Application Advantage for Linux

Chiphopper – IBM porting/rehosting, testing and assurance offering for ISVs

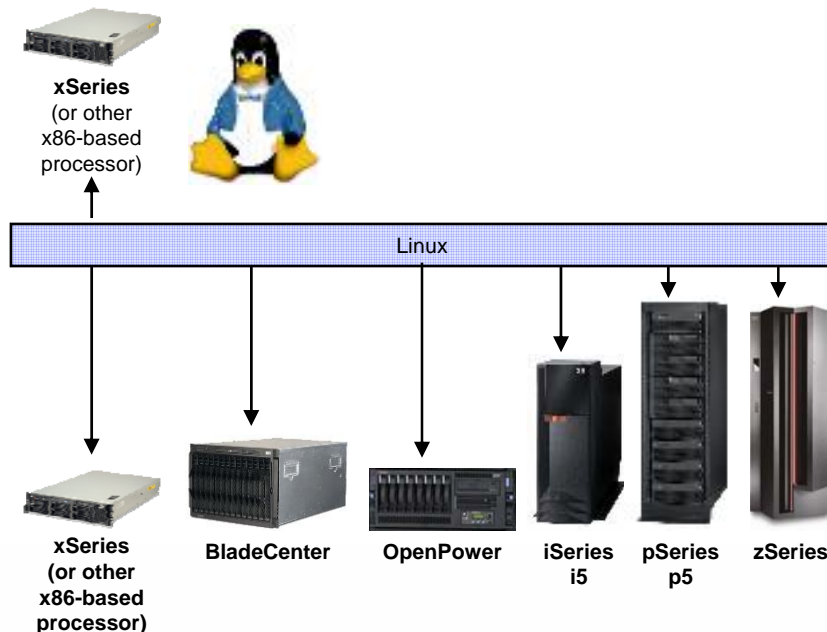
- ISVs achieve portability via standards
- Rigorous testing apps then porting assistance
- Attain **IBM Ready for eServer with Linux** mark
- ISV support is backed by IBM for porting-related customer problems on target platforms
- First of a kind offering

Ready for

IBM @server®

with Linux®

- Provides assurance that IBM stands behind your choice of ISV application on IBM eServer platforms
- Helps grow the number of Linux applications on your platform of preference
- Encourages application conformance to standards, important in emerging Linux landscape
- Helps accelerate the maturation of Linux by facilitating more cost-effective choices for mission-critical, high-end environments



IBM Linux Technology Center

ibm.com/linux/ltc

- **IBM well accepted by the Linux community**
 - 600+ developers world-wide
- **IBM engineers leading enterprise Linux focus**
 - Deeply involved in Linux kernel development
 - Linux on POWER and zSeries
 - Motivated community to focus on addressing scalability and threading issues
 - Defect support for a set of core Linux packages
 - Key participant and contributor to the OSDL



IBM Open Source Contributions

- **IBM participates in over 130 Open Source projects**
 - Apache, PHP, CIFS, Samba, ...
- **IBM projects contributed to Open Source include:**
 - Secure Mailer (as Postfix)
 - Andrew File System (as OpenAFS)
 - Eclipse (integrated development environment)
 - Cloudscape (to Apache as Derby database)
 - Research Hypervisor and Secure Hypervisor (to Xen)
 - Jikes (Java compiler)
- **500 patents into a “patent commons” to help drive innovation and future software development**



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Related links

- Deep Computing
- Grid

Linux at IBM

Linux and freedom

A Q&A with Linux guru, John Patrick
→ by Elliot King

Industries and solutions

Industries

No matter what industry you work in, IBM offers cost-saving, productivity-enhancing Linux solutions that will help you better meet the challenges and opportunities posed by partners, competitors and customers:

Circuit City

Selects IBM Linux point of sale solution for 600 stores

Select your industry:

▼
Go

IBM at LinuxWorld recap

LinuxWorld Conference and Expo® Boston 2005

PGA TOUR Download

Explore on demand technology in the real world

Vital Information for ISVs

Ready for

@server

with Linux®

We're here to help

Ask the experts

Get expert advice on Linux solutions



IBM developerWorks

ibm.com/developerworks



The screenshot shows the IBM developerWorks website. At the top, there is a navigation bar with the IBM logo, a search bar, and a dropdown menu for "Country/region" set to "All of dW". Below the navigation bar is a horizontal menu with links for "Home", "Products", "Services & solutions", "Support & downloads", and "My account". The main content area features a "Top story" section titled "Connect to Apache Derby databases with Jython", updated on 25 Feb 2005. This section includes an image of a coffee cup and network cables, and a brief description of using Jython to access Apache Derby databases. To the left of the main content is a vertical sidebar with a list of product categories such as "DB2", "eServer", "Lotus", "Rational", "Tivoli", "WebSphere", "Autonomic computing", "Grid computing", "Java™ technology", "Linux", "Open source projects", "Power Architecture™", "SOA and Web services", "Web architecture", "Wireless technology", "XML", and "Feedback". To the right of the main content is a "My developerWorks" section with a "Welcome guest" message and links for "Sign in" and "Register". Below this are links for "Downloads", "Tutorials and training", "RSS feeds", "Forums, blogs and community", and "Technical briefings and events". At the bottom right, there is a "Spotlight" section with links to explore new resources, download IBM Web Tools for Eclipse, and learn more about the IBM Academic Initiative. The Tux the penguin logo is also visible in the bottom right corner of the screenshot.



IBM developerWorks for Linux

ibm.com/developerworks/linux

The screenshot shows the IBM developerWorks website interface. At the top, there's a search bar and navigation links like 'Home', 'Products', 'Services & solutions', 'Support & downloads', and 'My account'. The main content area is titled 'Linux' and features a 'Top story' article: 'Build a GCC-based cross-compiler for Linux', updated on Feb 23, 2005. Below this are several article teasers. On the right, a sidebar contains 'My developerWorks' (with 'Welcome guest', 'Sign in', 'Register'), 'Spotlight' (with a blue arrow pointing to it, containing links for IBM trial software, Chiphopper announcement, and migrating to Desktop Linux), and 'Editor's picks' (with links for Pyrex and reentrant functions).

IBM alphaWorks

ibm.com/alphaworks

IBM

IBM home | Products & services | Support & downloads | My account

→ Select a country

← developerWorks **alphaWorks** *emerging technologies* 26 February 2005

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- alphaWorks
- Emerging technologies
- Application development
 - Autonomic computing
 - Collaboration
 - Data management
 - Eclipse technology
 - Grid computing
 - Java technology
 - Privacy & security
 - Systems management
 - Web services
 - Wireless
 - XML
- Licensing
- Discussion forums
- alphaWorks in the news
- alphaWorks newsletters

Newsletters

Subscribe to the aW flash newsletter:

IBM Touchpoint Simulator

IBM Touchpoint Simulator aids in the development of autonomic managers by emulating a managed resource. [More.](#)

New alphaWorks Technologies RSS Feeds **XML**

[Assertion Extensions for JUnit](#) - A set of extensions for JUnit that enable complex assertion abilities.

[Partitioning Facility Editor for WebSphere Extended Deployment](#) - An Eclipse plug-in that enables users to create partitions.xml files that can be used to define a WASXD application's partitions and partition expressions.

[IBM Touchpoint Simulator](#) - A simulator that aids in the development of autonomic managers by emulating a managed resource.

[IBM Web Tools for Eclipse](#) - The initial IBM contribution to the Eclipse Web Tools Platform project, with tools for data access, server control, XML authoring, and Web application creation, including Web services.

[Peer-to-Group Media Broadcast](#) - Peer-to-group grid delivery for streaming video and audio to thousands of receiver PCs.

[Data Collector for IBM Web Services Navigator](#) - A tool that intercepts and instruments Web service requests and

Emerging Topics

→ [New from alphaWorks: Semantics](#)

Top alphaWorks Downloads

- [NotesBuddy](#)
- [IBM Web Tools for Eclipse](#)
- [Integrated Development Environment for Laszlo](#)
- [Sametime Plug-in for Trillian](#)
- [IBM Toolkit for MPEG-4](#)

Licensable Technologies

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- [Development Tool for Java-COM Bridge](#)
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 - Networking
 - On Demand/Grid
 - pSeries
 - Solutions
 - Tivoli
 - WebSphere
 - Windows

IBM Redbooks



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IBM Retail Environment for SUSE LINUX Workshop

Seize the opportunities that Linux offers in Retail Solutions

Starting in Palisades NY on March 14, continuing in 11 cities worldwide

Redbooks Workshops

Linux Redbooks Domain

Latest Drafts ... [show all](#)

- Linux on i5: Implementation Guide
- IBM eServer i5 and iSeries System Handbook: IBM i5/OS Version 5 Release 3 October 2004 -

New Redbooks/Redpapers ... [show all](#)

- The IBM eServer BladeCenter JS20
- IBM eServer BladeCenter JS20 Programming Environment

Linux



IBM uses Linux extensively

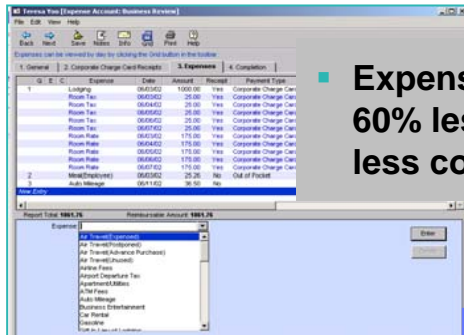
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 - Excludes Research and Development
- **Some of our internal Linux projects:**
 - IBM Intragrid
 - Linux on xSeries
 - e-mail anti-virus and anti-spam scanners
 - IBM Standard Client Installer (ISCI) and IBM Standard Software Installer (ISSI)
 - Linux on zSeries
 - e-hosting and network management
 - IBMLink
 - Asset monitoring
 - Lotus Domino

Client for

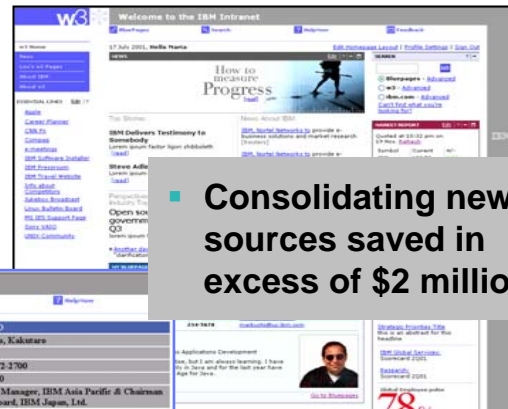
e-business



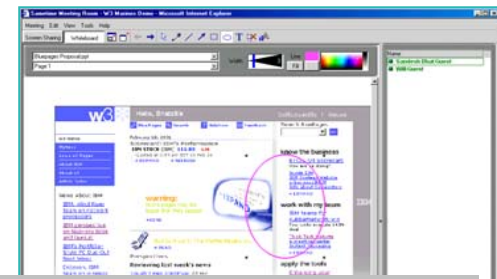
On Demand Portal in IBM



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



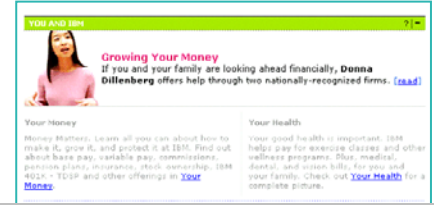
Consolidating news sources saved in excess of \$2 million



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



BluePages – 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



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

Worldjams, jukeboxes, personalized news, discussion forums

IBM eServer Blue Gene Solution

Leadership HPC performance

Broad applicability to important HPC workloads helps advance science, engineering and business

Enhanced accessibility to world-class computing

System
64 Racks, 64x32x32

Rack

Cabled 8x8x16

32 Node Cards

Node Card
(32 chips 4x4x2)
16 compute, 0-2 I/O cards

Compute Card
2 chips, 1x2x1

Chip
2 processors

5.6/11.2 GF/s
1.0 GB

90/180 GF/s
16 GB

2.8/5.6 TF/s
512 GB

180/360 TF/s
32 TB

Commercialized and aligned with the IBM server portfolio

Sustained investment in Blue Gene technology



IBM eServer and Linux

ibm.com/eserver/linux

- **IBM eServer zSeries**
 - Hundreds of Linux servers
 - Integration using z/VM with z/OS, z/VSE, and z/TPF
- **IBM eServer iSeries / i5**
 - Up to 254 Linux partitions
 - Integration with i5/OS
- **IBM eServer pSeries / p5**
 - Up to 254 Linux partitions
 - Linux affinity in AIX 5L
- **IBM eServer OpenPower**
 - Up to 40 Linux partitions
 - Linux-only server
- **IBM eServer xSeries**
 - Freedom of choice in operating systems
- **IBM eServer 326 (AMD)**
 - High performance computing
- **IBM eServer Clusters**
 - Component integration
 - Speed to market
- **IBM eServer Blades**
 - High density servers
 - Integrated components
 - Even more freedom of choice



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 300 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			IBM @server® zSeries				
DB2	Version - Release	Hardware	Tivoli software	Version - Release	Hardware	Kernel/Distribution	Sources
DB2 Administration Client	8.2	xSeries					
IBM @server® pSeries							
WebSphere software	Version - Release	Hardware	Kernel/Distribution	Sources			
NEW! WebSphere Application Server	6.0	pSeries	Red Hat Enterprise Linux 3 Update 2, Update 3 SUSE Linux Enterprise Server 8 SP3 SUSE Linux Enterprise Server 9	Available December 10, 2004 Software Announcement 204-289 November 30, 2004 Supported Platforms	IBM Business Partner Enterprise Linux Enterprise 8 Linux 1.0 Portal Manager: IBM Business Partner Enterprise Linux Enterprise 8 Linux 1.0 SAL: IBM Business Partner Enterprise Linux Enterprise 8 Linux 1.0	Software Announcement 203-315	
WebSphere Application Server	5.1.1	pSeries	Red Hat Enterprise Linux 3 Update 1 SUSE Linux Enterprise Server 8 SUSE Linux Enterprise Server 8 SP3 SUSE Linux Enterprise Server 9	Supported Platforms			



IBM Global Services and Linux

ibm.com/linux/services

- **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**



Get trained for the hot jobs.
Linux training from IBM.



IBM alliances with Linux distribution partners

■ Novell

- SUSE Linux Enterprise Server
www.suse.com/us/business/products/server/sles
- Certified at Common Criteria EAL4+ and COE



■ Red Hat

- Red Hat Enterprise Linux
www.redhat.com/software/rhel
- Certified at Common Criteria EAL3+ and COE
 - EAL4 certification planned for 2005



■ Support for all IBM eServer products

■ Service available from IBM or distributors





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Summary



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February 28, 2005

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Linux



Next Steps



- Familiarize yourself with Linux
- View Linux as a valid alternative for IT systems
- Incorporate open source software development into IT strategies
- Look at Linux to see how it can:
 - Lower costs
 - Increase reliability and security
 - Improve service

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Strategic Growth Businesses
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ibm.com/vm/devpages/jelliott**



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