Linux and Open Source: The View From IBM

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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 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
Open Architecture
Open Standards
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
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
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
Linux Technology Evolution

2.4

- Efficient 4-way SMP scalability
- 64-bit support
- Multi-tasking
- 1TB file size, Journaling
- Clustering
- IBM eServer partition support
- Enhanced RAS
- Advanced networking
- Linux standards base

Future (2.6 and beyond)

- 16-way+ scalability
- I/O & file system performance
- Security enhancements
- Hyperthreading performance enhancements
- Kernel and driver ‘hardening’
- Pre-emptive Kernel
- Improved Scheduler
- Large Page Support
- VM Enhancements
- Block I/O
- Sub-processor partitioning support

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

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

Six times performance improvement!
Linux Usage
Taking Linux Mainstream

Mainstream
Business-centric
mainstream users

Core business
Pervasive
Emerging ASPs
Retail/Distribution - Industrial
Finance/Insurance
Life sciences
Small and medium business
Service provider

Early adopters
Technology-centric

NetGen, Supercomputing, Universities

Scalability
Security
Availability
Reliability

How organizations are using Linux

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

Infrastructure

- Firewall
- File and Print
- Web Server
- e-mail
How organizations are using Linux

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

Infrastructure

Applications

Database server-low eCommerce Super Computing Clusters Software Development Web Hosting Branch Automation
How organizations are using Linux

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

Enterprise

Infrastructure

Applications

Database server-high Commercial Clusters ERP, CRM, SCM Vertical Industry Applications
How organizations are using Linux

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

- 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**
### 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:**

- Select one
Connect to Apache Derby databases with Jython
Take advantage of the elegance of Python while maintaining access to Java -- use Jython to access and manipulate Apache Derby relational databases. More »

Web Services Reliable Messaging reloaded: Survey the updates to the republished WS-RM specification and take an in-depth look at how changed elements will affect your code. (Web services)

Build a GCC-based cross-compiler for Linux: Step through the process of building a GNU Compiler Collection cross-compiler that targets a single platform or multiple platforms. (Linux)

Wireless messaging with JXTA: Integrate mobile clients within existing Java Message Service solutions using the JXTA application for JMS. (Wireless technology)

Reuse translations with TM and TMX: Find out how Translation Memory eXchange (TMX) helps you to achieve independence from translation tool vendors. (XML)

Learn business process modeling basics: Discover some of the modeling
Build a GCC-based cross-compiler for Linux

Follow step by step through the process of building a cross compiler that targets a single platform or multiple platforms. More>

C++ exception-handling tricks for Linux: Four useful tricks on Linux for working around C++ exception-handling restrictions let you more effectively capture and deal with error information. (Articles)

Basic tasks for new Linux developers: Get the latest trial IBM software for Linux and learn your way around Linux in no time; these basics cover logging in and logging out and all the typical tasks in between. (Articles)

Port from Solaris to Linux on POWER: Get tips on the six steps for a smooth port: review platform differences, set up your environment, rebuild your app, test it, tune it, and package it for distribution. (Articles)

Port enterprise apps from UNIX to Linux: Based on the hard lessons learned from moving a large, multi-threaded software project to Linux, get tips not only how to port, but how to stay portable. (Articles)

Build a heterogeneous cluster with coLinux and openMosix: Craft a hybrid cluster with the stability and performance of coLinux and openMosix that still allows Windows users to keep using their productivity applications. (Articles)
IBM Touchpoint Simulator
IBM Touchpoint Simulator aids in the development of autonomic managers by emulating a managed resource. More.

New alphaWorks Technologies
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
IBM Redbooks
ibm.com/redbooks/portals/linux

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

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
IBM uses Linux extensively

- 4000+ production servers world-wide
  - 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
On Demand Portal in IBM

- Expense reports take 60% less time, 80% less cost
- HR portal – 90% satisfaction rate
- Over 90% employees registered health benefits here last year, saving IBM over $1 million
- E-Meetings and instant messaging saves IBM over $4 million /month
- BluePages – over one million hits a day
  - 64% of employees use it at least once a week
  - 50+ applications use the same directory
- IBM realized over $400 million in cost avoidance in 2002 with over 40% of classes moved online
- Consolidating news sources saved in excess of $2 million
- Worldjams, jukeboxes, personalized news, discussion forums
- IBM realized over $400 million in cost avoidance in 2002 with over 40% of classes moved online

SHARE Session 9200
February 28, 2005
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

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

System
64 Racks, 64x32x32

Leadership HPC performance

Commercialized and aligned with the IBM server portfolio

Sustained investment in Blue Gene technology

Enhanced accessibility to world-class computing
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

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<th>IBM @server® xSeries</th>
<th>IBM @server® zSeries</th>
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**NEW! WebSphere Application Server**

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Hardware: IBM @server® xSeries, IBM @server® zSeries, IBM @server® pSeries

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- Supported Platforms

Software Announcement 203-315
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
IBM alliances with Linux distribution partners

- **Novell**
  - SUSE Linux Enterprise Server
  - Certified at Common Criteria EAL4+ and COE

- **Red Hat**
  - Red Hat Enterprise Linux
    - [www.redhat.com/software/rhel](http://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**
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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