

Linux for Tough Economic Times





Abstract

- **In our current troubled economy, there are even more compelling reasons to use Linux and Open Source solutions. This presentation will discuss how Linux and Open Source can reduce costs, be “green”, and still provide for mission-critical levels of availability and performance.**
- **The presentation will also provide some random thoughts from IBM**



Agenda

- **Linux for Tough Economic Times**
- **The cloud from a user's perspective**
- **Oh, yeah, my mainframe with Linux does that**
- **Some 2008 predictions, one year later**



Global forces are driving a fundamentally different world



- **Global financial crisis is changing business priorities – and the IT that supports them**
 - New incentives to reduce cost
 - Financial crisis putting new lens on TCO claims
- **The business landscape is evolving, and IT must evolve with it**
 - Increased M&A activity in a tight economy requires rapid integration
- **Government IT priorities are increasingly aligned with those of business**
 - Major stimulus packages include both funding for IT infrastructure – and increased scrutiny
- **Technology has enabled solutions that weren't feasible in the last downturn**
 - Bandwidth has evolved, providing greater capacity and reliability at much lower costs



Why is Linux important in the new economic reality?

- **Linux continues to grow rapidly in share, scale, and scope, even in the downturn**
 - 10 years have passed since IBM's initial public commitment to Linux
 - Linux continues to gain features that enable it to address broadening market opportunities
 - Robust ecosystem enables lower cost, Linux-based alternatives to proprietary solutions
- **Unique attributes of Linux enable novel simplification strategies to reduce cost**
 - Linux enables clients to choose the platform that makes the most sense
 - When consolidating IT operations during M&A activity, Linux can enable asset reuse





Five areas of interest

- **Project Big Green Linux: Reducing consumption, reducing cost**
- **Linux for Business-Critical Workloads: A lower cost alternative**
- **Linux on the Desktop: Providing choice, reducing costs**
- **Linux for the Midmarket: Leveraging Linux, less complexity**
- **Linux for Emerging Workloads: Enabling a smarter planet**



Project Big Green Linux: Reducing consumption, reducing cost

▪ Addressing rising energy infrastructure costs

- Linux is enabled to utilize advanced features on all IBM Systems, helping to avoid other costs
 - Virtualize workloads on new or existing systems that are more efficient than before
 - Increase utilization rates with RAS and virtualization features on large systems
 - Consolidation can reduce floor space or avoid costly datacenter expansion
 - IBM offers middleware to manage energy use

▪ Reducing the cost of heterogeneous hardware environments during M&A

- Linux empowers users to choose the platform that makes sense
 - Linux as a common denominator can drive faster integration of disparate platforms

▪ Reducing OS license costs

- Manage more with less using Linux
 - Standardizing on Linux can reduce the amount of skill needed to manage multiple OS environments when resources are tight
- Reduce OS license costs, avoid upgrade penalties
 - Subscription model guarantees that OS license costs remain predictable and smooth over time
 - Directly avoid costs by eliminating the need to pay for CALs, in addition to end-user licenses



Linux for Business-Critical Workloads: A lower cost alternative

- **The same business-critical workloads at lower cost than proprietary solutions**
 - Linux provides features that support business-critical workloads at a lower cost
 - IBM middleware is consistent across platforms
 - Native enterprise virtualization / consolidation
 - Government-certified security
 - Natively inheriting reliability and availability functionality built into the underlying platform
 - Industry-leading performance across multiple platforms
- **Enabling mixed environments**
 - Optimal solutions are often a gradient
 - Linux support for all IBM systems enables open and other OSs to commingle on the same hardware, reducing costs
 - IBM offers a blend of open and other solutions on Linux for maximum flexibility
- **Reducing risk by improving hardware choices with cross-platform Linux support**
 - Business-critical workloads should run on reliable platforms
 - Linux certification on all IBM Systems enables workload optimization by platform capability
 - Reduce the risk (and costs) of downtime by replacing physical hardware with virtual Linux machines running on more reliable platforms



Linux on the Desktop: Providing choice, reducing costs

▪ Linux enables reduced cost end-user work environment choices

- Having choice of solutions ensures cost saving opportunities
 - Linux is a viable alternative, making cost comparisons meaningful
- Linux-based alternatives to Microsoft save on desktop and server licensing
 - Reducing spending on client licenses can address budget cutbacks
 - Migrating 1 (or 10,000) desktops to Linux from Windows provides immediate license cost avoidance
 - Eliminating CALs saves on can free up 40% or more of the cost of a Microsoft enterprise agreement
 - Clear market demand for free productivity suites

▪ Cost savings beyond licenses

- Virtual Linux desktop solutions can help reduce desk-side and help desk support costs
 - Instant client updates, rapid problem resolution, simplified application deployment and backup
 - Significantly reduced threat of data loss through component failure or theft
- The ability to work from anywhere from multiple devices is reshaping the workplace by letting workers define their own productive spaces
 - Consistency across platforms helps clients adopt Linux and other solutions at their own pace



Linux for the Midmarket: Leveraging Linux, less complexity

*Mid-market solutions
should enable applications
to be managed like
devices*



- **Hiring additional IT staff can drive up TCO**
 - Linux appliances can help reduce the cost of deploying, managing, and supporting applications
 - IBM Lotus Foundations, built upon Linux, provides functionality that does not require a distinct IT staff
- **Medium-sized business need to position themselves for growth**
 - Enterprise-quality offerings built on Linux can enable scalability without sacrificing flexibility
 - IBM Express offerings, running on Linux



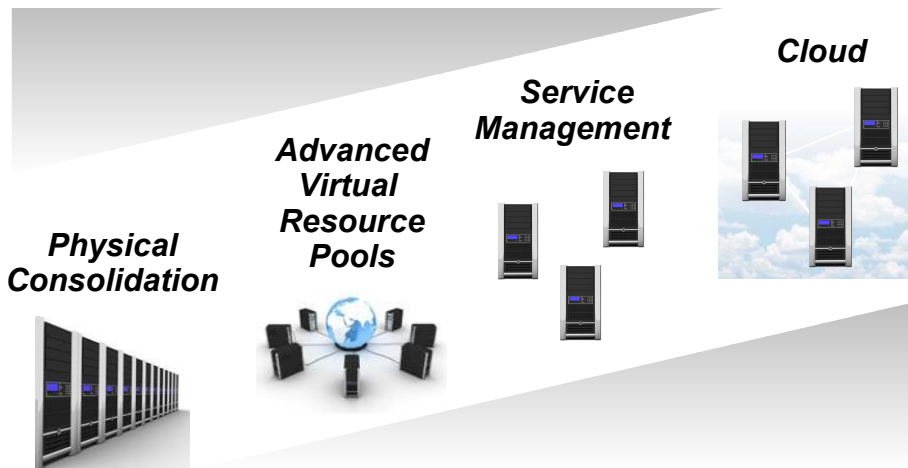
Linux for Emerging Workloads: Enabling a smarter planet

■ Providing innovative solutions to the complexity (and cost) problem

- IBM is a leader with Linux in cloud computing
 - Established a dedicated cloud organization
 - 9 IBM Cloud Labs around the world
 - 9 private cloud implementations
 - 2 academic alliances

■ IBM helps Linux users reduce cost by providing flexible utility computing

- Pay-as-you-go utility computing enables users to smooth IT expenditures over time
 - Replacing periodic capital expenditures with a predictable billing cycle reduces uncertainty
 - Add or remove incremental capacity without introducing sprawl or maintaining idle resources
- IBM enables others to resell cloud services
 - Consulting
 - Implementation
 - Cloud Delivery
- Private clouds can revolutionize IT budgets
 - Principles of utility computing – such as accurate measurement and billing – can transform IT from a cost center into a cost recovery center





Agenda

- **Linux for Tough Economic Times**
- **The cloud from a user's perspective**
- **Oh, yeah, my mainframe with Linux does that**
- **Some 2008 predictions, one year later**



Who is the user for cloud computing?

■ Could be ...

- A user of a virtualized desktop on a thin or fat client
- A non-technical end user who accesses services through a browser or via applications such as disk backup to remote storage
- A “cloud choreographer” who strings together cloud-based services to implement business processes
- A service provider who needs to handle peak load demands
- A developer who employs dynamic resource allocation in clouds to speed application or solution creation
- An IT system administrator who does not build clouds but deploys onto them, probably in addition to traditional managed systems



What does a cloud computing user want?

- **Cloud-friendly applications**
- **Resources: storage, processor, platform**
- **APIs: the more standard the better**
- **Interoperability among clouds (may learn of this need later)**
- **Reduced capital expense**
- **A good, workable pricing scheme**
- **Quality of service, including**
 - Availability
 - Reliability
 - Performance
 - Security
 - Privacy

I don't think any one of these contradicts the use of Linux, and they all potentially encourage it.



What does a cloud computing provider need?

- **Maximum practical use of resources: processors, memory, storage**
- **A good, workable pricing scheme**
- **Virtualization, virtualization, virtualization**
- **Acceptable licensing of operating systems being used**
- **Highly reusable skills of system administrators**
- **Minimal power used, heat generated, datacenter space needed**

I don't think any one of these contradicts the use of Linux, and they all potentially encourage it.



What special about Linux here?

- **Linux supports multiple hardware platforms**
 - Implementation span from embedded devices to supercomputers
 - Speed of support for new platforms
 - Availability of skills, portability of applications
 - Scale-out through clustering as well as scale-up through SMP
- **Linux has an affinity with virtualization and is being used in clouds**
 - Supported on all major hypervisors, from z/VM to VMware and Hyper-V
 - Ability to be paravirtualized with Xen
 - Inclusion of KVM as part of Linux
- **Linux is flexible**
 - Modular and customizable, with flexible usage licensing
- **Linux is developed by an open community**
 - Sharing skills and resources, leading to faster development



Agenda

- **Linux for Tough Economic Times**
- **The cloud from a user's perspective**
- **Oh, yeah, my mainframe with Linux does that**
- **Some 2008 predictions, one year later**





Why people are using Linux on mainframes

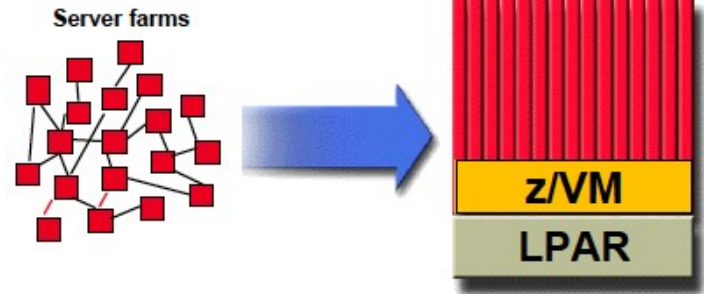
- **Virtualization was introduced commercially on IBM mainframes in 1972**
- **Hypervisor is integrated with the hardware**
 - Sharing of CPU, memory and I/O resources
 - Virtual network and virtual I/O
- **Reduced Total Cost of Ownership (TCO)**
 - Environmental savings – single footprint vs. hundreds of servers
 - Consolidation savings – less storage, fewer servers, fewer software licenses, less server management/support
- **Mainframe capabilities complement and enhance those of Linux**





Why people are using Linux on mainframes

- **Utilization often (usually) exceeds 90%**
- **Manageability of centralized Linux systems**
- **Typical deployment needs:**
 - High performance transaction processing
 - I/O intensive workloads
 - Large database serving
 - High resiliency and security
 - Unpredictable and highly variable workload spikes
 - Low utilization infrastructure applications
 - Rapid provisioning and re-provisioning
- **Mainframe characteristics complement cloud user requirements**





Project 'Big Green'



- **Major proof point for Project Big Green**
 - IBM will consolidate and virtualize thousands of server images onto IBM System z mainframes
 - Substantial savings: energy, software and systems support costs
 - 80% less energy, 85% less floor space
 - Enabled by virtualization capability

***IBM'S PROJECT BIG GREEN
SPURS GLOBAL SHIFT TO
LINUX ON MAINFRAME***
ARMONK, NY, August 1, 2007





Agenda

- **Linux for Tough Economic Times**
- **The cloud from a user's perspective**
- **Oh, yeah, my mainframe with Linux does that**
- **Some 2008 predictions, one year later**



2008 Prediction 1

“Green” will drive significant initiatives in open source

Linux will help reduce energy consumption through server consolidation, virtualization, load balancing and more efficient resources management.

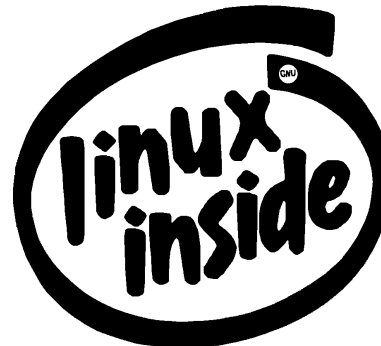
- This is happening as major customers such as banks move to reduce their carbon footprints by consolidating onto mainframes, often getting features such as disaster recovery as a bonus
- Aside from tangential benefits of using Linux, I'm not seeing much yet in the way of open source being applied to green initiatives in a focused and specific way



2008 Prediction 2

Linux will not be replaced

- I doubt anyone can seriously argue that any other open source operating system has made significant inroads on the growing installed base of Linux in the last year
- Linux will be introduced to thousands more users via implementations in mobile phones, though users may not know it
- Much of the hot technological action is happening on Linux, such as virtualization, and this will be essential for cloud computing
- Linux will increasingly find itself competing against proprietary virtualization technologies
- Linux Inside?





2008 Prediction 3

Linux mindshare will be less x86 focused

- **In the cloud, users may not know there is Linux Inside, much less x86 Inside**
- **From a device perspective, users will think less of operating systems and chips, but more of user interfaces, media, connectivity, applications, app stores, and coolness**
- **Customers are more than capable of choosing the correct hardware platform to match their planned workloads**
- **The instability and uncertainty in the industry this year is causing customers to re-evaluate their software/hardware platforms and has been a great opportunity for Linux and competitive winbacks**



2008 Prediction 4

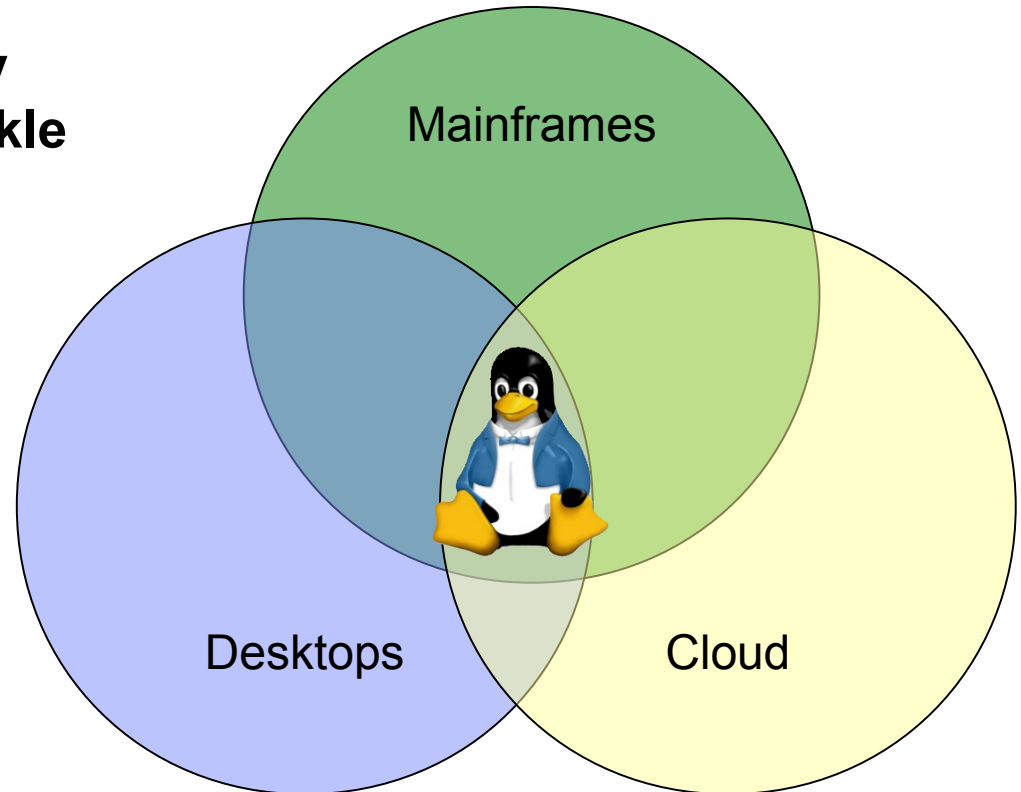
Open standards will grab more attention

- **The Open Document Format (ODF) is being approved for use in more and more countries around the world**
- **Recent adopters include Malaysia, Norway, Ecuador, Venezuela, Taiwan, Hungary, and Latvia**
- **The Open Cloud Manifesto has over 250 companies and groups supporting it**
- **The industry and users will benefit the most from an emerging technology when open standards are at the core, and there as early as possible**



Finishing up ...

- **Linux is at the center of the computing we have today and that which we are building for tomorrow**
- **I believe the Linux community and leadership will rise to tackle any challenges necessary to meet and exceed expectations**





Thank you

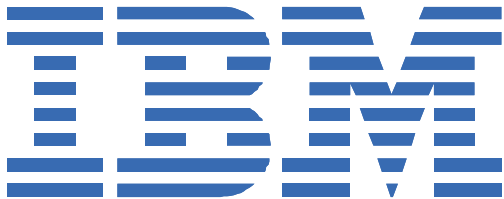
Jim Elliott

Consulting Sales Specialist – Linux Champion

IBM Systems and Technology Group

Jim_Elliott@ca.ibm.com

<http://ibm.com/vm/devpages/jelliott>





Notices

© Copyright IBM Corporation 2000, 2009. All rights reserved.

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.