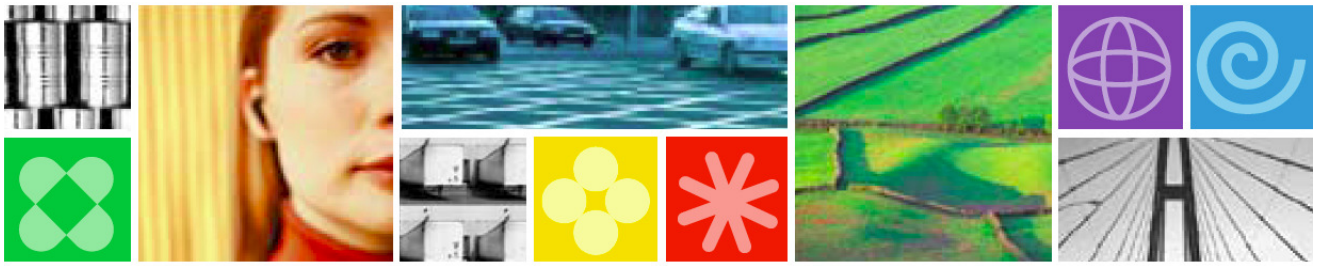
Consolidation and Virtualization Update with Linux and z/VM on IBM System z IFL Specialty Engines



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Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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Discussion Topics

- **The environment today – costs, instability, and risk**
- **Select IBM System z to consolidate and reduce costs now**
- **New System z Enterprise Linux offerings from IBM**
- **z/VM Version 6.1 overview**

Today, businesses and IT face more challenges and uncertainty than ever before

- **An unprecedented global economic downturn**
- **Increasing customer expectations and competitive pressures**
- **An explosion in the volume of data**
- **Exponential growth in communication subscribers and devices**

The result: systems and infrastructure that are reaching a breaking point

Virtualization and Security

Should IT Managers Be Concerned?

Virtualization security risks being overlooked, Gartner warns

Gartner raises warning on virtualization and security.

Companies in a rush to deploy virtualization technologies for server consolidation efforts could wind up overlooking many security issues and exposing themselves to risks, warns research firm Gartner.

“Virtualization, as with any emerging technology, will be the target of new security threats,” said Neil MacDonald, a vice president at Gartner, in a published statement.

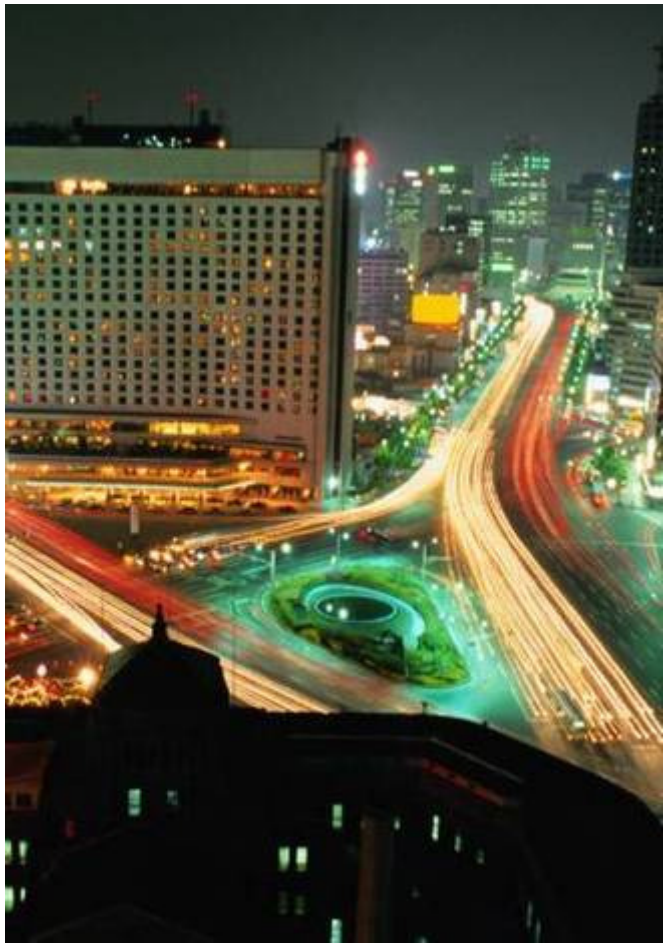
– NetworkWorld.com, April 6, 2007

Virtual Servers Introduce Real Risk

Sixty percent of virtualized servers will be less secure than the physical servers they replace through 2012. So says Neil MacDonald, vice president and fellow at Gartner. Virtual machines by themselves aren't inherently less secure. The problem is how VMs are deployed.

– Posted by Sharon Fisher at NetworkComputing.com, March 26, 2010

A Smarter IT Infrastructure Addresses Today's Challenges... *and* **Tomorrow's Opportunities**



REDUCE COST

Not just containing operational cost and complexity, but achieving *breakthrough* productivity gains through virtualization, optimization, energy stewardship, and flexible sourcing.

IMPROVE SERVICE

Not only ensuring high availability and quality of existing services, but also meeting customer expectations for real-time, dynamic access to innovative *new* services.

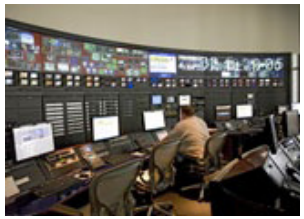
MANAGE RISK

Not only addressing today's security, resiliency, and compliance challenges, but also preparing for the new risks posed by an even more *connected* and *collaborative* world.

Many clients are **reducing costs**, **improving service**, and **managing risk** by consolidating servers and deploying new workloads on the *industry's most capable virtualization platform*.

IBM System z

Delivers Superior IT Optimization and Consolidation for Your Enterprise

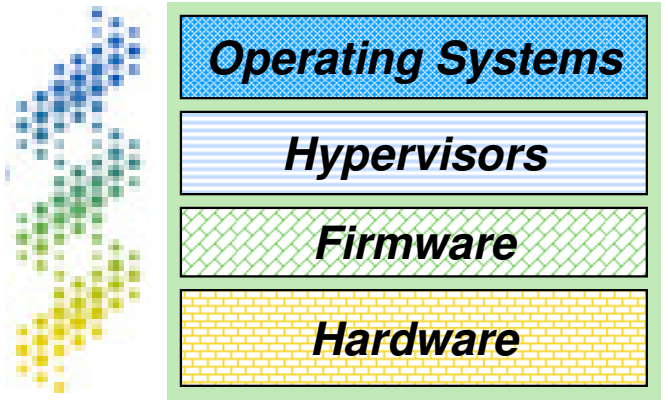
Reduce Cost		System z delivers superior **resource sharing** and **virtualization efficiency** – helping users optimize their spending on energy, floor space, software, and staffing.
Improve Service		System z provides an extensive set of time-tested **command and control** functions that help users maintain service agreements during peak periods and satisfy business demands with incredible **speed and agility**.
Manage Risk		System z offers unrivaled system **availability** and **flexible** business continuance and disaster recovery options to help clients protect their business.

System z offers a clear advantage over competitive alternatives because it delivers better business value in these key areas.

IBM System z Virtualization Genetics

The Key to Unlocking the Value of Consolidation on System z

- System z is thoroughly architected to host a mixed set of applications in a highly virtualized environment
- This is accomplished with a coordinated set of investments that permeate the technology stack of hardware, firmware, hypervisors, and operating systems
- This means clients can efficiently maximize the utilization and security of all system assets, including: CPU, memory, I/O adapters and devices
- All with exceptional levels of operational ease and cost efficiencies

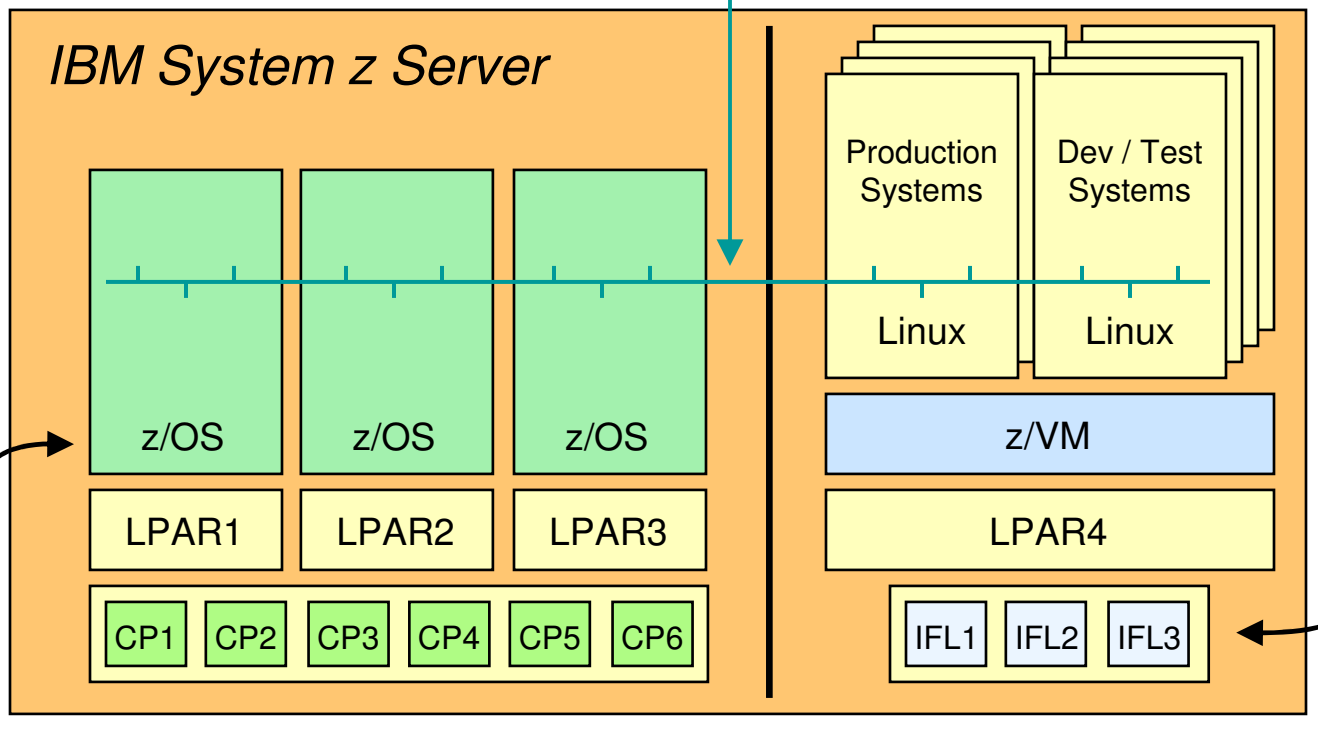


"But there's another key factor that could impede the growth of x86 server virtualization. With the mainframe, most system components [come] from the same vendor (IBM). With x86 server virtualization, the microprocessor, server platform, storage, hypervisor and operating systems typically come from multiple vendors. 'These vendors may have conflicting objectives,' Burns writes."

– Charles Burns, author of "The Many Faces of Virtualization: Understanding a New IT Reality", quoted in NetworkWorld.com*

* http://www.networkworld.com/news/2008/010708-virtualization.html

Sample Linux on z/VM IFL Configuration



"Inside the box" virtual networking

z/VM and most Linux software fees are priced on real CPU capacity...

IFL processors have no impact on z/OS license fees

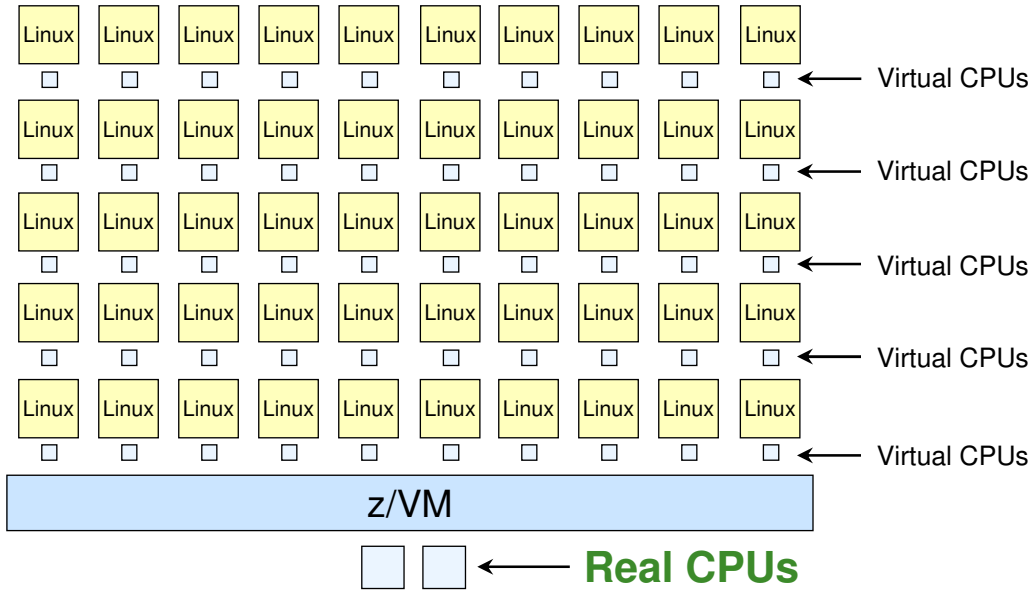
...a potential source of cost savings given z/VM's ability to overcommit CPU capacity

Linux on z/VM and Resource Overcommitment

A Key Aspect of Cost Savings When Running Linux on System z

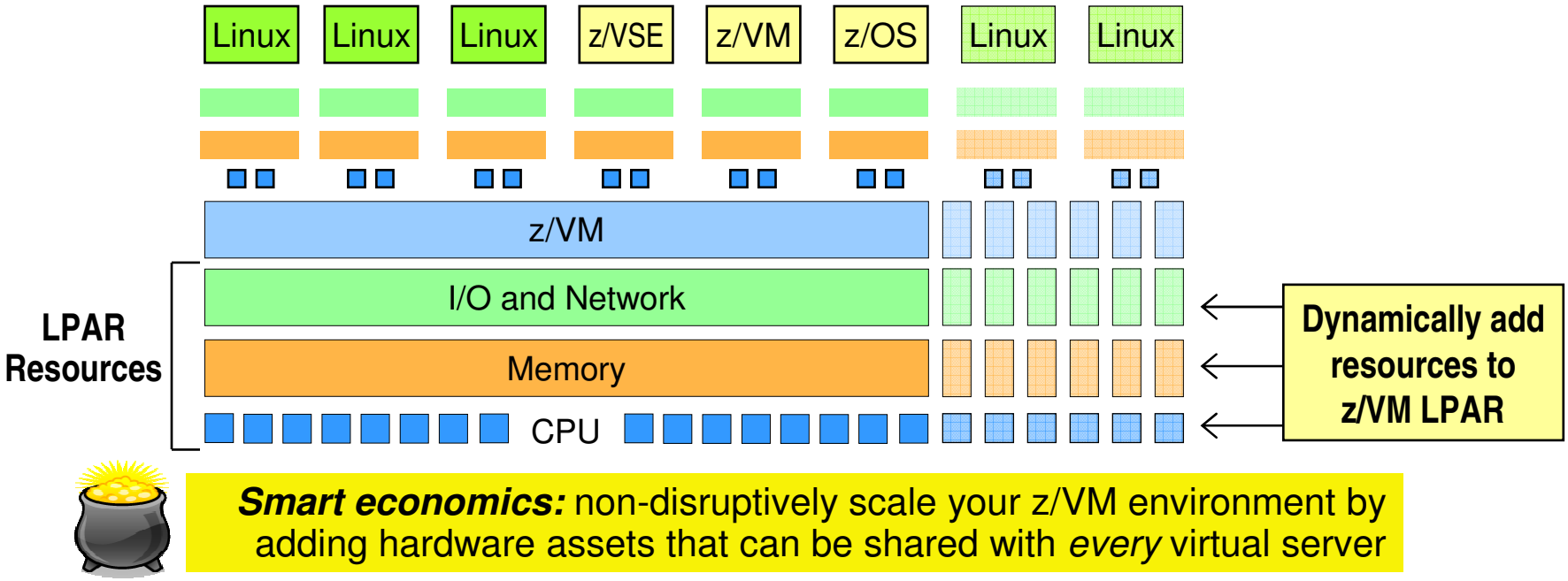
- A fundamental strength of z/VM is its ability to overcommit system resources: “Do more with less”
- Users can host an environment that consumes considerably more CPU and memory, in aggregate, than what is configured in the z/VM LPAR
  - This can translate into cost savings for hardware *and* software
  - Consider a Linux on z/VM environment with a 25-to-1 overcommitment of CPU capacity:

Software licensed for two **real CPUs** can run on 50 virtual CPUs in this example



Linux on z/VM: Flexible, Efficient Growth

- Clients can start small with Linux on System z and non-disruptively grow their environment as business dictates
- Users can dynamically add CPUs, memory, I/O adapters, devices, and network cards to a running z/VM LPAR
- z/VM virtualizes this capability for guest machines

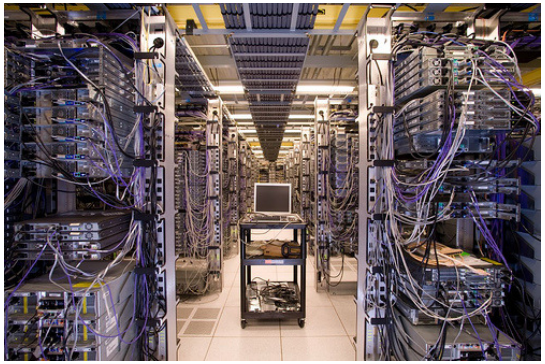


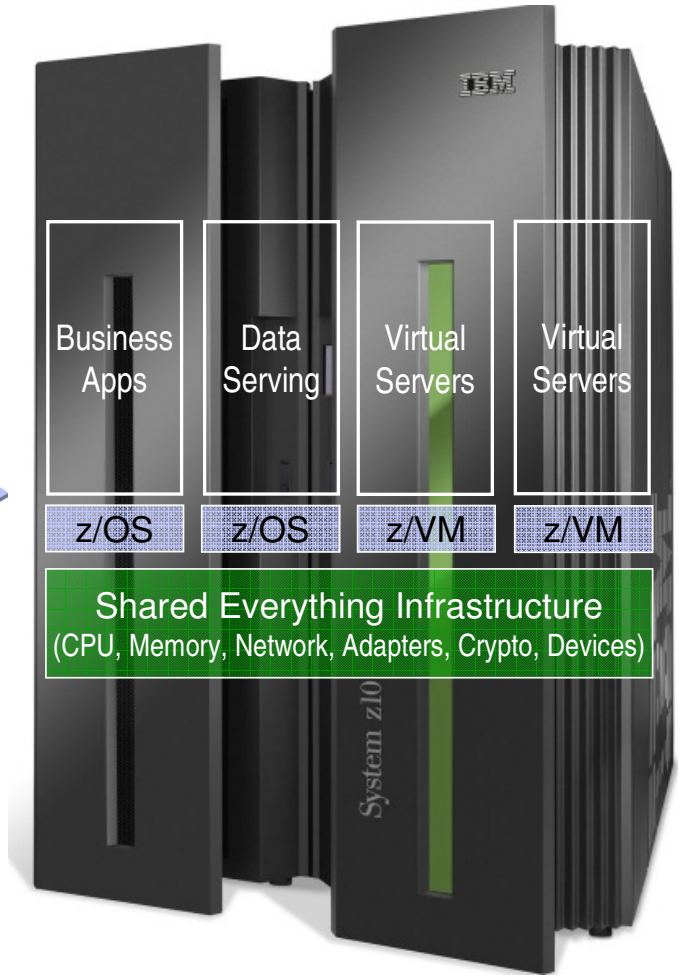
Smart economics: non-disruptively scale your z/VM environment by adding hardware assets that can be shared with *every* virtual server

IBM System z Virtualization Support

Saving Money and Reducing Complexity
Helping You "Do More with Less"

- Consolidate more servers per core and spend less on software, more than 70% less in some cases
- Manage more server images with fewer people, up to 50% improvement in staff productivity
- Save up to 80% on energy and floor space
- Deploy new servers and applications faster
- Absorb workload spikes and maintain service level agreements with less complexity
- Spend less on disaster recovery





Why are Data Centers Consolidating to System z?

- Virtualization on IBM System z offers unique value compared to competitive scale-out solutions from Sun, HP, and others
- Superior availability and security reduces risks and improves service levels
- Extremely efficient virtualization technology lowers costs – System z achieves very high core-to-core consolidation ratios
- **Real customers, real workloads**

Customer	Distributed Cores	Ratio of Distributed to System z Cores*	Ratio of Distributed to System z cores*
Allianz	**60**	**30 to 1**	48 hour migration
Government Agency	**292**	**58 to 1**	70% cost savings
Bank of Russia	**200**	**50 to 1**	Reduces payment processing costs by 95%

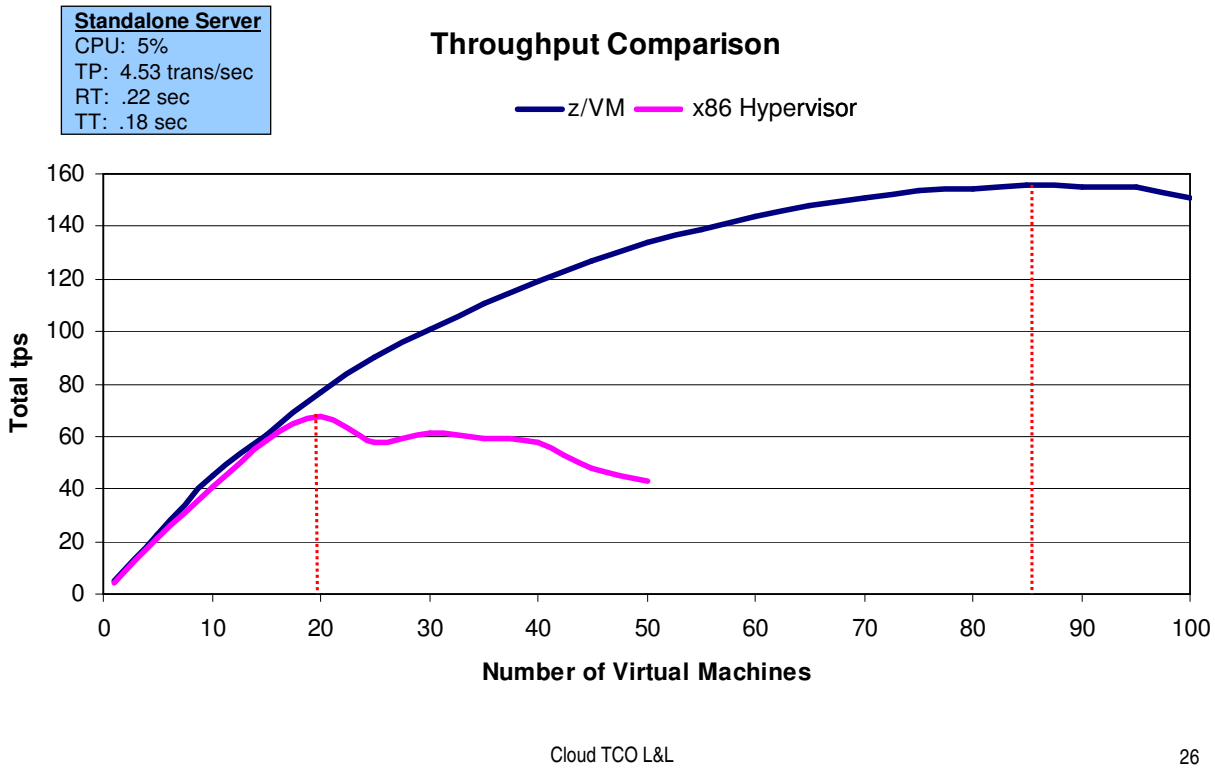
* Client results will vary based on each specific customer environment including types of workloads, utilization levels, target consolidation hardware, and other implementation requirements.

Superior Efficiency and Scalability with z/VM on System z

A Benchmark Study on Virtualization Platforms for Private Clouds

Find White Paper at: www.ibm.com/systems/z/os/linux/library/

Throughput Comparison



Cloud TCO L&L

26

Consolidated Server Images:

- Online banking application
- Using WebSphere App Server
- 5% average CPU utilization
- 40 ms average response time
- 4.5 transactions per second

VM images supported with acceptable response time

- x86 hypervisor: ~**30**
- z/VM: **75**

Maximum throughput

- x86 hypervisor: **20**
- z/VM: **85**

Virtual Machine images running WebSphere Application Server workload were created and placed on:

- An 8-core IBM x3950 (4 @ 3.5GHz dual-core) with 64 GB of total physical memory running popular **x86 hypervisor**
- Single frame IBM z10 EC (8 IFL @ 4.4 GHz) running **z/VM hypervisor**

What Makes a Best Fit Workload for Linux on System z?

- **Leverage classic strengths of IBM System z**
  - High availability
  - High I/O bandwidth capabilities
  - Flexibility to run disparate workloads concurrently
  - Requirement for excellent disaster recovery capabilities
  - Security
- **Shortening end-to-end path length for applications**
  - Co-location of applications
  - Consolidation of applications from distributed servers
  - Reduction in network traffic
  - Simplification of support model
- **Consolidation Effects**
  - Power requirements
  - Software costs
  - People Costs
  - Real Estate
  - Workloads requiring extreme flexibility

Yahoo! Finance:
Survey Predicts Continued Strong Growth of Linux Use on Mainframes*
June 15, 2009

"The study surveyed 100 IT executives and managers at companies with at least $2 billion in annual revenue about their use of the Linux operating system on IBM mainframes. 93% of respondents projected that their use of IBM's IFL (Integrated Facility for Linux) specialty mainframe processor would increase or at least remain steady over the course of the next two years. ***42% projected that their use of the IFL would grow between 21% and 40%,*** and 10% projected that it would grow more than 76%."

"The two main reasons cited by respondents for this increased use of Linux on the mainframe were: 1) the desire to take advantage of computing capacity available on their mainframe's central processors and/or IFLs, and 2) ***their assessment that using Linux on the mainframe would be more cost-effective than other platforms***. Respondents also said they were using Linux on the mainframe to support "green" computing initiatives and infrastructure consolidation strategies."

* http://finance.yahoo.com/news/Survey-Predicts-Continued-prnews-15547427.html?.v=1

Extreme Virtualization with IBM System z

Cost Saving Opportunities

- **Energy and floor space savings**
  - Up to 80% in some cases, including IBM itself
- **Reduced software license fees via CPU over-commitment**
  - One System z client saved 90% on software license fees with Linux-on-z/VM
- **Enhanced staff productivity with large-scale virtual server deployment and management using z/VM**
  - 50% or more productivity boost experienced by many
- **Reduced application outages**
  - Running z/VM on the highly reliable System z platform is the best of both worlds
- **Flexible configuration options for business continuance**
  - Multiple LPARs on a single system enables failover without duplication of hardware
  - Capacity Backup on Demand CPUs gives you cost-attractive multi-system failover
- **Low cost economic model for technology refreshes**
  - System z9 specialty engines carry forward when upgrading to System z10
  - Refresh hundreds of virtual servers by upgrading a single box

Clients Deploy Dedicated System z Servers

For Workload Consolidation with Linux

"It has really ticked all the boxes. It reduced the dependency on a data centre, it reduced the complexity from over 60 servers down to one box, it enabled us to put a lot more robustness around it in terms of DRP and scalability, and was environmentally friendly as well."

– Steven Coles, CIO, Allianz

Smart is: Consolidating from over 60 servers to just one!

Allianz

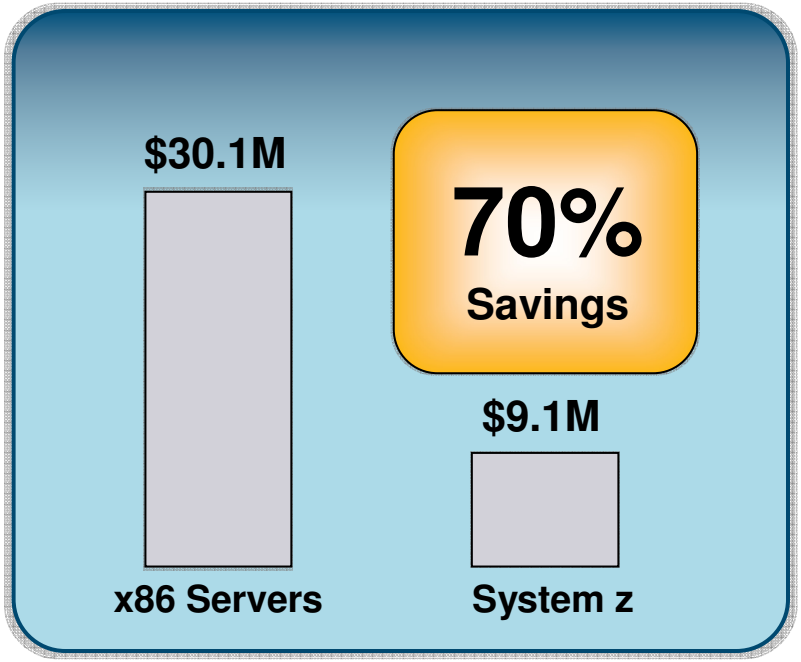
Reduced IT costs – paid for itself in just over a year

kVA power usage down from about 40 to 4

Minimum disruption in cutover to new server

Source: "Allianz consolidates from 60 servers to 1 mainframe in 48 hours"
Computerworld, November 4, 2009 -- http://www.computerworld.com.au/article/324815/allianz_consolidates_from_60_servers_1_mainframe_48_hours

A government organization consolidates applications and data to drive down costs of hardware, software, and management by 70%!



Top three reasons for savings

- Consolidated 292 Oracle servers to one System z
- System administration costs reduced 90%
- Subscription and support licenses reduced over 95%

Customer: A regional North American government organization

Other benefits:

Superior resiliency and security
Single administrator productivity
Infrastructure simplification
Lower energy costs

Automobile Services Company Selects IBM System z, Linux and WebSphere as New Strategic Direction for Enterprise Middleware

Business challenge:

Client relied on a Microsoft .net infrastructure running on HP blades to connect its various systems. Ad-hoc functionality and non-standard interfaces created support and scalability challenges that made the company less agile in responding to business requirements and new opportunities.

Solution:

A new project offering in-car communication services prompted the company to pursue an IBM WebSphere SOA-based enterprise standard for middleware running on Linux on System z. The System z solution significantly outperformed a Microsoft / HP alternative.

Benefits:

- IBM solution gives the client a more flexible middleware infrastructure to support innovative new solutions
- Increased responsiveness allows client to bring new offerings to the marketplace sooner rather than later
- Client is in a better position to differentiate itself from competitors

The client cited value, performance, and robustness as the primary reasons for selecting the IBM solution.

Solution components:

- IBM System z
- Linux on System z
- IBM Tivoli Composite Application Manager
- IBM Tivoli OMEGAMON
- IBM WebSphere Process Server
- IBM WebSphere Service Registry and Repository
- IBM WebSphere Modeler

Recent Linux on System z Success Stories

New mainframe customer selected System z to create an advanced IT platform to support explosive Internet growth

China Internet Network Information Center (CNNIC):

CNNIC decided to use IBM System z as the IT foundation of its *Prospective Business Research Platform* after stringent tests and simulations on various industry solutions. CNNIC chose IBM's mainframe technology for its superior integration capability as well as unmatched stability and security required for its IT infrastructure. (1)

Strong business continuity, security, and cost efficiency by deploying Linux and z/OS on IBM System z virtualization technology

Handelsbanken (Sweden):

"Customers entrust us with their hard earned savings so it's paramount that we select one of the industry's most powerful and secure servers - the IBM System z," said Roger Rydberg, technical manager at Handelsbanken. "[System z] allows us to keep up with business climate changes because we can add or eliminate capacity any time based on customer demands. We can even make changes easily without having to stop any services." (2)

Stable, predictable, easy-to-manage environment; license fee cost savings and improved server performance

Salt River Project (USA):

"We were very interested in Linux on the mainframe for the enhanced utilization, flexibility, workload consolidation, and management capabilities offered there," said Kevin Masaryk, Senior Linux/UNIX Administrator. "A key success for us is the ability to consolidate multiple workloads into one instance of Red Hat Enterprise Linux as opposed to running in our traditional environment, where each workload would have to run on a separate server; that's a huge benefit for us." (3)

(1) ibm.com/press/us/en/pressrelease/27768.wss
(2) ibm.com/press/us/en/pressrelease/27282.wss
(3) ibm.com/software/success/cssdb.nsf/cs/JRDS-7S8NEV?OpenDocument&Site=corp&ref=crdb

Discussion Topics

- The environment today – costs, instability, and risk
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- **New System z Enterprise Linux offerings from IBM**
- z/VM Version 6.1 overview

Linux on System z Business Perspective

A Convergence of Market Forces

1. The adoption of virtualization for consolidation is now the industry norm
   - Clients are looking to take the next step – very large scale consolidation
   - But there are challenges:
     - Questions over the scaling of x86 virtualization solutions
     - Speculation over the longevity of some UNIX® offerings
2. Linux on System z has strong acceptance in the market
   - High level of adoption from existing mainframe clients
   - Bringing new clients to the System z platform
   - Underpinning technologies are designed for very large scale computing with the highest Qualities of Services

➔ The convergence of two forces:

- Linux on System z is the ideal platform for clients looking for a large scale consolidation solution

IBM System z Offerings for Large Scale Consolidation

The Enterprise Linux Server

A dedicated IBM System z server for large-scale Linux workloads

System z Solution Edition for Enterprise Linux

Additional capacity on an installed IBM System z server for large Linux workloads

- **Offerings include**
  - System z IFL specialty processors, memory, and I/O connectivity
  - Hardware maintenance for three to five years
  - z/VM virtualization software package with three to five years of subscription and support
- **Supported with new promotions from Linux Development partners Novell and Red Hat**
- **Very competitive pricing**
  - Competitive TCA with scalable Linux and UNIX alternatives
  - Total Cost of Ownership and Qualities of Service that blow away the competition
  - Price / performance improves as you grow your environment
  - Pricing starting at under $2,000 per virtual server for 3 years for large-scale consolidations(1)

More Solution Editions include: SAP, Business Resiliency, Security, WebSphere, Application Development, Chordiant, ACI, Data Warehousing, Cloud

(1) Calculations based on specific solution offering components using IBM and client experiences. Results can vary.

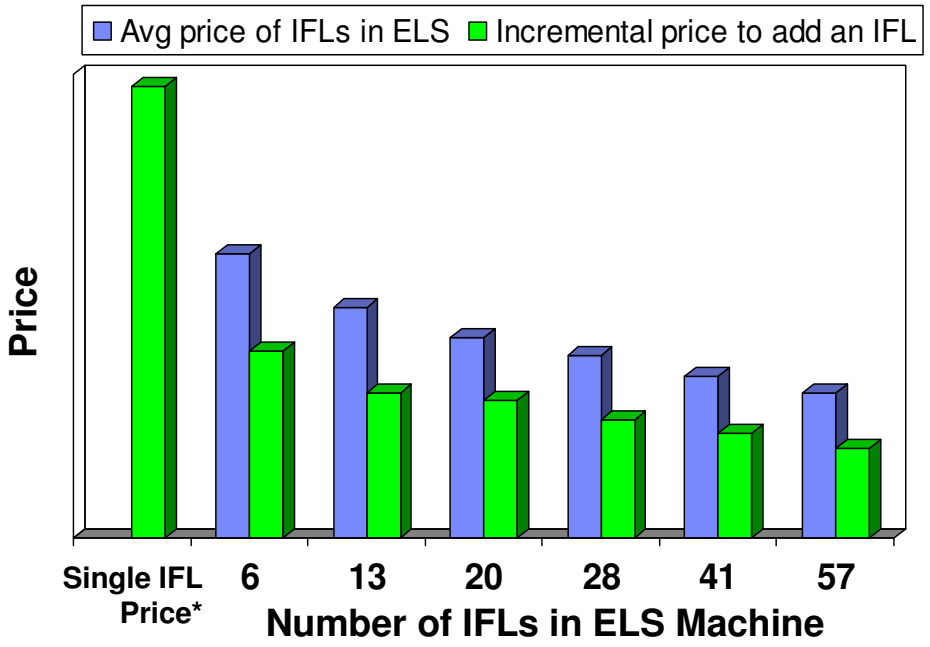
TCA: hardware, virtualization software, memory, maintenance

IBM Enterprise Linux Server

Transforming the Economics for Large Scale Consolidation

Enterprise Linux Server (z10 EC)
Price per IFL

Includes: IFL, 16 GB memory, z/VM,
3 years maintenance and S&S



- **The new Enterprise Linux Server dramatically reduces the marginal cost of scaling for consolidations**
  - The average cost of consolidation declines significantly as the scale of consolidation increases
  - The marginal price of an incremental IFL can be as much as 80% less than the single IFL price
  - You don't have to buy big to save big!

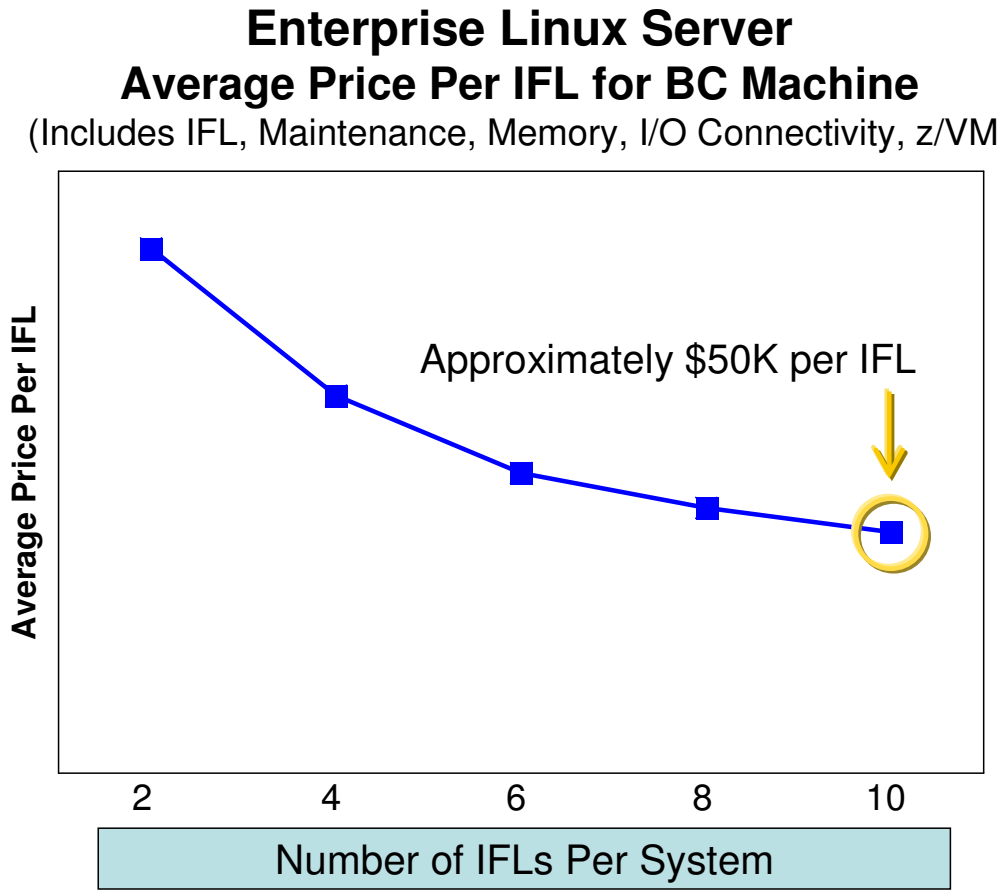
Note: participation and pricing may vary by country.

Unprecedented Economies of Scale for Consolidation on Linux on System z

* Based on July 2009 pricing for IFL ($75K) and memory ($2250/GB) with discounted software and hardware maintenance for 3 years.

IBM Enterprise Linux Server – z10 BC Machine

Enterprise-Class Linux Virtualization in a Smaller Footprint



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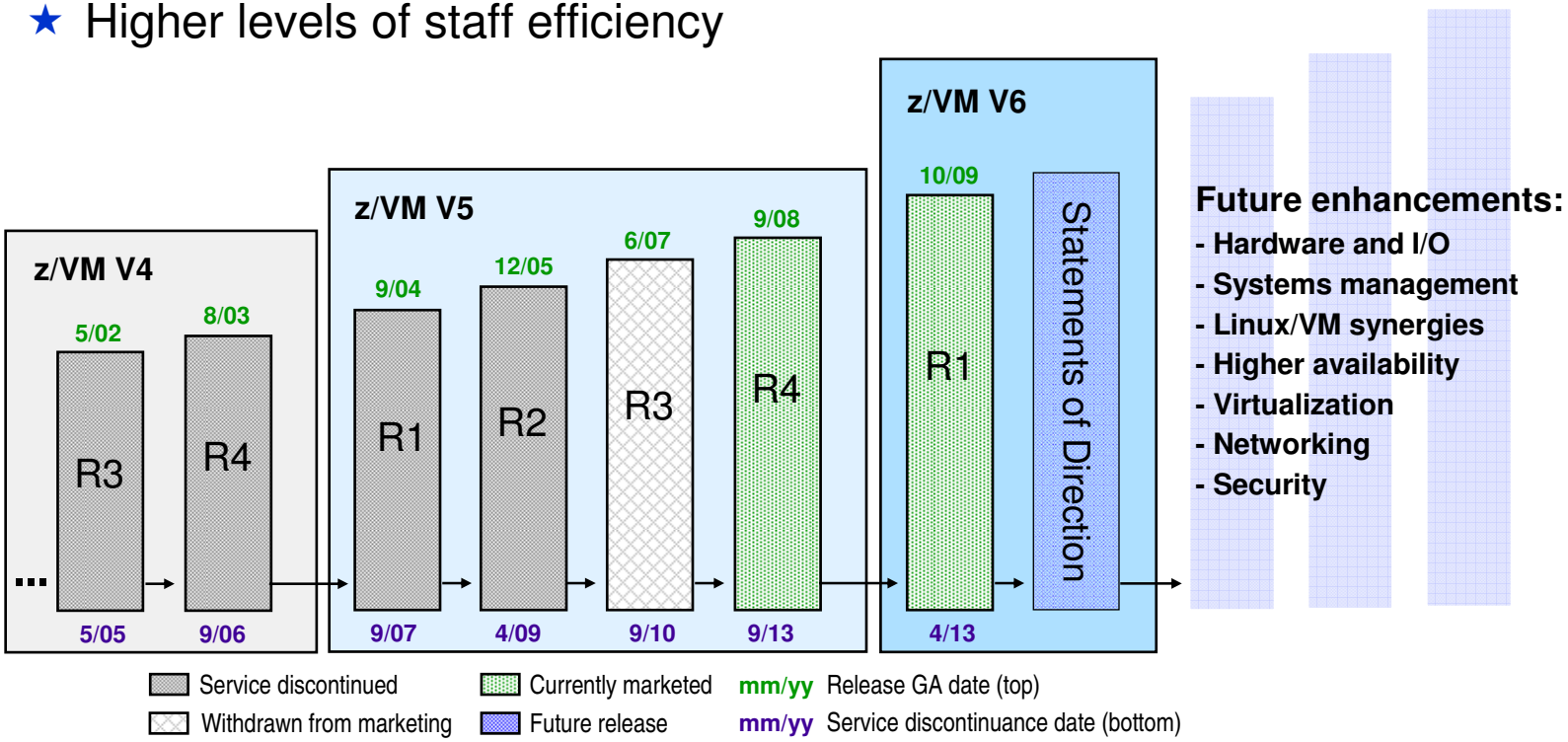
z/VM Release History

Helping clients "do more with less"

- ★ Higher core-to-core consolidation ratios
- ★ Higher levels of resource sharing and utilization
- ★ Higher levels of staff efficiency

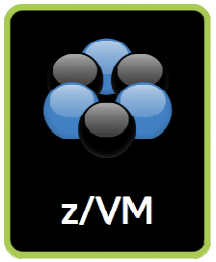


IBM has received certification of z/VM V5.3 from the German Federal Office of Information Security (Bundesamt für Sicherheit in der Informationstechnik) for conformance to the Controlled Access and Labeled Security protection profiles (CAPP and LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4+ (EAL 4+).
While z/VM V5.4 and V6.1 have not been officially evaluated for conformance, they are designed to meet the same standards.

z/VM Version 6.1

The Foundation for System z Virtualization Growth

Announced October 20, 2009; Available October 23, 2009



- **Establishes a new z/VM technology base for IBM System z10 and future systems**
  - z/VM V6.1 only operates on z10 EC, z10 BC, and future generation servers
  - Acknowledges the ***highly attractive economics*** of workload consolidation on z10 servers
  - Allows optimization of z/VM function for greater business value on newer hardware
- **New function and packaging for z/VM V6.1**
  - Exploitation of the System z10 server cache management instructions to help improve the performance of z/VM virtual networking for guest-to-guest streaming workloads
  - Better integration with IBM Systems Director by providing the z/VM Manageability Access Point (zMAP) agent (including the Platform Agent for Linux) with z/VM V6.1 for easier agent installation
  - Support for FICON Express8 – designed to provide faster access to data (link data rate of 8 Gbps)
  - Support for Crypto Express3 – the next generation cryptographic feature for System z (via PTF)
  - Support for IBM System Storage DS8000 Extended Address Volumes (via PTF)
  - Inclusion of several functional enhancements previously delivered in the z/VM V5.4 service stream
- **Product announcement includes statements of direction for future z/VM support**
  - z/VM hypervisor clustering support: "Single System Image"
  - Linux virtual machine mobility support: "Live Guest Relocation"

Integrated Function in z/VM Version 6.1

Previously Delivered in the z/VM V5.4 Service Stream

- *Port isolation security* that provides the ability to restrict guest-to-guest communications within a z/VM Virtual Switch by exploiting OSA-Express2 and OSA-Express3 QDIO data connection isolation with required minimum MCLs
- Additional support for Linux guests using *Dynamic Storage Reconfiguration* (DSR)
- *SSL server* that operates in a CMS environment instead of requiring a Linux distribution
- Providing I/O device information from the I/O definition file (IODF) using Hardware Configuration Definition (*HCD*) for the World-Wide Port Name (WWPN) prediction tool
- Support for the *IBM FlashCopy SE feature* on the IBM DS8000 which provides a space-efficient snapshot capability that can greatly reduce the storage capacity needed for point-in-time copies
- Multiple *file dump* support
- Support for the IBM System Storage Enterprise *3592 Tape* Controller Model C06 and 3592 Tape Drive Model E06, including DFSMS/VM
- Display *encryption and solid-state* indicators for IBM DS8000
- DFSMS/RMS support for disk-only configuration of IBM Virtualization Engine *TS7720* (via z/VSE)

Additional Function Delivered in the z/VM V6.1 Service Stream

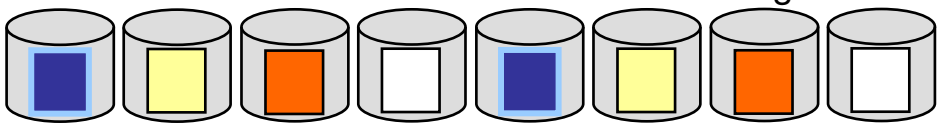
- IBM System z10 *Crypto Express3* support (APAR VM64656)
- IBM DS8000 *Extended Addressing Volumes* – dedicated and full-pack minidisks only (APAR VM64709)
- Dynamic EDEV Path Control support (APAR VM64743)
- IBM XIV disk support for z/VM system use (e.g., paging, spooling) (APAR VM64708)

Next Generation Virtual Storage Meets Linux on System z Virtualization

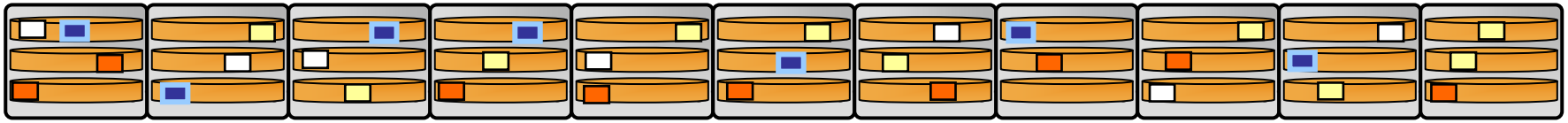
Native z/VM support for XIV (e.g., paging, spooling) is available now via service for z/VM V5.4 and V6.1

- **Benefits of XIV architecture**
  - Intuitive Management Interface
  - Snapshot technology enables granular Guest OS recover
    Quickly mount snapshot to pick and choose with Guest OS to restore
    Snapshot used for backup
- **Benefits of Linux-on-z/VM virtual infrastructure**
  - Maximum consolidation to reduce data center footprint
  - Streamline deployment and configuration processes
  - Automatic and dynamic load balancing

Conventional virtual machine disk storage



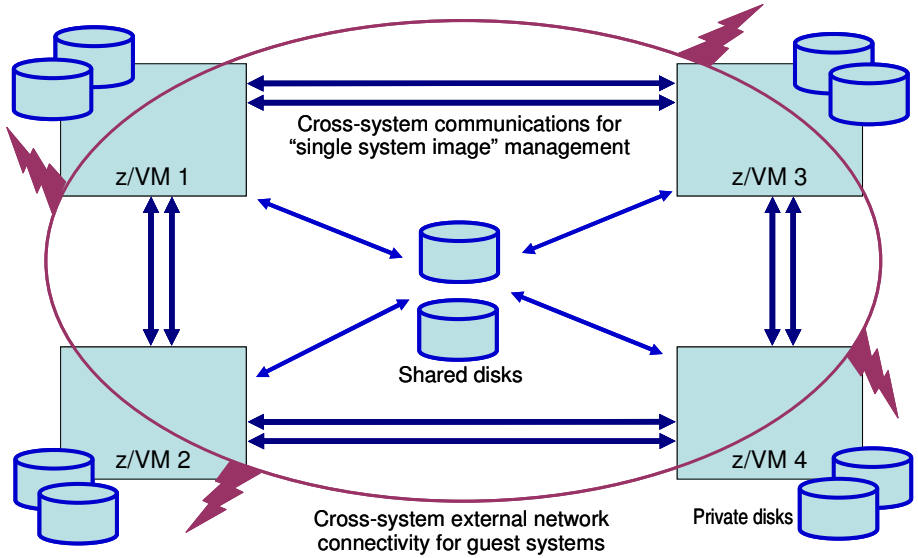
XIV Load Balanced Virtual Machine Storage



z/VM Statements of Direction

Clustered Hypervisor Support and Guest Mobility
Overview of Planned New Function

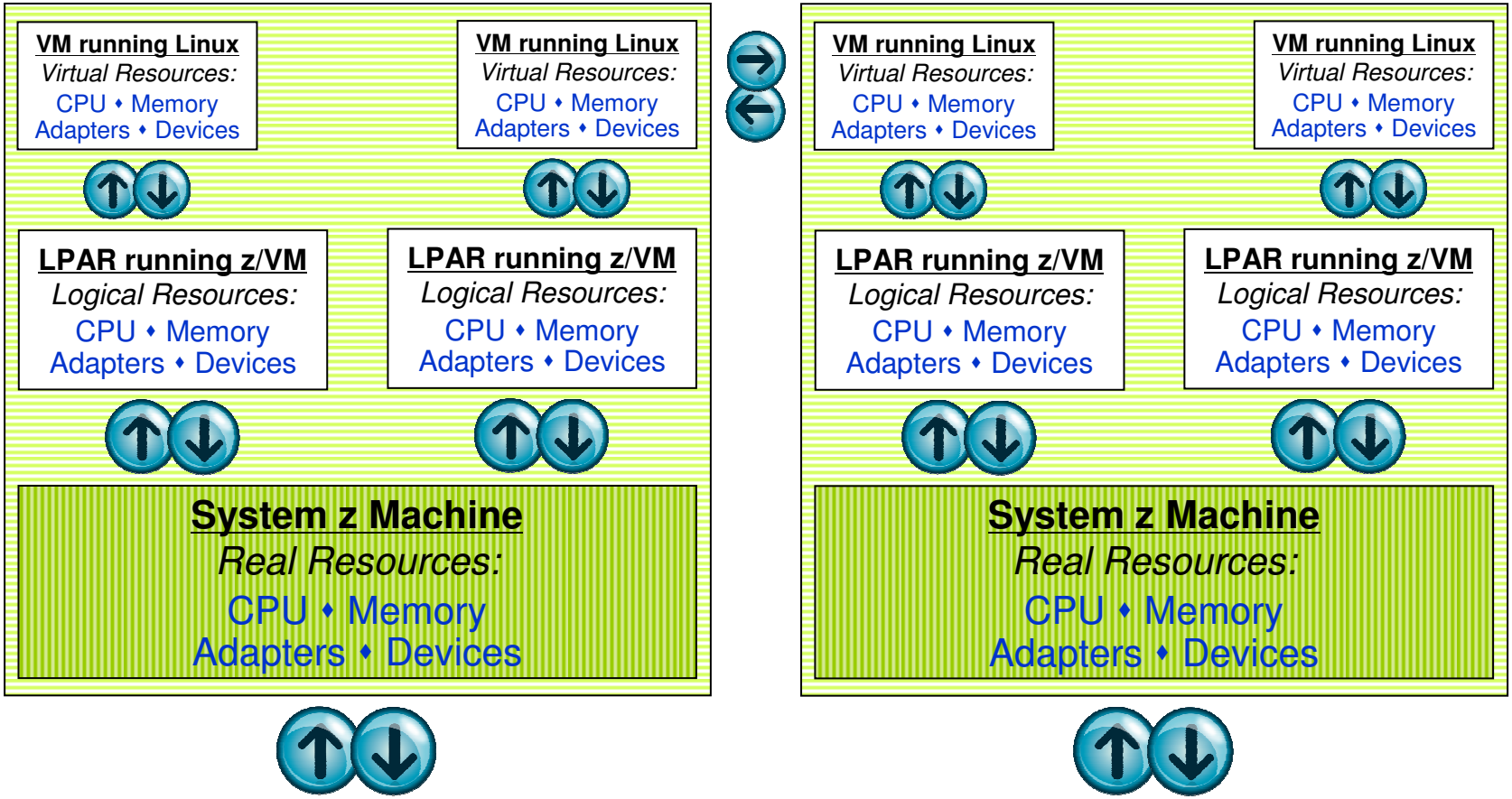
- Clients can cluster up to four z/VM systems in a **Single System Image** (SSI)
- Provides a set of shared resources that can be used by both z/VM and hosted virtual machines, with full awareness of sharing by the clustered z/VM systems – be they on the same and/or different z10 servers
  - Directory, minidisks, spool files, Virtual Switch MAC addresses
- Helps simplify systems management for a multi-z/VM environment
  - Single user directory
  - Cluster management from any system
    - Apply maintenance to all systems in the cluster from one location
    - Issue commands from one system to operate on another
  - Built-in cross-system capabilities
  - Service consolidation: run one copy of service virtual machines for the cluster
  - Resource coordination and protection: network and disks
- Dynamically move Linux guests from one z/VM system to another in the cluster via **Live Guest Relocation**
  - Helps reduce planned outages; enhances workload management
  - With z/VM: dynamically move work to available resources **and** dynamically move resources to work



z/VM and System z Virtualization Leadership

Multi-Level Workload and Resource Management

Dynamically Adding Resources to Work **and** Moving Work to Resources



Concurrent Hardware Upgrade

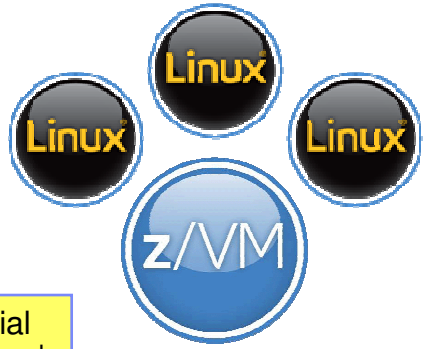
Concurrent Hardware Upgrade

 Notes: a) z/VM shutdown required to remove LPAR memory, b) virtual machine mobility requires Live Guest Relocation support (planned)

IBM Systems Director VMControl Image Manager for Linux on System z Version 2.1

Announced July 21, 2009; Available July 24, 2009

- VMControl Image Manager is a plug-in to IBM Systems Director V6.1
  - Effectively replaces the “z/VM Center” extension of IBM Director V5.20
- Provides support to manage and automate the deployment of virtual images from a centralized location
  - A virtual image consists of an operating system instance and the software stack, such as middleware and applications, running on that operating system
- VMControl Image Manager provides a graphical interface to create and deploy Linux images on z/VM and AIX images on Power systems
  - Definition of these system images is based on the industry-standard Open Virtualization Format (OVF) specifications – facilitates importation of virtual images
  - Deploy an all-in-one solution instead of OS, middleware, and application piece parts
  - Clone already-tested system configurations
  - Propagate virtual image updates to all instances
- IBM Systems Director and VMControl Image Manager help support a Dynamic Infrastructure
  - Helps improve responsiveness to changing business needs
  - May increase operational productivity
  - Can help reduce service and support costs



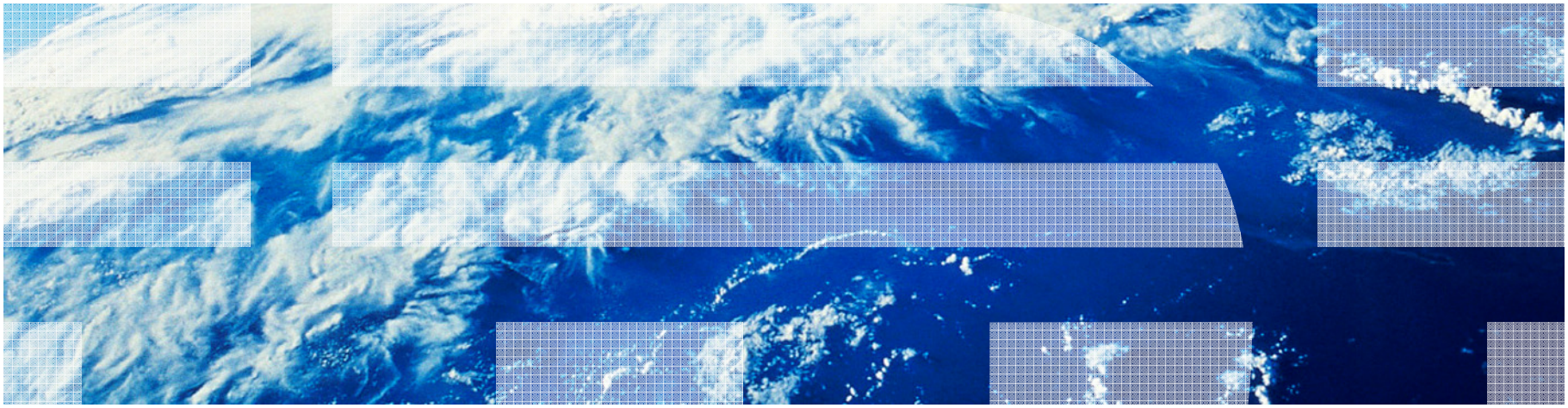
60-day Free Trial
Available via download

When Do you Need More than "Good Enough"?

Business Drivers – Making the Case for Mainframe Virtualization

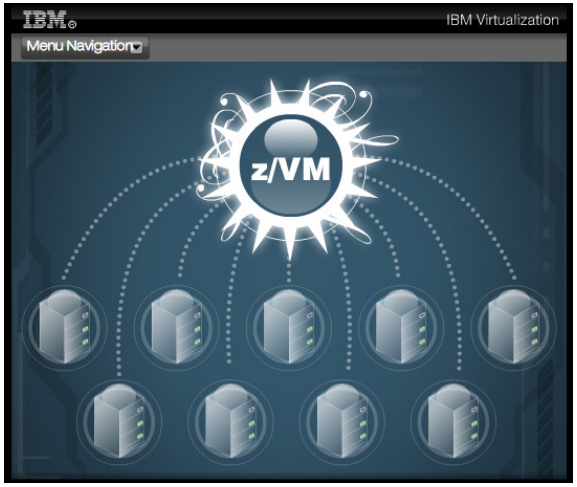
- When business continuance is a high priority
- When you want to spend less on environmental expenses such as floor space and energy
- When business results suffer as a result of IT resources not matching customer demand
- When speed to market affects your business results
- When your IT staff wants to optimize their productivity for deploying and managing virtual servers
- When workload growth and decline is difficult to predict, be it production, development, or test and assurance systems
- When your server applications need fast, flexible and secure access to z/OS data and applications
- When innovation is stifled because your staff cannot experiment or develop new solutions using existing resources

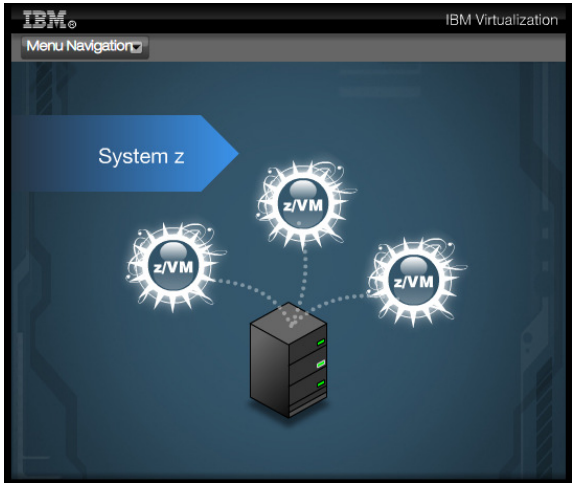
Thank you!

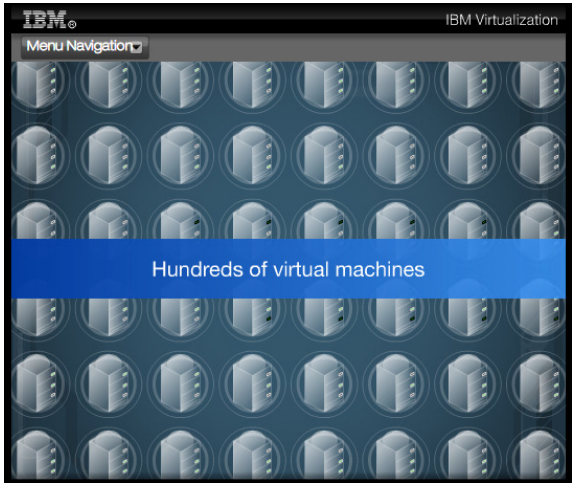


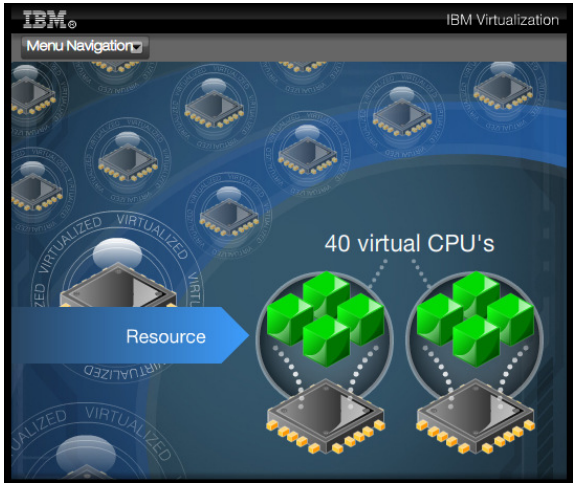
IBM System z Virtualization with z/VM

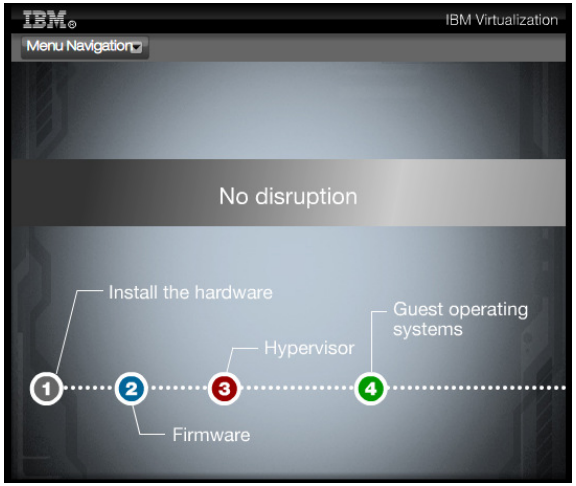
ibm.com/systems/data/flash/dynamicinfrastructure/videos/web_systemz

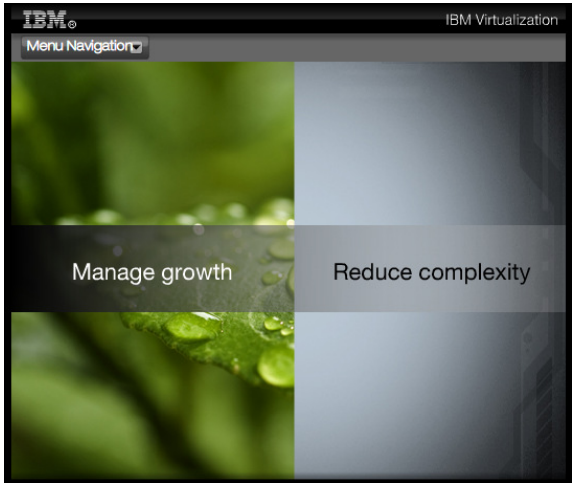












White Papers ibm.com/systems/z/os/linux/library

Title of Paper	Company	Date
Advantages of a Dynamic Infrastructure: A Closer Look at Private Cloud TCO Examination of TCO for a dynamic infrastructure built around private cloud services and comparison to public cloud alternatives as well as conventional one-application-per-distributed server models.	IBM	2009-07
A Benchmark Study on Virtualization Platforms for Private Clouds A technical study that compares different virtualization platforms for implementing a private cloud. How many server workloads can be consolidated onto a given virtualization platform? The number of workloads you can consolidate dictate what cost savings can be achieved with the cloud model.	IBM	2009-07
IBM System z: The Enterprise Server Virtualization Platform? With the current economic headwind, virtualization initiatives are one of the few IT priorities actually getting a fair share of IT spending. The IBM System z platform has some unique characteristics that make it the ideal candidate for today's modern applications.	ESG	2009-01
Consolidation of Lotus Domino and Lotus Notes to Linux on System z This paper provides an overview on the consolidation of Lotus Domino and Lotus Notes to Linux on IBM System z as part of IBM's Enterprise Computing Model transformation.	IBM	2009-04
Application Development Tools and Virtualization Advantages for Linux on System z This paper describes application development tools for Linux on IBM System z and the strengths of the flexible virtualization environment available for Linux on IBM System z.	IBM	2009-04
Extend the Value of the Mainframe for Collaboration The paper discusses how well Lotus and System z are making beautiful technology together! Run the Lotus Domino 8.5 solution on System z and achieve collaboration and e-mail at lower cost. Read how System z can help you consolidate an additional type of workload - Office Systems.	IBM	2009-02
How to Architect z/VM and Linux for WebSphere V7 on System z This paper introduces a methodology for setting up the infrastructure for WebSphere applications to run efficiently on Linux for System z. It concentrates on the memory calculation needed for the Linux systems, and how to allocate that memory to VM and Linux.	IBM	2008-11
How to – Share a WebSphere Application Server V7 installation among many Linux for IBM System z systems This document describes a process that enables you to share one installation of WebSphere Application Server among many Linux guests running under z/VM. This is an update to the previous versions of this document, which covered WebSphere v6.x.	IBM	2009-03

Articles ibm.com/systems/z/os/linux/library/broch_faq.html (1 of 3)

Title of Paper	Magazine / Author	Date
Sanity Check: Downsizing, Rightsizing, and Fantasizing This article shows that the mainframe excels as a hub for a utility computing environment (aka cloud computing) and it can actually deliver on lowering TCO.	Mainframe Executive / Bill Carico	2009-06
KMD's Simple Migration From an HP Cluster to an IBM Mainframe This article describes the significant advantage KMD, Denmark's largest locally owned IT service provider, gained by migrating their homegrown application, called Perspektiv, from an HP 9000 cluster to an onsite IBM mainframe.	Mainframe Executive / Joe Clabby	2009-06
Configuring Linux to Authenticate to the z/VM LDAP Server This article discusses how to configure the LDAP server on z/VM and how to integrate it into a Linux security infrastructure.	z/Journal / Rich Smrcina	2009-06
Going Mobile Read here how the release of version 8.4, IBM's Cognos 8 BI for Linux on System z demonstrates its commitment to address the business and IT needs of System z customers.	IBM Systems Magazine / Caryn Meyers	2009-05/06
The Mainframe Revival: An Interview With CA's Chris O'Malley An interview with Chris O'Malley, executive vice president and general manager for CA's Mainframe Business Unit. A 23-year veteran of the IT industry, he is responsible for defining and executing CA's mainframe strategy. He talks about CA's new mainframe initiatives, and how they will impact mainframe sites and the development of System z's next-generation workforce.	Mainframe Executive / Mary E. Shacklett	2009-05
IT Virtualization: Achieving Data Security Using Linux on System z This article highlights the key advantages of Linux on the System z and shows why combining Linux with IBM System z creates an ideal virtualization platform for distributed and centralized applications with special focus on security.	z/Journal / Alan Beaubien	2009-04
Linux on System z Hits the Mainstream This technical oriented article shows the advantages of Linux on the IBM mainframe out of different perspectives.	Mainframe Executive / Dave Jones & Jack Woehr	2009-05
atsec information security evaluates IBM PR/SM z10 EC/BC at Common Criteria Certification EAL 5 This article is describes the very successful partnership of atsec as evaluation lab, IBM as sponsor, and BSI as certification body in recent PR/SM certifications led to development of the EAL5 evaluation methodology provided by BSI (AIS34), which forms a sound basis for such high-assurance evaluations.	atsec	2009-05

Articles ibm.com/systems/z/os/linux/library/broch_faq.html (2 of 3)

Title of Paper	Magazine / Author	Date
IBM's System z Linux Strategy: A Discussion With Inna Kuznetsova, Director of Cross-IBM Linux Strategy In this article Inna Kuznetsova, director of cross-IBM Linux Strategy, describes IBM's Linux strategy in general, and recent sales and marketing successes on IBM's System z mainframe in particular.	Mainframe Executive / Joe Clabby	2009-04
Still Not Dead: More Evidence of Healthy Growth in Mainframe Workloads This article shows how IBM has been working to keep the mainframe and the enterprise data center current with changes happening in the world. It launched its green computing initiative with the System z at the heart of massive server consolidation designed to reduce both energy and labor costs.	Mainframe Executve / Alan Radding	2009-04
Transzap Moves to System z for Three 9's Uptime Transzap is a SaaS provider that made a strategic decision to move from an open and distributed computing environment to an open computing environment constructed around System z.	Mainframe Executive / Mary E. Shacklett	2009-03
Mainframe Sales Increasing in Southeast Asia, India, and China This article focuses on IBM's mainframe business growth in Asia Pacific and highlights some of the latest customer wins.	Mainframe Executive / Joe Clabby	2009-03
Main Man - Cheaper Than Your Grandpa's Mainframes This article describes Novell's view on how it works, the virtualization with Linux on the Mainframe. If you'll have to select virtualization software to create your virtualization environment, the choice -consolidating workloads onto mainframes - is often overlooked, but now is becoming more popular.	Novell / Bill Claybrook	2009
Consolidating Enterprise Open System Backup on the Mainframe This article describes IT's responsibility to ensure that data is continuously available and can be quickly recovered in case the active copy is damaged or unavailable. That means backing up data belonging to AIX, Linux, UNIX, Windows and, increasingly, data belonging to applications that run under Linux on System z.	z/Journal / Thomas J. Meehan	2009-02
Networking With Linux on System z This article presents a short overview of the layered structures of today's network architectures as well as the networking features provided by the IBM System z mainframe and how they're used under Linux.	z/Journal / Wolfgang Gellerich and Klaus-Dieter Wacker	2009-02
Open Letter to IT: Now Is the Time to Act on Big Savings 'It's time to act on big savings!' as the author say's in this article. He describes clearly why the mainframe is the most cost-efficient platform for new workloads running virtualized Linux images.	Mainframe Executive / Susan Eustis	2009-02

Articles ibm.com/systems/z/os/linux/library/broch_faq.html (3 of 3)

Title of Paper	Magazine / Author	Date
Perfect match: BI solutions Karl Freund, IBM vice president of strategy and marketing for the System z platform, discusses BI on the mainframe.	IBM Systems Magazine / Neil Tardy	2009-01/02
Leading the Pack Great article about IBM's leading position with it's powerful Linux-on-z/VM extreme virtualization/consolidation solution on System z.	IBM Systems Magazine / Reed Mullen	2009-01/02
State of Oklahoma Department of Human Services: Making a Difference for the Business & Consolidating Servers This article shows how Oklahoma Department of Human Services achieved green initiative goals and reached a flexible, scalable and cost-effective environment by migrating from HP-Unix to Linux on System z.	Mainframe Executive / Mary E. Shacklett	2008-12
Changing the Industry's Mindset About the Mainframe: Viewpoints From IBM's System z General Manager Anne Altman This article describes Anne Altman's work, background and future strategy as General Manager of System z and it shows the revenue increase of System z in 2008 with a very high growth of Linux.	Mainframe Executive / Joe Clabby	2008-01
Sanity Check: Scattered Computing This article analysis the problems of a scattered computing environment that many large enterprises have and shows how z/VM and Linux on System z, along with the mainframe's approach to logical partitioning, serve as the industry's guiding light for how to deal with scalability problems.	Mainframe Executive / Bill Carico	2008-11
Virtualized System z Brings Green Computing to Highmark This article highlights the IT green initiative of Highmark by first virtualizing significant numbers of Linux servers on the Systems z.	Mainframe Executive / Mary E. Shacklett	2008-09
Web Application Firewalls and the PCI Standard The article describes the Web Application Firewalls (WAF) and the PCI Standard. The required tooling for both network firewalls and WAF are available in the System z hardware to protect Web applications running in this environment. This is especially important, given the consolidation of distributed architectures and growth of e-commerce on the System z.	z/Journal / Richard Layer & Peter Spera	2008-09
System z Business Partner Success Stories Starts with the Cover Story, 'Solving Customer Problems' with Bob Hoey, VP of WW Mainframe Sales and goes on with three customer stories, Boston University, HSL Technology Inc. and 21st Century Software.	IBM Systems Magazine / Bob Hoey	2008-07/08

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Performance Papers ibm.com/systems/z/os/linux/library/performance.html

Title of Paper	Company	Date
Performance of an Oracle 10g R2 Database Import Environment	IBM	2009-07
z/VM and Xen Virtualization Performance	IBM	2009-01
Tuning WebSphere Application Server Cluster with Caching	IBM	2008-12
WebSphere Application Server 6.1 Base Performance	IBM	2008-09
Performance of environments using DB2 Connect Enterprise Edition	IBM	2008-02
Performance and scalability of a large OLTP workload with DB2 9 for System z on Linux	IBM	2007-12
WebSphere Application Server base performance	IBM	2008-09
z/VM Large Memory - Linux on System z	IBM	2007-12
Performance of large journaling file systems	IBM	2007-11
z/VM virtualization performance	IBM	2007-09
Performance of a webApp.secure Environment	IBM	2007-11
Tivoli WebSEAL – Sizing and Capacity Planning	IBM	2007-09
End-to-End Performance of a WebSphere Environment Including Edge Components	IBM	2007-01