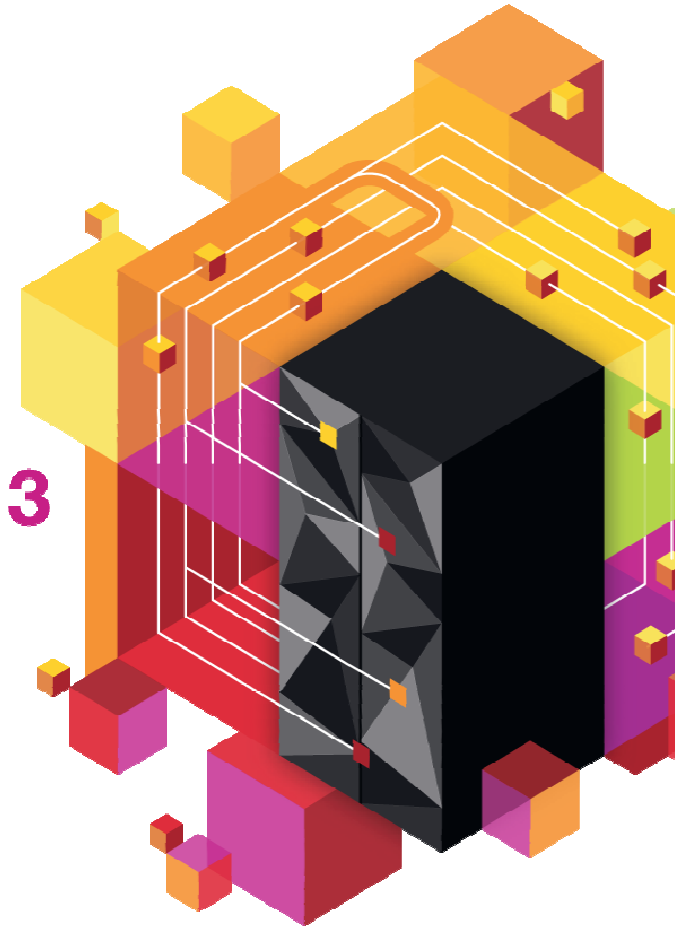
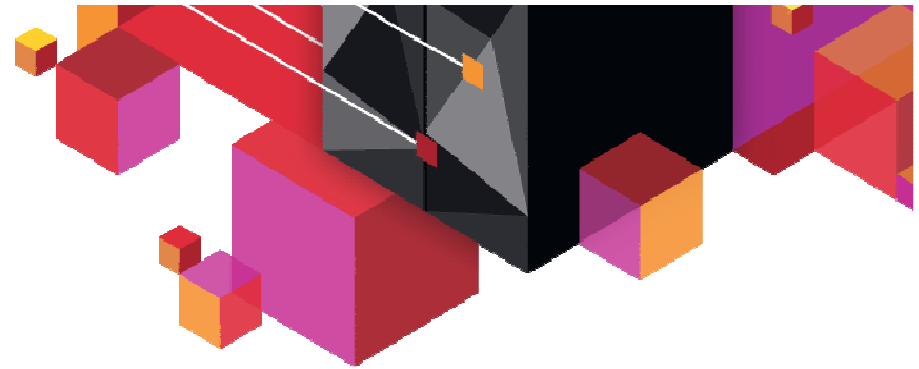


Université du Mainframe 2013

4-5 avril





ELS, Cloud Computing et zEnterprise

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ELS, Cloud Computing et zEnterprise

- Enterprise Linux Server

- Cloud Computing

Université de

4-5 avril

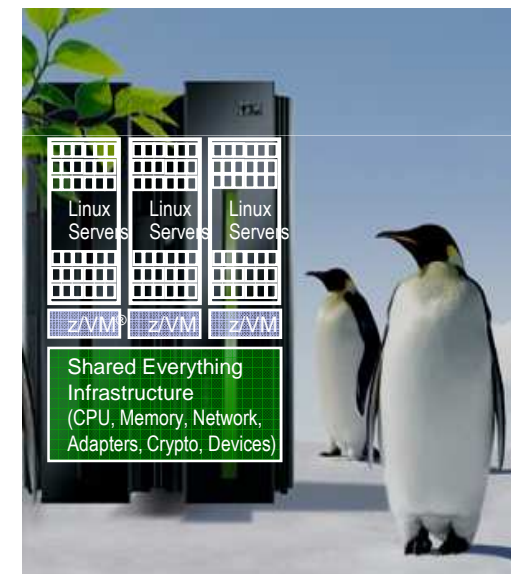




Enterprise Linux Server

Université du Mainframe 2013

4-5 avril



IBM Enterprise Linux Server = IBM ELS

→ a dedicated server for Linux workload :System z with IFL only

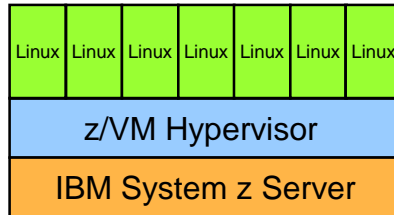
IBM System z® + z/VM® hypervisor + Linux



Mainframe Server



Virtualization

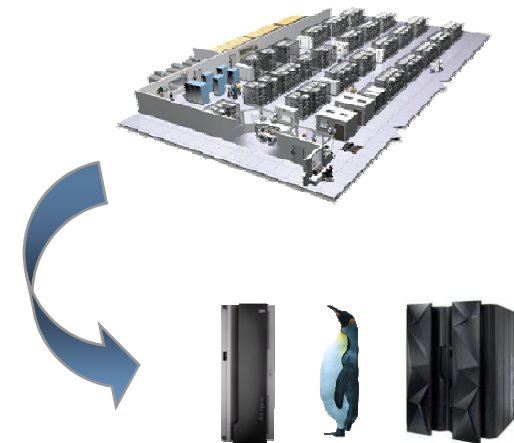


Native OS



A Datacenter in a Box – Not a server farm

- Central point of management
- Increased resource utilization
- Potentially lower cost of operations (less servers, fewer software licenses, fewer resources to manage, less energy, cooling and space)
- Extremely large I/O bandwidth
- Fewer intrusion points (tighter security)
- Fewer points of failure (greater availability)



IBM Enterprise Linux Server = IBM **ELS**

Enterprise Linux Server

= IBM System z® + z/VM® hypervisor + Linux

→ Enterprise with specialty engines : IFL (Integrated Linux Facility)

Solution Edition for ELS offering includes:

- Hardware → several options : z114 or z196 or **zEC12**
 - Processors = IFL (Integrated Facility for Linux) = specialty engines dedicated to Linux workload
 - Memory
 - I/O adapters for disk and networking
 - Three to five years of maintenance
- Software → z/VM
 - z/VM base product and z/VM features
 - Three to five years of subscription and support

Does NOT include:

- Linux distribution

ELS : Added Value

■ Availability, Reliability :

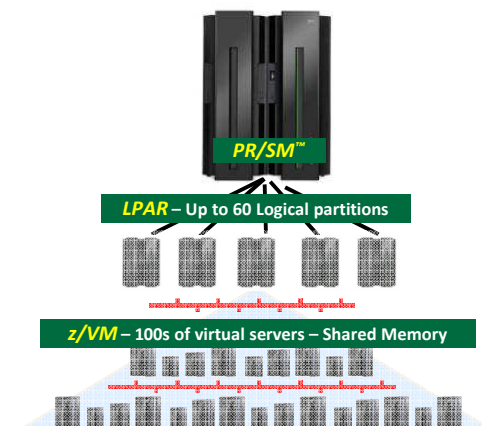
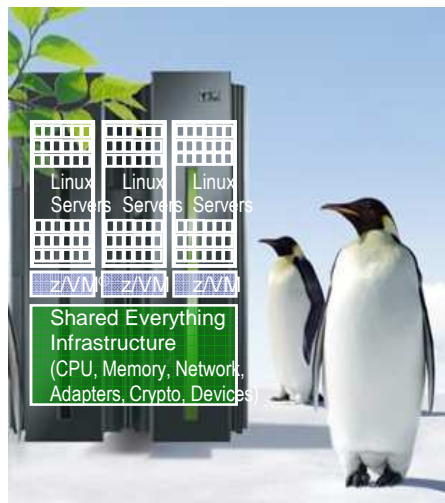
- Robust platform, redundant components, maintenance on the fly
- Mature technology – VM/370 introduced in 1972
- Software Hypervisor integrated in hardware
- Less Points of Failure

■ Security :

- Private network, encryption, EAL5 (zEnterprise), EAL4+ (z/VM)

■ Scalability :

- Deploy new servers and applications faster
- Dynamically expand your system “on demand” : scale-out & scale-up



■ Consolidation efficiency

- Consolidate and manage more servers per core
- Absorb workload spikes more easily
- Simplified environment with easier administration
- Extreme virtualization (network, CPs, Memory, IOs) : highly granular resource sharing (<1%)
- Simplify Network

■ Low environment costs :

- Occupy less floor space, save on energy (Green !), simplify network

■ Software licenses :

- Save Software license fees (e.g. Oracle)

■ Disaster Recovery :

- Simplify and spend less on disaster recovery
➔ ONE box !
- Easier to have same technology
- CBU

IBM ELS - zEnterprise's **Extreme Virtualization**

Built into the architecture not an “add on” feature

Logical Partition

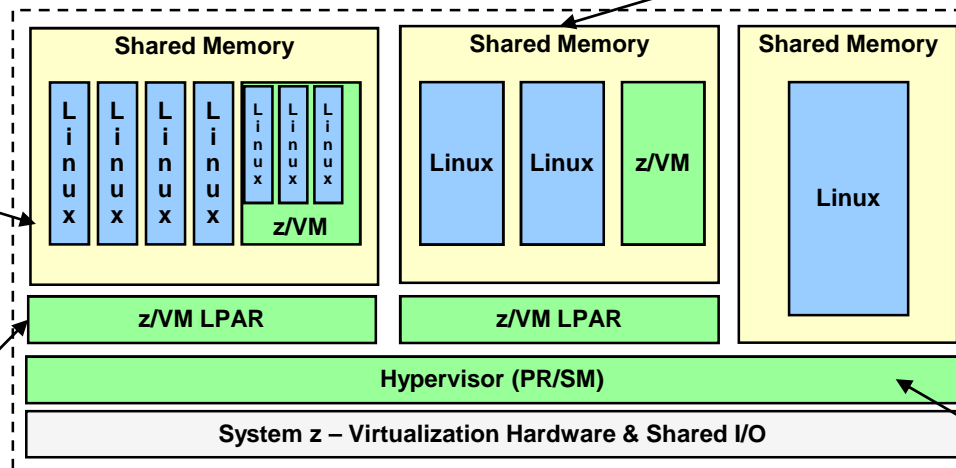
- Also called an **LPAR**, virtual machine, or **VM** or **guest** (z/VM)
- Runs an OS such as **Linux** or **z/VM**

2nd Level Hypervisor : z/VM

- Hypervisor inside an LPAR
- Can provide unique features

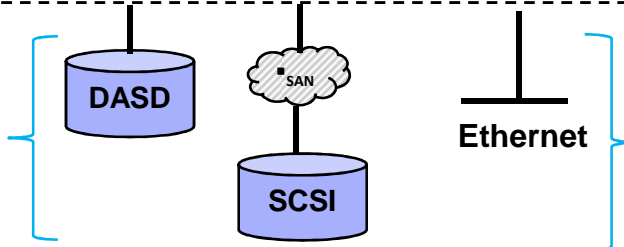
Memory Virtualization

- Dedicated to an **PR/SM** LPAR
- Shared by guests within **z/VM**



I/O Virtualization – Provided by

- **Direct hardware virtualization (z)**
- Ethernet (**OSA**), Disk (**DASD, SCSI**)



Hypervisor

- “Virtualization” firmware
- Divides real computing into LPARs
- Referred to as “**PR/SM**” on System z

Overview

- Two Hypervisors
- Direct CPU and I/O hardware virtualization
- Virtual networks available for both Hypervisors
- Shared or dedicated I/O
- Mixed production & non-production very common

PR/SM

- Introduced in 1988
- 1 to 60 LPARs
- Integrated firmware
- Dedicated memory
- Longer time slice than z/VM
- EAL5+ security rating

z/VM

- 1966 : CP-40
- 1 to 1000s of guests
- Shared memory
- Multiple z/VM LPARs
- z/VM under z/VM
- FICON and FC disk
- EAL 4+ security rating

z/VM Basic Components and Resource Control

- z/VM Control Program (CP)
 - z/VM Hypervisor
 - Schedules guests and virtualizes the hardware

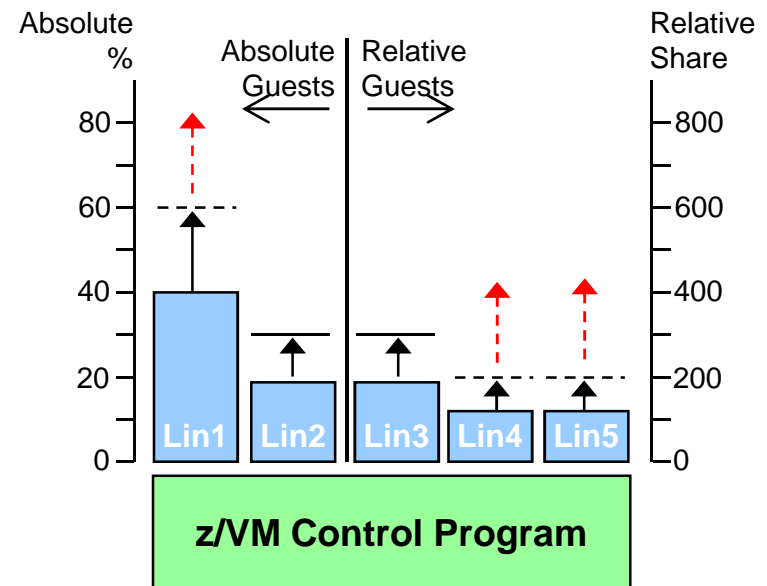
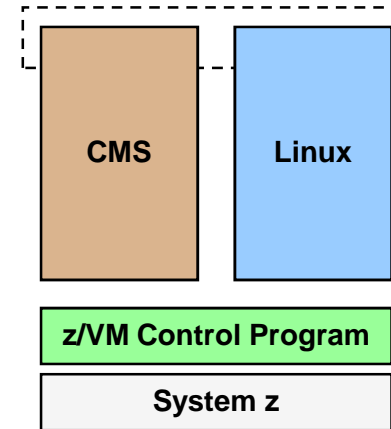
- Conversational Monitor System (CMS)
 - Lightweight interactive OS
 - Similar to a shell on UNIX
 - Editors, commands, scripting languages, etc
 - Used by administrators and some service machines

- Guests
 - Service machines
 - Linux, CMS, z/VM
 - Authorized guests can pass commands to CP

- Granular sharing of resources → Resource allocation
 - Sets priority for CPU, main storage, and paging capacity
 - Use shares or absolute values
 - Absolute guests receive top priority

- Consumption or allocation model

- Settings can be changed on the fly
 - Command or programmed automation
 - Virtual Machine Resource Manager



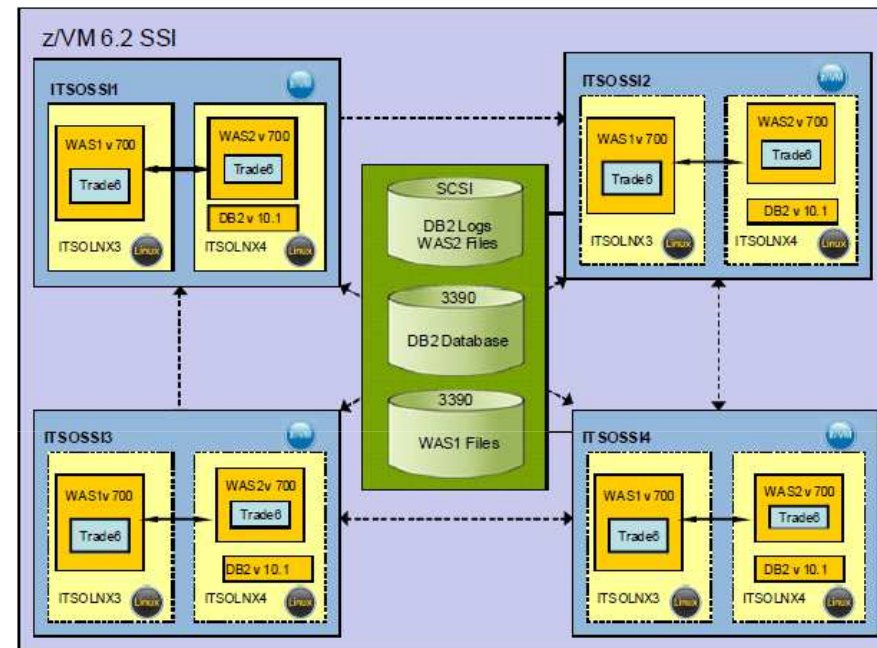
z/VM Single System Image and Live Guest Relocation

□ Single System Image (SSI) - connect up to four z/VM systems as members of a cluster

- Provides a set of shared resources for member systems and their hosted virtual machines
- Cluster members can be run on the same or different ELS servers
- Simplifies systems management of a multi-z/VM environment

□ Live Guest Relocation (LGR) – Dynamically

- move Linux guests from one z/VM member to another
- reduce planned outages; enhance workload management
 - – Non-disruptively move work to available system resources **and non-disruptively move system resources to work**
 - – When combined with Capacity Upgrade on Demand, Capacity Backup on Demand, and Dynamic Memory Upgrade,
 - you will get the best of both worlds



z/VM 6.3 Preview

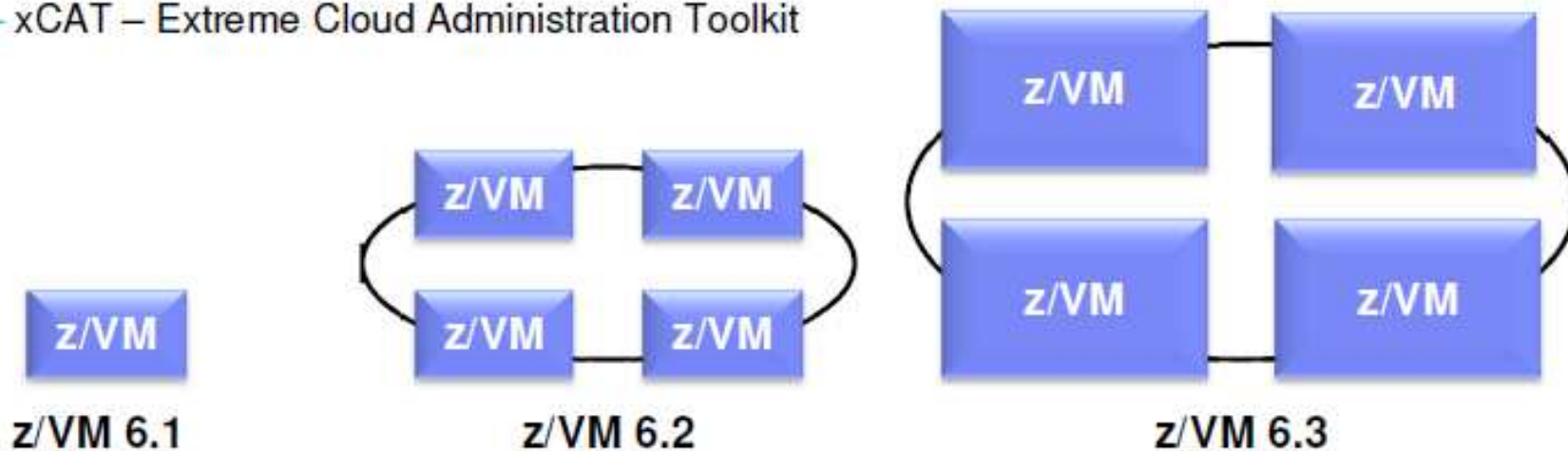
- Major Enhancements for Scalability and Performance

- Support for larger amounts of real memory → Real Memory up to **1TB**
- Increased processor efficiency → HiperDispatch
- Part of the Preview Announcement



- Improved Systems Management Infrastructure

- xCAT – Extreme Cloud Administration Toolkit



IBM Software Products

« IBM offers full support for Red Hat Enterprise Linux and SUSE Linux Enterprise Server across our [entire server portfolio](#). »

- | | | |
|-------------------------------------|------|---|
| ▪ Software products by brand | | ▪ IBM Software Workload Focus |
| ▪ AIM (WebSphere) | ~90 | – Application Infrastructure |
| ▪ Enterprise Content Mgmt. | ~8 | – People Productivity with Portal |
| ▪ Information Management | ~58 | – Connectivity and Integration |
| ▪ InfoSphere | ~29 | – Business Process Management |
| ▪ Lotus® | ~6 | – Content Management |
| ▪ Rational® | ~17 | – Business Intelligence |
| ▪ Tivoli | ~101 | – Cloud Computing |
| ▪ Maximo® | ~26 | – Service and Security Management |
| ▪ Other | ~20 | – Service Management and Process Automation |

~300 IBM Software products available for Linux on System z

More than 1400 New and Upgraded Applications added for z/OS and Linux Added over 90 New ISV Partners in 2012

- **z/OS**
 - Over 1,080 New or Upgraded applications
 - More than 4,400 total z/OS applications
- **Linux**
 - Over 400 New or Upgraded applications
 - More than 3,000 total Linux applications



Examples of ISVs with New or Updated Applications

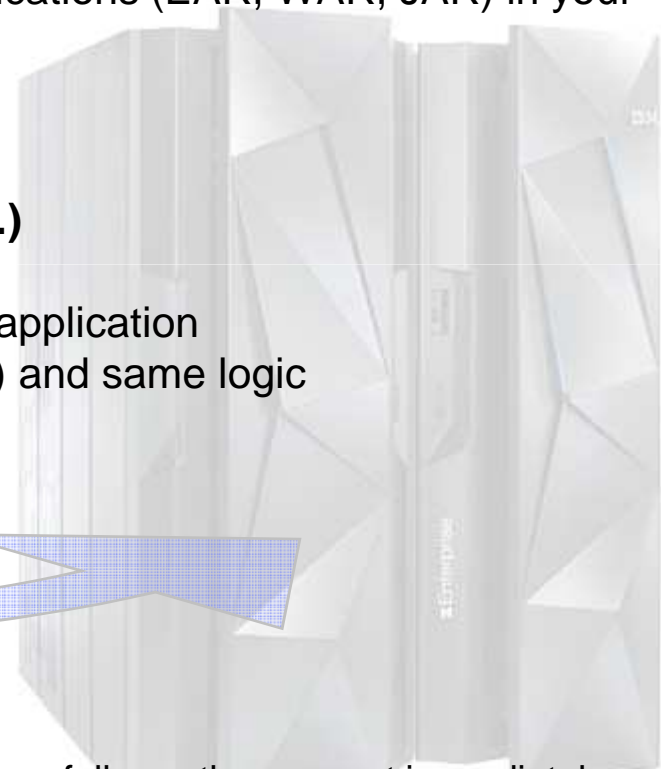
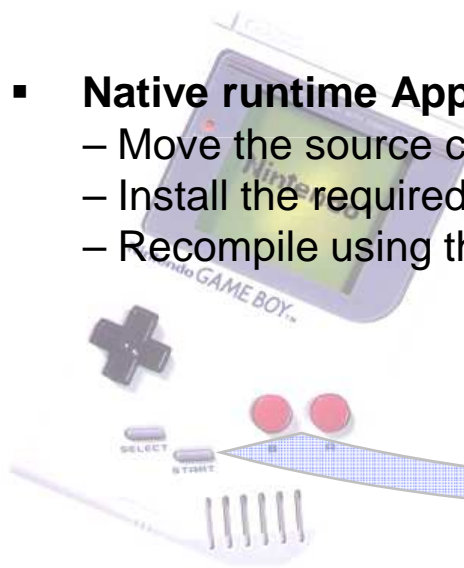
- AddressDoctor GmbH
- Advanced Software Engineering Ltd
- American Business Software, Inc.
- Andrzej Wojcicki Software
- Arsblue, d.o.o.
- Beijing Geong Business Networks Co., Ltd.
- Brinqa, LLC
- CCA Software Pty Ltd.
- Centrifly Corporation
- CFXWorks, Inc.
- Code Magus Limited
- CyberSafe Limited
- Dovetailed Technologies, LLC
- Environmental Systems Research Institute, Inc (ESRI)
- FLEXDOC IT
- FusionWare Integration Corp.
- GT Software, Inc.
- InfoPro SDN BHD
- INTERCOPE GmbH
- Linoma Software
- Logica Pvt Ltd
- Loqate, Inc.
- Metalogic Systems Pvt. Ltd
- Mobilistic Innovative Business Solutions Pvt. Ltd
- Montran Corporation
- More-IT-Resources Ltd
- Oracle Corporation
- OSS Nokalva
- Raytheon Trusted Computer Solutions
- Raytheon Trusted Computing Solutions
- Tata Cunsultancy Services
- TeamQuest Corp.
- Unisys Corporation

For complete list see the Global Solutions Directory: ibm.com/partnerworld/gsd

Last 6 months kept in: ibm.com/systems/z/solutions/isv/linuxproduct.html

Porting an application to Linux on System z

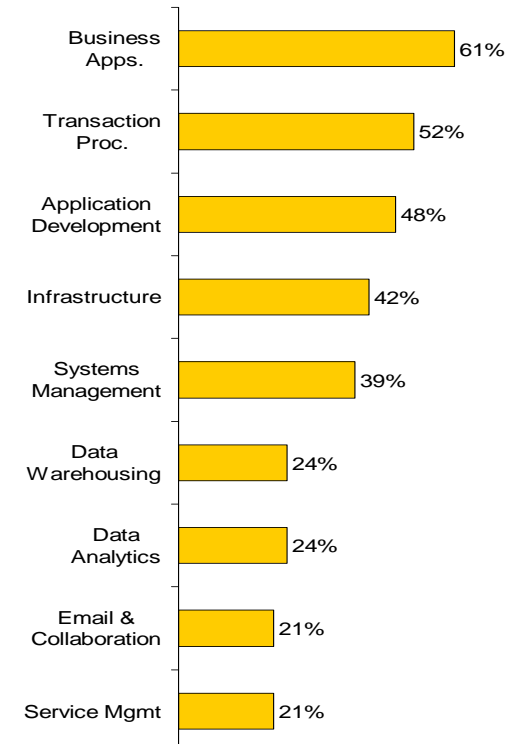
- **Java Applications running in a Web Application Containers (WAS, JBoss, Tomcat):**
 - Nothing to do specifically, deploy your packaged applications (EAR, WAR, JAR) in your new Application Container
- **Native runtime Applications (C/C++, Perl, Python, ...)**
 - Move the source code to Linux on System z
 - Install the required librairies to be compiled with your application
 - Recompile using the same compiler (gcc for example) and same logic



Applications including assembler code should be treated carefully, as they are not immediately portable. x86 assembler must be translated in z/Architecture assembler !

Recommended Workloads for Linux on System z

- **Data services:** Cognos, SPSS, DB2, InfoSphere, Informix®, Oracle Database, Builders WebFOCUS, ...
- **Business applications:** WebSphere Application Server, WebSphere Process Server, WebSphere Commerce, ...
- **Cloud management:** Infrastructure (IaaS), Platform (PaaS), Software (SaaS), Business Process as a Service – Tivoli System Automation Manager, Tivoli Provisioning Manager, Integrated Service Management for System z, Maximo® Asset Management, ...
- **Development & test:** e.g. of WebSphere/Java applications – Rational Asset Manager, Build Forge®, ClearCase®, Quality Manager
- **Email & collaboration:** Lotus Domino®, Lotus Collaboration (Sametime, Connections, Quickr™, Forms) WebSphere Portal, ...
- **Enterprise Content Management:** FileNet® Content Manager, Content Manager, Content Manager On Demand
- **Business Process Management:** Business Process Manager, WebSphere Business Monitor, FileNet Business Process Manager, WebSphere Operational Decision Management, ...
- **Infrastructure services:** WebSphere MQSeries®, WebSphere Message Broker, WebSphere Enterprise Service Bus, DB2 Connect™, FTP, NFS, DNS, Firewall, Proxy, ...

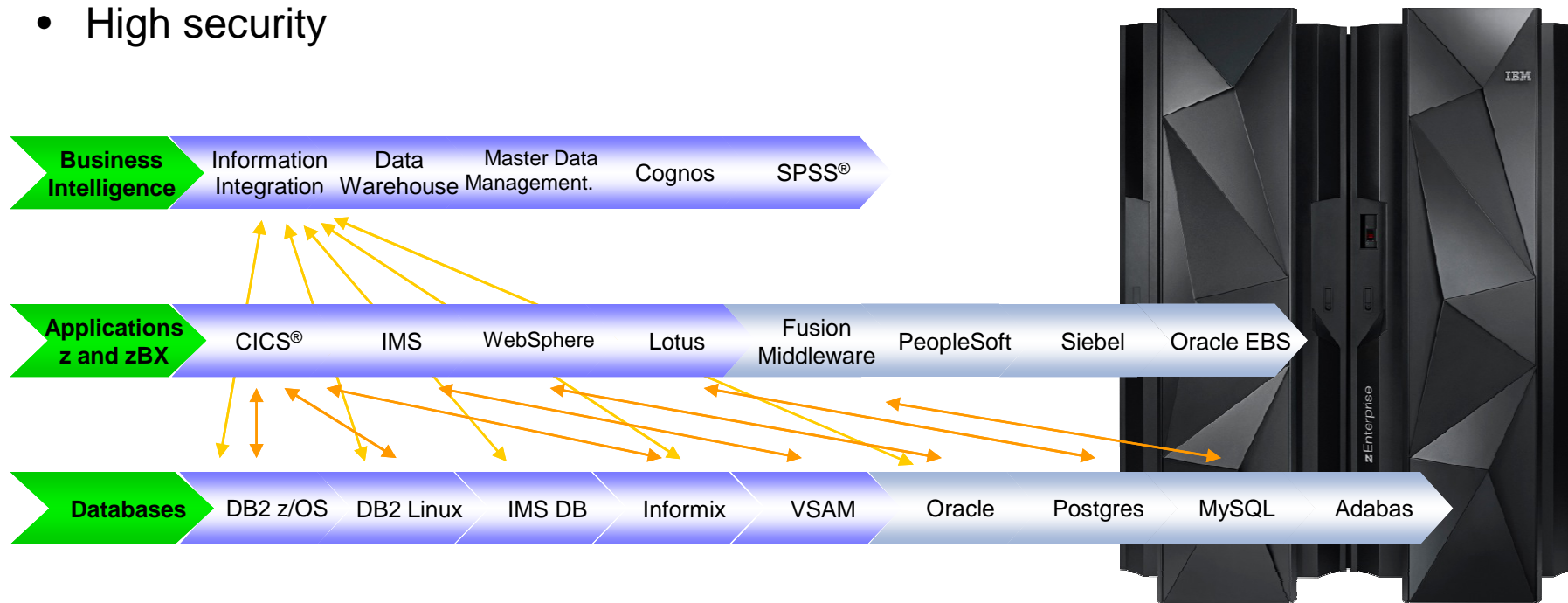


Source: IBM Market Intelligence 2012
Percentage of survey respondents

Example: Leverage Proximity of Data and Applications

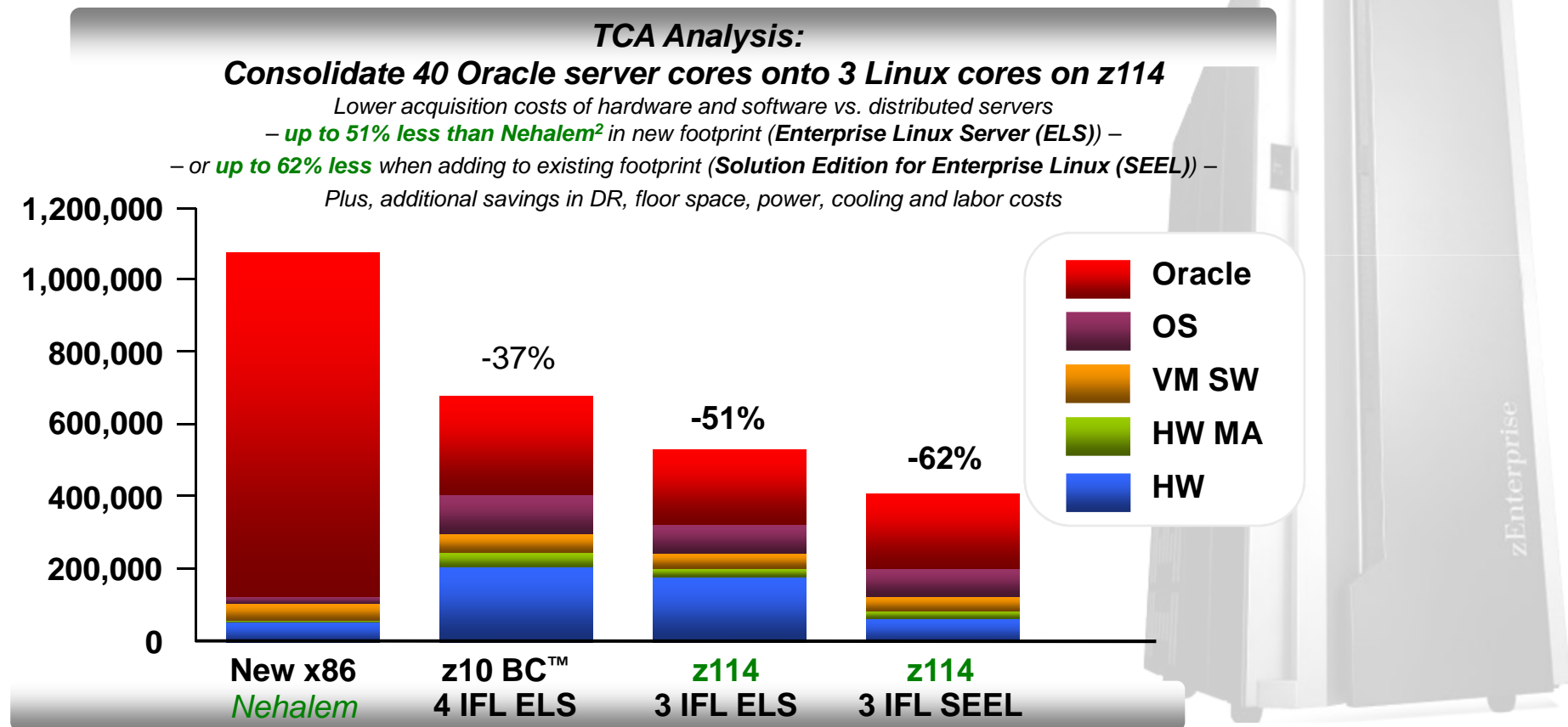
Proximity of existing and new applications / data on the same physical System z server allows to „Get the Best from Your Investments“

- Access from All applications to All data
- Centralized management
- High performance
- High security



Linux on zEnterprise for Consolidation to Reduce Cost

- Consolidate **10 to 80 distributed servers** or more on a single core, or **hundreds** in a single footprint.
- Deliver a virtual Linux server for approximately **\$500 per year** or as little as a **\$1.45 per day per virtual server** (TCA)¹

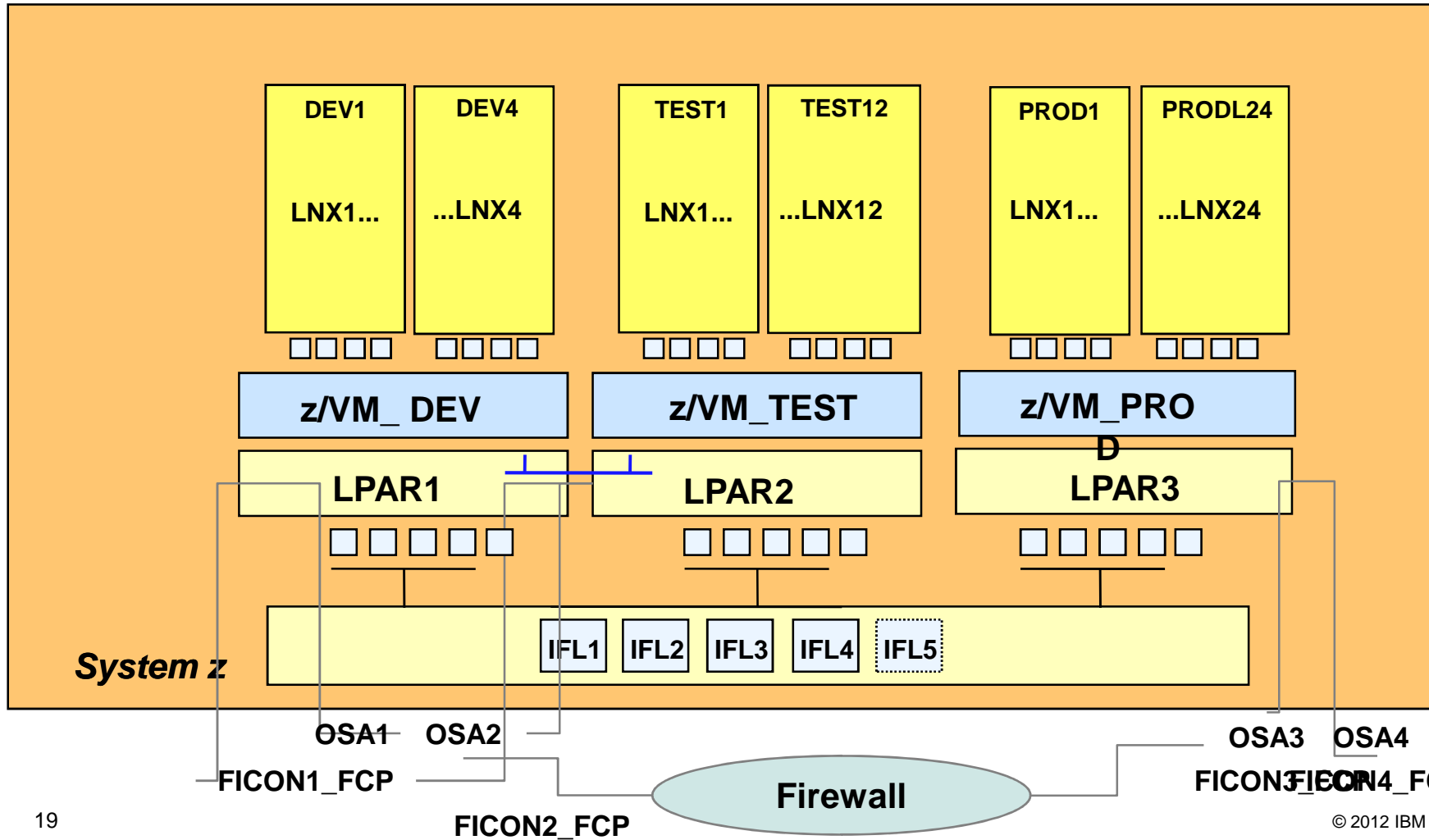


¹ Based on US Enterprise Linux Server pricing. Pricing may vary by country. Model configuration included 10 IFL cores running a mixed workload averaging 31 virtual machines per core with varying degrees of activity. Includes zEnterprise hardware and z/VM virtualization software. Does not include Linux OS or middleware software.
² Distributed server comparison is based on IBM cost modeling of Linux on zEnterprise vs. alternative distributed servers. Given there are multiple factors in this analysis such as utilization rates, application type, local pricing, etc., savings may vary by user.

Target Architecture example

Architecture overview

Hipersocket network



Project assessment

- Existing architecture
- Server inventory

Hardware inventory :

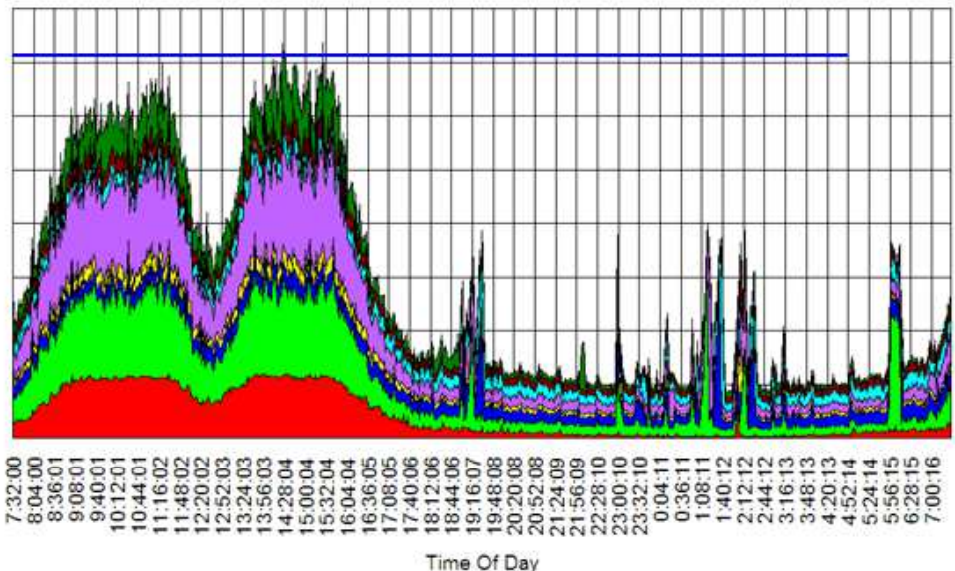
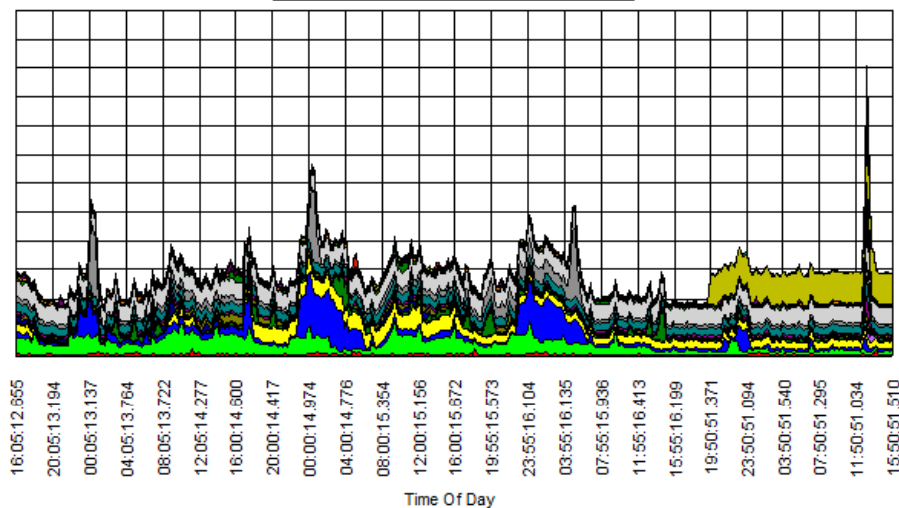
quantity	Server Name	Operating System & Level	Major Middleware	Server Function / Application Description	Application Criticality (H / M / L)	Location	Environment (Prod / Int / Test / Dev / Bkp / ...)	Server Vendor	Server Model	Number of Total CPU (Cores)	#CPU Cores assigned to this VM/LPAR	Processor Architecture	CPU Frequency (MHz)	Peak %CPU	Avg %CPU	Memory size (MB)	Average Used Memory (MB)
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Software inventory :

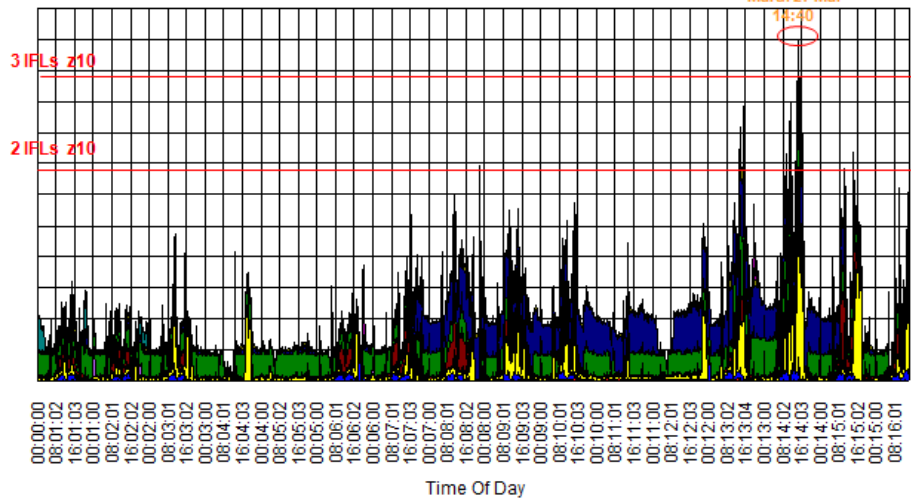
Software Name	Vendor	Version / Level	Features	Comments
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IBM ELS for CONSOLIDATION

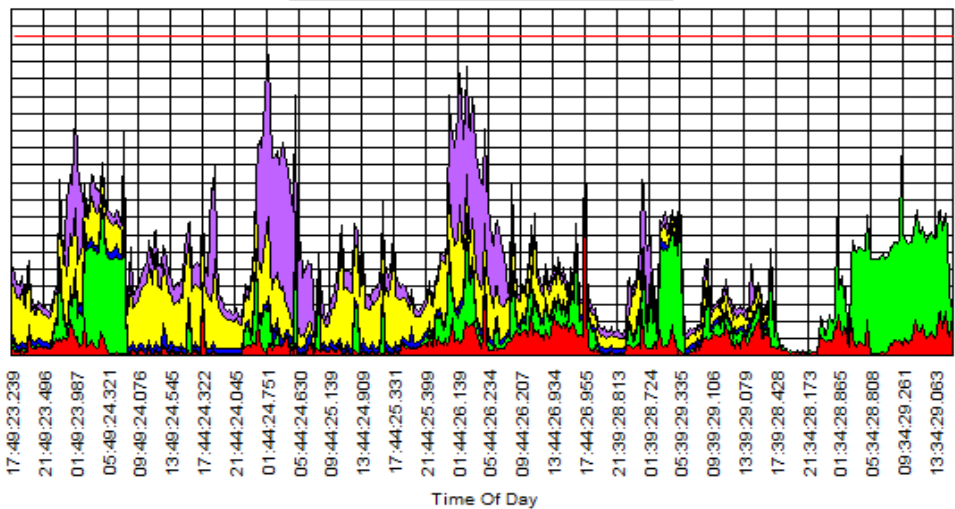
Capacity Consumed by Server
for 24 hours each day in 15 minute intervals



Capacity Consumed by Server
for 24 hours each day in 15 minute intervals



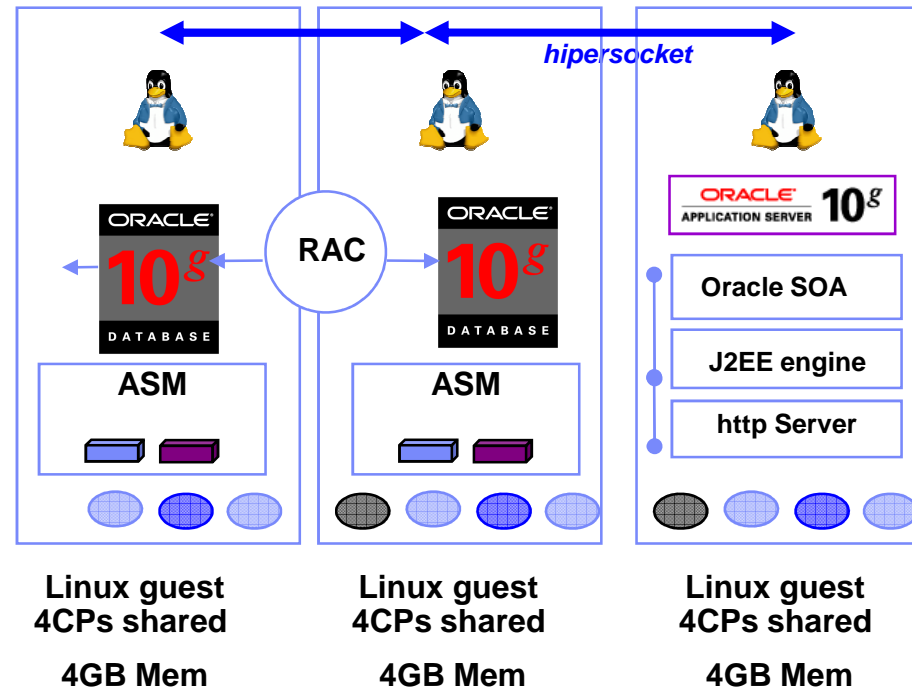
Capacity Consumed by Server
for 24 hours each day in 15 minute intervals



1 IFL z10

Why IBM ELS z for Oracle

- High Availability Requirements
- Open Standards and Linux
- Disaster Recovery Requirements
- Customer Data on Mainframe
- Increased Performance Requirements
- Economics of Linux (IFL) Specialty Engines
- TCO versus Total Cost of Acquisition
- ‘Green’ Value from Mainframe
- zEnterprise servers can virtualize everything with up to 100% utilization rates
- zEnterprise is the only Heterogeneous platform in the industry
- System z has the highest security rating or classification for any commercial server



ORACLE

- Mis à jour importante des niveaux supportés en 2012

	2008			2009				2010				2011				2012			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enterprise Manager Grid Control Agent			10.0.2.4			10.0.2.5													
EBS		v12				v12.1.1				v12.1.2	v12.1.3	12.1.x Oracle DB 10gR2	12.1.x Oracle DB 10gR2 10.2.0.2						12.1.x Oracle DB
Oracle AS				10g 10.1.3.4		10gR2 10.2.0.4	10gR3 10.1.3.5												
Oracle Data Vault	10.2.																		
Oracle DB	10gR2	10gR2				RH 4,5 SLES 9,10	10.2.0.4 PSU2	10.2.0.4	10.2.0.4	10.2.0.4	10.2.0.4	10.2.0.5 SLES 11	10.2.0.5 PSU3 10.2.0.4 PSU8	10.2.0.5 PSU4	10.2.0.5 PSU5				
Oracle DB	11gR2											v11.2.0.2	11gR2 PSU2	11gR2 PSU3	v11.2.0.2 PSU4 v11.2.0.3	v11.2.0.2 PSU4 v11.2.0.2.5 v11.2.0.3.1			v11.2.0.3.2
Oracle Tuxedo												11gR1							
PeopleSoft	v9														v9 PT 8.51 on				
PeopleSoft People Tools	v8.49					8.50													
Siebel CRM		v8.1													8.0 et 8.1 sur Oracle DB				
SOA												11gR1SP3	11gR1PS4						11gR1PS5
Split Tier Oracle DB		10gR2	10gR2 10.2.0.4 RHS																
WebCenter												11gR1SP3	11gR1PS4						11gR1PS5
WebLogic Portal								10.3.											
WebLogic Server						10.3.1		10.3.2	10.3.3			11gR1PS3	11gR1PS4						11gR1PS5

- Oracle DB : ratio consolidation core IFL/x86 → 1/15 au minimum

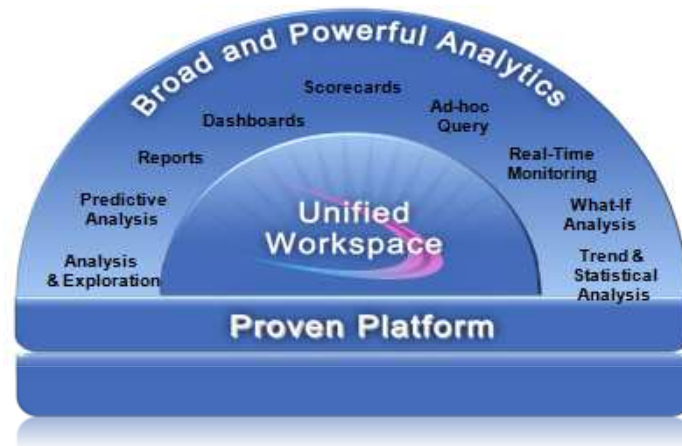
IBM ELS for BIG DATA

→ Added value

- Co-locations of data warehousing, business analytics, transactional data
- Integrated technology stack :
 - Predictive Analytics, BI, DW on, highly scalable and secure System z platform
 - Software stack : Cognos, SPSS, InfoSphere
- Reduced data movement
- Lower latency and near real time data
- I/O capabilities : better throughput than Blades
- Rapid acceleration of complex queries for improved query response times
- End-to-end solution on a single platform :
 - Manage + Integrate + Analyse
 - Run multiple and mixed workloads concurrently
- Fast internal network (Hipersockets)
- Better protection against unauthorized intrusion
- High security (EAL5)
- Better availability

IBM Cognos Business Intelligence 10

IBM Cognos Business Intelligence for Linux on System z



- Full range of BI capabilities
 - Query, reporting, analysis, dashboarding, realtime monitoring
- Delivers information where, when and how it is needed
 - Self-service reporting and analysis
 - Automated delivery of information in context
 - Author once, consume anywhere
- Purpose-built SOA platform
 - Fits client environments and scales easily

IBM SPSS Products available on Linux for System z

- IBM SPSS Statistics:
 - Drive confidence in your results and decisions
- IBM SPSS Modeler:
 - Bring repeatability to ongoing decision making
- Deployment
 - **IBM SPSS Collaboration and Deployment Services**
 - **IBM SPSS Decision Management**

Maximize the impact of analytics in your operation



CUSTOMER evolves to a mature and feature-rich Business Analytics Platform with zEnterprise and Cognos Software



The Client

CUSTOMER is a super expert in payroll, HR, and tax and legal matters, with a 67-year history. CUSTOMER's provides tailor-made solutions to many local and international clients, especially with cross border HR challenges, such as various contracts and employment conditions, wage costs and optimization in different countries, and salary splits.

The Challenge

CUSTOMER makes use of Cognos Reporting and Cognos PowerCubes. The Cognos BI 8.3 environment is hosted on MS Windows Server 2008. The Data Warehouse is running on MS SQL Server. Two big challenges must be solved:

- 1. The end user community is going to be extended on the short term. A more scalable and robust business Analytics platform is needed for this growing community*
- 2. The required batch window to load the Cognos PowerCubes on Windows is becoming too small. Improved performance is required for the PowerCube construction, while the response times for accessing the PowerCubes must remain equivalent.*

CUSTOMER wants to make use of new features offered by Cognos BI 10.1.1

Solution

- IBM zEnterprise EC12 (upgrade from zBC10)*
- Two IBM System z Integrated Facility for Linux (IFL) Processors, with 32GB*
- SUSE Linux Enterprise Server 10 Service Pack 2 (SP2)*
- Cognos BI 10.1.1 on SLES 10 SP2*
- The solution was encapsulated in the combination of a Solution Edition for Enterprise Linux (SEEL) and an Enterprise License Agreement (ELA)*





Cloud Computing et zEnterprise

IBM System z Cloud Blueprint

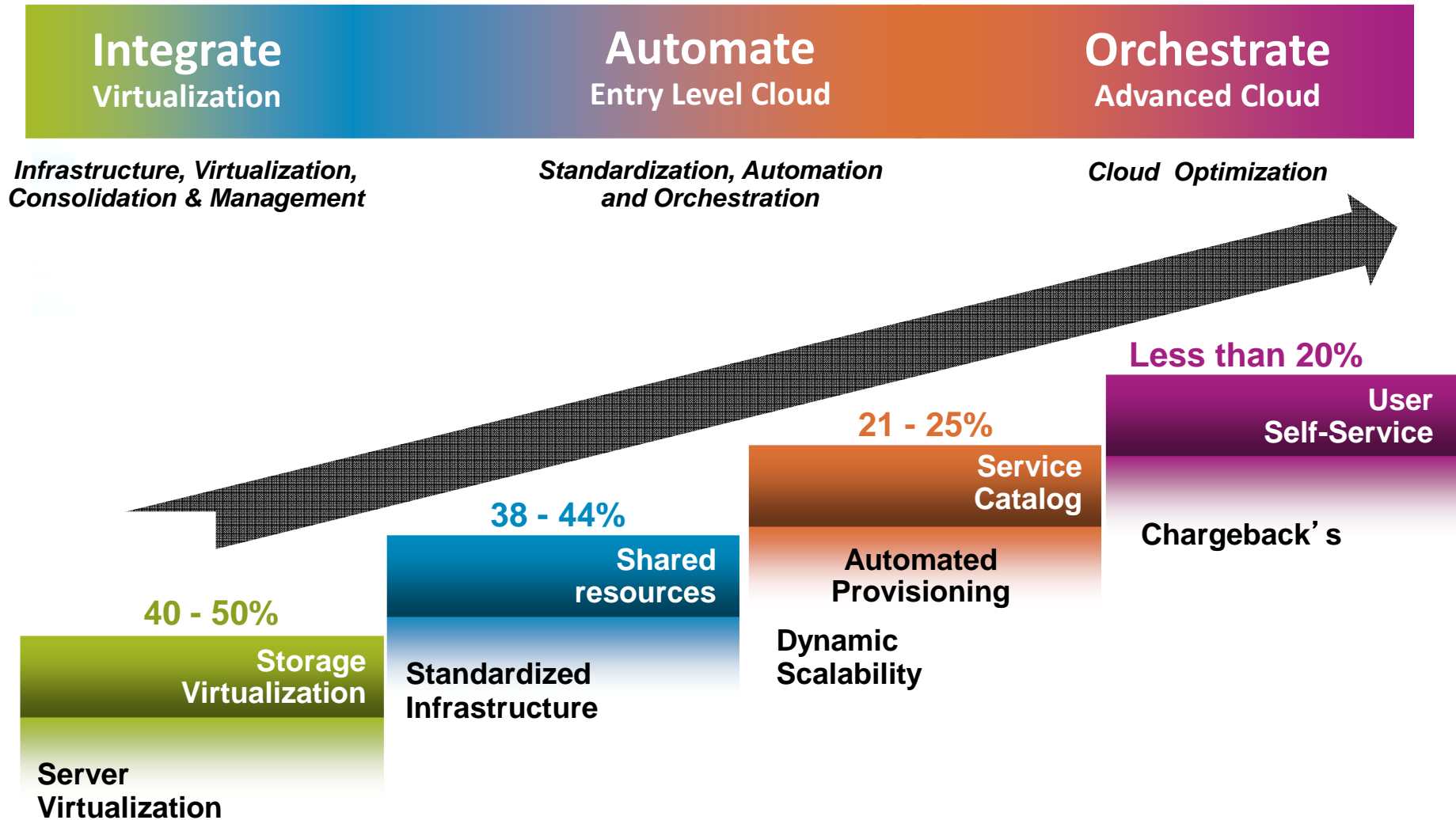


- Rapid deployment of Linux® virtual servers for less than one dollar a day
- Industry leading "gold standard" security for tenant isolation
- Elastic scaling achieved by dynamically adjustable capacity at sustained performance
- Multisystem virtualization simplifies management by clustering shared resources

- Automated provisioning and de-provisioning
- Pool standardized virtualized building blocks
- Plug-and-play capacity across hardware generations
- Capture and catalog virtual images in the data center
- Automated methods for faster delivery of services with higher levels of control

- Integrated virtualization management with IT service delivery processes
- Self-service provisioning
- Automated service lifecycle management including dynamic instantiation of cloud services
- Pay for use
- Optimize IT resources to reinvent business processes

Cloud Implementation Stages



Client Examples

	<p>Nationwide On Your SideSM</p>			
<p>Taking advantage of its System z and deploying an IFL engine running Linux, Honolulu was able to provide useful data to its citizens in real time. The city also leveraged this new platform to create a custom cloud environment for its employees and citizens. The cloud environment reduced database licensing costs by 68 percent and reduced time to deploy applications from one week to a few hours.</p>	<p>“The creation of a private cloud built around the z196 servers supports our business transformation goals by enabling the rapid, seamless deployment of new computing resources to meet emerging requirements, ultimately, the ability to develop new offerings faster and at a lower cost means that we can bring valuable new services to market ahead of our competitors.” <i>Jim Tussing, Chief Technology Officer for Infrastructure and Operations, Nationwide</i></p>	<p>Marist built a virtualized cloud environment to maximize data and service accessibility. They worked closely with IBM to deploy a hybrid, heterogeneous IT environment consisting of zEnterprise 114, z/VM, and Linux operating environments. Leveraging the cloud, Marist delivers a wealth of services to its students, faculty, and administrators — as well as to the local business community, vendors, and the open source community.</p>	<p>Transzap boosts Software-as-a-Service uptime with IBM System z. “We intend to deliver a 99.9% application uptime guarantee to our customer base, thanks to the availability characteristics of System z.” <i>Peter Flanagan, CEO, Transzap, Inc.</i></p>	<p>Consolidating 20+ multi-product, departmental BI deployments to Cognos[®] 8 BI on System z. Deploying private cloud self service to support 200,000+ users across global workforce 56% cost savings per user (grows with volume).</p>

Advantages of Deploying Clouds on System z

Increased Productivity



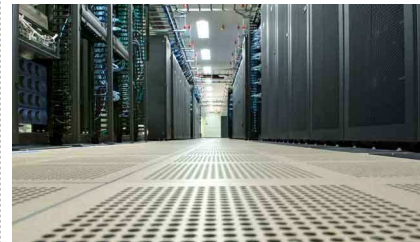
- Advanced workload management that provisions resources on the fly for 90%+ utilization and maximizes ROI
- U.S. Bank reduced provisioning time from 45 days to 20 minutes
- 79% less TCA vs. leading public cloud

Higher Utilization



- Up to 100% CPU utilization
- “Shared everything” architecture
- Manage up to 100,000 virtual servers

More Efficient Data Center



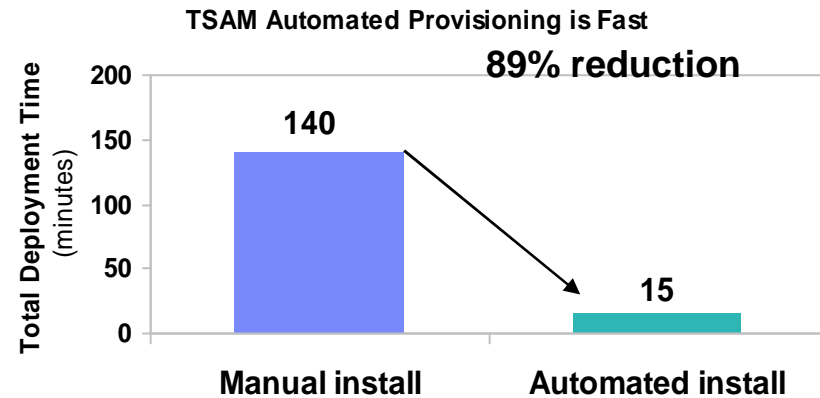
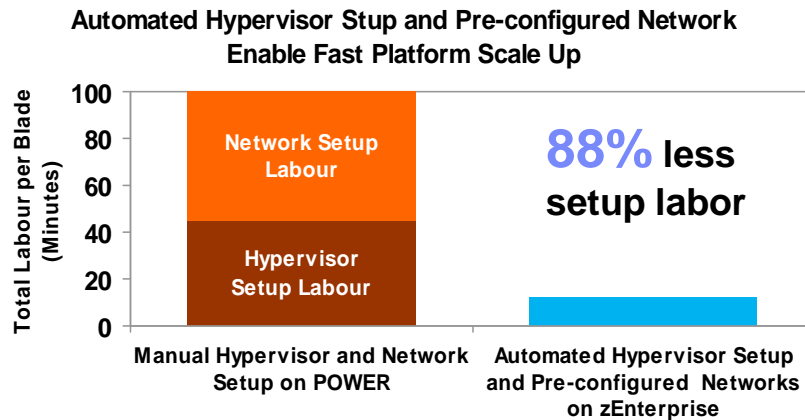
- Up to 80% less energy than existing distributed servers
- Less floor space
- Fewer parts to manage

Greater Reliability, Availability

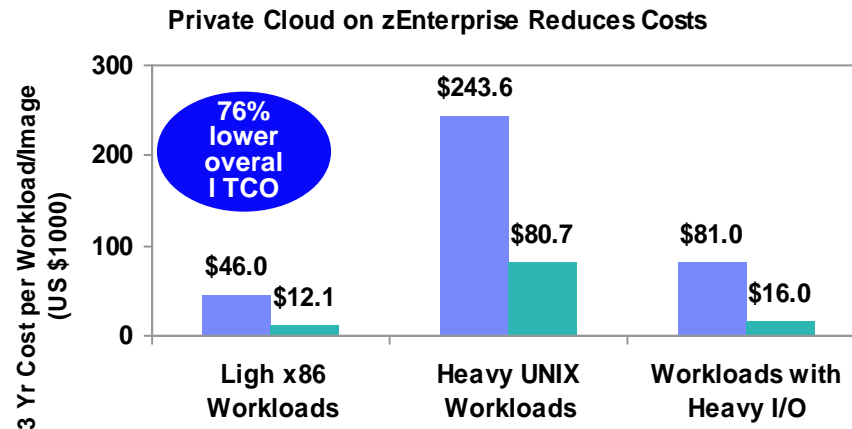


- Built-in hardware redundancy
- Decades of RAS innovation
- Capacity and Backup on Demand
- Ultimate security

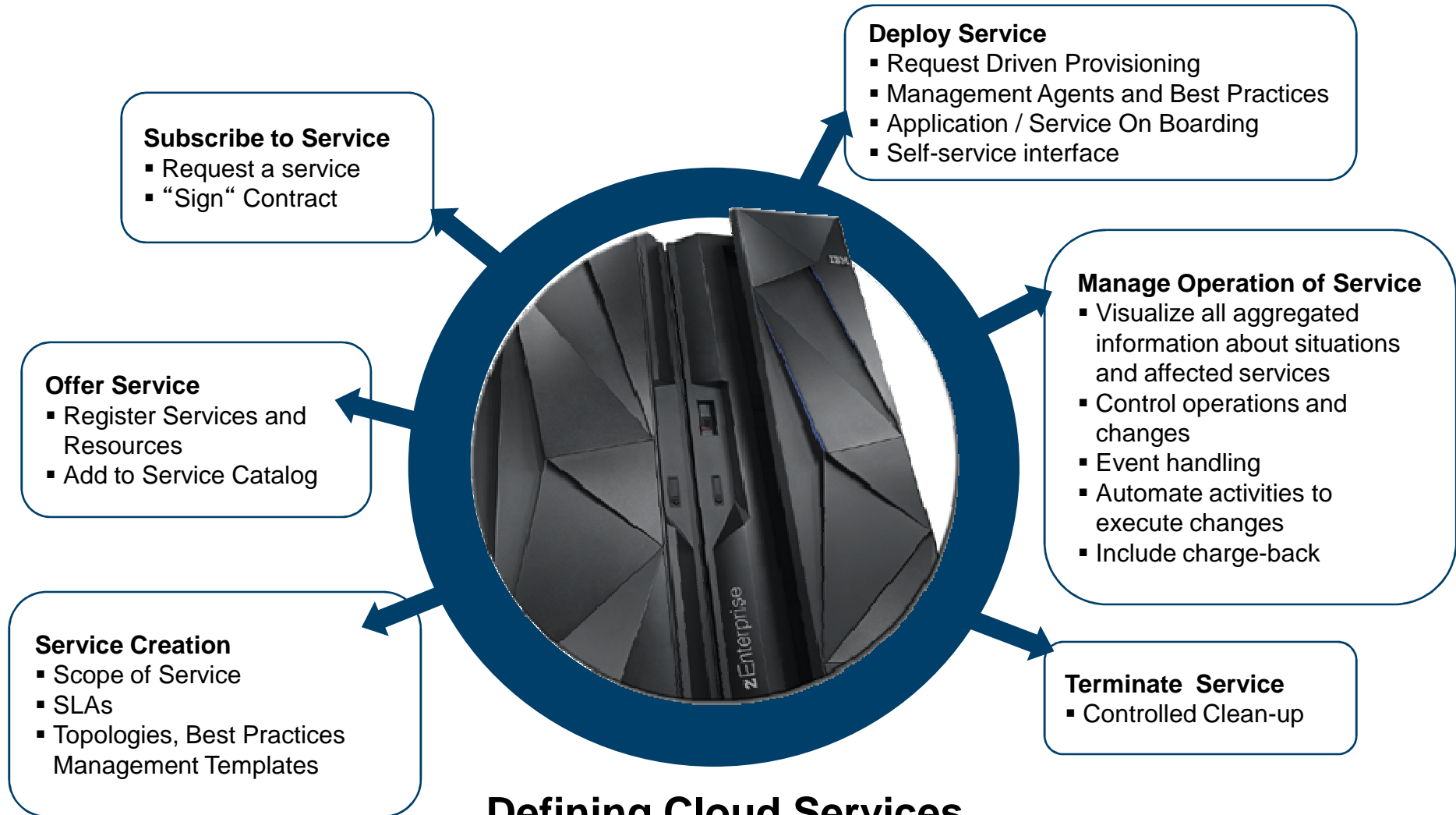
Designed to fit your business the way you run your business



- Automated hypervisor setup and pre-configured networks on IBM zEnterprise® use 88% less setup labor than manual
- Automated provisioning using Tivoli Service Automation Manager running on System z 89% faster than manual provisioning
- TCA 79% less when deploying a private cloud on zEnterprise vs. leading public cloud



Service Lifecycle Management of Cloud Workloads on IBM zEnterprise



Defining Cloud Services Cloud Server Model

What Workloads are Good targets for Cloud on zEnterprise?



- **Database applications**
- **Transaction-processing systems**
- **ERP workloads**
- **Highly regulated services**
- **Agile Operations (Such as multi-architecture cloud management)**
- **Help Desk**
- **Test/Development (Java™, WAS, Portal, Process Server, Web Hosting)**
- **Cross Architecture solutions (Business Intelligence, Fraud, Analytics)**

Why System z for cloud workloads

Key differentiators for clients dependant on systems to provide flexible, secure, 24x7 uptime for improved QoS and drive innovation

Resilient & Secure

1. System z is trusted for its' ability to consistently deliver higher workload availability, and higher security than x86 platforms, especially those running Microsoft® Windows®
2. System z hypervisor and virtualization technologies provide higher security levels with fewer vulnerabilities reported than VMWare on x86 providing EAL5+ security
3. Because IBM owns the server design, manufactures and tests components, and provides warranty and maintenance service for the systems (including processors, memory buffers, I/O hub controllers, service processors, firmware, etc.), IBM system architects have a broad view of how to build a reliable server
4. Predictive Failure Analysis® and dynamic system adaptation, the IBM availability team has helped to create a unique processor that unleashes significant value to the client.
5. Zero reported security vulnerabilities versus x86: Average of 50+ breaches for Windows ¹ and average of 25+ breaches for Linux
6. Superior availability versus competition: 80% more downtime for Windows/x86 ¹ and 35% more downtime for Linux/x86 ¹



Source: [Does Your OS Matter? Selecting a Strategic Operating System](#); Solitaire Interglobal Ltd (All rights reserved); October 2011.

Why System z for cloud workloads

Key differentiators for clients dependant on systems to provide flexible, secure, 24x7 uptime for improved QoS and drive innovation

Optimized

1. Unlike x86 systems that feature components from multiple vendors, IBM can optimize performance across the full software and hardware on System z
2. IBM has specifically optimized Tivoli to leverage the System z software stack
3. More than *5x the throughput and 2x the efficiency over VMware/x86¹*
4. IBM provides a complete system stack optimized across hardware, firmware, hypervisor, operating system, middleware and applications to deliver maximum efficiency
5. Higher utilization of larger shared resource pools adapt better to peak demand
6. System utilization driven at over 80% sustained average



¹Source: The Edison Group, A Comparison of PowerVM and VMware vSphere (4.1 & 5.0) Virtualization Performance https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=stg-web&S_PKG=us-en-po-ar-edison&S_CMP=web-ibm-po--ws-powervm

Why System z for cloud workloads

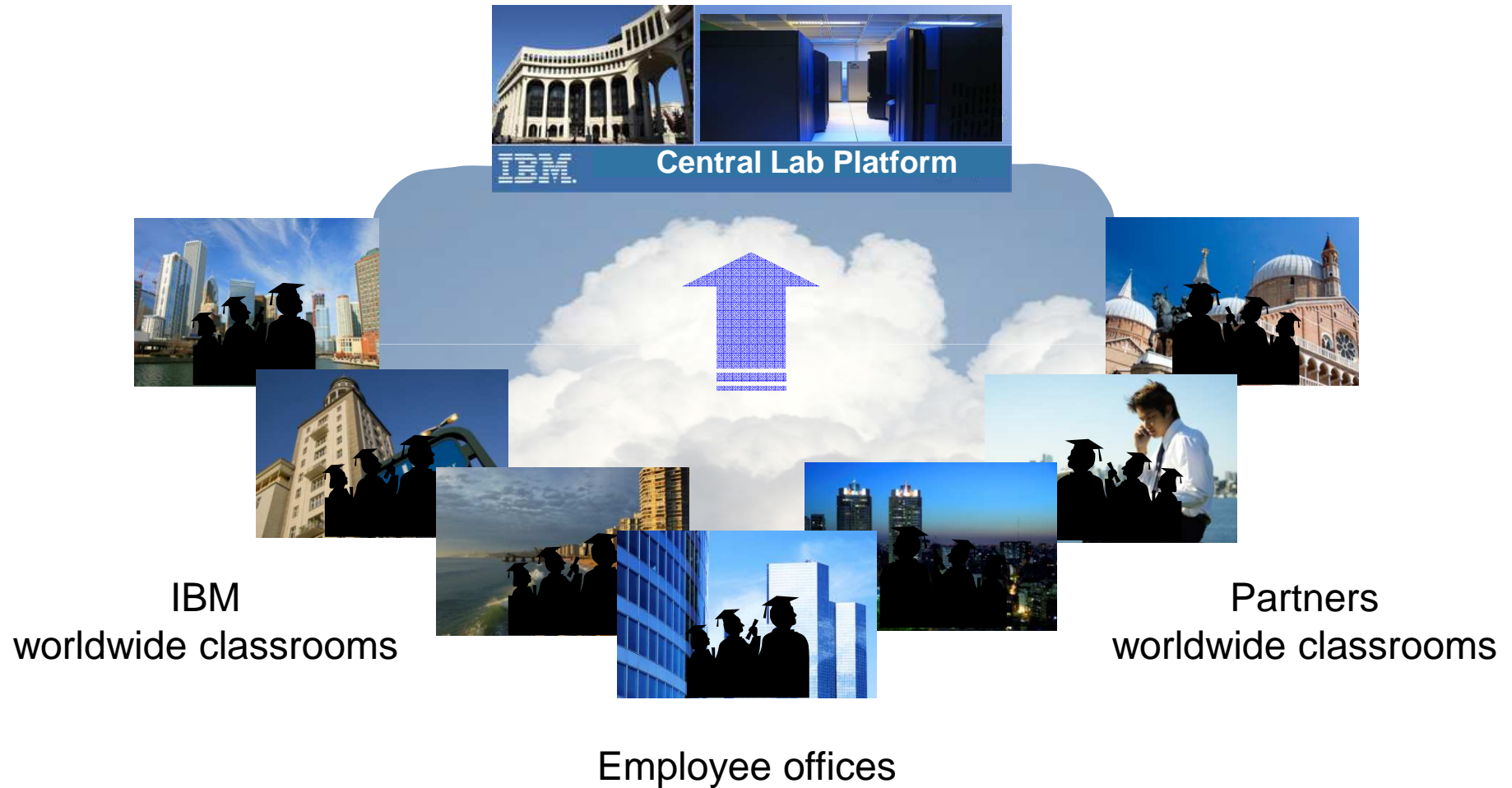
Key differentiators for clients dependant on systems to provide flexible, secure, 24x7 uptime for improved QoS and drive innovation

Scalable

1. In addition to scale out deployments common on x86 servers, System z can scale up and scale within providing near linear performance scalability
2. Unlike x86 systems with VMWare, System z has highly efficient hypervisor technologies with dynamic workload resource balancing that maximize system utilization
3. Autonomous system resources management improves response time, lowers cost and improves performance
4. Greater flexibility to meet peak workload requirements of individual workloads
5. Fewer systems required for equivalent workloads due to higher VM density and leading per-core performance

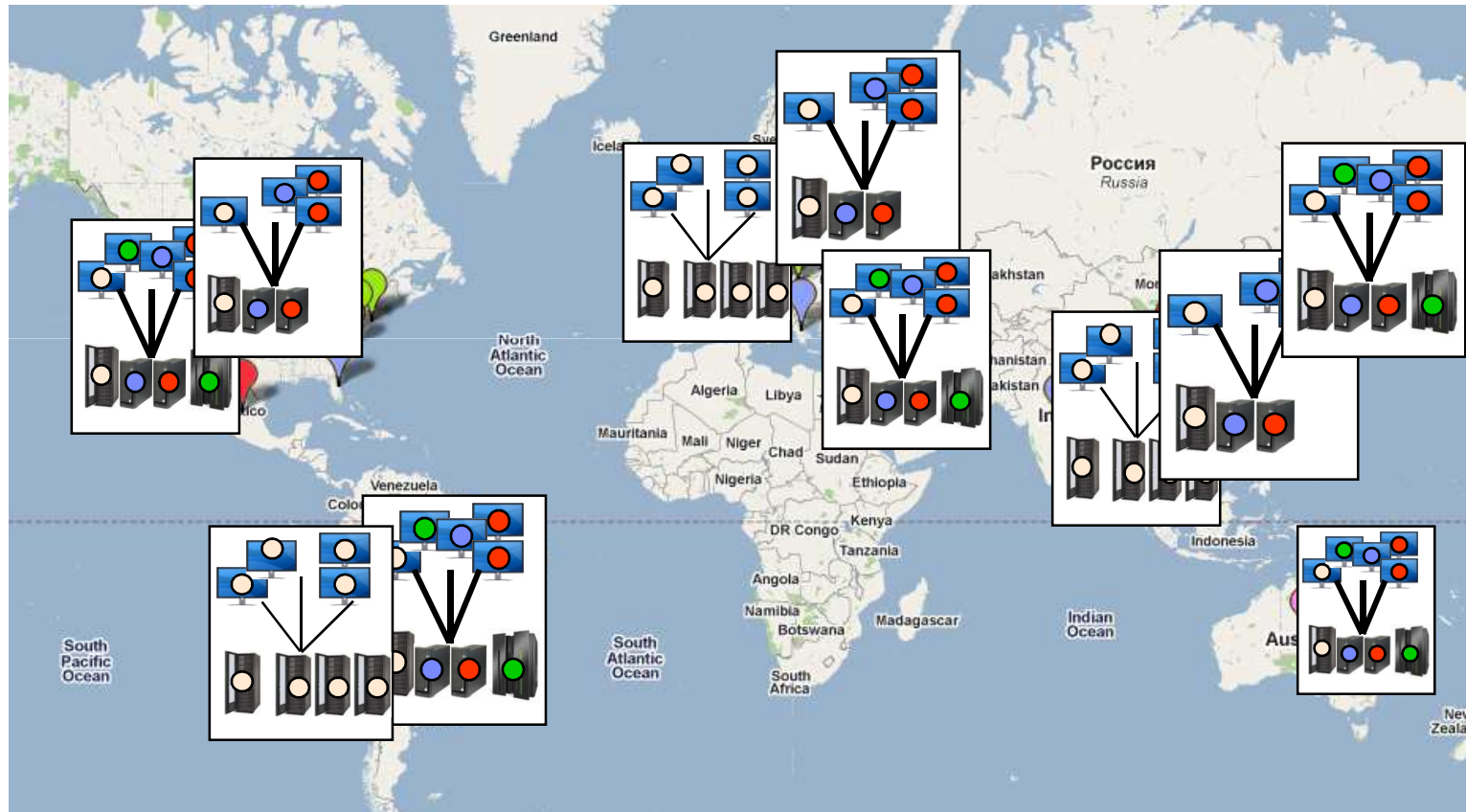


IBM Education cloud: CLP (Central Lab Platform)



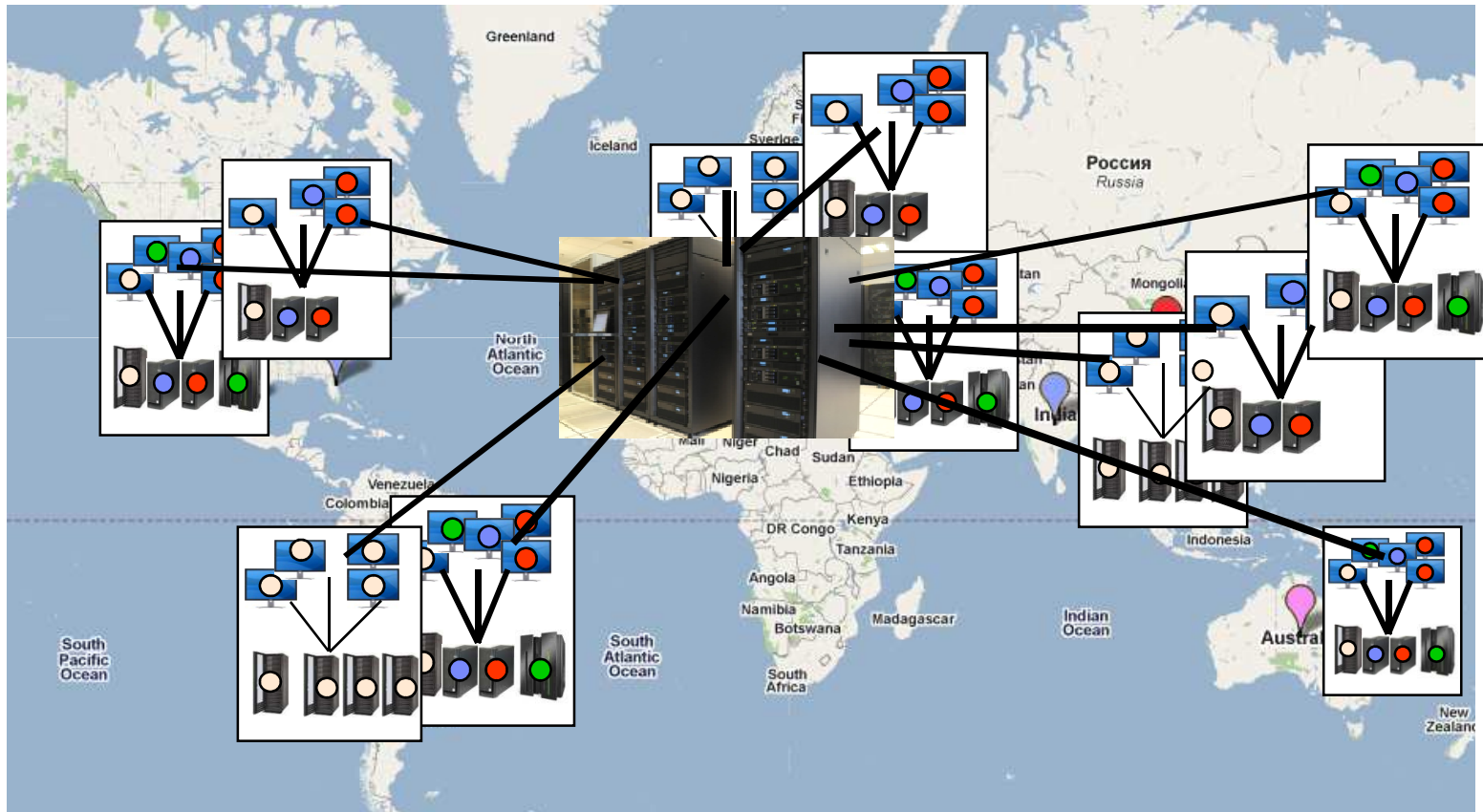
Central Lab Platform – Before

Scattered Infrastructures for hands-on classes: high costs and business transformation roadblocks



Central Lab Platform – After

Centralized consolidated hands-on Cloud Platform



Cloud Software

Cloud Ready offering supports quick and easy provisioning of images and applications today

- Automated provisioning from simple VMs to clustered infrastructure applications
- Automated and integrated server lifecycle management for physical and virtual machines across platforms and hypervisors
- Pre-built automation that can be leveraged by customers existing tools



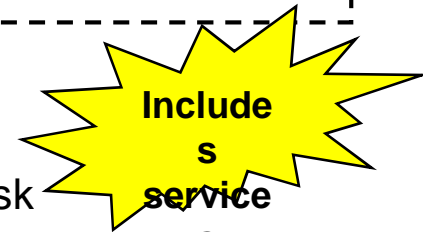
Benefits:

- Client turnaround time reduced per service request from 2 months down to 4 hours
- Build simple to complex VMs consistently and fast in an automated fashion
- Ensures standardized VM rollout at large volumes according to enterprises' best practices - 7 days a week, 24 hours a day, highly available and meeting the highest security standards

Solution Contains:

- Tivoli Provisioning Manager
- Tivoli System Automation for Multiplatform

- Tivoli Storage Manager
- SmartCloud Control Desk
- ITM (OMEGAMON for z/VM & Linux)



A journey through Cloud on z



Cloud Ready

- Basic Cloud Administration
- Multi-tenancy, Isolation
- Basic Single Image Composition, Manipulation
- Approvals / Rejection
- Provisioning
- Monitoring
- Accounting

SmartCloud Orchestrator

- Runbook Automation
- Solution Extensibility and Integration
- Hybrid cloud support
- Service Usage and Accounting
- Built in Cloud Monitoring
- Capacity Planning Analytics

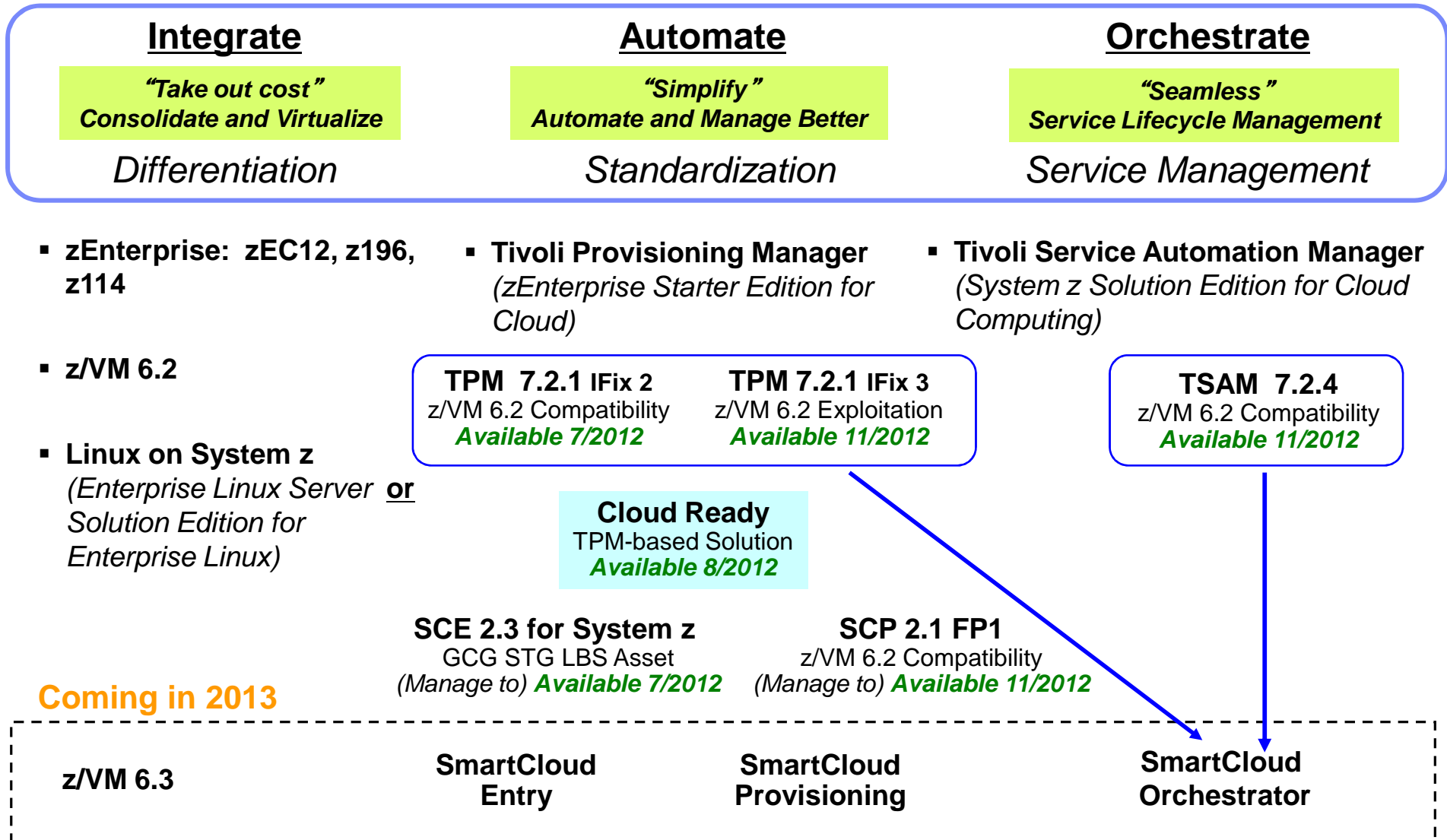
SmartCloud Provisioning

SmartCloud Entry

- Self Service Portal for VM Provisioning
- Cloud Administration
- Multi-tenancy, Isolation
- Basic Single Image Composition, Manipulation
- Approvals / Rejection
- Quota, Capacity Reporting and Expiration
- Optimized IBM Hardware, runs on all
- Rapid , Scalable Provisioning
- Automatic Fault Tolerant HW/SW
- Workload Mobility (composite VMs as group)
- Image Library (Search / Compare, Versioning, and SW Stacks)
- Virtual System Patterns
- Optimized Virtual Application Patterns



System z Cloud Portfolio - Linux on System z



Audelium (Asset developed and supported by Montpellier)

- **z/VM Linux environment for the provisioning of Linux, z/OS and z/VM systems**
 - Deployment logic is controlled by an application running on a Linux guest in z/VM
 - Lifecycle management (provisioning, deprovisioning)
- **Audelium capabilities:**
 - Deployment of Linux, z/OS, an z/VM systems
 - Control of IPL target (none / local / remote z/VM / remote cluster / native LPAR)
 - Cold moves and Live Guest Relocation (z/VM 6.2) supported
- **z/OS provisioning**
 - z/OS subsystems configured during provisioning
 - Requesters can choose which subsystem to deploy in z/OS (IMS, DB2, CICS, MQ, OMEGAMON, ...)
- **Front-end Multi-user access through Web interface**

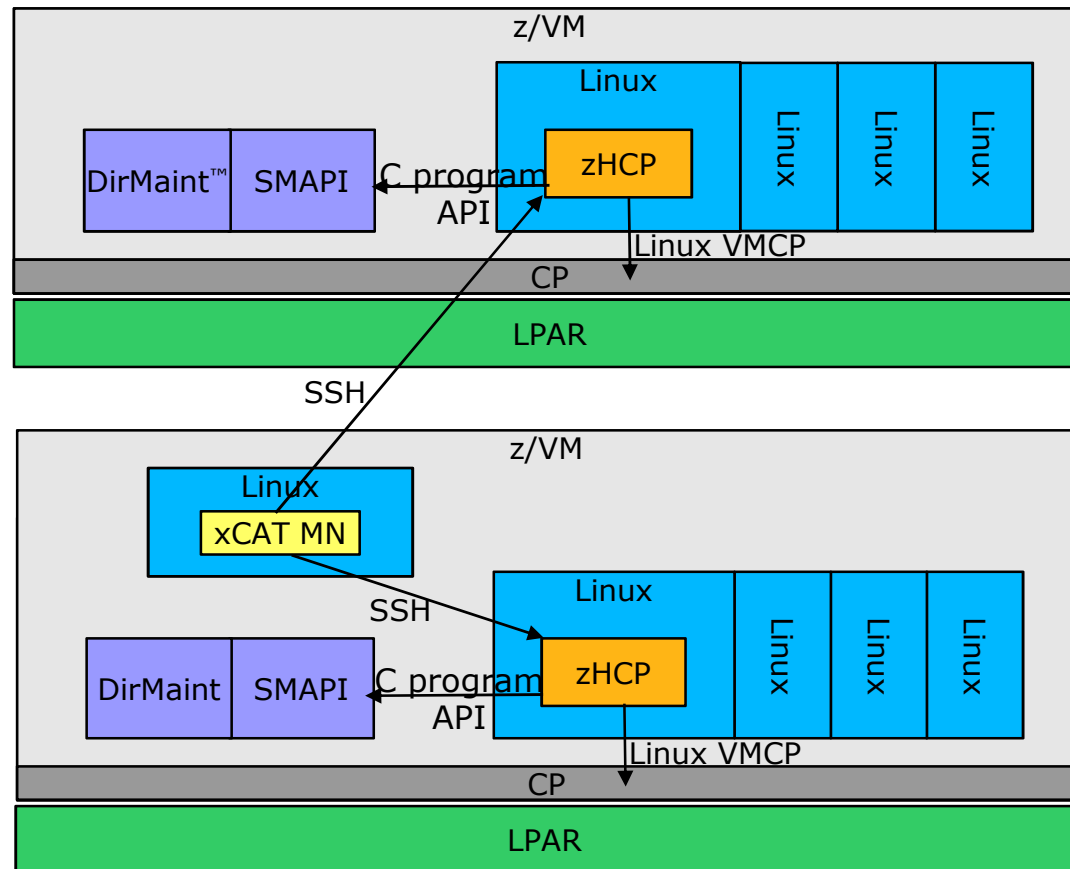


xCAT Architecture on System z

- Stands for Extreme Cloud Administration Toolkit
- Tool to manage, provision, and monitor physical and virtual machines on IBM
- Easy to use
- Open sourced in 2007 and licensed as EPL (Eclipse Public License)
- Used by NASA, University of Toronto, IBM, Adaptive Computing, Los Alamos Laboratory, and more!

xCAT MN: Central management server running on normal Linux

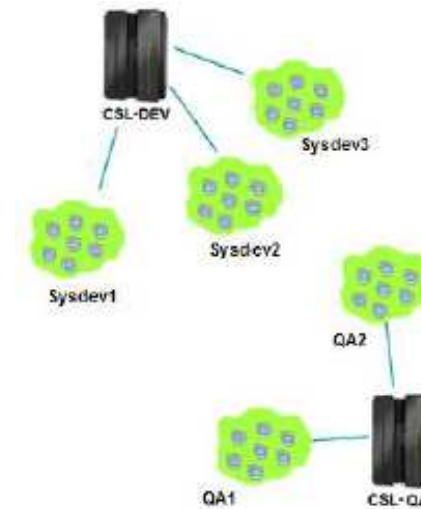
zHCP: Runs on privileged VM and manages other VMs via SMAPI and CP



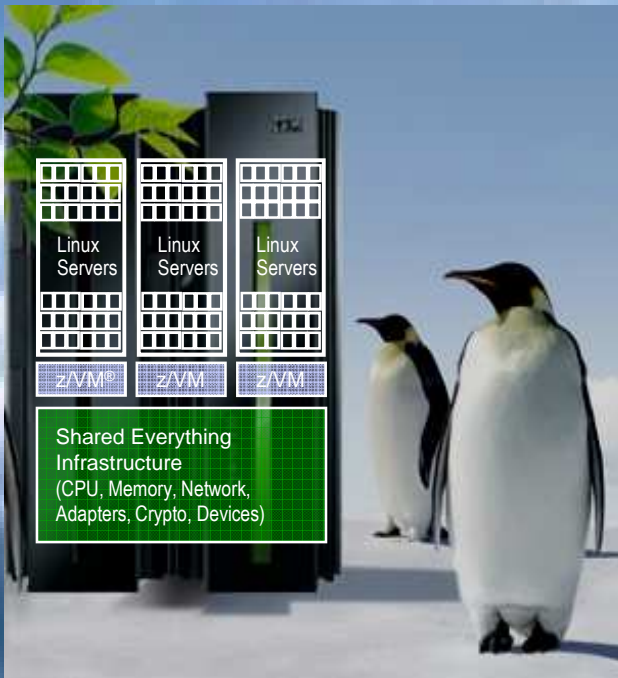
Computer Solutions Leaders International (CSL) Web Administration VM Environment (WAVE)

- **Complete provisioning and management solution for z/VM environment**
 - Offers provisioning of all aspects of the z/VM hypervisor, including server, network and storage provisioning
- **Gives Linux administrators the freedom to manage their Linux on System z servers without the need to employ a zVM system programmer for every VM USER environment change needed for their Linux on System z servers**
 - System administrators do not need to have any knowledge or understanding of the physical or virtual infrastructure hosting their virtual servers
- **Fully abstracts the virtual and physical resources while providing automation of operating procedures**
- **Currently runs and is supported on the following:**

Linux on System z Versions	z/VM Versions
<input type="checkbox"/> SLES 9 (31 and 64-bit)	<input type="checkbox"/> z/VM 5.2
<input type="checkbox"/> SLES 10 (All service packs)	
<input type="checkbox"/> SLES 11 (All service Packs)	<input type="checkbox"/> z/VM 5.3
<input type="checkbox"/> RHEL 4 (From 4.7)	
<input type="checkbox"/> RHEL 5 (All Service Packs)	<input type="checkbox"/> z/VM 5.4
<input type="checkbox"/> RHEL 6 (All Service Packs)	<input type="checkbox"/> z/VM 6.1
	<input type="checkbox"/> z/VM 6.2



Merci de votre attention



Les cas clients :

Cases ordered by date (publication or *validation*)


 New

- NWK (South Africa, Jan 2013)
- Baldor (USA, Jan 2013)
- South American Bank (LA, *val. Jan 2013*)
- Bankia (Spain, Nov 2012)
- Marist College (USA, Oct 2012)
- Rizal Commercial Banking Corporation (Philippines, Oct 2012)
- Eurocontrol (Netherlands, Oct 2012)
- Nationwide (USA, Oct 2012)
- gkd-el (Germany, *val. Oct 2012*)
- Colacem S.p.A. (Italy, *val. Oct 2012*)
- A large Payment Processing Company in Europe (Europe, Sep 2012)
- City and County of Honolulu (USA, Sep 2012)
- Shelter Mutual Insurance Company (USA, Aug 2012)
- Miami-Dade County (USA, Aug 2012)
- The University of Bari (Italy, *val. Aug 2012*)
- Dundee City Council (UK, *val. Aug 2012*)
- Fratelli Carli S.p.a. (Italy, *val. Aug 2012*)
- Procempa (Brazil, *val. Aug 2012*)
- University of Arkansas (USA, *val. Aug 2012*)
- Florida Agricultural and Mechanical University (USA, *val. Aug 2012*)
- EFIS AG (Germany, Jul 2012)
- Liberty Mutual Insurance (USA, Jun 2012)
- National Registration Department of Malaysia (Malaysia, *val. Jun 2012*)
- University of North Carolina (USA, *val. Jun 2012*)
- IBM - Analytics on an enterprise scale (USA, May 2012)
- BCBS Minnesota (USA, *val. May 2012*)
- Marsh (UK, *val. May 2012*)
- Atos Origin (UK, *val. May 2012*)
- Business Connexion (South Africa, Apr 2012)
- IBM Field Management Systems (USA, *val. Apr 2012*)
- Austrian insurance company (Austria, Mar 2012)
- AutoData Norge AS (Norway, Feb 2012)
- Computacenter (UK, *val. Feb 2012*)
- Embasa (Brazil, Jan 2012)
- Blue Cross Blue Shield of South Carolina (USA, Jan 2012)
- Peter Hahn (Germany, *val. Jan 2012*)
- Russian Hydrometeorological Research Institute -WDC (Russia, *val. Jan 2012*)
- Shikoku ((Domino), Japan, *val. Jan 2012*)
- Svenska Handelsbanken (Sweden, *val. Jan 2012*)
- BG-Phoenix (Germany, Dec 2011)
- Numius (France, *val. Dec 2011*)
- Numius (Belgium, *val. Dec 2011*)
- Shikoku (Japan, *val. Dec 2011*)
- Transzap (USA, *val. Dec 2011*)
- RENFE (Spain, Sep 2011)
- Healthcare company (USA, Aug 2011)
- Salt River Project (USA, *val. Aug 2011*)
- Endress+Hauser (Germany, Jun 2011)
- Sparda Datenverarbeitung eG (Germany, Jun 2011)
- Banco Pastor (Spain, May 2011)
- Volvo IT (Sweden, May 2011)
- Canada Dept. of National Defence (Canada, 2011)
- Citigroup (USA, Apr 2011)
- Telcel (Mexico, 3Q2010)
- VietinBank (Vietnam, Jul 2010)
- Gruppo API (Italy, Jun 2010)
- Allianz (Australia, Nov 2009)
- Home Depot (USA, Nov 2009)
- Con-Way Freight (USA, Jun 2009)
- Bank of New Zealand (New Zealand, Feb 2009)

Liens

- Linux on system z :
 - ➔ <http://www-03.ibm.com/systems/z/os/linux/about/>
<http://www-03.ibm.com/systems/z/os/linux/>
- Un certain nombre de logiciels ISVs référencés sur le Web mais pas exhaustif
 - ➔ <http://www-03.ibm.com/systems/z/solutions/isv/linuxproduct.html>
- Les logiciels IBM supportés :
 - ➔ <http://www-03.ibm.com/systems/z/os/linux/software/index.html>
 - ➔ Tarification comme dans le OPEN
 - IFL z114 = 100 PVUs
 - IFL zEC12 = 120 PVUs
 - Sub-capacity : ILMT
- Des cas clients
 - ➔ <http://www.ibm.com/systems/z/os/linux/success/index.html>