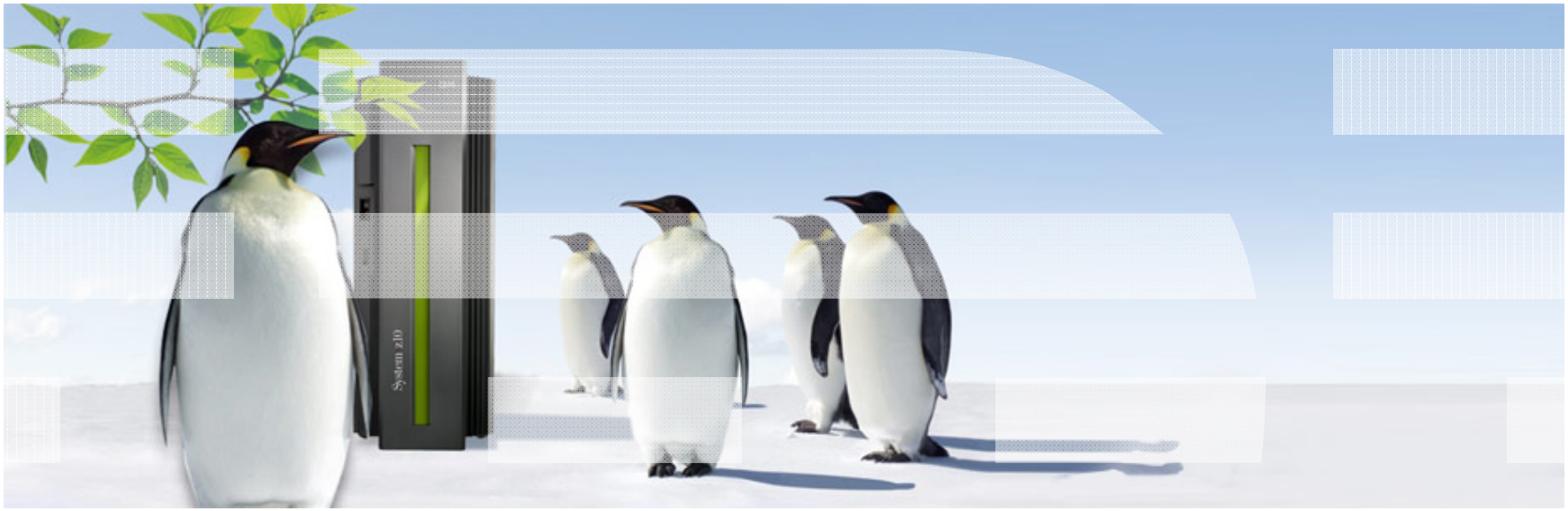
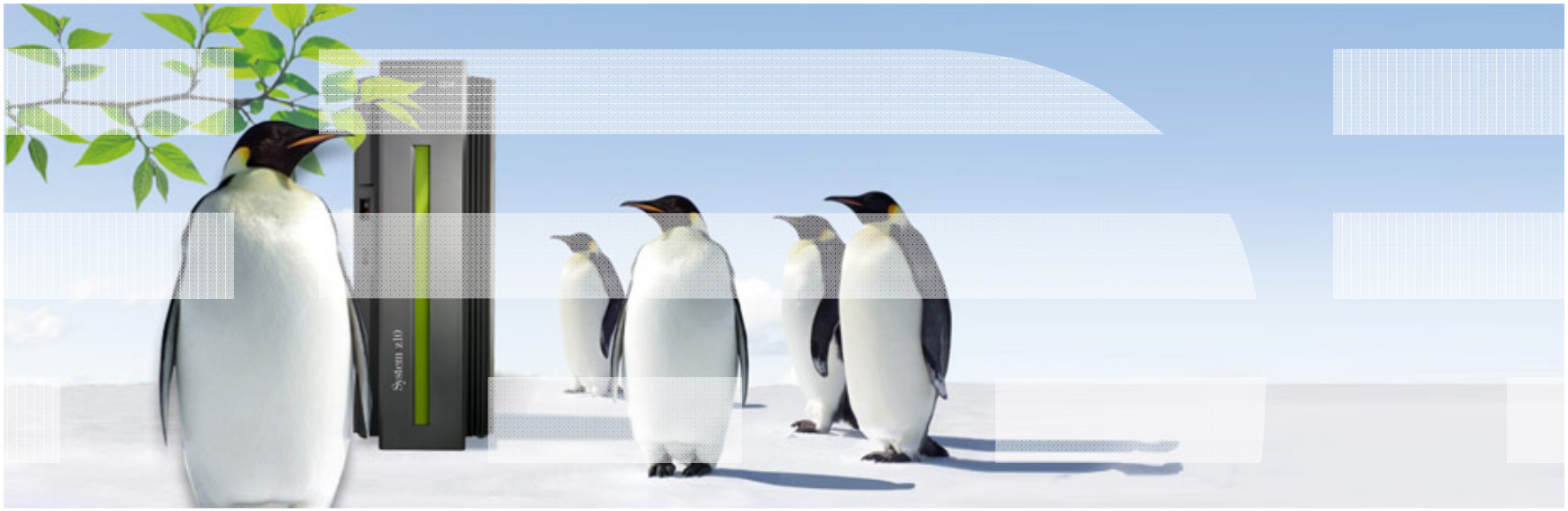
Managing Mission Critical Workloads on Linux on System z



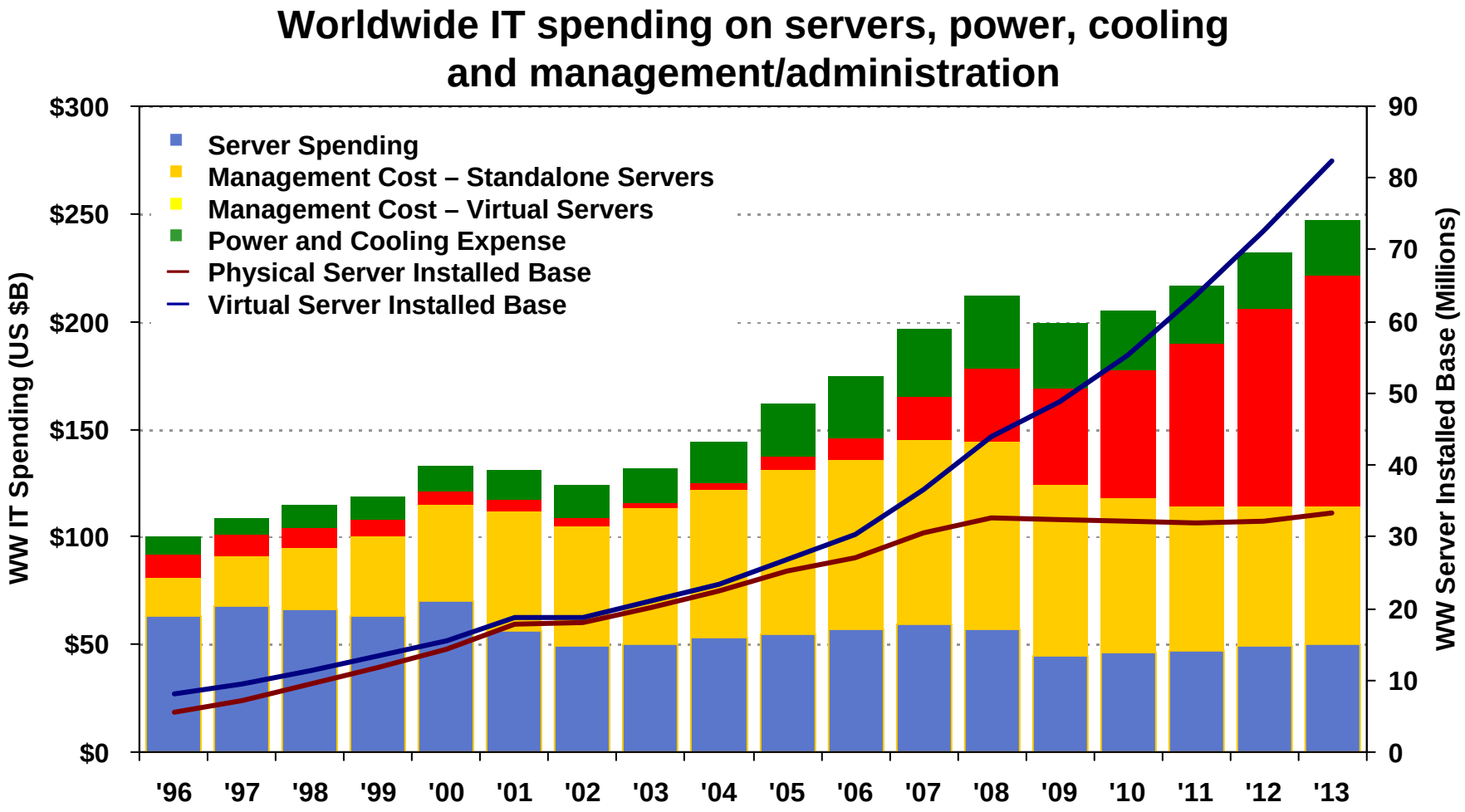
Today's Agenda

- **Addressing IT Challenges**
  - IBM
- **Best Practices for Managing a Virtualized Environment**
  - StreamFoundry
- **Solutions for Managing Virtualization**
  - IBM
- **Best Fit Applications for a Virtualized Environment**
  - IBM
- **Implementing Management Solutions**
  - Pirean

Addressing IT Challenges



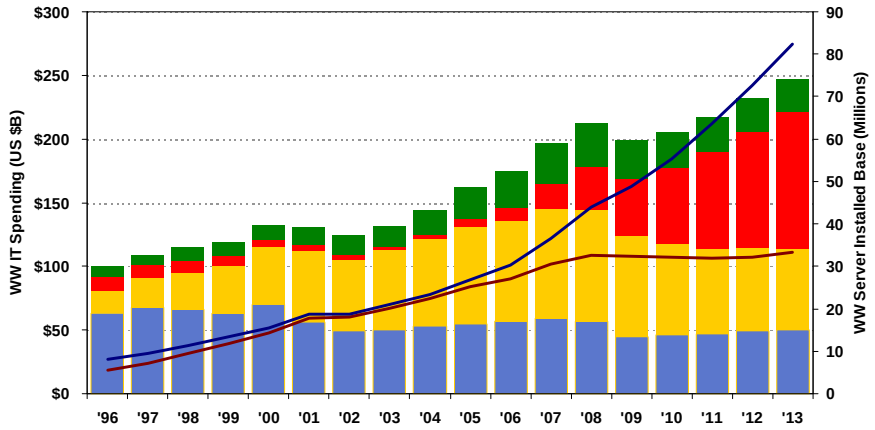
Annual Operating Costs Are Out Of Control



Source: IDC – *"Three Data Centers – One Vision?"*, March 2010

Businesses face challenges today

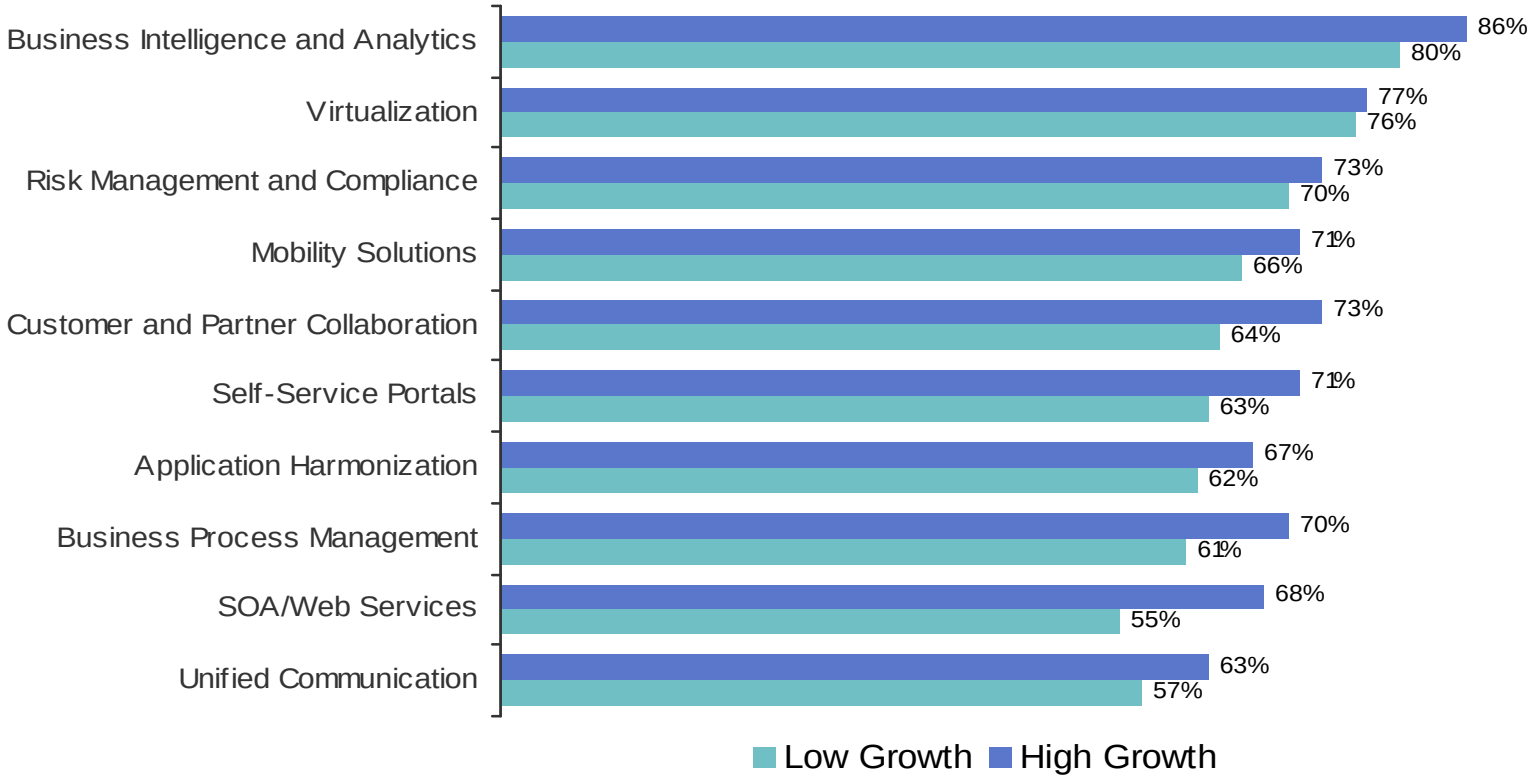
- Lost business opportunity because IT too slow to react. Lack of agility
- Long deployment timelines for new systems (weeks/months+)
- Many people involved in the process, high cost & complexity
- Many steps are manual and prone to error
- Huge up front investment for new infrastructure
- Server sprawl
- Low utilization
- Costly compliance, auditing, and security patching



Innovation is not limited to IT solutions: Business-oriented plans rank high among CIOs' visions of enhancing competitiveness

Ten most important visionary plan elements

Interviewed CIOs could select as many as they wanted

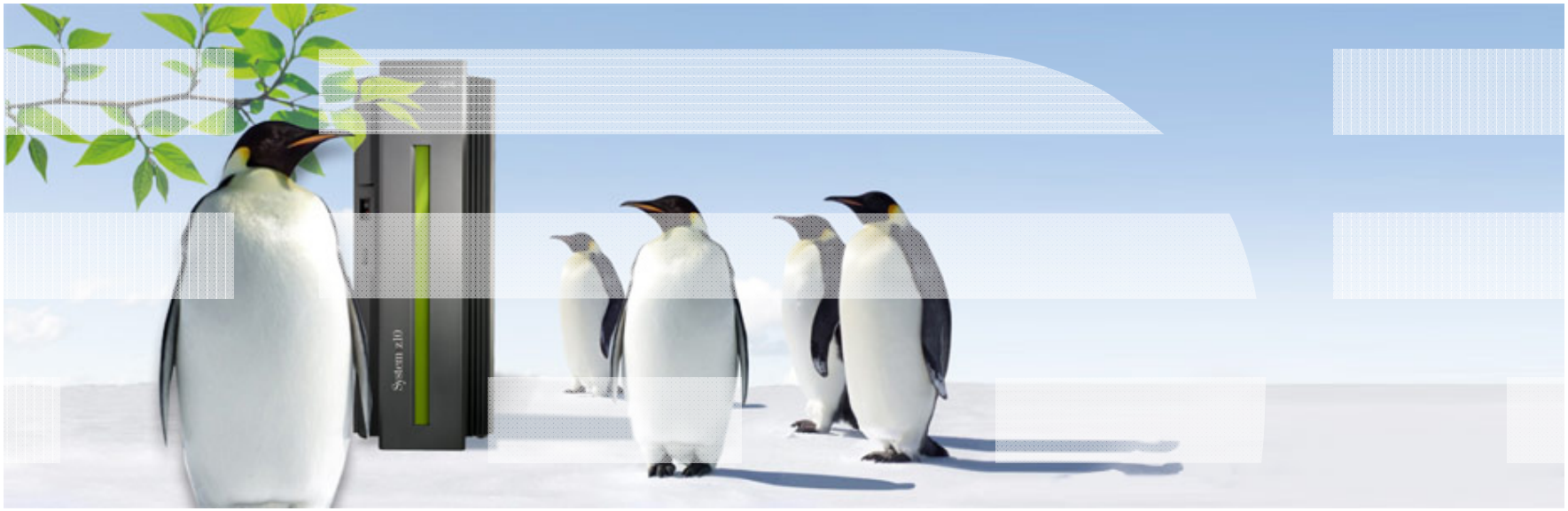


Source: IBM Global CIO Study 2009; n = 2345

What Is The Solution?

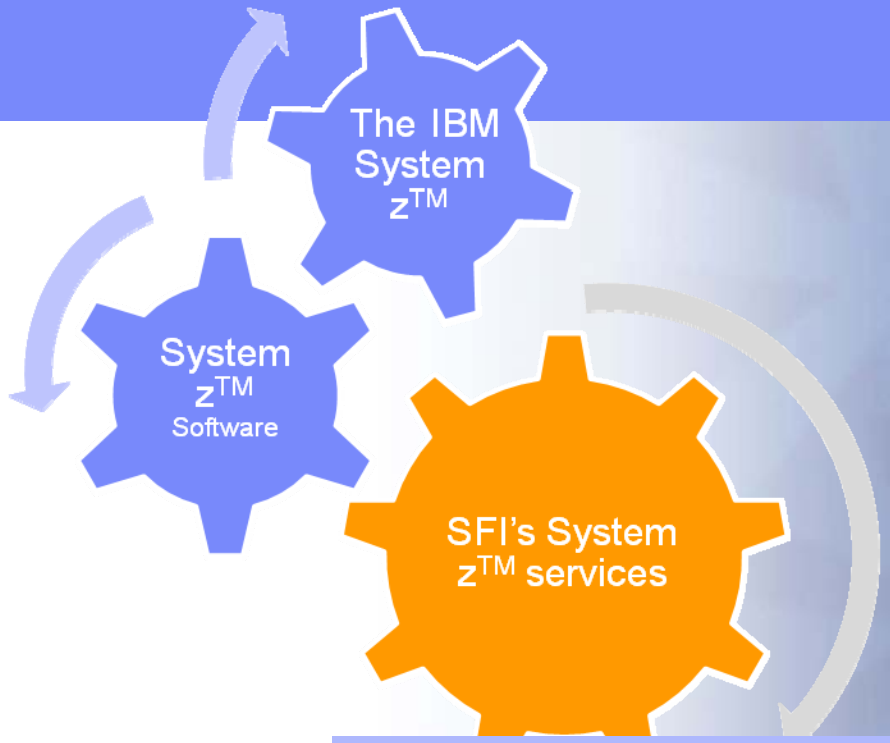
- **Reinvent the data center to build a more dynamic infrastructure**
  - Take Cost Out
    - Virtualization and consolidation
  - Reduce Energy Consumption
    - Green Data Center
  - Reduce Labor Costs
    - Simplified Administration

Best Practices for Managing a Virtualized Environment



StreamFoundry, Inc.
IBM Mainframe Software Services

The IBM zEnterprise 196™



PUTTING THE ZIP BACK INTO THE 'Z'

Streamfoundry
Managing Process More Efficiently

Marc Heimlich
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617.455.5449

IBM Business Partner

- **Why SFI?**
  - A company focused on Mainframe Software Solutions
  - 100% Success Rate
    - Consultants average 20 plus years experience from Fortune 50 and/or IBM
  - An official sub to IBM Lab Services and Software Migration Project Office
    - Plan
    - Design
    - Implement
    - Upgrade
    - Health Checks
    - On-going system monitoring, programming and administering
- **SFI's Linux on System z Practice led by David Kreuter**
  - Over 10 years of experience in the space
  - *Awarded 2007 SHARE Award for Excellence – Province of Quebec*
  - Proven dollar savings in driving server consolidation and workload optimization

Optimizing the Mainframe environment through sensible services

- **SFI's Service Categories**
  - Life extension
  - Clean-up
  - Applications
  - Modernization
  - On-going support

SFI's various levels of support

Streamfoundry
System z™ Software Services

Automation

Process Engineering

•Sys Programming

Integration

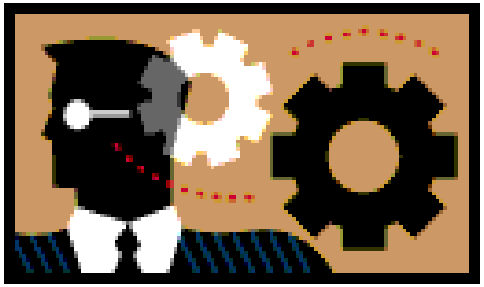
Virtualization

Optimization

Web Services

Consolidation

1	**"*Ask the Mainframe software expert*" blog** www.streamfoundry.com **No charge!**
2	**Fixed rate phone support to address general questions**
3	**Fixed rate remote support* 24 x 7**
4	**Dedicated remote support* 24 x 7**
5	**Dedicated on-site support* TBD (Requirement driven)**



*Customer remote access required

**Rates are subject to change based on customer requirements.

Linux on z Assessment and Recommendation

Applications/Infrastructure

- **SFI's Mainframe Software Savings Series …**
  - Can your enterprise lower the cost of the current z/OS environment by using Linux on System z?
  - Which workloads are appropriate to migrate to Linux on System z?
  - What software, how many IFLs (Integrated Facility for Linux), how much memory, what network schemes, and how much disk storage are necessary?
  - How many UNIX and Wintel servers can be consolidated?
  - What are appropriate roll-out strategies?

SFI's *Blue Print* Linux on System z Architecture Services

David Kreuter

Dave Jones

SFI's Resident Linux on System z Experts

Objectives

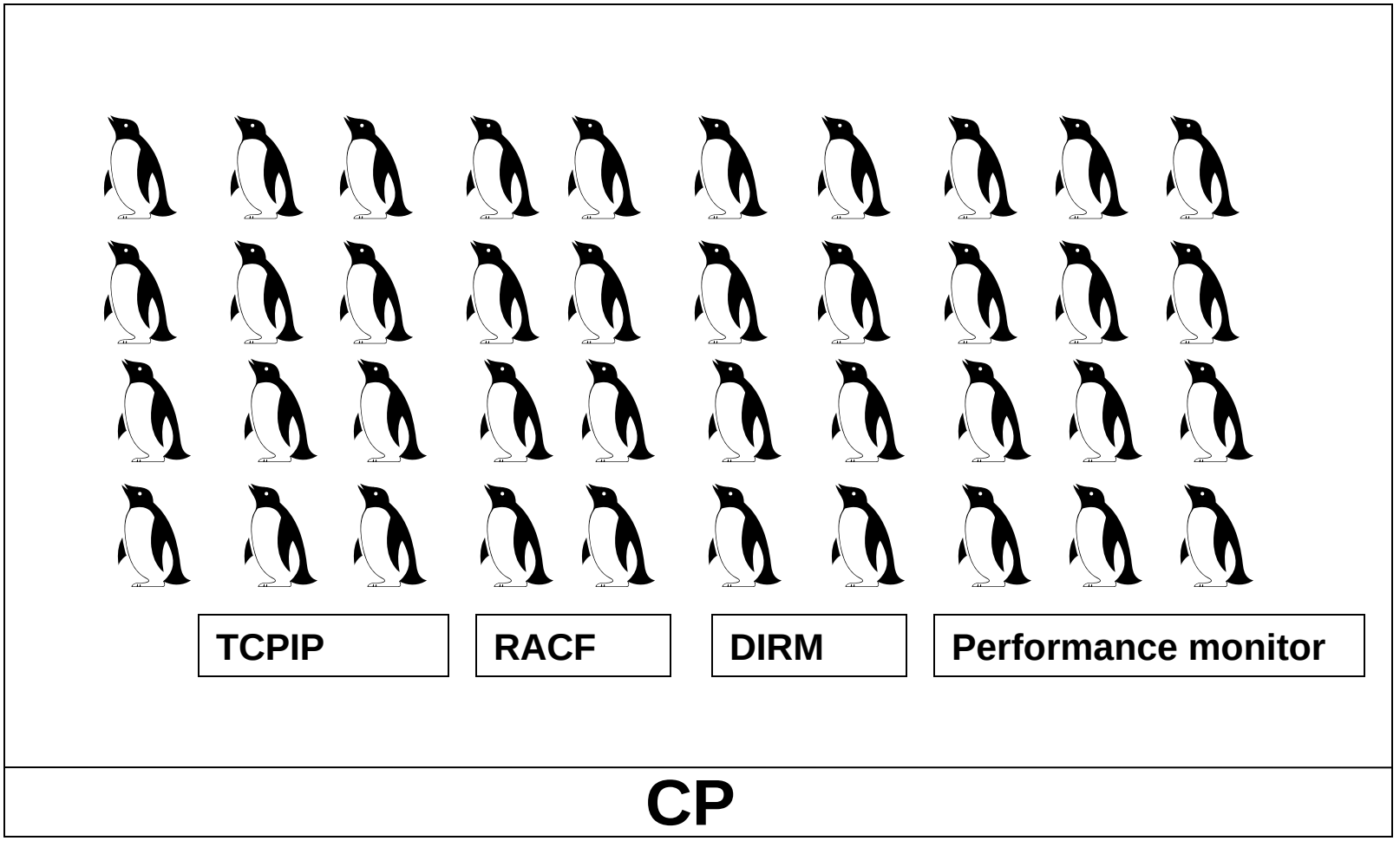
- Value proposition
- Colonizing with Linux Virtual Machines
- A great place for networking and data
- Strategies for using z/VM and Linux on System z
- Networking and data architectures
- Customer workloads
- Hints and Tips
- Best Practices

Why Linux on System z?

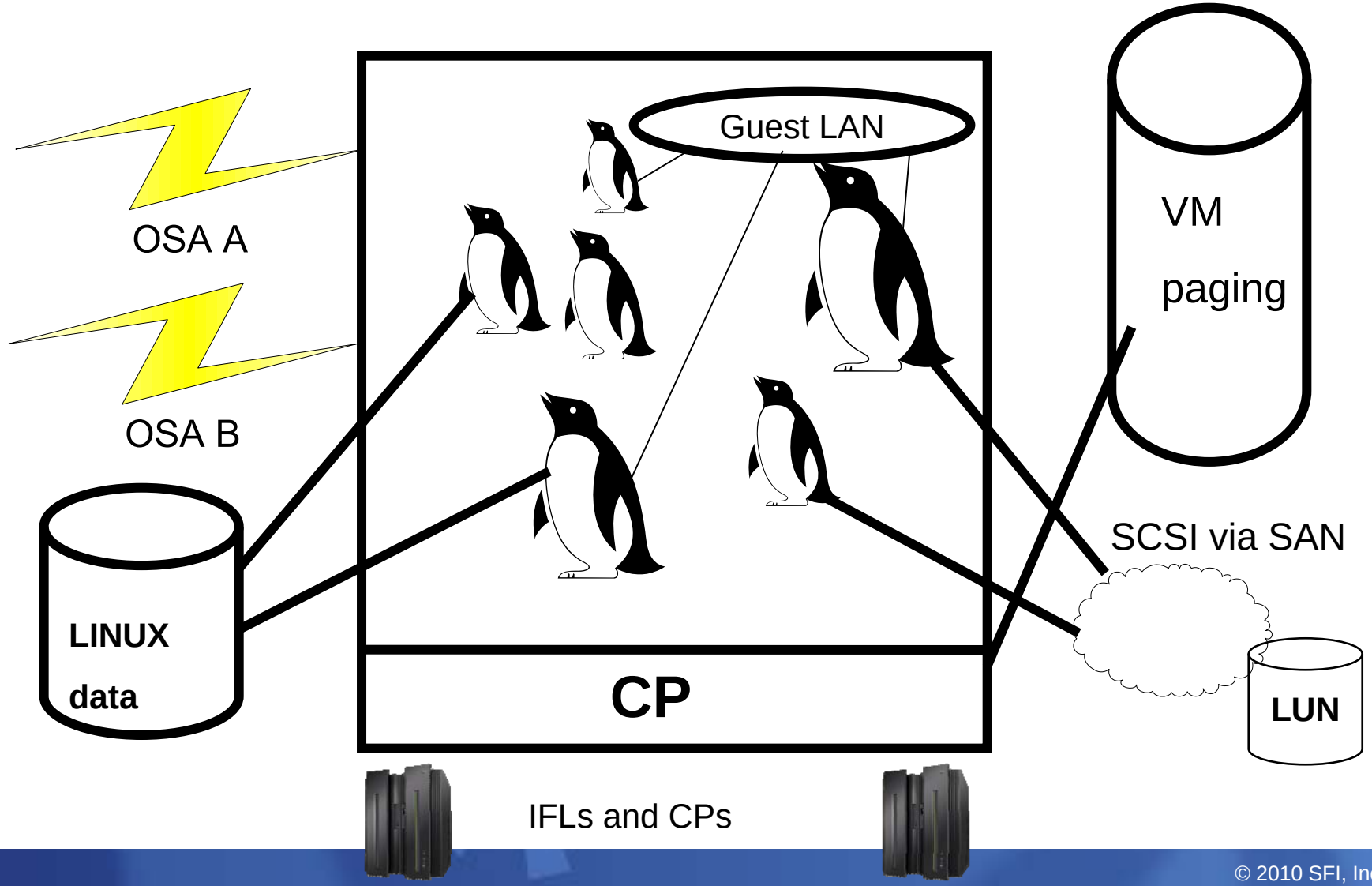
- Potential for cost savings by reducing software licensing costs
- Servers in a box
- Networks in a box
- Green energy
- Large scale virtualization benefits the organization
- High ratio of servers to systems personnel

Linux colonies on z/VM

Client architectures



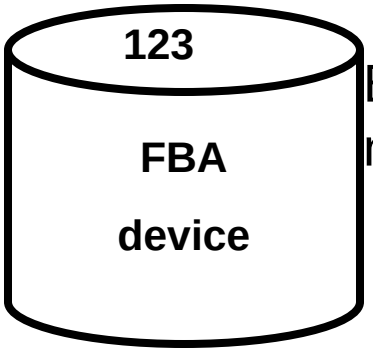
Intensive Resource Sharing: CPU, memory, network, I/O – everything!



z/VM: The storage friendly place to park your data

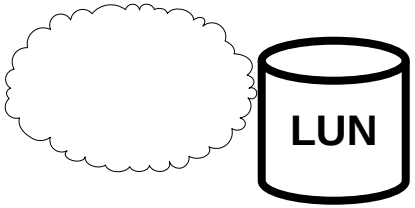
Client architectures

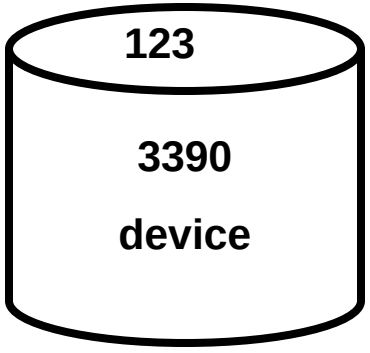
- **Support conventional ECKD disk**
- **And FBA disk**
- **And SCSI disk**



Block numbers

SCSI via SAN



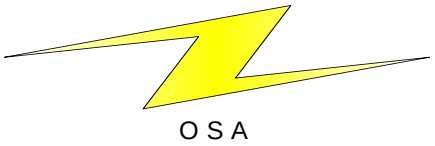


Cylinders, tracks, records

Removing Mythology from IBM Mainframe Network Devices

Client architectures

- **HiperSockets and OSAs are mainframe networking devices**
- **z/VM virtualizes networks with guest LANs and vswitches**
- **Real and virtual play well together**

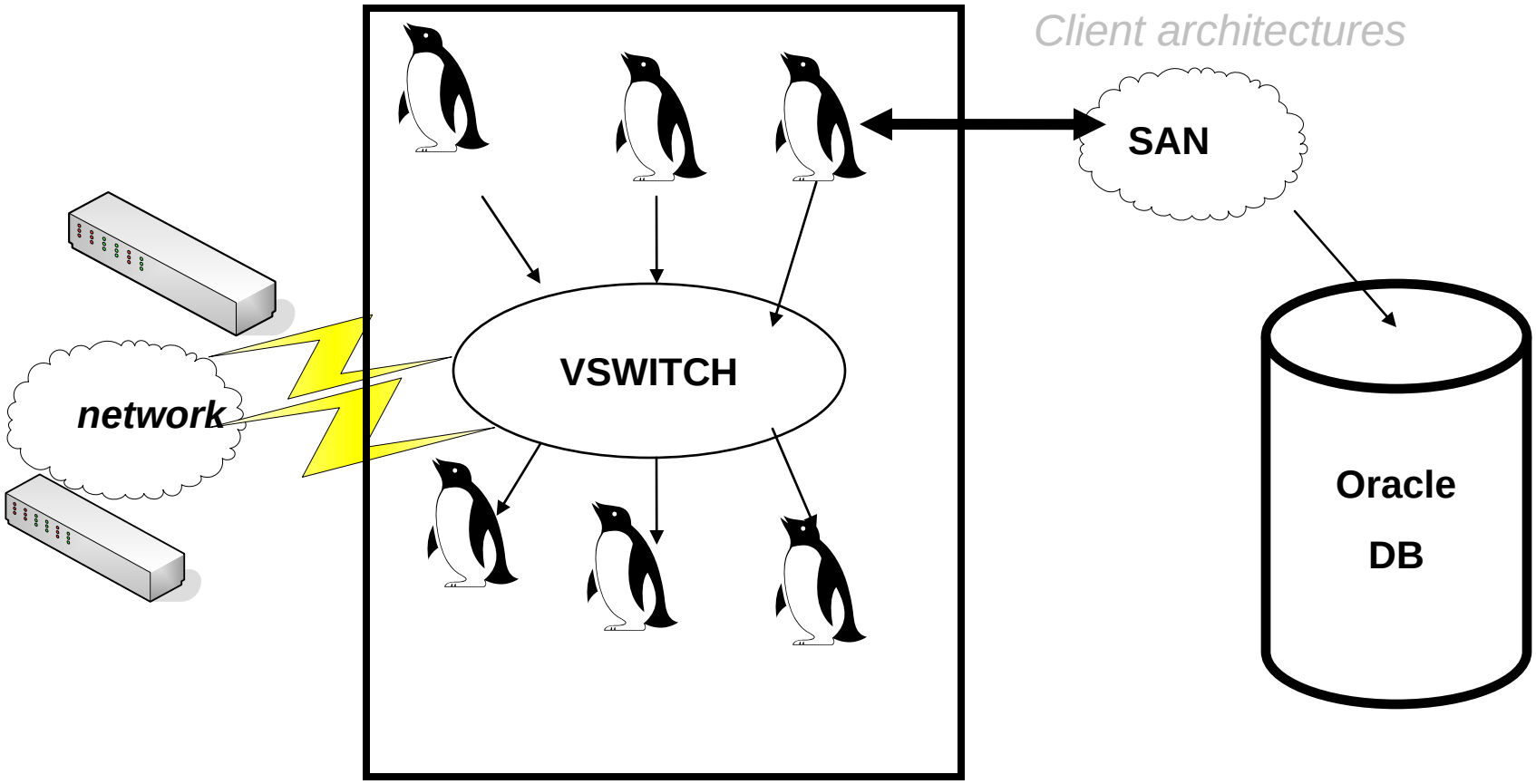


- *Connects the mainframe to the network. Cost feature.*
- *OSA ports operate independently of each other.*
- *Support for up to 4096 VLANs for Linux.*

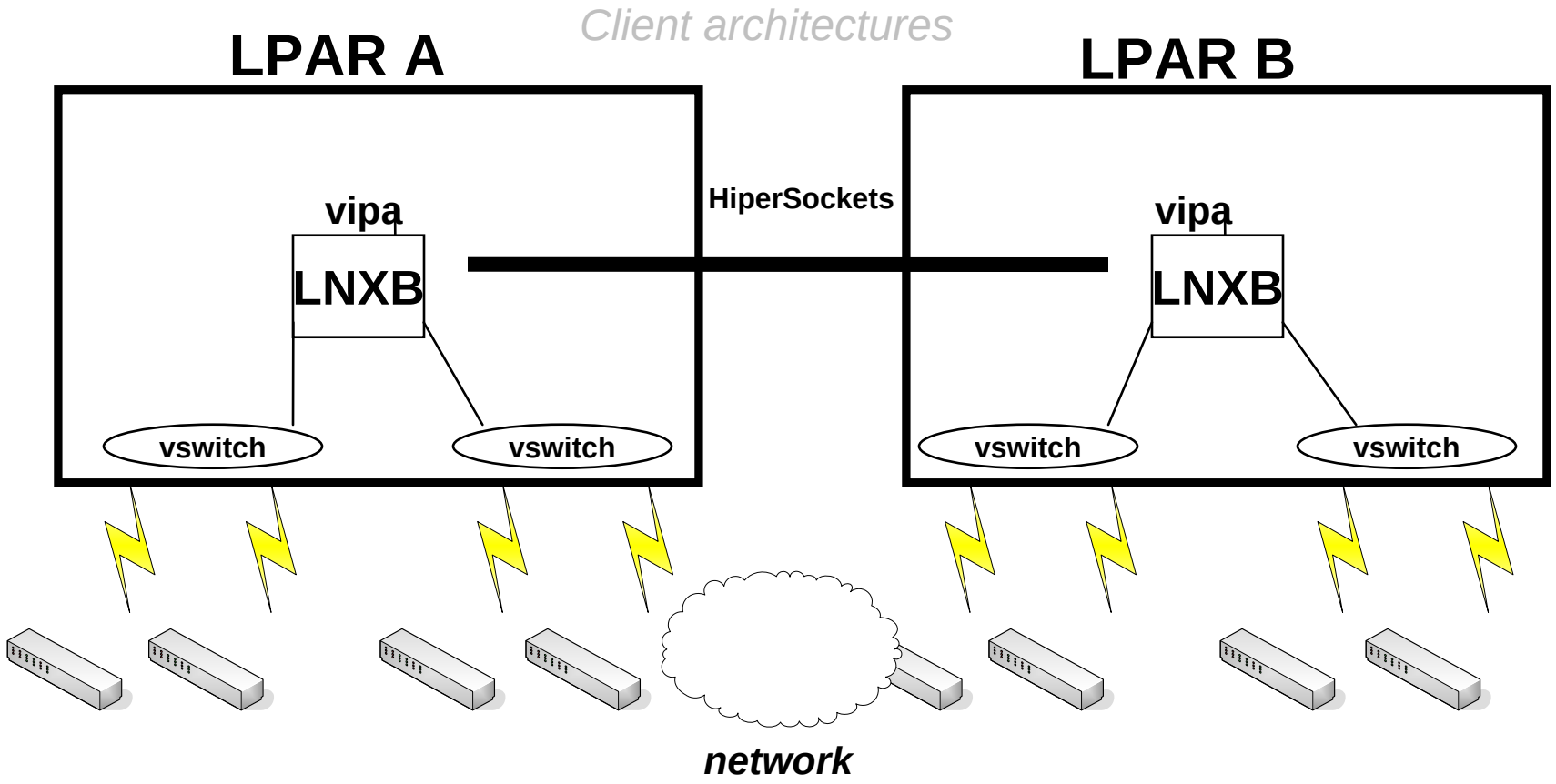
HiperSockets: Network in a Box

- *HiperSockets provide an internal CEC network. They are high speed and high volume networks.*
- *HiperSockets are supported by z/OS, z/VM and Linux.*
- *HiperSockets are included in System z mainframe.*

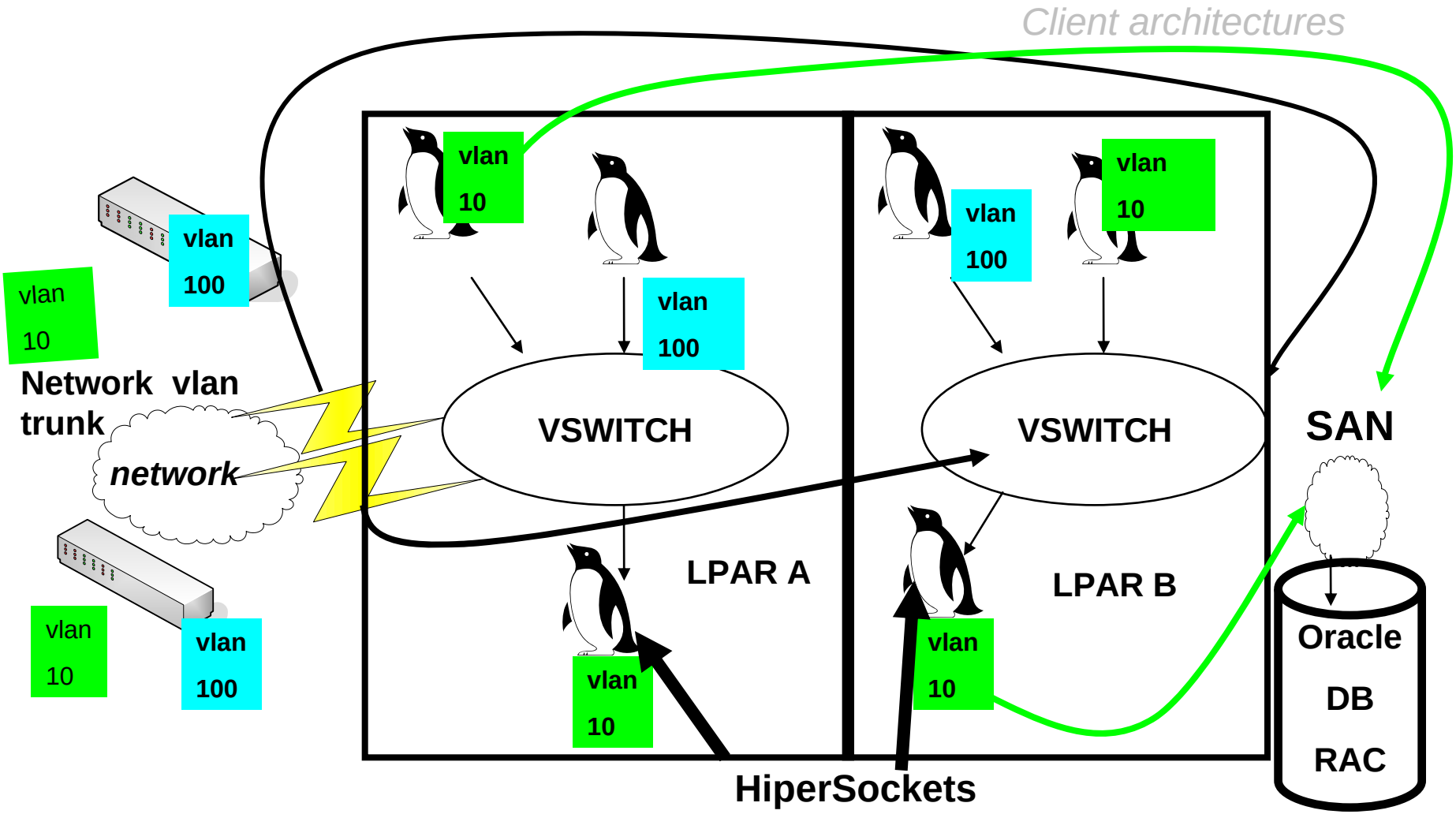
z/VM LPAR with Linux Oracle Servers. Data is on FCP SAN. vswitch network (built in redundancy)



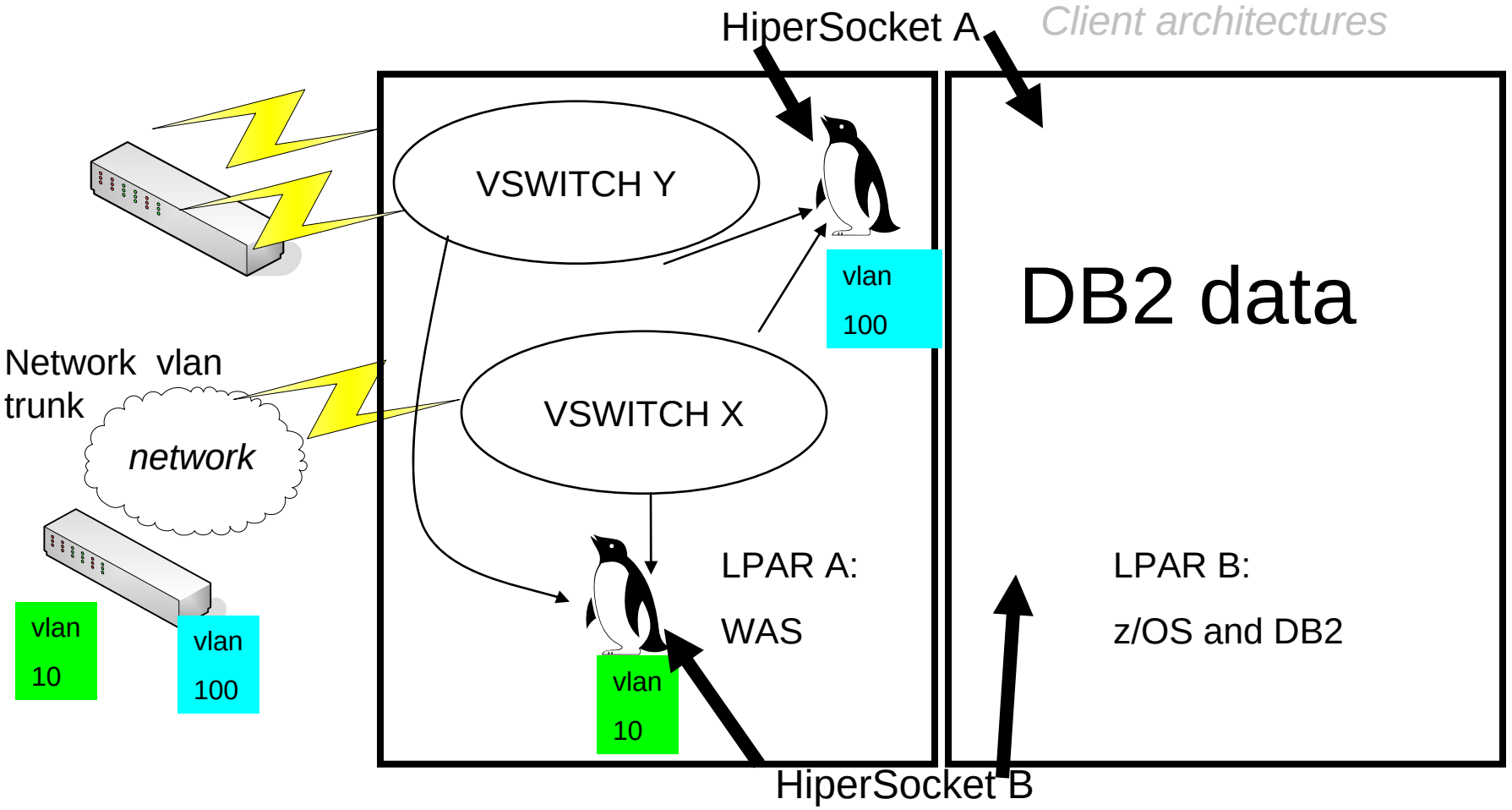
Linux machines have four interfaces: two on vswitches, one on HiperSockets and one vipa dummy. Using OSPF through Quagga network losses are announced and other paths and routing used. Heartbeat software in the application will also notice outage.



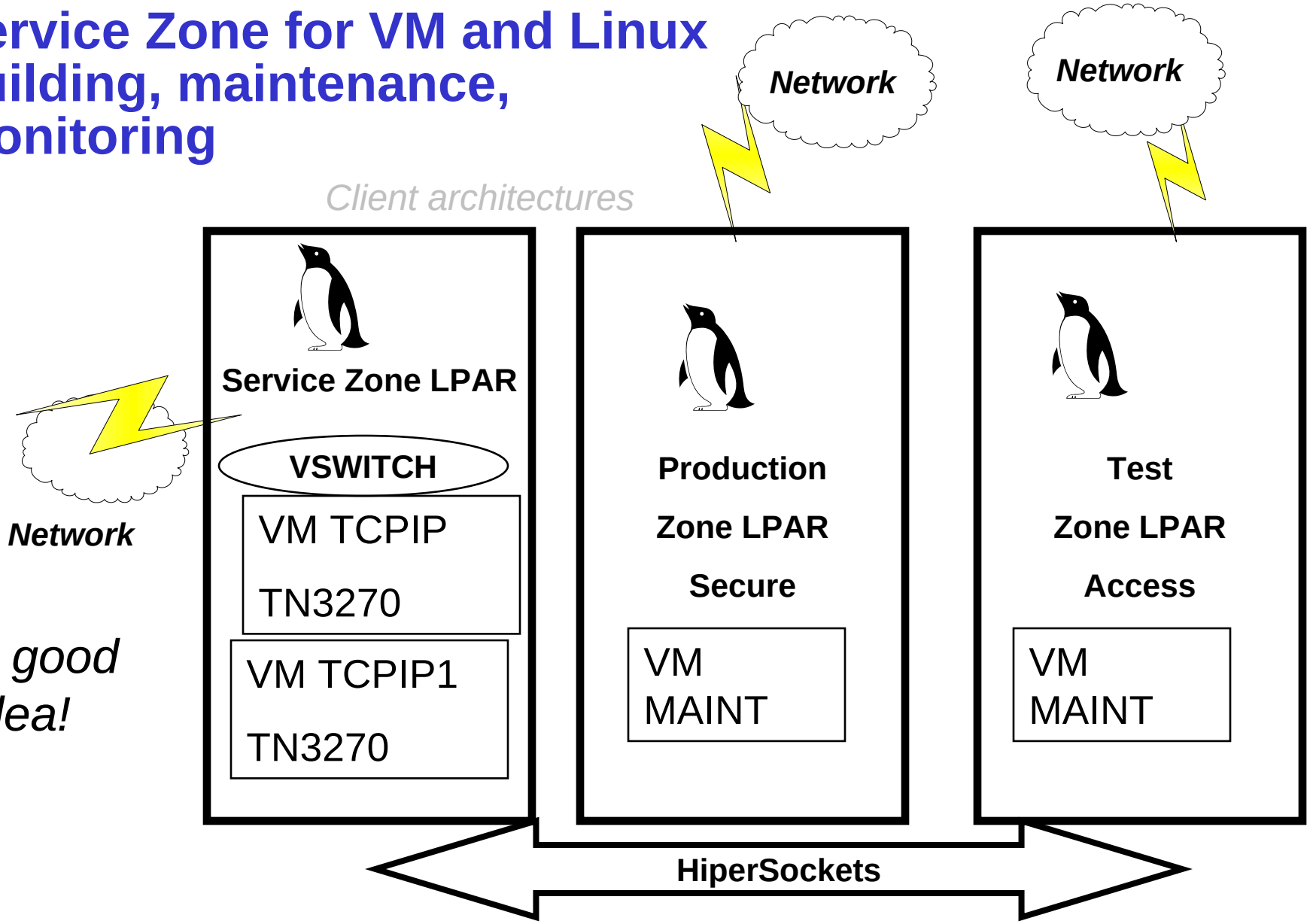
z/VM LPARs with vswitches, vlans and HiperSockets. Shared OSAs and ORACLE RAC on the SAN. Creates a nice maintenance window method.



One z/VM LPAR with WAS in LPAR “A” connecting to the cloud. LPAR “A” connects to LPAR “B” over HiperSockets to get the z/OS DB2 data. WAS Linuxen with multiple vswitches. Failures noticed by OSPF. Uses WebSphere MQ and DB2 Connect.

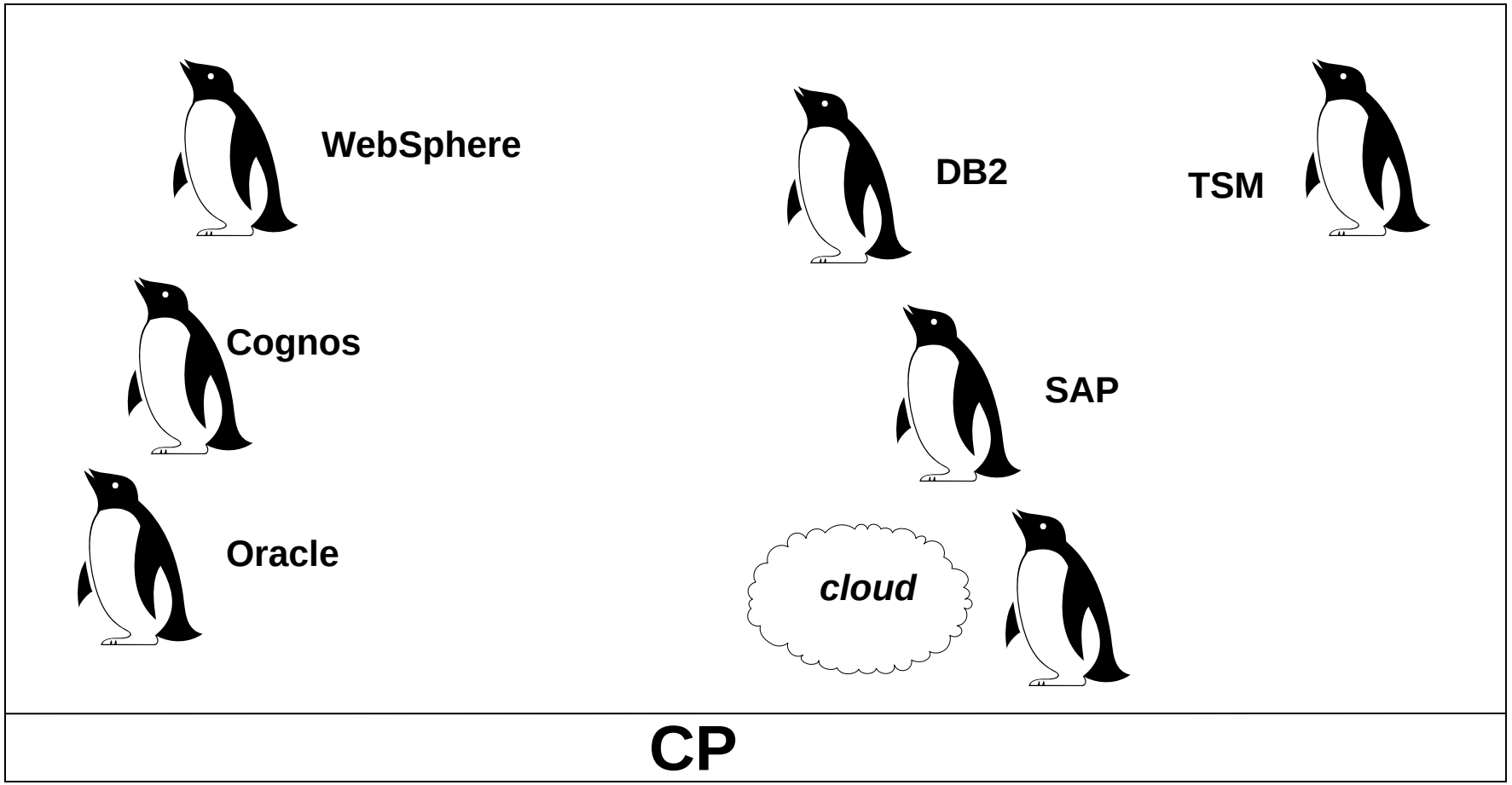


Service Zone for VM and Linux building, maintenance, monitoring



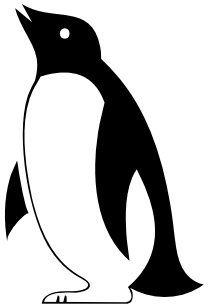
A good idea!

Important applications customers are doing today ... and tomorrow



Client Profiles

1. Large government service bureau
2. Police force
3. Software as a Service company



Client profiles: Government Service Bureau

- **IT service provider for many government offices (125)**
  - *Going back several years:*
    - Existing mainframe shop
    - 5 z890 + 1 z800 + 1 G5 on the floor on 3 sites
    - 450+ physical servers (750+ logical) (HP, SUN, pSeries, …)

Before Linux on System z

Government Service Bureau: Current Configuration

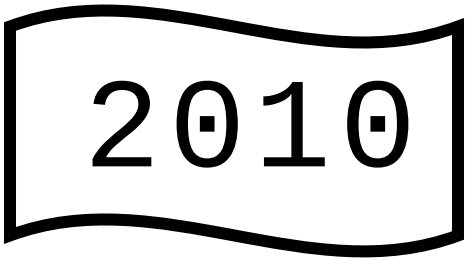
- **1 z10 BC mainframe with 5 IFLs (~ 2400 MIPS)**
  - Started with z9 EC with 4 IFLS
- **5 LPARs**
  - Oracle/DB in LPAR with 3 IFLs
  - WAS
  - Service Zone
  - Lab Zone
- **Over 40 different networks**
- **Software**
  - z/VM v.5.4 +
  - SLES9 SP3 Oracle 10*g*R1
  - SLES10 SP1 Oracle 10*g*R2
  - CA products (Automation, Scheduler)

With Linux on System z

2010

Government Service Bureau: Lessons Learned and What We Know

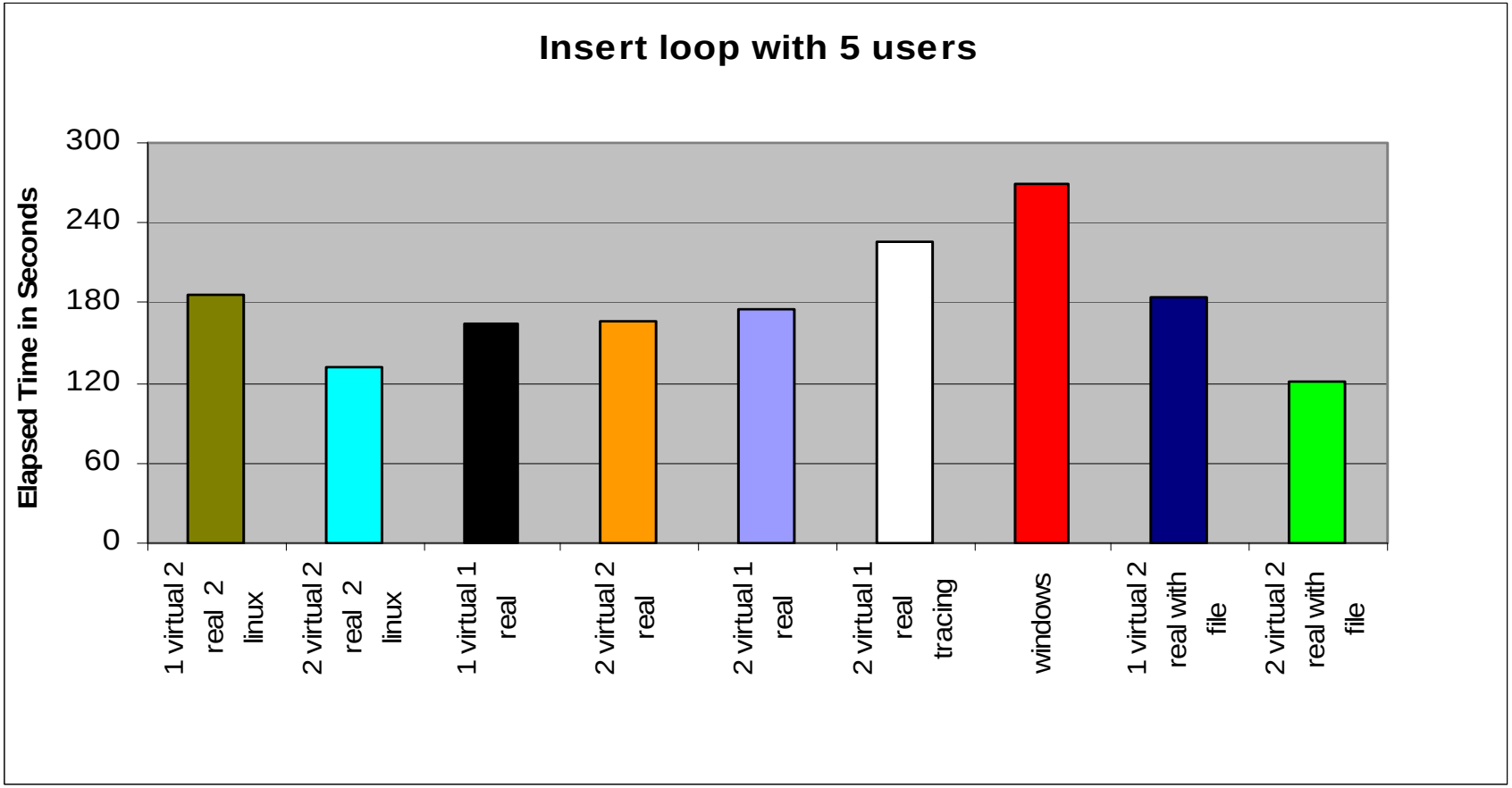
- **Reduction in software license costs saved substantial money!**
- **System z with Linux and z/VM can support different workloads in same CEC (Oracle, WEB)**
- **Business as usual for the DBA's and Web administrators – platform appears agnostic**
- **Supports many isolated networks**
- **Service zone is a great idea**
- **Horizontal growth while keeping licenses stable**
- **Great tools in CMS**



Client Profile: Major Police Force

- **Deployed Oracle on z10 BC 2 IFL machine with z/VM, Novell SLES Linux, and Oracle in 2010**
- **Completed study in early 2009 with sample scripts executing in Windows compared to System z.**
  - Performed on z890 with two IFLs
  - Windows machine was a 4 way.
- **Most scripts performed better on System z**
  - Exception was a long running script.
    - *In production z10 will handle CPU intensive work better than the z890.*
  - System z performed better than windows on insert and delete loop tests with multiple users.

Client Profile: Major Police Force: Comparison Report of Record Insert



Software as a Service Company

System z timeline

Pondering, Planning, Considering

Architecture, Planning, Installation, Testing

Production

JAN

2007

2008

JUNE

4 IFLs

2009

3 IFLs 24Gb

2010

16Gb

Dell, Linux, Windows Shop. No mainframe!

z9 BC and DS6800 on floor

Oracle Servers on z/VM and Linux

Software as a Service Company

Lesson learned

Reduced from 4 to 3 IFLs

- **Workload reduction?**
- **Workload redeployment to other platforms?**
- **Decrease in transaction rates?**
- **Decrease in database size?**

Software as a Service Company

Lesson learned

Reduced from 4 to 3 IFLs

- **Workload reduction?**
- **Workload redeployment to other platforms?**
- **Decrease in transaction rates?**
- **Decrease in database size?**
- **No! Workload, transaction rates and database size all increased.**
  - Vertical growth with virtual machine storage increase
  - Added new servers too
- **Memory increased to accommodate new workload.**
- **The application was tuned!**

Software as a Service Company

Hardware Configuration

z9 BC model R07-A01

3 IFLs
2096-A01

24Gb

DS6800

15 Tb

TS3400 Tape Library

Software as a Service Company

Software Suite

z9 BC model R07-A01

3 IFLs

24Gb

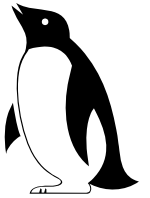
z/VM 5.4

++ tools: systems management, automation, deployment, and monitoring

Linux Novell SLES 10

Oracle 10G EE

Software as a Service Company



Best practices

- **Use a performance monitor**
  - The IBM Performance Toolkit
  - Generating daily csv format files used for analysis and reporting
- **Using DIRMAINT for directory and storage management**
- **Use the z/VM wrapper: CMS tools.**
- **Using small locally written automation and remote control tools**

Common hint and tip:
Must have a network integration plan

- How existing networks connect with new z/VM and Linux networks.
- Routed or flat topologies – or both –
- Network redundancy
- Fail over
- Securing access to the mainframe networks
- Establishing administration only network
- Which personnel responsible for maintaining network configurations in z/VM and Linux stacks.

Common hint and tip: Success strategy: Must have an architecture

- **Architecture document includes:**
  - Hardware and software details including model numbers, versions, MIPS, storage sizes.
  - Recommendations for z/VM and Linux automation tools and performance monitoring methods.
  - Detailed design documents.
  - Network deployments focusing on OSA, guest LAN, vswitch and HiperSockets strategies.
  - Security strategy.
  - Planned future growth and capacity plan.
  - Application deployment strategy.
  - Backup/restore and disaster recovery strategy.

Common Best Practices: Server Migration

- **Must plan and calibrate Linux virtual machine size so it consists memory adequate for kernel and application workload but do not over commit caching memory:**
  - Do not size virtual machine too high – wasting precious resource
  - Do not self defeat! This is a heavily shared environment
- **Set swap size to be around 50% of virtual machine size**
  - *Usually*
- **Always begin with one virtual CPU increase when needed.**
  - *Just because you have a "4 quad CPU Intel" doesn't mean you should use 4 virtual CPUs!*

So … What do we know now? What have we learned?

- **System z provides opportunities for vertical and horizontal server growth.**
- **Must calibrate virtual machine storage size**
  - Almost always smaller then in distributed environment
- **Plan for swapping but avoid in most cases.**
- **Must use a performance monitor:**
  - You paid for it must know how the resources are being utilized
- **Must keep z/VM and Linux safe and secure**
  - Linux security is … Linux security
  - Secure the z/VM environment with RACF

Common Lessons Learned: Best Avoided

- **Vendor documentation and recommendations often not optimized for System z.**
  - Creates confusion with personnel new to System z
- **Overzealous Proof of Concept Deliverables**
  - Don’t attempt to test everything in the house – just choose a room
- **Executive scope creeping**
  - Have a sponsoring manager interested in your success

Wrap Up

- Value proposition
- Colonizing with Linux Virtual Machines
- A great place for networking and data
- Strategies for using z/VM and Linux on System z
- Networking and data architectures
- Customer workloads
- Hints and Tips
- Best Practices

SFI's All-Stars

- **Experts in their craft**
- **Steve Gorman – CICS, DB2 SDSF and ACF2**
- **Rob Zenuk – CICS and DB2**
- **Peter Enrico – Capacity, Performance and Reporting**
- **Russ Evans – CICS Web Services**
- **David Kreuter – Linux on System z & z/VM**
  - ** 2007 SHARE Award for Excellence
- **Dave Jones – z/VM System Programmer**
- **Henrik Sandin – TWS & TDS**
- **Dave Bernheisel – OMEGAMON**
- **Paul Scaglione – System Automation**
- **Dan St. Cyr – Parallel Sysplex Expert – Installed the very first PS @ Verizon (Nynex)**
- **Tom Conley – Storage Expert**

Conclusion – SFI adds value!

- **SFI's Software Services**
  - Hire one consultant and access the knowledge of the entire Mainframe Software industry
  - Short and/or long-term assignments
  - Deliverables done correctly the first time in a fraction of the time
  - 100% customer satisfaction

Streamfoundry
Managing Process More Efficiently

Welcome comments or questions

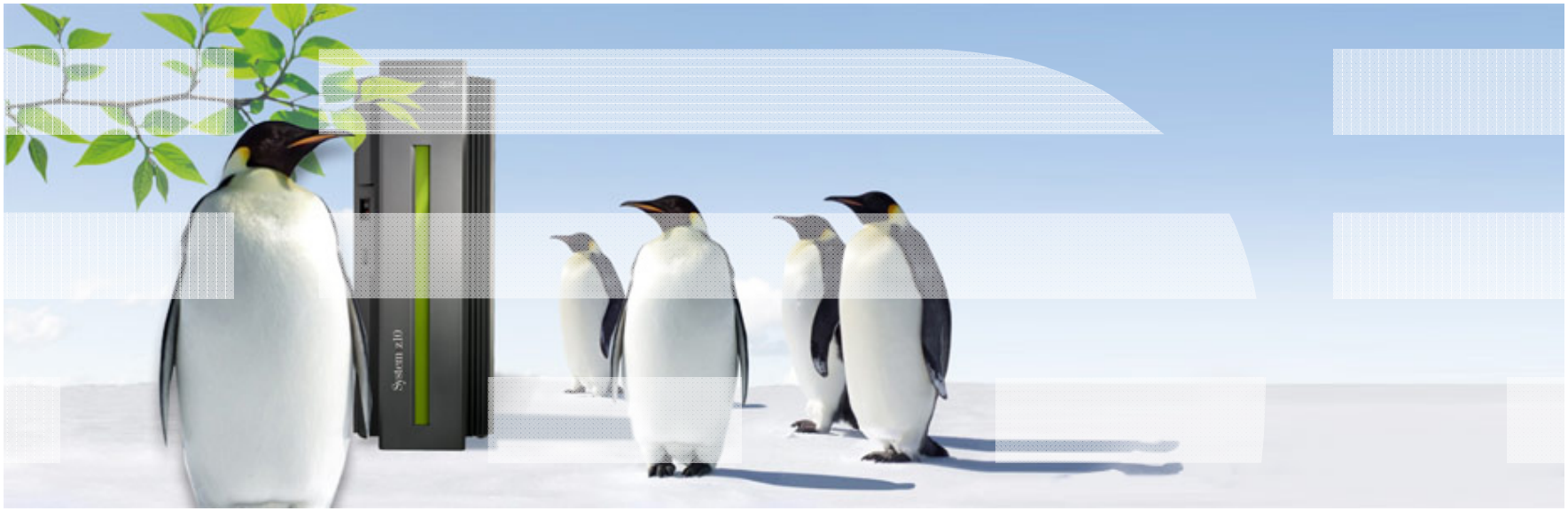
We appreciate your support.

Marc Heimlich, VP, Sales & Marketing

StreamFoundry, an IBM Business Partner

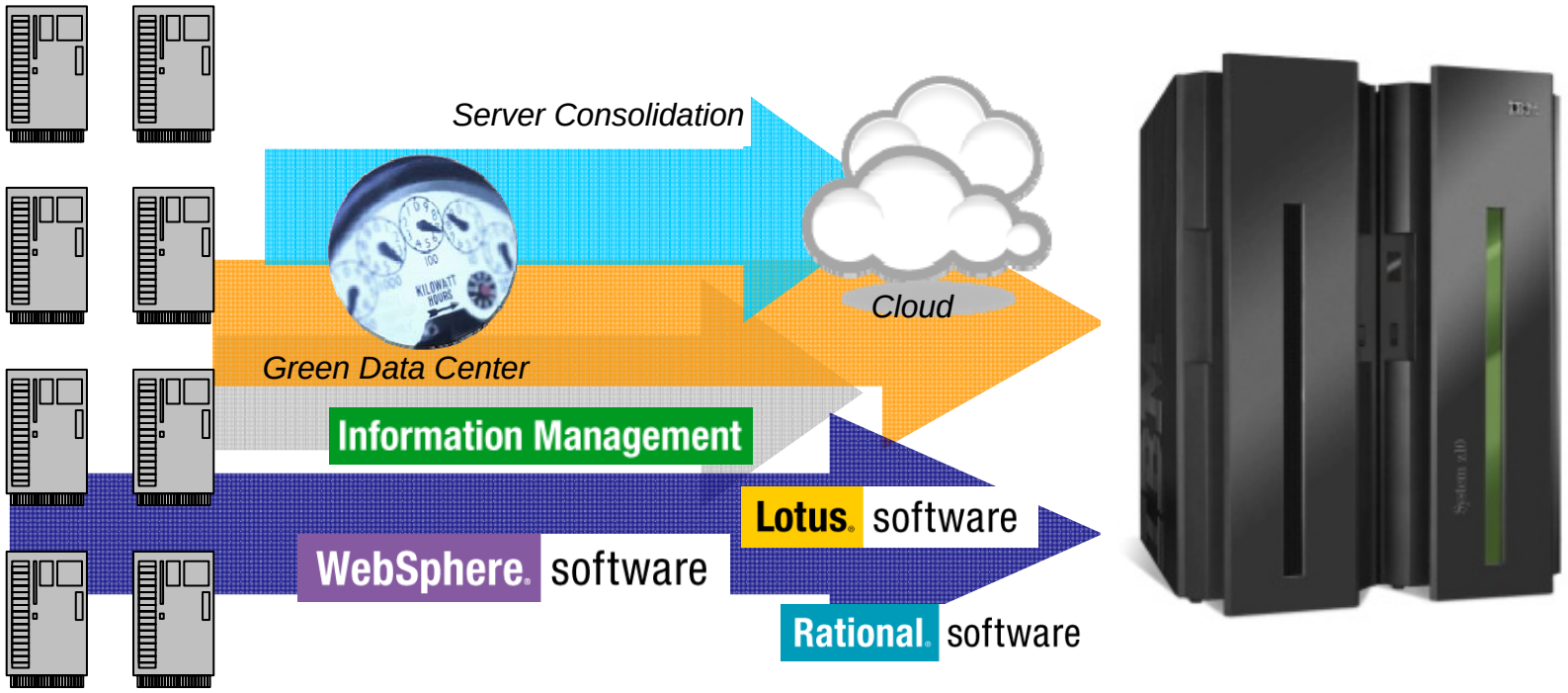
heimlich@streamfoundry.com or 781.272.4307

Solutions for Managing Virtualization



Moving Workload to System z

Why do clients move workloads to System z?



But, how do you manage this new environment? Tivoli. software

IBM Service Management

Enabling quality service delivery and business innovation

Visibility:
See your Business

Respond faster and make better decisions

Control:
Manage your Business

Manage risk and compliance

Automation:
Improve your Business

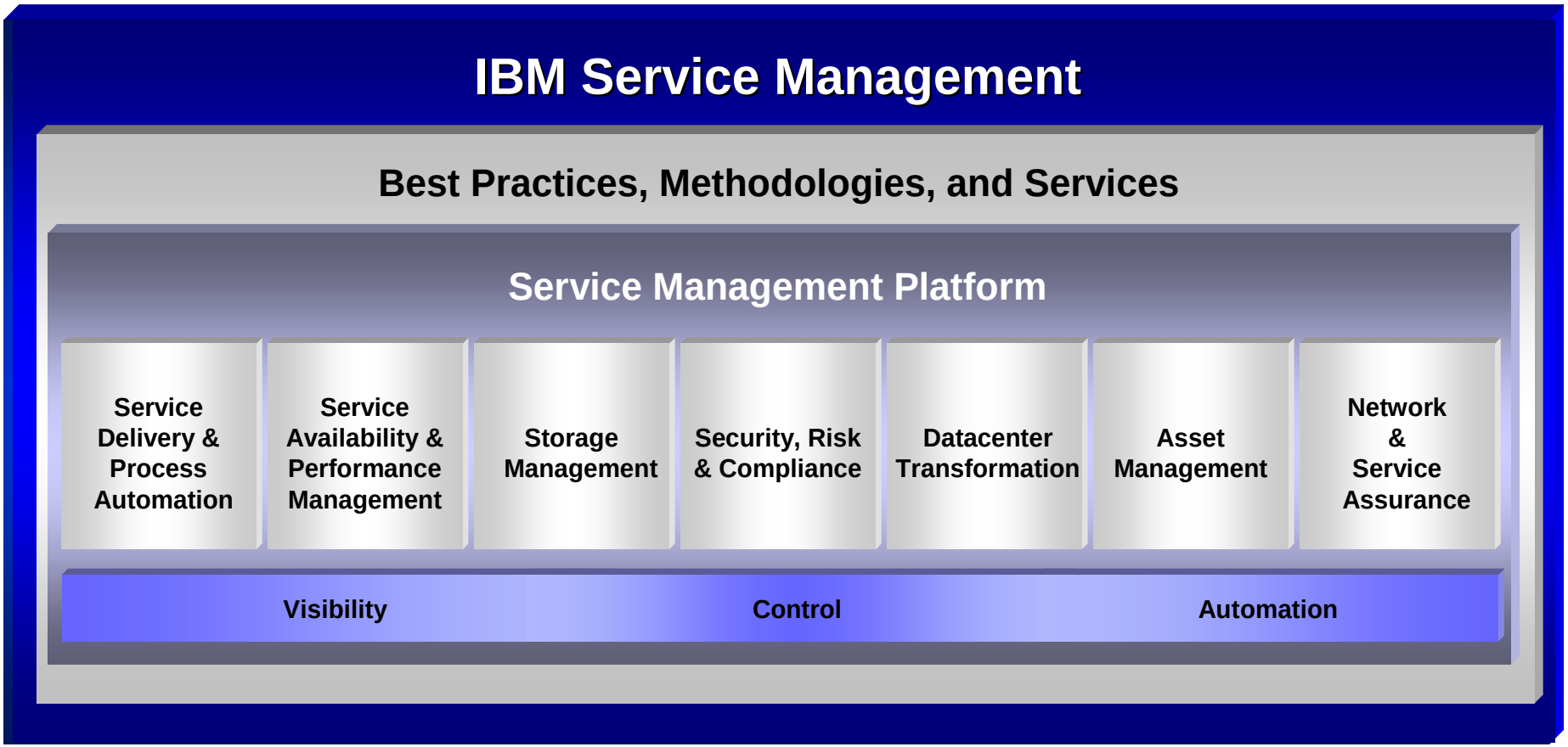
Lower costs and build agility

Simplify Service Management

Increase return on investment with differentiating value from IBM

- **Align IT objectives with business objectives**
  - Visualize service delivery and incident impact on line of business and key performance indicators
  - Automatically map application and IT infrastructure to line of business
- **Enforce ITIL management processes**
  - ITIL-based process automation solutions with common workflow engine and data platform
  - Standardize management processes and institutionalize best practices
- **Eliminate multiplicity of service management solutions**
  - Integrated, end-to-end process automation solutions that span the mainframe and distributed systems
  - Leverage best practice and standardize management processes enterprise-wide
- **Break down silos**
  - Integrate enterprise-wide processes, and reduce the frequency and impact of failed customer interactions

Service Management



IBM Service Management Center for System z

A service management and best practices model for System z clients

Manage your enterprise from System z

– **Enables System z as the Strategic Platform of Choice for managing the enterprise**

Integrate across service management & business delivery processes

– Improve visibility, reduces complexity and cost, increases efficiency

Incremental roadmap to transform to a green and cloud infrastructure

– Further realize cost savings, Increase flexibility and efficiency

Swiss Re – Reaching the Pinnacle of Mainframe Management

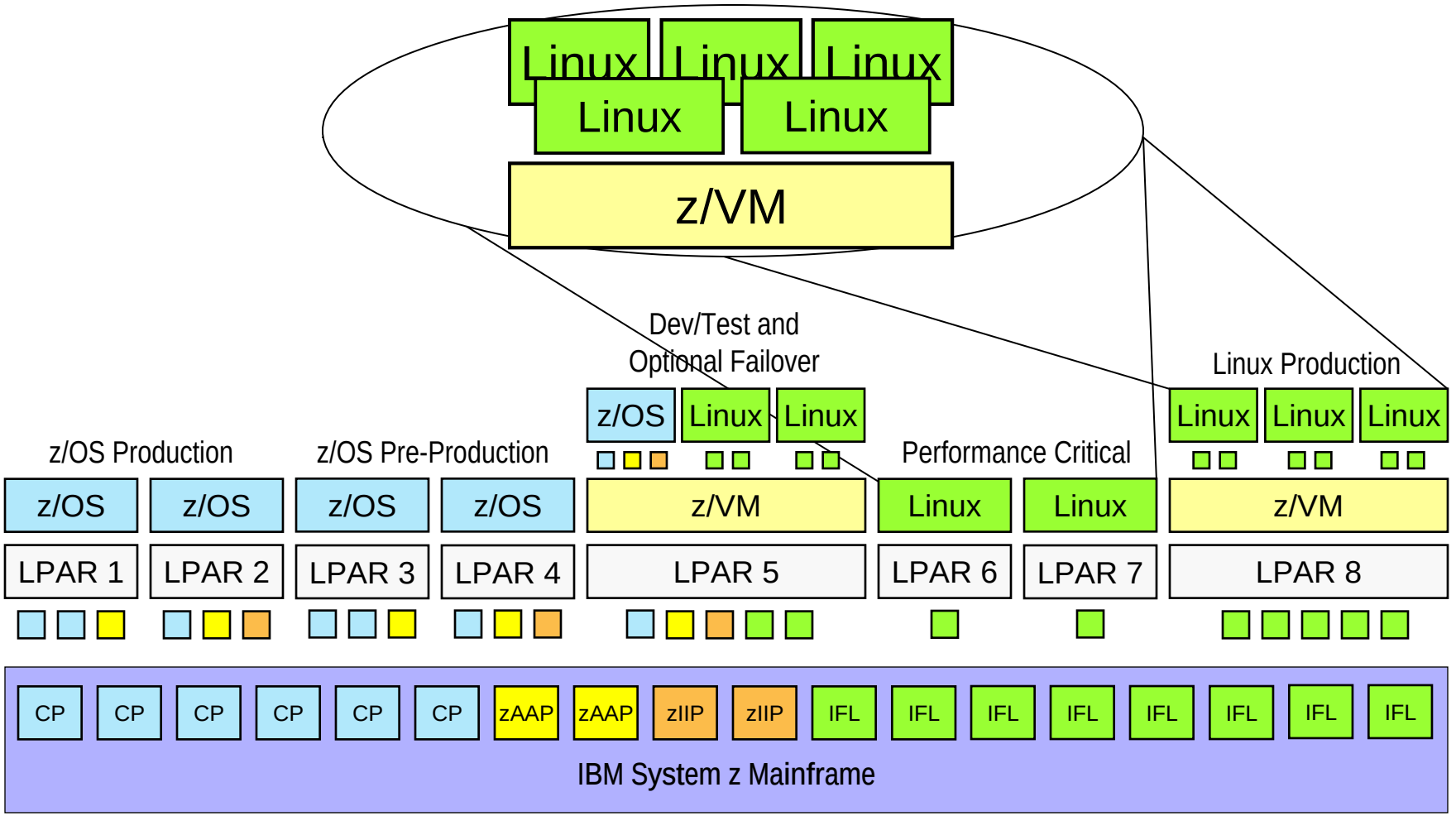
- **Client Needs:**
  - Move from a siloed, manual approach in managing key IT processes to an end-to-end service management model in which IT processes are standardized, automated and aligned with business needs
  - Tremendous pressure to meet the rapid growth due to acquisitions without increasing the budget
- **Solution:**
  - Centralized and proactive health based performance management across mainframe and distributed environments
  - Automatically identifies and fixes performance issues
  - Fully automated deployment solution
- **Client Benefits:**
  - Able to accommodate the 300% growth in the past few years with the same budget
  - Reduced problem resolution time from several days to less than one day
  - Cut number of unsolved problems to virtually zero
  - Achieved 99.999% availability of mainframe environment while cutting operating costs
  - Developers can forecast new infrastructure requirements, communicate them to IT staff and gain approval early in the process to avoid unnecessary delays

Industry: Insurance

"IBM is the only company covering the whole scope we wanted to address, from business process design to application development to operational infrastructure. Because Tivoli Provisioning Manager software can be integrated in the planning process and applications can be deployed automatically without manual intervention, we can improve staff productivity and accelerate deployment times"

- Heinrich Waldhier, director of global processes, IT, Swiss Re

z/VM and Linux on System z



Basic Requirements

Core Systems Management Disciplines

- **Security**
- **Asset Management**
- **Monitoring**
  - Availability
  - Performance
  - Event Management
- **Automation**
  - Application Automation
  - Operational Automation
- **Other**
  - Storage Management
    - Backup/Archive
  - Discovery

Security

The world is riskier than it used to be …

Massive insider breach at DuPont
February 15, 2007
By: Larry Greenemeier

TJX data breach: At 45.6M card numbers, it's the biggest ever
March 29, 2007
By: Jaikumar Vijayan

COMPUTERWORLD

Blackberry outage widespread
February 14, 2007
By Marcia Walton

CNN

Black Friday Turns Servers Dark at Walmart, Macy's
November 25, 2006
By: Evan Schuman

eWEEK
THE ENTERPRISE NEWSWEEKLY

Bill would punish retailers for leaks of personal data
February 22, 2007
By Joseph Pereira

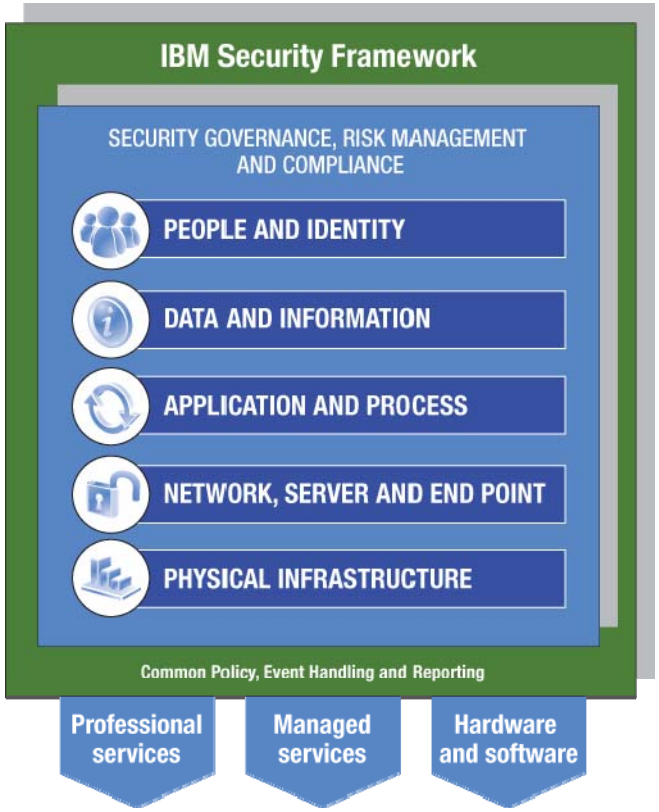
THE WALL STREET JOURNAL.

What is at risk?

- Intellectual Property
- Legal and Regulatory Exposures
- Cost of Remediation
- Business Disruption
- Your Customer Information
- Your Brand
- Customer Confidence
- Your Job

Tivoli Security Solutions

IBM Tivoli Security delivering on the IBM Security Strategy

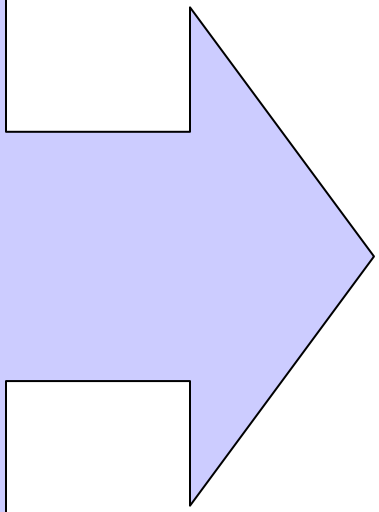


- **Identity and Access Assurance**
  - Reduce cost and risk by easing the onboarding and offboarding of users, reporting on user activity and ongoing certification
- **Data and Application Security**
  - Protect business information and reputation by safeguarding data in use or at rest
- **Security Management for System z**
  - Improve mainframe security administration and enable integrated mainframe and distributed security workloads

Identity and Access Assurance

Tivoli Capabilities:

- User provisioning and role management
- Unified single-sign-on
- Privileged user activity audit and reporting
- Directory and integration services
- Log Management
- Self-service password reset
- Identity Assurance / Strong authentication management



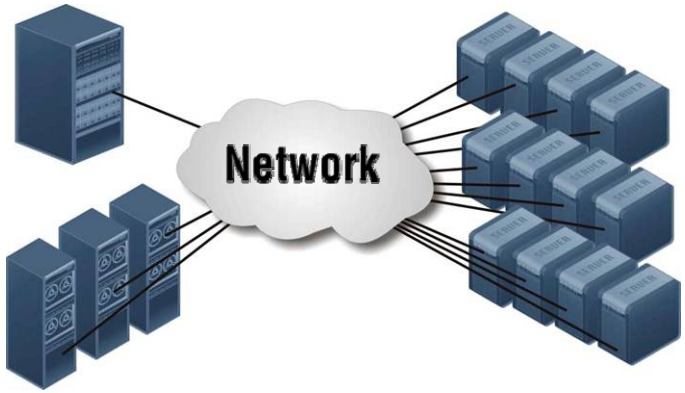
Benefits:

- Reduce help desk operating expenses
- Comply with regulations
- Improve user productivity
- Reduce risk from privileged insiders
- Respond quickly to business initiatives (e.g. new applications, M&A, restructuring)

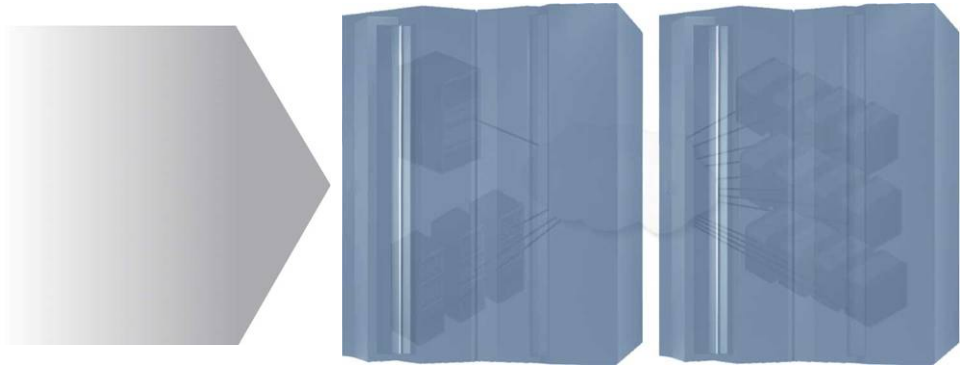
Asset Management

Virtualization: Significant advantages / new challenges

From Dedicated Systems, Storage, Applications …



… to Shared Virtualized Environments and SOA



- **Advantage:**
  - More simple to account for with a spreadsheet – one machine, one workload, and one cost center
- **Challenges – Resources are highly underutilized which means:**
  - Paying more for hardware and software
  - Unnecessarily high energy costs
  - Using more real estate than required
  - More assets that are harder to track, manage, and maintain
  - Inflexible to varying peak in demand

- **Advantages:**
  - Better utilization of existing resources so future investments can be deferred
  - More cost effective – hardware, software, energy, staff, and floor space
  - More responsive to differing peak loads
- **Challenges:**
  - How to allocate costs
  - Prove to the users they're getting what they deserve

Dilemma solved with TUAM!!

What is needed to do Usage & Accounting?

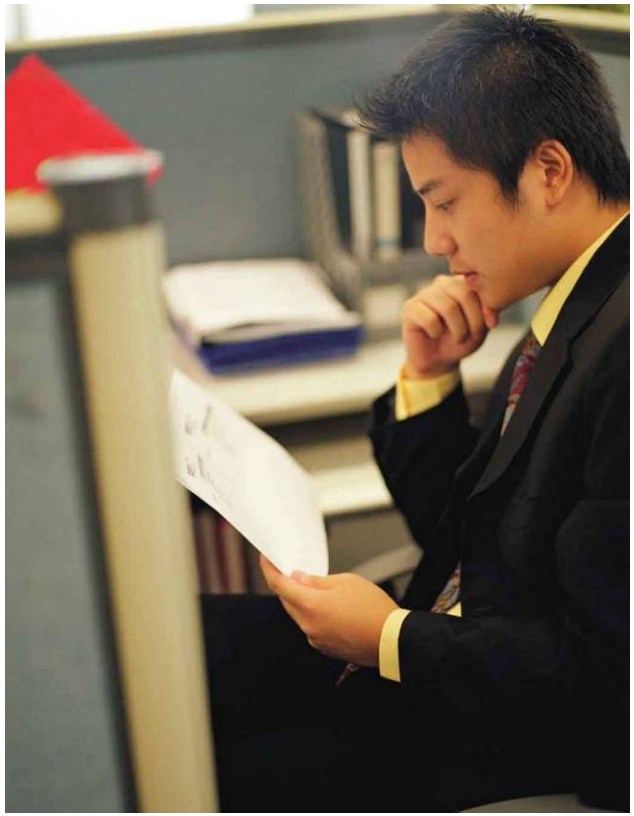
Three variables to the equation

Align IT Software Spending with Business Priorities	Capability
Who is consuming which IT resources?	Data collectors for IT infrastructure can review consumption across multiple dimensions
What is the cost of those resources, including those that are shared?	Costing engine assigns cost to resource usage
How should IT allocate cost for chargeback, ROI, costing analysis, and reporting/billing?	Costing and reporting engine associates and report usage costs to consumers of IT resources

All three questions help align IT spending with business priorities

Tivoli Usage Accounting Manager capabilities can help realize immediate benefits

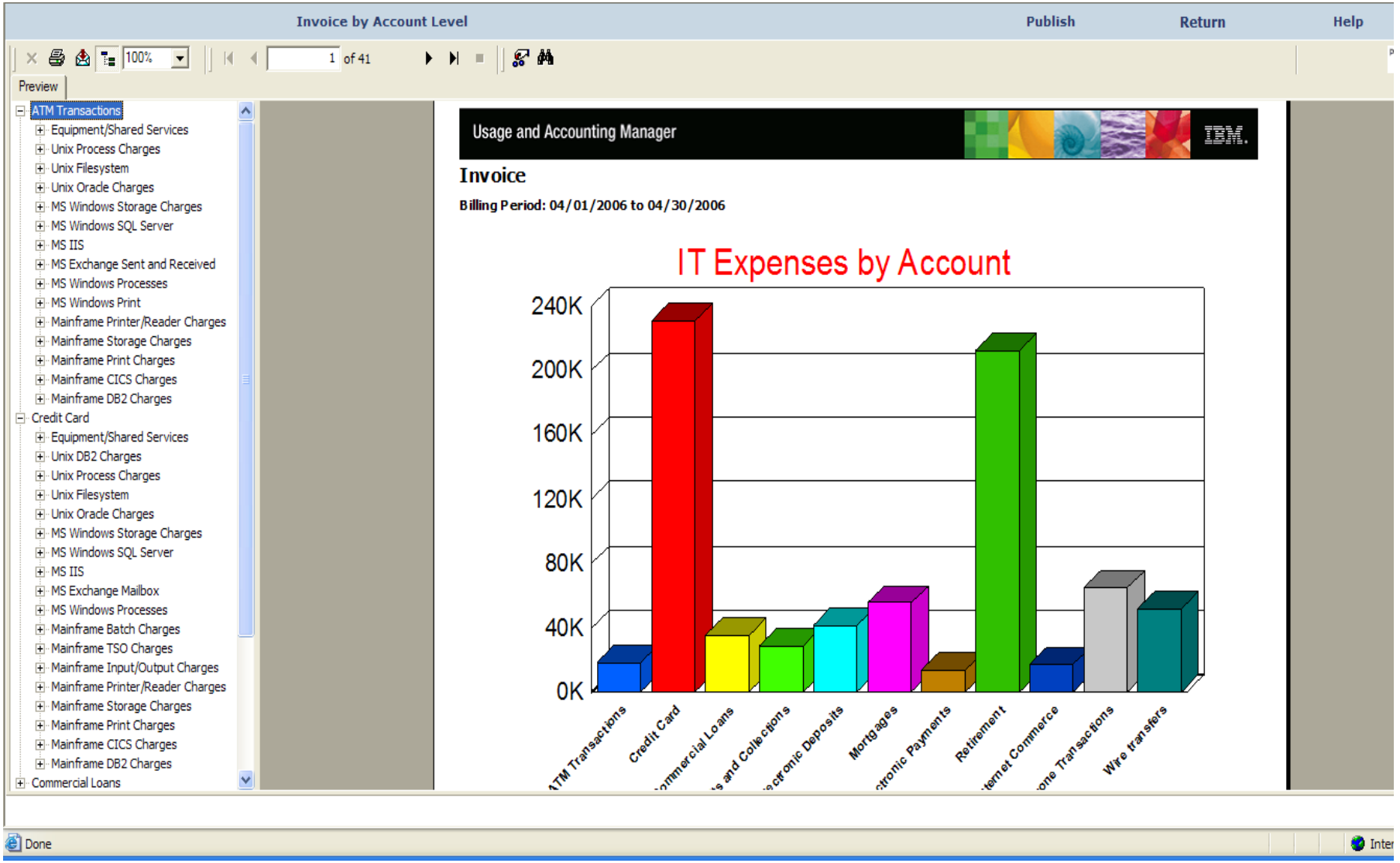
- **Increase Client (Business Units) Satisfaction**
  - Real Usage = Accurate Reporting
  - Accountability = Improved services
  - Alignment between Business and IT costs
- **Lower Infrastructure Cost**
  - Reduced server sprawl
  - Higher utilization
  - Rationalization of resources
- **Continued Infrastructure Improvement**
  - Understanding costs can lead to managing costs
  - Usage comparisons can lead to more effective investments



When running a business, nothing matters more than knowing how much something costs.

You can't manage what you don't measure!

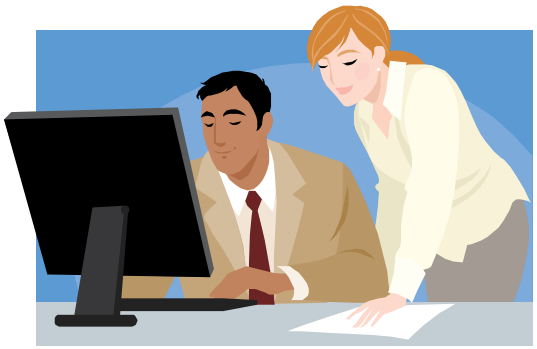
Tivoli Usage and Accounting Manager



Availability & Performance Management

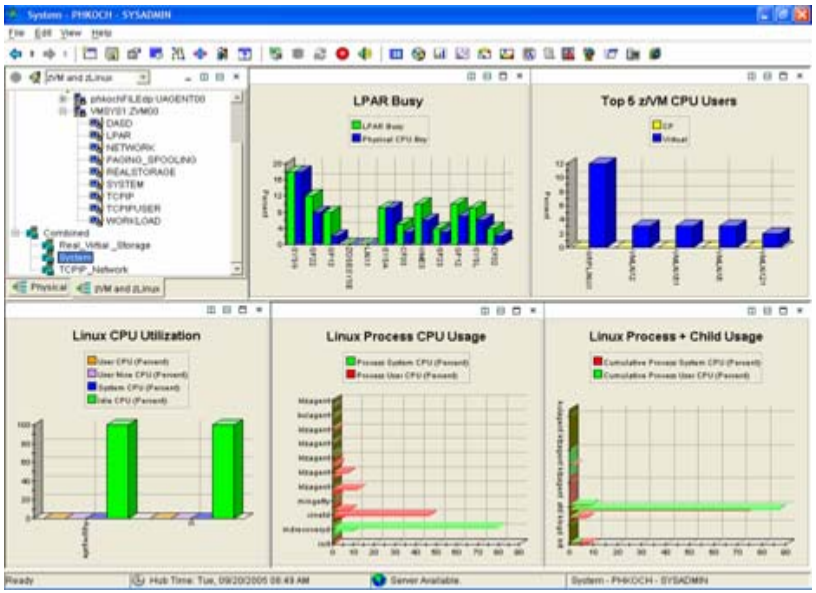
What Should Performance Management Provide?

- Problem identification and isolation
- Alerting and notification
- Automation
- Historical trends
- Relationship to applications
- Event correlation
- Problem tracking
- Flexibility



OMEGAMON XE on z/VM and Linux

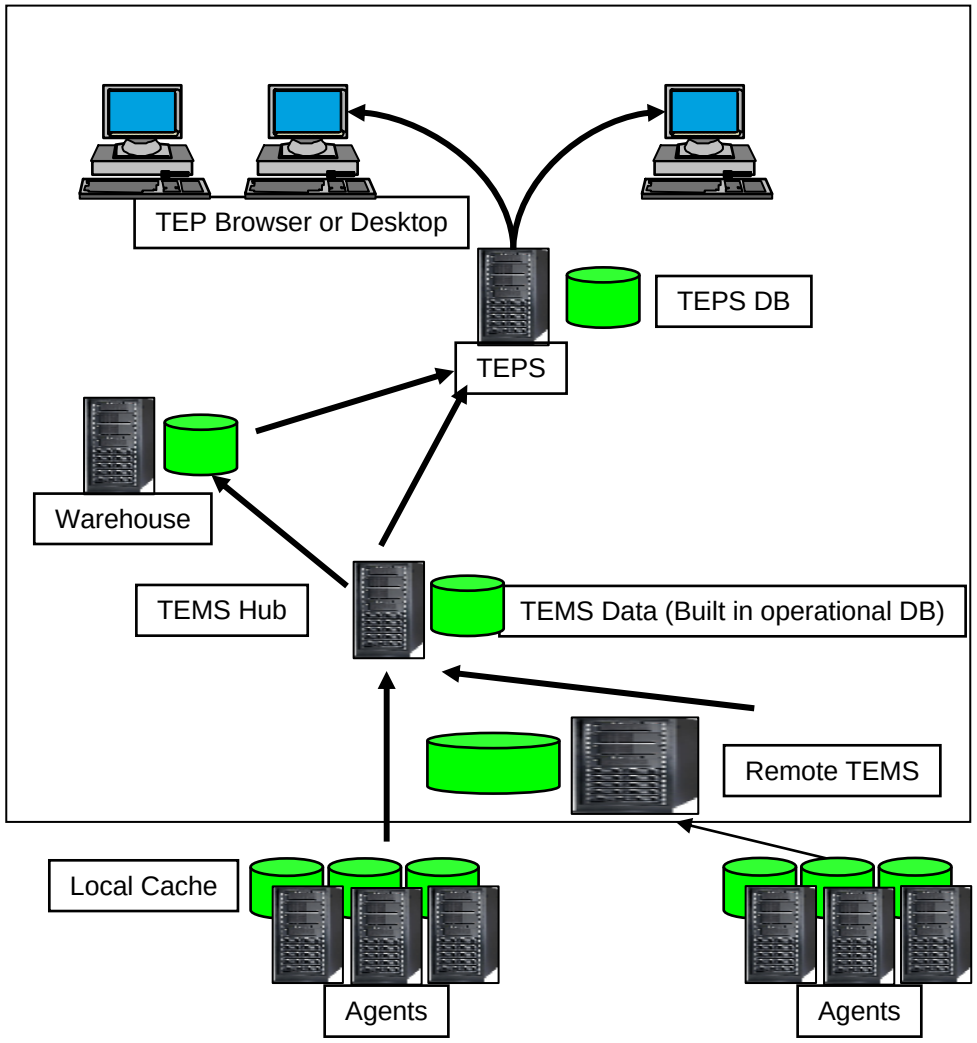
- **Monitors z/VM and Linux on System z**
- **Provides workspaces that display**
  - Real time and historical views
  - Overall System Health
  - Workload metrics for logged-in users
  - Individual device metrics
  - LPAR Data
- **Composite views of Linux running on z/VM**
- **Single workstation to view alerts and perform situational analysis**
- **Leverages the VM Performance Toolkit**
- **Integration:**
  - z/VM and Linux in common view
  - Enterprise monitoring in a single view
  - Dynamic Workspace Linking



Metrics required to Manage z/VM and Linux

- **z/VM**
  - Processors
  - SYSTEM Utilization
  - Workload (z/VM User ID)
  - LPAR Utilization
  - PAGING and SPOOLING Utilization
  - DASD
  - Minidisk Cache
  - Channels
  - CCW Translation
  - REAL STORAGE Utilization
  - NETWORK Utilization (HiperSockets and Virtual Switch)
  - TCPIP Utilization – Server
  - TCPIP Utilization - Users
- **Linux**
  - Linux OS
  - System Information
  - Process
  - Users
  - Disk Usage
  - File Information
  - Network

TMS/OMEGAMON XE Architecture Overview



Key:

TEP – Tivoli Enterprise Portal
TEPS – Tivoli Enterprise Portal Server
TDW – Tivoli Data Warehouse
TEMS – Tivoli Enterprise Monitoring Server
TEMA – Tivoli Enterprise Monitoring Agent

Monitoring Infrastructure

Automation Using Operations Manager for z/VM

Operations Manager for z/VM

- **Increase productivity**
  - Authorized users view and interact with monitored virtual machines without logging onto them
  - Multiple users view/interact with a virtual machine simultaneously
- **Improve system availability**
  - Monitor virtual machines and processes
  - Take automated actions based on console messages
  - Reduce problems due to operator error

- View & interact with consoles
- View spool files

Monitor spool usage

Console monitoring

Service Virtual Machine being monitored

Operations Manager for z/VM

Take action

Service Virtual Machine being monitored

Schedule tasks

Console monitoring

- **Automation**
  - Routine activities done more effectively with minimal operations staff
  - Schedule tasks to occur on a regular basis
- **Integration**
  - Fulfill take action requests from OMEGAMON XE on z/VM and Linux

Monitor Service Machine Consoles

Operations Manager

Test Data
TEST Message 1
TEST Message 2
TEST Message 3
…

OPERATOR
OPER Message 1
OPER Message 2
OPER Message 3
…

LINUX
LNX Message 1
LNX Message 2
LNX Message 3
…

TCP/IP
TCP Message 1
TCP Message 2
TCP Message 3
…

syslog data
slog Message 1
slog Message 2
slog Message 3
…

Data space 1
TEST Message 1
TEST Message 2
…

Data space 2
OPER Message 1
OPER Message 2
…

Data space 3
LNX Message 1
LNX Message 3
…

Data space 4
TCP Message 1
TCP Message 2
…

Data space 5
slog Message 1
slog Message 2
slog Message 3
…

Data space 6
OPER Message 1
LNX Message 1
LNX Message 2
TCP Message 1
slog Message 1
slog Message 2
TEST Message 1
OPER Message 2
…

Daily log
DIRM Message 1
LNX Message 1
LNX Message 2
TCP Message 1
DIRM Message 2
TCP Message 2

Monitor Service Machines & Guests

- **Define rules to**
  - Scan console messages for text matching
    - Includes column, wildcard, and exclusion support
    - Optionally restrict to specific user ID(s)
  - Take actions based on matches
- **Multiple rules can apply to one message**
  - Rules processed in order of definition in the configuration file
  - FINAL option available to indicate no additional rules should be evaluated

Adjusting Resources for a Linux Guest

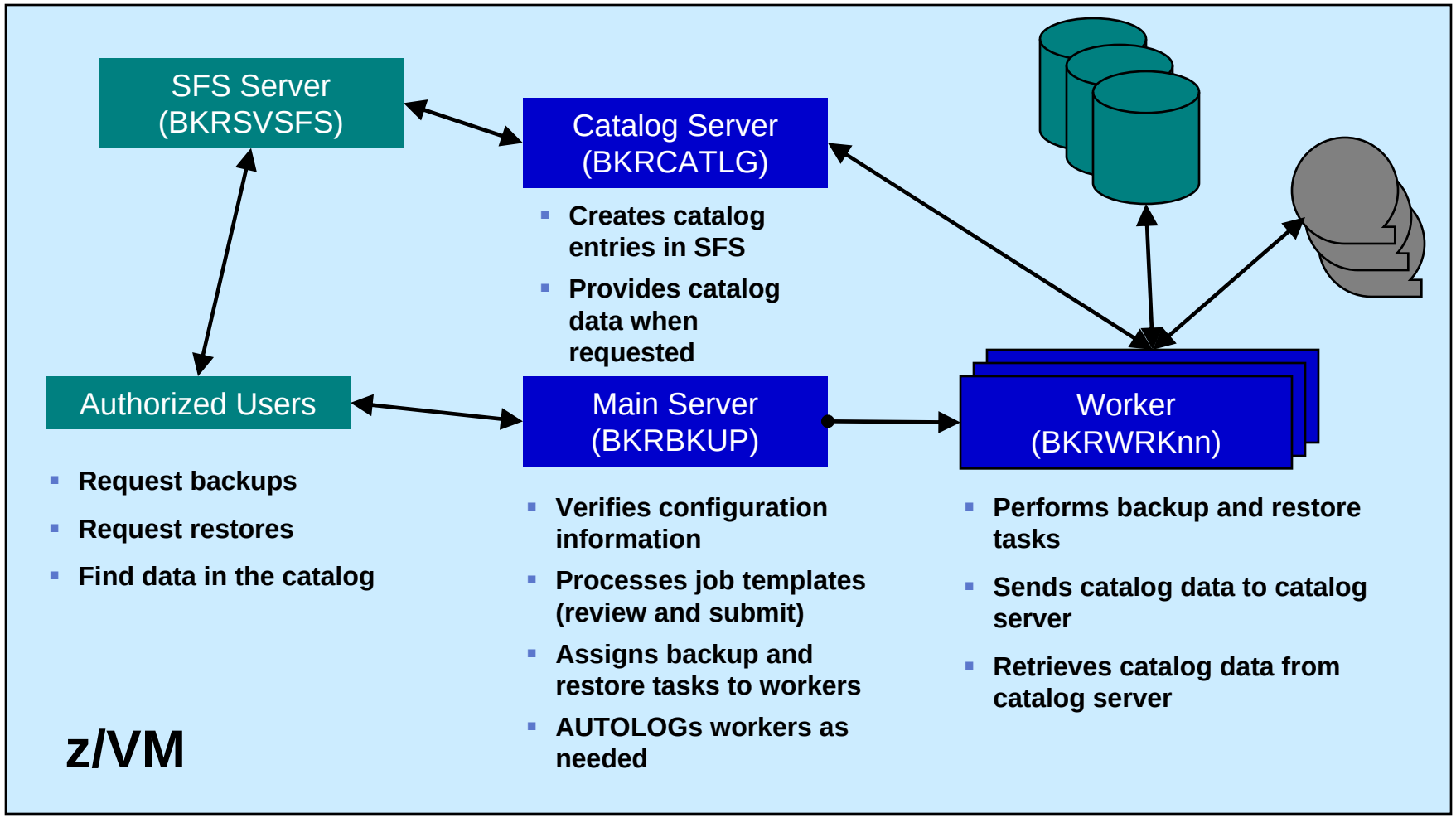
- **Virtual CPU consumption is high for a Linux guest**
- **Detect the alert**
  - Automation receives the message
- **Action is triggered by a rule in Operations Manager**
- **Operations Manager issues CP commands to tune the guest**
  - SET QUICKDSP
  - SET SHARE
- **Ability to monitor the output is key**

Backup and Recovery

Backup and Restore Manager for z/VM – Product Overview

- **Backup**
  - Requested by administrators
  - Full or incremental
  - Flexible selection of disks and files to back up
  - Review job before submitting for backup
  - Catalog housed in Shared File System
- **Restore**
  - Performed by users for their own data
  - Extending to other users available via exit
  - Performed by administrators for any data
  - Selection of data to restore
  - Full screen interface or commands
- **Integration with Tape Manager for z/VM**
- **Optional compression of data during backup**
  - Call your own compression algorithm
  - Use IBM provided routine
- **Encryption exits available**
  - Call your own routine
  - Use IBM or other vendor written routine

Backup and Restore Manager Service Machines



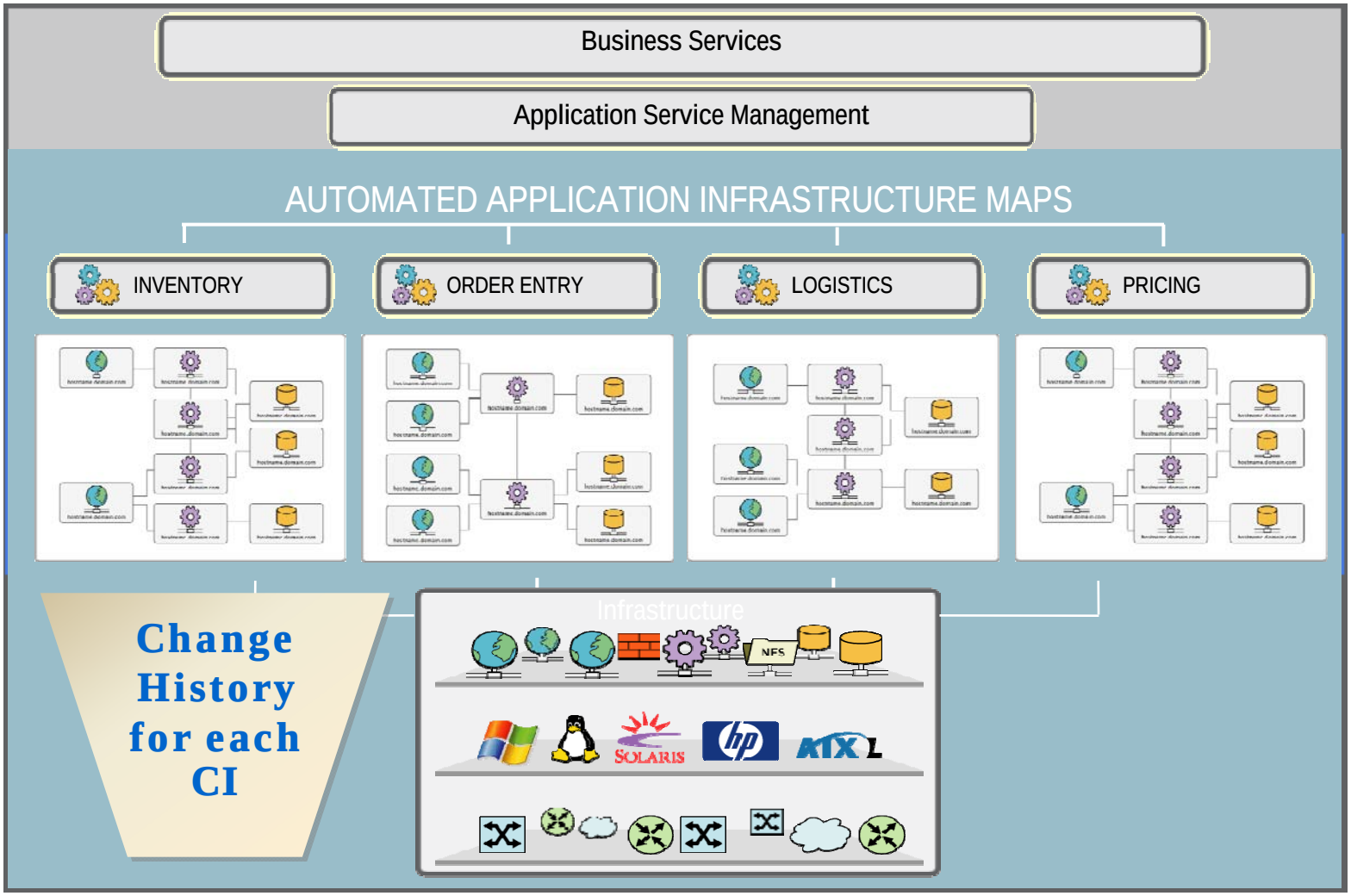
Backup and Restore Manager for z/VM – Summary

- **Use Backup and Restore Manager to**
  - Perform file-level backups of z/VM data
  - Perform image level backups on non-z/VM guest data
  - Perform disaster recovery backups of entire system
  - Easily find and restore data as needed
  - Manage retention of backup data

Other Service Management Disciplines

TADDM's Configuration Auditing provides the changes

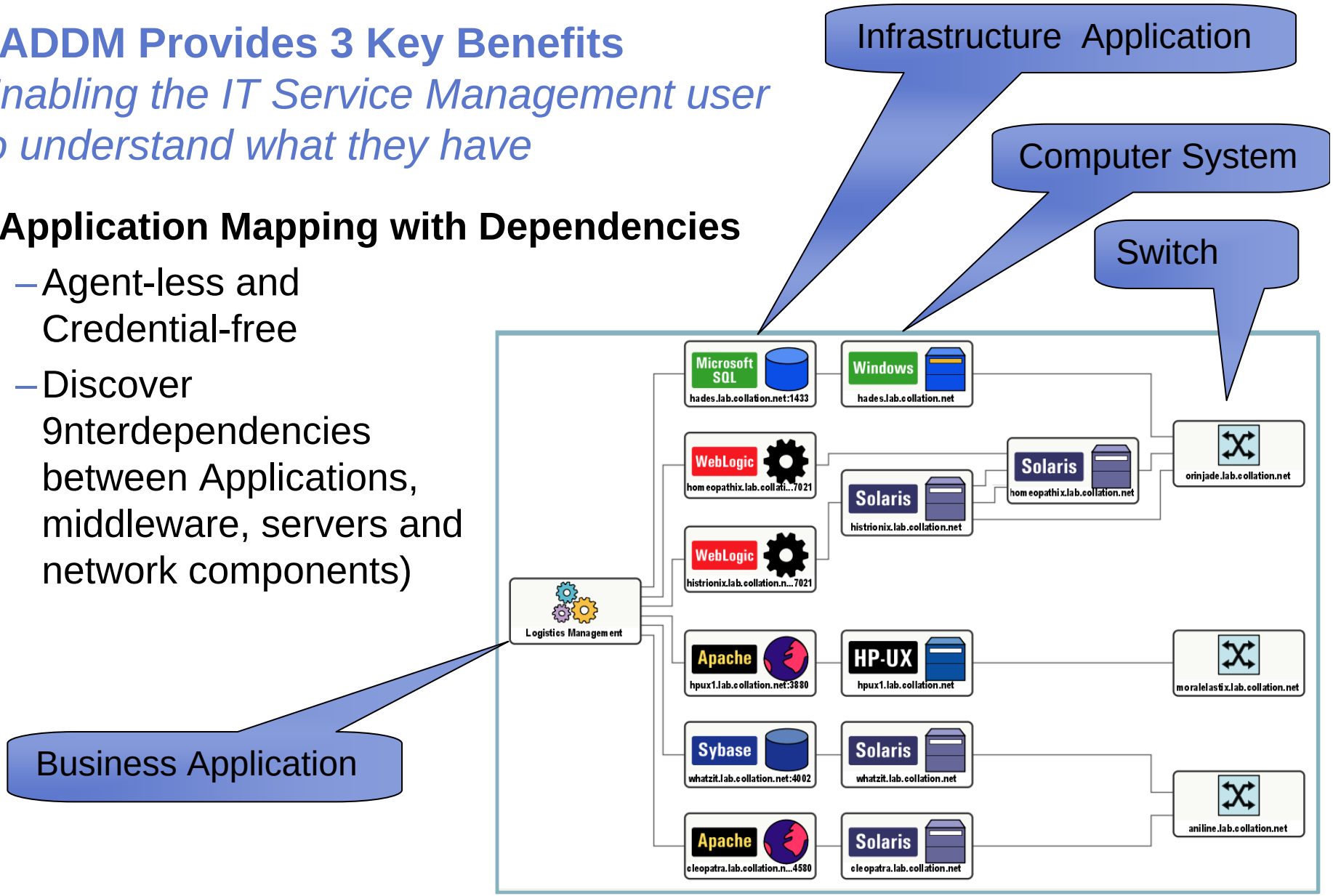
Together you can see the impact of changes … across your dependencies



TADDM Provides 3 Key Benefits

Enabling the IT Service Management user to understand what they have

- **Application Mapping with Dependencies**
  - Agent-less and Credential-free
  - Discover 9nterdependencies between Applications, middleware, servers and network components)



TADDM Provides 3 Key Benefits

Enabling the IT Service Management user to learn how their CIs are configured

- **Configuration Auditing**
  - Tracks changes in applications
  - Depicts that information on the map
  - Depicts that information thru reports

Automatically tracks changes on all CIs & attribute values over time…

Application

Type	Component	Change	Date	Attribute	Old Value	New Value
Apache	homeopathix.lab.collati	Updated	12/04/2004 15:01 PST	appDescriptors		/usr/local/apache/appd
Apache	homeopathix.lab.collati	Updated	12/04/2004 15:01 PST	appDescriptors		/usr/local/apache//app
ApacheWebContainer	homeopathix.lab.collati	Updated	12/04/2004 15:01 PST	ApacheWebContainer	/usr/local/apache/	/usr/local/apache
ApacheWebContainer	homeopathix.lab.collati	Updated	12/04/2004 15:01 PST	ApacheWebContainer	15	20
ApacheWebContainer	homeopathix.lab.collati	Updated	12/04/2004 15:01 PST	ApacheWebContainer	88	100
ProcessPool	homeopathix.lab.collati	Updated	12/04/2004 15:01 PST	homeopathix.lab.collati	/usr/local/apache//bin	./httpd -d /usr/local/a

TADDM Provides 3 Key Benefits

Enabling the IT Service Management user to determine if it is compliant

- **Compliance**
  - Compare configuration to “reference master”
  - Compare to your standard policy

Comparing two instances of an Apache Web Server to the reference master

Values in red and blue are policy violations

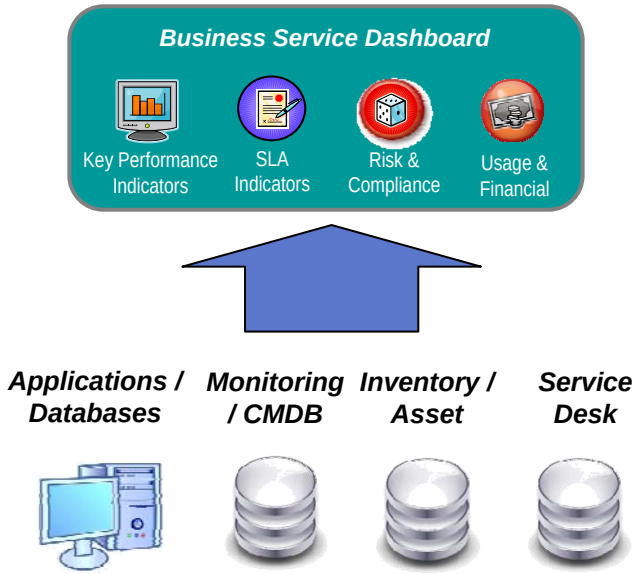
	hpux1.lab.collation.net:4880 - Version:Current	utah.lab.collation.net:4880 - Version:Current	utah.lab.collation.net:3880 - Version:Current
Primary SAP			
Listening Port	4880		3880
Product Version	Apache/1.3.26 (Unix)	Apache/1.3.9 (Unix)	
Process Pools			
Hpux1.lab.collation.net:4880			
Arguments	/opt/apache13/bin/httpd -d /opt/apache13 -R /opt/apache13/l...	/home/jwang/apache/apache_1.3.9/bin/httpd -d /home/jwang...	/home/jwang/apache/testserver4/bin/httpd -d /home/jwang/a...
Product Name	Apache/1.3.26 (Unix)	Apache/1.3.9 (Unix)	
Config Contents			
Httpd.conf			
Permissions	-rwxr-xr-x	-rw-r--r--	-rw-r-----
Last Modified	[Not Set]	04/15/2004 22:24 PDT	02/24/2005 16:33 PDT
Size	37404	31660	36609
Checksum	+8MD5CmmRS7Ea6eNtx+npQ==	bKbFu12LwsAWsQkboI8sAg==	GVzu+7w4L+HvhaNxKuMMOw==
Containers			
Apache Web Container			
Keep Alive Timeout	15	55	
Max Spare Servers	10	20	
Virtual Hosts			
Hpux1.lab.collation.net:4880	hpux1.lab.collation.net:4880	[Not Set]	[Not Set]
Spartakis.lab.collation.net:3880	[Not Set]		spartakis.lab.collation.net:3880
Spartakis.lab.collation.net:4880	[Not Set]	spartakis.lab.collation.net:4880	
Shannon.unixpeople.com:4880	[Not Set]	shannon.unixpeople.com:4880	
Server Root	/opt/apache13	/home/jwang/apache/apache_1.3.9	/home/jwang/apache/testserver4
Max Clients	150	50	
Timeout	300	500	
Max Keep Alive Requests	100	50	
Score Board File	/opt/apache13/logs/httpd.scoreboard	/home/jwang/apache/apache_1.3.9/logs/httpd.scoreboard	
PID file	/opt/apache13/logs/httpd.pid	/home/jwang/apache/apache_1.3.9/logs/httpd.pid	
Start Servers	5	8	
Min Spare Servers	5	10	
Name	hpux1.lab.collation.net	utah.lab.collation.net	utah.lab.collation.net

Business Service Dashboard: Integrated Visibility & Context

Service Tree

	State	Total Users Today	Total Users Last Hour	Avg. User Response Time (sec)	Baseline Response Time (sec)	Current Resp. Time vs. Acceptable (%)	Derived Productivity Gain (min.)	Daily Avail. %	Downtime Today	SLA Penalty	Transactions - Last Hour	Transactions - Last 24 Hours	Tickets - Last 24 Hours
Billing		452899	29874	1.209 sec.	2.477 sec.	48%	631.0 min. saved	84.146 %	3 hours, 48 min.	$24730.69	15827.0	283968.0	44.0
Credit Verification		20534	1065	0.746 sec.	0.149 sec.	500%	10 min. lost	85.027 %	3 hours, 35 min.	$23354.86	1677.0	30355.0	41.0
Logistics Management		48477	2978	0.697 sec.	0.568 sec.	122%	6 min. lost	95.743 %	1 hours, 1 min.	$6640.83	2496.0	71472.0	42.0
Order Management		159778	9128	3.556 sec.	5.924 sec.	60%	360.0 min. saved	93.672 %	1 hours, 31 min.	$9869.16	11442.0	230836.0	34.0

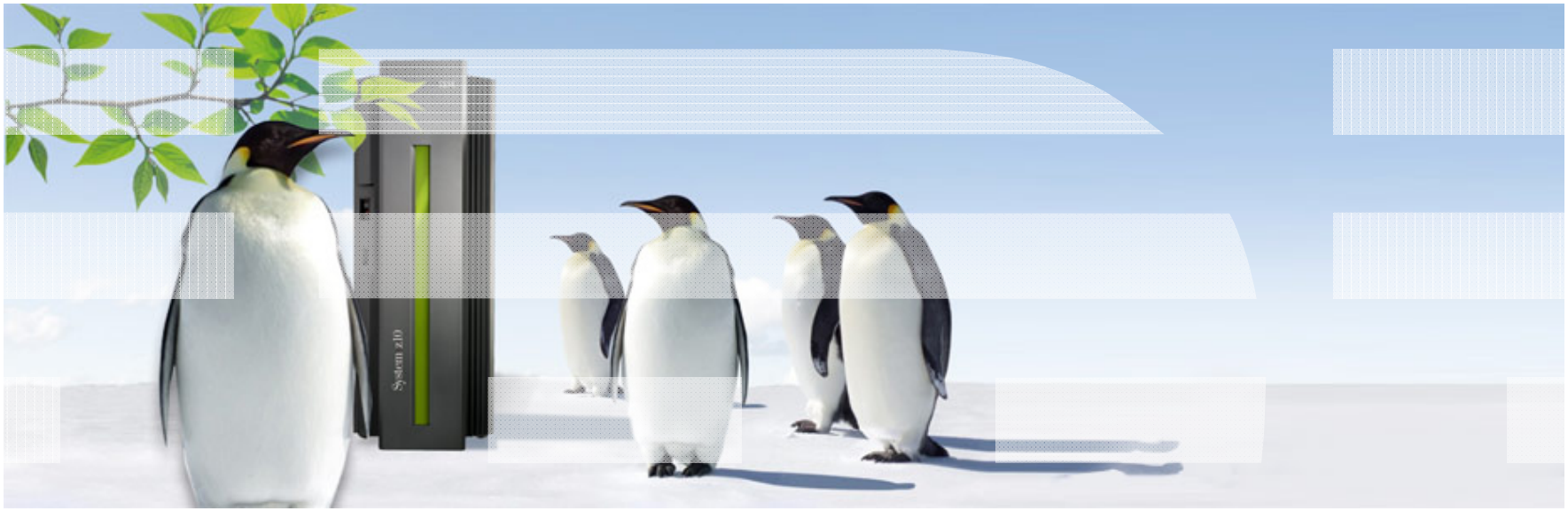
- **Measuring and Improving Delivery Against Objectives:**
  - Key Performance Indicators:
    - e.g. Transactions, Revenue, MTTR, Call Volume
  - SLA Indicators:
    - e.g. Customer Experience, Service Uptime, Transaction Rate, Infrastructure
  - Risk & Compliance Indicators:
    - e.g. Cobit, ISO, SOX, Basel II
  - Usage & Financial Indicators:
    - e.g. Service usage by LOB, Power by Service, IT cost per service



Core Systems Management Disciplines

- **Security**
- **Asset Management**
- **Monitoring**
  - Availability
  - Performance
  - Event Management
- **Automation**
  - Application Automation
  - Operational Automation
- **Other**
  - Storage Management
    - Backup/Archive
  - Discovery

Best Fit Applications for a Virtualized Environment



Take back control of your IT infrastructure

A data center in a box – not a server farm

- **Potentially lower cost of operations**
  - Less servers
  - Fewer software licenses
  - Fewer resources to manage
  - Less energy, cooling and space
- **Central point of management**
- **Increased resource utilization**
- **Fewer intrusion points**
  - Tighter security
- **Fewer points of failure**
  - Greater availability

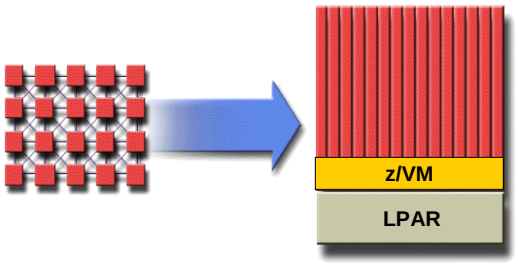
Linux on IBM System z

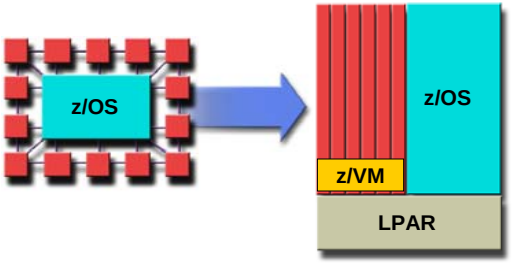
Linux + Virtualization + System z = SYNERGY

- **The legendary IBM mainframe – IBM System z**
  - Legendary dependability
  - Extremely security-rich, highly scalable
  - Designed for multiple diverse workloads executing concurrently
  - Proven high volume data acquisition and management
- **The IBM mainframe virtualization capabilities – z/VM**
  - Support for large real memory and 32 processors
  - Enhanced security and LDAP server/client
  - Enhanced memory management for Linux guests
  - Enhanced management functions for Linux
- **Open standards operating system – Linux for System z**
  - Reliable, stable, security-rich
  - Available from multiple distributors
  - Plentiful availability of skills administrators and developers
  - Large selection of applications middleware and tooling from IBM, ISVs and Open Source

What is Linux on System z?

- **A native mainframe operating environment**
  - Exploits IBM System z hardware
  - Not a unique version of Linux
- **Application sourcing strategy**
  - The IBM commitment to z/OS is not affected by this Linux strategy
  - Customers are offered additional opportunities to leverage their investments through Linux
  - New doors are opening for customers to bring Linux-centric workloads to the platform



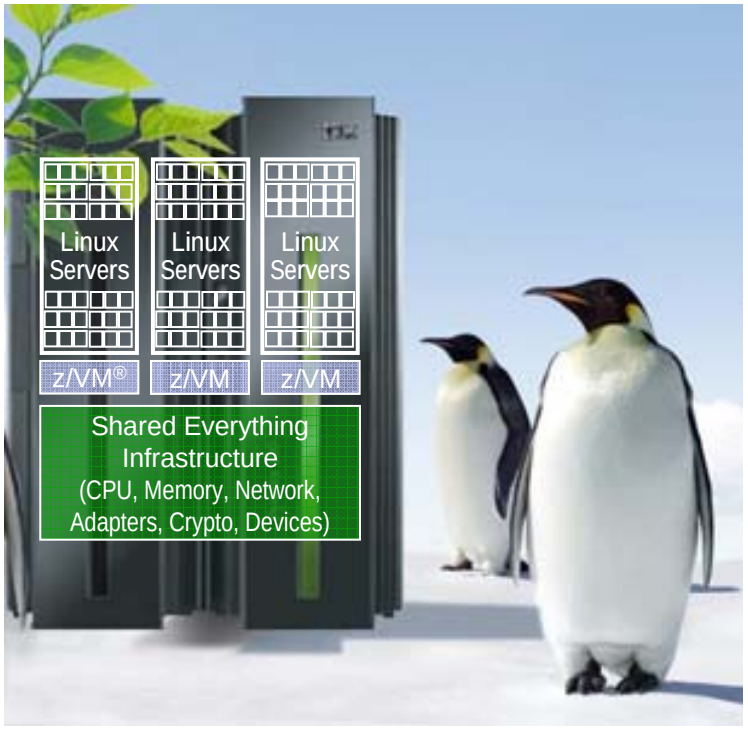


What System z brings to Linux

- **The most reliable hardware platform available**
  - Redundant processors and memory
  - Concurrent operations
  - Error detection and correction
  - Remote Support Facility (RSF)
- **Designed to support mixed work loads**
  - Allows consolidation while maintaining one server per application
  - Complete work load isolation
  - High speed inter-server connectivity
- **Scalability**
  - zEnterprise System 196 (z196) scales to 80 application processors
  - System z10 EC scales to 64 application processors
  - System z10 BC scales to 10 application processors
  - Up to 14 (z196), 11 (z10 EC), 2 (z10 BC) dedicated I/O processors
  - Hundreds to thousands of Linux virtual servers

What is different about Linux on System z?

- **Access to System z specific hardware**
  - Crypto support – CPACF, CryptoExpress2, CryptoExpress3
  - Traditional and Open I/O subsystems
    - Disk (ECKD or SCSI) and tape
    - DS8000, XIV
    - SAN Volume Controller
  - OSA-Express2 and OSA-Express3 for very high speed communication between z/OS and Linux
  - HiperSockets for ultra-high speed communication between z/OS and Linux on the same machine
- **z/VM aware**
  - Enhanced performance
  - System management tools



Value of Linux on System z

- **Reduced Total Cost of Ownership (TCO)**
  - Environmental savings – single footprint vs. hundreds of servers
  - Consolidation savings – less storage, less servers, less software licenses, less server management/support
- **Improved service level**
  - Systems management (single point of control)
  - Reliability, availability, security of System z
  - High performance integration with z/OS, z/VSE, z/TPF
- **Speed to market**
  - Capacity-on-demand capability on System z
  - Dynamic allocation of on-line users, less than 10 seconds to add a new Linux server image using z/VM and IBM DS8000

Survey predicts continued strong growth of Linux use on mainframes

- **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
  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**

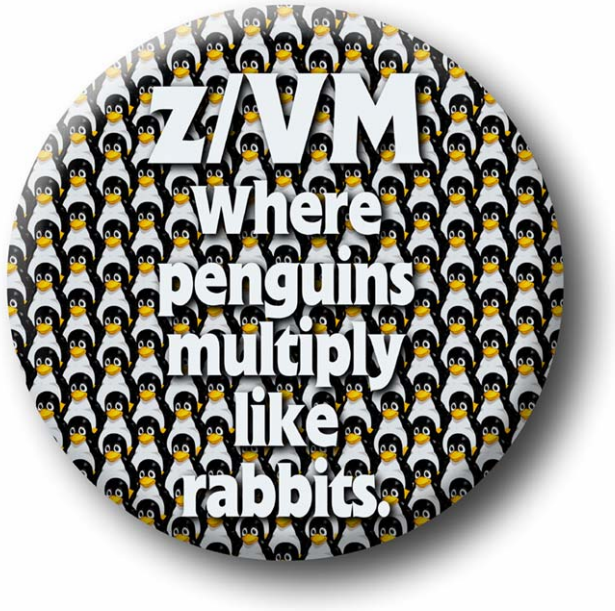
http://www.ca.com/us/press/release.aspx?cid=209611

System z – The ultimate virtualization resource

- **Utilization often (usually?) exceeds 90%**
  - Handles peak workload utilization of 100% without service level degradation
- **Massive consolidation platform**
  - Up to 60 logical partitions, 100s to 1000s of virtual servers under z/VM
  - Virtualization is built-in, not added-on
  - HiperSockets for memory-speed communication
  - Most sophisticated and complete hypervisor function available
- **Intelligent and autonomic management of diverse workloads and system resources based on business policies and workload performance objectives**

z/VM – Unlimited virtualization

- **z/VM provides a highly flexible test and production environment for enterprises deploying the latest e-business solutions**
- **z/VM helps enterprises meet their growing demands for multi-system server solutions with a broad range of support for operating system environments**
- **Mature technology – VM/370 introduced in 1972**
- **Software Hypervisor integrated in hardware**
  - Sharing of CPU, memory and I/O resources
  - Virtual network – virtual switches/routers
  - Virtual I/O (mini-disks, virtual cache, …)
  - Virtual appliances (SNA/NCP, etc.)
- **Easy management**
  - Rapid install of new servers
  - Self-optimizing workload management



z/VM V6.1: Foundation for future virtualization growth

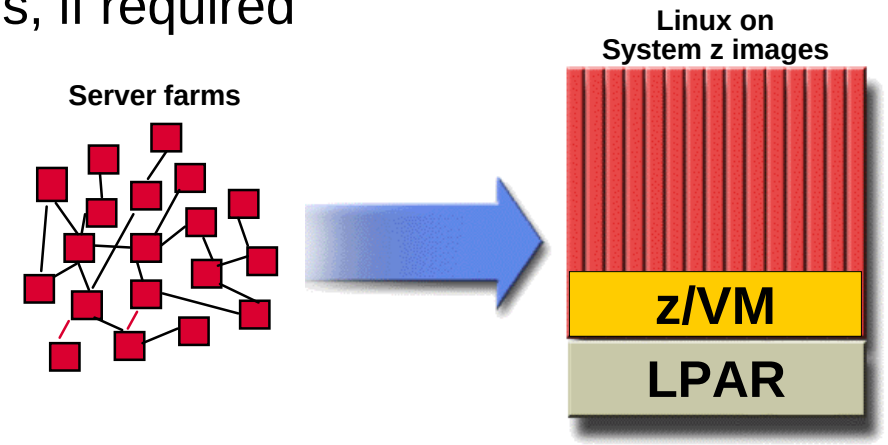
- **z/VM V6.1 is the base for all future z/VM enhancements**
  - This release implements a new Architecture Level Set available only on the IBM System z10 servers and future generations of System z servers
  - Includes several enhancements, plus support for the IBM Systems Director VM Control Image Manager
- **Statements of Direction**
  - z/VM Single System Image
    - IBM intends to provide capabilities that permit multiple z/VM systems to collaborate in order to provide a single system image
  - z/VM Live Guest Relocation
    - IBM intends to further strengthen single system image support by providing live guest relocation

IBM Systems Director VMControl

- **IBM Systems Director VMControl can visualize, navigate, and manage virtual appliances and is designed to help you:**
  - Discover, import, and manage virtual appliances
  - Create new virtual appliances from existing fully-tested software stacks
  - Automate the creation of a virtual server and deployment of a virtual appliance into that virtual server
  - Decrease dependency management problems by deploying virtual appliances that contain setup and configuration requirements
  - Capture and deploy Linux images on z/VM systems and AIX NIM images on Power Systems from a single management server
  - Integrate with IBM Systems Director Virtualization Manager and IBM Systems Director Storage Manager

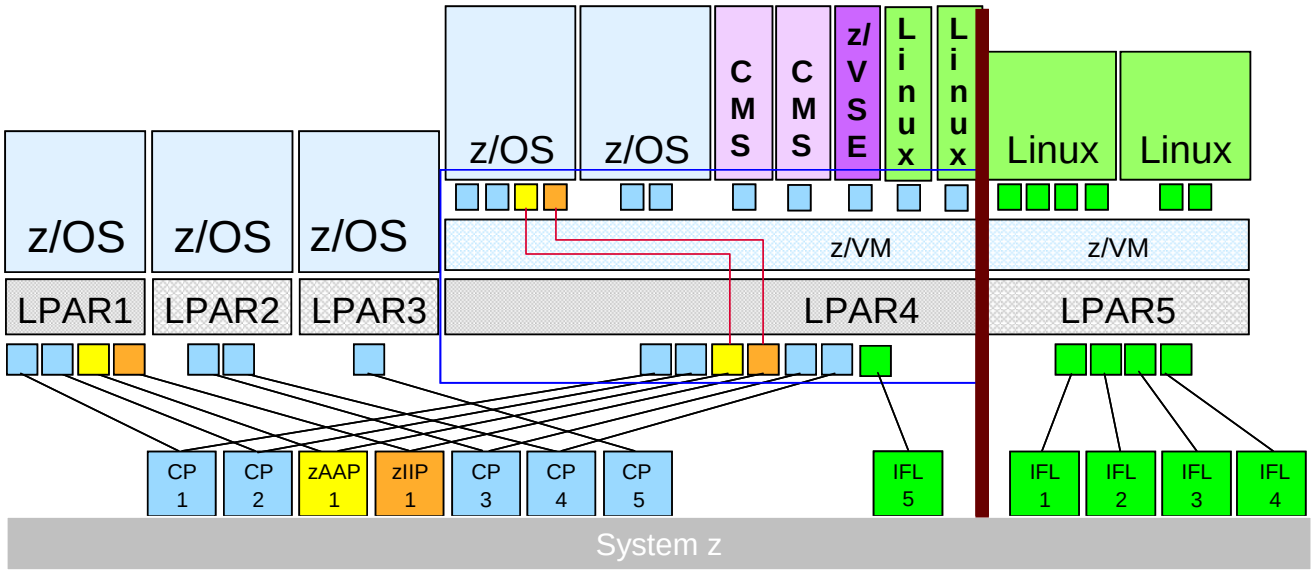
The value of z/VM for Linux

- **Enhanced performance, growth and scalability**
  - Server consolidation enables horizontal growth
  - N-tier architecture on two tiers of hardware
  - Extensive support for sharing resources
  - Virtual networking
  - Effective isolation of Linux images, if required
- **Increased productivity**
  - Development and testing
  - Production support
- **Improved operations**
  - Backup and recovery
  - Command and control



Integrated Facility for Linux

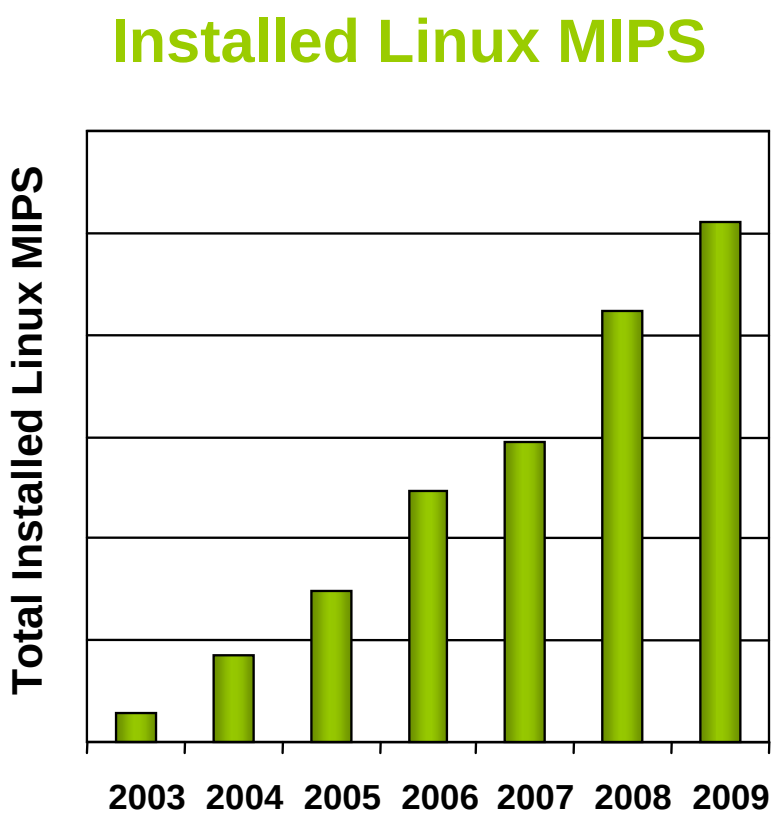
- **Additional engines dedicated to Linux workloads**
  - Supports z/VM and Linux on System z
  - IFLs on “sub-uni” systems run at “full speed”
- **Traditional mainframe software charges unaffected**
  - IBM mainframe software
  - ISV products
- **Linux and z/VM charged only against the IFLs**



System z Linux: The momentum builds

*Installed Linux MIPS at 43% CAGR**

- **The momentum continues:**
  - Shipped IFL engine volumes increased 35% from YE07 to YE09
  - Shipped IFL MIPS increased 65% from YE07 to YE09
- **Linux is 16% of the System z customer install base (MIPS)**
- **70% of the top 100 System z clients are running Linux on the mainframe**
- **More than 3,100 applications are available for Linux on System z**



* Based on YE 2004 to YE 2009

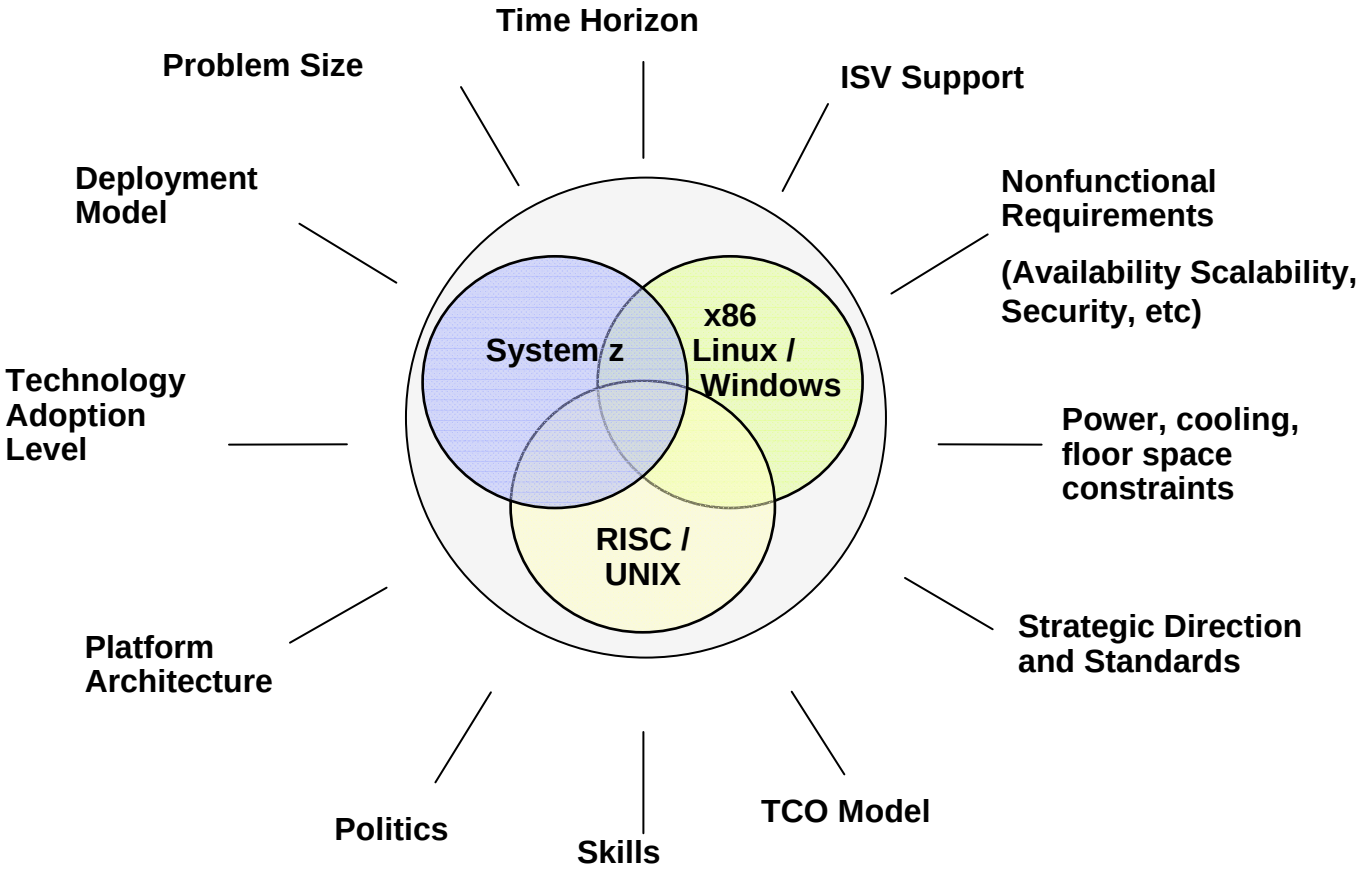
US Federal clients with Linux on System z

~1/3 with System z are running Linux on System z

- **Examples of US Federal clients running Linux on System z**
  - US Department of Agriculture
  - US Postal Service
  - US Senate
  - US Office of Personnel Management
  - US Department of the Interior – National Business Center

Platform choice – Fit for purpose

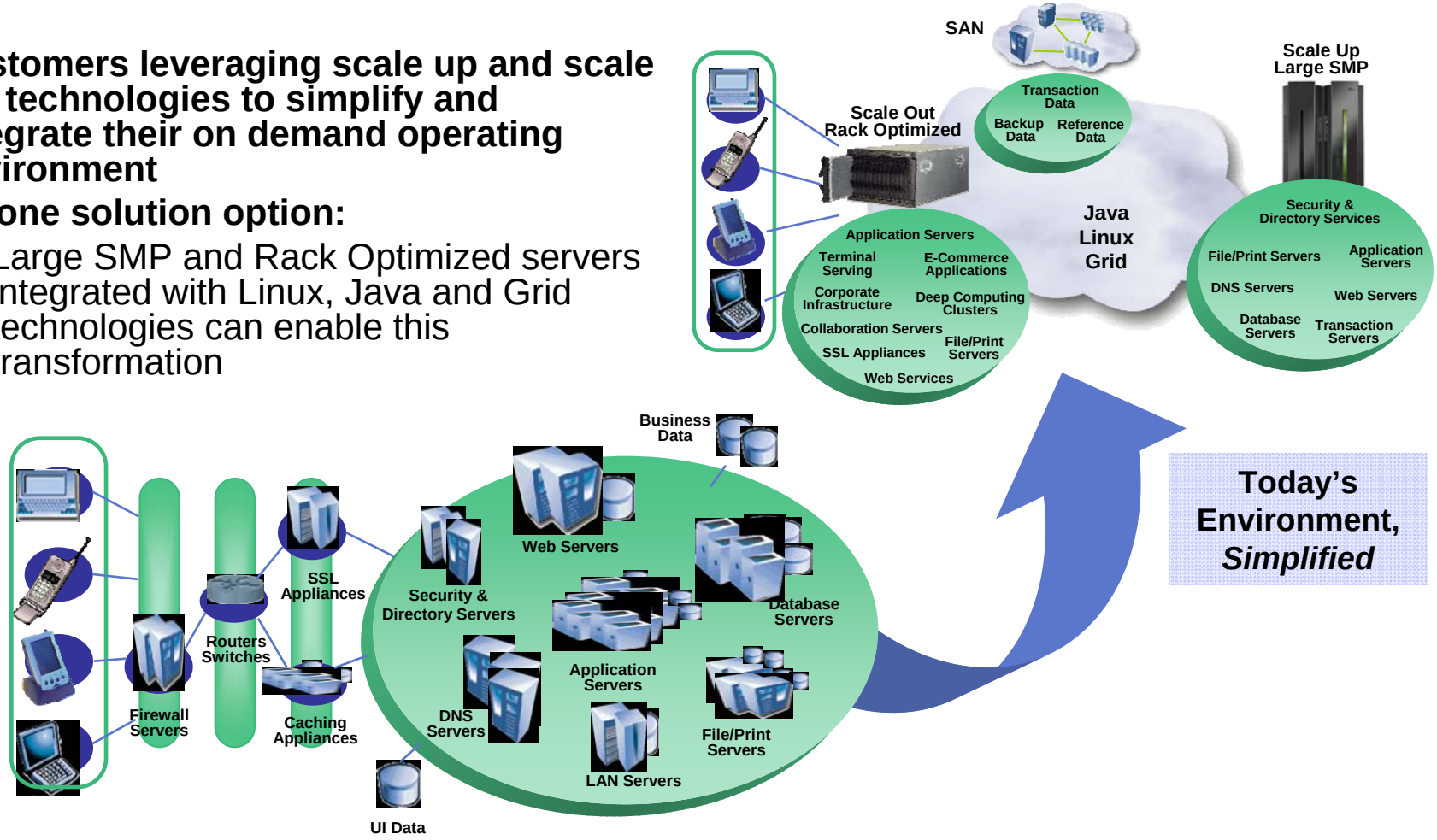
Many factors influence a platform selection, making it difficult to present a simple selection matrix



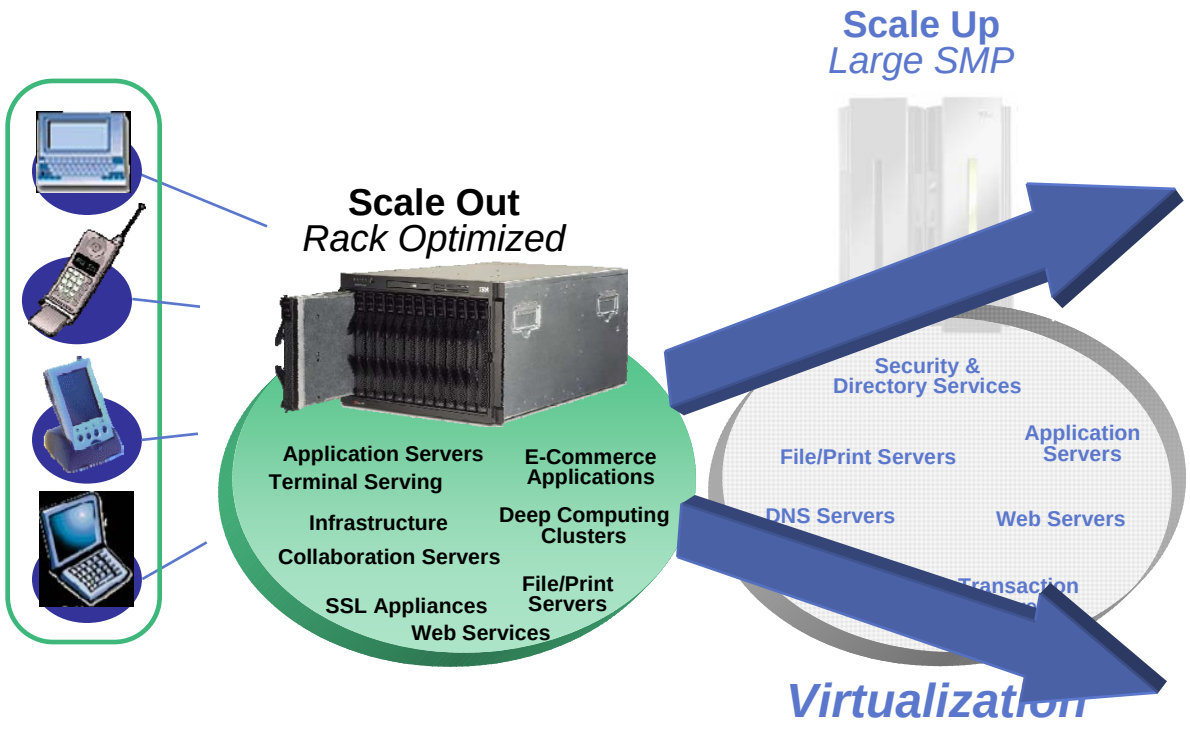
Some factors are specific to each business, others are common to all and can be generalized

Infrastructure simplification and platform choice

- **Customers leveraging scale up and scale out technologies to simplify and integrate their on demand operating environment**
- **As one solution option:**
  - Large SMP and Rack Optimized servers integrated with Linux, Java and Grid technologies can enable this transformation

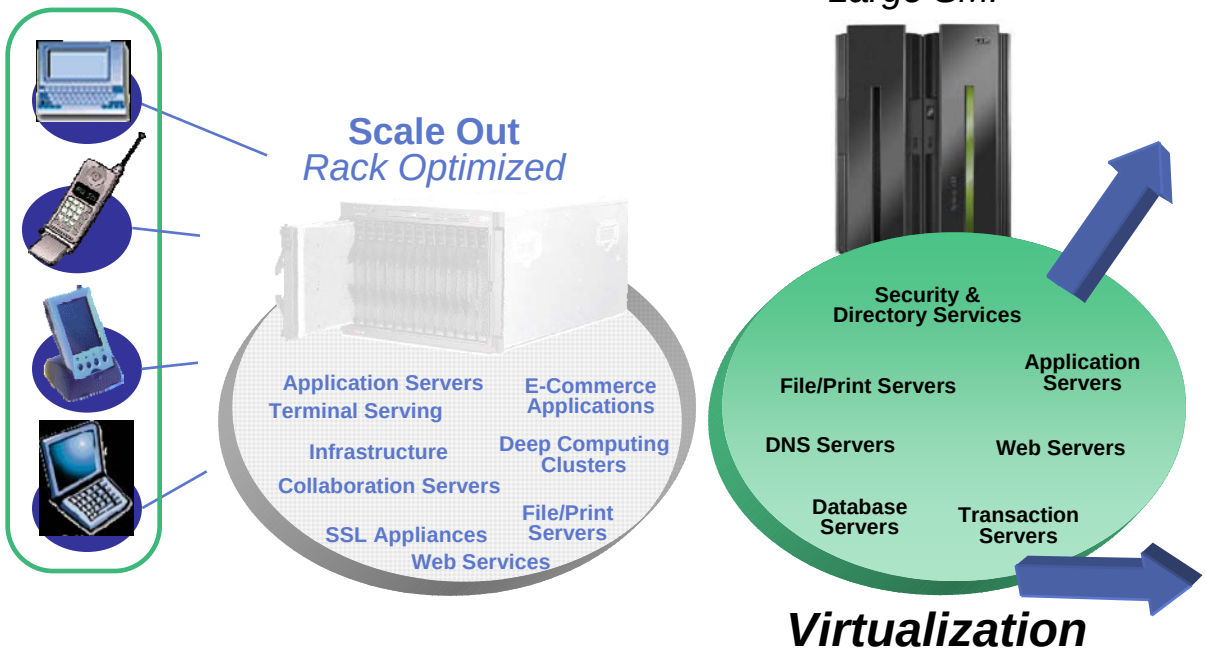


Ideal scale-out implementations



- **Clustered workloads**
- **Distributed computing applications**
- **Infrastructure applications**
- **Small database**
- **Processor and memory intensive workloads**

Ideal scale-up implementations



- 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

Selecting an application

- **Performance on System z CPUs is comparable to CPUs on other platforms of similar speed**
  - CPU speed is not the entire story – it's in the architecture!
    - *Both MIPS and GHz are meaningless indicators of processor speed*
  - Architecture designed for multiple or consolidated workloads
  - System z has definite advantage with applications that have mixed CPU and I/O
- **System z and z/VM provide excellent virtualization capabilities**
  - Look for applications that are on lower utilized servers
  - Development and Test are good choices to start
- **Good planning is essential**
- **IBM can:**
  - Perform sizing estimates
  - Assist with planning and initial installation needs

Where to deploy on System z – z/OS or Linux?

Technical Considerations

Linux → **z/OS**

Quality of Service

Linux ← **z/OS**

Speed of deployment

Linux ← **z/OS**

Degree of portability

Other Considerations

- **Application availability**
- **Workload Management function and granularity**
- **File sharing across a Sysplex**
- **Manageability and scaling characteristics**
- **Availability of skill**

Where to deploy – System z or "distributed"

Technical Considerations

System z ← **"distributed"**

Quality of Service

System z ← **"distributed"**

Speed of deployment
Instances 2 - n

System z ← **"distributed"**

Data Intensity

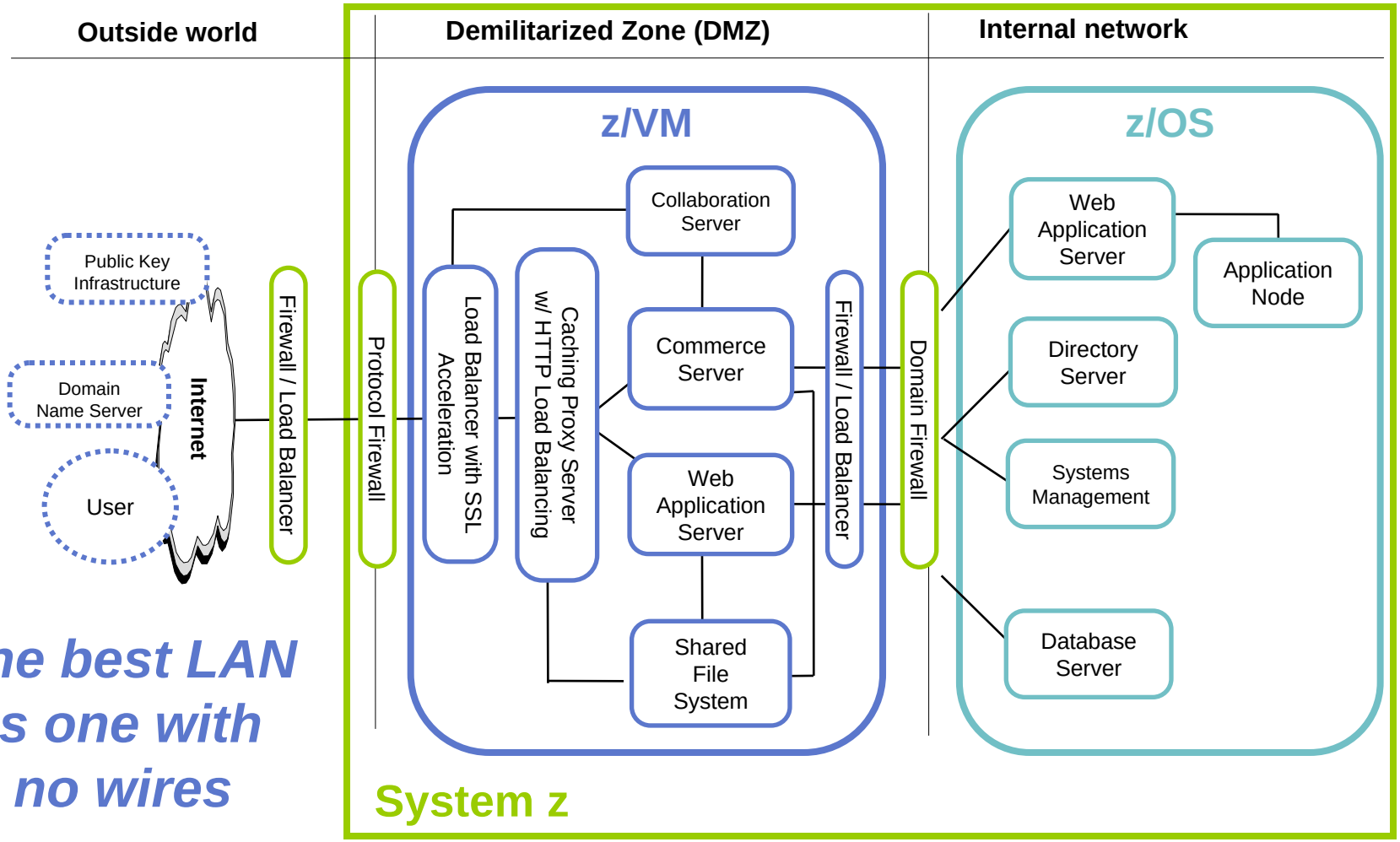
System z → **"distributed"**

Compute Intensity

Other Considerations

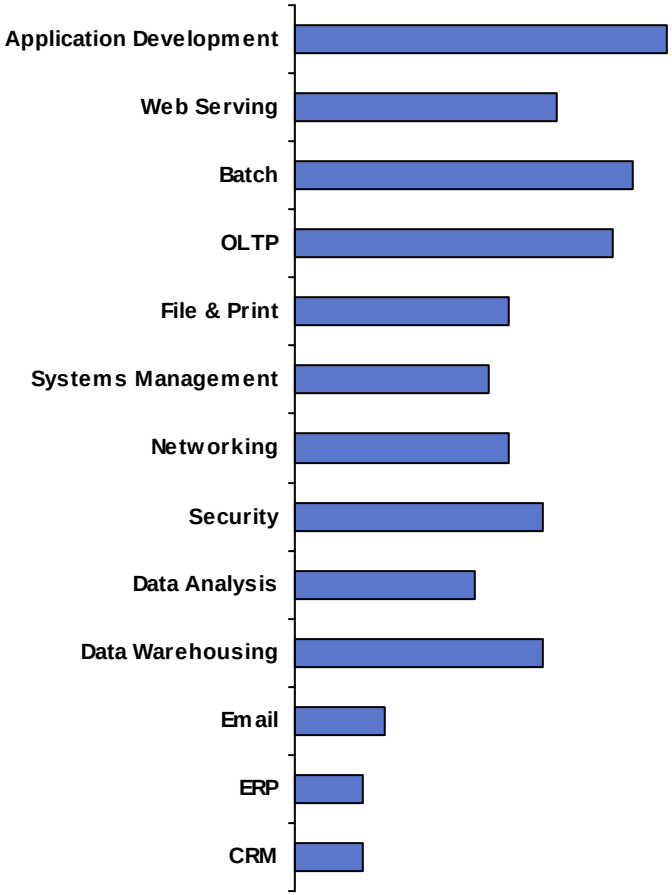
- **Application availability**
  - Certification of solution on hardware/software platform
- **Workload Management**
- **Manageability and scaling characteristics**
  - Especially DB2 and WebSphere on z/OS
  - Proximity of data to application
  - The best network is an internal network!

Application serving with Linux on System z



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



IBM Survey: *"What applications have you deployed or are planning to deploy in the next year on System z?"*

IBM Cognos Business Intelligence (BI)

Cognos. software

- **Broad range of BI capabilities: all user communities receive relevant information how, when and where it is needed – Now delivered on System z**
- **Open enterprise-class platform: IT delivers flexible and cost effective scale to meet growing user demands – available on System z**
- **Proven Partner to our customers: Customers benefit from deep IBM expertise in both System z and Cognos**

Why Use Domino On System z?

- **General z benefits described earlier**
  - Domino mainframe users get high availability, reliability and scalability
- **Domino Version 8.5 is native 64-bit version for Linux on System z**
- **System z with Linux performs well with multiple Domino partitions in a single LPAR**
  - With Domino partitioning and multi-processors
  - Domino infrastructure scales well
- **Balancing of system workloads**
- **Increase in utilization through virtualization**
  - DPARs and LPARs are individually managed on System z
  - DPARs can scale to support thousands of users
  - Add more DPARs, if needed
  - Portable solution given Domino code base

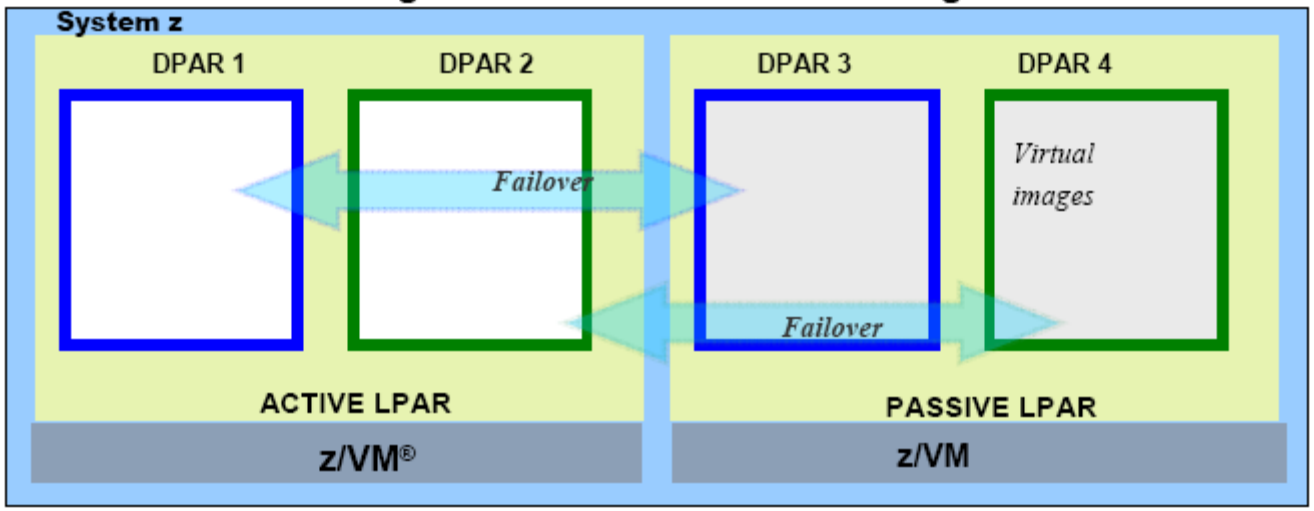
Architecture of Domino Aligns with System z

- **One instance of a Domino server is called a Domino partition (DPAR)**
- **You can run multiple DPARs in different LPARs on a single processor**
- **You can run multiple DPARS spread across more than one processor**
- **Each DPAR is independent of other DPARs, with its own address spaces and files**
- **DPARS can easily be moved from one image to another**
- **Use TCP/IP to communicate and transfer data**
- **Domino also makes use of multiple processors with multiple threads and processes**
  - The Domino main server address space has a pool of physical threads for separate tasks, and multiple tasks execute concurrently

Domino Clustering for High Availability

Lotus. software

Active/Passive Cluster – Two LPARs
Configuration on One Machine running Linux



This configuration uses 4 DPARS, 2 active and 2 passive.
In the event of a failure of the active DPARs, the passive DPARS take over.

- **Domino supports clustering and failover across different hardware, and different operating systems**
- **Multiple database replicas are created on Domino servers**
  - Databases changes are synchronized across replicas
- **Domino clustered servers can be deployed on the same mainframe using different LPARs or Linux guests**
- **This offers more flexibility when scheduling system maintenance**
  - HiperSockets or VLAN communication can be used on System z

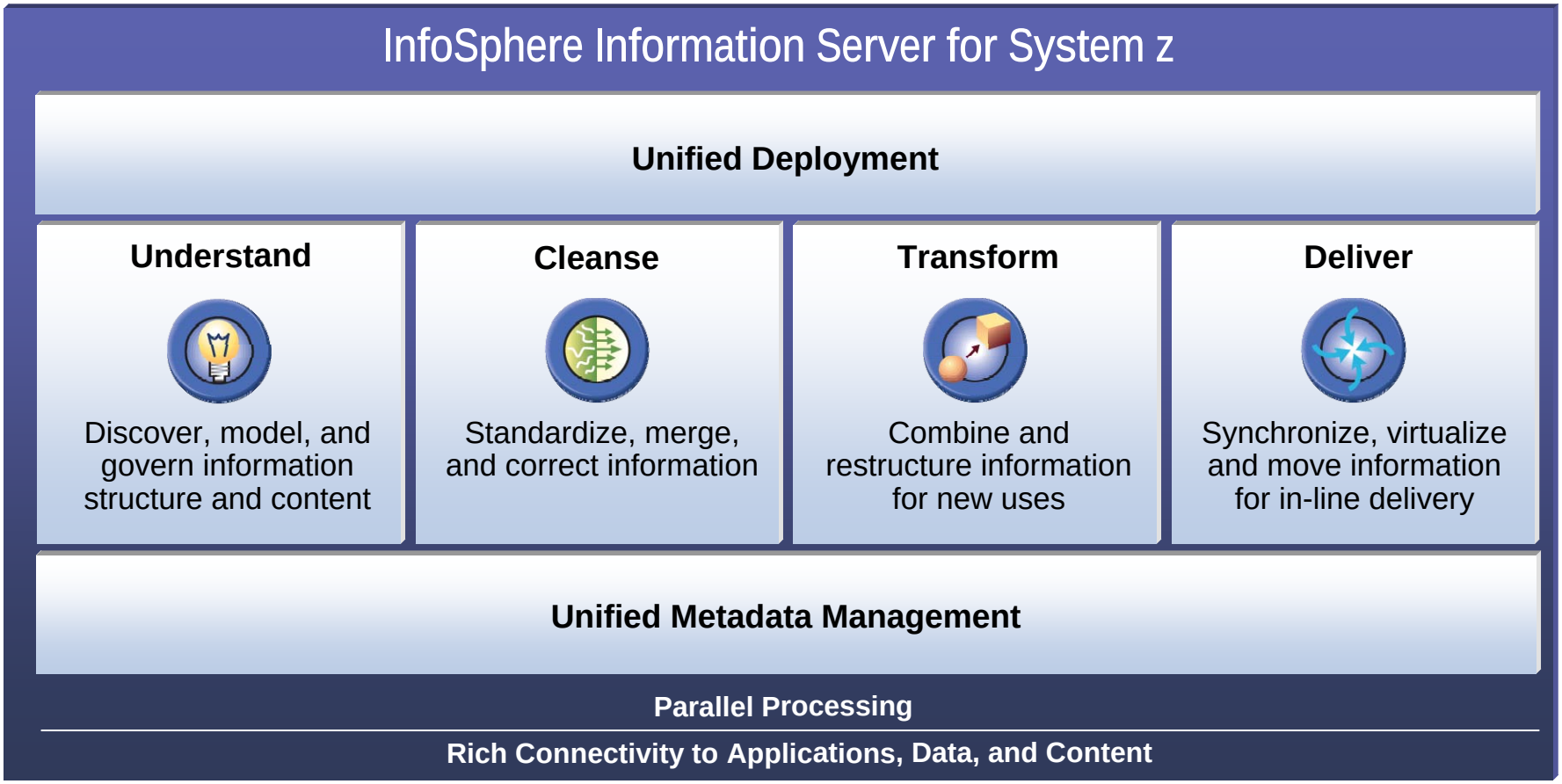
InfoSphere Information Server

Delivering trusted information for dynamic business optimization

- **Data in context equals Information**
- **Accelerating and extending Information for insight**
- **Enabling Information-centric business processes**
- **Improved governance with best practices and methodologies**
- **“Don’t let bad data happen to you!”**

InfoSphere Information Server

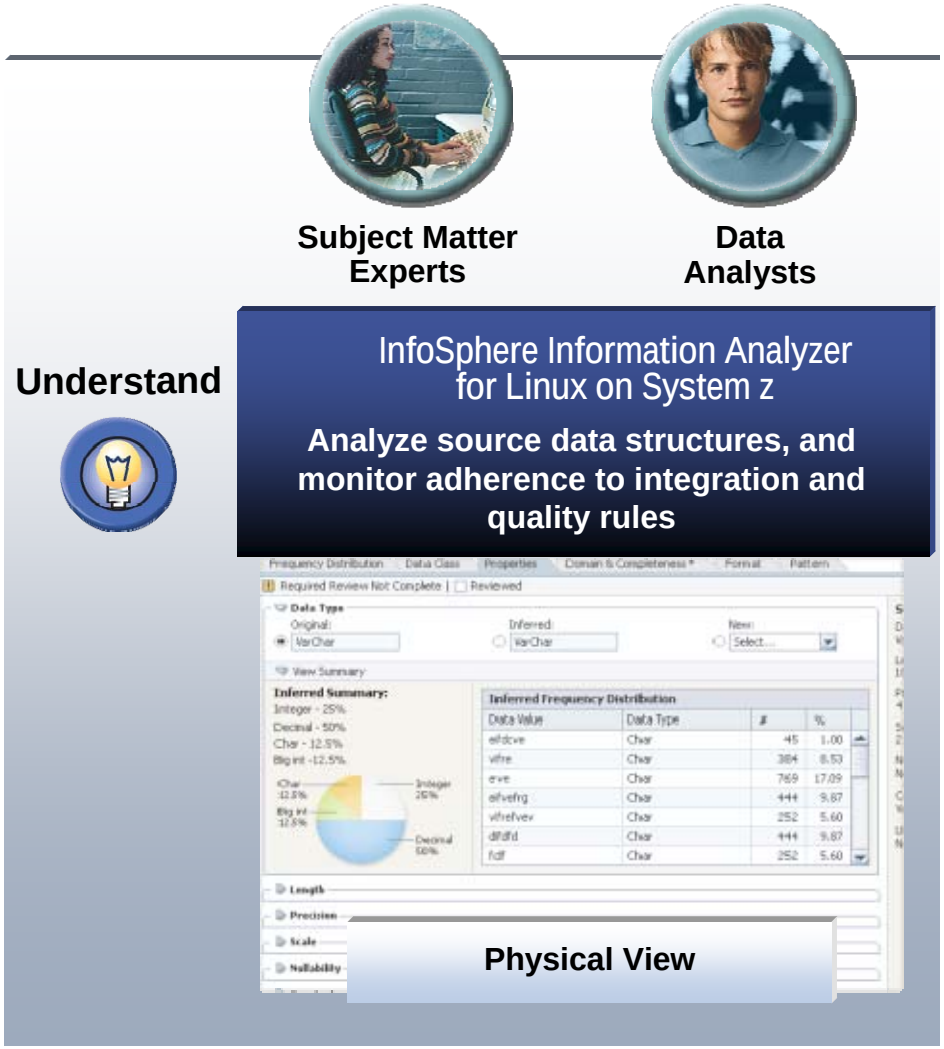
Trusted information for dynamic business optimization



InfoSphere Information Analyzer for Linux on System z

Understand what you have – physical metadata

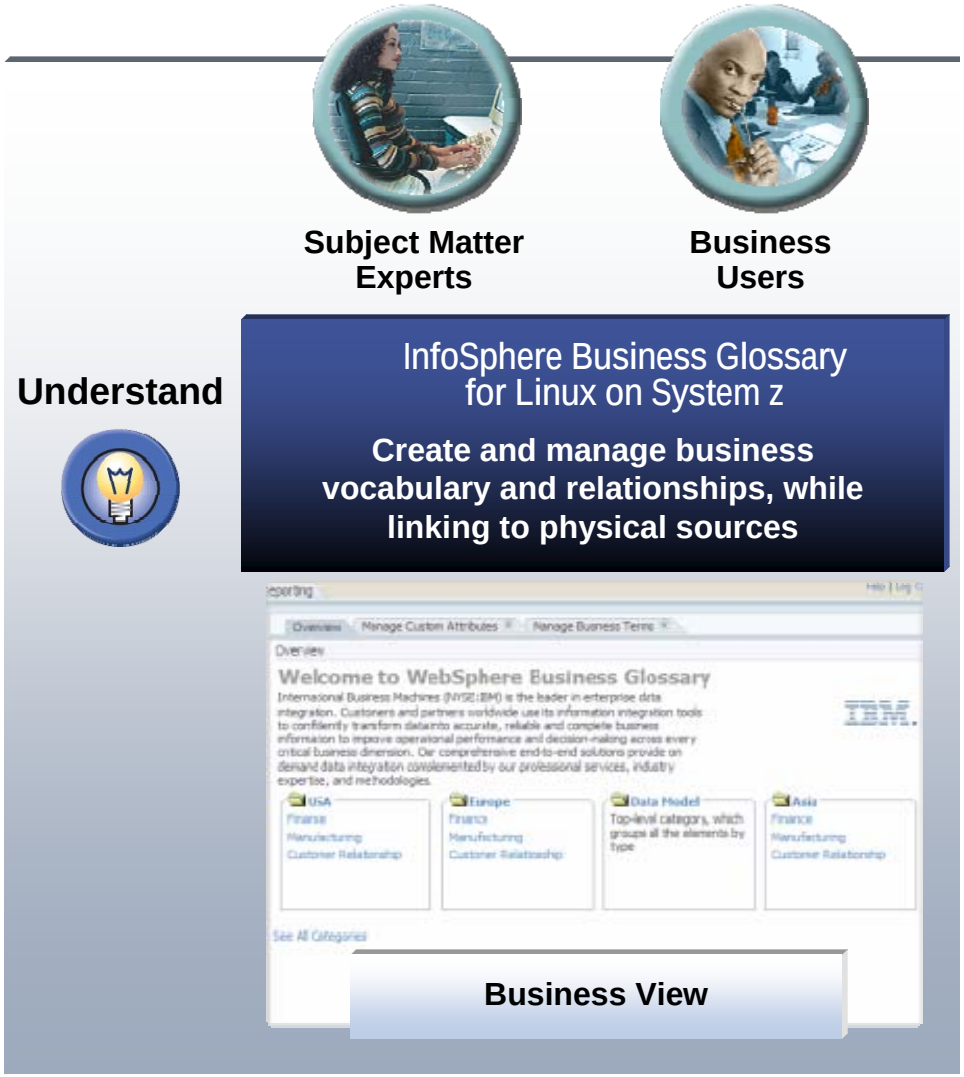
- **Data-centric analysis of application, database and file-based sources**
- **Secure, detailed profiling of fields, across fields and across sources**
- **Creation of metadata from profiling results**
- **Results instantly promotable across InfoSphere Information Server**



InfoSphere Business Glossary for Linux on System z

Create a consistent terminology – business metadata

- **Web-based authoring, managing and sharing of business metadata**
- **Aligns the efforts of IT with the goals of the business**
- **Provides business context to information technology assets**
- **Establishes responsibility and accountability**



Database = DB2

Schema = NAACCT

Table = DLYTRANS

Column = ACCT_NO

data type = char(11)

Technical

Business

GL Account Number

The ten digit account number. Sometimes referred to as the account ID. This value is of the form L-FIIIIVVVV.

InfoSphere QualityStage for Linux on System z

Cleanse

- **Specialized data quality functions seamlessly integrated with DataStage**
- **Visual tools for defining complex matching and survivorship logic**
- **Ensures clean, standardized, de-duplicated information**
- **Enables a single version of the truth**

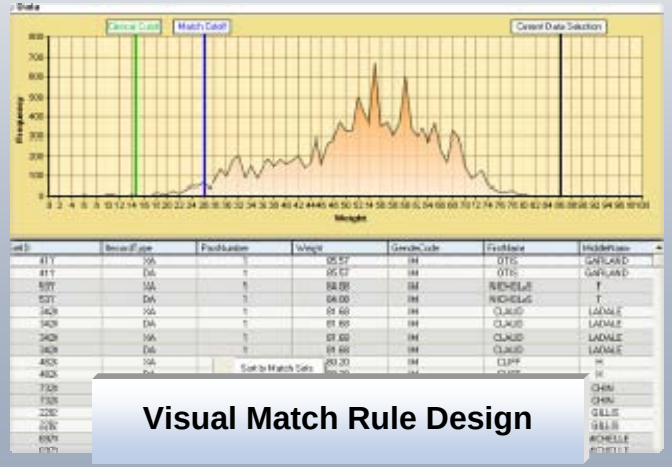
Subject Matter Experts

Data Analysts

Cleanse

InfoSphere QualityStage™
for Linux on System z

Standardize and correct source data fields, and match records together across sources to create a single view

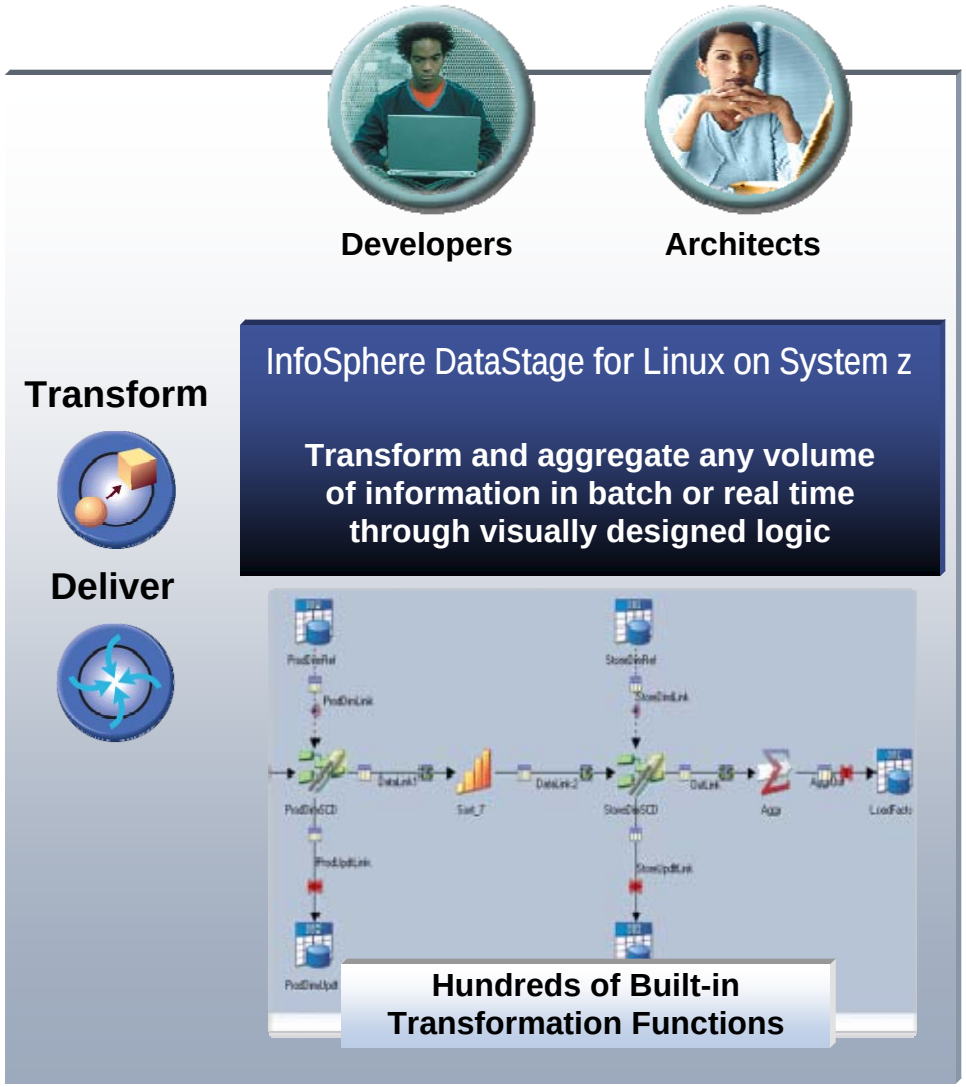


Visual Match Rule Design

InfoSphere DataStage for Linux on System z

Transform

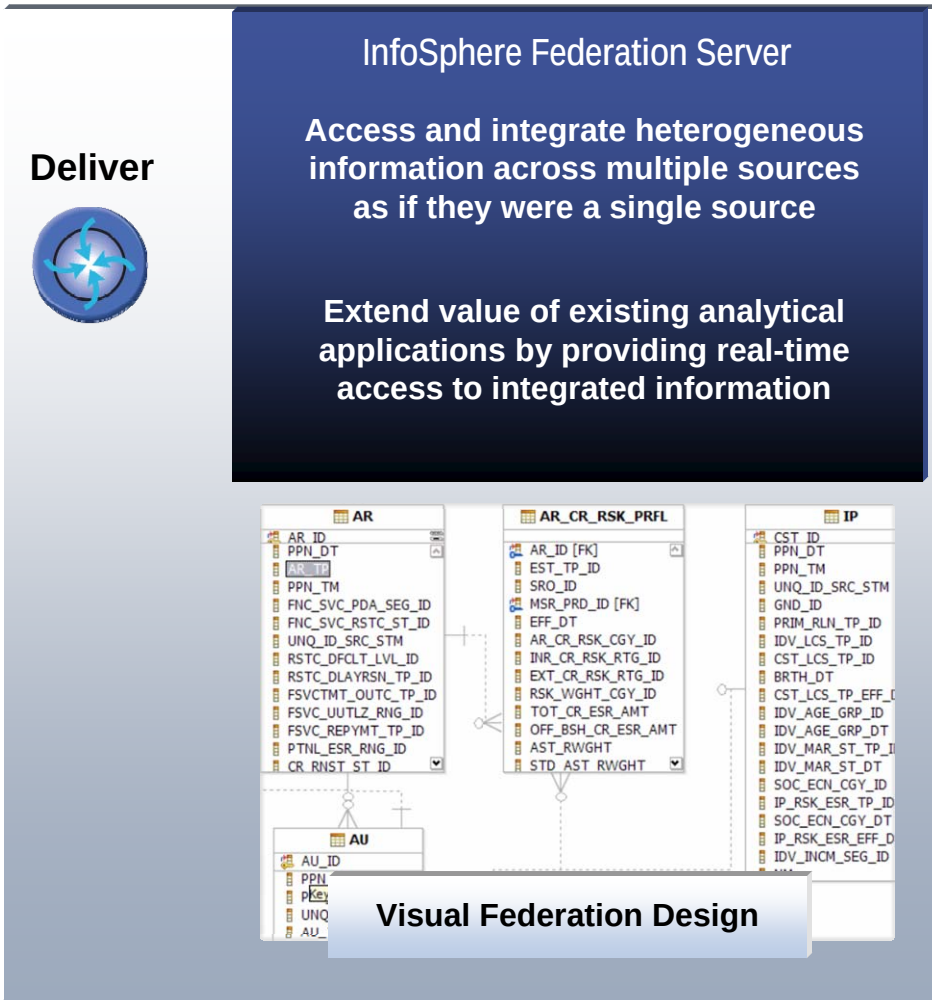
- **Codeless visual design of data flows with hundreds of built-in transformation functions**
- **Optimized reuse of data integration objects**
- **Leverages parallel processing without requiring design changes**
- **Capable of supporting batch and real-time operations**



InfoSphere Federation Server

Delivery – access highly diverse and distributed data

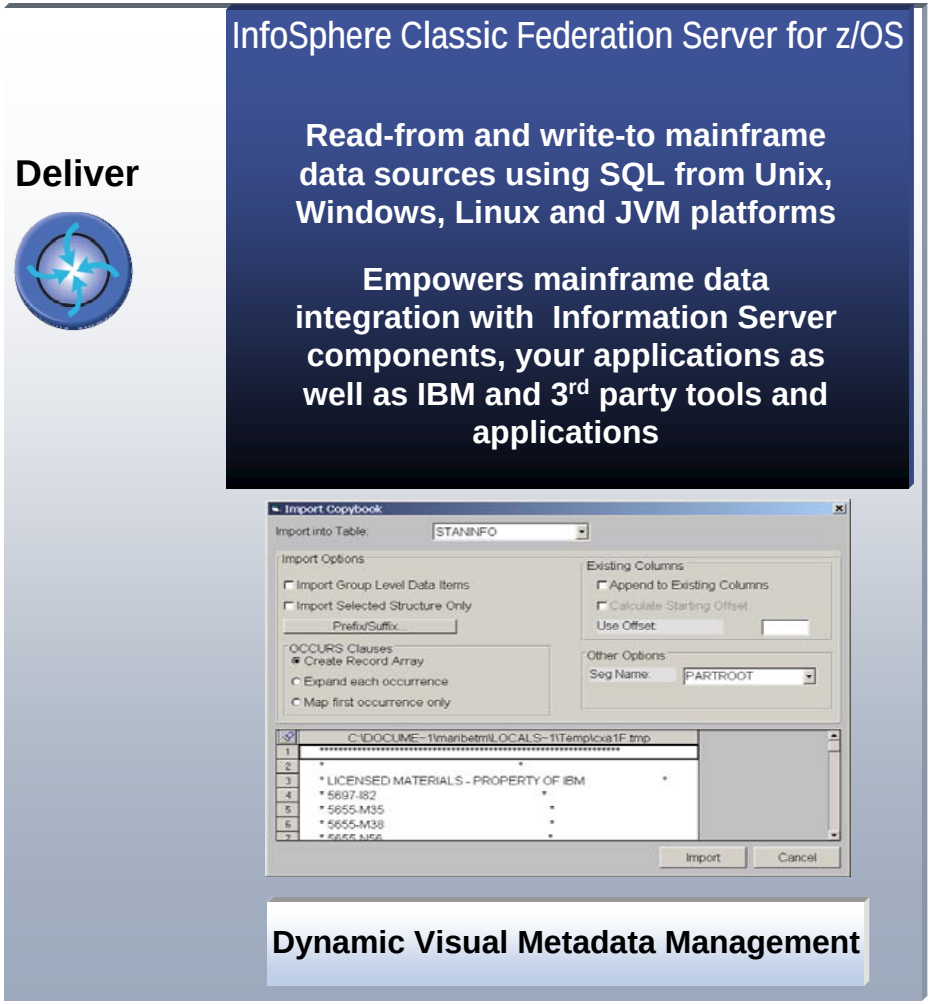
- **Industry leading query optimization with single sign-on, unified views, and function compensation**
- **Transactional write capabilities across heterogeneous sources**
- **Visual tools for federated data discovery and data modeling**



InfoSphere Classic Federation Server for z/OS

Delivery – legacy Mainframe data is an equal participant

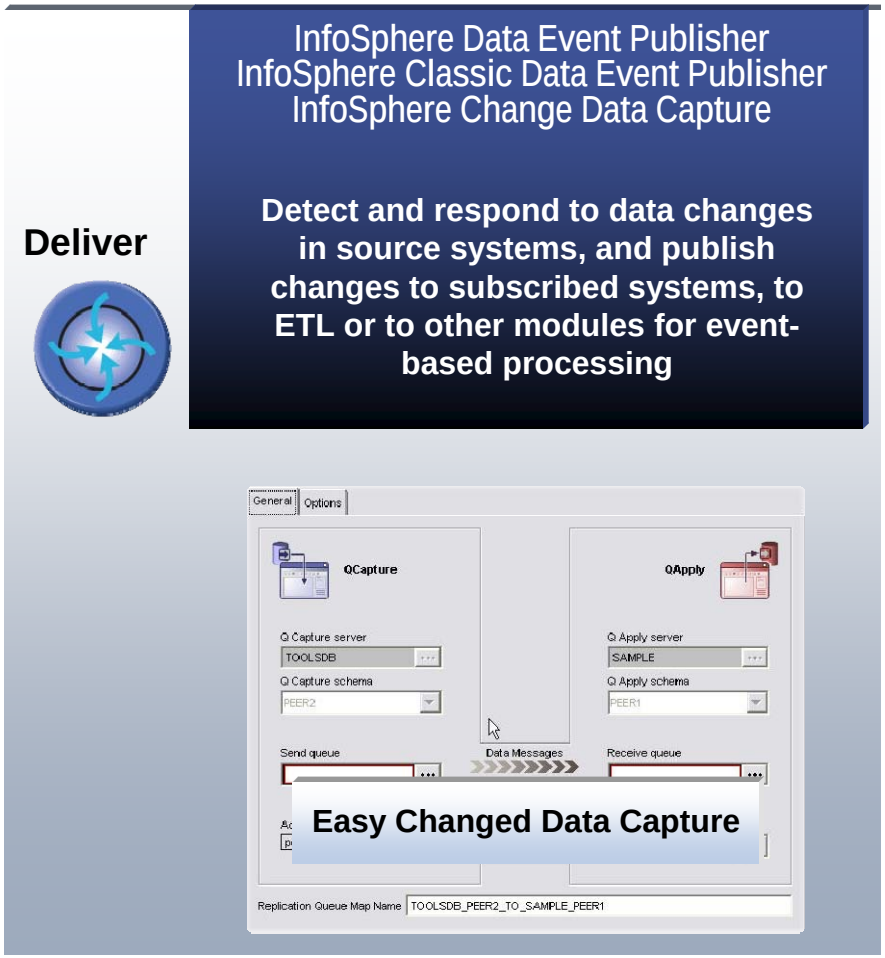
- **Standardized ODBC and JDBC SQL interfaces to VSAM, IMS, CA-IDMS, CA-Datacom, Adabas and sequential data**
- **Metadata-driven, so there's no mainframe programming needed**
- **Works with existing mainframe infrastructure and "modern" applications and tools you need**
- **Deliver mainframe data to:**
  - IBM's own data profiling, cleansing and transformation solutions
  - Self-service portals
  - e-commerce solutions
  - Reporting and analytical tools



InfoSphere Data Event Publisher, InfoSphere Classic Data Event Publisher, InfoSphere Change Data Capture (CDC)

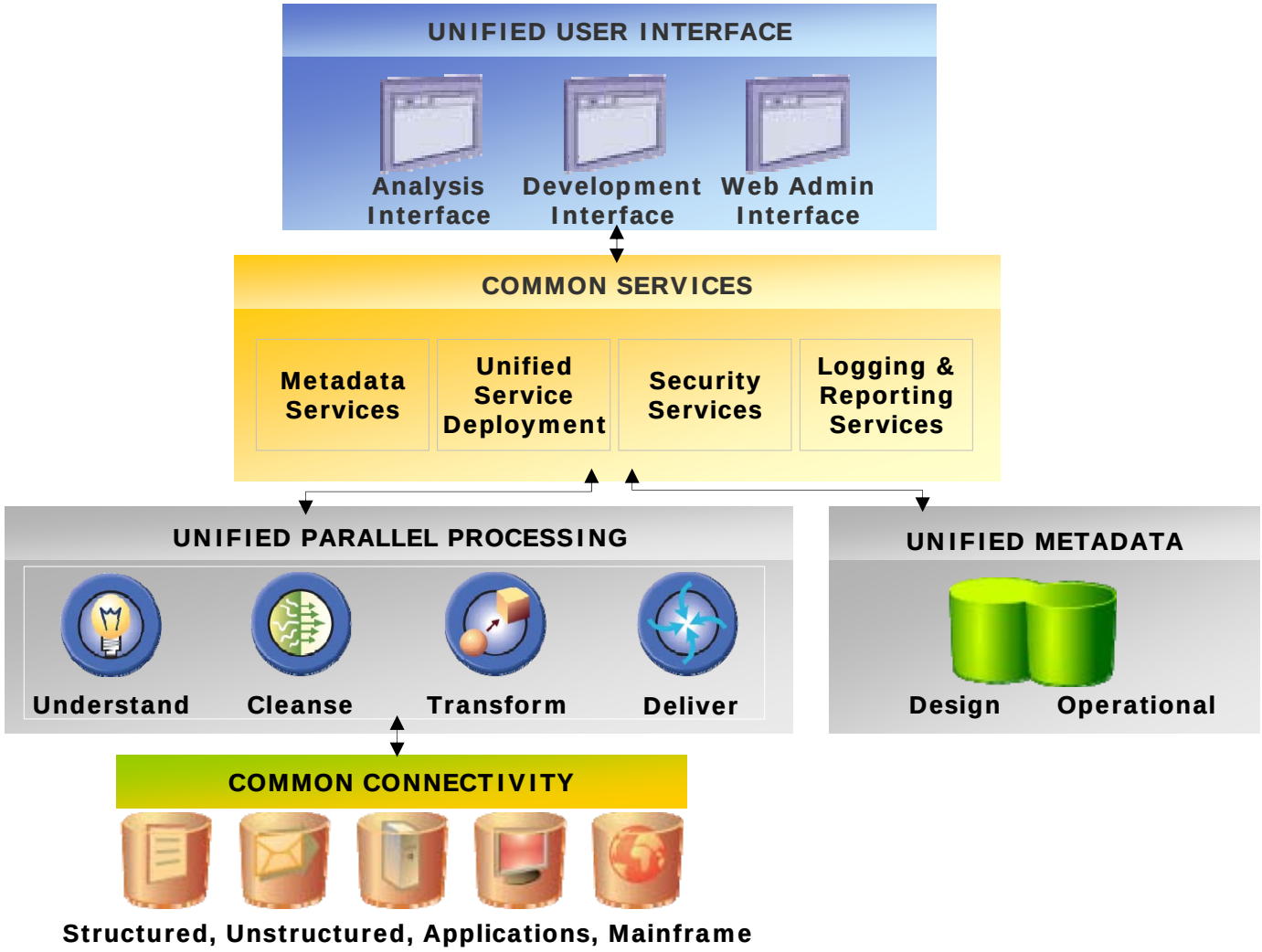
Deliver

- **Integration using data events rather than application development**
- **Capture data changes in real time, publish as "data events" to drive integration and incremental database updating**
- **Flexible and efficient:**
  - Low-latency or scheduled data capture
  - Multiple publication formats:
    - Consistent relational format for ease of use
    - XML for ease of consumption
    - Delimited values for reduced message size
  - Recoverable
  - Assured delivery
  - Eliminates dependence on batch window!
  - Loosely coupled approach



InfoSphere Information Server for Linux on System z

Operational platform architecture

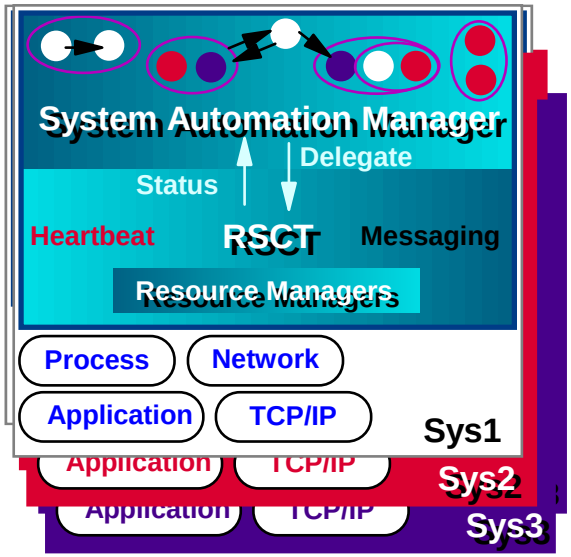


InfoSphere Information Server for System z Advantage

A complete information infrastructure

- **A comprehensive, unified foundation for enterprise information architectures, scalable to any volume and processing requirement … that leverages the scalability, security, manageability and reliability of the mainframe without added z/OS operational costs**
- **Fully integrated, auditable data quality as a foundation for trusted information across the enterprise**
- **Metadata-driven integration, providing breakthrough productivity and flexibility for integrating and enriching information**
- **Broadest and deepest connectivity to information across diverse sources: structured, unstructured, mainframe, and applications to maximize the value of your IT investments**
- **Simplified scalability at lower cost to manage current and future data requirements**
- **Data governance capabilities to ensure consistent and accurate compliance with information-centric regulations and requirements**

IBM Tivoli System Automation for Multiplatforms provides policy-based application and resource self-healing



- **Manages application availability by:**
  - Fast detection of outage through monitoring
  - Sophisticated knowledge about application components and their relationships
  - Quick and consistent recovery of failed resources and whole applications either in place or on another system in an AIX or Linux cluster
  - 64bit Support for System z Linux
  - Support virtual communications when running Linux on System z under z/VM
    - HiperSockets, VM Guest LAN, CTC

Availability

- **The relation between Availability, Downtime and Costs:**
  - A z/OS Parallel Sysplex is designed to provide up to 5 nines availability
    - Which corresponds to a downtime / year of just 5.3 minutes.
  - Linux and AIX can approach 4 nines availability
    - With the help of IBM Tivoli System Automation for Multiplatforms
  - Downtime probability formula: P = P1 * P2 * ... *Pn
    - 2 systems with 0.1 downtime probability (0.9 availability) get up to 0.1 * 0.1 = 0.01

Number of 9s > > > > > >		downtime per year
1 nine	90.0000% availability	37 days
2 nines	99.0000% availability	3.7 days
3 nines	99.9000% availability	8.8 hours
4 nines	99.9900% availability	53 minutes
5 nines	99.9990% availability	5.3 minutes
6 nines	99.9999% availability	32 seconds

Tivoli System Automation

- **SA z/OS provides application high availability and advanced z/OS and Sysplex management**
  - It is the base for GDPS
- **SA for Multiplatforms provides high availability for AIX, Windows, Linux and Solaris**
- **AF/OPERATOR provides z/OS automation for simpler environments without NetView**
- **SA Application Manager helps establishing one operations and automation team through end-to-end automation**
  - Was a SA MP V2 feature
- **Adapters for MSCS, HACMP and Veritas**
- **SA for Integrated Operations Management (AF/REMOTE) provides escalation, secure outboard automation, remote consoles**
- **The Business Continuity Process Manager helps testing and managing disasters and integrates with GDPS**

Product / Packaging change SA MP – SA AM

- **IBM Tivoli System Automation for Multiplatforms, Version 2.3**
  - Base Component
  - End-to-end Automation Component

- **IBM Tivoli System Automation for Multiplatforms, Version 3.1**
  - Formerly ‘Base Component’
  - Optional xDR feature for Linux on System z
- **IBM Tivoli System Automation Application Manager, Version 3.1**
  - Formerly ‘End-to-end Automation Component’
  - New and separate product

Disaster Recovery for Linux on System z

- **Industrial Strength DR Solution for Linux for System z based on GDPS**
  - Enables lower skilled operators to perform DR if specialists unavailable
  - Pre-tested DR solution with highest probability of success
  - Continuous availability through HyperSwap even in DR case
- **High customer value for coordinated Linux for System z – z/OS DR**
  - Coordinated planned and unplanned transparent HyperSwap
    - e.g. because storage subsystems are used by both, Linux for System z and z/OS
  - Coordinated site takeover
  - In-place re-IPL of failing operating system images
- **xDR for System z consists of the following parts:**
  - Linux for System z: Novell SLES or Red Hat RHEL
  - z/VM V5.3 (or earlier with fixes), if Linux is running on z/VM
  - System Automation for Multiplatforms V3.1 with xDR option
  - Service offering GDPS/PPRC Multiplatform Resiliency for System z (xDR)

Tivoli OMEGAMON XE for z/VM and Linux

Gain Insight Into Linux

- **Monitors Linux capabilities in real-time for proactive mgmt and tuning**
- **See Linux workloads to detect runaway processes and resource consumption**
- **Collects and analyzes Linux specific information including:**
  - Operating System and CPU Performance
  - Disk information and performance
  - Network statistics
  - Process Status analysis
  - Process User information
  - System Statistics
  - User Login Information
  - Virtual Memory Statistics
- **Lets you incorporate Linux information into an enterprise-wide view**

Value of using OMEGAMON XE on z/VM and Linux

- View multiple Linux instances from a single screen
- Reflex automation capabilities with the 'Take Action' function
- 'Expert Advise' helps facilitate knowledge when situations (Alerts) occur
- Create alerts using and/or logic … smart alerts
- Customized workspace 'views'
- Incorporate Linux information into enterprise view.
- TN3270 and Web Browser interface in the UI (CNP) to access other information
- Provides Linux monitoring capabilities in real-time; thus, the ability to manage and tune the Linux environment.
- Historical capabilities using the Tivoli Data Warehouse
- You can scan the Linux system logs for errors and provide alerts.
- Linux workloads can be monitored providing information on runaway processes or resources being consumed.
- Network and disk information critical to workloads and the image will be monitored and reported on.

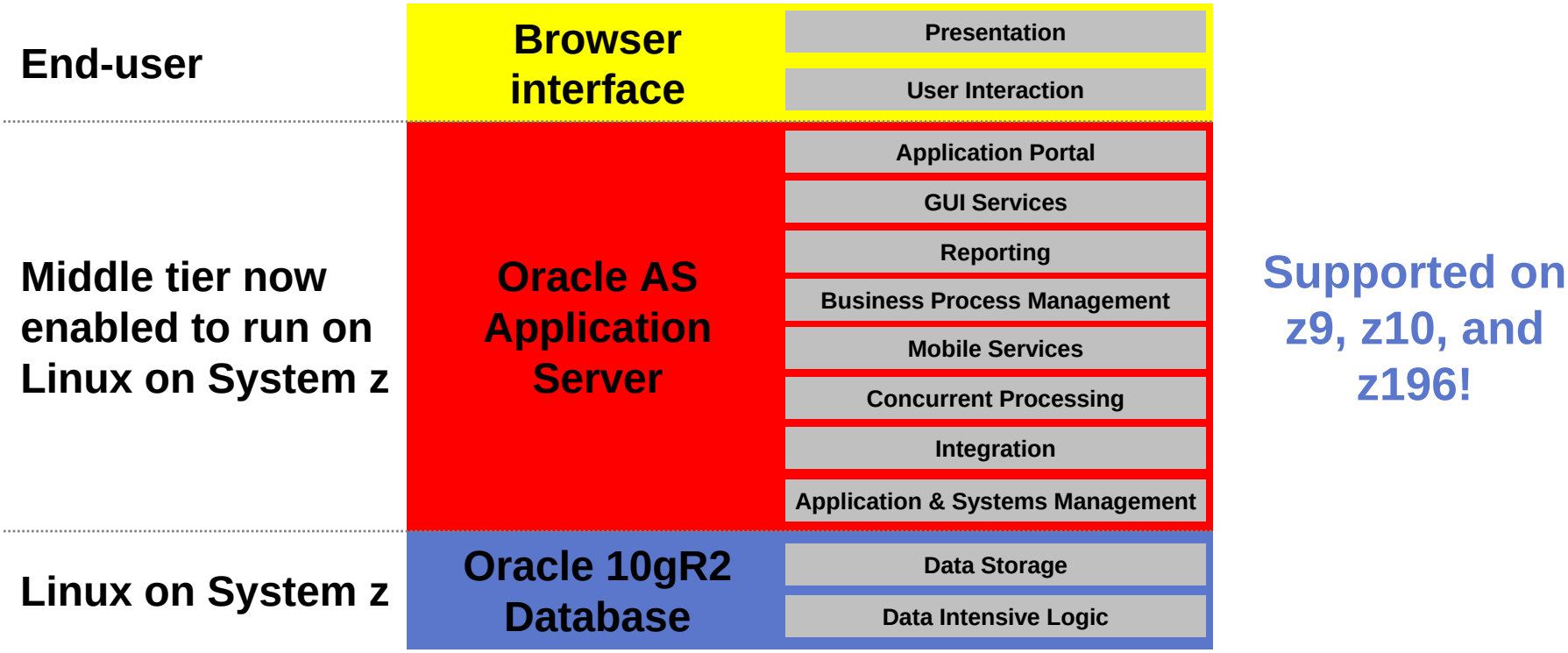
Oracle E-Business Suite for Linux on System z

- **Enterprise Resource Planning**
- **Financials, HR, Project Management**
- **Supply Chain Management**
- **Manufacturing**
- **Technology (Oracle)**
- **CRM**
- **Procurement**
- **Asset Lifecycle Management**
- **Product Lifecycle Management**

- **Cross industry solution with highest traction in:**
  - Financials Services
  - Mfg (auto parts, packaging, electrical controls, engines, materials, mining)
  - High Tech (both products and design companies, semiconductors)
  - Asset Based Industries (like E&C, Utilities, Oil & Gas services)
  - Telecommunications
  - Travel & Transport
  - Public Sector (Federal Agencies & Counties) etc.

The full application runs on Linux on System z!

Previously E-Business Suite available on System z in a "split tier mode" with only the Oracle 10gR2 database tier running on Linux on System z



Supported on z9, z10, and z196!

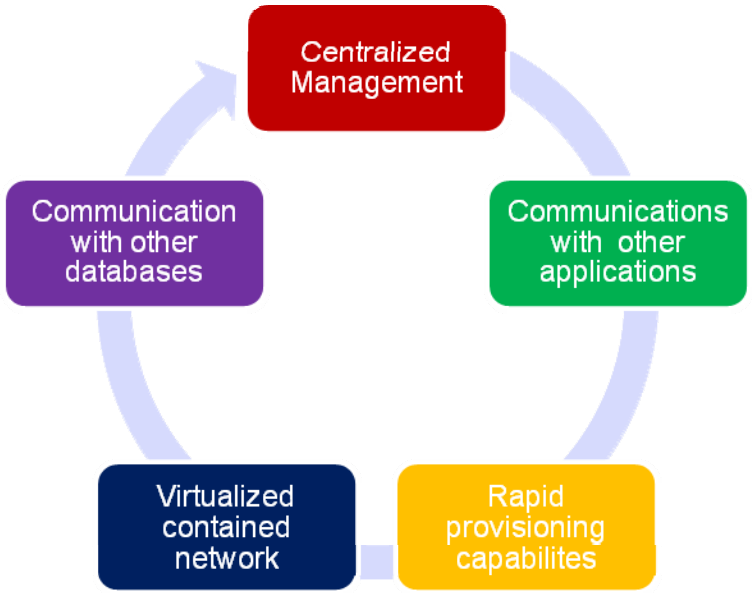
Note: Other Oracle solutions that are sometimes associated with E-Business Suite but are not supported on Linux for System z – Oracle Retail Suite, Retek, ProfitLogic, 360Commerce, Demantra, Oracle Transportation Management (G-Log), Oracle Pharmaceuticals (Clinical), Oracle iLearning

So why run E-Business Suite on System z?

Availability	**Best continuous availability and disaster recovery for mission critical applications.**
Efficiency	**Reduced infrastructure complexity through consolidation, automation and virtualization, saving on energy, labor, software, and more. Now with management of applications POWER and x86 blades for even greater efficiency of an application end to end and improved performance/throughput.**
Scalability	**Near-linear large scalability, unmatched in the IT world, to grow with your clients business, now with up to 60% more capacity than z10 EC and new scalable options for application deployment on IBM blades.**
Integration	**Integration of data on multiple OS, working seamlessly with large volumes of data, and providing industry – leading QoS for applications on Linux on System z with improved operational integration, automation, and qualities of service extended to Power and x86 blades.**
Security	**Comprehensive protection of business critical data from all types of IT security threats, now extended to applications deployed on IBM blades.**
Affordability	**Solution Editions with low TCA, competitive with distributed, and unbeatable TCO.**
Flexibility	**Choice of deployment of full application to Linux on System z for best qualities of service and/or split tier to IBM blades with zEnterprise.**

System z solutions can support and integrate data like no other platform, providing a foundation for other analytic and application capability

- The only platform that can run 9 commercial databases, supported at the same time
- Better align and synchronize data, for data integrity. Use the internal architecture to consolidate database communications
- Leverage internal networking between databases and applications
- Centralize management across entire enterprise



Database	DB2 z/OS	DB2 LUW	IMS DB	Oracle DB	Informix	VSAM	Postgres	MySQL	Adabas
Application Server	WebSphere	Lotus	PeopleSoft	Oracle EBS	Siebel	ESRI	Fusion	CICS	IMS
Business Intelligence	InfoSphere	Cognos	SPSS	DataStage	DataPower				

- Consolidation of databases
- Tighter integration of data to applications
- Business intelligence close to the data

Competitive consolidation yields great business outcomes!

These are all z10 consolidations – imagine possibilities with z196!

Customer	Distributed Cores	Ratio of Distributed to System z cores	Additional Benefits
Allianz	60	30 to 1	48 hour migration!
Government Agency	292	58 to 1	70% cost savings!
Large Bank	200	50 to 1	$9M savings, fast migration w/GTS services
Bank of Russia	200	50 to 1	Reduced payment processing costs by 95%
Trading Companies		40 to 1	Scale and availability

Automated operating system hardening for Linux

Raytheon
Trusted Computer Solutions

- **Value proposition:**
  - Security Blanket from Trusted Computer Solutions is an enterprise platform that automatically configures your Linux and Solaris operating systems to meet industry standard and customized security requirements.
  - Security Blanket consistently and predictably secures your enterprise-wide systems in a fraction of the time it takes to lock them down manually.
- **The problem:**
  - Manual OS hardening is labor intensive and prone to errors
  - Patching can reset system file permissions to OS default settings, resulting in loss of your security posture
  - System Administrators may not have experience or expertise in all operating systems deployed in the enterprise
  - Compliance guidelines are constantly being re-issued which could change current organizational policy
  - Maintaining consistency of security configurations throughout the enterprise is a challenge
  - Preparing and documenting security posture is time consuming which can cause delays identifying where there are issues

Security blanket profiles

Raytheon
Trusted Computer Solutions

- **An easy way to implement and organization's security policy**
- **High-level policies are implemented across multiple operating systems**
- **Profiles allow full compliancy or adjustments to policy areas to address mission requirements**
- **Create customized compliancy policies from the Security Blanket library of security modules**
- **Security Blanket's pre-defined profiles:**
  - Center for Internet Security (CIS) Red Hat® Enterprise Linux and Solaris Benchmarks
  - Payment Card Industry Data Security Standard (PCI DSS)
  - Sys Admin, Audit, Network, Security (SANS) Institute Consensus Audit Guidelines (CAG) Top 20 Critical Controls
  - SANS Institute Top 20 Security Risks
  - Critical Infrastructure Protection (CIP)
  - Defense Information Systems Agency (DISA) UNIX Security Technical Implementation Guide (STIG)
  - Joint Air Force Army Navy (JAFAN) 6/3
  - Director of Central Intelligence Directive (DCID) 6/3
  - National Industrial Security Program Operating Manual (NISPOM), Chapter 8

Affordability: Start with IBM System z Solution Edition for Enterprise Linux and/or the IBM Enterprise Linux Server

- **Competitively priced, Industry-leading virtualization, built with security and availability**
- **Overview**
  - A Linux-ready virtualization offering that combines the outstanding z/VM virtualization and the industry-leading IBM System z technologies with solution pricing that accelerates return on investment for workload consolidation and new Linux workload deployments.
  - The Enterprise Linux Server (ELS) is a System z configured to run Linux-only workloads
  - The Solution Edition for Enterprise Linux delivers a similar solution stack that users can add to an existing System z
  - Acquisition pricing for Solution Edition for Enterprise Linux and the ELS is ***very*** competitive

Oracle solutions available today on IBM System z

		DB2 on z/OS or Linux on System z	Oracle DB on Linux on System z
ERP and CRM solutions	**Oracle PeopleSoft Enterprise**	*** Version 9.0 & 9.1 / Tools 8.49 & 8.50** DB2 8, 9 (Database and batch server supported)	*** Version 9.0 & 9.1 / Tools 8.49. & 8..50** Oracle 10*g*R2
	Oracle Siebel Enterprise	*** Version 8.0 & 8.1.1** DB2 9.1	*** Version 8.0 & 8.1.1** Oracle 10*g*R2
	Oracle E-Business Suite		***New!*** **Version R12.1.2** Oracle 10*g*R2
Banking and Insurance	**Oracle Financial Services**	**FLEXCUBE** **Retail Core Banking V2.2.1** WAS 6.1 and DB2 9.1	**FLEXCUBE** **Retail Core Banking V2.2** **Universal Banking (UBS) V10** Oracle 10*g*R2 on SLES9
	Oracle Insurance	**Documaker 11.4** DB2 8.2 & 9.1 (z/OS)	
	Oracle Cross Industry		**Oracle Policy Automation v10.1** Oracle 10*g*R2 on SLES10

* Note: Multi-platform "Split Tier" configuration – Only the database runs on System z servers

Oracle solutions available today on IBM System z

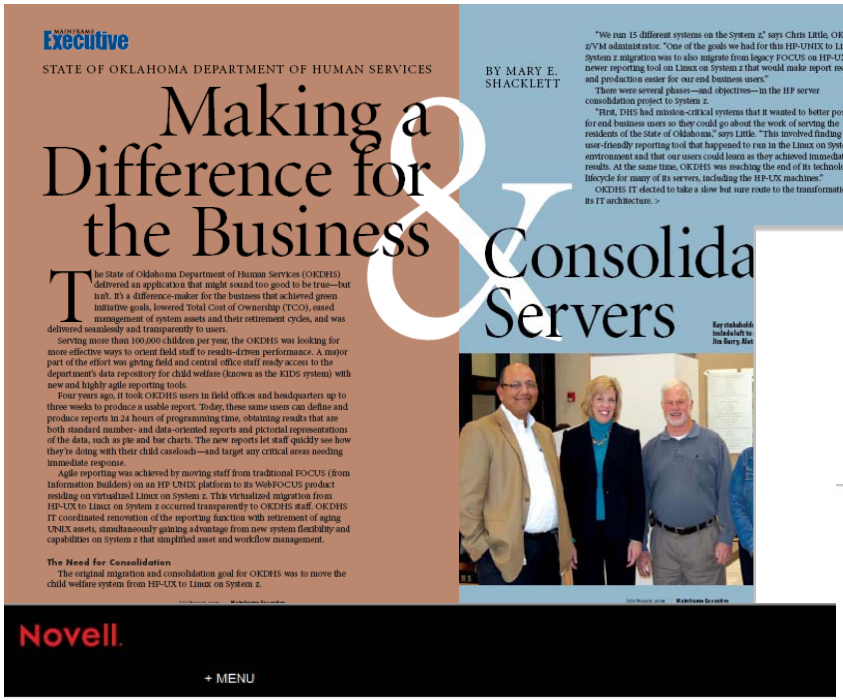
		DB2 on z/OS or Linux on System z	Oracle DB on Linux on System z
Public sector solutions Taxpayer registration, tax return processing, revenue collection and audit, Siebel CRM	**Oracle Enterprise Tax Management**	**Version 2.2** DB2 8 & 9, WAS 6.1	
	Oracle Siebel CRM for Public Sector	**Version 8.2** DB2 8 & 9	
BIEE solutions Data source only	**Oracle Business Intelligence Enterprise Edition**	***Version 10.1.3.4.1** DB2 8.2 & 9	***Version 10.1.3.4.1** Oracle 10*g*R2

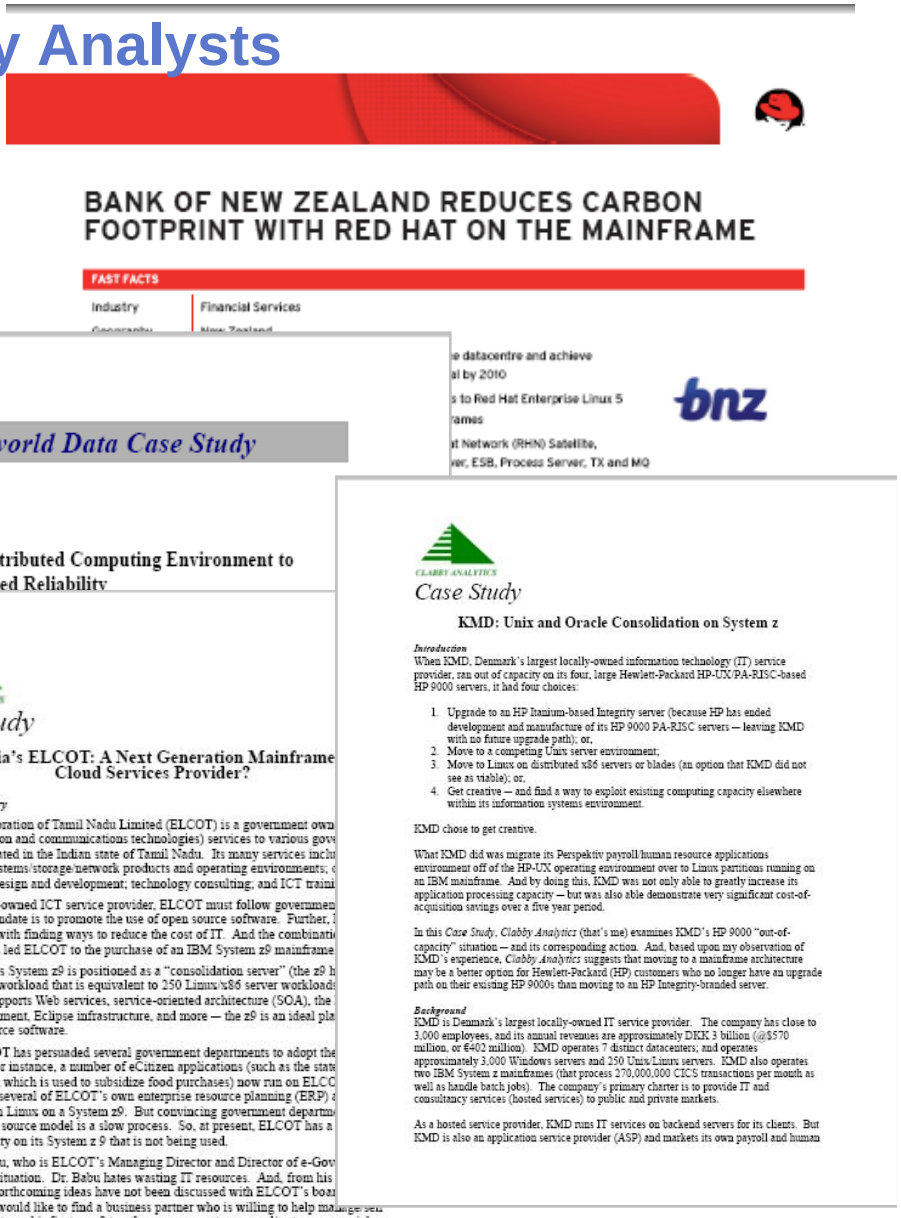
* Note: Multi-platform “Split Tier” configuration – Only the database runs on System z servers

Oracle server technology for Linux on System z

	Oracle Solution	Version Available	Technology Status – Planned
Database	Oracle Database 9*i*R2	Oracle DB 9*i* 9.2.0.8 and later	
	Oracle Database 10*g*R2	Oracle DB 10*g*R2 10.2.0.4 PSU 5 *5 quarters of patch set parity!*	Oracle DB 10*g*R2 10.2.0.5 Planned – 4Q2010
	Oracle Data Vault 10*g*R2	Oracle Data Vault 10.2.0.4	
	Oracle Database 11*g*R2		Oracle DB 11*g*R2 Planned – 1Q2011
Fusion Middleware	Oracle FMW 10*g*R2/10gR3 Application Server	Oracle Application Server 10*g*R2 10.1.2.3 10*g*R3 10.1.3.5	Oracle DB components ▪ Oracle Real Application Clusters ▪ Oracle OLAP ▪ Oracle Spatial ▪ Oracle Label Security ▪ Oracle Partitioning ▪ Oracle Data Mining ▪ Oracle Advanced Security ▪ Oracle Data Guard
	Oracle FMW WebLogic	Oracle FMW WebLogic Server 10.3.2, 10.3.3 WebLogic Portal 10.3.2	
Enterprise Manager	Oracle Enterprise Manager Agent	Oracle Enterprise Grid Control Agent 10.2.0.5	

Customer Case Studies by Industry Analysts





Our Customers

Idaho Power Company

IDAHO POWER
An IDACORP Company

Idaho Power Company moved to SUSE Linux Enterprise Server on an IBM mainframe to improve performance and take advantage of virtualization, with dramatic cost reductions.

Transzap Boosts uptime with IBM System z

- **Business challenge:**
  - Transzap offers its customers a comprehensive suite of financial software tools. As a small business with tens of billions of dollars in client transactions flowing through their systems each year, Transzap needed an economical, reliable platform to provide clients with high availability, while enabling the capacity to accommodate growth within their software-as-a-service business model.
- **Solution:**
  - Transzap decided to consolidate on an IBM System z platform to provide the stability and scalability needed to accommodate triple digit volume growth, enabling them to focus on the business of software innovation. Transzap migrated to System z and virtualized its critical applications on Linux on System z, a platform that supports Transzap's dynamic Java and Oracle environments.
- **Benefits:**
  - Helps Transzap serve more than 69,000 users across 6,800 companies
  - Provides higher levels of uptime for their customers
  - Offers peace of mind through 24x7 world-class hardware support

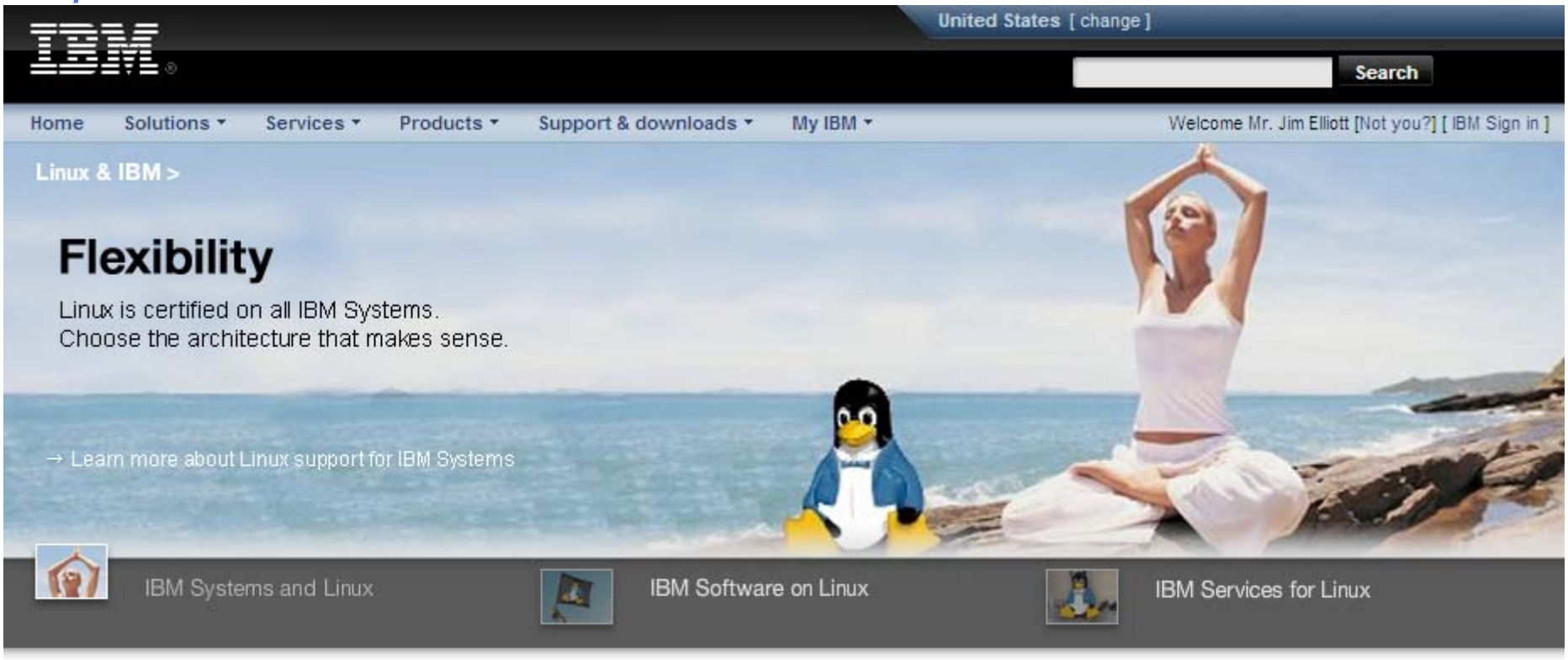
"We intend to deliver a 99.9% application uptime guarantee to our customer base, thanks to the availability characteristics of System z."

Peter Flanagan
CEO of Transzap, Inc.

- **Solution components:**
  - IBM System z
  - Linux on System z
  - IBM z/VM

Linux at IBM

http://ibm.com/linux/

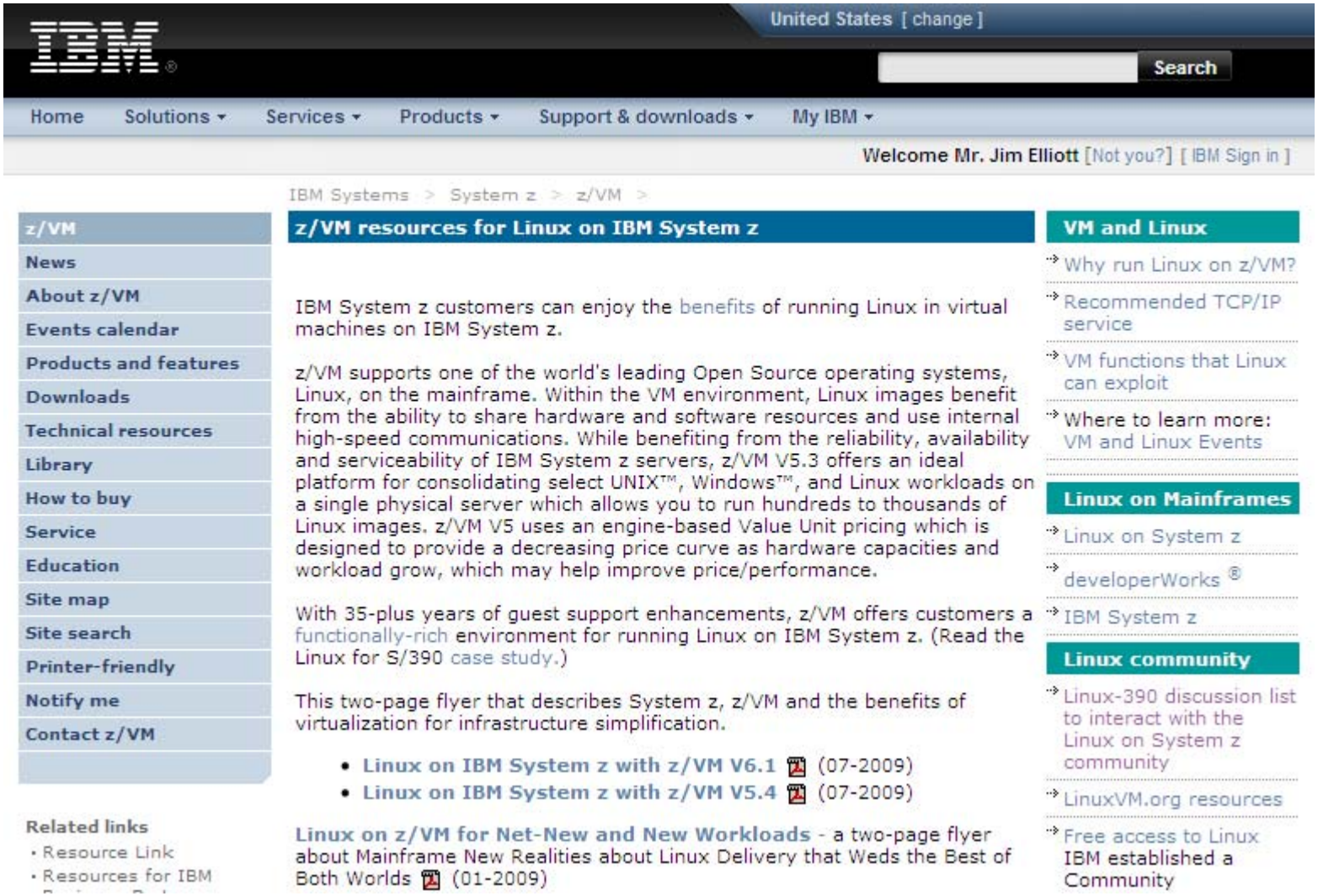


Linux on System z

http://ibm.com/systems/z/linux/

z/VM and Linux on System z

http://ibm.com/vm/linux/



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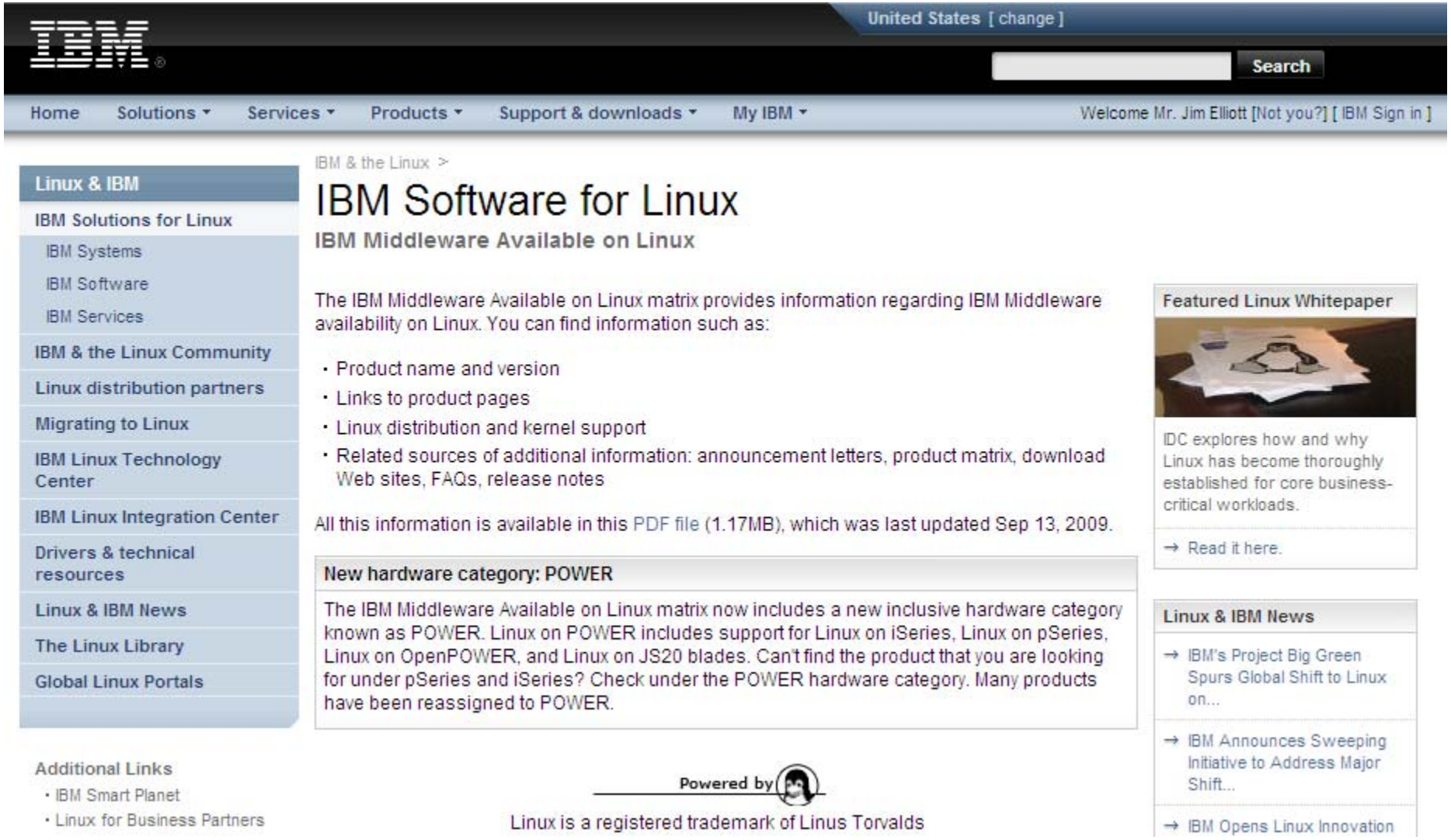
1. Configuring Logical Volume Management (LVM) on Linux for zSeries
   Technote, published 13 Jan 2003, last updated 7 Oct 2009, Rating: ☆☆☆☆☆ (based on 5 reviews)
2. Tuning IBM System x Servers for Performance
   Redbooks, published 4 Aug 2009, last updated 12 Aug 2009, Rating: ☆☆☆☆☆ (based on 5 reviews)
3. IBM Optimized Analytic Infrastructure Solution: Installation Guide V1.0
   Redbooks, published 14 Dec 2006, last updated 9 Jun 2009

IBM Middleware for Linux

http://ibm.com/software/linux/

IBM Software Available for Linux

http://ibm.com/linux/matrix/



IBM developerWorks for Linux

http://ibm.com/developerworks/linux/

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Internet list server discussions

- **IBMVM discusses z/VM**
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- **LINUX-390 discusses Linux on System z**
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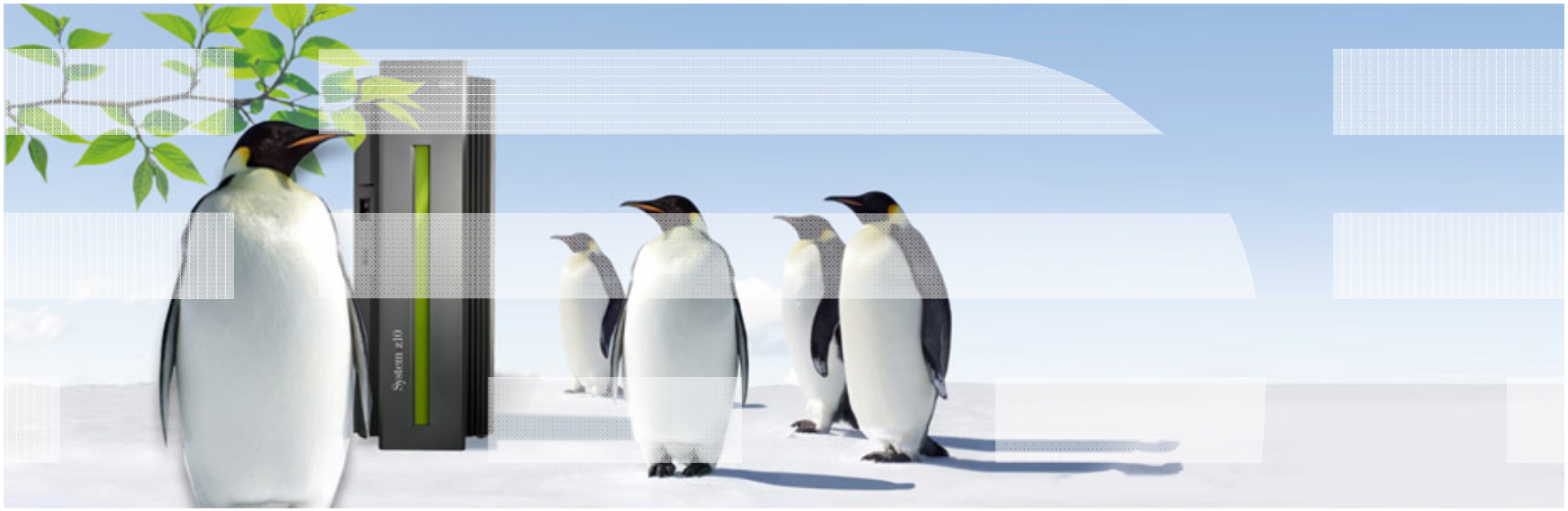
  - View and search the current list and archives:
    - http://www.marist.edu/htbin/wlvindex?linux-390

Linux on IBM System z

Take back control of your IT infrastructure

- **Unify the infrastructure**
  - IT optimization and server consolidation based on virtualization technology and Linux
  - Linux can help to simplify systems management with today's heterogeneous IT environment
- **Leverage the mainframe data serving strengths**
  - Deploy in less time, accessing core data on z/OS
  - Reduced networking complexity and improved security network “inside the box”
- **A secure and flexible business environment**
  - Linux open standards support for easier application integration
  - Unparalleled scale up / scale out capabilities
  - Virtual growth instead of physical expansion on x86 or RISC servers
- **Leverage strengths across the infrastructure**
  - Superior performance, simplified management, security-rich environment
  - High-performance security-rich processing with cryptographic co-processors
  - Backup and restore processes

Implementing Management Solutions



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INTEGRATED SERVICE MANAGEMENT

INTRODUCTIONS

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- The technology you've heard about today presents amazing opportunities, from cost savings and efficiencies through sustainability.
  - but to realize it's true potential you must consider the management of your infrastructure and the applications you run end-to-end.

- IT Service Management has matured considerably over recent years – our approach encapsulates traditional Service, Security and Storage management.

- Based on our experiences, we're here to talk about best practice methods for realizing an end to end IT Service Management vision for your organization.

- With years of experience to draw on, we'll talk about real world examples of how you make the journey to an ITIL aligned Service Support and Delivery model.

- Our goal? To take you from a reactive, disjointed service to an integrated 'Smarter' model.

Organizations embark on this journey everyday, and you don't have to go it alone - experience matters, learn from others and partner with experts.

STARTING PRINCIPLES

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- Best practice looks the same, whatever the organization.
- Look to industry experience and best practice to build a solid approach:
  - ITIL for how IT services are to be delivered and supported;
  - COBIT to address what needs to be controlled and how it is to be measured.
- ITIL provides an industry recognized framework for best practice while COBIT helps us to measure the success of your transformation.
- Benchmark where you are today, and use this to demonstrate your progress.
- Successful governance ties IT's goals to those of the business – make sure you have business buy-in and communicate.

Take a pragmatic approach…

•Projects aren't always about enterprise wide change. You can introduce best practice on a project by project basis. New infrastructures and business services are a great place to start.

•Start with the new, and extend the reach of your best-of-breed platform across existing and new services.

•Bring together the legacy, distributed and datacenter under one platform…

•… and easily extend to new services, including virtualization and cloud.

•Leverage your platform to introduce new and support existing business processes.

•Engage the business, they'll soon realize your strategy helps to drive their agenda for change!

CONSIDERATIONS

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A successful organization is built on a solid framework of data and information. To meet the goals of the business you must effectively manage the union between business processes and information systems.

- Successful IT Service Management projects are delivered in phases - understand the big picture, but don't try and eat it whole.
- Focus on what delivers the most value to you and your organization, and deliver it in a strategic way.
- Engage the business, understand both business and technology drivers - use this to validate your strategy and delivery routes.
- Define a program for change made up of work packages – translate the business requirements to a delivered technical solution.
- Deliver value quickly, target prominent pain points and areas where improvement can be quickly demonstrated.

MAKING SENSE OF COMPLEXITY

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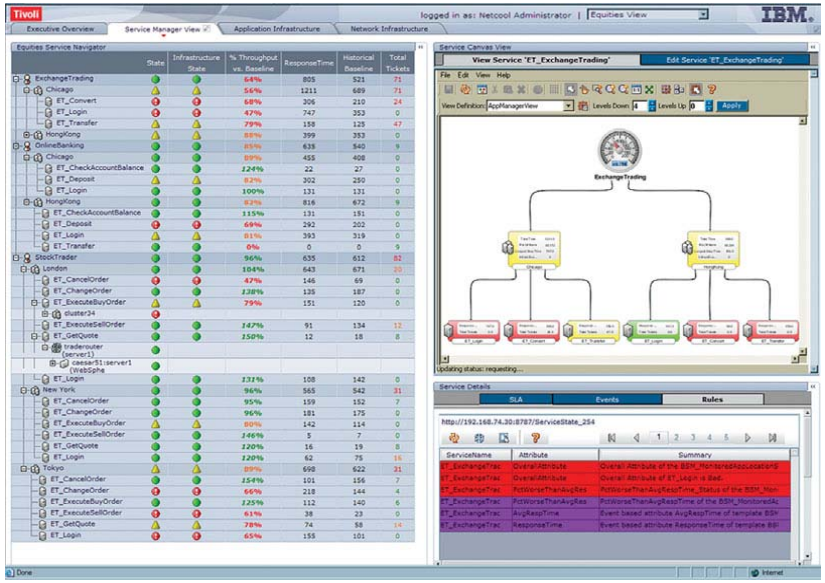
Looking at the technologies outlined today the simplification, consolidation and centralization of your infrastructure is more achievable than ever before.

IBM has delivered the platform and applications you need for a best of breed IT infrastructure.

Improving your infrastructure helps to make your business run better – but you want it to run smarter.



IT Service Management Challenges we see every day:

- **The Operations Lifecycle, runbook automation and applying business process to technology;**
- **Understanding and cataloguing IT Assets;**
- **Centralizing control and integrating systems;**
- **Managing Change and Configuration Management;**
- **Detecting and responding to Incidents and Problems;**
- **Automating processes to improve service delivery;**
- **Securing the infrastructure; and**
- **Proactively managing SLA's.**

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THAT SOUNDS GREAT, BUT WHO'S REALLY DONE THIS?

OUR SERVICE MANAGEMENT APPROACH

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Let's talk about four real world examples…

1. CMC Markets — **A Global Market Maker**
2. First Data — **The World's largest Merchant Processing provider**
3. UK GOVERNMENT — **The home of ITIL**
4. AVIVA — **The World's 5th Largest Insurer**

… and how each one of these organizations overcame the challenges you see today.

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CMC MARKETS

A GLOBAL MARKET MAKER

OVERVIEW

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Business Drivers

Building a new global infrastructure, using technology to gain competitive advantage and to extend market reach.

- Moving from a legacy infrastructure to a new worldwide datacenter model.
- Systems must handle unpredictable load driven by market movement.
- Measure and report the performance of the infrastructure, from the customer's point of view.
- Understand the true impact of an incident, manage problems and their impact on the business.
- Verify availability and Performance of Key Services.

The Solution…

- A collection of worldwide datacenters, all built on IBM hardware and monitored by Tivoli Software.
- Provided the ability to monitor with immediate visibility all aspects of infrastructure and business services
- We now simulate users interacting with key application and web based services from all over the world – measuring response time and the ***true*** customer experience.
- We delivered an intelligent business dashboard and centralized operations to a single operations hub.
- We provided closed loop integration – driving everything via the Service Desk.

CMC Markets

CMC MARKETS AND IBM TIVOLI SOFTWARE

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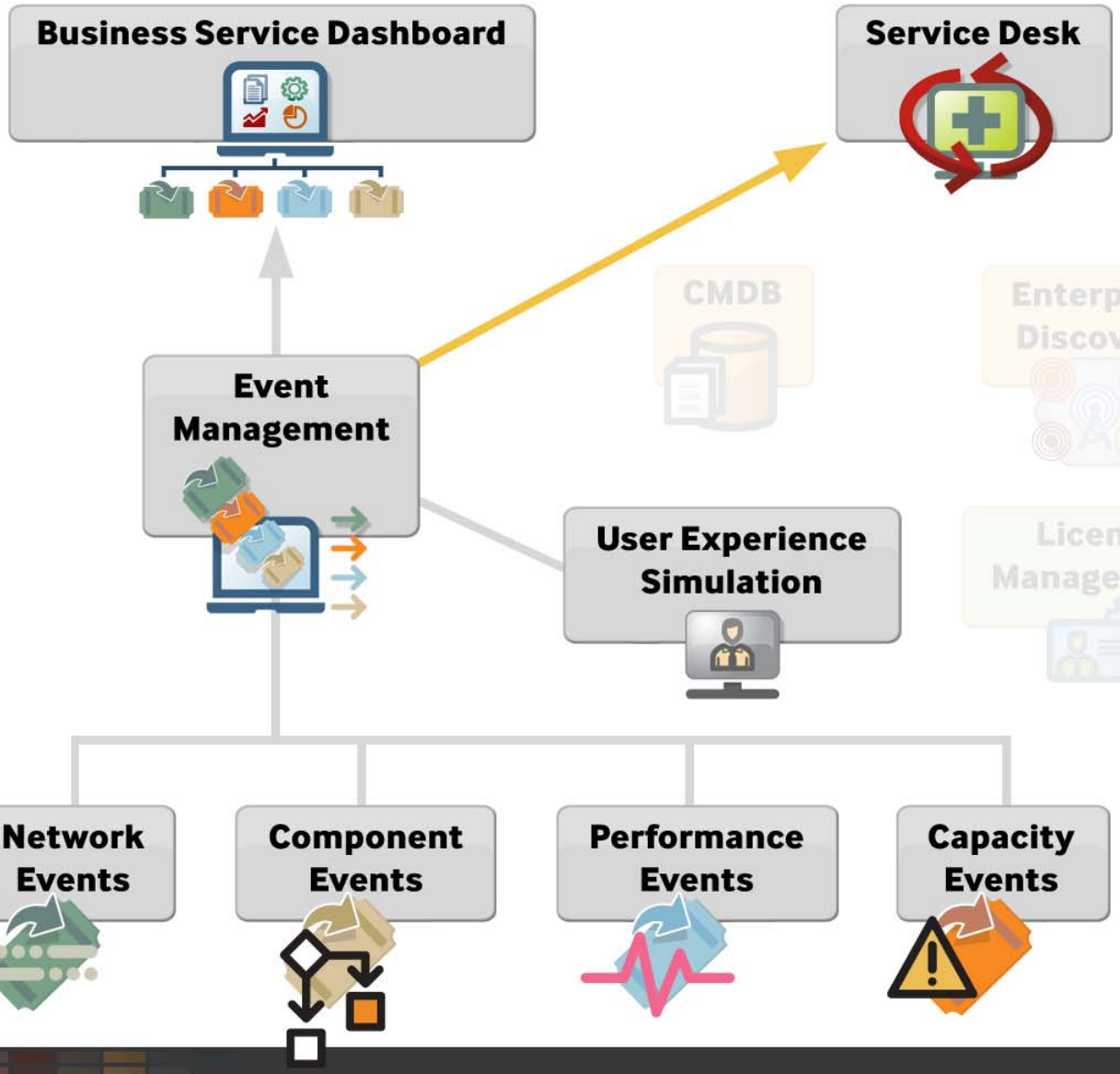

Enterprise Reporting
Workload Management
CMDB
Enterprise Discovery
Identity Management
Access Management
License Management
Compliance Management
Storage
Usage and Accounting

BUSINESS BENEFITS

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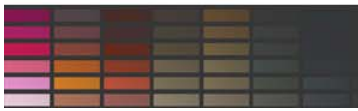
- We moved from a legacy estate to a best of breed IBM datacenter model.

- Through visibility of the IT Infrastructure, it's performance and capacity management CMC Markets are now able to tune their infrastructure to cope with spikes in demand as they happen.

- The new platform provides the scalability, capacity and extensibility to support trading worldwide, 24x7x365.

Competitive advantage? CMC Markets made millions of dollars in one day when the competitors stopped trading due to high demand and their inferior Infrastructures failed.



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FIRST DATA
MERCHANT PROCESSING

OVERVIEW

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Business Drivers

Gain a detailed understanding of deployed systems and the relationships between them

- Move IT infrastructure management from point monitoring towards a defined set of business views, representing customer experience.
- Consolidate management for a mix of vendor packages, and a proprietary CMDB.
- Integrate with the production Service Desk to extend existing business processes.
- Automate discovery across the IT estate, and link the systems and applications to the business services they provide.
- Tune the Service Management platform to prioritise and report on financial penalties associated with SLA's.

The Solution…

- Discovery – what's out there.
- Change – If something changes, we want to know and link it back to a Change Record.
- Visualization – implementing a Subway map of Business Services, ensuring outages down the line could be mitigated through rerouting.
- Diagnostics – supporting drill down to the components behind the service, dynamically updated through discovery.
- Dashboarding – providing real time SLA views and predicatively reporting breaches.

First Data

FIRST DATA AND IBM TIVOLI SOFTWARE

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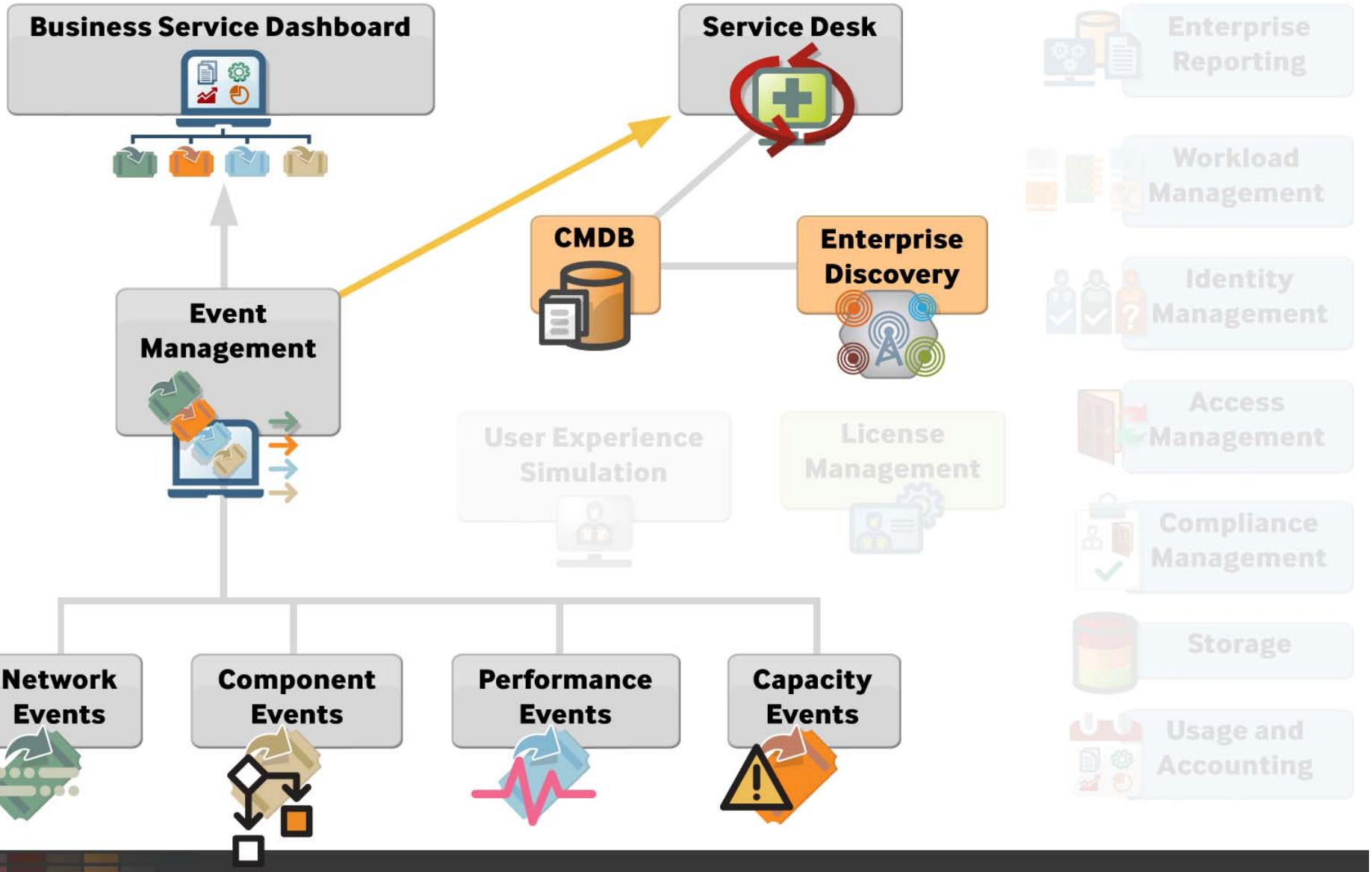

BUSINESS BENEFITS

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- Introduced a business service view of operations.
- Provided a better understanding of the impact of Change on business services.
- Provided a visibility of outages in a business context – not just 'what went wrong?', but 'what did it mean to the business?"
- Drove service improvements from a customers perspective.
- Ensured incident and problems were identified, prioritised and solved before they impact SLAs.
- Reduced costs through a better inventory of services and components.

The bottom line? Faster resolution of incidents and problems, more powerful root cause analysis and strict change and configuration management.

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UK GOVERNMENT

THE HOME OF ITIL

OVERVIEW

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Business Drivers

Automate internal processes through the realisation of ITIL and gain control over the impact of change on business services

- Significant Service Management Challenges.
- Processes were documented and ***assumed*** to be in use.
- Struggling with Change and Configuration management.
- No accurate view of the IT estate.
- No integration between HR and Service Desk.
- No integration between people and assets.
- Limited KPI reporting .
- Time consuming SLA management.

The Solution…

- Automate discovery and change management.
- Introduce structure and control through workflows.
- Integrate Incident, Problem, Change and Configuration Management.
- Provide a business dashboard, with a subway map of key services.
- Compliment the Service Desk and Business Dashboard with a 'What Changed?' view – a view of all changes outside of change control.

UK GOVT AND IBM TIVOLI SOFTWARE

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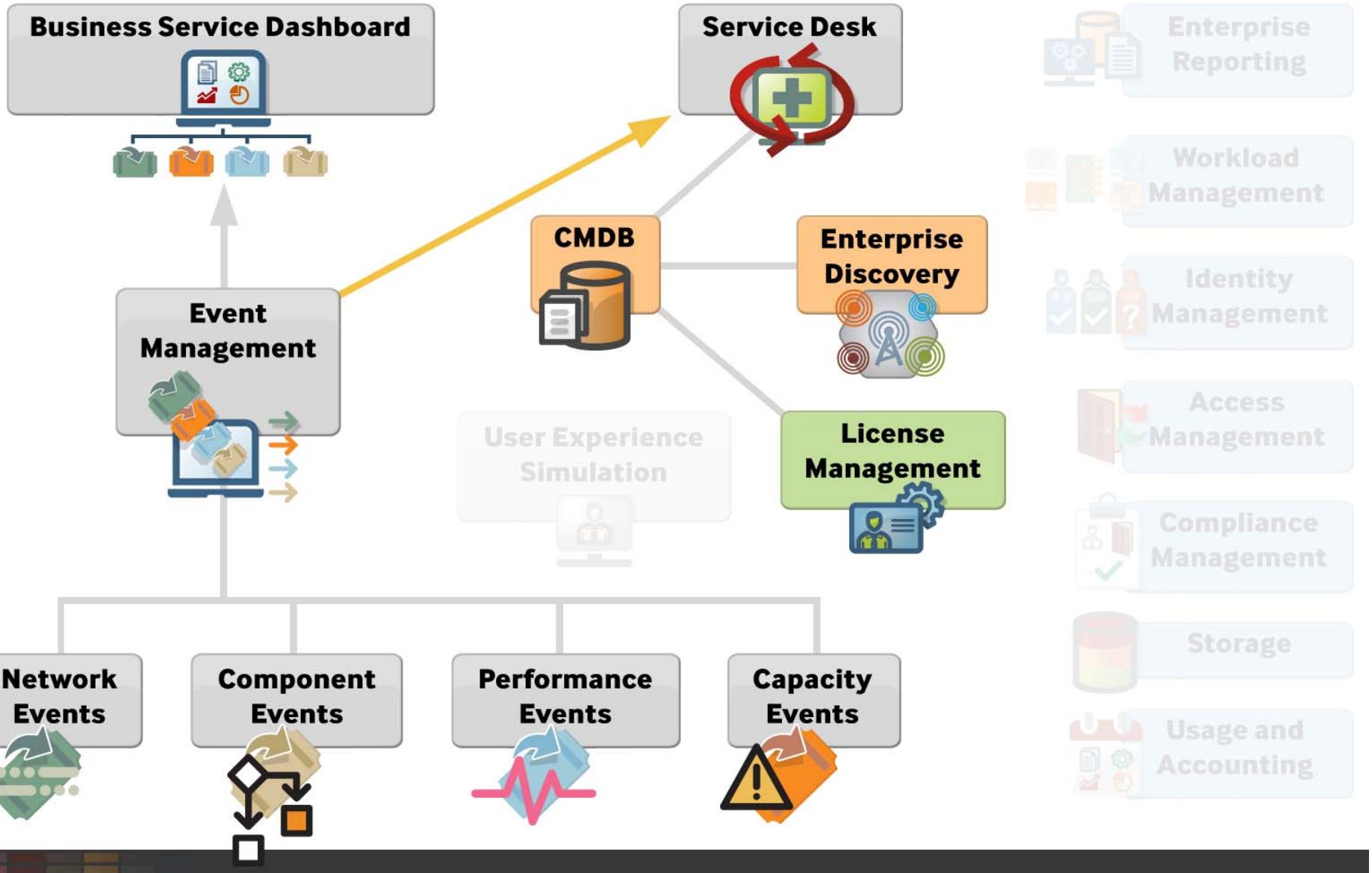

BUSINESS BENEFITS

PIREAN
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- Integrated end-to-end realisation of ITIL aligned Incident, Problem, Change and Configuration Management.
- Provided a better understanding of the impact of Change on business services.
- Provided a visibility of outages in a business context – not just 'what went wrong?', but 'what did it mean to the business?"
- Moved on to reduce the load on the service desk through user self-service.

What does it mean for citizens? Better service … faster resolution of incidents and problems, more powerful root cause analysis and strict change and configuration management.

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AVIVA

THE WORLD'S 5TH LARGEST INSURER

OVERVIEW

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Business Drivers

Leverage the eCommerce platform to drive new business lines and reduce support and operational cost.

- Refreshing Aviva's eCommerce platform with new IBM technologies.
- Reduce the time taken to bring new applications into production.
- Standardise and automate the deployment process.
- Define and enforce service levels for key components.
- Implement a best practice, repeatable performance and availability management solution.
- Improve the efficiency of support and maintenance.

The Solution…

- Automated build and provisioning, from software to user provisioning and self service.
- Enable rapid, repeatable environment and application builds.
- Provide for detection of non-automated changes ("drift").
- Provide a business view of impact of failures, affect on services and potential breaches of SLAs
- Improve capacity reporting, issues are identified before they begin to impact on the service.

AVIVA

IBM TIVOLI SOFTWARE - INTEGRATED VIEW

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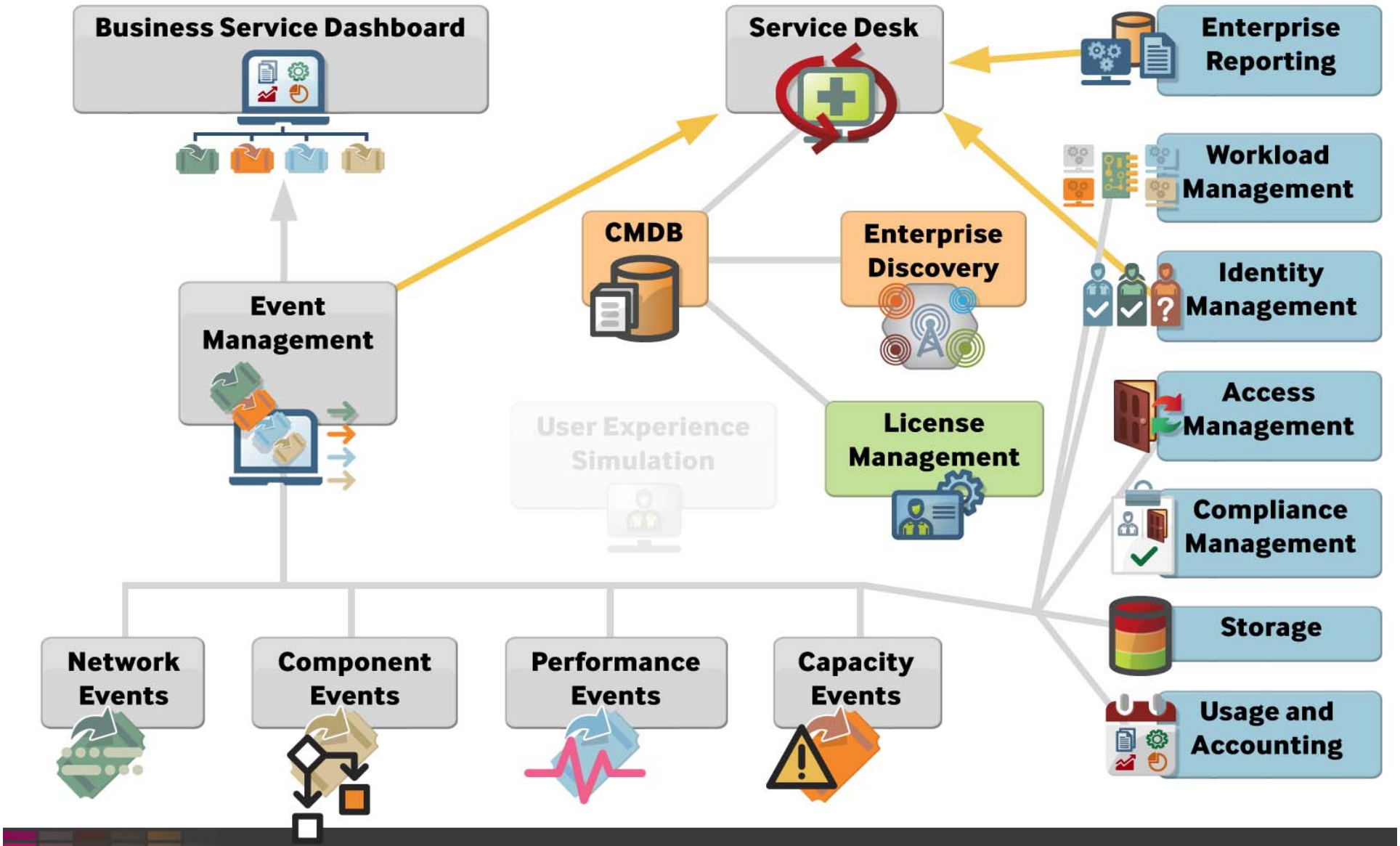

BUSINESS BENEFITS

PIREAN
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- Meantime to delivery of business functionality in reaction to market changes reduced from months to weeks.
- Service availability moved to 99.9%.
- Utilization of infrastructure increased from 25% to 75% without loss or degradation of service, reducing infrastructure investment needs by 50%.
- Standardization and automation of management and delivery processes provides consistency and reduces organizational support needs and resources.

Real world benefits? Faster delivery, greater flexibility, less downtime and the capability to add capacity and new services on demand.

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FINAL THOUGHTS

BRINGING IT TOGETHER

PIREAN
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- No matter whether you're tackling a legacy or green field estate – the problems and approach is always the same.
- Build on best practice and learn from others experiences.
- Technology alone is not the answer, engage your business users and keep delivering.
- Communicate your progress.
- An integrated portfolio is essential, interoperability accelerates delivery and removes pain.

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Together We're Smarter.

ABOUT PIREAN

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PIREAN
Together We're Smarter.

A strategic partner for the delivery of IT Service and Security Management solutions with a reach across Business Consultancy, Technology and Outsourcing.

With AAA Accreditations across the IBM Tivoli Software portfolio we are recognized worldwide as industry leaders – delivering best of breed, smarter, solutions on IBM Tivoli Software.

2010 MOST ACCREDITED* IBM TIVOLI BUSINESS PARTNER IN THE WORLD

*Source: IBM, based on AAA accreditations for IT Service Management and Security

"As of March 10, 2010, Pirean are the most accredited Tivoli business partner in the World."

IBM

Pulse2010
The Premier Service Management Event

Winner 2010 – Best IT Service Management Solution

IBM
Beacon Awards
2009 Finalist

Finalist 2009 – Outstanding Service Management Tivoli Award

Pulse 2008

Winner 2008 – Business Partner Innovation Award

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ANY QUESTIONS?

Summary