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**Platform Matters –**  
*Simplifying the complexity and driving down  
Enterprise IT costs with IBM zEnterprise System...*



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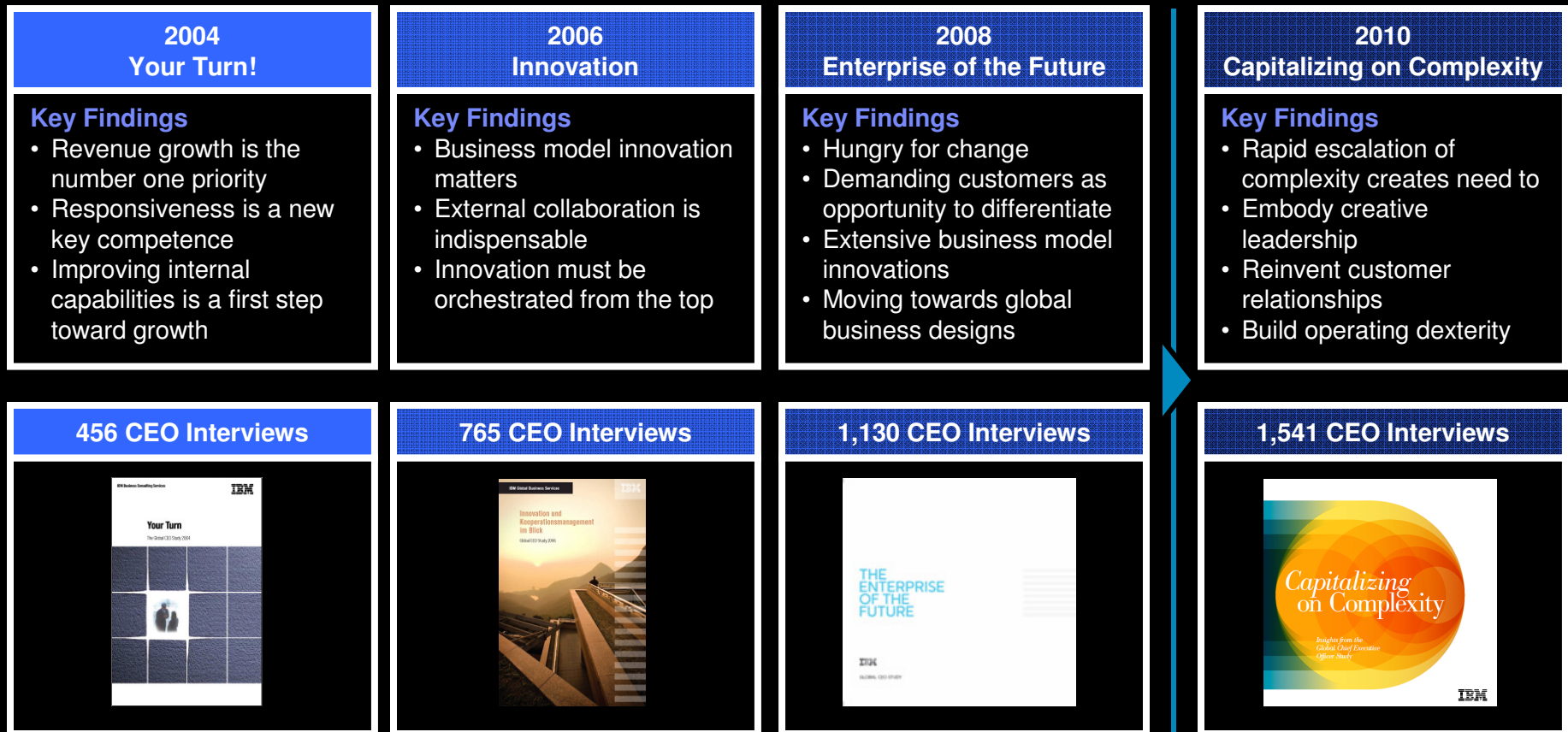
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# The Global CEO Study 2010 is the fourth biennial CEO study, building on our insights and findings over the last 6 years...



# Smarter Planet – Initiatives – Dynamic Infrastructure

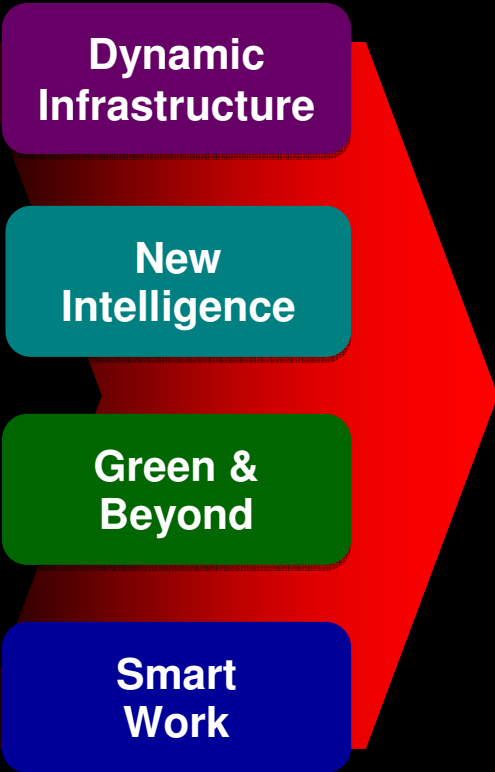
## IBM's smarter planet vision



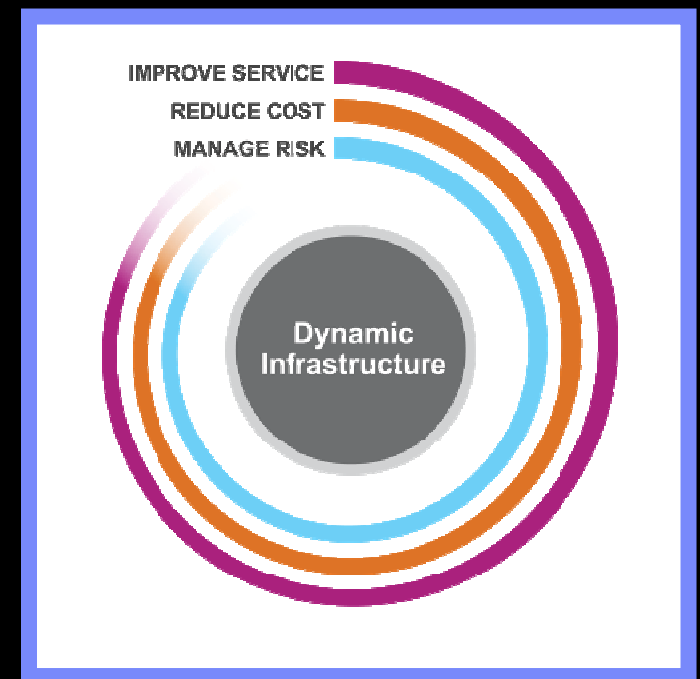
*The world has become flatter and smaller.*

*Now it must become smarter.*

## Four major IBM initiatives



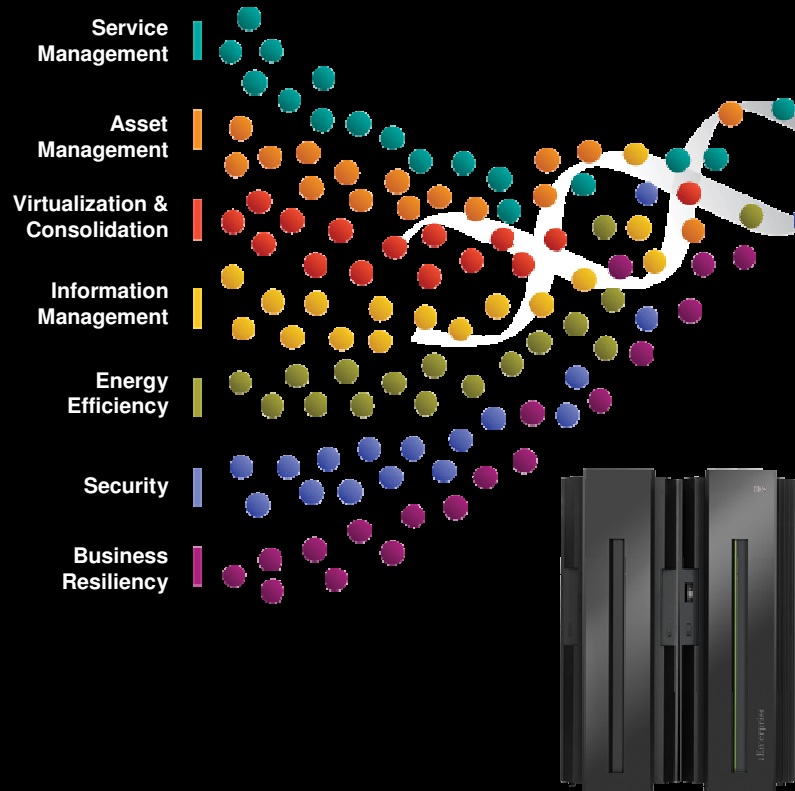
## Dynamic Infrastructure





*Delivers superior business and IT services with agility and speed*

# System z innovations for a dynamic infrastructure

... System z delivers extreme business value through industry leading *security, availability, scalability, flexibility, virtualization* and *ease of system management* capabilities



## IBM System z Mainframe Server

- 
**IMPROVE SERVICE**
  - Dynamic, policy based, and automated SOA infrastructure
  - Adapt and respond quickly to changing business imperatives
- 
**REDUCE COST**
  - Industry-leading virtualization, energy efficiency, and scale
- 
**MANAGE RISK**
  - Secures your business, reduces risk, builds trust and confidence
  - Superior qualities of service allows clients to run their businesses reliably

## IBM System z mainframe – just a fact...

IBM officials said **a wide gap remains between the capabilities of mainframes and those of systems running Unix**. For instance, unlike with Linux or Unix systems, the risk of someone cracking into a mainframe system "is almost zero," said Ravi Arimilli, an IBM fellow and chief architect of the IBM Systems Group.

Unix will eventually close the gap with improved security, availability and virtualization, said Arimilli. "When will that crossover happen? **I don't think it's anytime soon,**" he said, estimating that it would be **at least a decade.**



*Source: ComputerWorld  
July 19, 2004*

Ravi Arimilli  
(IBM Fellow)  
STG Chief Architect

There has always been the need for **higher level of sophistication as more sophisticated customers want to use our products and functions and capabilities in very different ways.**

And this is very clearly true even in the rest of the industry. And that's the reason why people want to be a mainframe, knowing full well when they claim, "I am an alternative mainframe," **what they are talking about was the mainframe of some time ago, and the new mainframe has gone further ahead.**

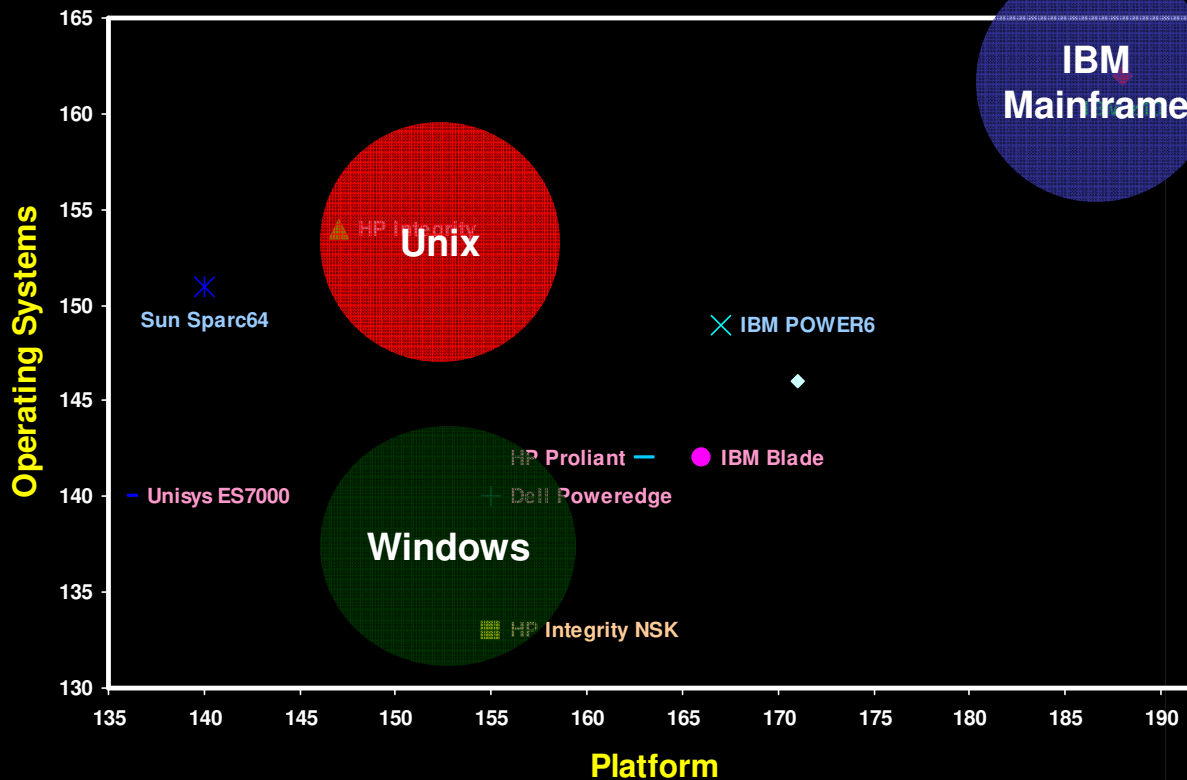
*Source: IBM Inside Story  
Jan 2006*



Gururaj Rao  
(IBM Fellow)  
STG Chief Engineer

# System z has distinguished itself as the leading enterprise server in the industry for decades...

## Gartner



### Platform

- Single system availability
- Planned downtime
- Disaster tolerance recovery
- Hardware protection and security
- Hardware electrical isolation
- Virtual machines (hypervisors LPAR)
- Mixed workload OS hosting
- Mixed workload OS management
- Server management tools

### Operating Systems

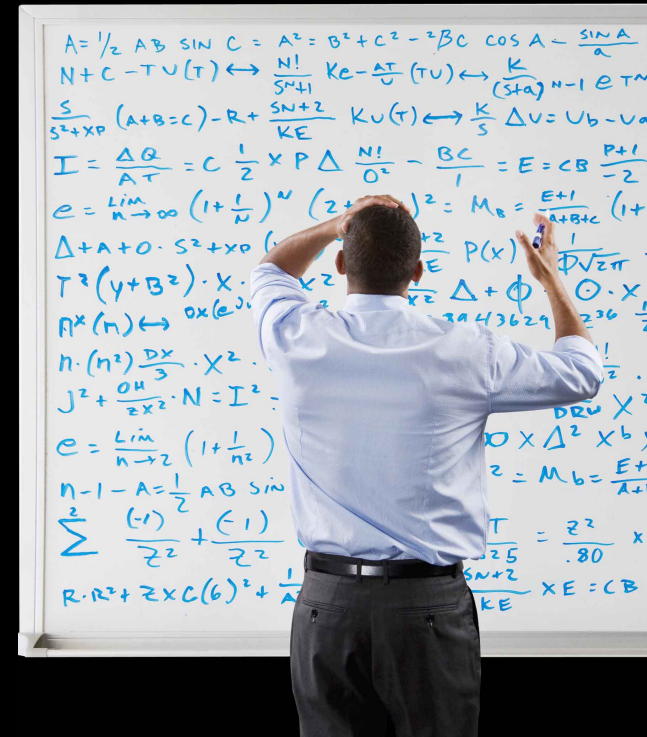
- Failover clustering
- Workload management
- Capacity demand
- OS manageability
- OS Workload Management
- 3<sup>rd</sup> party tool support
- L3 Engineering services
- High availability services

Source: The Gartner Server Evaluation Model (SEM) Release 6 – December 2009

Some people advocate “one size fits all” server approach...

but today’s enterprise computing environments are multi-platform for good reasons. They are optimized to run different production workloads:-

- Database and Transaction Processing
- Business Analytics
- Web-based Interactions
- Enterprise Applications (such as ERP)
- The myriad of x86 Applications.



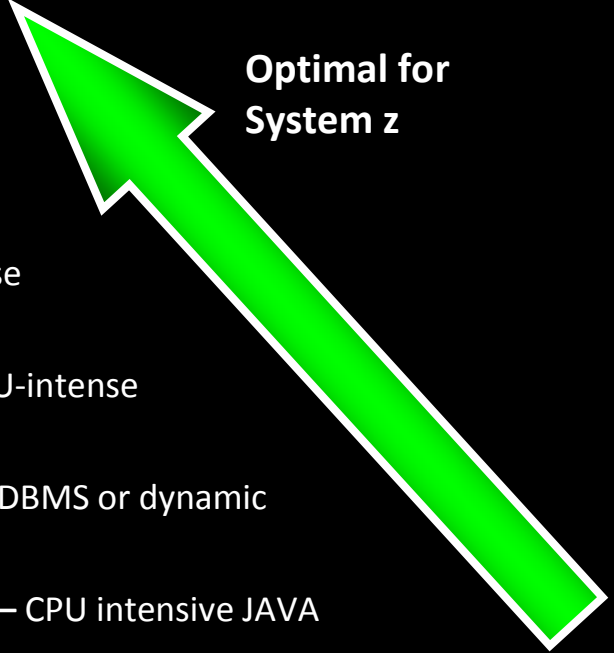
**These Solutions are *optimally* deployed on multi-tier, heterogeneous server infrastructures ...**



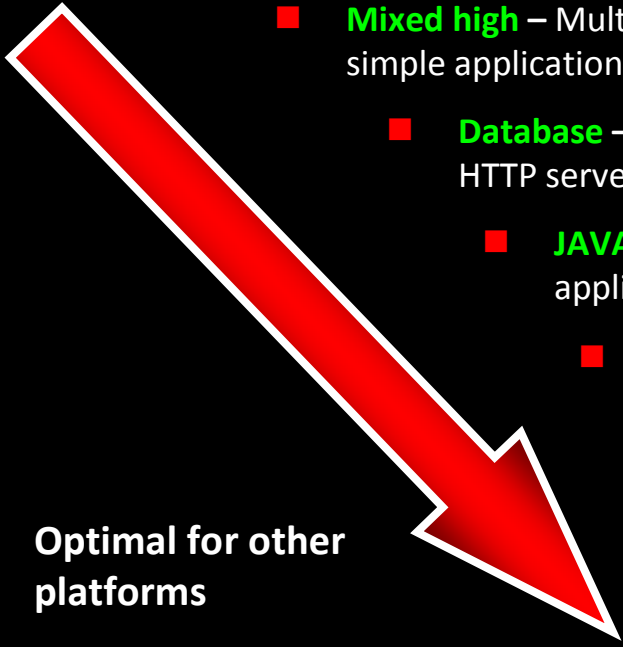
## Application Performance Characteristics – what fits on which platform?

Workload performance varies by application and can be best served by different platforms or the right mix of multiple platforms.

- **Data intensive** – Large working set and/or high I/O content application
  - **I/O Bound** – High I/O content applications
    - **Mixed low** – Multiple, data-intense applications or skewed OLTP, MQ
      - **Mixed high** – Multiple, CPU-intense simple applications
        - **Database** – Oracle DBMS or dynamic HTTP server
          - **JAVA Heavy** – CPU intensive JAVA applications
            - **Skewless OLTP** – Simple and predictable transaction processing
              - **Protocol Serving** – Static HTTP, firewall, etc.
                - **CPU Intensive** – Numerically intensive, etc.



Optimal for  
System z



Optimal for other  
platforms

## IBM vision is to develop a platform that delivers unbeatable workload-optimized platform for enterprise applications...

Re-write the rulebook and set new standards for business-centric IT with IBM System z, to be the world's premier workload-optimized platform for enterprise applications.



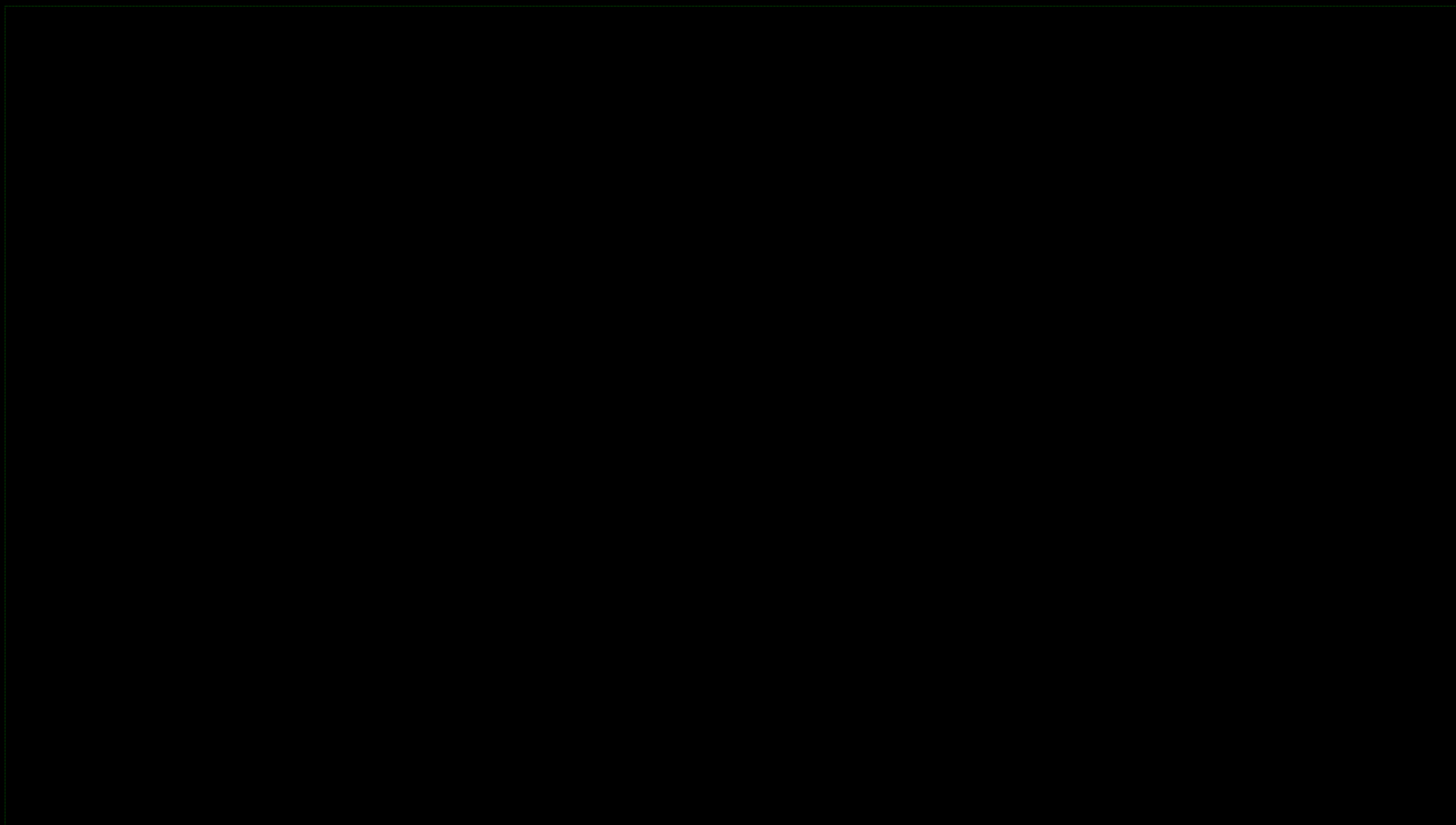
### Our Vision:

*Deliver the best of all worlds, Mainframe, UNIX, x86 and single function processors, integrated in a single system for ultimate flexibility and simplicity to optimize service, risk and cost across multiple heterogeneous workloads.*



# Introducing... IBM zEnterprise System

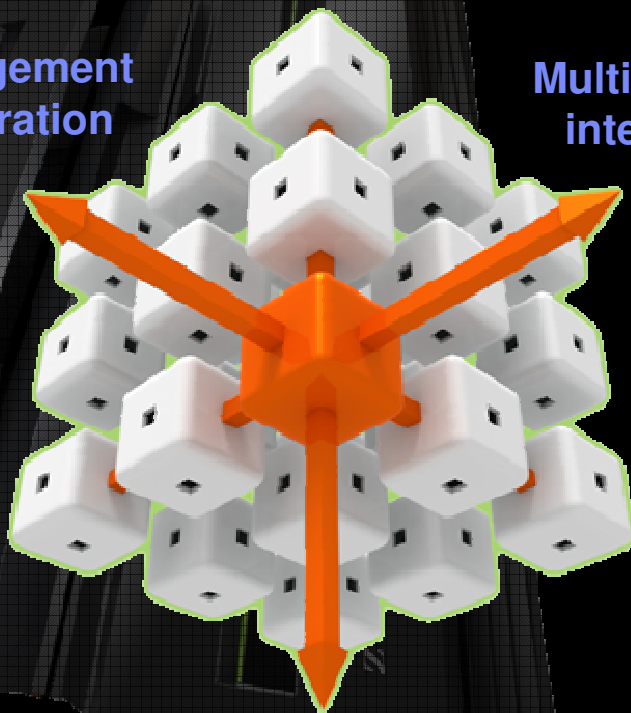
*The defining standard and a new dimension in computing...*



## Announcing IBM zEnterprise System – the world’s premier workload-optimized “System of Systems” ...

Management  
integration

Multi-platform  
integration



Stack  
integration

- A “System of Systems”, integrating IBM’s leading technologies to dramatically improve productivity of today’s multi-architecture data centers and tomorrow’s private clouds.
- The world’s fastest and most scalable enterprise system with unrivalled reliability, security, and manageability.
- The industry’s most efficient platform for large scale data center simplification and consolidation.

## Brief investment background of IBM zEnterprise System...

The new IBM zEnterprise system – the ultimate workload optimized system – was developed at a cost of \$1.5 billion in R&D. More than 5,000 IBMers worked more than three years totaling more than 31 million person hours in a 24-hour development process across 18 IBM labs worldwide. Nearly 40 IBM Fellows and IBM Distinguished Engineers led this process.

## IBM has been collaborating with clients to prepare for this day

IBM worked closely with a team of 30 customers on the design and development the zEnterprise System. Those companies had a combined annual revenue of more than \$1.5 trillion in 2009.

Jeffrey A. Frey received the top IBM technical innovator award (IBM Fellow) on 25<sup>th</sup> May 2010...



NOVEMBER/DECEMBER 2010  
WWW.MAINFRAMEZONE.COM

# MAINFRAME Executive

IT MANAGEMENT IN THE MAINFRAME-CENTRIC ENTERPRISE

BEHIND THE SCENES:  
**THE MAKING**  
of IBM's *new*  
**MAINFRAME/  
BLADE HYBRID**

Jeff Frey,  
IBM Fellow

# IBM zEnterprise is designed to address today's most critical workloads of all type at the most optimum level...

- **Data intensive** – Large working set and/or high I/O content application
  - **I/O Bound** – High I/O content applications
    - **Mixed low** – Multiple, data-intense applications or skewed OLTP, MQ
      - **Mixed high** – Multiple, CPU-intense simple applications
        - **Database** – Oracle DBMS or dynamic HTTP server
          - **JAVA Heavy** – CPU intensive JAVA applications
            - **Skewless OLTP** – Simple and predictable transaction processing
              - **Protocol Serving** – Static HTTP, firewall, etc.
                - **CPU Intensive** – Numerically intensive, etc.

**zEnterprise is designed to run all workloads at the most optimal level**

**Optimal for other platforms**

# IBM zEnterprise System – Best-in-class systems & software technologies

A “System of Systems” that unifies IT for predictable service delivery



## IBM zEnterprise 196 (z196)

- Optimized to host large-scale database, transaction, and mission-critical applications
- The most efficient platform for large-scale Linux consolidation
- Capable of massive scale-up
- New easy-to-use z/OS V1.12

## zEnterprise Unified Resource Manager (URM)

- Unifies management of resources, extending IBM System z qualities of service end-to-end across workloads
- Provides platform, hardware and workload management

## zEnterprise BladeCenter Extension (zBX)

- Selected IBM POWER7 blades and IBM System x Blades\* for tens of thousands of AIX and Linux applications
- High-performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high-performance private network

All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.



## IBM zEnterprise System Technology... (video presentation)



# IBM zEnterprise 196: The heart of the new machine

## *The industry's fastest and most scalable enterprise system*

*Dramatic improvement over IBM System z10™:*

### For Linux

Up to

**60%**

Improvement in  
performance

for **35%**

### For z/OS

Up to

**40%**

Improvement in  
performance

with **60%**

With no increase  
in energy  
consumption

And even better  
performance with  
new software

- 5.2 GHz superscalar processor
- Up to 96 Cores, 1 to 80 configurable for client use
- Up to 3 TB RAIM memory
- Over 100 new instructions
- 1.5 MB L2 Cache per core, 24 MB L3 Cache per processor chip
- Cryptographic enhancements
- Optional water cooling

# The evolution of System z Specialty Engines...

**Optimizers**

IBM Smart Analytics Optimizer  
WebSphere DataPower Appliance\*

**IBM  
Blades**

## zEnterprise 196

Internal Coupling Facility (ICF) 1997

System z Apps Assist Processor (zAAP) 2004

System z Integrated Info Processor (zIIP) 2006

Integrated Facility for Linux (IFL) 2001

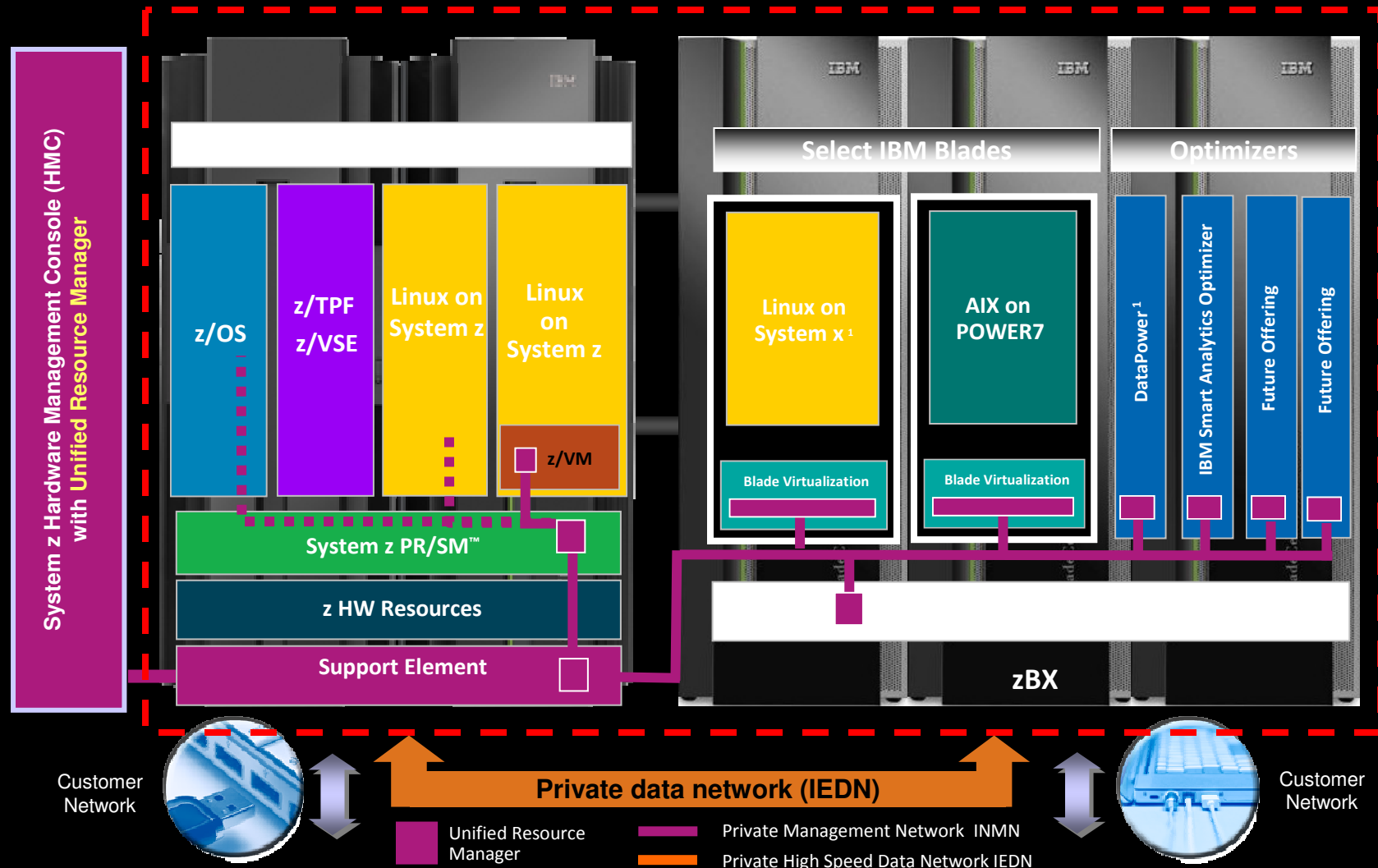
**z/OS LPAR**

POWER 7 (AIX)  
System x (LINUX)\*

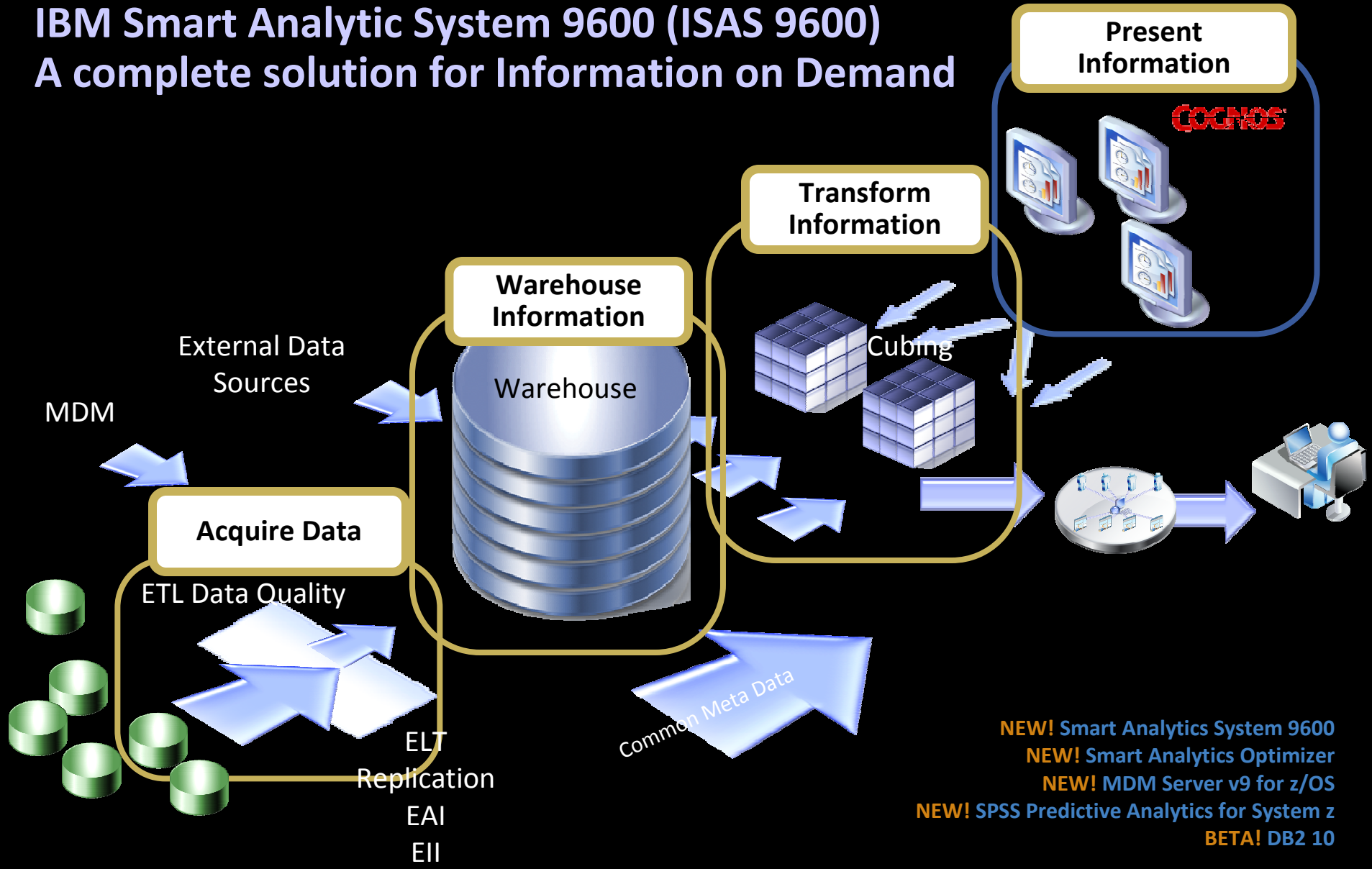
**zEnterprise BladeCenter  
Extension (zBX)**

# Putting zEnterprise System to the task

## Use the smarter solution to improve your application design



# IBM Smart Analytic System 9600 (ISAS 9600) A complete solution for Information on Demand



- NEW!** Smart Analytics System 9600
- NEW!** Smart Analytics Optimizer
- NEW!** MDM Server v9 for z/OS
- NEW!** SPSS Predictive Analytics for System z
- BETA!** DB2 10

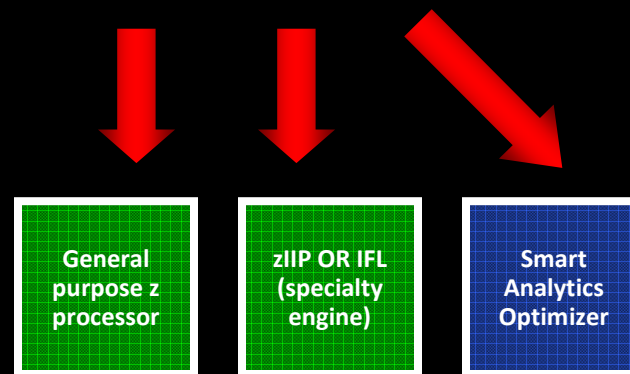
# An example of workload-optimized systems (Stack Integration) – IBM Smart Analytics Optimizer (ISAO)



An integrated business intelligence solution to deliver accelerated and accurate business insight

DB2 on z/OS Real time operational data ↔ Up to 4TB Data in memory

Query runs on optimal technology



Up to **80x improvement in performance** then z10 for predictable and accelerated business insight

# Comprehensive IBM Software leveraging the strengths of zEnterprise

## IBM Software

*Strong information management platform built for business workloads*

DB2, IMS, FileNet, InfoSphere Warehouse, InfoSphere MDM Server, Cognos, SPSS, Optim

- **NEW!** Smart Analytics System 9600
- **NEW!** Smart Analytics Optimizer
- **NEW!** SPSS Predictive Analytics for System z
- **NEW!** IMS 11, IMS Enterprise Suite 1.1
- **BETA!** DB2 10
- **BETA!** InfoSphere MDM Server 9 for z/OS
- **BETA!** Cognos 8 BI for z/OS

*Visibility, control, security, and automation from System z across your business*

IBM Service Management on System z, TSAM, System Automation and NetView® for z/OS, TWSz, OMEGAMON

- **NEW!** Tivoli Security for zEnterprise
- **NEW!** Tivoli Access Manager Family
- **NEW!** Tivoli zSecure Manager for RACF z/VM
- **NEW!** Tivoli Application Management for zEnterprise
- **NEW!** Tivoli Application Resilience for zEnterprise
- **NEW!** Tivoli Asset and Financial Management for zEnterprise

*Application infrastructure, connectivity and dynamic business processes*

WAS, CICS, BPM, WMQ, ESB, DataPower, ILOG, Lombardi

- **NEW!** WebSphere Application Server Feature Pack for Dynamic Scripting
- **NEW!** CICS Deployment Assistance for z/OS
- **ENHANCED!** Business Monitor for z/OS

*Application Development Tools and Software Delivery Platform*

Compilers (C/C++, PL/I, COBOL), RDz, RTCz

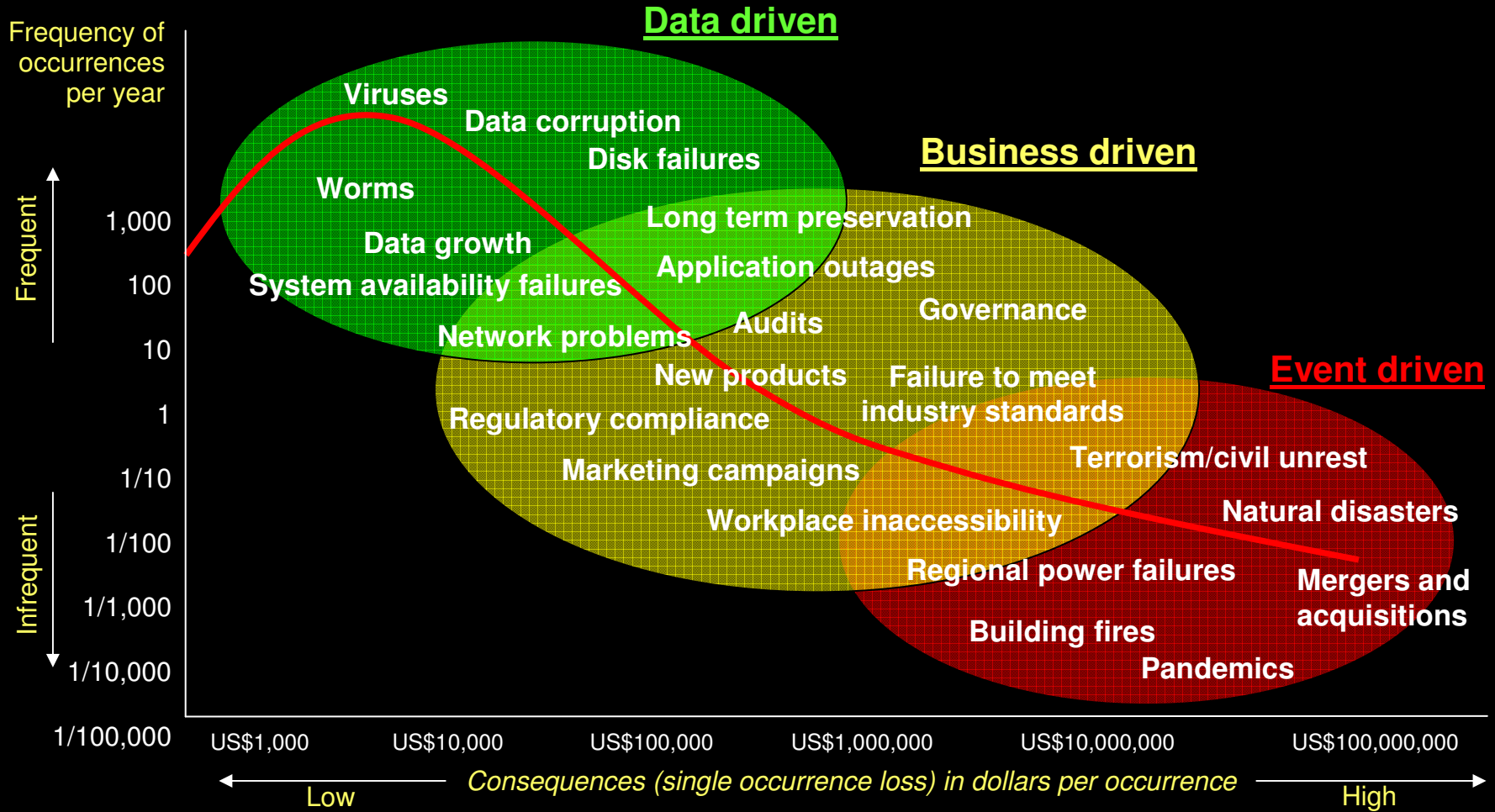
- **NEW!** Rational Developer for System z Unit Test
- **NEW!** z/OS XL C/C++
- **NEW!** Enterprise PL/I for z/OS
- **NEW!** Eclipse EGL Development Tools project

*Productivity and Collaboration*

Portal, Connections, Notes Domino, Sametime

- **NEW!** Lotus Quickr 8.5 for WebSphere Portal
- **NEW!** Lotus Sametime 8.5.1

# Different risks exist – but they all require a single resilience strategy



Source: IBM Corporation



**"you cannot think seriously about your longer-term IT architecture without thinking equally seriously about what today's mainframe environment has to offer"**



***CIO Magazine: Mainframe computing is set for a rebirth – September 29, 2009***

# System z ISV ecosystem provides numerous *Business Applications* to meet client business needs...

## *Dramatic growth responding to market demand*

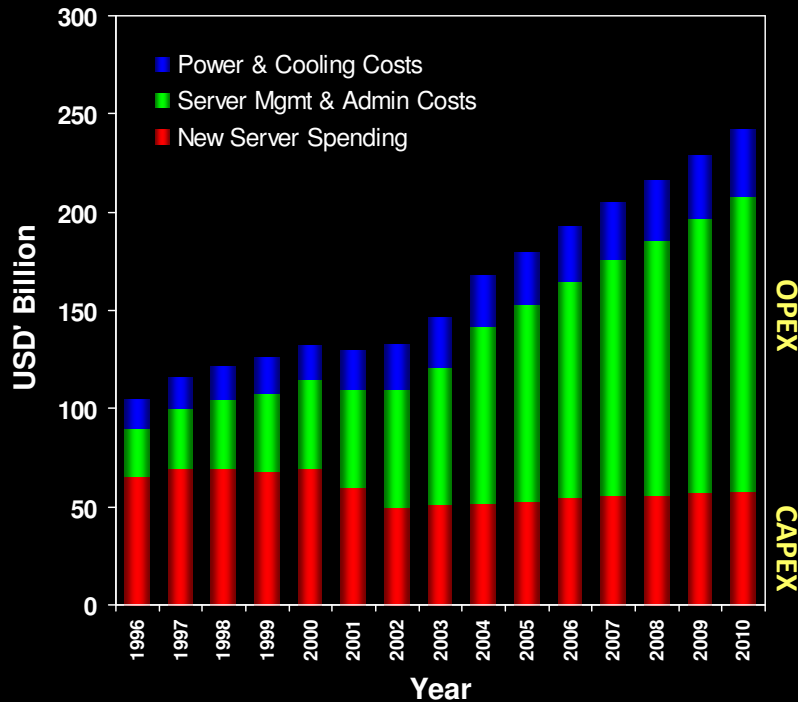


- \* 2009: 142 ISVs added, 900 new applications and tools
- \* 1,700 + ISVs developing for our System z Ecosystem
- \* 3,500 + applications available for z/OS
- \* 3,000 + applications available for Linux on System z
- \* 6,300 + applications available for System z





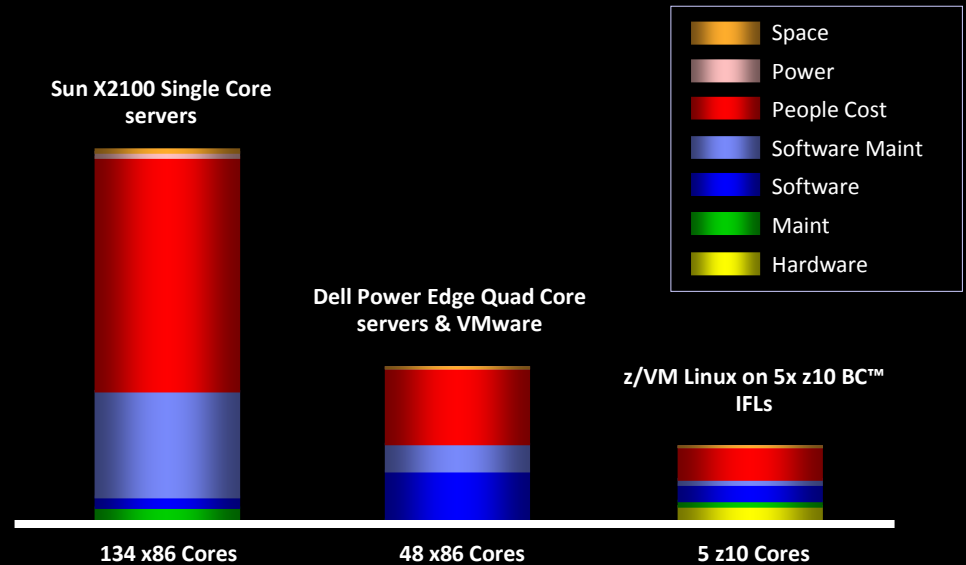
# Reduce cost through consolidation



Source: IBM Corporate Strategy analysis of IDC data, Sept. 2007

## Consolidating 134 Linux<sup>®</sup> servers to 5 IFLs Can save up to 50% over x86 w/ VMware

Oracle DB Workload, 3-Year Total IT Cost



All performance information was determined in a controlled environment.  
Actual results may vary.

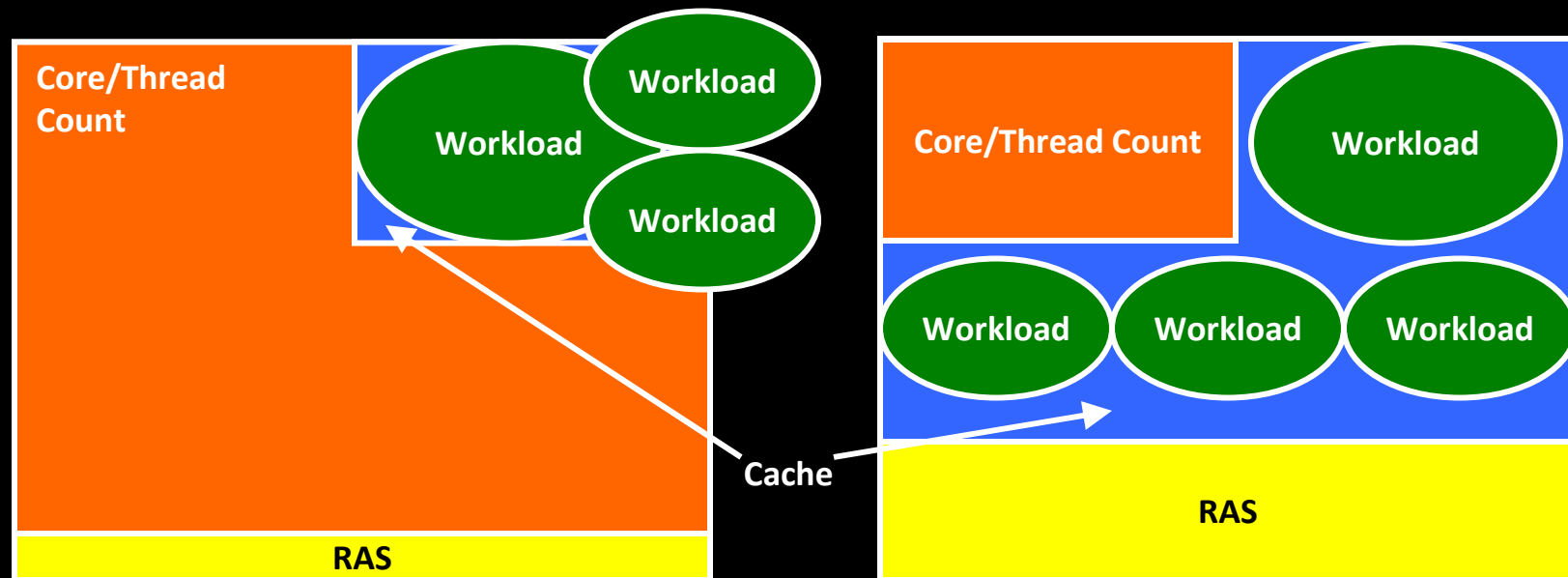
### Facility of Life Cycle Cost

For every dollar spent on CAPEX contributes to 3 times of OPEX

### Here's a cool example:

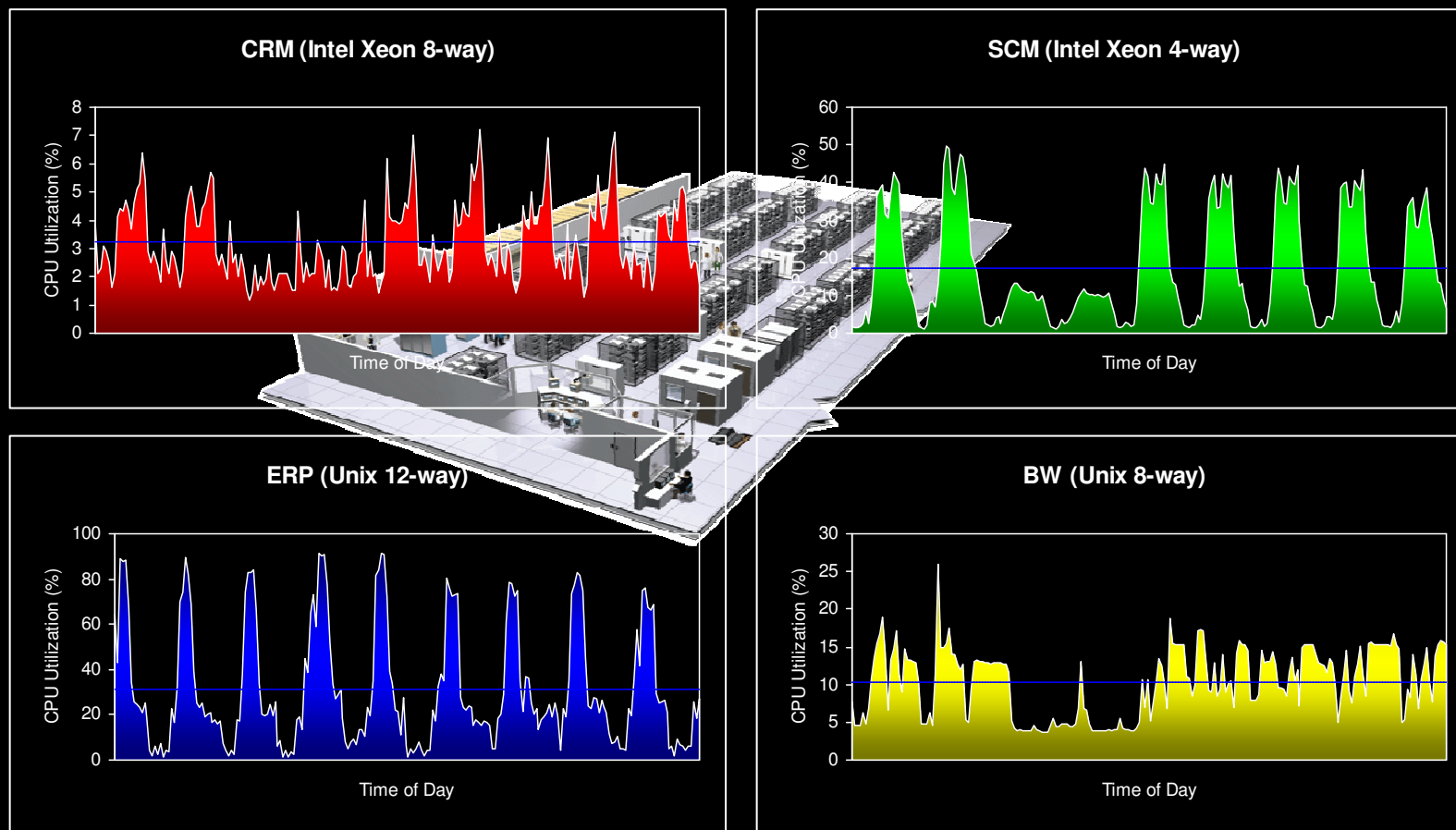
IBM will consolidate 3,900 servers to about 30 System z servers with expected reductions in energy consumption of over 80%

## Chip Design Affects Virtualization Capabilities



- Mixed workloads stress cache usage, requiring more context switches
- Working sets may be too large to fit in cache.
- Full processor speed is not realized due to cache misses.
- System z cache is able to contain more working sets
- zEnterprise 5.2 GHz Processor speed is optimized by increased cache efficiency
- Shared caches enable efficient dispatching of mixed-workload tasks with high processor utilization
- Comprehensive Remote Access Service (RAS) design supports putting more workload in a single processor

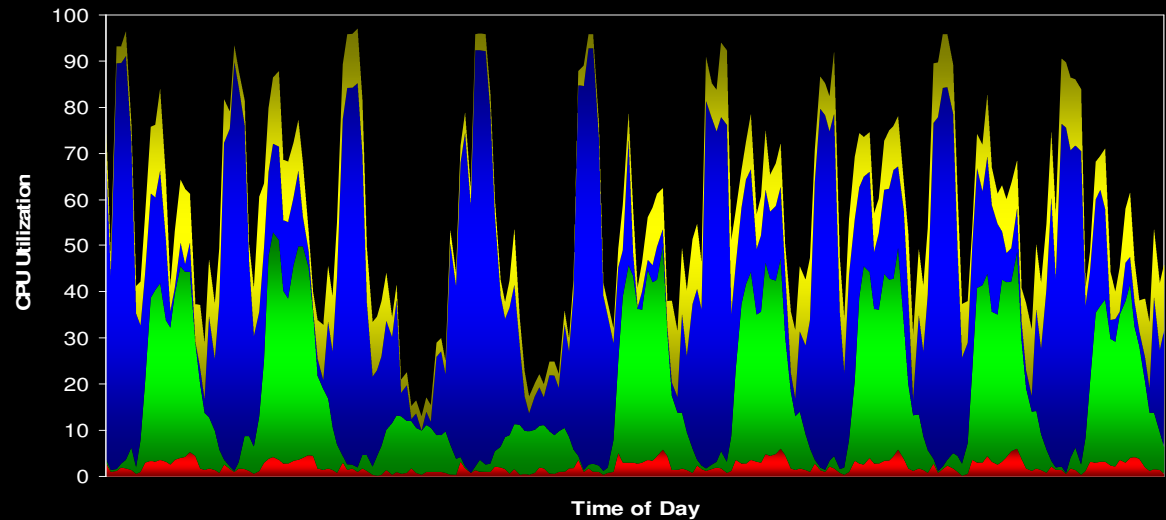
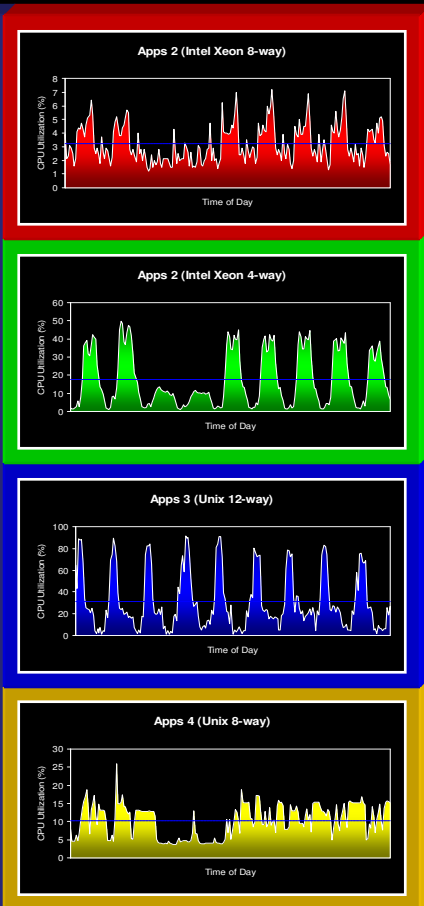
# Distributed server farm has lower CPU utilization



# The economics of workload consolidation

Large UNIX server offers physical consolidation

UNIX server with partition management SW



## IBM System z mainframe offers:-

- Advanced **virtualization** and **workload management**.
- Run multiple images on **fewer processors**, achieve utilization levels of 85% or more.
- **Lower TCO**
- **Lower energy consumption & facility**
- **Reduce complexity & ease of management**

## The IBM zEnterprise System

*Lowering the cost of distributed workloads through optimal platform selection*



Current data center: distributed workloads on a variety of Intel servers, connected to a System z

**Option 1:** Deploy distributed work on new Intel servers with 3<sup>rd</sup> Party VM

**--OR--**

**Option 2:** Optimize distributed work on zEnterprise with Linux on z, Power7 blades and Intel blades with Unified Resource Manager



**Simplify, automate, and improve service quality by consolidating on zEnterprise and ...**

**Lower cost of acquisition by up to 55%\*** compared to new Intel blades (option 1)

**Reduce cost of ownership by up to 56%\*** compared to current distributed data center

**Reduce network complexity (adapters, cables, and switches) by up to 98%\*** compared to current data center

## System z achieves high core-to-core ratios when consolidating from distributed environments

- Demonstrates unique IBM Value Proposition against competitive scale-out solutions
- Real customers, real workloads!

Customer	Distributed Cores	IBM System z10™ Cores	Ratio of distributed to z cores*
Nationwide	350	15	23 to 1
Gov. Agency	292	5	58 to 1
Railinc	186	3	62 to 1
ABP	1324	36	36 to 1

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



## Financial Client Consolidates 61 Sun and HP Servers to a System z10 and Saves 96% on Power and Cooling

	From ...	To ...
Current hardware infrastructure	Sun and HP servers	z10 EC
Footprints	61	1
Cores/Memory	442 cores / 1440 GB	16 IFLs / 82GB
Avg Utilization	13.3%	40%
Peak Utilization	28.7%	92%
# DBs, size of DB	61	61
Application	Oracle databases	Oracle databases
OS	Sun Solaris	Linux + z/VM
Savings:		
Power & cooling (Whr)	345,618 Whr	14,766 Whr-96%
Heat (BTUs/hr)	737,030 BTUs/hr	39,648 BTUs/hr- 95%

### Summary of Benefits:

Software savings, energy requirements reduced, better utilization

#### Distributed Licenses (One-Time-Charge):-

Distributed Servers:  $(\$50,000 \times 442) \times 0.25 \text{ factor} = \$5,525,000$

IBM z10 EC Servers:  $(\$50,000 \times 16) \times 1.00 \text{ factor} = \$800,000$

#### Distributed Annual Maintenance:-

Distributed Servers: 20% of OTC = \$1,105,000

IBM z10 EC Servers: 20% of OTC = \$\$160,000

## System z Solution Editions deliver unmatched value & price...

August 14, 2009

### System z Solution Edition Series announced by IBM

(Telecomworldwire Via Acquire Media NewsEdge) IBM (NYSE: IBM) announced on Friday the System z Solution Editions Series – seven integrated hardware, software and services packages

*A solution edition is an aggressive pricing / packaging concept for targeted workloads/use cases on IBM System z*

- Delivers tangible savings in hardware, comprehensive middleware stack software, services, and storage.
- System z Solution Edition Series – **Data Warehousing, Enterprise Linux Server, Cloud Computing, SAP, ACI, WebSphere, Security, Chordiant, Terminus, Application Development, and GDPS**



#### ■ A great tactical choice today:

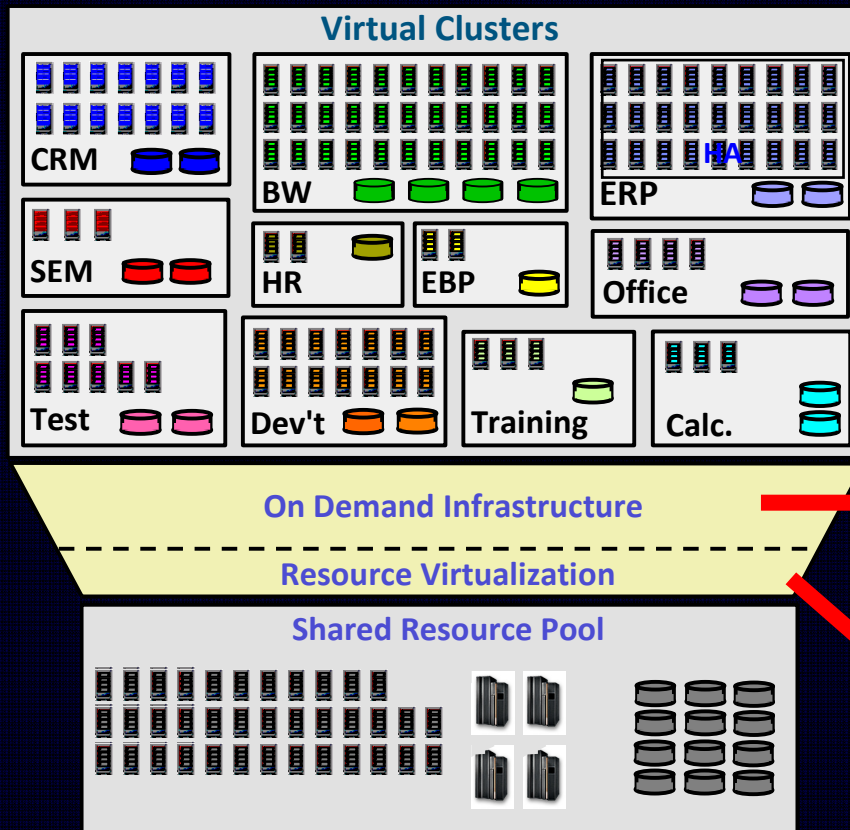
- Reduce cost, reduce risk and improve service

#### ■ A Strategic choice for the future:

- Re-writing the rulebook to set new standards for business-centric IT

Learn more about solution editions: <http://www.ibm.com/systems/z/solutions/editions/>

# IBM Dynamic Infrastructure for Business Solutions



## Key Requirements

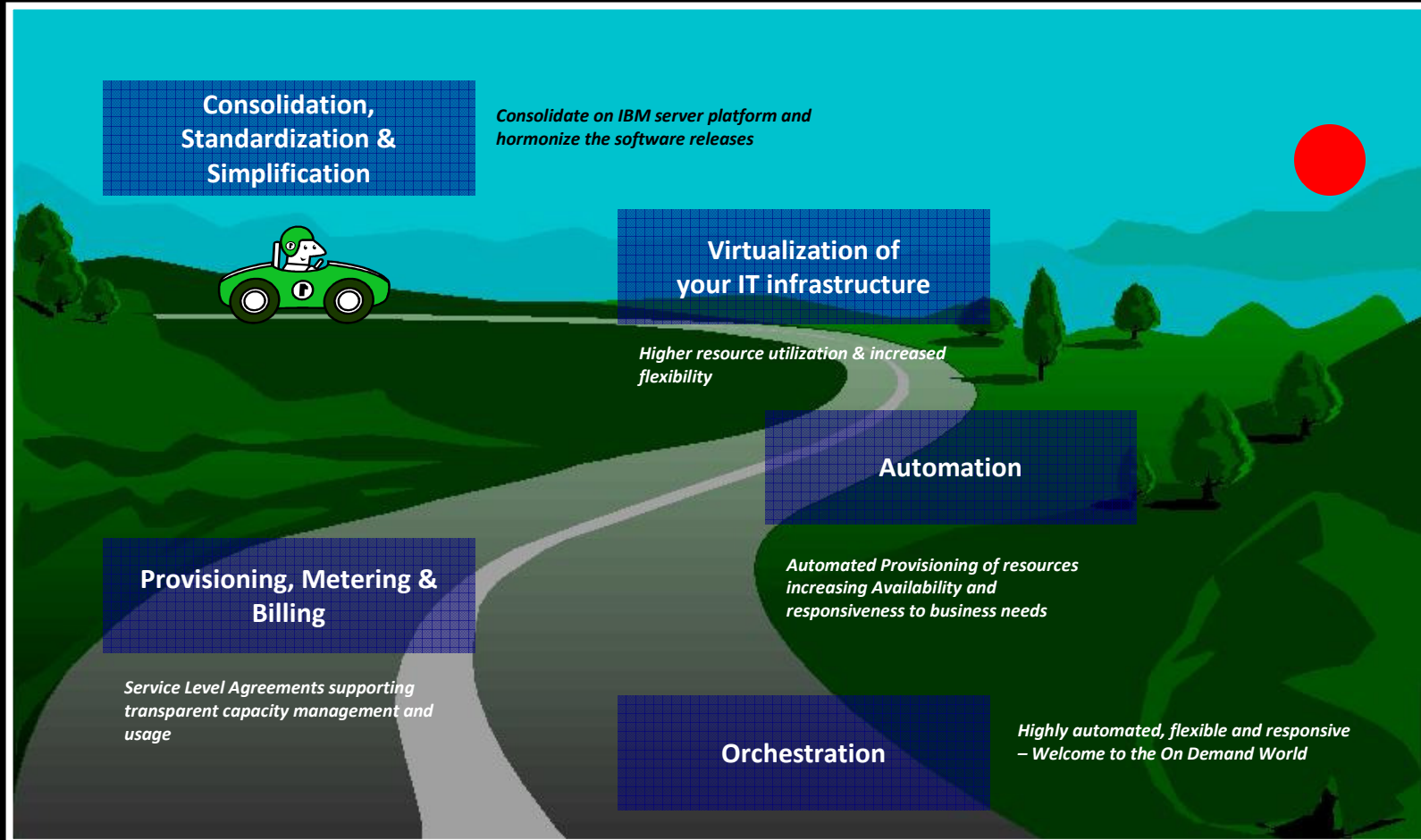
- Low Total Cost of Ownership
- Service Level Management
- Scalability
- Flexibility
- Continuous Availability
- Security Management
- Capacity Management

Provides automated, policy-based, end-to-end management of resources, performance, availability, security and metering/billing across heterogeneous systems.

Provides essential mechanisms for dynamic resource management

**IT resources are pooled, virtualized, and allocated dynamically to satisfy changing business needs – Resources are well utilized, workload priorities are used to control consumption, and consumers pay for what they used.**

# IBM Dynamic Infrastructure delivers a roadmap for ADB's Smarter Airport Vision and Initiatives...



Demo

***Thank you... Please tell us how can we help...***

