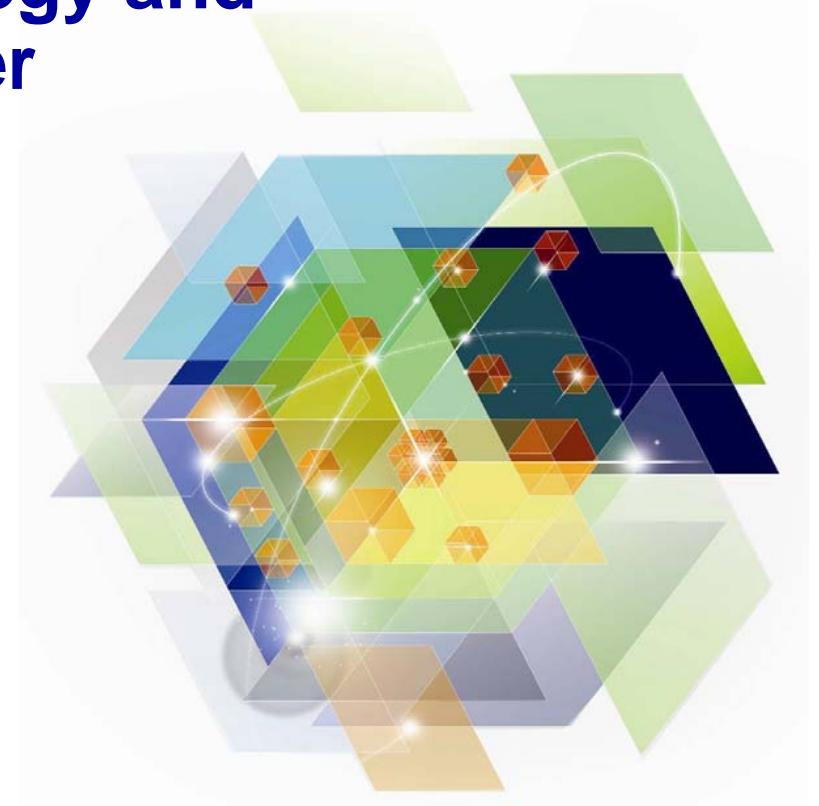




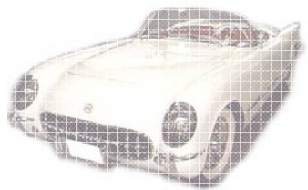
# IBM zEnterprise Server Strategy and Direction – Delivering Smarter Computing

Greg Lotko. Vice President &  
Business Line Executive IBM System z,  
Systems Technology Group

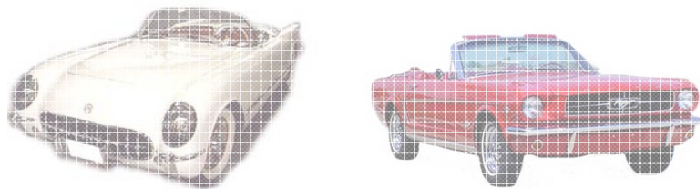
March 20, 2012



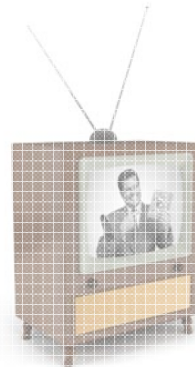
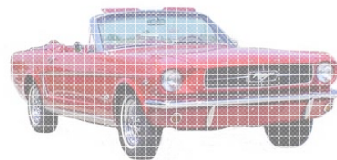
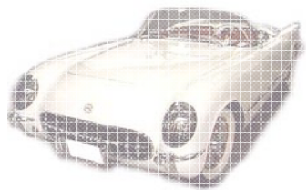
## Lasting technologies continuously innovate and advance while preserving core values



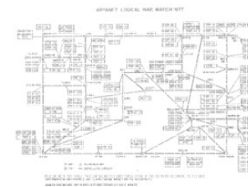
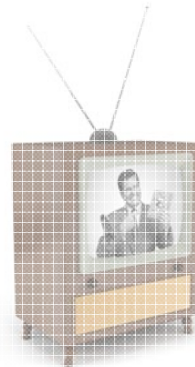
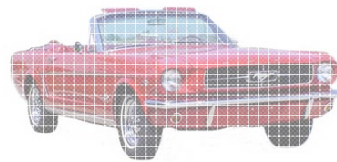
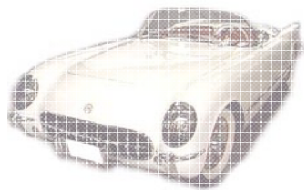
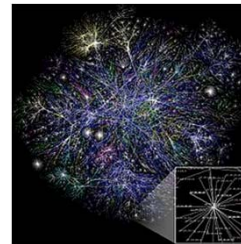
## Lasting technologies continuously innovate and advance while preserving core values



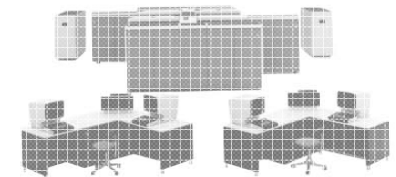
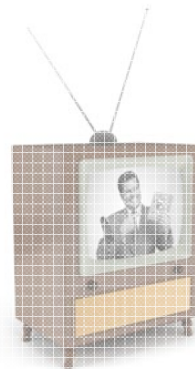
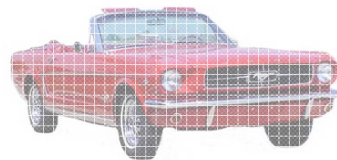
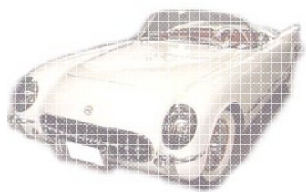
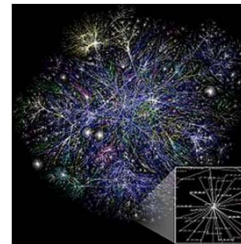
## Lasting technologies continuously innovate and advance while preserving core values



# Lasting technologies continuously innovate and advance while preserving core values



# Lasting technologies continuously innovate and advance while preserving core values





# The complete system of systems

## The IBM zEnterprise System Family



IBM DataPower XI50z

IBM BladeCenter HX5 (7873)

IBM BladeCenter PS701

IBM DB2 Analytics Accelerator V2.1

## Smarter computing is how you succeed in the new era

### Designed for data

**Harness all available information :**

**89% of CEOs** want better insight via Business Intelligence and analytics



### Managed with Cloud Technologies

**Reinvent IT:**

60% of CIOs plan to use cloud technologies and 55% of business executives believe cloud enables business transformation

### Tuned to the task

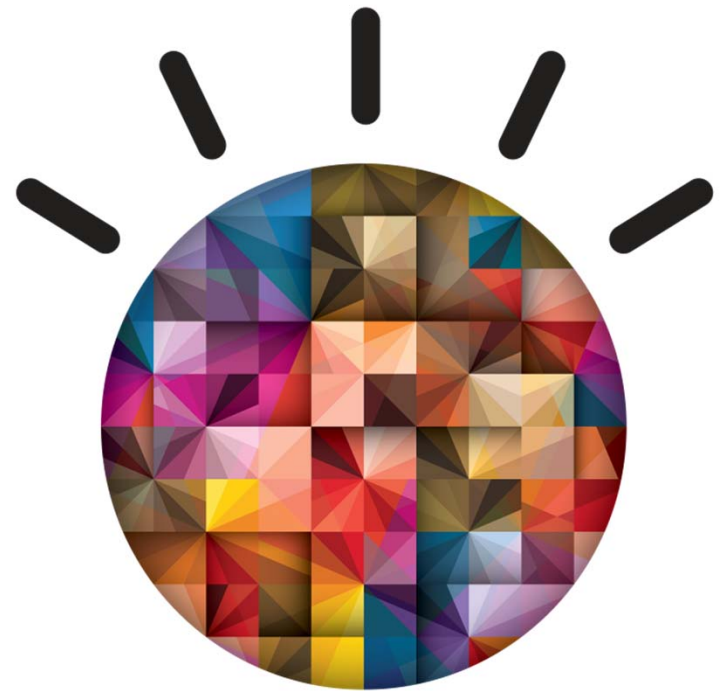
**Drive greater performance and improve IT economics:**

**CIOs can reduce total cost per workload up to 55%** with optimized systems



## Designed for Data

means an infrastructure that can deliver insights in seconds through systems built to process a variety of data at scale.



## Designed for data

How to spot trends, predict outcomes and take meaningful actions

### 1 Align

Your business around information

### 2 Anticipate

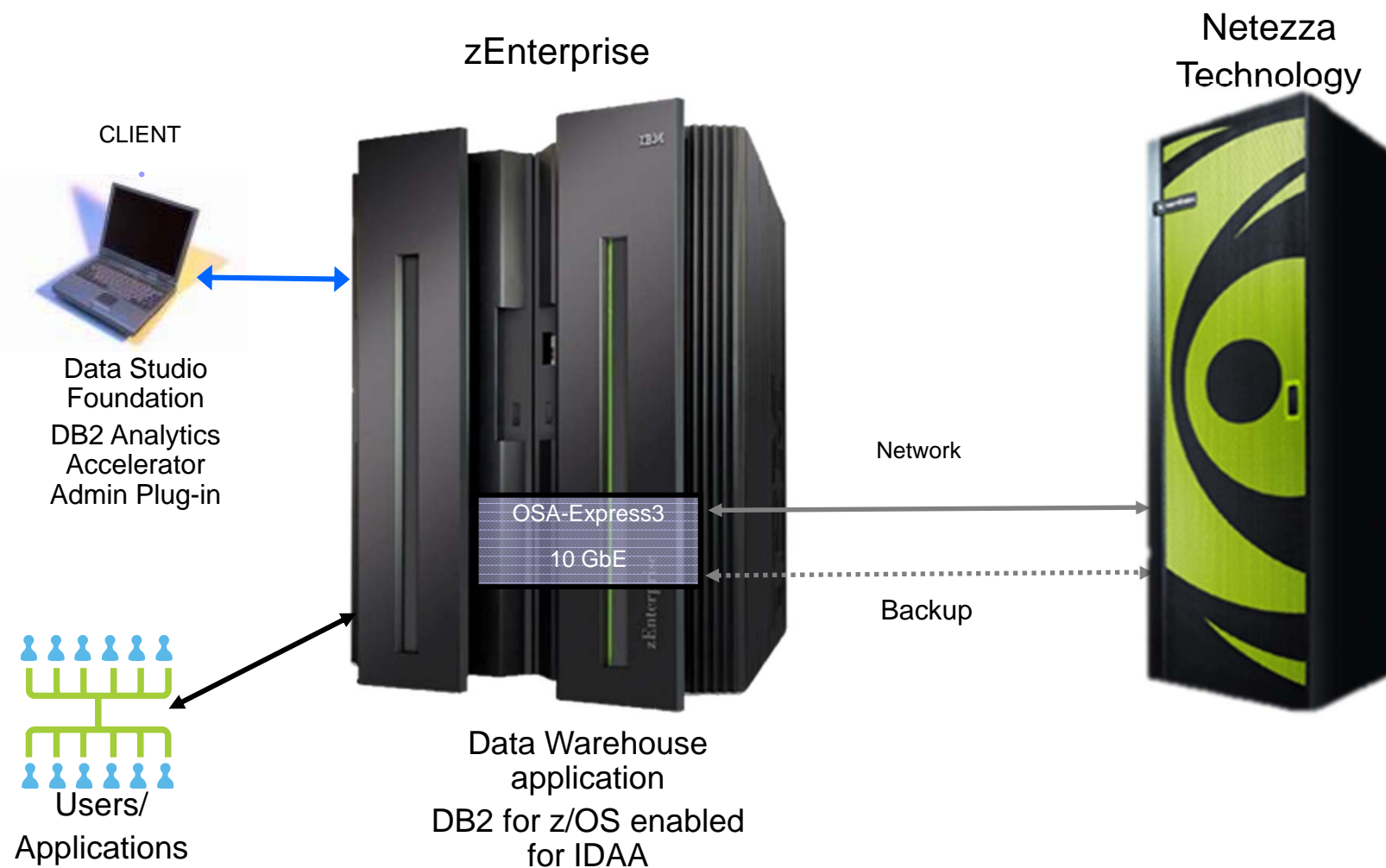
Predict and drive business outcomes

### 3 Act

Take action with confidence in real time



# IBM DB2 Analytics Accelerator (IDAA): Powered by Netezza



# Analytics at 5X the performance and one-fourth the unit cost

**\$24 / reports  
per hour**

Unit Cost (3yr TCA)

Highest value with ISAS 9700 +  
IDAA

**154,893** RpH (Reports/Hour)



**\$97 / reports  
per hour**

Unit Cost (3yr TCA)

**The competition**

**29,572** RpH (Reports/Hour)

**\$89 / reports  
per hour**

Unit Cost (3yr TCA)

High value with ISAS 9700 +  
z196

**57,904** RpH (Reports/Hour)



**\$194/ reports  
per hour**

Unit Cost (3yr TCA)

**z196 + competitive**

**29,572** RpH (Reports/Hour)



Based on IBM internal tests of Smart Analytics 9700 + IDAA solution compared to results of testing of a competitor's configuration (previous version; no longer available) executing an analytics workload in a controlled laboratory environment and a 3 year total cost of acquisition (based on US list prices). The cost calculation compares the average cost per report for 161,166 concurrently executing mixed complex, intermediate and simple report types. Intermediate/Complex reports offloaded to IDAA for serial execution. 9700+IDAA results are a projection based on actual data for simple reports on SA 9700 and complex/intermediate report times run on separate Netezza TwinFin 12. 3 year total cost of acquisition includes expected hardware, software, service & support. Results may not be typical and will vary based on actual configuration, applications, specific queries and other variables in a production environment. Users of this document should verify the applicable data for their specific environment. Contact IBM and see what we can do for you.

## Clients are deploying infrastructures that are designed for data

Swiss Re

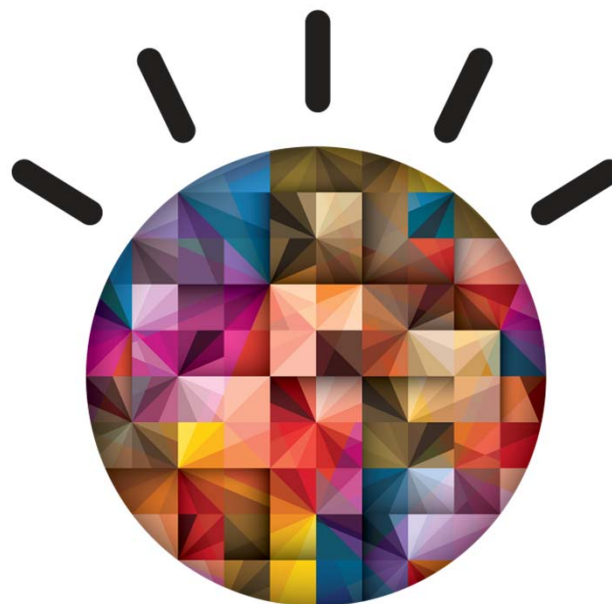


“The IBM DB2 Analytics Accelerator delivers the speed to create the insights we need ... to quickly adapt and grow.”

– Reto Estermann, SwissRe

70%

Faster query response times



40+

Terabytes of operational data managed from a central location

# Managed with Cloud Technologies

**means an infrastructure that incorporates cloud technologies to improve service delivery and efficiency.**





## Managed with cloud technologies

# How to manage inflexible, siloed systems to improve business agility

## 1 Integrate

Build an efficient IT infrastructure

## 2 Automate

Improve speed and dexterity

## 3 Orchestrate

Deliver IT without boundaries



# IBM cloud computing solutions accelerate business transformation

Private & Hybrid Clouds  
Cloud Enablement Technologies

**System z Capacity Cloud**

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**System z Disaster Recovery Cloud**

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Cloud Managed Services  
Infrastructure as a Service

**zEnterprise Starter Edition for Cloud**

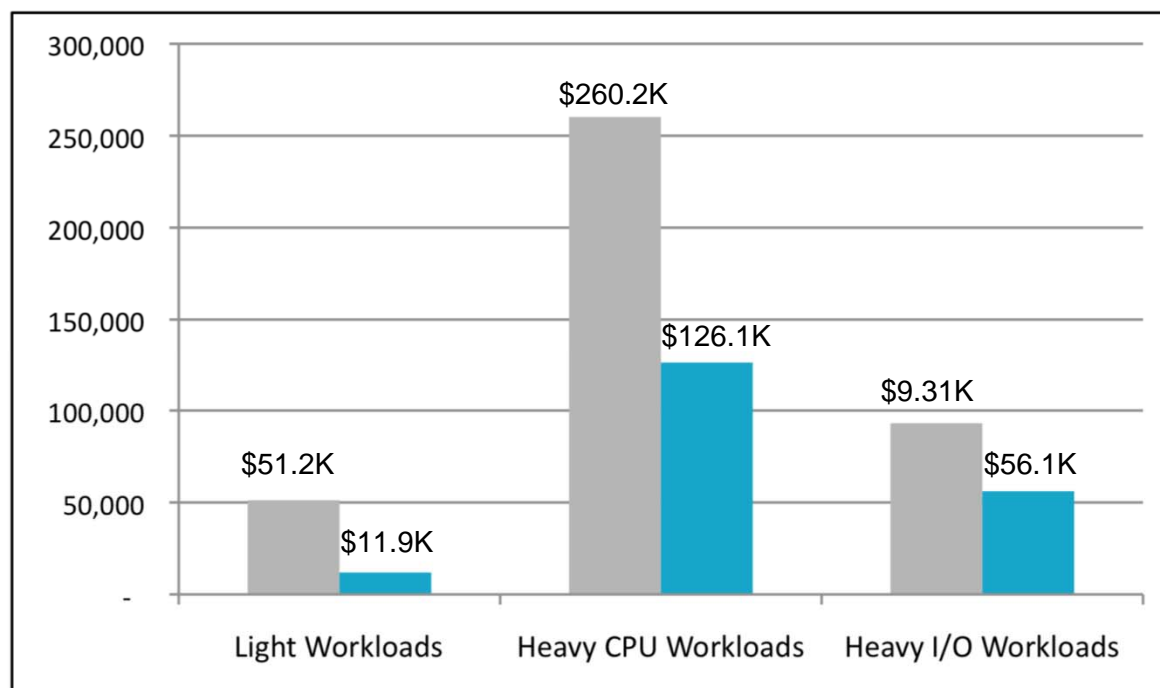
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**z/VM Live Guest Relocation**



80% of Fortune 500 companies use IBM cloud computing capabilities

# Freedom through Design: Optimizing private cloud workloads can drive dramatic reductions in costs

Workload deployment on zEnterprise vs. Leading Public Cloud Provider



**68%**  
lower overall  
TCO

Public Cloud   
Private Cloud with zEnterprise 

Source: IBM internal study. zEnterprise configurations needed to support the three workload types were derived from IBM internal benchmarks. Public cloud sizing needed to support the three workload types was calculated based on compute capacity of public cloud services. 3 yr TCO for public cloud calculated using web-based calculator made available by the service provider. 3 yr TCO for zEnterprise includes hardware acquisition, maintenance, software acquisition, S&S and labor. US pricing, prices will vary by country.

## Clients are deploying infrastructures that are managed with cloud technologies



A System z on Linux cloud solution helps a government agency in China create a scalable and intelligent traffic and transportation system.

# 100K

Cameras will send traffic data to zEnterprise

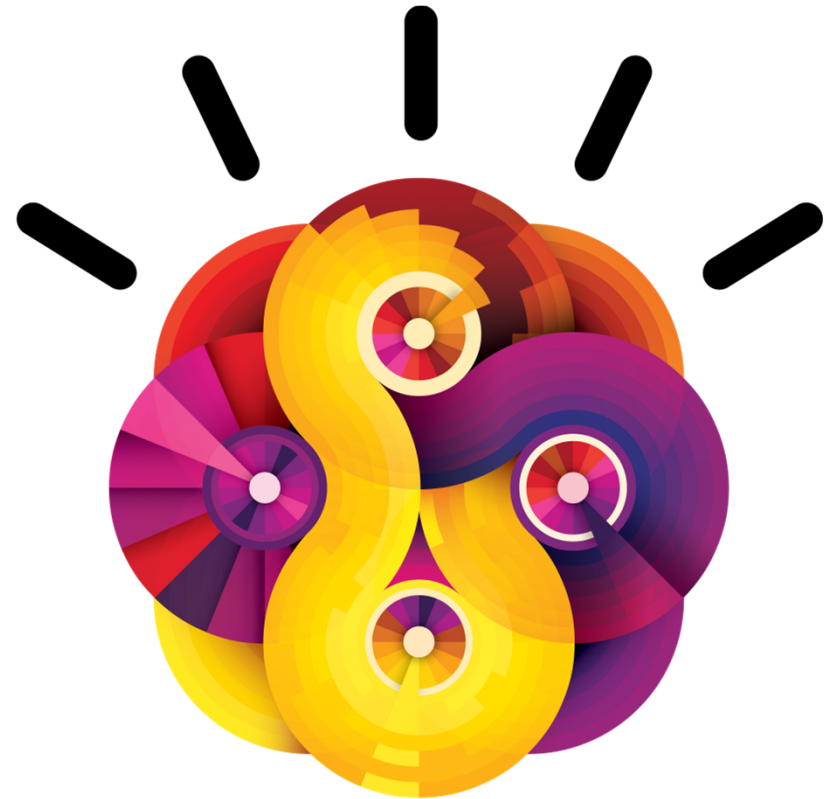


# 1

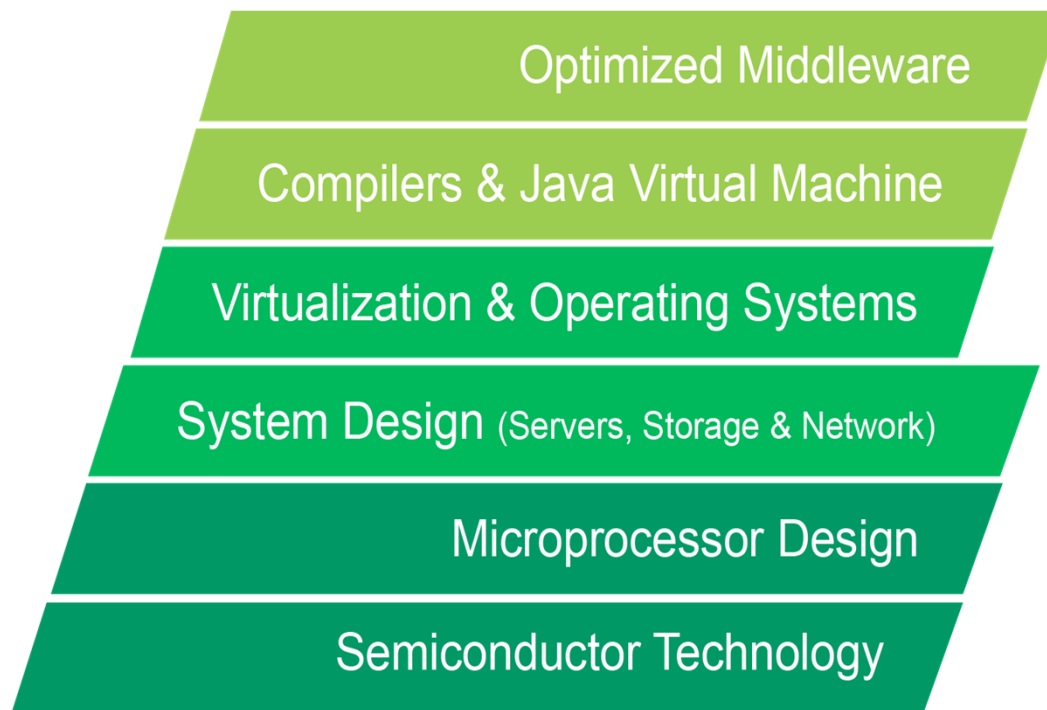
Single point of control over service levels, significantly simplifying IT administration

## Tuned to the task

means an infrastructure that matches workloads with platforms for optimized performance and economics.



## IBM is pioneering advances in systems design



### 1) Expertise

- Workload Characteristics
- Workload interdependencies
- Architecture options

### 2) Software

- Full Stack integration
- Middleware tuned for hardware
- Integrated management across architectures

### 3) Hardware

- Multi-core architectures
- Advanced threading
- Low latency



## Tuned to the task

How to manage IT costs and complexity while speeding time-to-market for new services

**1 Consolidate**  
Consolidate workloads to improve economics

**2 Optimize**  
Optimize existing workloads to improve performance

**3 Innovate**  
Innovate and deploy new workloads



System z, Power, System x,  
Storage, Networking,  
Systems Management



Netezza



zEnterprise with  
zBX



Storwize V7000  
with EasyTier

Expert  
Integrated  
Systems &  
Storage



IBM Watson

# Matching workloads to the right system can deliver superior performance and economics

## System z

*Freedom by Design*



Achieve up to 55% lower TCO per workload

## Power Systems

*Performance Redefined*



Runs DB2 as low as 1/3 the cost of Oracle Database\*

## System x

*Defining the Next Generation of x86 Servers*



Industry-leading Intel performance and lower management cost by 50%

**Introducing the world's first family of systems with integrated expertise.**

Integrated Expertise:  
Unveiling a New Era of Computing  
April 11, 2012  
Beijing, London, New York, Mumbai, Sao Paulo

Source: Based on IBM internal studies

\*Pricing comparison based on US list prices of IBM DB2 Advanced Enterprise Edition and the Oracle software with analogous capabilities: Oracle Database Enterprise Edition, Advanced Compression, Active Data Guard, Label Security, Partitioning, Oracle Enterprise Manager, Internet Developer Suite, Diagnostics Pack, Oracle-to-Oracle Federation, Golden Gate. All list prices based on US and valid as of 01/26/2011.

## zEnterprise reduces network cost and complexity

**240**  
heavy I/O  
workloads

**25**  
heavy  
workloads

**235**  
light  
workloads

### Best Fit on zEnterprise

**21** Total network parts  
**\$0.03M** TCA

Additional network parts

1 Switch  
10 Cables  
10 Adapters

### Deploy on Intel

**664** Total network parts  
**\$0.2M** TCA

Additional network parts

16 Switches  
340 Cables  
208 Adapters

**86%**  
less cost

# z/OS optimized for large-scale transaction processing

## Fit for purpose



**HP Superdome Servers**  
HP-UX, Oracle

Equivalent Benchmark Performance  
TCS BANCS



**IBM zEnterprise 196**  
z/OS, DB2

**39%**  
less cost

Hardware	\$ 98,214,576
Software	\$ 78,185,950
Networking	\$ 948,000
Space	\$ 1,061,710
Energy	\$ 1,522,488
<b>Total (5yr TCO)</b>	<b>\$ 179.9 M</b>

*Scalability Not Demonstrated*  
*Energy (kWh) 3,045K per year*

Hardware	\$ 64,201,120
Software	\$ 45,643,445
Networking	\$ 39,500
Space	\$ 78,067
Energy	\$ 131,400
<b>Total (5yr TCO)</b>	<b>\$ 110.1 M</b>

*Excellent Scalability*  
*Energy (kWh) 263K per year*

## Clients are deploying infrastructures that are tuned to the task

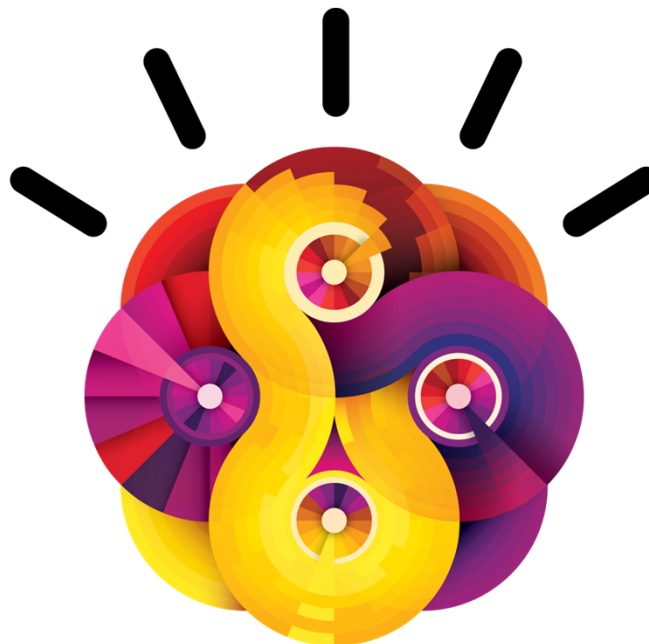


“I want to run each application where we get the lowest cost and the best performance.”

– Huub Meertens, EUROCONTROL

# 20%

Cost advantage delivered by zBX hybrid environment over fully virtualized x86 environment



# 1

Single point of control over service levels, significantly simplifying IT administration

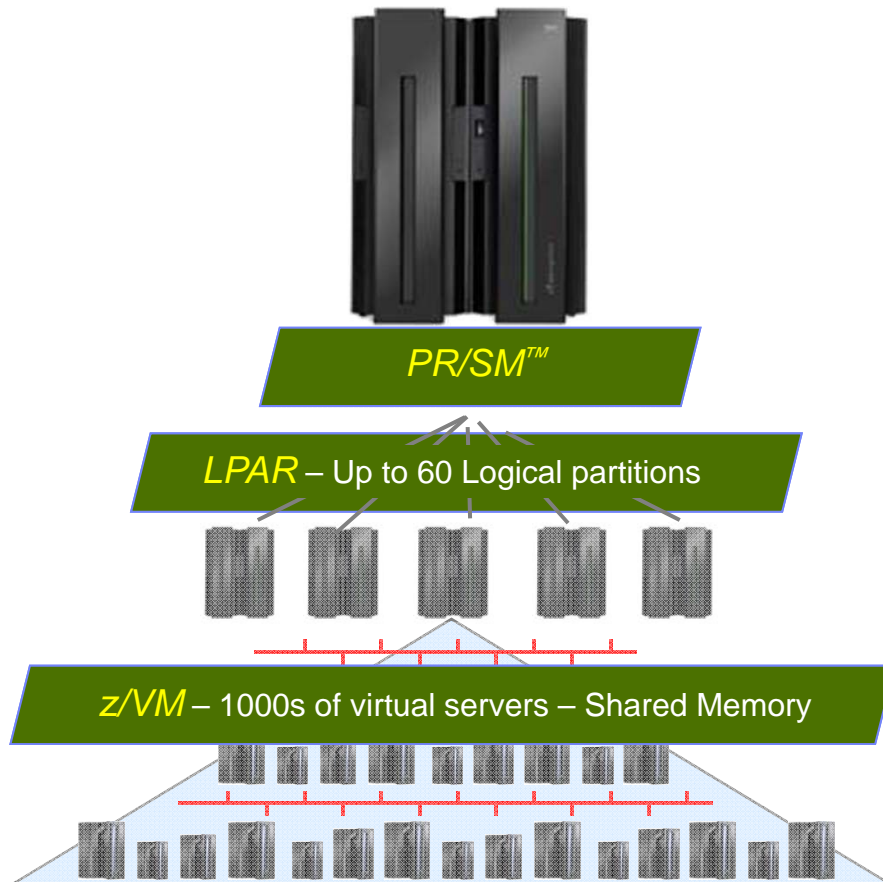
## Breakthrough technologies from an optimized system: System z



- eDRAM cache integrated on processor chip
  - Efficient packaging
  - 2x transistor density\*
  - 28% increased transistor speed\*
  - 4x array density\*
- World's fastest chip at 5.2 GHz
  - More cache for superior data serving
  - On-chip crypto and data compression
  - Instruction co-optimized with compilers
- Optimized I/O pathways & subsystems with massive scale
  - Best-of-breed reliability, availability & serviceability
  - RAIM memory for high availability
  - Integrated cryptographic coprocessor
  - Highest security certification in industry (EAL5 & FIPS)
  - Multi-platform design of mainframe and distributed technologies
  - Designed for highest utilization with heterogeneous workloads
- SLA management of heterogeneous workloads based on business policies
  - Granular, scalable Virtualization of servers, memory and I/O with low overhead
  - PR/SM and z/VM offer two-tier approach for superior virtualization supporting native Linux
  - Dispatching on z/OS keeps software close to cache for optimized performance
  - Intelligent management of mainframe & distributed technologies
- Java Compiler optimized to exploit hardware architecture
- WebSphere, MQSeries, DB2 exploit multi-system workload management, scale and availability
  - Middleware optimized and tuned to scale up
  - Tivoli optimized for operations management and security



## zEnterprise extreme virtualization built into the architecture



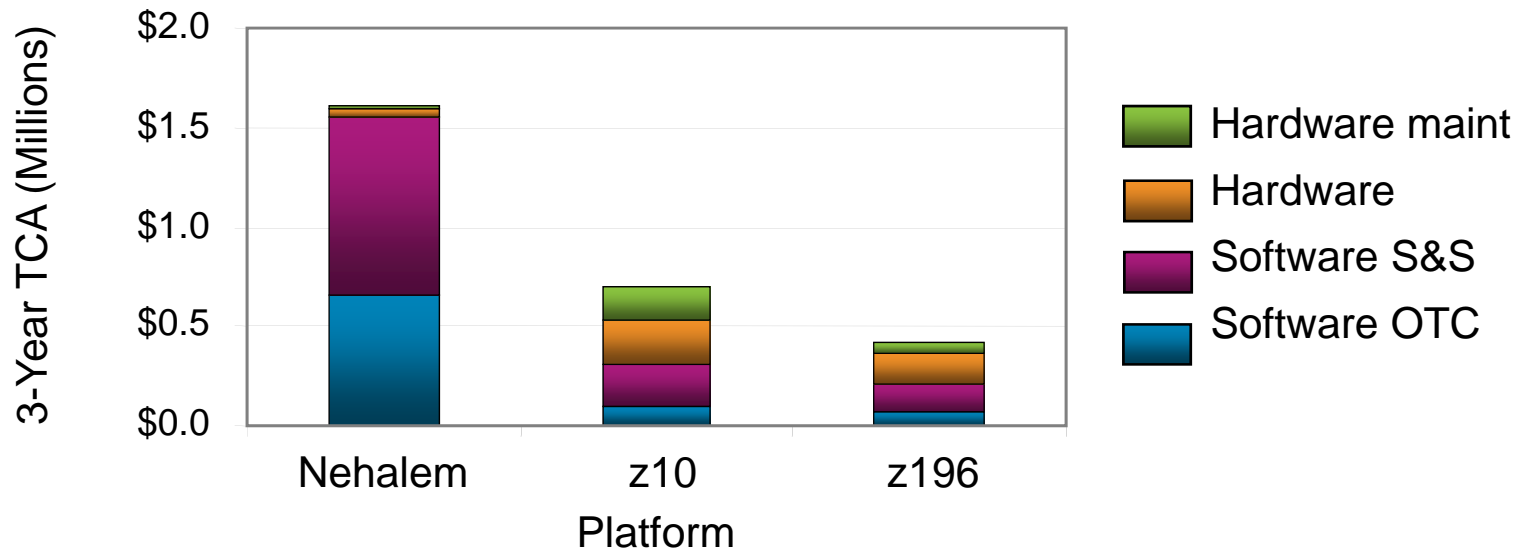
- Deploy virtual servers in seconds
- Highly granular resource sharing (<1%)
- Add physical resources without taking system down – on the fly
- Scale out to 1000s of virtual servers
- More virtual servers per core; share more physical resources across servers
- Extensive virtual server life-cycle management
- Hardware-enforced isolation

# The most efficient platform for large-scale consolidation

## Linux on zEnterprise

- Lower acquisition costs of hardware and software vs. distributed servers\*
- Less than \$1.00/day per virtual server (TCA)\*
- Reduce floor space by up to 90% compared to distributed servers\*
- Reduce energy consumption by up to 80% compared to distributed servers\*

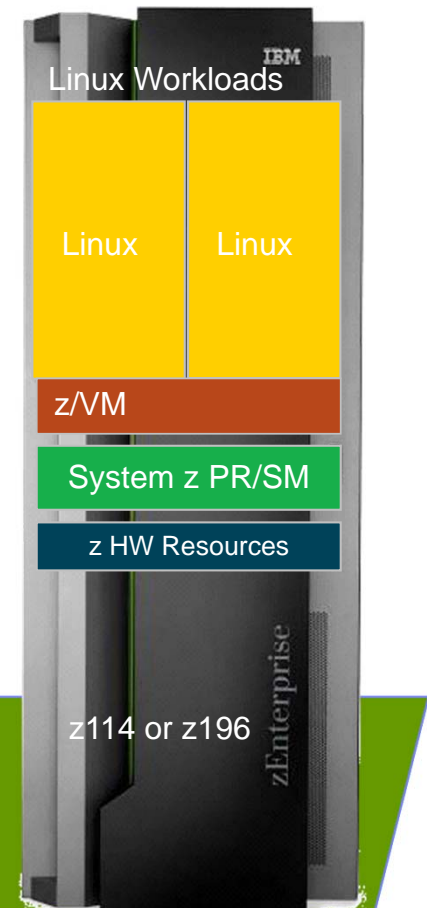
*Example: Consolidate 40 Oracle server cores to 2 Linux engines on zEnterprise*



## Linux on zEnterprise takes advantage of best-in-industry hardware

- **HiperSockets for ultra-high speed communication between Linux images on the same machine**
- **OSA-Express3 and OSA-Express4S for very high speed communication between systems**
- **Traditional mainframe and Open I/O subsystems**
  - IBM DS8000 Enterprise Storage Systems
  - IBM XIV Storage System and Storwize V7000
  - SAN Volume Controller for other storage
- **Crypto support – CPACF, CryptoExpress3**

Only zEnterprise can boast the combination of EAL5+, an EAL4+ certified hypervisor, FIPS 140-2 Level 4 and related security certifications



## The value of DB2 for Linux



### Simple

Easy development,  
XML support  
and virtual appliances

### Low Cost

Unparalleled  
automation,  
compression and  
virtual appliances

### Reliable

World-class audit &  
security features,  
high availability and  
workload management



**Blue Insight**

*The IBM internal Private Analytics Cloud*

Our commitment to informed decision making led us to consider private cloud delivery of Cognos via DB2 and WebSphere Application Server on Linux for System z, which is the enabling foundation that makes possible \$25M+ savings over 5 years. – IBM CIO Office

## Optimized systems improve cost and performance



STATE STREET

*70% reduction in software licensing fees*

### Consolidate

Financial services provider

- Expanding data center sprawl led to a large-scale Linux on System z consolidation project that has helped contribute to savings of \$3.5M and CO2 emissions reduction of 30k metric tons annually.



*\$15M savings*

### Optimize

Leading insurance provider

- Facing the need for a new data center due to server sprawl, decided to optimize workloads instead, deploying two fully virtualized System z mainframes.



*Servicing 2.4M+ customers*

### Innovate

Financial services provider

- Driving innovation with new services that enable sales agents to research customers, up-sell and cross-sell, and verify new insurance policies in less than 30 seconds with zEnterprise-based solution

## System z's critical role in IBM's journey

Designed for  
data

IBM Blue Insight is making possible more than **\$20M** savings over five years

Managed with  
cloud  
technologies

IBM Collaboration cloud hosted over **300M** meeting minutes in 2010

Tuned to  
the task

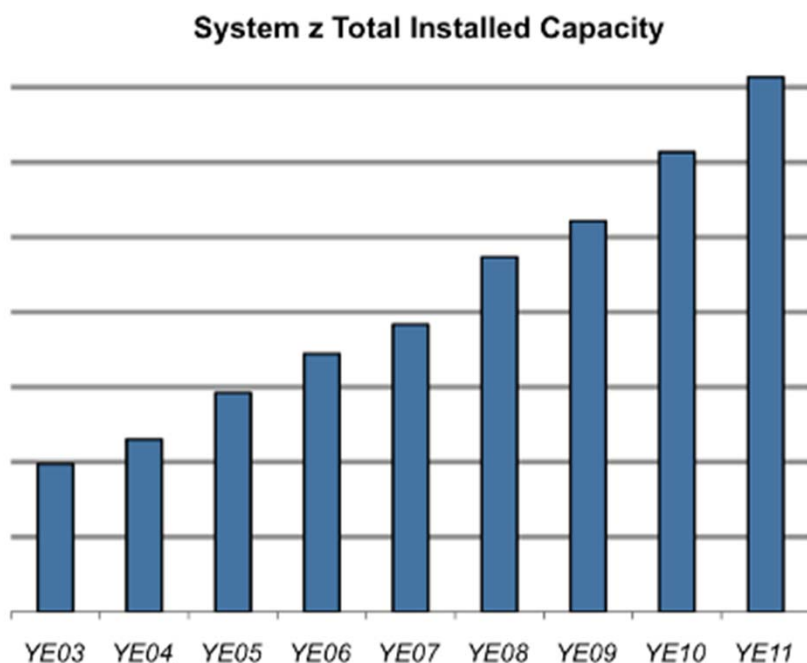
Migrations to System z have delivered almost **60%** of the project's total cumulative savings to date

IBM zEnterprise's hybrid computing model offers further opportunities for cost reduction and new service delivery





## Clients realize the value of zEnterprise



100+

**BladeCenter  
Extension units**

950+

**blades shipped**

[ITD]

35%

**of System z clients  
have IFLs installed**

[4Q11]

**16**

percent shipped MIPS  
growth in FY2011

Delivered **back-to-back revenue growth** externally over the last two years, the first time since 2003 / 2004.

\* Source: IDC Server Tracker 2Q11



## New-to-z clients span the globe

29 in 2009.

61 in 2010.

76 in 2011.

**100+**

new-to-System z  
clients in 2012

**137** new accounts in 2011 / 2010

**35%+** from the growth markets

**55%** from general business

**18%** from public sector

## IBM's consistent, sustained investments in System z

### System z Freedom through design



- Offer real-time transactional analytics
- Provide infrastructure as a service for heterogeneous cloud
- Enable new capabilities with flash memory
- Increase performance and system capacity
- Continue leadership on single-thread performance
- Improve OS / app availability via real-time monitoring / diagnosis

# Thank you.



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| •BladeCenter* | •IBM*          | •PR/SM            | •Tivoli*     |
| •CICS*        | •IBM (logo)*   | •Smarter Banking* | •WebSphere*  |
| •Cognos*      | •POWER*        | •System p*        | •zEnterprise |
| •DataPower*   | •Power Systems | •System x*        | •z/OS*       |
| •DB2*         | •POWER4        | •System z10*      | •z/VM*       |

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