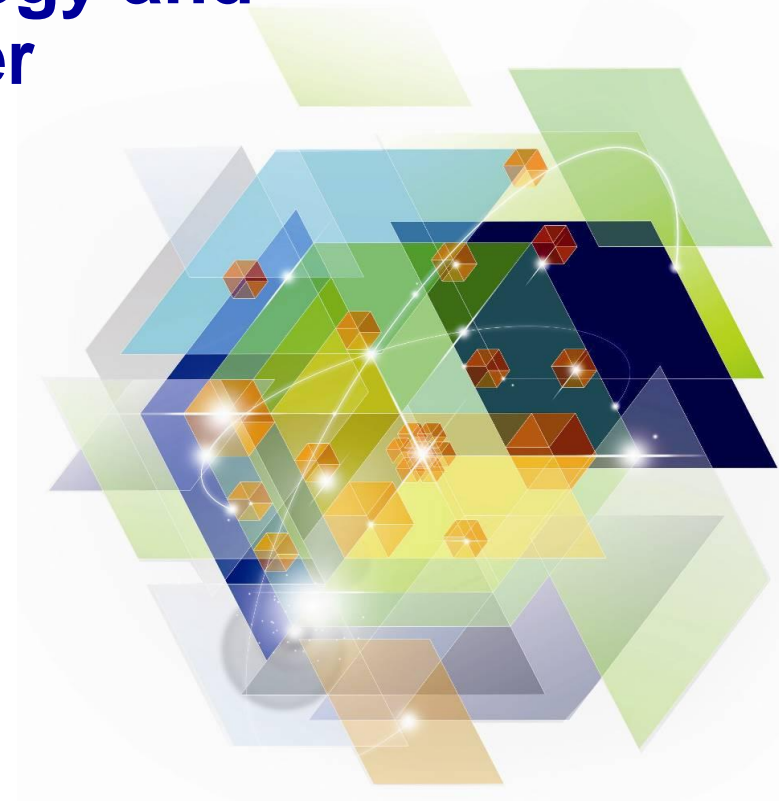




IBM zEnterprise Server Strategy and Direction – Delivering Smarter Computing

Mark Anzani, Vice President and Chief Technology Officer -System z, IBM Systems and Technology Group

April 2012



Lasting technologies continuously innovate and advance while preserving core values



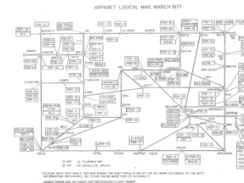
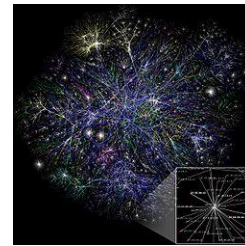
Lasting technologies continuously innovate and advance while preserving core values



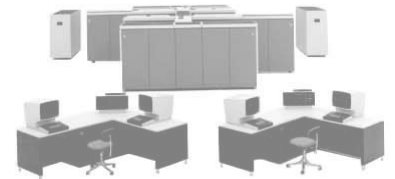
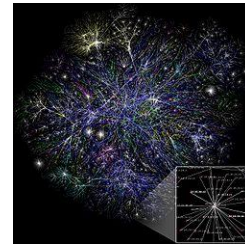
Lasting technologies continuously innovate and advance while preserving core values



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

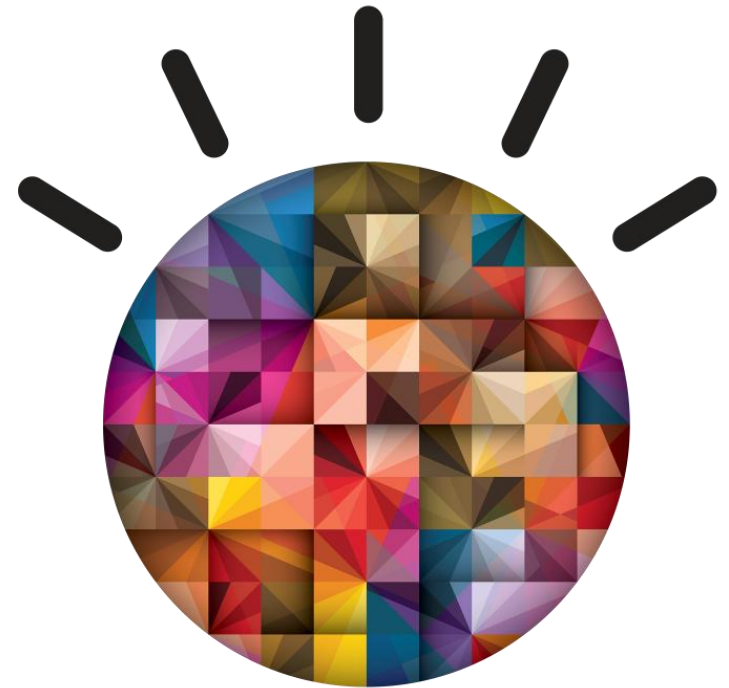
Tuned to the task

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

 **Netezza**

Custom Warehouse Implementations

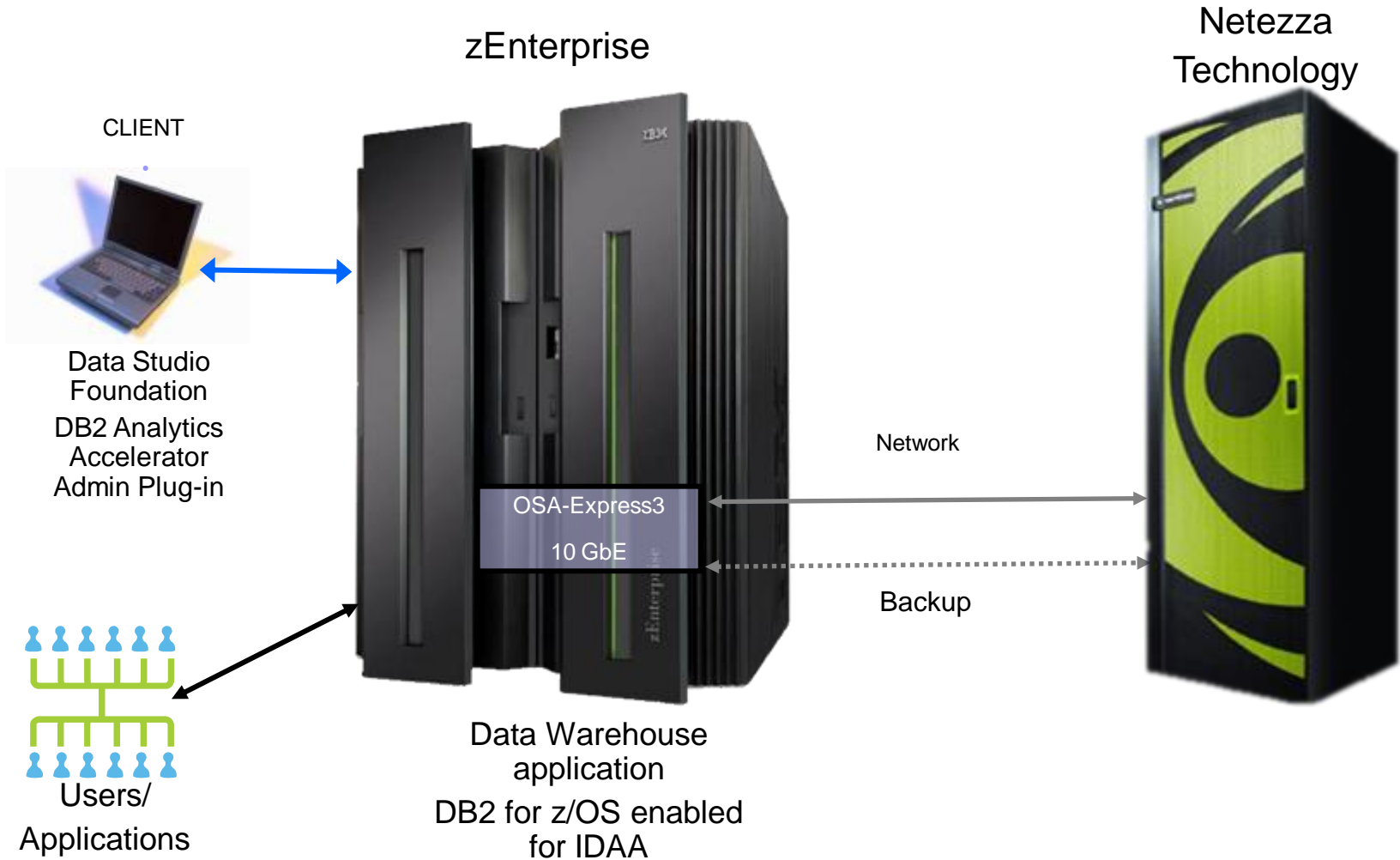

Smart Analytics System


DB2 Analytics Accelerator
 **Optimized for IBM Systems**


SAP HANA Appliance

 **InfoSphere Streams**
IBM Watson 

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

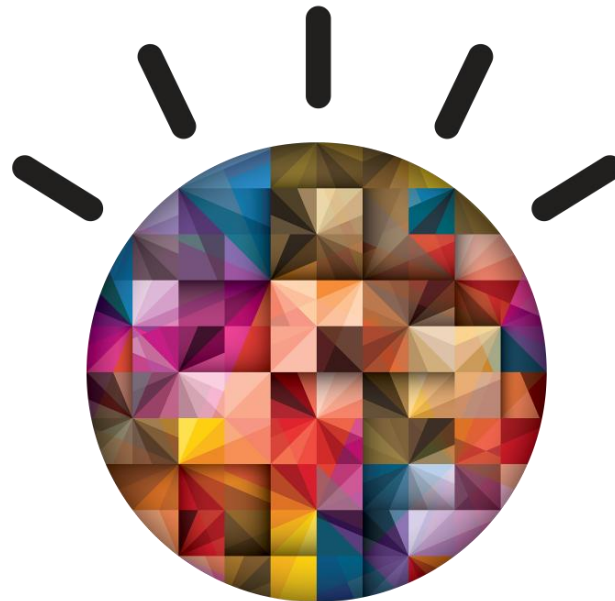


“The IBM DB2 Analytics Accelerator delivers the speed to create the insights we need ... to quickly adapt and grow.”

– 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

Cloud Managed Services
Infrastructure as a Service

System z Disaster Recovery Cloud

zEnterprise Starter Edition for Cloud

z/VM Live Guest Relocation

80% of Fortune 500 companies use IBM cloud computing capabilities

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

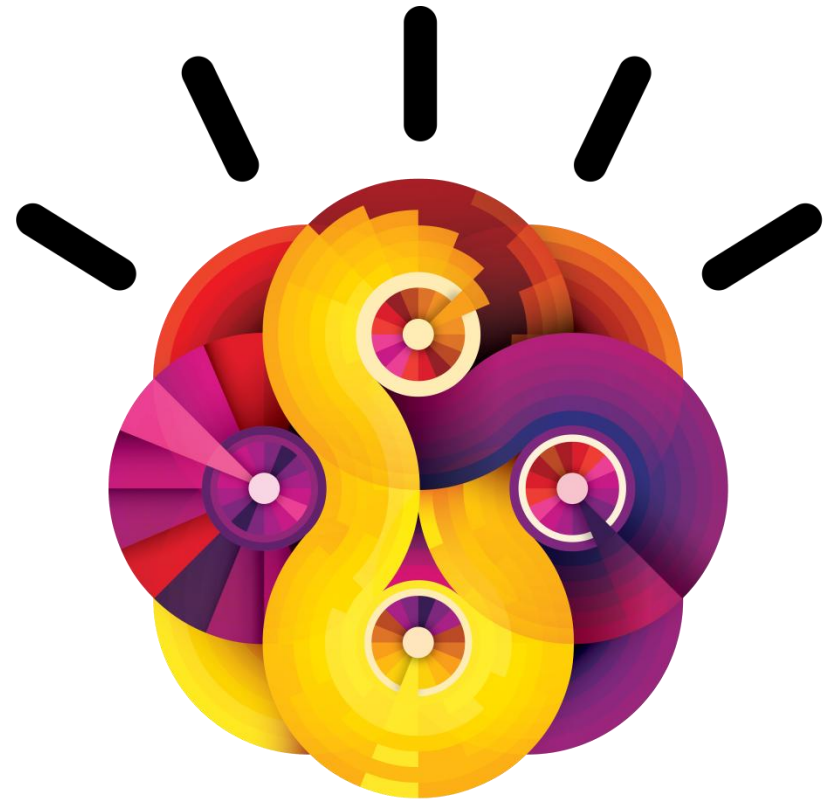


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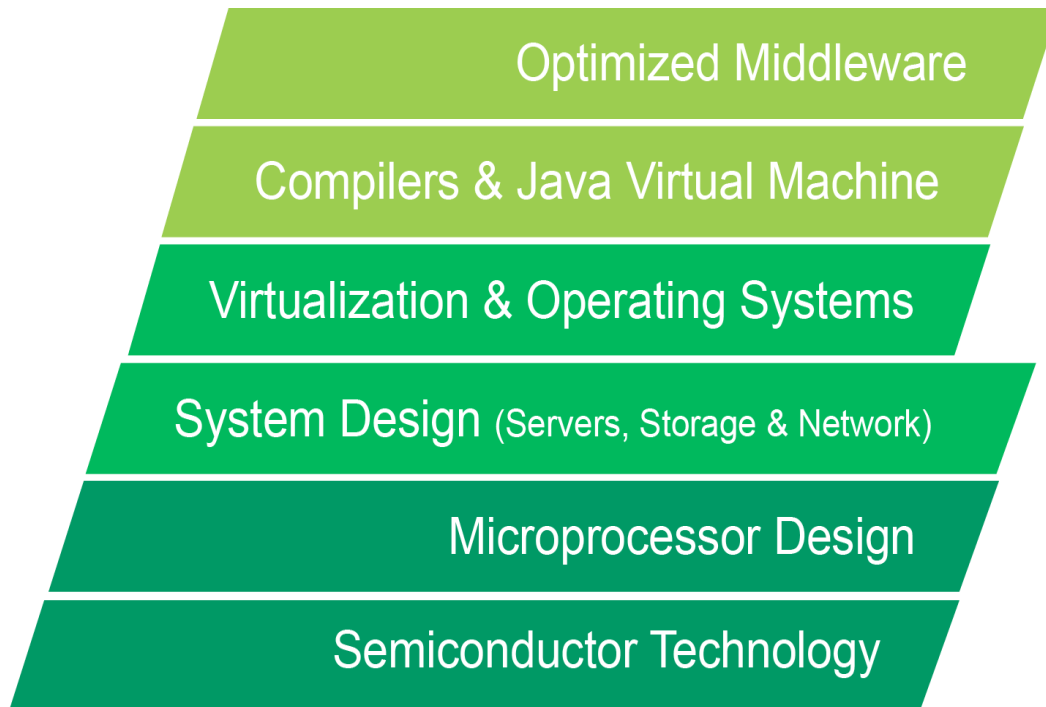
Single point of control over service levels, significantly simplifying IT administration

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.

PureSystems: *A new family of expert integrated systems*

- Built-in expertise to address complex business and operational tasks automatically
- Integration by design to accelerate system setup and application management
- Simplified experience from purchase to maintenance

PureFlex System

- Pre-integrated and optimized infrastructure
- Management integration across compute, storage and networking – both physical and virtual
- No compromise design with system level upgradeability
- Designed for cloud with flexibility and simplicity



PureApplication System

- Optimized for performance and virtualized for efficiency
- Designed for transactional web applications and enabled for cloud
- Application-aware workload management



zEnterprise Client Optimized Systems



- Multi-Architecture System for z/OS, AIX, Linux and Windows
- Centrally managed through the Unified Resource Manager
- Best fit when data or applications exist on System z and clients desire z governance

PureSystems Integrated Expert Systems



- Multi-Architecture system for AIX, i/OS, Linux and Windows
- Centrally managed through Flex System Manager (FSM)
- Best fit when data and applications run on a combination of POWER and System x architecture

Today: Clients can also attach IBM zEnterprise and IBM PureSystems (via Ethernet) to gain benefits of simplified management and lower IT infrastructure costs for all workloads.

IBM's Tivoli service management platform allows for integration for improving delivery of business services.

In future: Tighter integration of these two systems. Today's investment in either will gain value over time.

Clients are deploying infrastructures that are tuned to the task

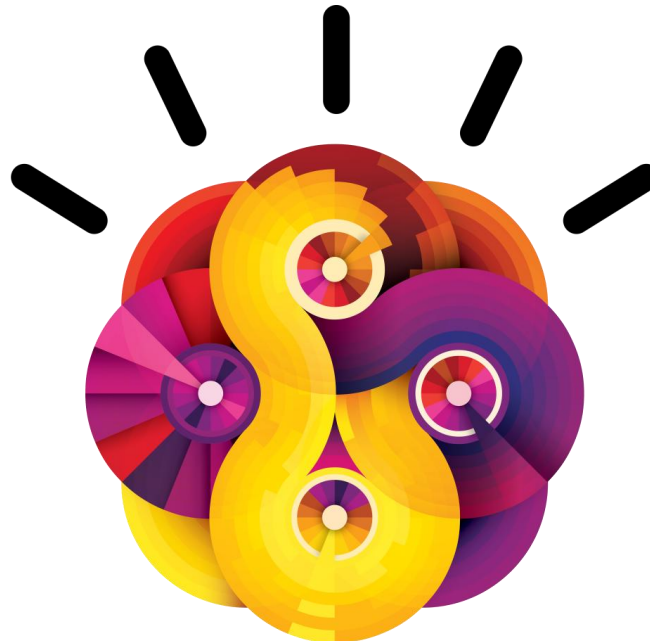


“I want to run each application where we get the lowest cost and the best performance.”

– 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

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.



PRIMERICA

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

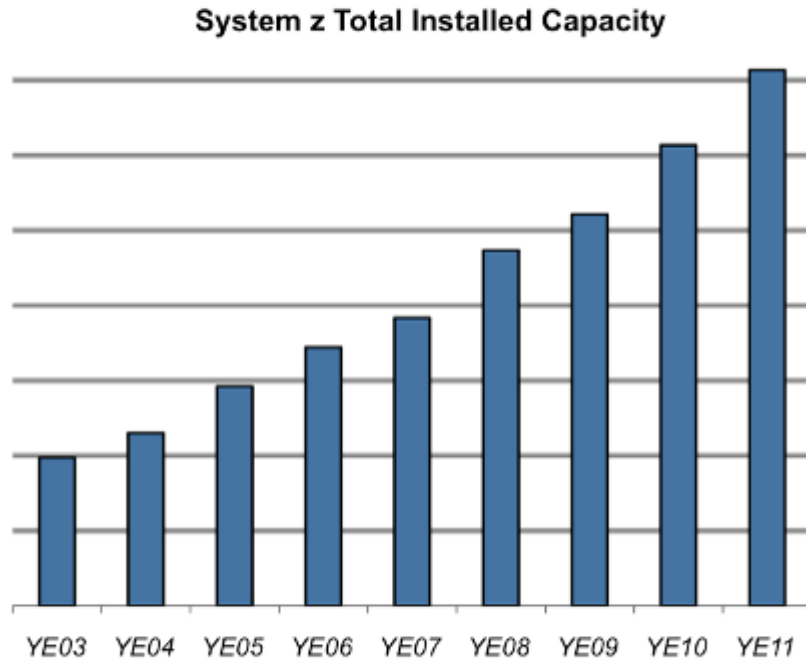
Tuned to
the task

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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•Notes:

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