zEnterprise.

A New Dimension in Computing

The New IBM zEnterprise System

Karl Freund, VP System z Strategy and Marketing

SHARE 2010

Boston, MA

IBM

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BladeCenter*	FICON*	RACF*	System z10	z/OS*
				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 multiprogramming 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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Welcome to the decade of Smart

Every decade or so in computing, there is a chance to redefine the playing field.

We are in that phase of redefinition now

IBM

Today's Data Center is Under Pressure.

7 out of 10 companies in the Global 1000 will need to modify their data centers to meet increased power and cooling requirements.

**70 cents per dollar** is spent maintaining current IT infrastructures rather than adding new capabilities.

78% of CIOs want to improve the way they use and manage their data.

IBM

Despite the allure of a
"one size fits all" server approach …

Today's enterprise computing environments are multi-platform for a reason. They're optimized to run different workloads:

– Database and transaction processing
– Analytics
– Web-based interactions
– Enterprise applications such as ERP
– The myriad of x86 applications
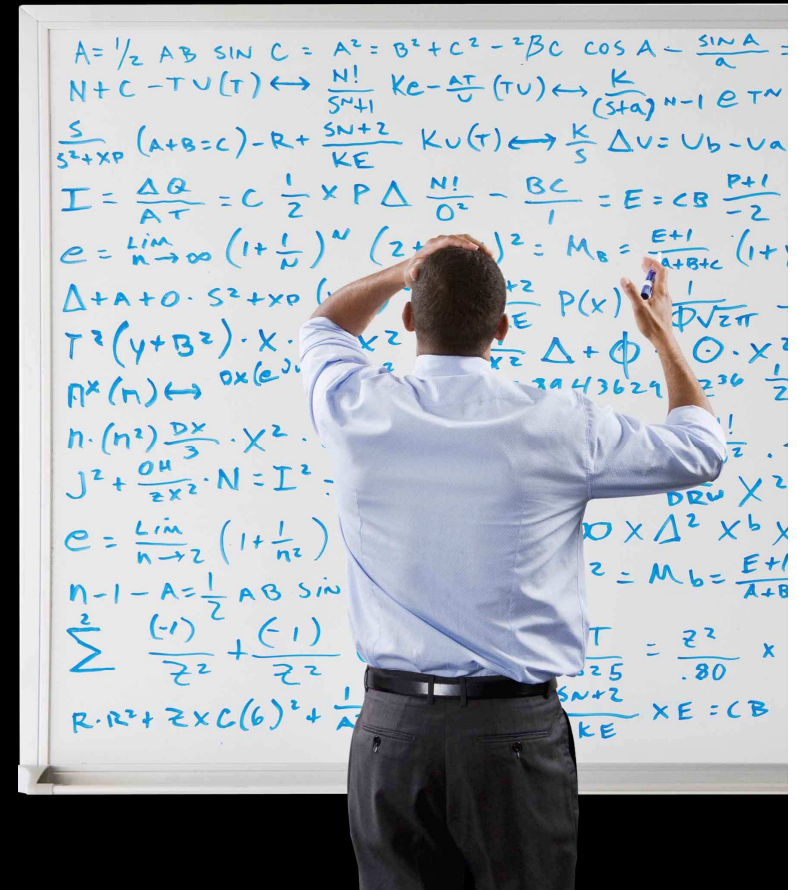
Complex solutions are optimally deployed on multi-tier heterogeneous infrastructures …

… and cost less on System z

System z improves IT efficiency across industries*

44%
lower cost per
credit card transaction

31%
lower IT spend per
consumer loan

25%
lower cost per
mega watt hour produced

24%
lower cost per
hospital bed

20%
lower cost per
airline passenger

26%
lower cost per
new vehicle

25%
lower cost per
retail store

23%
lower cost per
barrel of oil

"… in the long run, the marketplace rewards those that make the optimum use of the right computing resources in the right way as evidenced by business performance."

-- * Dr. Howard Rubin, CEO and Founder Rubin Worldwide

* Based on an analysis of actual IT spend and business performance, comparing companies with greater than average mainframe mix vs. less than average mainframe mix …

IBM

We need Smarter Systems

and software for enterprise computing
and robust cloud environments that …

… unify and optimize multiple systems to work as
a single, integrated service delivery platform

… can scale without adding complexity to meet the
growing demands on the infrastructure

… simplify data center management

… can turn IT into a catalyst for business
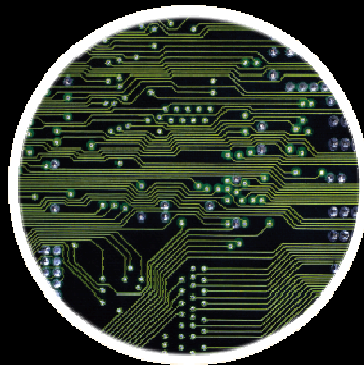innovation and growth

IBM
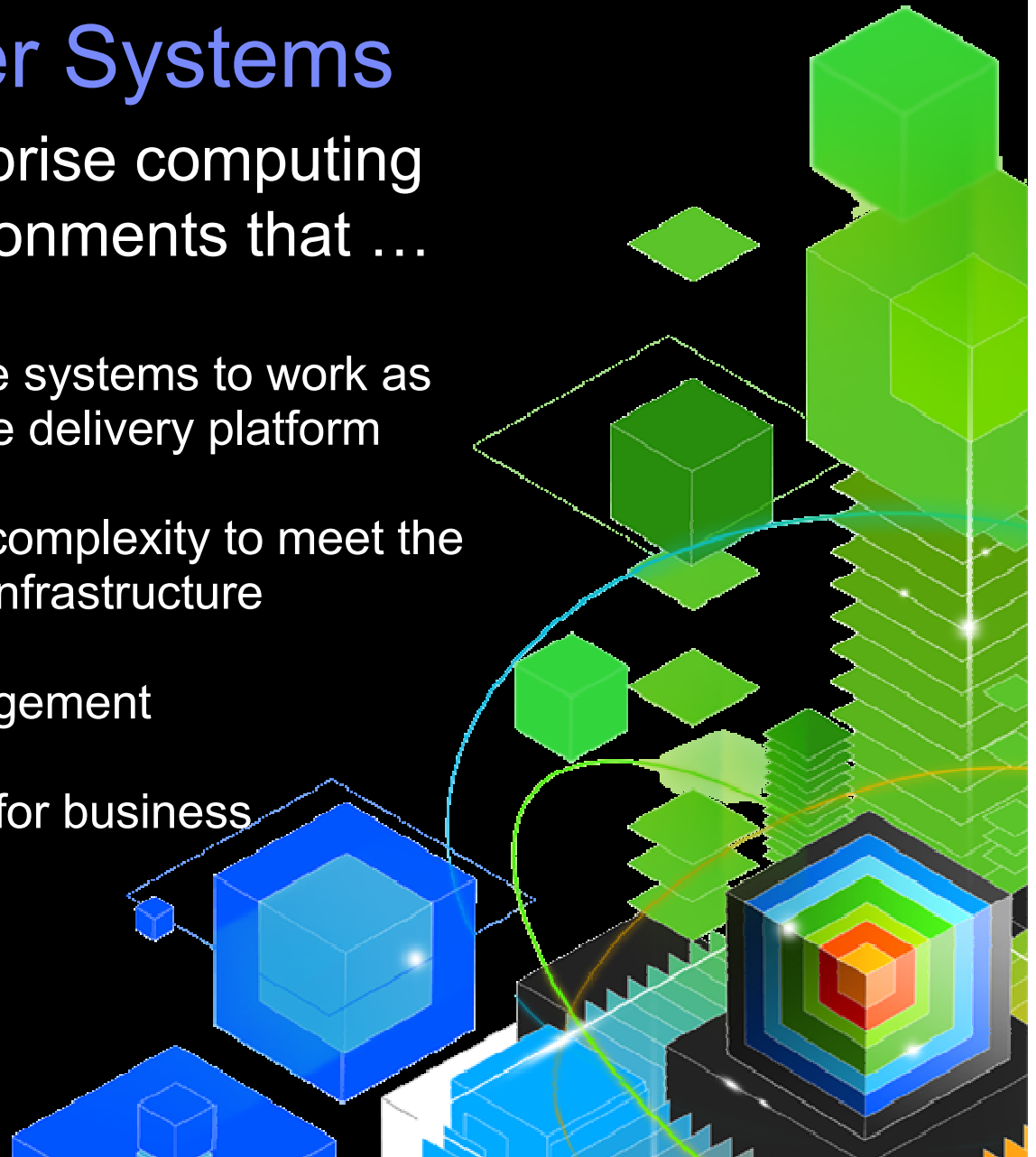
IBM Smarter Systems
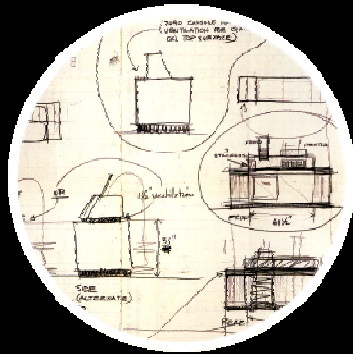
1964
System/360

Centralized computing
for the back-office

1990 - 1993
System/390
Bipolar to CMOS
Parallel Sysplex

Chip-level and
architectural changes
providing system-level
benefits and high
availability

2000
eServer z900
Linux on
Mainframe

Specialty processor to
bring mainframe
qualities of service to
Linux applications

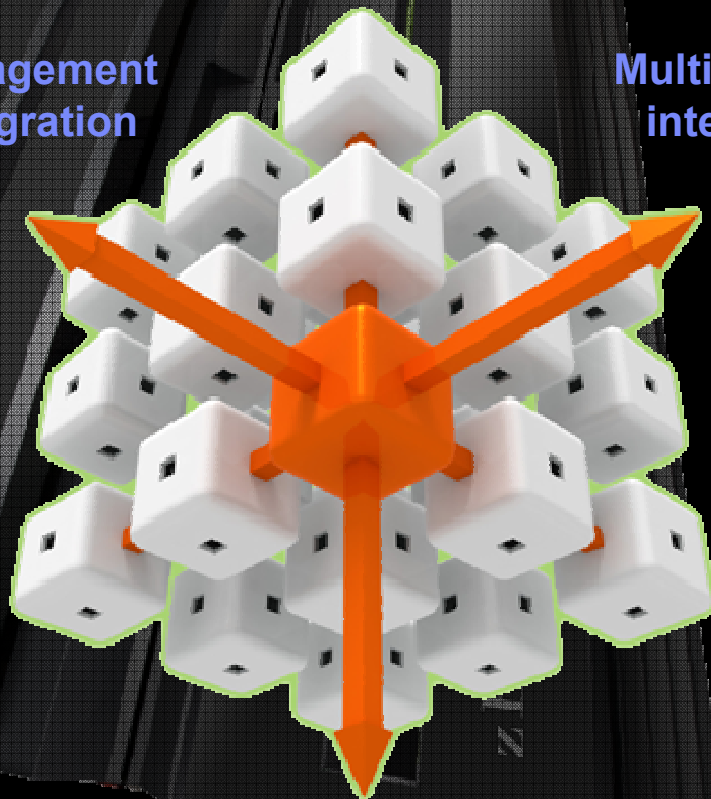*July 2010*
zEnterprise

*A new
dimension in
computing*

Today that tradition continues with zEnterprise…

Announcing the IBM zEnterprise System
A New Dimension in Computing

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.

IBM zEnterprise System – Best-in-class systems and 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
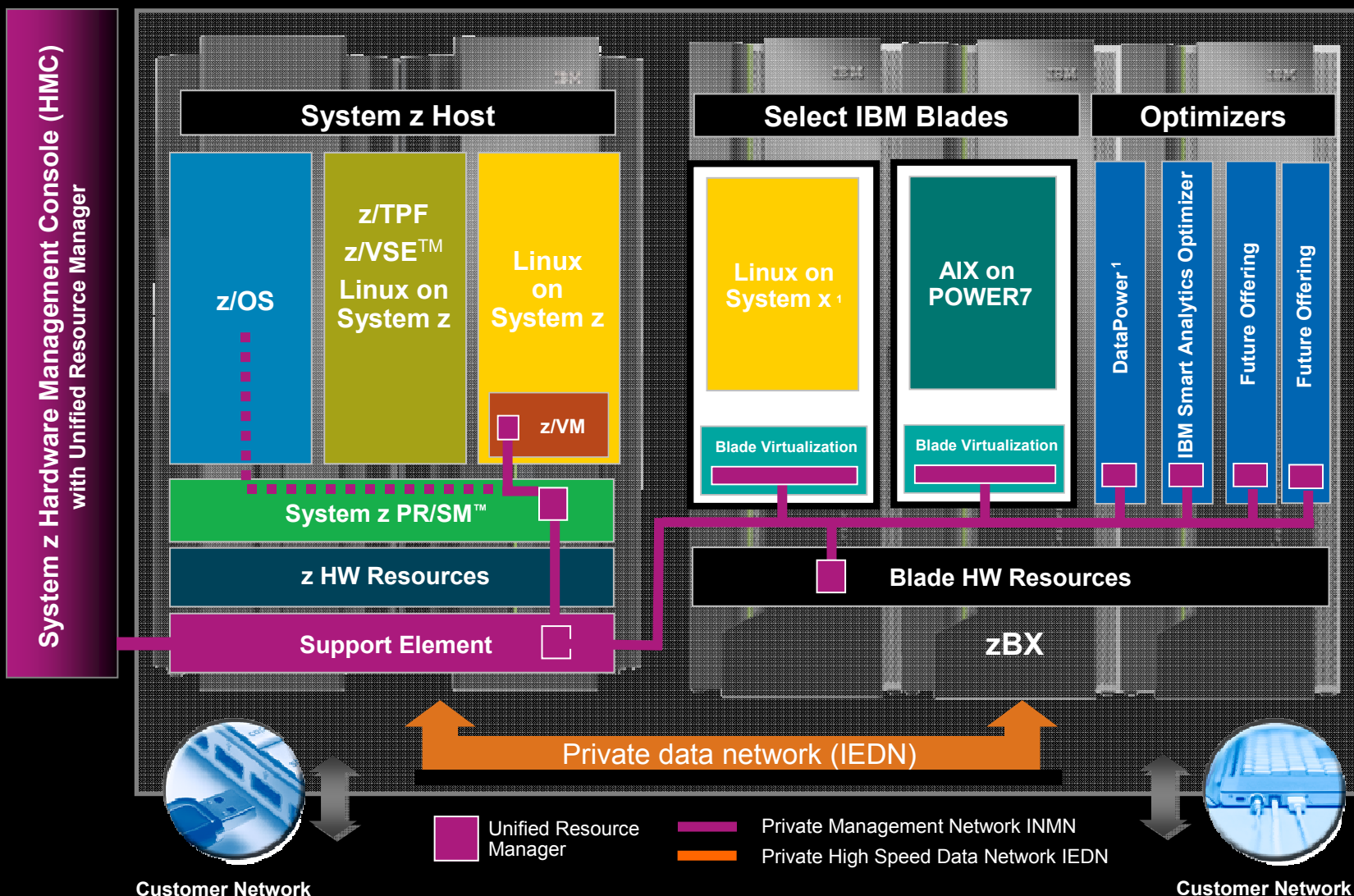
zEnterprise Unified Resource Manager

- 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

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IBM

A look inside the IBM zEnterprise System

Enabling a new dimension in application architecture

System z Hardware Management Console (HMC) with Unified Resource Manager

System z Host

z/OS

z/TPF
z/VSE™
Linux on System z

Linux on System z

z/VM

System z PR/SM™

z HW Resources

Support Element

Select IBM Blades

Linux on System x [1]

AIX on POWER7

Blade Virtualization

Blade Virtualization

Blade HW Resources

zBX

Optimizers

DataPower [1]

IBM Smart Analytics Optimizer

Future Offering

Future Offering

Private data network (IEDN)

Unified Resource Manager

Private Management Network INMN

Private High Speed Data Network IEDN

Customer Network

Customer Network

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

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%**
Less cost

For z/OS

Up to
40%
Improvement in performance

with **60%**
More capacity

- 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

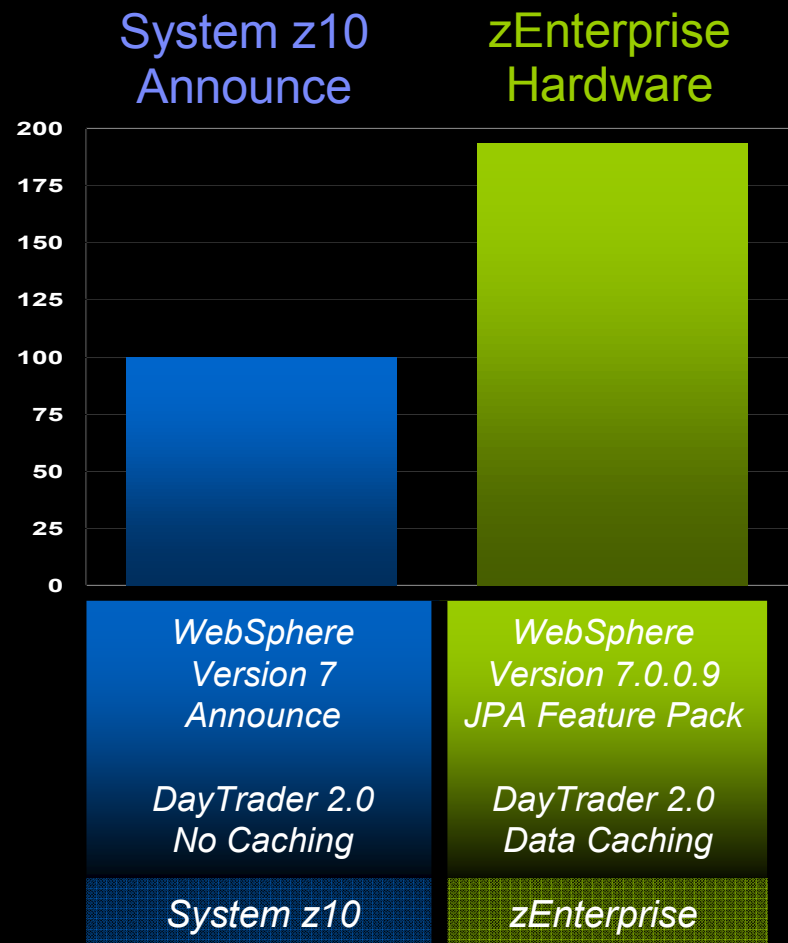- 1.5 MB L2 Cache per core, 24 MB L3 Cache per processor chip

- Cryptographic enhancements

- Optional water cooling

IBM

Continued WebSphere optimizations for z/OS
From then to now

Continued investment to optimize WebSphere software for z/OS environment

- 1.35 times performance improvement for JPA 2.0 applications that exploit the caching features available in WebSphere Version 7, and the WebSphere Version 7 JPA Feature Pack

- Uplevel to zEnterprise hardware produces 1.43 times performance improvement

- *From then to now – 1.93 times performance improvement*

System z10 Announce   **zEnterprise Hardware**

| 200 |
| 175 |
| 150 |
| 125 |
| 100 |
| 75 |
| 50 |
| 25 |
| 0 |

WebSphere Version 7 Announce

DayTrader 2.0 No Caching

System z10

WebSphere Version 7.0.0.9 JPA Feature Pack

DayTrader 2.0 Data Caching

zEnterprise

Then ⟶ *Now*

IBM

zEnterprise Unified Resource Manager: *Enabling a new dimension*

Simplified installation of hypervisors

Gain significant time to market with improved speed of deployment
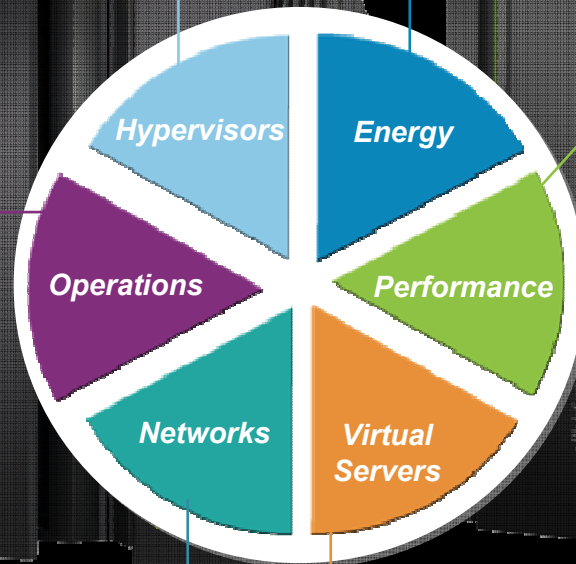
Simplified energy management

Energy cost savings

Save time, cost and simplify asset management

Decrease problem determination and resolution time for cross-platform resources

Improve and simplify cross-platform availability procedures

Enable broader and more granular view of resource consumption

Allocate resources and adjust priorities based on goal-oriented policies aligned to business requirements

Smart business adjustments based on workload insight

Provide deep insight into how IT resources are being used

Hypervisors

Energy

Operations

Performance

Networks

Virtual Servers

HMC

Factory installed and configured network

Improved network security with lower latency, less complexity, no encryption/decryption

Gain flexibility, consistency and uniformity of virtualization

Provide the business with faster time to market

Simplified network management for applications

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IBM

The IBM zEnterprise System

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

Option 1: Deploy distributed work on new Intel servers with 3rd Party VM

--OR--

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

Current data center: distributed workloads on a variety of Intel servers, connected to a System z
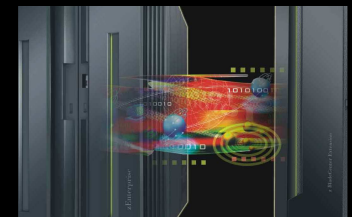
Simplify, automate, and improve service quality by consolidating on zEnterprise and …

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

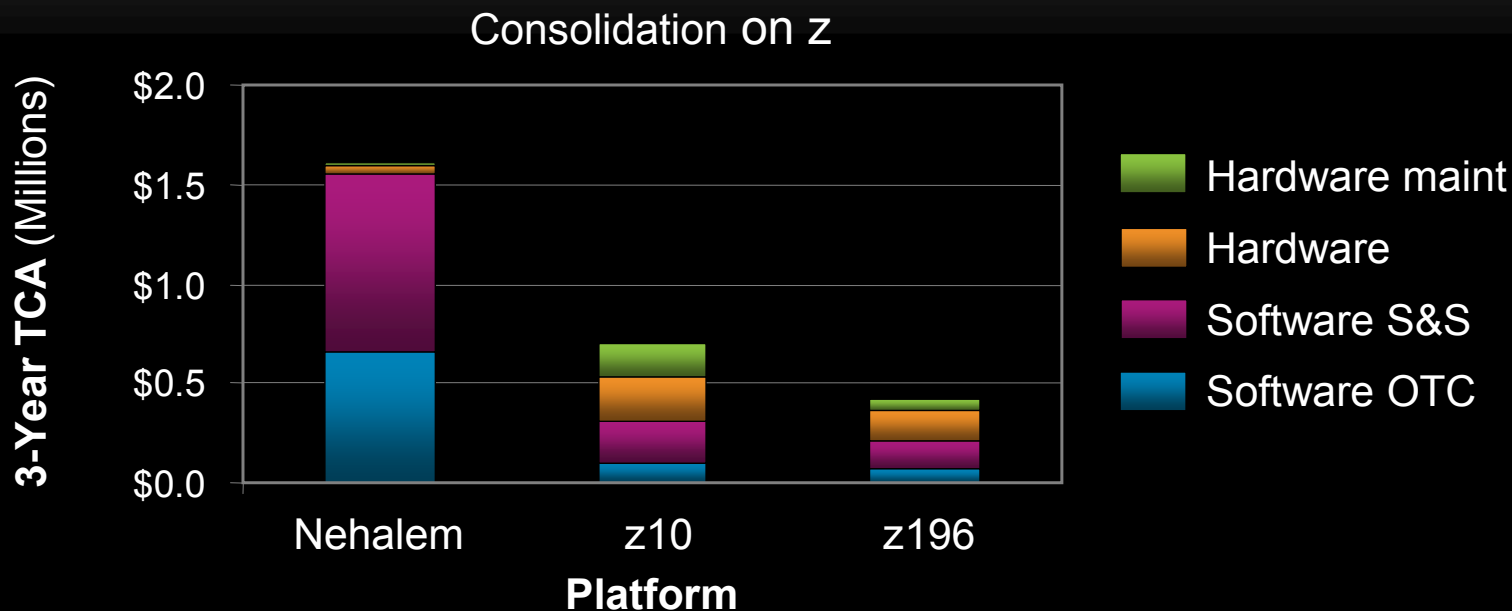**Reduce cost of ownership by up to 56%*** compared to current distributed data center

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

* Based on IBM analysis of a large Financial Services company Datacenter. See details on ibm.com/systems/zenterprise

IBM

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**

Consolidation on z

Legend:
- Hardware maint (green)
- Hardware (orange)
- Software S&S (magenta)
- Software OTC (blue)

Y-axis: 3-Year TCA (Millions) — $0.0, $0.5, $1.0, $1.5, $2.0

X-axis (Platform): Nehalem, z10, z196

* Distributed server comparison is based on IBM cost modeling of Linux on zEnterprise vs. alternative distributed servers. Given there are multiple factors in this analysis such as utilization rates, application type and local pricing, etc.; savings may vary by user

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Cloud computing: More value with zEnterprise

Security

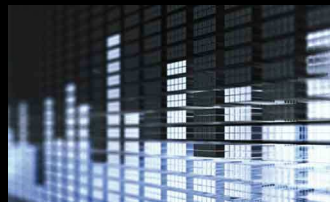Industry-leading security at the core of an integrated infrastructure

Identifies potential fraud in Real Time

Availability
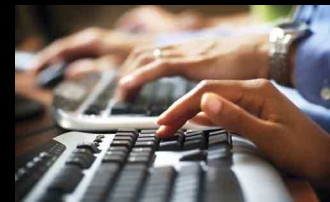
Resiliency management and fewer points of failure

Centralized workload management aligned to business priorities

Scalability
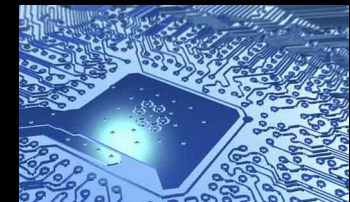
Ability to meet massive demands from users and data

Unmatched scalability with the highest transaction processing capacity

Efficiency

Economies of scale for labor, software and environmental costs

Reduce labor, energy, and development costs

Virtualization

Centralize management of virtual servers across a heterogeneous pool

Enable thousands of virtual servers within a single integrated system

z/OS Version 1 Release 12
A smarter operating system for a smarter planet

up to 40% performance improvement for VSAM-based online and batch workloads*

up to 50-90% performance improvement for SVC dump capture time*

up to 30-50% performance improvement for XML workloads*

up to 30-50% networking throughput improvement*

the power to act more quickly and accurately (with z/OS Predictive Failure Analysis and z/OS Runtime Diagnostics)

*configure FICON disk and tape in a fraction of the time*

reduce time for system management tasks by hours with z/OS Management Facility

* Based on IBM Lab results, your results will vary.
- *VSAM performance improvement is through the use of VSAM CA Reclaim; actual benefit may be more or less and will depend on the degree of VSAM data fragmentation and how the data is accessed. It is anticipated that VSAM key sequenced data sets (KSDS) that are severely fragmented or rarely reorganized will see the most benefit. For applications that delete a large number of records from a narrow key range and then immediately re-insert them, CA Reclaim could result in some performance degradation.*
- *z/OS XML System Services validation parsing performance will depend on the amount of data being parsed and the degree of complexity of the schema.*
- *Actual SVC dump time will depend on amount of data being captured and the amount of that data dumped from auxiliary storage.*
- *The interactive networking throughput measurements were obtained on System z10, model 2097-E64 with OSA Express 3 Inbound Workload Queuing function. Actual benefit will depend on amount of data being transferred, presence of bulk-data traffic in the mix, and whether communication is z/OS to z/OS, or z/OS to distributed system.*
- *Performance improvements are based on internal IBM lab measurements, and the performance improvement of over 11% was observed using compute-intensive integer workload code generated by the z/OS V1.12 XL C/C++ compiler with high optimization when compared to code generated using the z/OS V1.11 XL C/C++ compiler.*

The new face of z/OS …
z/OS Management Facility Version 1 Release 12
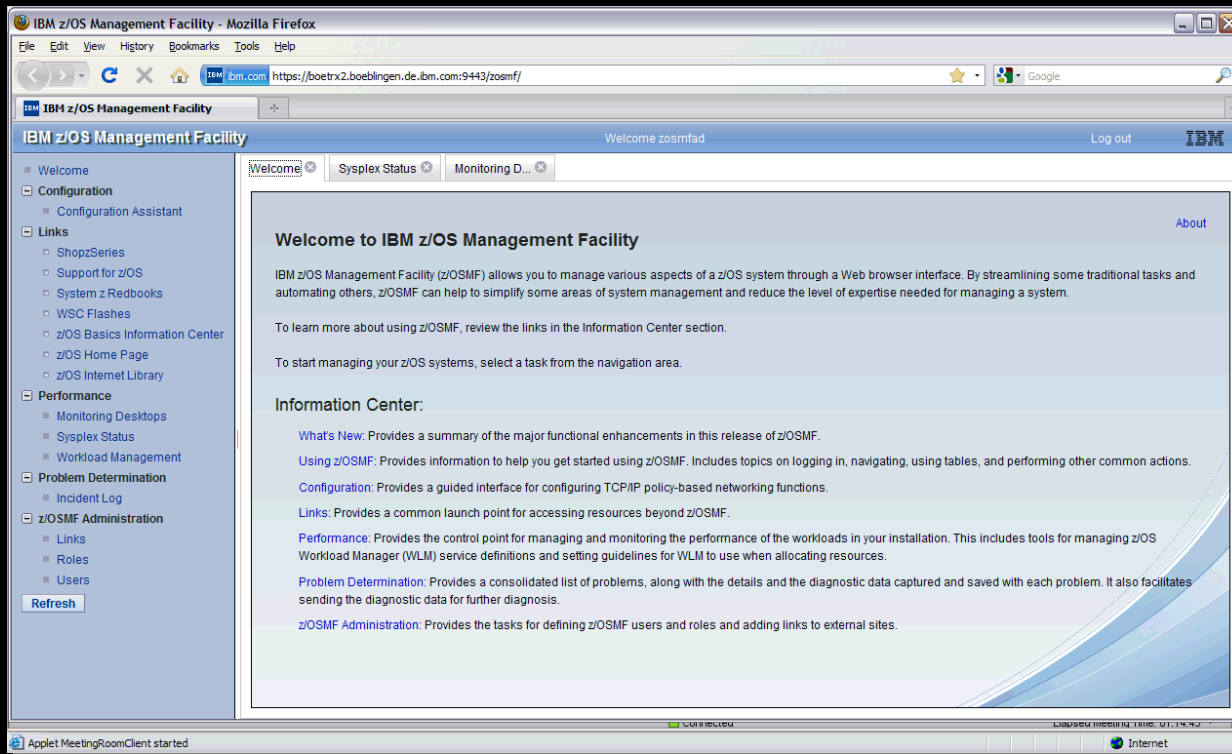
Streamlined tasks

Intuitive navigation

Active assistance

Best practices

***Capturing and analyzing incident data, configuring TCP/IP networks
and z/OS Workload Management policies, and monitoring performance
data have never been easier.***

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IBM

Integrated value with software optimized for Smarter Systems
Innovative software solutions

- Strong information management platform solutions built for business workloads

- Visibility, control, security, and automation across your business with integrated service management

- Flexible application infrastructure, connectivity and dynamic business processes

- Easy-to-use, multi-platform development tools

- Cost-effective collaborative tools

22 new software announcements working together to bring optimal application availability to your business critical services.

PLUS 100s of existing software products run on zEnterprise today.

IBM Smart Analytics Optimizer
Capitalizing on the best of relational and columnar databases

Workload optimized, appliance-like, add-on, that enables the integration of business insights into operational processes to drive winning strategies.

Performance: unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance

Integration: connects to DB2 through deep integration providing transparency to all applications

Self-managed workloads: queries are executed in the most efficient way

Transparency: applications connected to DB2, are entirely unaware of ISAO

Simplified administration: appliance-like hands-free operations, eliminating many database tuning tasks

Up to **80x** faster than z10

IBM

IBM has been collaborating with clients to prepare for this day

BANKING	INSURANCE	RETAIL	HEALTHCARE	PUBLIC SECTOR
Core Banking	Internet Rate Quotes	Online Catalog	Patient Care Systems	Electronic IRS
Wholesale Banking – Payments	Policy Sales & Management (e.g. Life, Annuity, Auto)	Supply Chain Management	Online Claims Submission & Payments	Web-based Social Security
Customer Care & Insight	Claims Processing	Customer Analysis		

Retail client using SAP financials

> **The Future:** *DB2 for z/OS with Application Server on POWER7 Blades + Future exploration of SAP Business Warehouse Accelerator on x86 Blades*

Client Pains

- Resource intensive and vulnerable to several points of impact
- Too many network hops
- Outages when applying microcode updates
- Multiple software tools and software process for site failovers

Benefits

- Consistency of business controls
- Monitor and manage applications end to end
- Manage, maintain and provision resources with true application insulation
- Better utilization of assets
- Insulate application development teams from infrastructure technology
- Consolidation of skills through consistent tools

Public sector client develops an Internet tax application

The Future: DB2 z/OS with Application Server on POWER7 Blades in zBX, IBM WebSphere® DataPower

Client Pains

- Not able to respond quickly for need of new function

- High cost of staff required to maintain multi-tier application

Benefits

- Network speed increased by ten times

- Single workload management view across multiple platforms reducing labor overhead

- Everything is pre-tested, pre-configured for their mission-critical application

IBM

Banking client enables Internet banking

The Future: **System z (IMS™/CICS/DB2); p7 Blades running AIX for WebSphere and IBM System x Blades running Linux**

Client Pains

- Extremely complex environment

- Majority of maintenance applied to systems manually

- Several single points of failure

- Bank presence in multiple countries across Europe and are maintaining different infrastructures based on acquisitions

Benefits

- Increased flexibility through simplification and standardization

- Lower cost through a single management and policy framework

- Reduced risk by extending System z Quality of Service to multiple platforms

- Better service to users from improved resource management

- Greater focus on delivering new business functions through reduced manual coordination of tasks

IBM

IBM Services
Help get the most for your business from zEnterprise System

Assess and design an IT architecture to optimize for business advantage

- Develop a business case and high level transition plan

- Fit-for-purpose analysis

- Deliver a roadmap for an adaptable and efficient infrastructure that integrates IT and business strategy and priorities

Build and run a smarter system with services for zEnterprise

- Migrate effectively and efficiently to zEnterprise environment.

- Create a more cost-effective and manageable computing environment with server optimization, integration, and implementation services

- Enhance and simplify cross-platform high availability

- Effectively run and manage zEnterprise with maintenance and technical support services

IBM

zEnterprise receives strong endorsement from industry analysts

Gordon Orr

Director, Enterprise Client Services, International Technology Group

Where mainframes constitute the back-end data tier of complex business-critical server architectures, zEnterprise systems may offer new, cost-effective opportunities to extend "mainframe-class" capabilities across all platforms and tiers.

Ian Bramley

Managing Director, Software Strategies

… IBM's immensely powerful new "System of Systems" runs the three most vibrant, important MPU stack-workload sets in our industry today … a truly inspiring leap forward.

Alan Radding

Research Director, Independent Assessment

The zEnterprise has the potential to change the way the organization thinks about mainframe computing; suddenly it's not just a mainframe anymore.

Richard L. Ptak

Managing Partner, Ptak, Noel & Associates LLC

IBM's zEnterprise System provides the single largest opportunity of this decade to shift IT efforts towards creative problem solving and away from maintenance.

Gary Barnett

Partner and CTO, The Bathwick Group

This release of the IBM mainframe dramatically extends the platform's value proposition for existing customers, and offers non-mainframe customers a real choice when it comes to delivering large scale applications reliably and cost effectively.

The IBM zEnterprise System
*Now extending System z cost savings
and value to a new dimension*

- Designed to meet the need of today's heterogeneous data centers

- Enables a mixed set of workloads to be deployed on best fit technologies

- Delivers lower acquisition and operating costs than a "one size fits all" approach

- Reduces risk by extending the reach of System z Qualities of Service

- Improves service through tighter integration for multi-tier workloads

IBM

The IBM zEnterprise Launch:

Rob Enderle, of the Enderle Group,
summed up the launch nicely…..

"With this announcement, IBM is saying they not only are not going to go quietly into the night, defeated by the sheer volume of x86-based server solutions, but intend to kick the collective butts of anyone that gets in their way. IBM is on a roll and folks better follow, get out of the way or prepare to face a formidable competitor that will object with a vengeance to anyone else who tries to lead in the enterprise systems space."

"The Best Interview Starts by Meeting the Teacher"

California State University, CA	Mohsen Beheshti
Columbus State University, GA	Dr. Wayne Summers
Illinois State University, IL	Dr. Chu J. Jong
Marist College, NY	Dean Roger Norton, Susan Scanlon
North Carolina A&T University, NC	Dr. Cameron Seay
Pace University, NY	Dr. Lixin Tao
Stevens Institute of Technology, NJ	Dominic Duggan
Syracuse University, NY	Susan Dischiave, David Dischiave
University of Arkansas	Dr. David Douglas
University of Maryland Eastern Shore	Dr. Bryant Mitchell, Dr. Gurdeep Hura
University of South Carolina	Robert Brookshire
Widener University, PA	Dr. Suk-Chung Yoon

IBM

Thanks for joining us today.

Let us know how we can help.