

zEnterprise.
A New Dimension in Computing

The New IBM zEnterprise System



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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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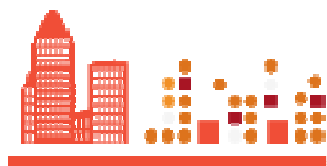
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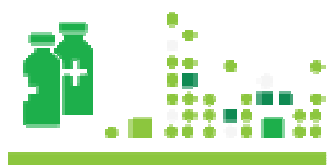
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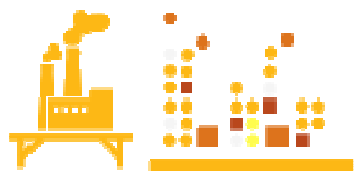
Smarter Planet:
The progress is inspiring



Smarter cities around the world



Smarter medicine



Smarter energy grid



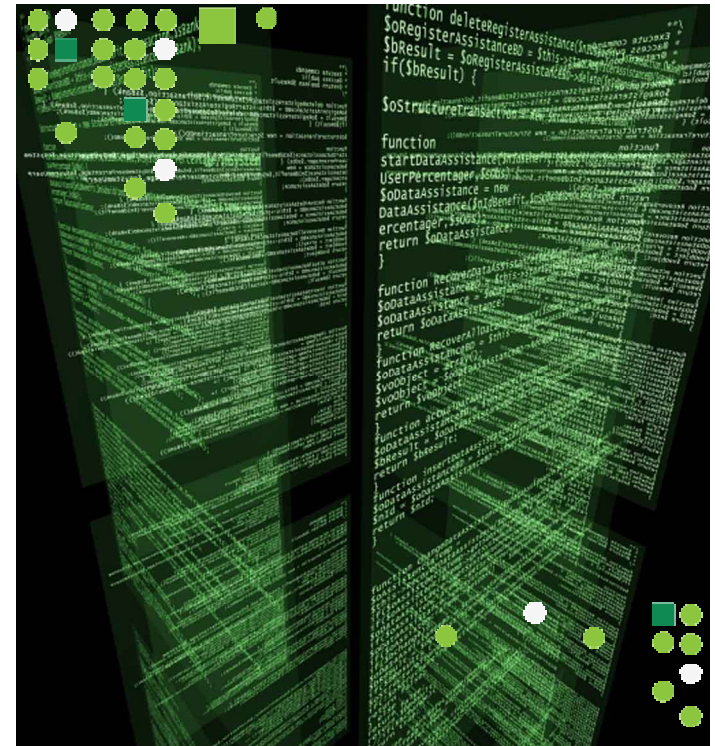
Smarter traffic systems

Yet the Reality Can Seem Daunting

While technology has made great strides and all platforms are more capable than ever before...

... the demands set upon them have never been greater

- Workloads are more diverse and more complex
- The volume of data is unprecedented
- The sheer performance required is staggering
- Security and resiliency are paramount



And the reality is that these demands grow exponentially as we embrace the opportunities of a smarter planet.



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 lowers IT spending across many industries

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...*



44%

lower IT cost per credit card transaction



31%

lower IT costs per consumer loan



25%

lower IT cost per mega watt hour produced



24%

lower IT cost per hospital bed



20%

lower IT cost per airline passenger



26%

lower IT cost per new vehicle



25%

lower IT cost per retail store



23%

lower IT 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*

System z helps give IBM clients a Competitive Advantage

e.g., in Banking and Financial Services ... System z clients, on average, realize: *

49% more income per employee for retail banking

48% less IT spend per employee for deposits

31% less IT spend per customer loan

65% less IT spend as a percent of revenue for credit card services

18% less call center IT costs as a % of expenses

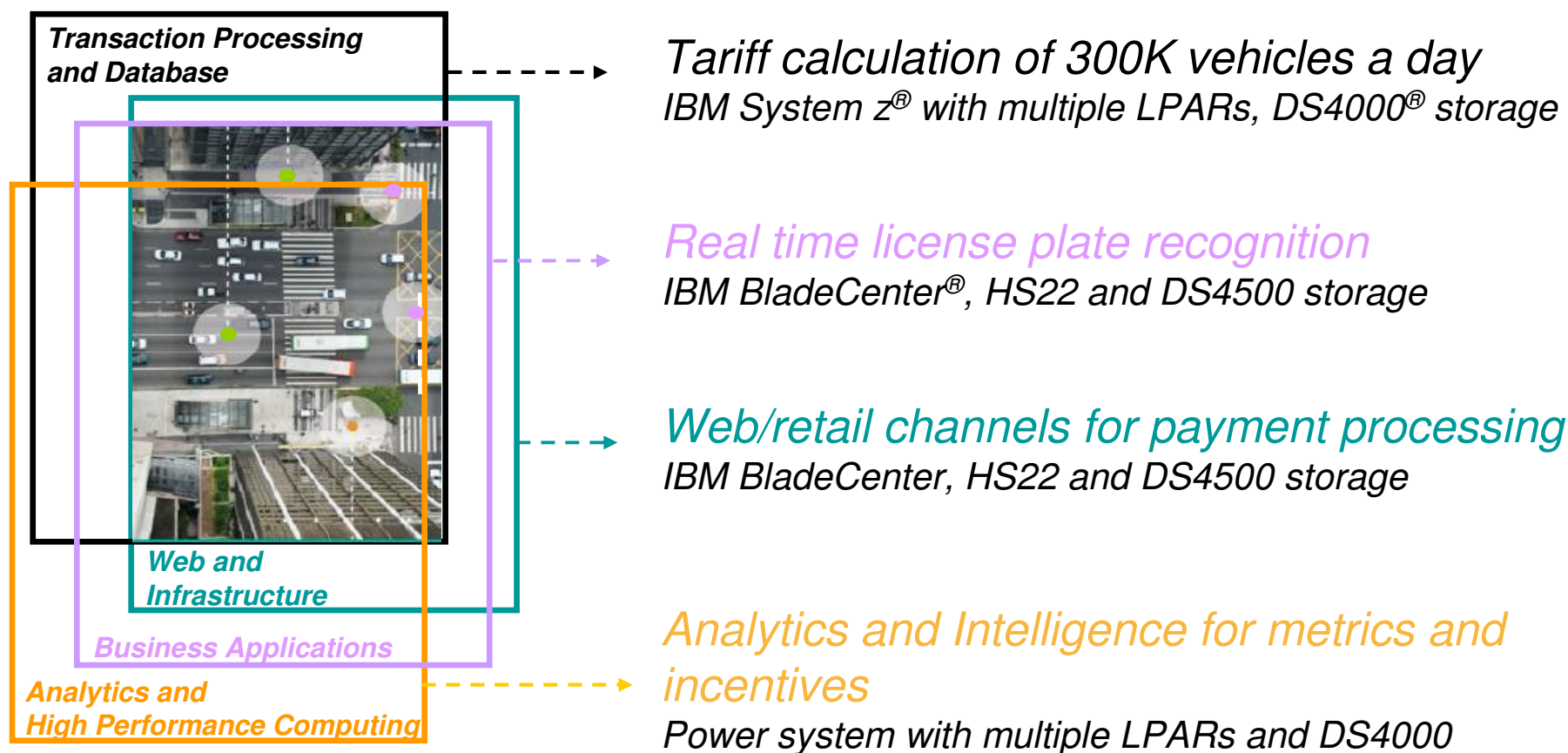
65% less cost per teller transaction



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.

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

A Smarter Traffic System: Optimized with the right mix of technologies

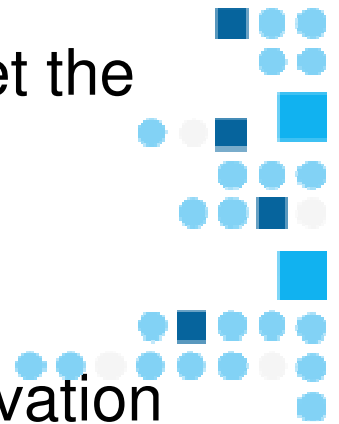


While optimizing each of these workloads in its native environment is smart...

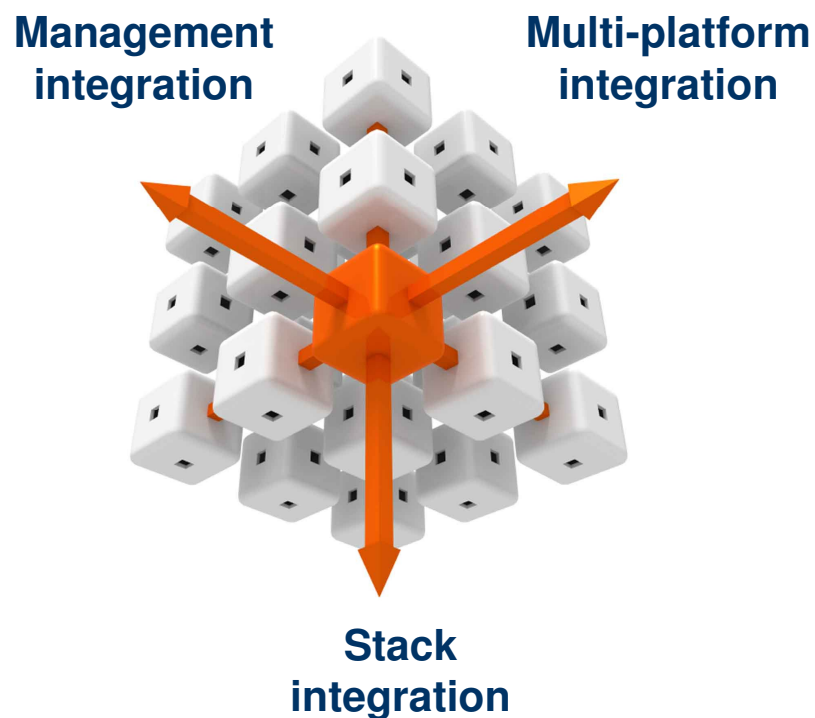
...Optimizing the way they work together is smarter.

We Need Smarter Systems and Software for Enterprise Computing and Robust Cloud Environments

1. That unify and optimize multiple systems to work as a single, integrated service delivery platform
2. That can scale without adding complexity to meet the growing demands on the infrastructure
3. That simplify data center management
4. That can turn IT into a catalyst for business innovation and growth



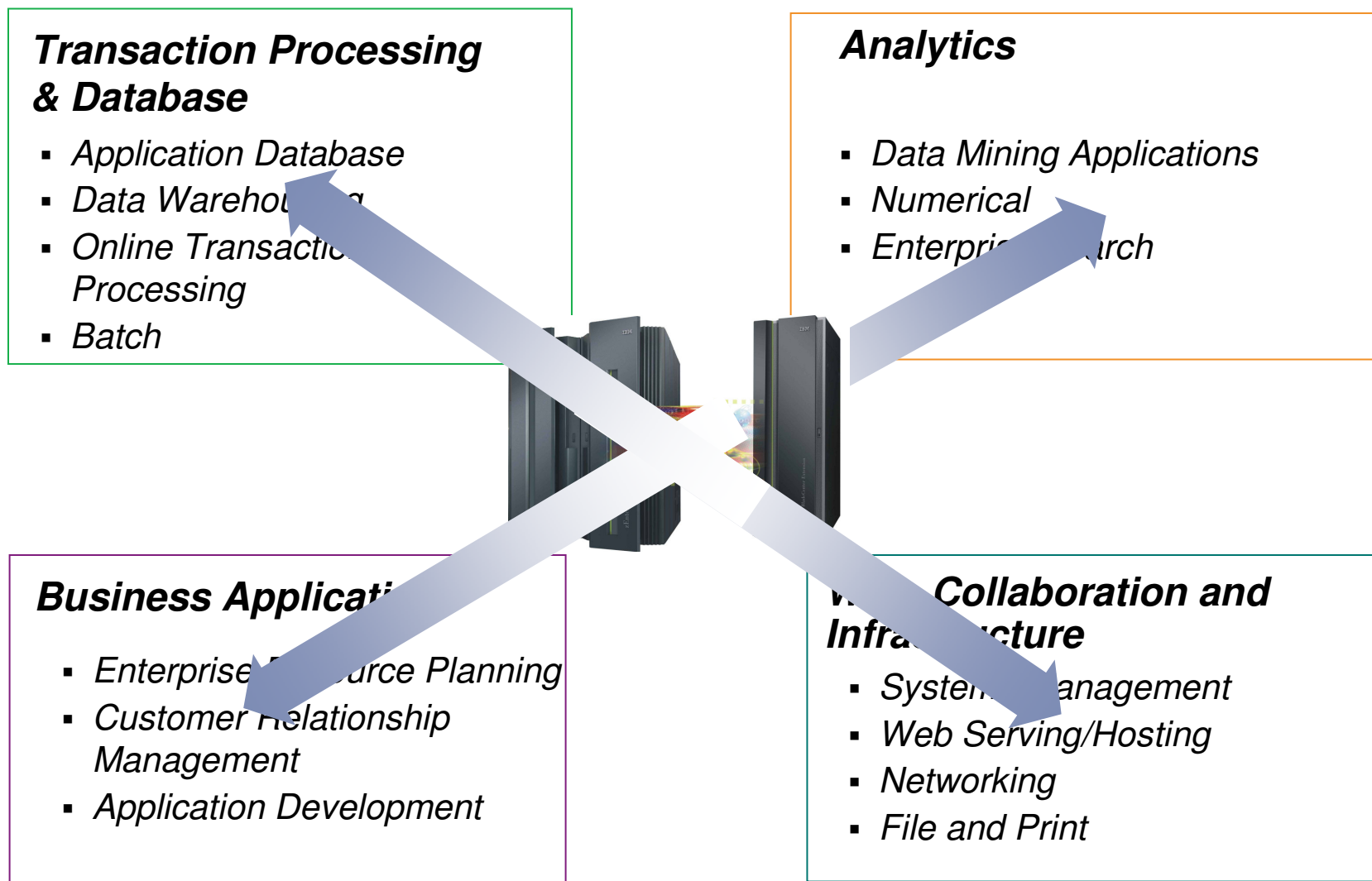
Announcing the IBM zEnterprise System: *A New Dimension in Computing*



- 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.

zEnterprise: A System of Systems

Managing multi-tier workloads and extending System z governance



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

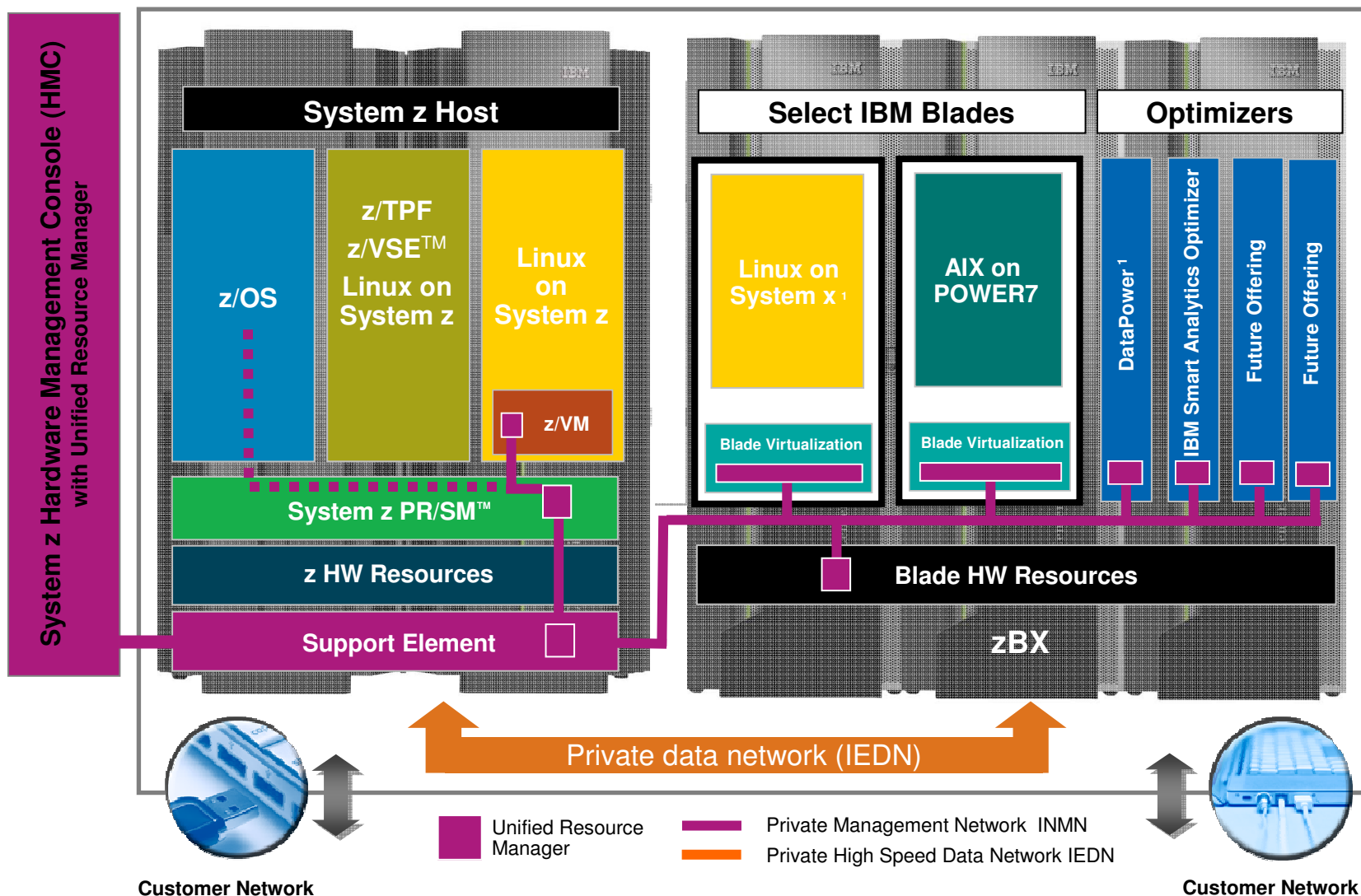
- Unifies management of resources, extending IBM System z qualities of service end-to-end across workloads
- Part of the IBM Systems Director family, provides platform, hardware and workload management

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

A look inside the IBM zEnterprise System

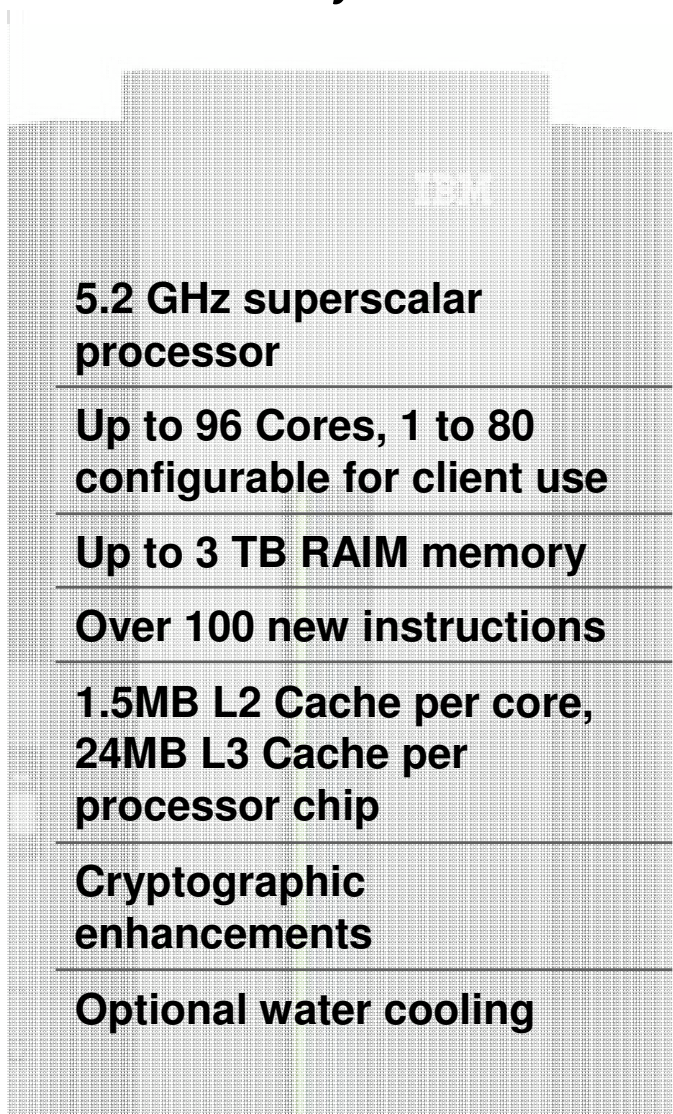
Enabling a new dimension in application architecture



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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%**

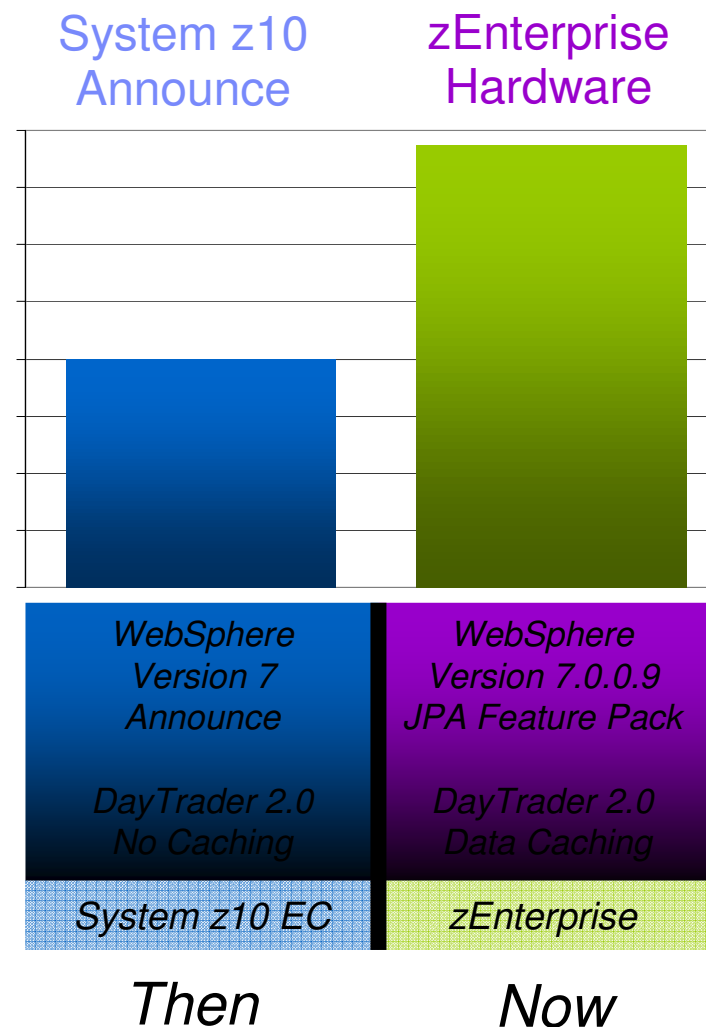
More capacity

- With no increase in energy consumption
- And even better performance with new software

Continued WebSphere optimizations for z/OS

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***

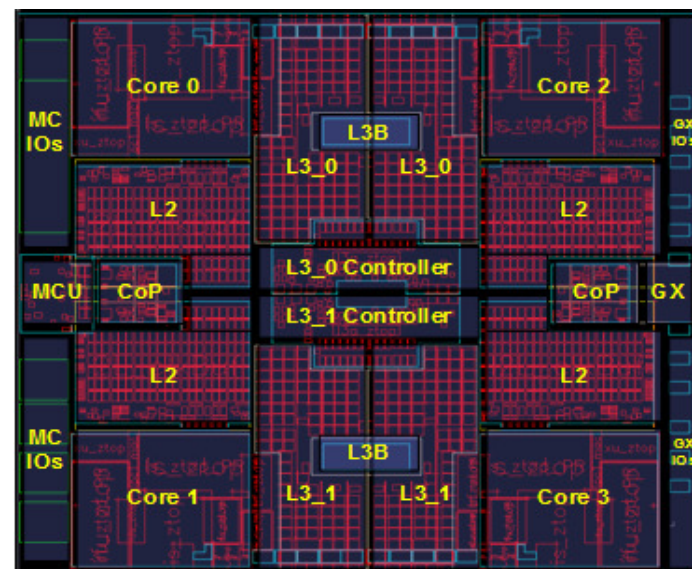


z196 - IBM Leadership Technology at the Core

- New 5.2 GHz Quad Core Processor Chip boosts hardware price/performance
 - 100 new instructions – improvements for CPU intensive, Java™, and C++ applications
 - Over twice as much on-chip cache as System z10 to help optimize data serving environment
 - Out-of-order execution sequence gives significant performance boost for compute intensive applications
 - Significant improvement for floating point workloads

- Performance improvement for systems with large number of cores – improves MP ratio

- Data compression and cryptographic processors right on the chip

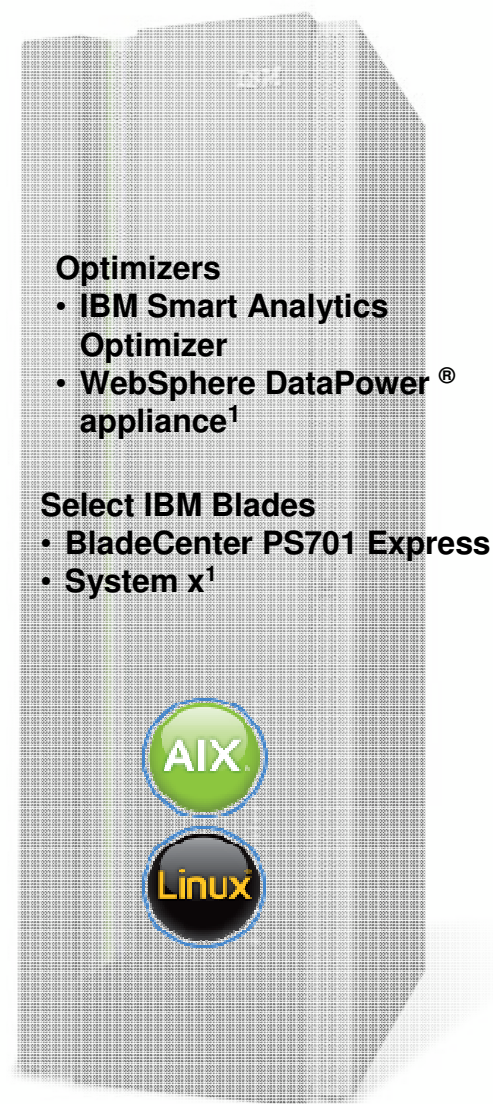


Extending the Magic of System z to Heterogeneous Platforms

IBM zEnterprise BladeCenter Extension (zBX)

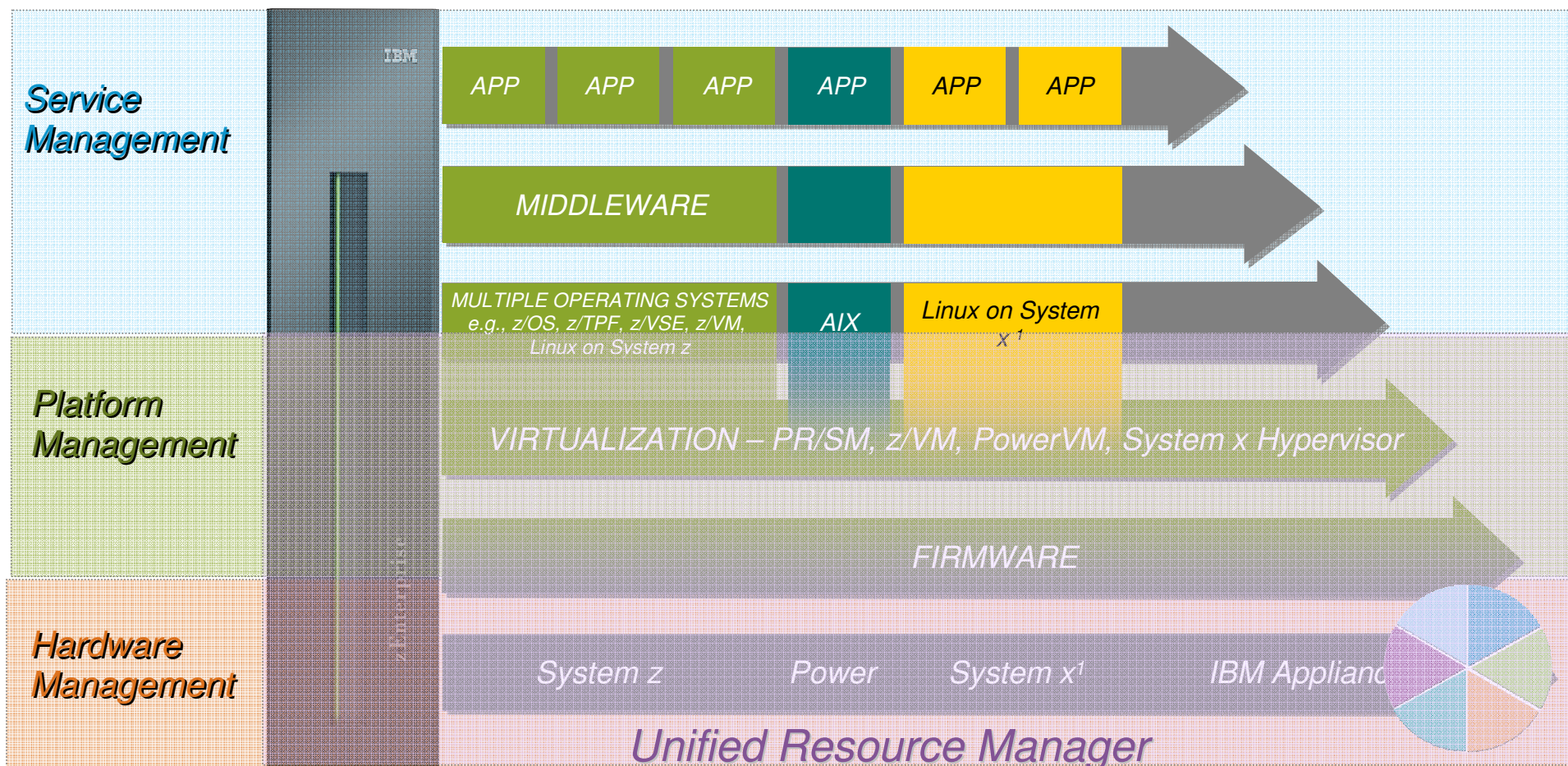
- Up to 4 shareable racks, capacity for 112 blades
- Configured for high availability
- Secure network connection between zBX and z196 for data and support.
 - Fast 10 Gb Ethernet connection to the data
 - Less latency – fewer ‘hops’ to get to the data and no need for encryption / firewall
 - Traffic on user networks not affected.
- System z support
 - Problem reporting, hardware and firmware updates

**... managed by the
zEnterprise Unified Resource Manager**



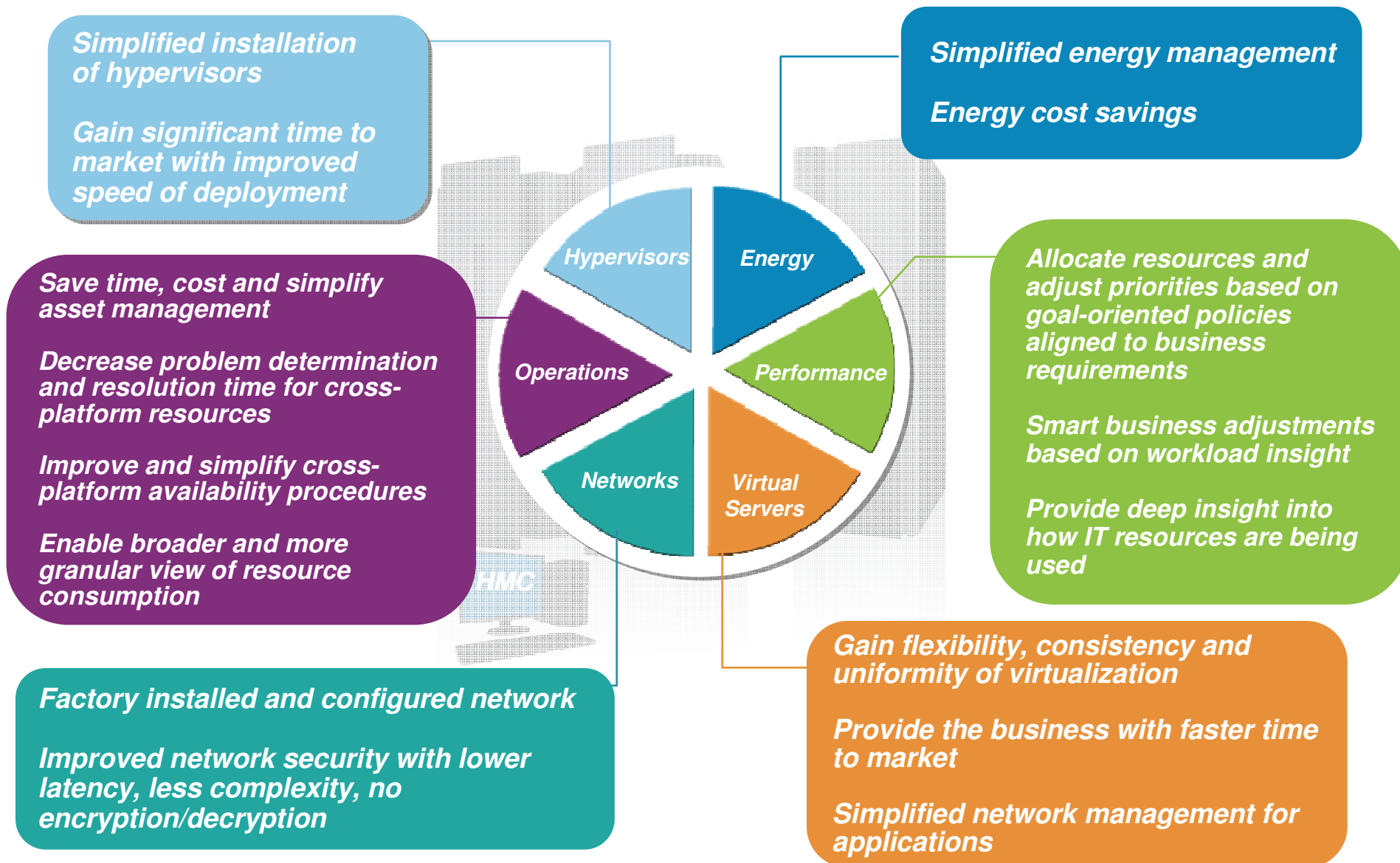
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zEnterprise extends Service Management for improved governance



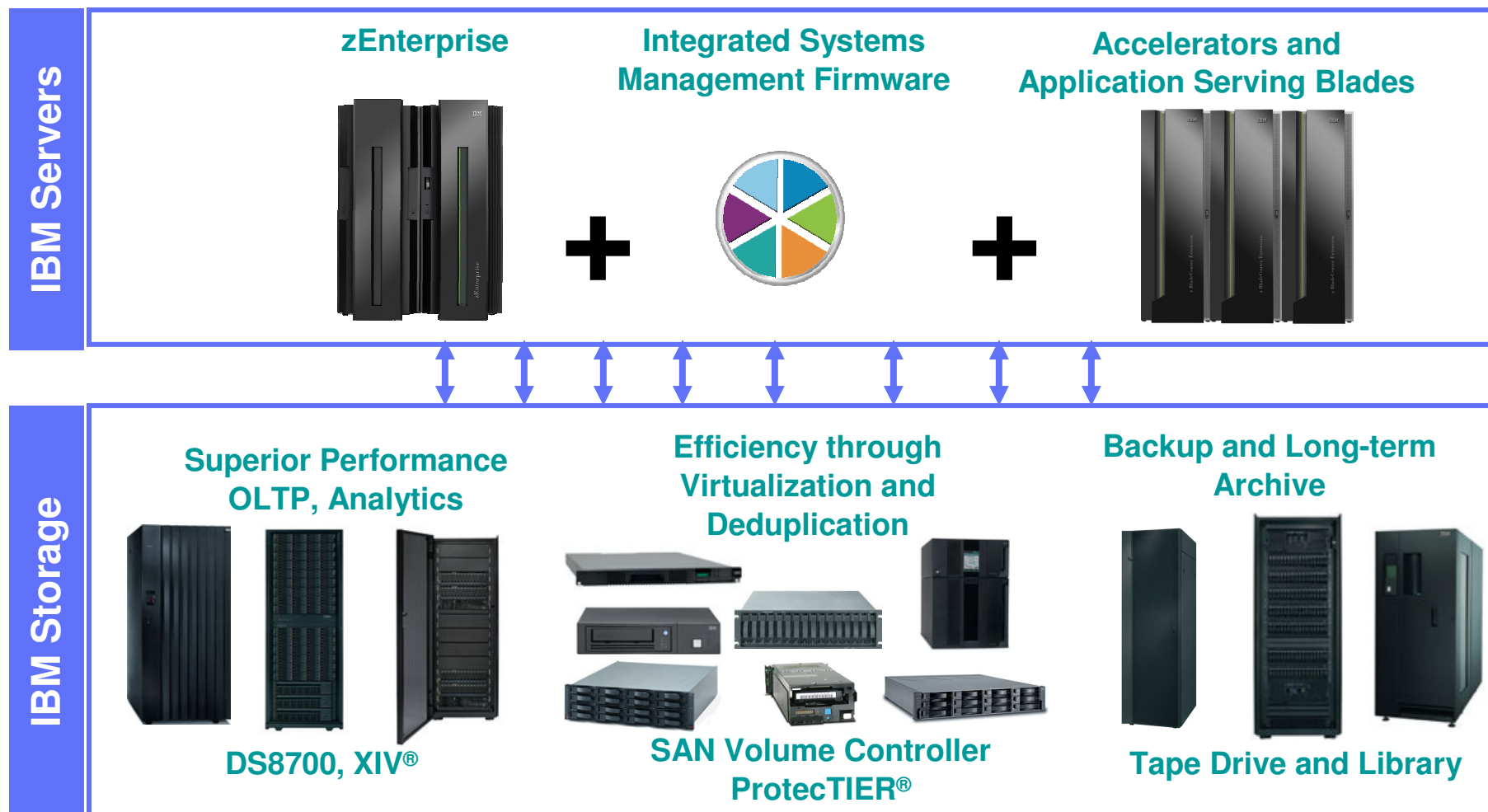
Focused, collaborative innovation
A “complete systems” approach

zEnterprise Unified Resource Manager: enabling a new dimension



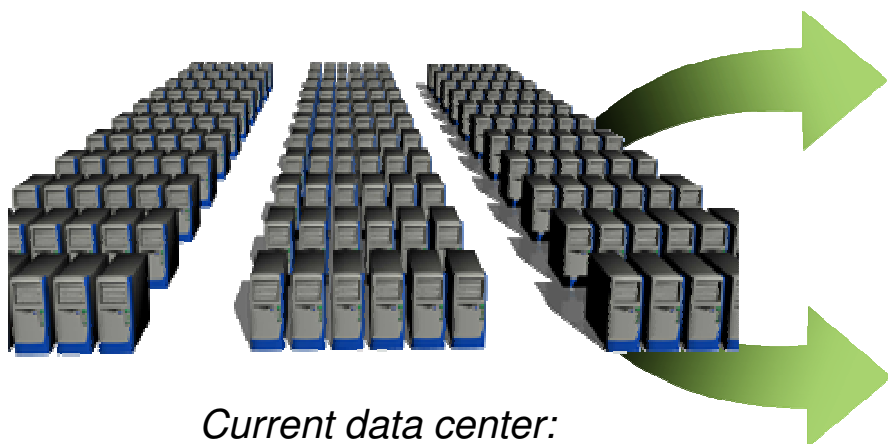
IBM Storage Portfolio Allows Optimization for Data on zEnterprise

- Leadership in transaction processing performance
- Leadership in business continuity
- Leadership in backup and archiving
- Leadership in data deduplication
- Leadership in security



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 3rd
Party virtualization



--OR--

Option 2:
Optimize distributed work on
zEnterprise with Linux on
System 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 distributed data center

• Based on IBM analysis of a large Financial Services company Datacenter. See details on ibm.com/systems/zenterprise/
• Deployment configurations based on IBM studies and will vary based on workload characteristics. Price calculations based on publicly available US list prices, prices will vary by country.

Cloud computing: More value with zEnterprise

Security

industry leading security at the core of an integrated infrastructure

Identifies potential fraud in Real Time



Virtualization

Centralize Management of virtual servers across a heterogeneous pool

Enable thousands of virtual servers within a single integrated system



Availability

Resiliency management and fewer points of failure

Centralized workload management aligned to business priorities



Efficiency

Economies of scale for Labor, software and environmental costs

Reduce labor, energy, and development costs



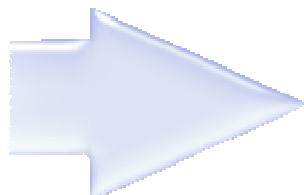
Scalability

Ability to meet massive demands from users and data

Unmatched scalability with the highest transaction processing capacity

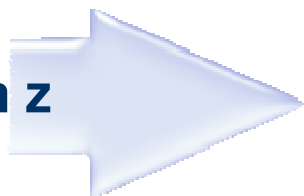
IBM zEnterprise: Designed to Host your Critical Workloads

z/OS®



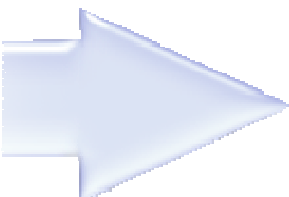
The Gold Standard for mission critical enterprise applications and secure, scalable data serving

Linux® on System z



The most efficient platform for large scale application consolidation

AIX and Linux on Blades



For new and existing Blade workloads with affinity to data and applications hosted on z/OS

Dedicated Workload optimizers and appliances



Single function processors operating in conjunction with workloads on DB2® on z/OS

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

- ✓ **Advantages to your operations through performance improvements and fewer workload disruptions.**

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 to 50% performance improvement for XML workloads*

Up to 30-50% networking throughput improvement*

Up to 11% performance improvement for C/C++ workloads*

- ✓ **Advantages to your organization with improved productivity, automatic real time capabilities, improved diagnostics, and built-in expert guidance that reduces time to perform tasks**

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.

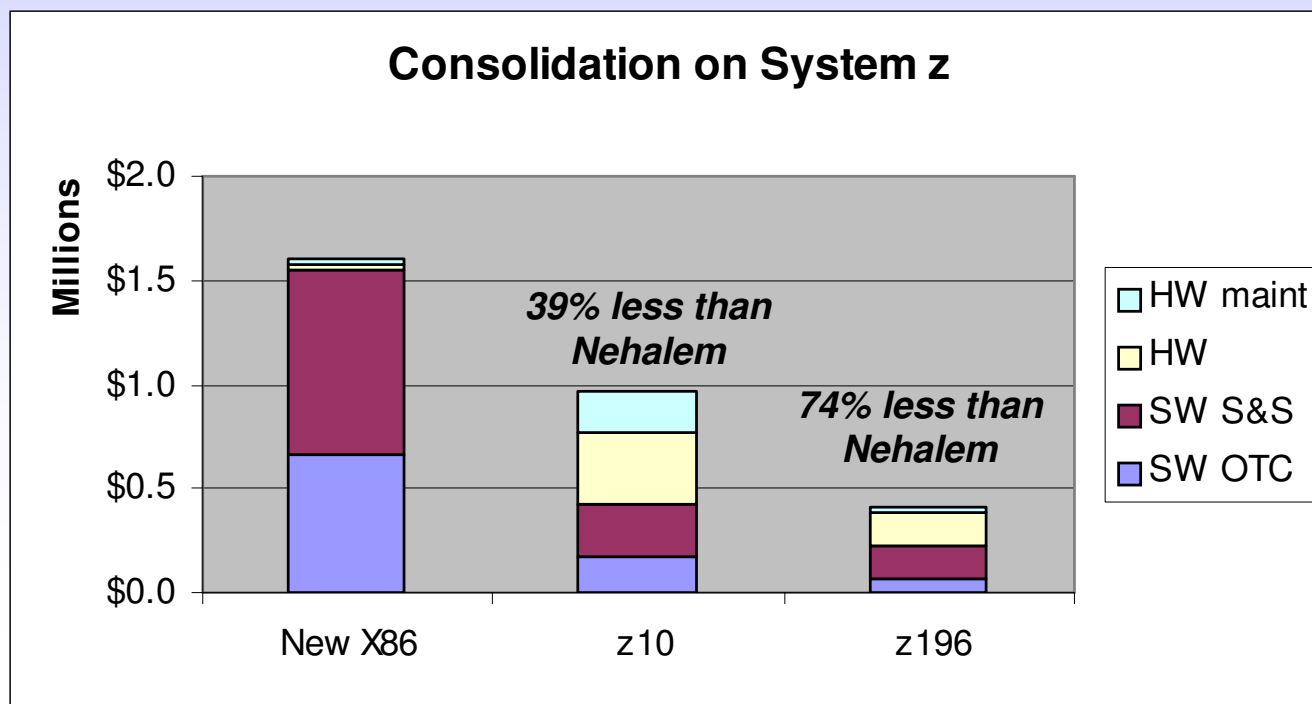
- VSAM performance improvement is through the use of VSAM CA Reclaim; actual benefit may be more or less and will depend on the degree of VSAM data fragmentation and how the data is accessed. It is anticipated that VSAM key sequenced data sets (KSDS) that are severely fragmented or rarely reorganized 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 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***

Consolidate 40 Oracle server cores to 2 Linux Cores on zEnterprise



System z Software Exploits the Strengths of zEnterprise

Capitalize on Traditional IBM System z® Strengths

- Batch and Transaction processing, Messaging, Quality of Service, Security, and Data Serving
- Optimize to the evolving System z Hardware design point

Extend Value Proposition to New and Mixed Workloads

- Systematic re-engineering of the software stack
- Integrate with Modern Application Development Environments
- Deliver extensive Data Management services
- Leverage the wave of workload consolidation; Linux® on System z
- Simplify System z – make it easier to install and manage for better TCO

Deliver Value through IBM Software

- SOA for reuse of Web services
- Unified application development
- Cross platform resource and service management
- Advanced integrated business analytics

Continue to expand the System z Ecosystem, as of 1H 2010:

- ***1,650 unique ISVs have enabled more than 6,300 applications on the System z platform***
- ***4,000 applications are enabled on z/OS®***
- ***3,000+ Linux applications are supported on System z***

**22 new IBM
Software
Announcements**

Comprehensive Software Leveraging the Strengths of zEnterprise

Information Management

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

Tivoli

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 Access Manager Family

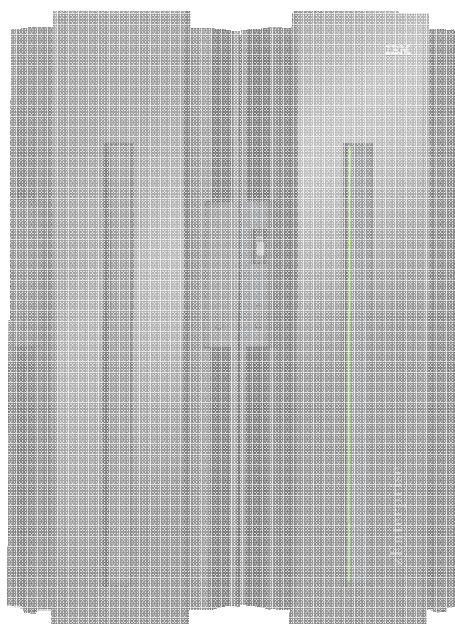
NEW! Tivoli zSecure Manager for RACF z/VM

NEW! Tivoli Security for zEnterprise

NEW! Tivoli Application Management for zEnterprise

NEW! Tivoli Application Resilience for zEnterprise

NEW! Tivoli Asset and Financial Management for zEnterprise



WebSphere

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! WebSphere Business Monitor for z/OS

Rational

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

Lotus

Productivity and Collaboration

Portal, Connections, Notes Domino, Sametime

NEW! Lotus Quickr 8.5 for WebSphere Portal

NEW! Lotus Sametime 8.5.1

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

Breakthrough technology enabling new opportunities

Multi-platform development and deployment on zEnterprise Systems

- **An integrated and collaborative software delivery platform**
 - Improve developer productivity, team efficiency, skills transfer and speed delivery of traditional and modern workloads across all zEnterprise operating environments

- **New rapid development and testing of z/OS applications *with RDz UT, offering a more affordable development and test environment on x86 Linux***
 - Frees up development MIPS for production capacity

- **New zEnterprise compilers speed application performance *by exploiting new zEnterprise hardware instructions with C/C++ and PL/I compilers***
 - Faster performance for new and existing applications



IBM Rational Enterprise Modernization solutions

zEnterprise is an Ideal Fit for Workloads Across Many Industries

Banking	Insurance	Retail	Healthcare	Public Sector
<i>Core Banking</i>	<i>Internet Rate Quotes</i>	<i>On-line Catalog</i>	<i>Patient Care Systems</i>	<i>Electronic Tax</i>
<i>Wholesale Banking – Payments</i>	<i>Policy Sales & Management (e.g. Life, Annuity, Auto)</i>	<i>Supply Chain Management</i>	<i>On– line Claims Submission & Payments</i>	<i>Web based Social Security</i>
<i>Customer Care & Insight</i>	<i>Claims Processing</i>	<i>Customer Analysis</i>		



zEnterprise provides the foundation for the “smart” infrastructure on which we can build the workloads of today and tomorrow

They are workloads that.....

- *Rely on data serving and application components on System z*
- *Solutions that need to leverage strengths of System z... Security, Reliability, Availability.*
- *Have application components on Power or x86 but require a higher level of integration capabilities and efficiency*



....and / or.....

- *Reside in low utilization / development environments*
- *Can be made more efficient through consolidation*
- *Can be optimized by using the newest virtualization technology*

....but also may.....

- *Reside in complex multi-platform IT environments*
- *Require flexible development and test infrastructure*
- *Require simplified, integrated policy and management*

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 thru 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 Appliance

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

Banking Client Enables Internet Banking

The Future: System z (IMS™/CICS/DB2); POWER7 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 co-ordination of tasks

IBM Services

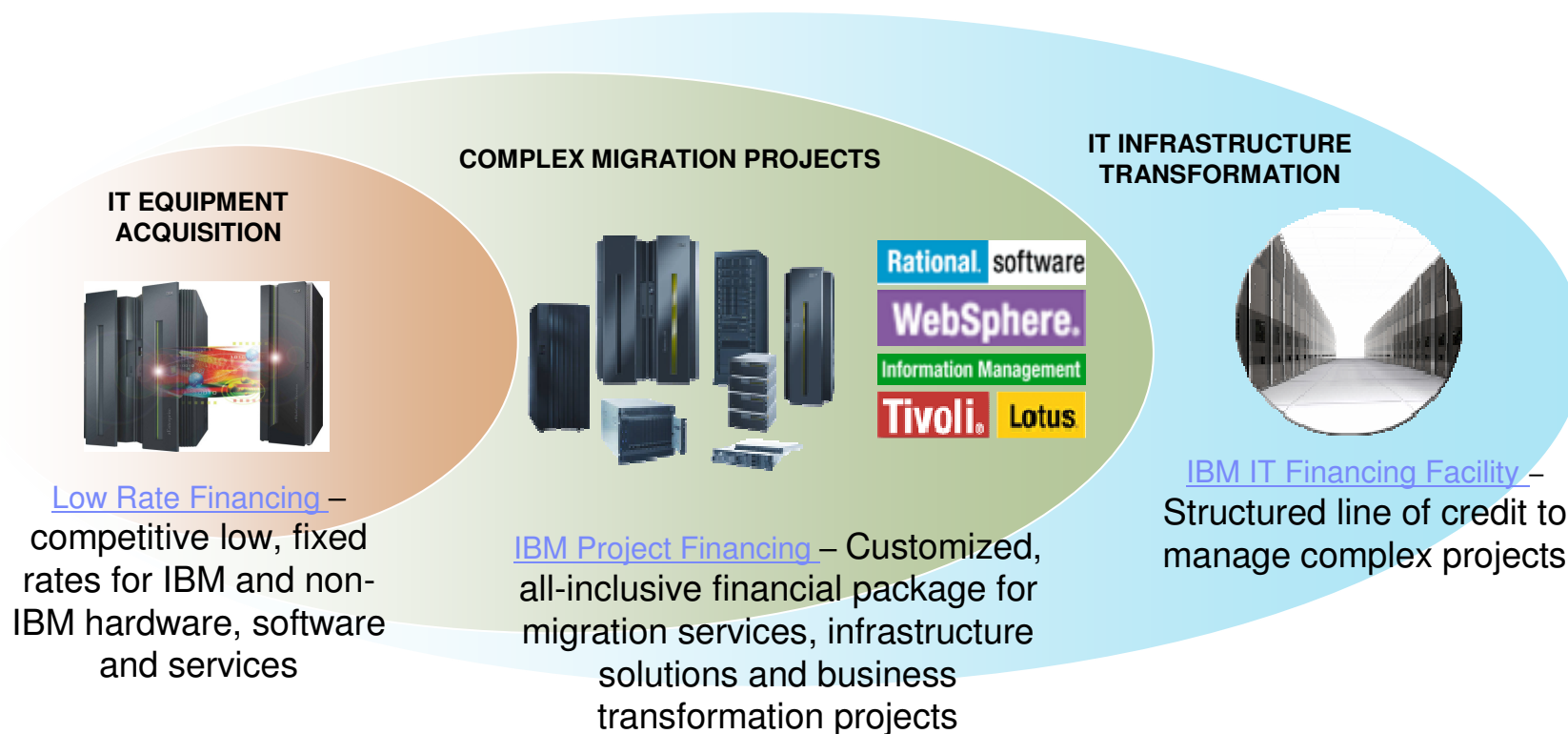
Help get the most for your business from zEnterprise System

- **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 & simplify cross platform High Availability
 - Effectively run and manage zEnterprise with maintenance and technical support services



From zEnterprise Upgrades to Datacenter Transformation, IBM Global Financing Can Help You Achieve Greater IT Economic Value



Analyst praise for IBM zEnterprise System

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,
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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**

