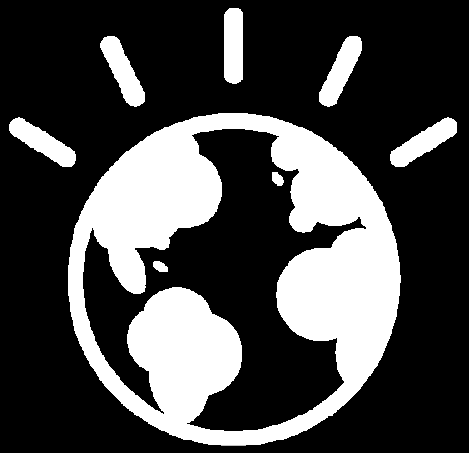
Leveraging System z for Information On Demand

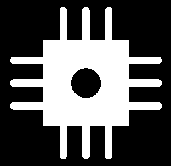
Smart Ways to Reduce Costs and Deliver a Competitive Edge

Jim Reed
Program Director, Silicon Valley Lab

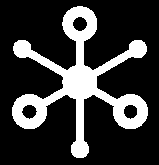
IBM

The world is changing… becoming instrumented, interconnected, and intelligent





Instrumented



Interconnected

Intelligent

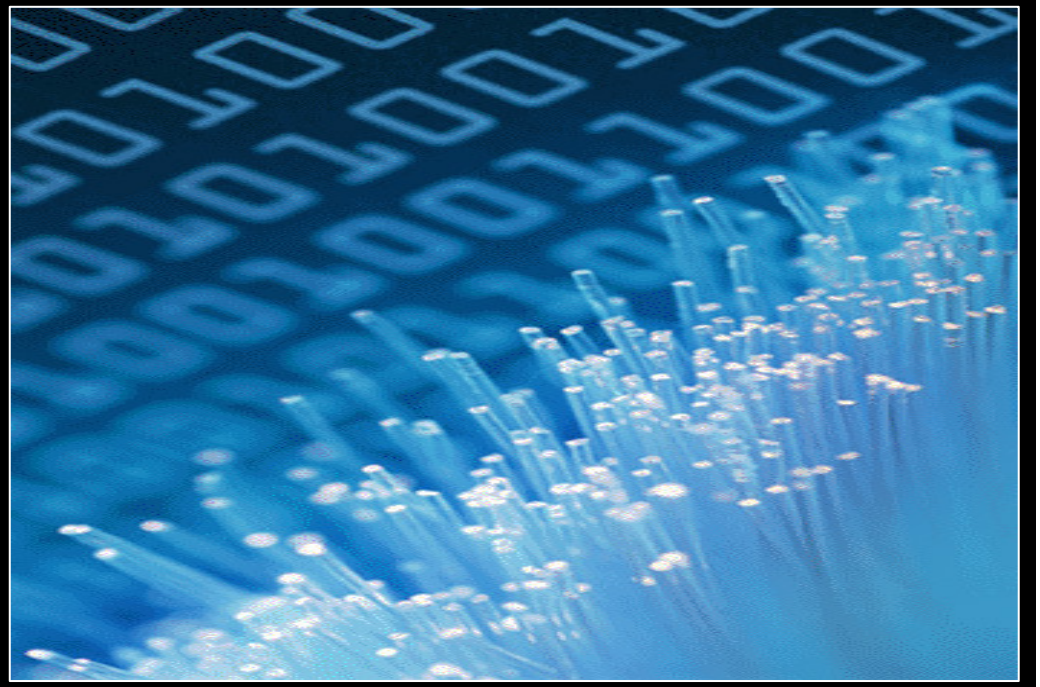
On a Smarter Planet, new business challenges and conditions have placed a renewed urgency on optimization and a need for a new kind of intelligence….

With this change comes an explosion in information …

Volume of Digital Data
- 57% CAGR for enterprise data through 2010
- Machine generated data : Sensors, RFID, GPS..

Variety of Information
- 80% of new data growth is unstructured content
- Emails, images, audio, video..

Velocity of Decision Making
- Rapidly changing business climate
- Need to get ahead of the curve : predict issues and fix them



New Data → New Information!

…. but that information is not driving better decisions.

3 in 4

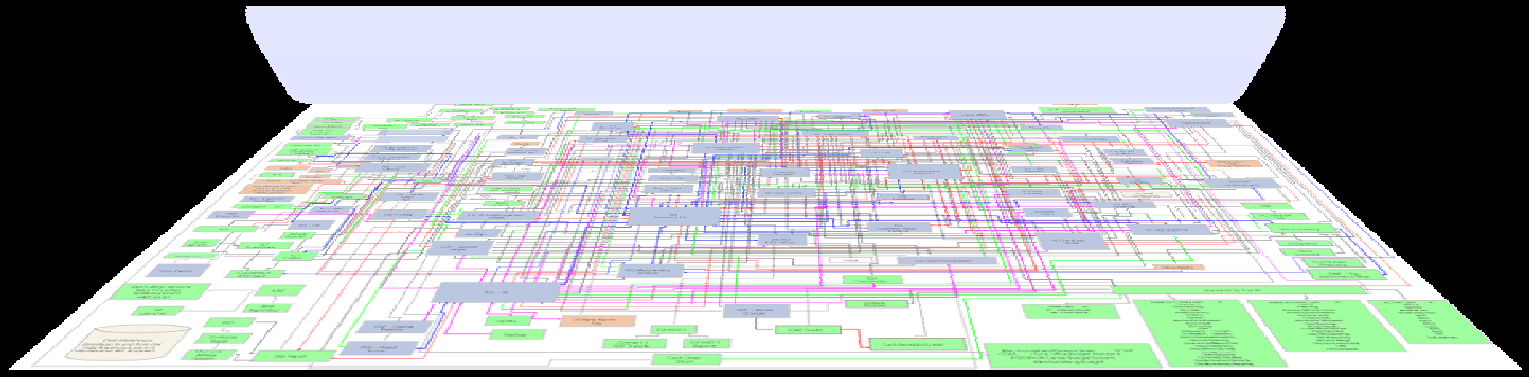
business leaders say more predictive information would drive better decisions

1 in 3

managers frequently make critical decisions without the information they need

19+ Hours

spent by knowledge workers each week just searching for and understanding information



"…40 exabytes of data created in 2008…
more than created in the previous 5,000 years combined…"

Source: Various Industry Studies

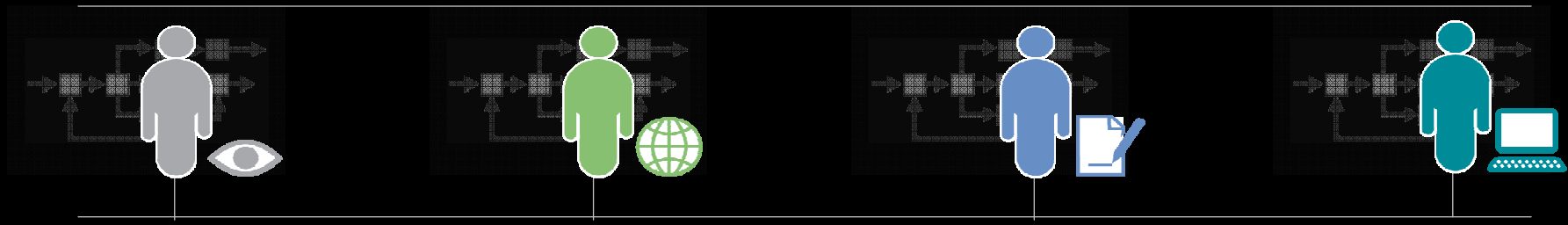
The key is empowering an organization to make informed, real-time decisions at the point of impact

…predict infection in premature newborns 24 hours earlier?

…apply social relationships of customers to prevent churn?

…adjust credit lines as transactions are occurring to account for risk fluctuations?

…determine who to offer discounts at time of sale instead of offering to all?



Physician

Telco Call Center Rep

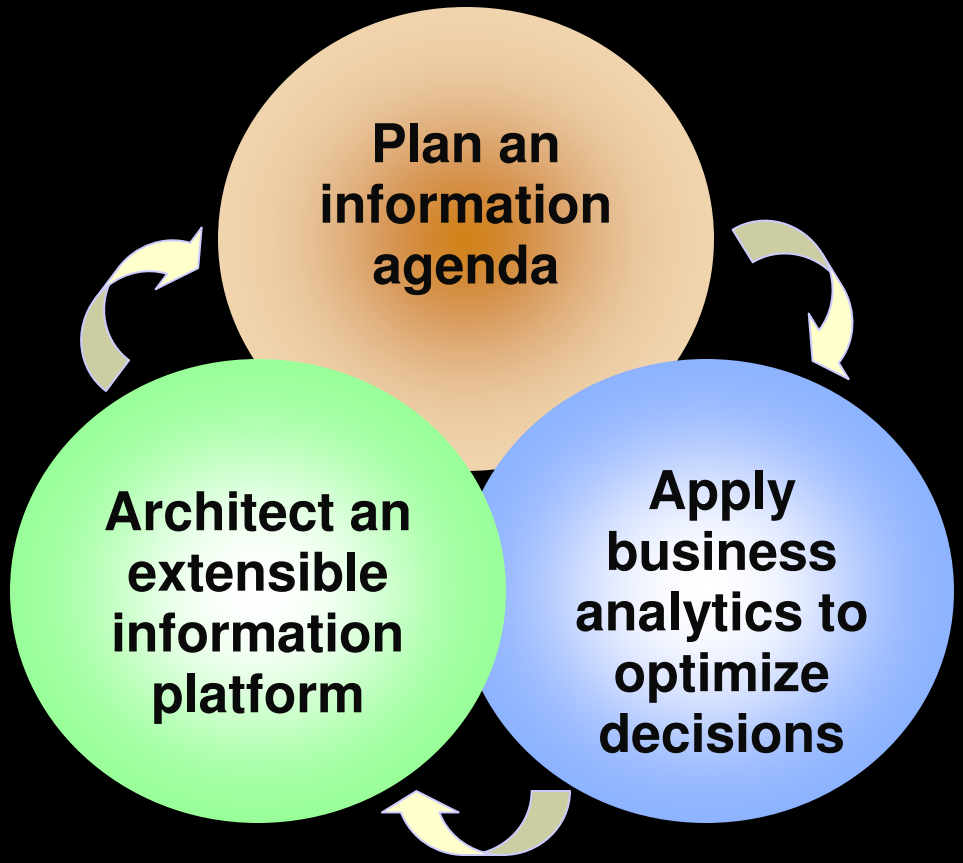
Loan Officer

Retail Sales Associate

…this empowers an Information-Led Transformation

What is needed for an information-led transformation?

3 elements required but you can start anywhere



Information-Led Transformation at Commerzbank

Real-time, Predictive Analytics

COMMERZBANK

Profitable Growth

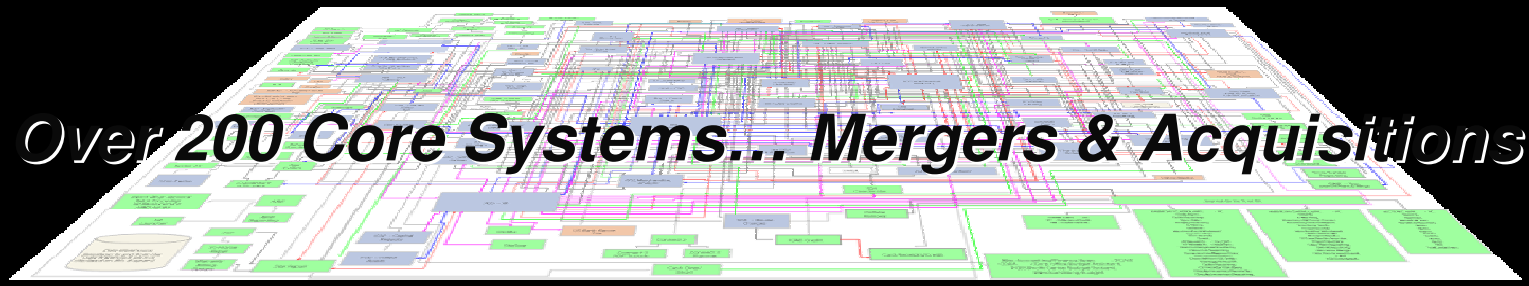
Cost Take-out & Efficiency

Proactive Risk Management

Real-time Trading Positions, Real-time Risk Analysis, Withholding Tax Optimization, M&A Agility…

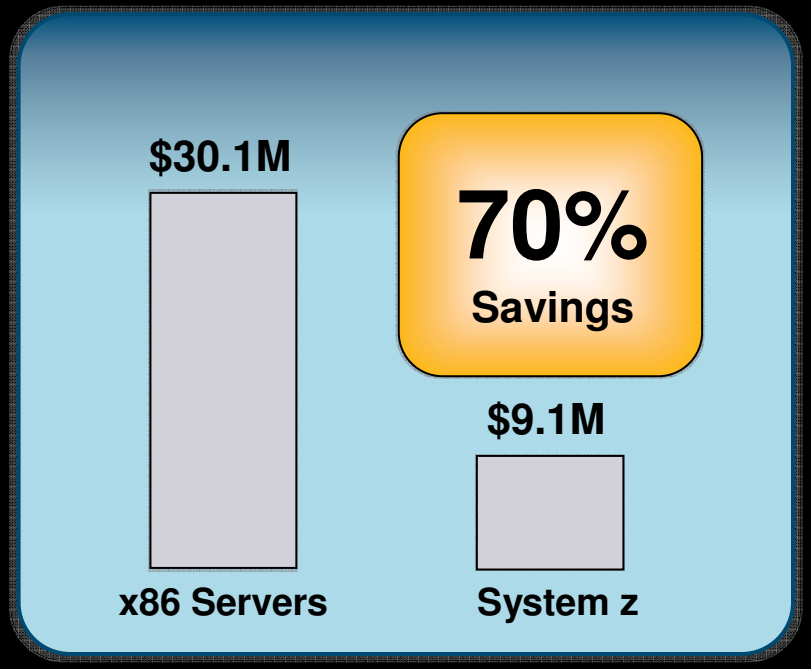
Trusted Customer Information → *Enterprise-wide Expansion* → *Advanced Analytics*

Trusted Information — *Information as an Asset* — *Real-time*



Over 200 Core Systems… Mergers & Acquisitions

A government organization consolidates applications and data to drive down costs of hardware, software and management by 70%!



Top three reasons for savings

- Consolidated 292 Oracle servers to DB2 for z/OS on one System z
- System administration costs reduced 90%
- Subscription and support licenses reduced over 95%

Customer: A regional North American government organization

Other benefits:

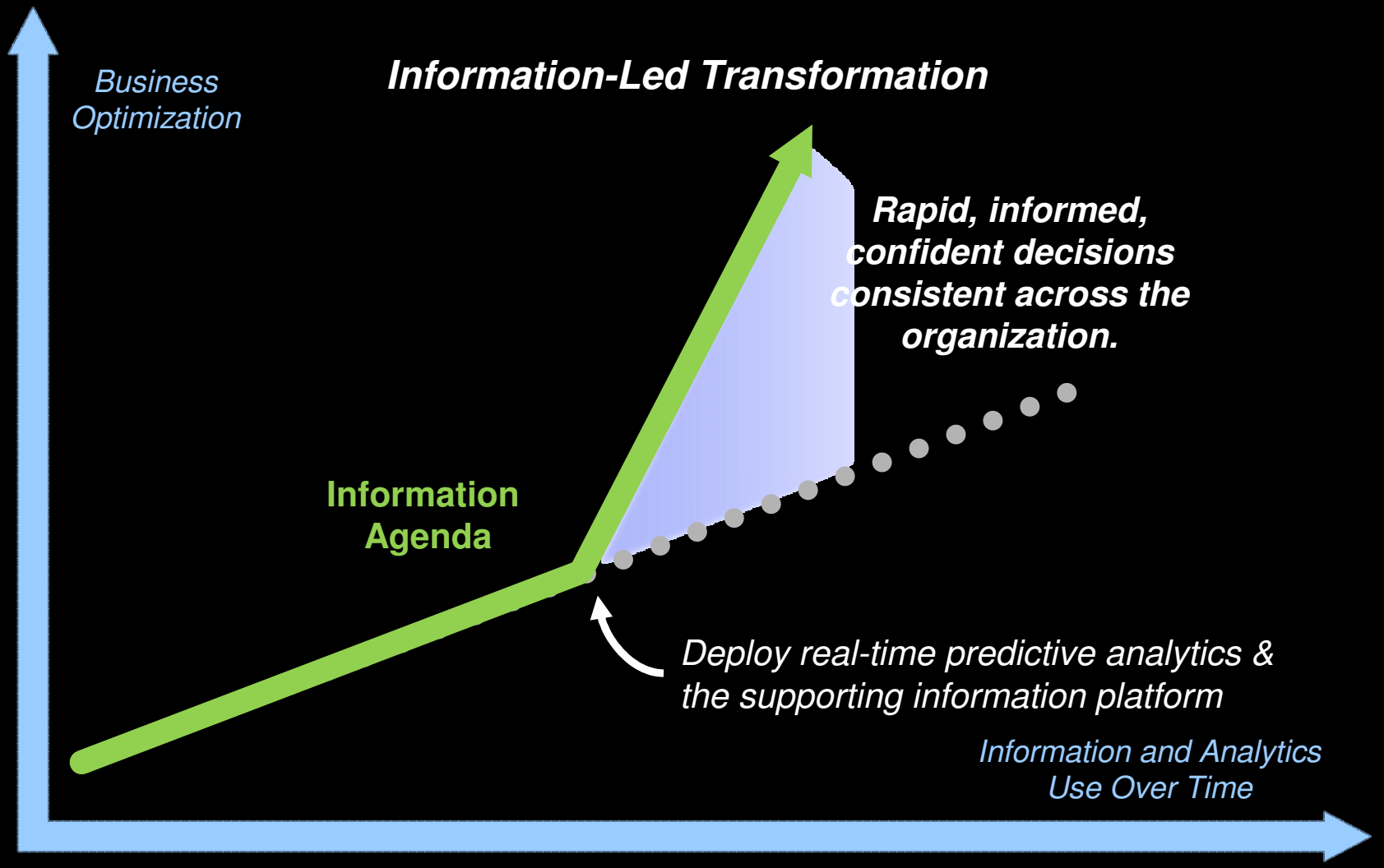
Superior Resiliency & Security

Single administrator productivity

Infrastructure simplification

Lower Energy Costs

Organizations Will Reach a Tipping Point When They Apply Real-time Analytics at the Point of Impact



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Leveraging System z for Information On Demand

More new capabilities delivered in the past 3 years than at any point in the mainframe's history

and much more coming . . .

IMS 11

Open Access

InfoSphere Warehouse for System z

2009

InfoSphere Global Name Recognition for System z

DW Tools

FileNet Content Manager for System z

Cognos 8 BI for System z

Business Intelligence

Data Studio pureQuery for System z

InfoSphere MDM Server for System z

Info Agenda Launch

Optim Data Governance for System z

2008

App Dev Tools

Information Server for System z

Content Manager 8.4

Data Archiving
Test Data Mgmt

DB2 9 for z/OS

IMS 10

Data Warehousing

IOD Launch 2006

2007

ETL & Data Quality

SOA

pureXML

DB2. InfoSphere Cognos. FileNet.

Cost Saving Strategies

IBM

Consolidation on System z meets the challenge

Potential savings up to 80% compared to x/86 Sprawl

DGTI Quebec on System z9

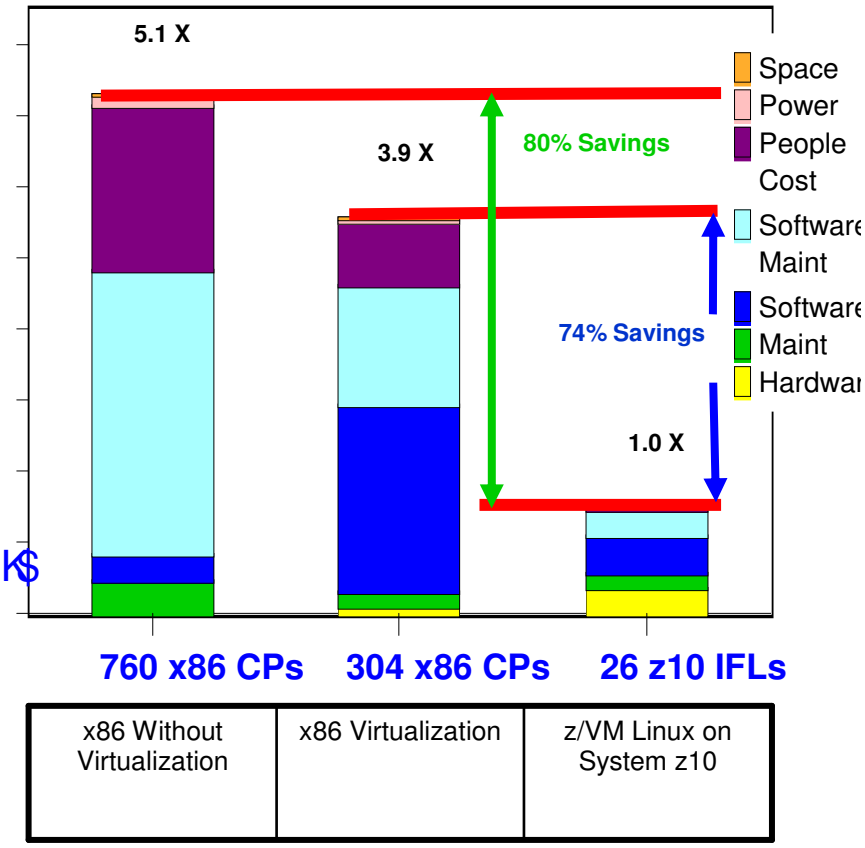
- 60 UNIX servers to 5 IFLs on z9
- Increased capacity by over 2.5X

Nationwide Insurance on System z9

- 250 Servers to 6 IFLs on z9
- Will save $16M over next 3 Yrs

First National Bank Omaha

$2M yearly savings by consolidating 30 Unix servers
"It's revolutionary. It paid for itself in a year."
Ken Kucera, Senior Vice President



Potential savings of up to 80% when consolidating to System z10 and Linux versus distributed x86 Servers

Application Performance Characteristics – what fits on which platform?

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

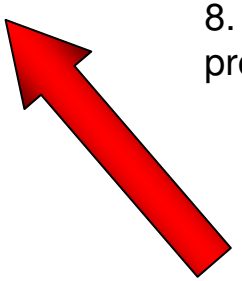
10. **CPU Intensive** – e.g. numerically intensive, etc.

9. **Protocol Serving** – e.g. static HTTP, firewall, etc.

8. **Skewless OTLP** – e.g. simple and predictable transaction processing

7. **Java Heavy** – e.g. cpu intensive java applications

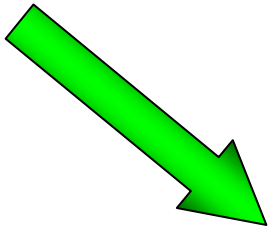
6. **Java Light** – e.g. data intensive java applications



Optimal for other platforms

5. **Database** – e.g. Oracle DBMS or dynamic HTTP server

Optimal for System z



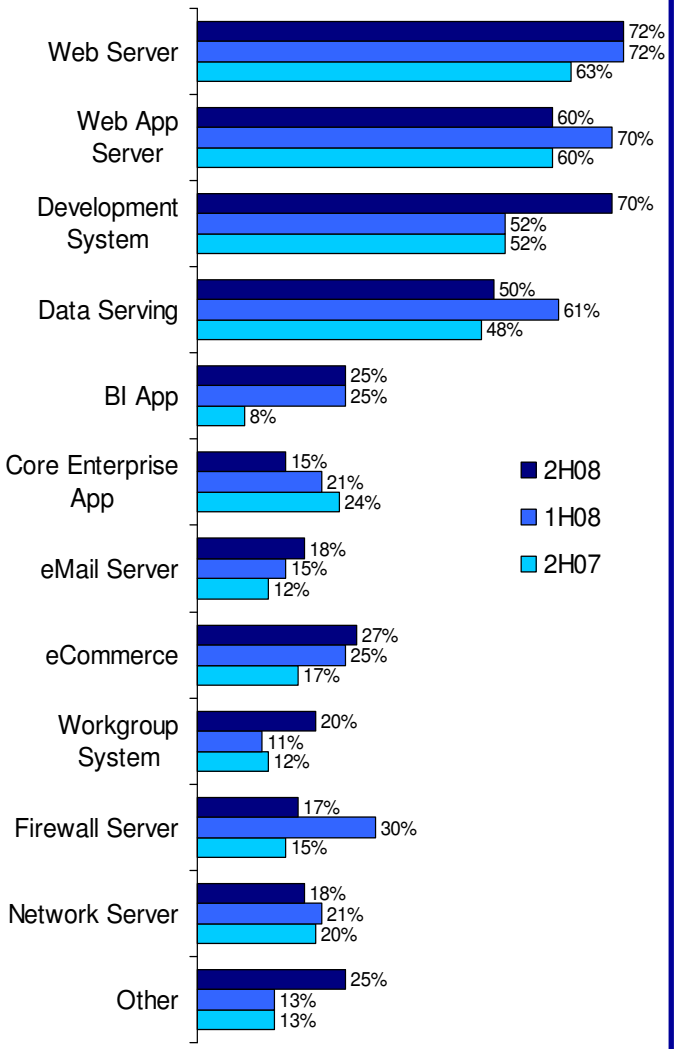
4. **Mixed High** – e.g. multiple, cpu-intense simple applications

3. **Mixed Low** – e.g. multiple, data-intense applications or skewed OLTP, MQ

2. **I/O Bound** – e.g. high I/O content applications

1. **Data Intensive** – large working set and/or high I/O content applications

What are Clients Consolidating to System z?



Surveys indicate IBM System z® customers use Linux for:

- Web Serving
- Web Application Serving
- Data Services
- Systems Development

"Best Fit" Workloads for Linux on System z:

- **Business connectors**: WebSphere® MQSeries®, DB2® Connect, CICS® Transaction Gateway, IMS™ Connect for Java®
- **Business critical applications**: e.g. SAP
- **Development** of WebSphere and Java™ applications
- **WebSphere Application Server** (WAS)
- **Email & collaboration**: Domino™, Web 2.0
- **Network Infrastructure**: FTP, NFS, DNS, etc. and Comm Server and Communications Controller for Linux, Communigate Pro (VoIP)
- **Data services**: Cognos®, Oracle, Informix®, Information Builders WebFOCUS
- **Applications requiring top end disaster recovery model**
- **Virtualization and Security Services**

Source: IBM Market Intelligence

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What System z Brings to Linux

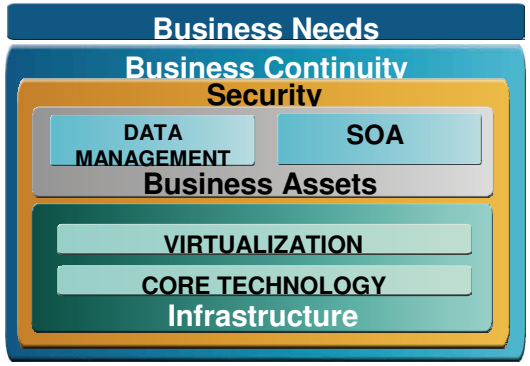
- The most reliable hardware platform available
  - Redundant processors and memory
  - Error detection and correction
  - Remote Support Facility (RSF)
- Centralized Linux systems are easier to manage
- Designed to support mixed work loads
  - Allows consolidation while maintaining one server per application
  - Complete work load isolation
  - High speed inter-server connectivity
- Scalability
  - System z10 EC up to 64-way
  - System z10 BC up to 8-way
  - Plus up to 8 dedicated I/O processors
  - Hundreds of Linux virtual servers

What's Different About Linux on System z?

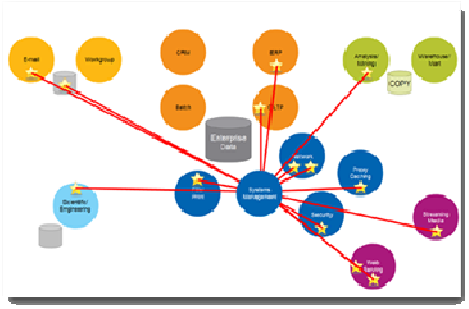
- Access to System z specific hardware
  - Crypto support – CPACF, Crypto2
  - Traditional and Open I/O subsystems
    - Disk (ECKD or SCSI) and tape
    - SAN Volume Controller
  - OSA-Express and OSA-Express2 for very high speed communication between z/OS and Linux
  - HiperSockets for ultra-high speed communication between z/OS and Linux on the same machine
- z/VM aware
  - Enhanced performance
  - System management tools

System z Futures

Next Gen System z Mainframe HW & SW



Integrated Systems Management firmware



- Integrate, monitor, and manage multi-OS resources as a single, logical virtualized system
- Single WLM, Security, and System Management interface across all resources

Accelerators

- Extend and accelerate System z workloads
- Lower cost per transaction while improving application response time for CPU intensive applications

Application Serving Blades

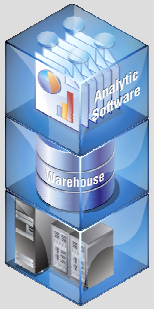
- Logical device integration between System z resources and application serving commodity devices
- Providing competitive price-performance and improved QoS for applications with a close affinity to mainframe data

New Analytics Workload Optimized Systems

Today's News...

Analytics workload optimized systems

Fast, Flexible, Affordable



IBM Smart Analytics System

Optimized for Analytics Solutions

Powerful and flexible system with a growing spectrum of analytics capabilities to simplify deployment, optimize performance and speed better business results..

IBM Smart Analytics Optimizer

Technology Preview

Optimize Existing Data Systems

Integrates into your existing environment to optimize analytic query performance, without replicating data across the enterprise.

IBM Smart Analytics System with Solid State Disk

Technology Preview

Technology preview on System z

Analytics solutions for any client need

InfoSphere software

Cognos software

Custom Solutions

IBM Servers, Storage, Software and Services

A wide ranging portfolio for assembling a customized Analytics environment.

Today's News...

IBM Smart Analytics Optimizer

Technology Preview for System z

What is it?

- ✓ A high performance extension that easily integrates with IBM data systems, delivering predictable, order-of-magnitude faster, analytic query response times, while lowering operating costs

How is it different

- ✓ **Deep integration with IBM data management systems**
- ✓ **High performance query software, based on advanced data in-memory technologies**
- ✓ **Leveraging existing data system investment and values without any changes to applications**
- ✓ **For System z, extends gold-standard manageability, security, and availability to high-performance analytic applications**

IBM Smart Analytics Optimizer

Technology Preview for System z

Client Need:	*The IBM Smart Analytics Optimizer:*
Fast and predictable query response time on unpredictable workloads	Capitalize on data in existing systems by improving performance of typical analytic queries by an order of magnitude
Lower cost	Dramatically reduce administration efforts by reducing the need for database tuning
Better price / performance	Significantly improve price/performance with workload optimized software and hardware

New System z Solution Editions:

Rewriting the economic rules for new mainframe workloads

Solution	Description	New Price
Data Warehousing	Complete HW and SW solution for conducting real-time business intelligence with operational data, with fast and affordable access to business insights. Avoid the cost of building an entire datamart!	**36-54% reduction**
WebSphere	Complete HW and SW solution for new Java applications using WebSphere, DB2 in one virtual server (LPAR) for superior performance.	**~60% reduction**
GDPS	Predefined, simplified and competitively priced DR solutions for truly mission critical enterprise applications	**~50% reduction**
Application Development	Simplified and competitively priced environment for application development workloads.	**~50% reduction**
ACI	IBM hardware, software and maintenance tailored for the ACI retail and fraud applications optimized for the System z stack	**50-70% reduction**
Security	Bust Cyber security attacks with a complete, simplified, competitively priced bundle for Compliance/Risk Mitigation, Centralized Enterprise Identity and Access Management, Encryption & Key Management, and fraud Analysis.	**50-70% reduction**
SAP Apps	Complete IBM HW and SW solution at 15% above Unix,	**50-70% reduction**

Business Intelligence and Data Warehousing On System z

IBM

The Changing Data Warehouse Market

The data warehouse is a mission-critical system, with data warehouses serving in an increasingly mixed workload capacity, including as a data source for online applications. "Deep mining“ analysts and business analysts are running less-structured but equally complex queries and fast running tactical queries, each with differing service-level expectations. These differing workloads are all competing for CPU, memory and disk access. At the same time, data latency continues to progress from batch to continuous loading demands.

Why is driving the movement to System z for Data Warehousing and Business Intelligence?

Many System z customers already use System z for warehouse and BI	IBM is responding to customer demand with new DB2 features, new software offerings and improved hardware performance and efficiency.
Customers want to leverage their existing System z infrastructure	Costs can be reduced through the utilization of existing processors, people, practices. Cost savings may also be achieved through co-location or consolidation.
New BI trends map well to the strengths of DB2 for z/OS and System z	Distinction is blurring between warehouse and OLTP databases due to new trends like Dynamic Warehouse and Operational BI Driving the need for: increased reliability, availability, security, and compliance in a DWH
Specialty processors and the new z10 provide additional ways to optimize TCO	zIIPs and IFLs are driving down hardware and software costs; DW/BI makes excellent use of these processors The new processors are delivering excellent speeds and feeds, making CPU horsepower less of an Issue.

Why Data Warehousing on System z?

Reduce Operational Costs

- Save on storage using DB2 for z/OS System z hardware based data compression without compromising performance
- MDX query workloads can greatly benefit from the Cubing Services cache, avoiding SQL re-execution in DB2 and therefore, save CPU and improve elapsed time for data warehouse applications
  - Internal testing reduced the total elapsed time for a warehouse workload from 11,000 seconds to sub second !*
- Save on labor, energy, and floor space using System z and DB2 for z/OS
  - Save up to 85% on floor space**
  - Save up to 80% on energy costs**
  - Save up to 50% on labor resource**

Reduce overall Risk Exposure

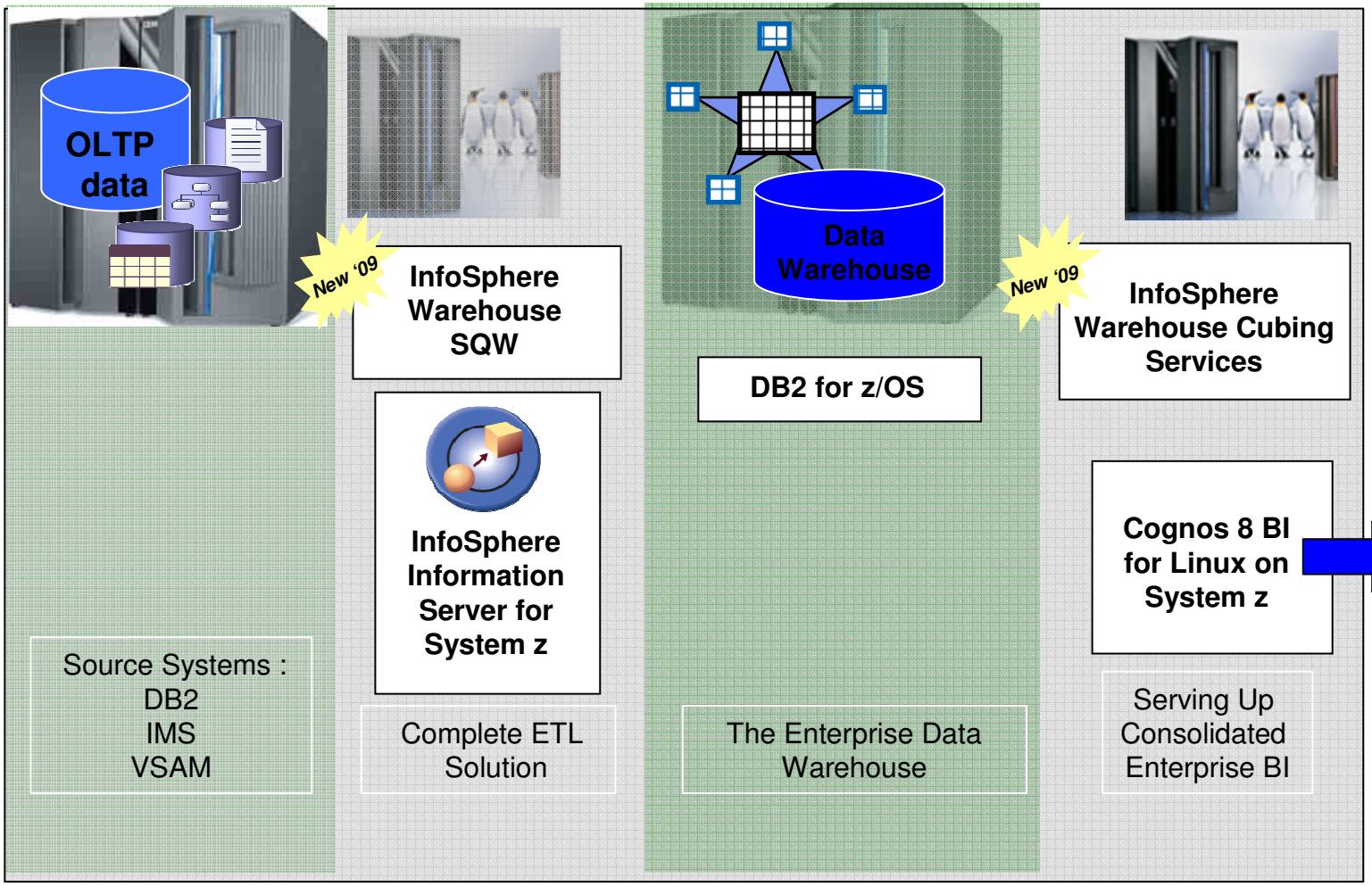
- Highly sensitive personal or financial data is secure and auditable
- DB2 for z/OS data sharing and GDPS provide unparalleled availability
- Mixed workloads benefit from the capability of the world class System z workload manager
- Reduced latency and duplication provide a sound basis for timely and consistent business analysis

Position for Growth

- Application growth on System z scales well, while cost savings increase
- Parallel Sysplex and DB2 for z/OS data sharing enable incremental growth
- System z provides a non-disruptive upgrade path; System z tech dividends make that upgrade path more cost effective

** Based on internal IBM testing using an actual distribution customer warehouse workload*
*** Based on calculations of savings realized in internal IBM System z consolidation projects*

The Data Warehouse and BI Solution on System z

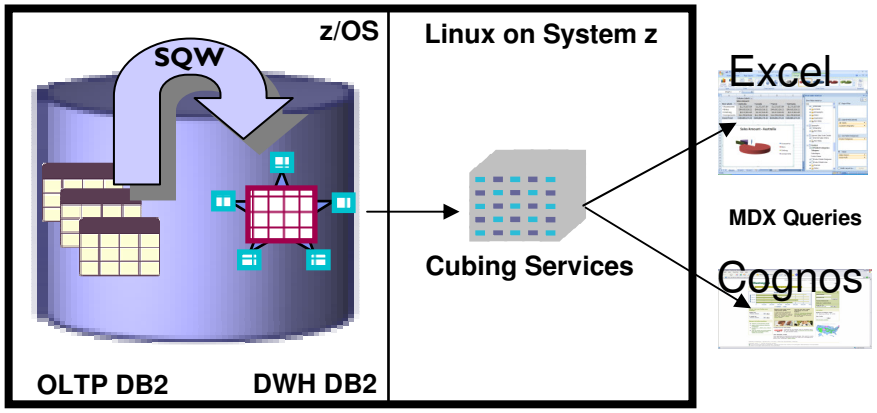


Combining the Reliability and Availability of DB2 for z/OS with Cost Effective Applications running on Linux for System z

New! InfoSphere Warehouse on System z

Adds core data warehouse and analytics capability to DB2 for z/OS

- Advanced physical database modeling and design
- In-database data movement and manipulation capabilities of SQL Warehouse Tool (SQW)
- Optimize multidimensional reporting and analysis of data with Cubing Services



System z Environment Enhanced with InfoSphere Warehouse

Why Cognos 8 BI for Linux on System z?

- **New workload is moving to System z**
  - Leveraging the platform strengths to improve performance, scalability, reliability, availability, bullet-proof security and energy-saving capabilities of the mainframe

- **Leverage investments in DB2 for z/OS & IMS**
  - Run middleware software as close to their transactional data as possible
  - To take advantage of a single point of control
  - For close access to data hosted and accessed on System z

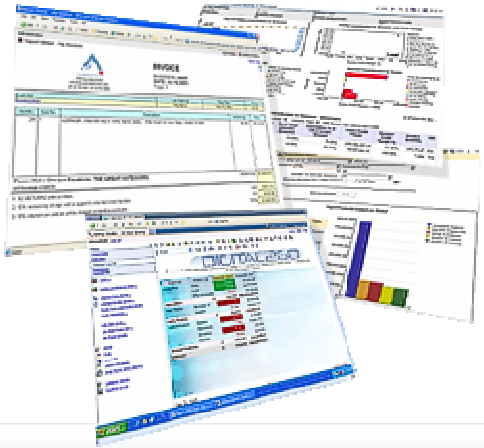
- **Benefits of running IBM Cognos 8 BI for Linux on System z**
  - With a BI solution on the same platform as the operational data, customers can reduce the time to access critical operational data which is the foundation of their businesses.

  - IBM Cognos 8 BI for Linux on System z is built on the open Cognos 8 platform so customers can now combine the enterprise-class Cognos 8 platform with the z platform

The core components of Cognos 8 BI for Linux on System z

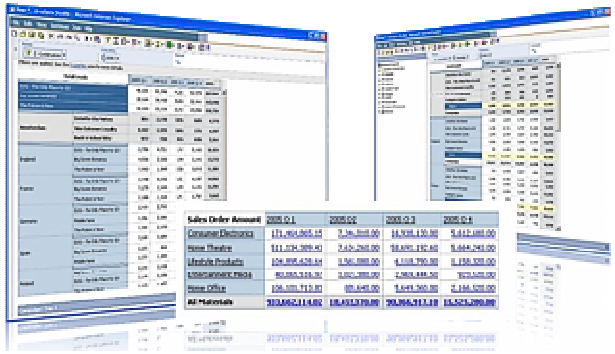
Reporting

- Provides full breadth of report types
- Ensures consistent information to all users
- Engages business users with simplified role-based interface
- Delivers personalized content via email, portal, MS-Office, search and mobile devices etc
- Enables collaboration across users, communities and with IT



Analysis

- Provides guided exploration across multiple dimensions of information
- Performs complex analysis and scenario modeling easily and quickly
- Exposes the “why” behind trends to reveal symptoms and causes
- Moves from summary level to detail levels of information effortlessly



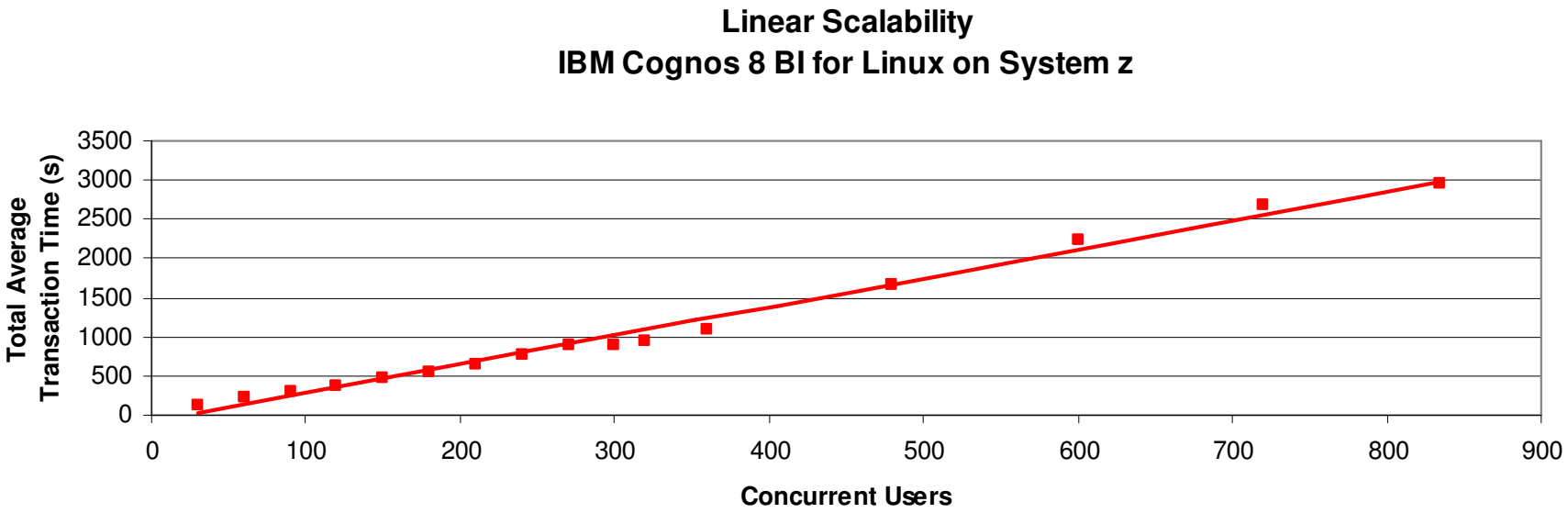
Continued …

Dashboards

- Provides at-a-glance, high impact views of complex information
- Helps quick focus on issues that need attention and action
- Are highly visual and intuitive
- Combines information across disparate sources

Proven that Cognos 8 BI for Linux for System z can: Scale Across the Enterprise

Testing demonstrated IBM Cognos 8 BI for Linux on System z ***scales linearly*** *to large user groups.*



"**Cognos, …makes it easy for companies to deploy BI and PM** to a broader user population, while **minimizing the resulting workload for IT** departments."

- Nucleus Research, Cognos Takes on the Rest of the Enterprise, November, 2007

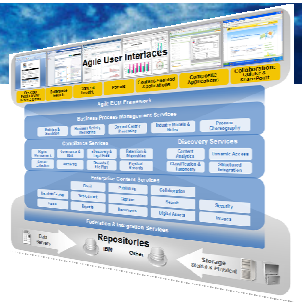
- Testing was conducted on up to **90,000 named users**


Enterprise Content Management

What Is ECM?

- ECM Solutions helps organizations make better decisions faster by:
  - Managing all forms of content (document images, PDFs, MS Word files, reports, emails, statements, etc)
  - Delivering content intelligence (mine and search)
  - Optimizing associated business processes
  - Enabling compliance (with regulator requirements)

IBM ECM Repositories



IBM FileNet Content Manager
Content Management Across Repositories
Content Management services for enterprise-class content applications and master content catalog services for managing content across ECM repositories

IBM Content Manager
Content Management
Content Management services for enterprise-class content applications

Enterprise Scalable Repositories - Federated and Integrated

IBM Content Manager OnDemand
Optimized Report Management
Enterprise report management optimized for high volume reports & statements

IBM FileNet Image Services
Optimized Image Management
Enterprise image management optimized for high volume, scalable image collection, storage and retrieval

Why Do Customers Run ECM on the Mainframe?

- **Ball State University** - deployed on System z to harness the reliability, scalability, versatility, and power of the System z platform while reducing their energy consumption in an overall “greening” effort

- **Primerica Financial** - deployed on System z because they believe it is the best platform to achieve the availability and scalability they need, that it facilitates disaster/recovery and information security administration, and that it provides the best overall total cost of ownership.

- **Health Care Service Corporation** – deployed ECM on System z to extend their existing infrastructure, skills and disaster recovery solution to their ECM applications and is deploying next applications on Content Manager (z/OS) using Web services

Enterprise Data Governance

- *Data breaches, corporate mistakes, use of bad data continue to make headline news.*

- Every organization is concerned with regulatory compliance, security, privacy, data quality. C level execs need to lower risk and costs, increase profitability and create differentiation. Bad data is bad for business - CFOs are fed up of being given bad numbers and data which exposes their organizations to unnecessary risk.

- IBM created three entry points to address their more pressing needs while embracing other aspects of data governance as and when required :
  - *Information Quality – understand, analyze, cleanse, transform, deliver*
  - *Lifecycle Management – collect, store, process, optimize, manage, report, retain*
  - *Information Protection – security, privacy, audit, logging, reporting*

Accenture survey *75 percent of CEOs want to better manage and use their information ,78 percent believe they can achieve better competitive advantage, only 15 percent are comprehensively managing their data.*

Data Governance is foundational to successful information projects.

System z–Thriving environment for today's new and existing applications

Thousands of ISVs investing in System z platform

- Over 1,000 new applications and more than 150 new ISVs in 2008
- Over 2,800 LINUX applications are supported on System z; 18% growth in 2008
- Over 1,500 ISVs building applications for System z
- Recent ISV investment includes:

Chordiant. Optimizing the Customer Experience
TEMENOS The Banking Software Company
SAP

90% growth in mainframe education

Students educated:

- Over 50,000 worldwide, 5,000 more students in China by 2010

University adoption:

- 600 schools enrolled globally as of May 2009
- 90% growth in 2 years; 2,000% since 2003; continued flow of schools adding curricula
- 50%+ outside of US

Schools participating across North America, Latin America, Europe, Middle East, Africa, and Asia:

Typical Utilization for Servers

Windows: 5-10% Unix: 10-20% **System z: 85-100%**

System z can help **reduce** your floor space up to **75%-85%** in the data center

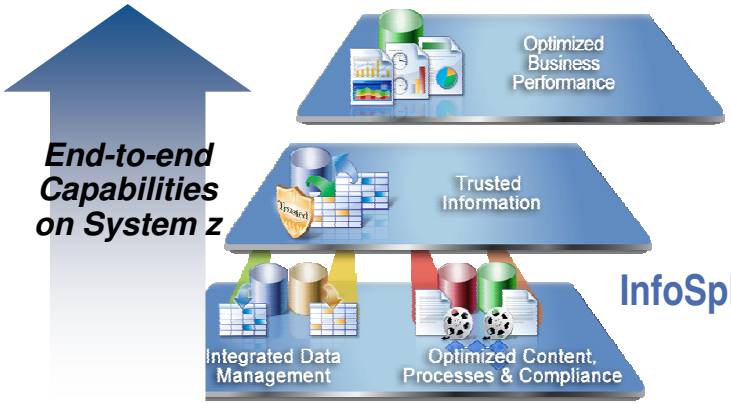
Thank You

System z can lower your total cost of ownership, requiring **as little as 30%** of the power of a distributed server farm running equivalent workloads

The cost of storage is typically **three times more** in distributed environments

Leveraging System z for Information On Demand

More new capabilities delivered in the past 3 years than at any point in the mainframe's history



End-to-end Capabilities on System z

and much more coming . . .

IMS 11

Open Access

InfoSphere Warehouse for System z

2009

InfoSphere Global Name Recognition for System z

DW Tools

FileNet Content Manager for System z

Cognos 8 BI for System z

Business Intelligence

Data Studio pureQuery for System z

Info Agenda Launch

InfoSphere MDM Server for System z

Optim Data Governance for System z

2008

App Dev Tools

Information Server for System z

Data Archiving
Test Data Mgmt

Content Manager 8.4

DB2 9 for z/OS

IMS 10

Data Warehousing

2007

IOD Launch 2006

ETL & Data Quality

SOA

pureXML

DB2. software

InfoSphere software

Cognos. software

FileNet. software