System z 2012 4Q
ISV and SI Technical Marketing Call

4 October 2012

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Agenda

1) **Enterprise Systems**
   Angela Fresne

2) **IBM zAware and Flash Express**
   Barbara Sannerud

3) **DB2 for z/OS Real-Time Scoring**
   Jaime Avaya, Rebecca Wormleighton

Enterprise Systems

September 24, 2012

The world is changing.
Is your infrastructure ready?

70% of IT budget is devoted to operations and maintenance[1]

Connected devices will surge to **22** billion by 2020[2], with digital content rocketing to **8 zettabytes** by 2015 (**90%** unstructured)[3]

The average IT infrastructure is **attacked nearly 60,000 times every day**[4]

The time is now to…

Leverage cloud to improve efficiency and speed time to market

Unlock the power of Big Data to deliver more actionable insight

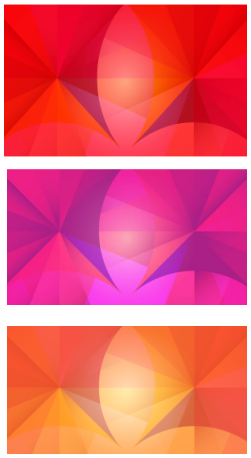
Secure critical information to protect and reduce risk

1 Source: IDC, Analyst Matt Eastwood, IDC Directions Presentation, 2011
2 Source: Forrester, BT 2020: To Thrive In The Empowered Era, You'll Need Software, Software Everywhere, January 2012

3 Source: IDC Predictions 2012: Competing for 2020
4 Source: 2012 Data Breach Investigations Report

Smarter Computing: Tomorrow Ready.

Smarter Computing is the IT infrastructure that enables a smarter planet.



Cloud Ready

Data Ready

Security Ready

A portfolio of systems to uniquely address clients' varying needs

Cloud Ready

Public and Private and Hybrid

Pre-integrated and custom built

Optimized for any scale

Data Ready

Structured and unstructured data

Predictive, advanced and operational analytics

Optimized for any scale

Security Ready

Fully secured and best possible security

Fully built in and individual additions

Compliance and governance requirements

Current market trends drive clients to demand enterprise systems

1 Billion **Smartphones and 1.2 billion mobile employees by 2014**

20 Billion+ **intelligent business assets**

2.7ZB **of digital content in 2012, up 50% from 2011**

77% **of global risk survey respondents believe adopting cloud computing makes protecting privacy more difficult**

from *50B to 150B* China online banking transactions

Enterprise Systems deliver capabilities that serve these requirements:

A secure enterprise cloud solution provides efficiency for existing workloads…

With the scale to manage unprecedented volumes of transactions

Manage vast volumes of structured and unstructured data in real time…

With the ability to apply analytics across that data for new insights

Unmatched Protection for the critical information and services of the business…

With protection against new threats from more open access and cloud adoption

Increasing momentum for enterprise systems: efficiently deploying a core set of workloads at scale

*IBM enterprise system deployments in top 100 organizations by industry**

Banking 	***96 out of 100***
Insurance 	***87 out of 100***
Healthcare 	***80 out of 100***
Central government 	***72 out of 100***
Retail 	***86 out of 100***

Clients are moving to enterprise systems and their use is increasing

Thousands of clients have migrated to **POWER** over the last few years

System z installed capacity has more than **Doubled** since 2006

* Top 100 IT spenders by Industry Source = IBM Market Development

Enterprise Systems:
The servers, storage and software at the core of an enterprise IT infrastructure

Cloud — **A secure cloud infrastructure enabling utmost efficiency for the delivery of critical business services**

Data — **Making critical data and actionable insights available and accessible in real time across the enterprise**

Security — **Providing ultimate security for critical data, risk mitigation and assured compliance**

Securing the cloud, delivering insight, protecting critical data…
…At enterprise scale

A Cloud ready infrastructure speeds time to market and improves efficiency

A **Cloud ready** infrastructure enables…

60% **of CIOs ranked cloud computing as high priority in their visionary plans up from 33% in 2009[1]**

80% **of new apps will be distributed/deployed via the cloud[2]**

New sources of business innovation and value

Improved speed and flexibility

An efficient, scalable infrastructure

1 Source: 2011 IBM CIO Study
2 Source: IDC Predictions 2012: Competing for 2020

Delivering a secure enterprise cloud

Manage IT as a **Cloud** with enterprise systems

"For a lower cost, we were able to achieve the exact same performance…"

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

- **Unmatched scalability and security for critical services**
- **For thousands of users across hundreds of workloads**
- **For 100s or 1000s of virtual servers in a single system**
- **Centralized to accelerate service deployment and reduce cost**
- **For all key IT resources across multiple workloads**
- **To optimize performance and cost of exponential data growth.**

zEnterprise: Efficiency at scale

Support 59M account postings per hour with SAP solutions

TCA of less than $0.70 per day per virtual server[1]

Delivers 50% more processing capacity and 25% more performance

Manage up to 100,000 virtual servers in a single system[1]

[1] IBM calculations of zEnterprise limits across maximum z196 configuration. Results may vary. 5-Year Total IT Cost

Power Systems: dynamic efficiency

55% energy savings with POWER7+

<1 day to deploy a cloud

Minutes to add a new virtual machine

17X compute utilization improvement – from 4% to 70%*

*Based on Adobe Systems Pinehurst October 2012

A data ready infrastructure delivers more actionable insight

83% **of CIOs ranked business intelligence and analytics as high priority in their visionary plans[1]**

48% **The estimated increase in digital content from 2011 to 2012[2]**

A data ready infrastructure enables…

- **Shared access to trustworthy information**
- **Actionable insights on operational data**
- **Maximum availability of business insight**

1 Source: 2011 IBM CIO Study
2 Source: IDC Predictions 2012: Competing for 2020

Delivering the data ready IT infrastructure

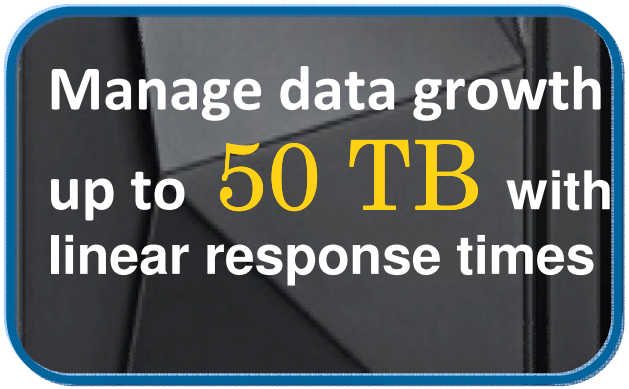
Unlock the power of **d**ata with enterprise systems

"The analytics solution helped us empower our sales and marketing teams ..."

"But the move to System z enabled a complete transformation in our ability to deliver analytics on a large scale

- **Integrated with real time data flows and transactions**
- **High volume reporting and advanced predictive analytics**
- **For continuous global operations and disaster recovery**
- **Consistently from any device anywhere at any time**
- **For data consolidation and enterprise transaction processing**

zEnterprise: Operational analytics



[1] *(Source: customer case studies, individual results may vary)*

Power Systems: business analytics

Up to 40% better performance with POWER7+, ideal for business analytics

2 defeated Jeopardy! world champions by IBM Watson

3 seconds to process 200 million pages of structured & unstructured data

20 billion raw transactions turned into actionable insights*

*Fiserv (case study)

A security ready infrastructure protects and reduces risk

$5.5M The average total organizational cost of a data breach[1]

68% The increase in the cost of lost data in 5 years[2]

A Security ready infrastructure enables…

- **Data security and integrity**
- **Trusted identity and access management**
- **Minimal overhead to meet compliance requirements**

1 Source: 2011 Cost of Data Breach Study: United States, Ponemon Institute LLC, March 2012
2 Source: Computerweekly.com, 2011

Delivering the security ready IT infrastructure

Secure critical information with enterprise systems

"Making sure our Website can't get hacked into is a key issue. With IBM, we have been able to keep it tightly locked up and prevent unauthorized access

"Encryption on zEnterprise is critical to our company success to allow us to protect customer privacy data…"

- Protect and encrypt critical data over its lifecycle
- Secure development principle with agreed rules
- Secure isolation of virtualized workloads
- Creating a unique trusted identity for each user
- Best practices for governance, risk and compliance

zEnterprise: Ultimate security by design

Deliver EAL5+ highest level of certification for general purpose servers

process >17500 SSL transactions per second

Save up to 70% in security audit and compliance overhead[1]

96 out of the top 100 worldwide banks use System z

[1] *(Source: customer case studies, individual results may vary)*

Power Systems: enhanced compliance

Up to 100% of data can be encrypted

Real time compliance automation, monitoring and reporting

Minimize performance impact with Cryptography accelerator

85% reduction in security data processing errors*

*Eurasian City Government Client Value

zEnterprise and enterprise Power Systems leadership capabilities for enterprise systems

Support 1000+ Virtual images per system

Maximize ROI with 70%+ utilization

Dynamic allocation and provisioning of resources

Cloud Ready

Manage vast quantities of data

Integrate analytics and data at scale

Deliver 99.997%+ availability

Data Ready

Up to 100% encryption of data

Dedicated security processors for high throughput

Deliver high assurance digital signatures

Security Ready

IBM zEnterprise and enterprise Power Systems

zEnterprise is the secure cloud for data, enabling enterprises to improve service to their customers, ideally suited for …

Vast quantities of structured data

Large Scale transaction throughput

Centrally serving multiple mixed workloads

Securing the most critical IT services

Operational analytics embedded in the business transaction

Power is the engine for faster insight, delivering services faster, more efficiently and with higher quality, ideally suited for …

Critical, information-centric databases and compute intensive applications

Managing large amounts of structured and unstructured data in real time

Databases and ERP applications

Delivering advanced, business, predictive and operational analytics in a single system

Creating a comprehensive enterprise systems solution

IBM Systems Storage

Enterprise class storage to manage cost, performance and security of ever increasing volumes of data

"Our business is to a very large extent built on trust…"

- Michael Lawley, Vice President, Technology Shared Services, BCBST

IBM Services

Comprehensive service offerings to ensure optimal deployment of enterprise systems tailored to individual need

"This project aims to integrate and optimize BBK management systems…"

- Juan Miguel Abendaño, IT director, Bilbao Bizkaia Kutxa (BBK)

IBM Global Financing

Solutions for financial efficiency by optimizing cash flow through a "lease, refresh, and scale up" approach

"We were happy with our original decision to lease with IBM Global Financing…"

- Wayne Swallow, IT Director at Nisa-Today's

Transforming IBM with Enterprise Systems

Cloud

Reduced expense by **over $20 million** over five years with IBM private cloud for analytics

IBM collaboration cloud hosted **over 500 million meeting minutes** in 2011

Data

Providing information and insight to **over 200,000 users** across IBM through a private cloud

New reports that were months in planning can now be produced **in a few hours**

Security

IBM Blue Insight securely consolidates information from 115 data warehouses, **over 1 Petabyte of data**

85%+ of IBM's current web meeting minutes securely with anyone from anywhere

Enterprise Systems

Cloud Ready.

More efficient IT infrastructure delivery

Data Ready.

Always available and accessible in new ways

Security Ready.

Protecting critical data across the enterprise

Find out more at ibm.com/smartercomputing

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IBM zAware and Flash Express

October 2012
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Enablement for Flash Express and IBM zAware: an Availability Story

- **Agenda**
  - *IBM zAware and Flash Express improve high availability*
  - *Value propositions and benefits*
    - Flash Express
    - IBM zAware
    - Value to IT
    - Industry Considerations
    - Appendix

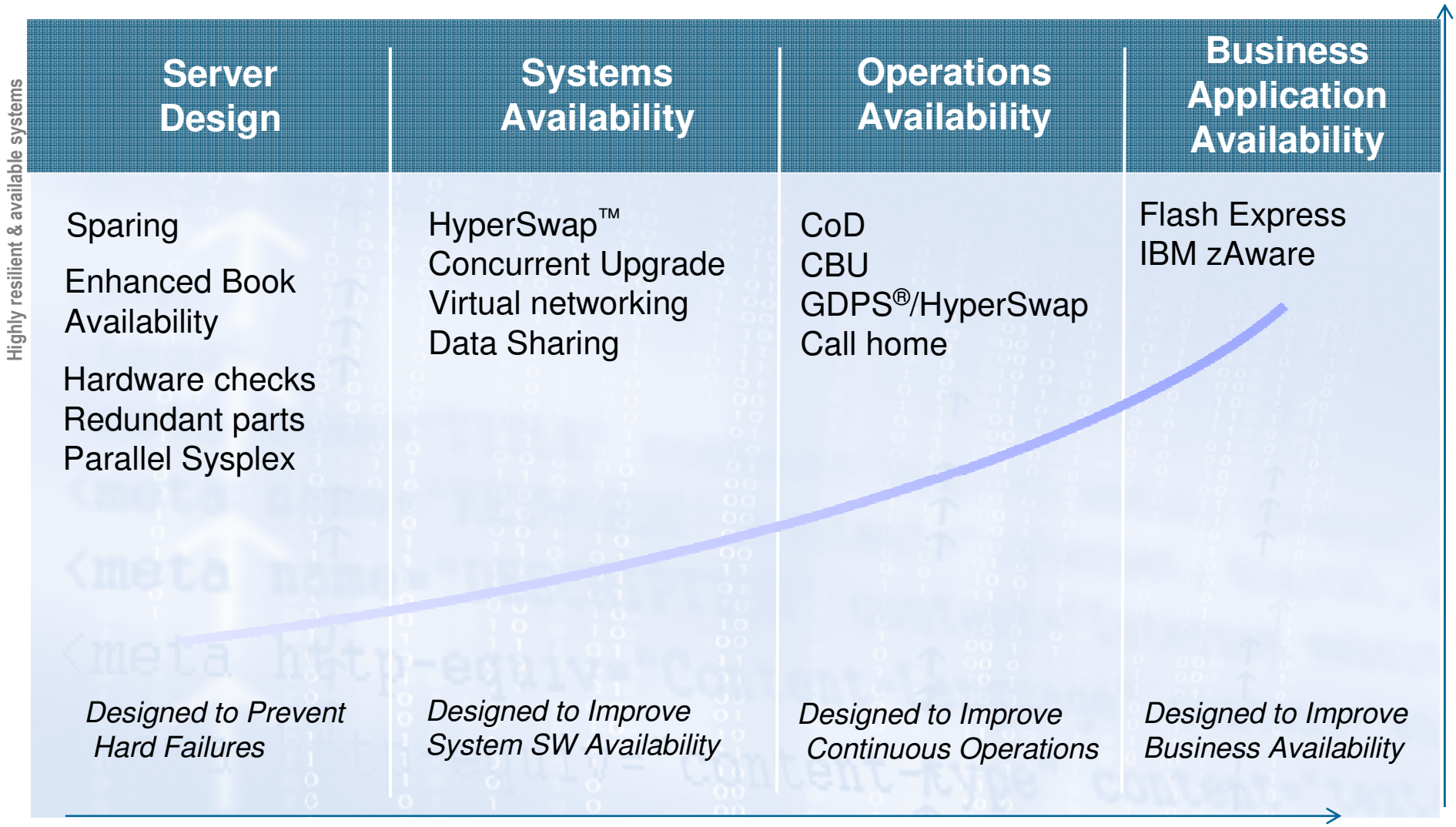
Extending IBM System z Availability

- **Companies are competing more aggressively to deliver outstanding Service Levels**
  - Availability and performance are key to achieving service differentiation
  - Market dynamics have changed to 24 by 7, global environments, digital markets
  - Commoditization drives value differentiation in services which depend on highly available systems
- **According to Aberdeen Group*, business drivers behind most companies' high availability strategies are focused on reducing unplanned downtime (80%), reducing financial risk of data loss (75%) and the need for applications to be up and running 24/7 (65%)**
- **IBM has historically excelled at delivering high availability**
  - Systems Hardware
  - Systems Software
  - Operations
  - The next step on the journey toward even higher availability
    - Strengthen business application availability
    - Simplify the problem determination process

IBM zAware and Flash Express help you further extend high availability and performance to drive service levels to new heights

* Aberdeen Group Feb 2012

Extending System z Availability with Flash Express and IBM zAware



IBM Flash Express – Smarter Availability for Smarter Systems

Outstanding Availability and Performance - Innovative Flash Express

- Companies competing for the highest quality of service in today's market must deliver **outstanding** availability and performance
- Changes in workload processing can impact service levels at critical processing times

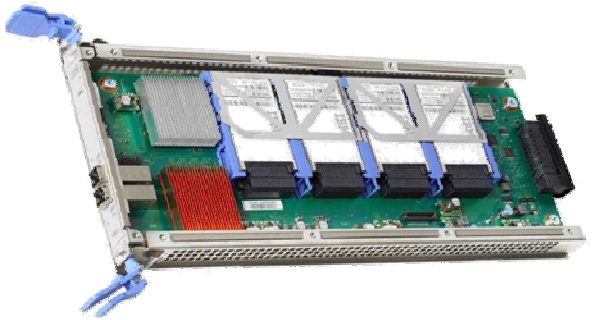
- **Flash Express is an innovative solution designed to help you improve availability and performance to compete effectively in today's market**
  - Automatically improves availability for key workloads at critical processing times
  - Drives availability and performance for workloads that cannot tolerate paging spikes or inconsistent performance
  - Slashes latency for critical application processing such as start of day processing and also collection of diagnostics (SVC dumps, standalone dumps)
  - Delivered as a new adapter card in the PCIe I/O drawer

- **Benefits**
  - Improves availability and performance helping companies achieve highest service levels
  - Delivers a secured, resilient and immediately usable solution
  - Automatic, requires minimal setup, no special training needed

Flash Express – What is it?

FLASH Express

- Physically comprised of internal storage on Flash SSDs
- Used to deliver a new tier of memory, storage class memory
- Uses standard PCIe I/O drawer
- Supported on z/OS V1.13 plus web deliverable
- Flash Express cards delivered as a RAID 10 mirrored card pair

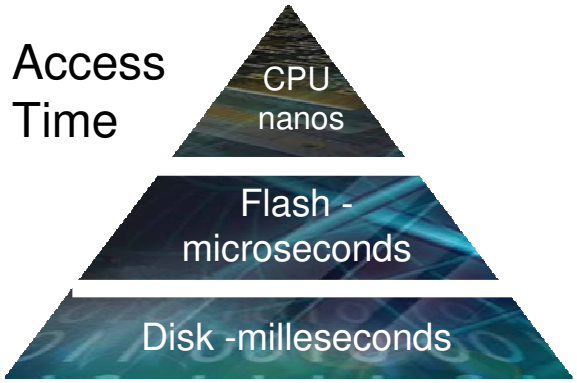


One Flash Express Card

- Sized to accommodate *all LPAR paging*
  - Each card pair provides **1.6 TB** usable storage (3.2 TB total)
  - Maximum 4 card pairs (4 X1.6=6.4 TB)

- Immediately usable
  - No capacity planning needed
  - No intelligent data placement needed
  - Full virtualization of card across partitions

- Robust design
  - Designed for long life
  - Designed for concurrent replacement or upgrade



Flash memory blurs the distinction between memory and storage characteristics

- Security Characteristics
  - Data encrypted on the flash express adapter with 128 bit AES encryption
  - Keys stored on smart cards plugged into the System z SE
  - Removal of smart cards renders data unusable

Flash Express Strengthens Availability

- **Innovation to drive availability to exceptional levels**
  - Extends IBM's expertise in memory management introducing a new tier of memory using Flash Express
  - Is an *industry unique* application of Flash to improve availability
  - Takes the next step in advanced memory management
- **Flash Express can improve availability and reduce latency**
  - Improves availability during transition periods and paging spikes
  - Helps accelerate start of day processing and other transitions such as batch to online
  - Enables faster snapshots of diagnostics (e.g. standalone dump)
  - With pageable large pages can improve performance of DB2 and Java
  - Ideal for applications with random read access or high read/write ratios
- **Helps customers deliver vigorous service levels**
  - Designed to help provide *exceptional* availability
  - Delivered with pageable large pages for *superior* performance
- **Minimal configuration- no special skills needed**
  - Usable immediately; no special training required
  - Easy to set up and dynamically configurable

Performance Benefits from Application of Flash Express

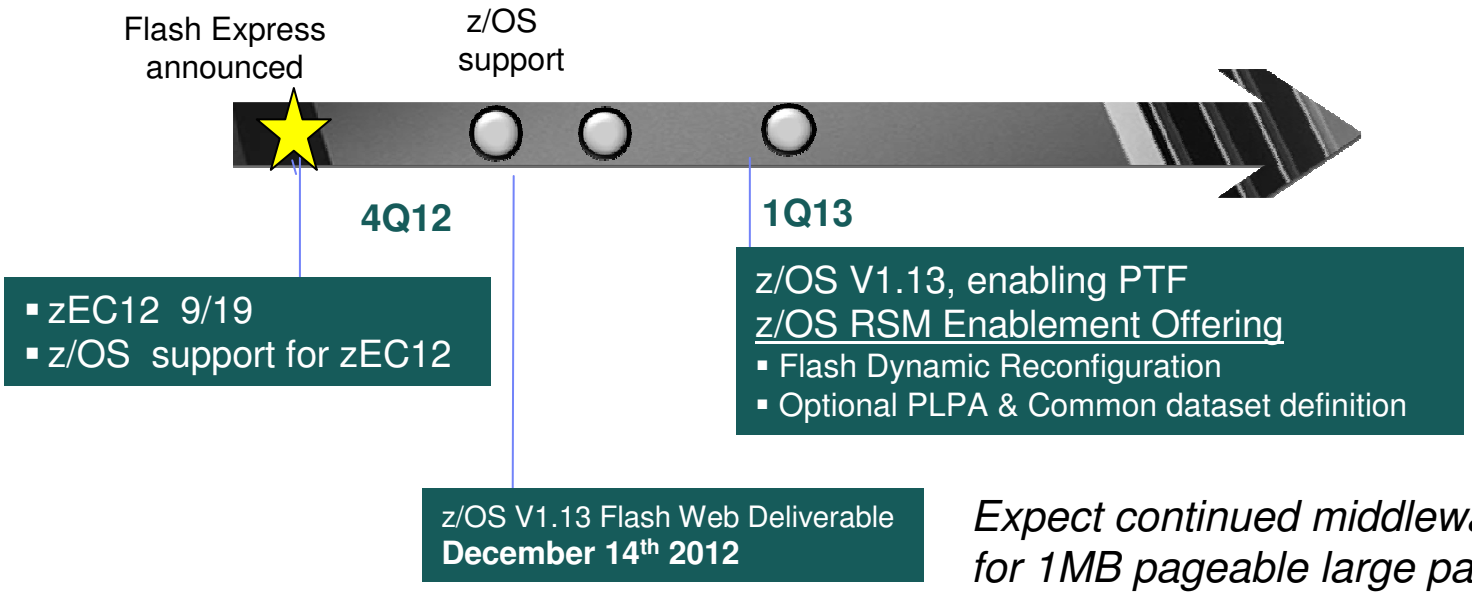
- **Achieve outstanding availability**
  - Flash memory is designed to improve availability and paging performance
  - Enough capacity so that all paging data can easily reside on a pair of Flash Express cards
  - CPU performance benefits expected from the use of pageable large 1 MB pages

- **Expected Benefits**
  - **DB2, Java:**
    - Estimated incremental several percent system CPU benefit from pageable large pages

- **Longer roadmap**
  - Continued optimization of 1MB pageable large pages vs. 4K pages
  - Additional exploitation expected by middleware
  - Available for ISV exploitation
  - Continued expanded use of new memory tier

Flash Express Exploitation

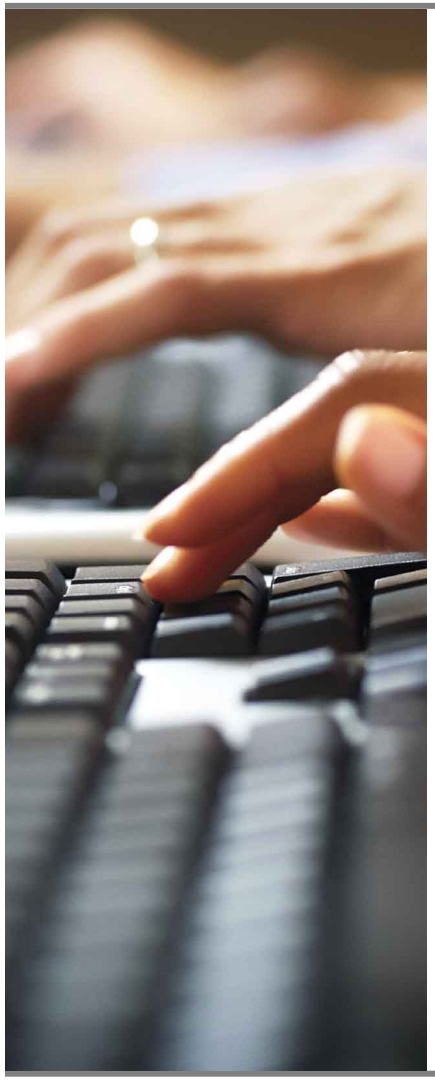
Flash support in z/OS sets the stage for further use



Expect continued middleware exploitation for 1MB pageable large pages

- ***Planned* Flash Express and pageable large page exploiters:**
  - DB2 for z/OS
  - Java SDK7
  - WAS Liberty Profile v8.5
  - IMS 12
  - z/OS V1.13 Language Environment
  - Other (CICS)

Representative Use Cases - Flash Express



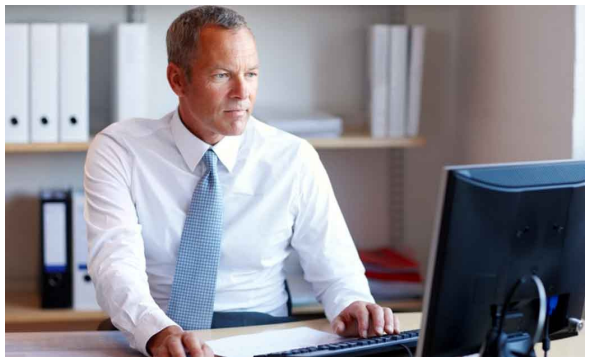
Flash Express can reduce latency delays from paging to bring system availability to new heights and improve overall service levels

Application related errors will require collection of diagnostics. These diagnostics can be collected faster with Flash Express, reducing paging related delays that can impact your overall performance and availability.

Having working data resident in Flash can help accelerate start of day processing, and improve service for many industries at the busiest time of their work day - a time when they cannot afford paging disruptions.

DB2® and Java™ in memory buffer pools work to store and process application data. DB2 and Java can benefit from 1MB pageable large pages with Flash Express, improving overall CPU performance.

Flash Express for the CIO



- CIOs are continually challenged to grow profitably in the face of increased competition in the global marketplace. Facing a new economy and constrained resources they must innovate to find new sources of value for their firms.
- Many CIOs believe innovation in service will drive that sustainable competitive advantage. By consistently delivering service levels that exceed the expectations of customers, CIOs can leverage new and enhanced services as the differentiator for their businesses.
- To meet service goals, CIOs must find a solution that quickly, non-disruptively and cost effectively bolsters availability and performance.

Flash Express *can automatically improve availability and performance enabling CIOs to help meet and exceed their commitments to deliver superior quality of service.* ***Flash Express*** *is a compelling solution for improving availability that is secure, resilient, delivers rapid time to value, and is usable right out of the box.*

Flash Express for IT VPs

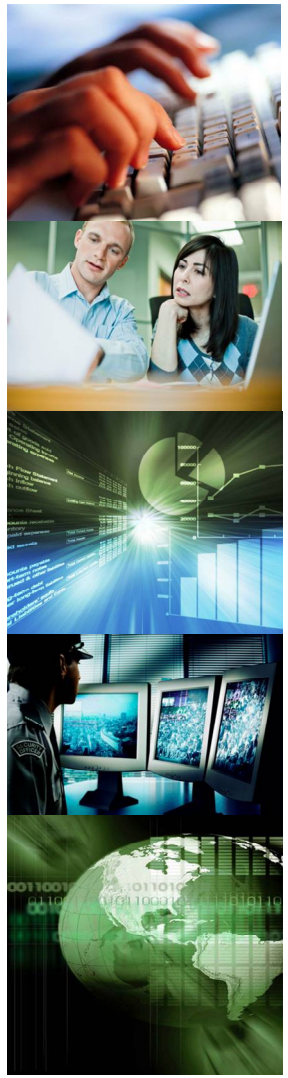
- You need to run IT as a service provider. You need availability and performance at maximum levels regardless of application errors, shifts in processing, batch to first shift.
- You need the highest availability and performance capabilities so you can meet the critical IT service level agreements your customers demand.
- You need to be highly available at first shift without any transitional delays typical from overnight processing.
- You need to be able to balance work often even at the most critical times of the day while delivering superior performance.
- **Flash Express** is a low risk, low cost solution and easily deployed solution to improving application availability, performance and service levels.
- Resilient and secured, **Flash Express** is fully operational without requiring special skills for either planning or operations.

*For companies that require superior availability and performance, **Flash Express** is uniquely designed to automatically strengthen availability and performance even during periods that stress your system – such as system diagnostics, start of day processing or other transitional periods.*

IBM System z Advanced Workload Analysis Reporter (IBM zAware)- Smarter Computing for Faster Service Restoration

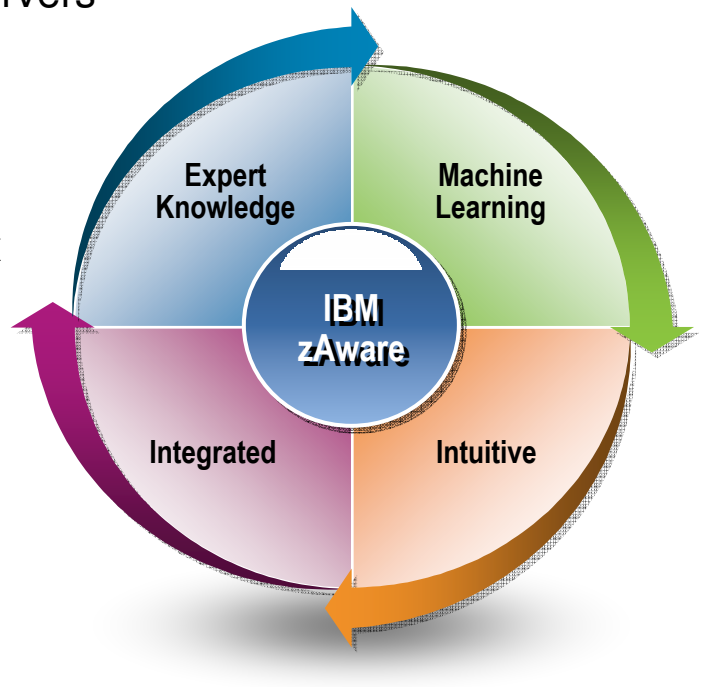
- **The complexity and rate of change of today's IT infrastructures stress the limits of IT to resolve problems quickly and accurately--while preserving SLAs**
- **IT is challenged to diagnose system anomalies and restore service quickly**
  - Systems often experience problems which are difficult or unusual to detect
  - Existing tools do little to identify messages preceding system problems
  - Some incidents begin with symptoms that remain undetected
  - Manual log analysis is skills-intensive, and prone to errors

- **IBM zAware with Expert System Diagnostics Gets it Right, Fast**
  - IBM zAware helps improve problem determination in *near real time* – helps rapidly and accurately **identify problems** and **speed time to recovery**
    - Analyzes **massive amounts of data** to identify problematic messages, providing information to enable faster corrective action
    - Analytics on log data provides a near real time view of current system state
    - Cutting edge pattern recognition examines system behavior to help you pinpoint deviations
    - Machine learning, modeling and historical data work to analyze **your unique environment**
- **Benefits**
  - Can reduce problem determination and troubleshooting
  - Particularly helpful when problems involve multiple teams
  - Helps you diagnose problems quickly and more accurately to improve service recovery time
  - Easy to use graphical interface



IBM zAware : An Expert integrated Analytics Solution
IBM System z Advanced Workload Analysis Reporter

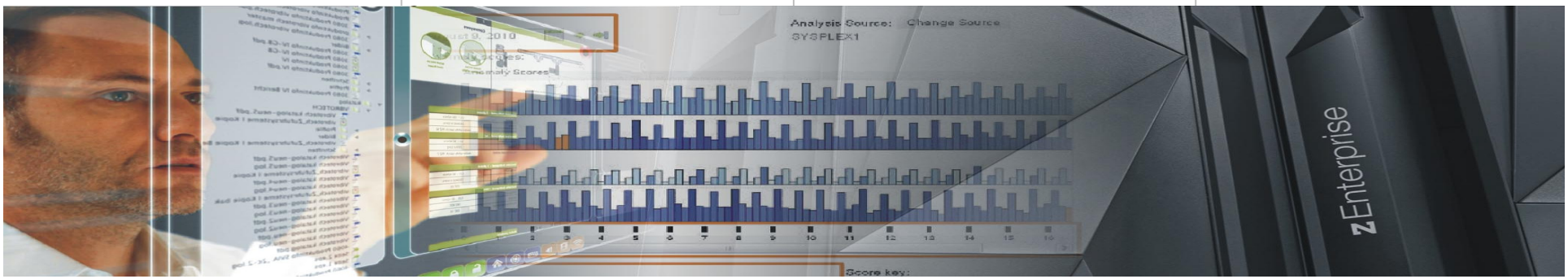
- **IBM zAware is a self learning, integrated expert solution that analyzes messages in near real time to provide insight into the behavior of your system**
  - Analytic solution that adapts and learns your unique environment
  - Host on zEC12 server; can monitor other System z servers
    - Runs on IFL or general purpose CP
    - 4 GB memory base
      - For up to six monitored z/OS systems
      - Additional .25 GB per connected system after six
    - 500 GB storage (estimated)
    - Under 1% CPU overhead on monitored systems
    - Self managed data store
  - Shareable OSA ports required for communications
  - Dedicated IP address for partition
  - Requires z/OS V1.13 + PTFs
  - IE or Firefox browser



IBM zAware - Identify Unusual System Behavior

IBM zAware contains sophisticated analytics, applies IBM insight, and machine learning to understand your unique system.

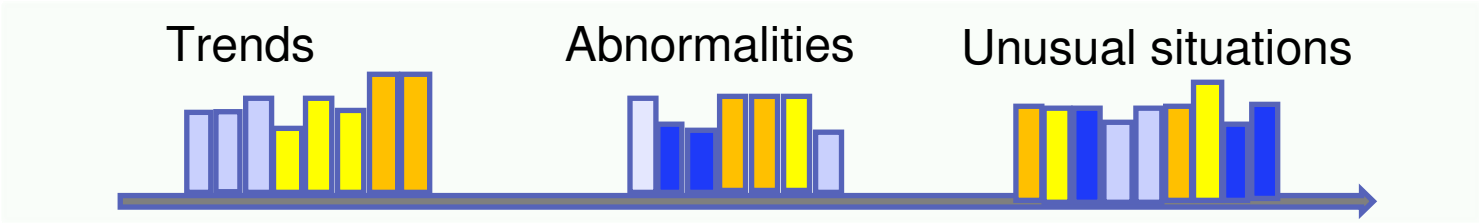
Monitoring	Detection	Frequency	Reporting
▪ Supports IBM and non IBM middleware and applications ▪ Monitors OPERLOG in a sysplex or monoplex ▪ Assigns a message anomaly score to help you identify potential issues	▪ Detects anomalies other solutions might miss ▪ Can find the rare or infrequent message ▪ Can also detect an unusual number of normal messages ▪ Can detect messages issued out of context	▪ Samples every 2 minutes ▪ 10 minute reporting interval ▪ Uses 90 day rolling baseline; utility provided to populate baseline ▪ Allows dates to be included, excluded	▪ Near real time analysis ▪ High level and drill down intuitive web based reporting ▪ Color coder, time slice graphics ▪ XML output can drive other ISVs or processes



Specific Applications of IBM zAware

- **Identify a possible z/OS incident**
  - ***Which image is having unusual behavior?***
    - Examines unique message behaviors
    - High score generated by unusual messages or message patterns
  - ***When did the behavior start?***
    - For a selected 10 minute interval either the current 10 minute interval or past intervals
      - Which messages are unusual?
      - How often did the message occur?
      - When did the message start to occur?
  - ***Were similar messages issued previously?***
    - Understands message characteristics and message patterns
- **Identify behavior after a change has been made**
  - ***Are unusual messages being issued after a change?***
    - New software levels (operating system, middleware, applications)
    - Updated system settings or system configurations
- **Diagnose intermittent problems**
- ***Are new unusual messages being issued when an intermittent problem occurs?***
  - Are more messages issued then expected?
  - Are messages issued out of a normal pattern?

Finds Anomalies that Would be Difficult to Detect

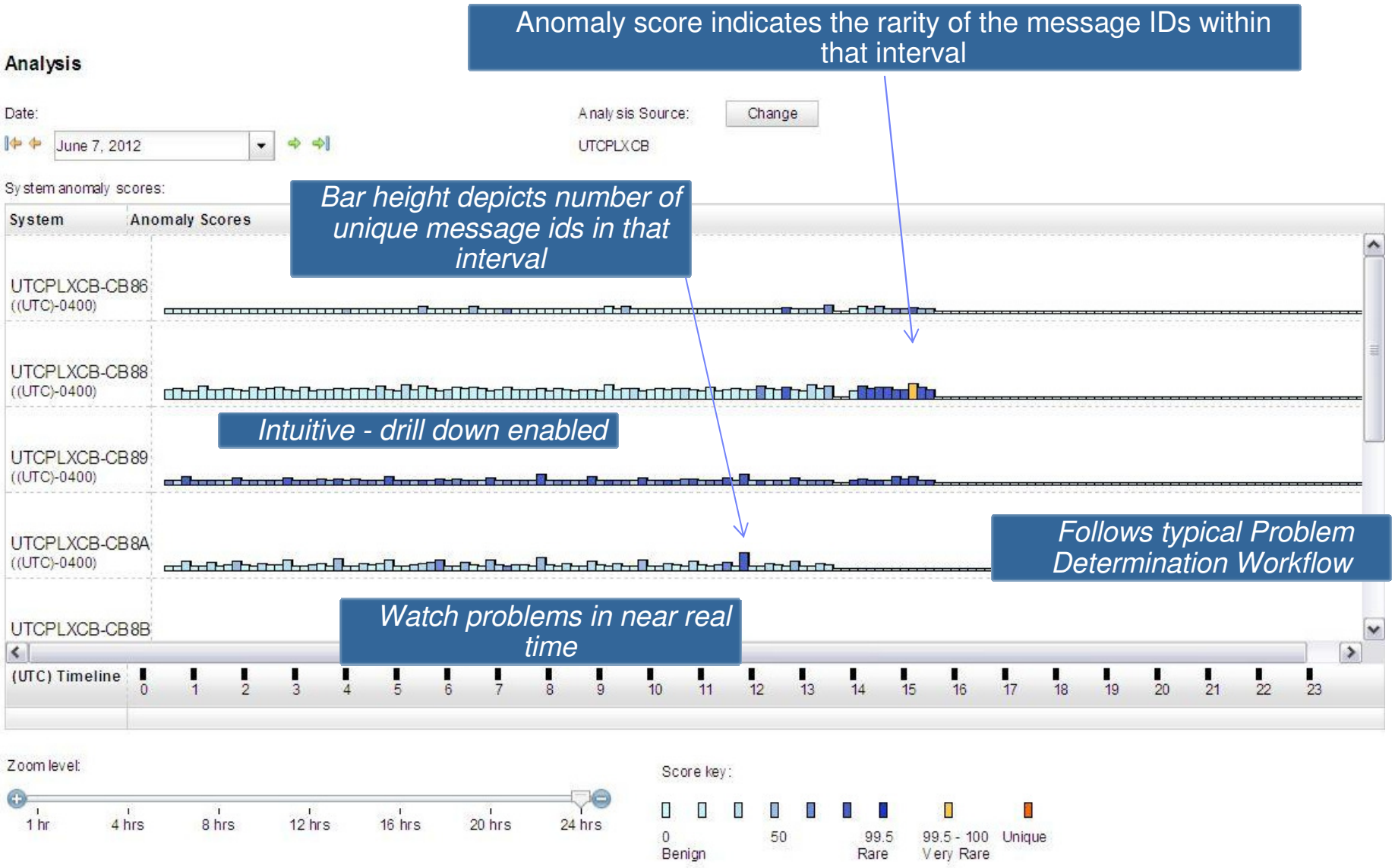


Reduces time and effort to identify & diagnose problematic messages

IBM zAware Configuration for Maximum Flexibility

Monitors zEC12 or any other System z servers running z/OS v1.13 +PTF
Support z/OS on VM
Requires OPERLOG

IBM zAware Sysplex View



Sample Output - Interval View

Drill down, see messages related to the anomaly

Interval View for System CB88

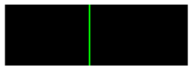
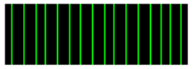
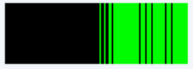
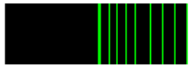
Date: July 1, 2012

Time interval (local time): 04:00 AM -- 04:10 AM

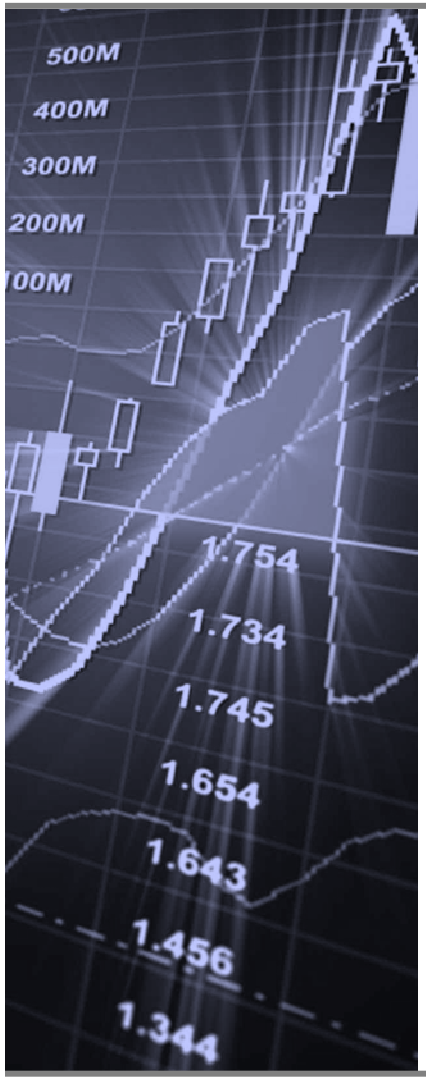
Analysis Source: All Managed Systems

Interval anomaly score: 99.7

Actions

▼1 Anomaly Score	Interval Contribution Score ▼2	Message Context	Rules Status	Appearance Count	Time Line	Message ID	Message Example	Rarity Score	Component	Cluster ID
1	0.226	new	None	1		EYUXS1004W	M88CM88 Interval Timing queue element shortage detected	101	EYUXS	-1
1	0.226	new	None	1		EYUXS1005I	M88CM88 Interval Timing queue element shortage relieved	101	EYUXS	-1
1	0	in_context	IMPORTANT	16		HASP050	JES2 RESOURCE SHORTAGE OF TGS - 100% UTILIZATION REACHED	50	HASP	102
0.999	10.974	unclustered	None	57		IEE043I	A SYSTEM LOG DATA SET HAS BEEN QUEUED TO SYSOUT CLASS M	2	IEE	-1
0.998	6.706	unclustered	None	7		EYUCL0016I	M88CM88 Send Link Task terminated for MRO Network connection with CMAS M8ACM8A.	74	EYUCL	-1
0.998	6.519	unclustered	None	4989		ITP136I	ADSWCB G2APA001 G2LUA001-1 LU IS NOW INACTIVE 00.02.50.86	27	ITP	-1
0.987	4.427	unclustered	None	40		IEC070I	209-220,NETVIEW,NETVIEW,DSILOGS,683C,NE	12	IEC	-1

Representative Use Cases - IBM zAware



One member in the sysplex has communications related problems causing symptoms (delays) showing up on another Sysplex member. Problem was due to an error in the coupling facility exit.

Online banking applications were timing out. Team could have stopped subsystems to isolate problem. IBM zAware identified LDAP as running short on memory, and this unusual memory situation impacted other systems

Network slowdown problem evidenced itself as a probable TCP/IP definition error. Cause was really security related, due to an incorrectly coded RACF access rule.

Typical problems identified are complex, cross sysplex and sometimes are due to an unexpected cause. For instance many slip trap messages might signal a problem but one or two might be expected in certain conditions.

IBM zAware for the CIO

- CIOs are competing increasingly based on services in the global marketplace. Facing new pressures to sustain high levels of availability and respond rapidly to IT service outages, you need to be able to resolve system problems without painful delays.
- In a 24 X 7 environment, a system incident can drive up operations costs and disrupt service for hours – even days. Resolution of complex system problems can incur high costs and impact reputation
- With 70–80%+ of IT expenditures spent on operations costs, and ever increasing IT complexity, CIOs are facing fiscal pressures to reduce spend, yet meet demanding service levels. IBM zAware is designed to support this growing sophistication of IT while reducing operations complexity.
- **IBM zAware** can help you quickly restore service levels by applying integrated expert analytics in near real time to quickly and accurately isolate system anomalies. Using IBM zAware you can take action to prevent problem recurrence and optimize service delivery.

IBM zAware *is an integrated, self learning, analytics solution that helps identify unusual system behavior to help improve service levels.* ***IBM zAware*** *uses machine learning to help your organization gain visibility into system behavior helping you optimize service.*

*IDC 2009

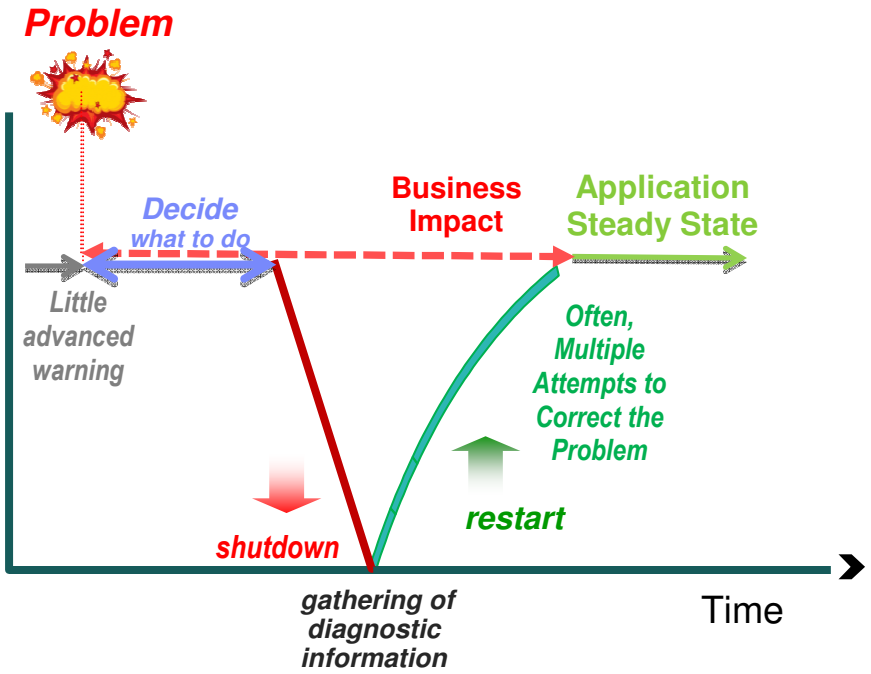
IBM zAware for IT VPs and staff

- You need to improve IT availability to compete as a service provider. You need to be able to rapidly identify any system problems and reduce the time to diagnose problems. You need to address problems quickly and accurately, to keep availability at its highest levels.
- You function as a service provider whether your customers are internal or external. You cannot afford service disruptions that take too long to diagnose and repair.
- Yet unsolved system outages and performance degradation can limit your ability to meet critical IT service level agreements and remain competitive.
- You need to monitor system health with vigilance to understand typical system behavior and identify possible deviations.
- You must identify problems and quickly restore service even when symptoms are sporadic or demand high skills.
- **IBM zAware** is an **integrated expert solution** that uses analytics to help you identify potential problems helping you to improve overall service levels

For companies that require superior service levels and fast problem resolution, ***IBM zAware*** *uses expert analytics to learn your system characteristics to help you identify problematic system behavior.* ***IBM zAware*** *can help you detect problematic trends and resolve issues quickly so you can restore service levels without delay.*

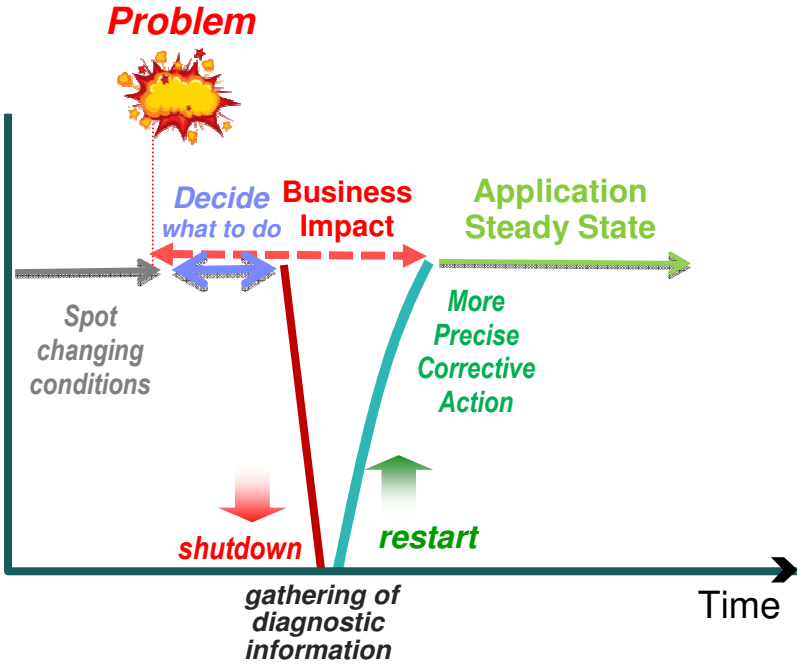
IBM zAware Can Reduce Time to Repair to Improve Availability

Without IBM zAware



Ineffective time spent in problem determination and trial and error. Incorrect problem identification may result in the wrong fixes being applied.

With IBM zAware



More precise and early diagnosis can shorten impact time and help you to avoid a similar problem. Gain an edge in your ability to detect trends.

Summary: Why Flash Express and IBM zAware are Important

Flash Express

- Today's market transformation, evolution to cloud and new service delivery models will demand increased availability
- New social networking and mobile computing applications drive the demand for high performance and highly available applications
- Big Data and other analytic applications will require random access of data, and improved paging performance, leveraging the use of pageable large pages (PLP) and Flash Express

IBM zAware

- As companies innovate, new interaction and complexity between applications can result in complex problems that need to be resolved quicker and more accurately
- Global IT departments have a reduced likelihood of having all the right experts available at the same time to resolve complex problems with many interdependencies
- Organizations need a solution that is self tuning, with expert analytics to diagnose anomalies. The complexity and flux of today's problems makes them virtually impossible to codify in advance

IBM z/OS Solution Family Can Improve Problem Diagnostics

Solutions Available:		Rules based	Analytics/ Statistical model	Examines message traffic	Self Learning	Method
Included in z/OS - z/OS Health Checker	▪Checks configurations ▪Programmatic, applies to IBM and ISV tools ▪Can escalate notifications	✓				Screens for conditions
- z/OS PFA	▪Trending analysis of z/OS system resources, and performance ▪Checks metrics on storage, frames ▪Can invoke z/OS RTD		✓		✓	Early detection of a problem
- z/OS RTD	▪Real time diagnostics of specific z/OS system issues	✓		✓		Examines the operating system when an incident is reported
- IBM zAware	▪Pattern based message analysis ▪Self learning ▪Provides aid in diagnosing complex z/OS problems, including cross sysplex, “sick but not dead”		✓	✓	✓	Helps you diagnose an incident anywhere in the z/OS software stack while it is occurring

IBM zAware uniquely analyzes messages in context to determine unusual behaviors
IBM zAware uniquely understands and tunes its own baseline to compare against current activity
IBM zAware does not depend on other solutions, coding of rules, and is always enabled to watch your system

Cost of Downtime

Table 1: Cost Savings

Yearly Cost Metrics	Best-in-Class	Industry Average	Laggards
Business interruption events	.3	2.3	4.4
Time per business interruption event (hours)	.1	1	9
Total disruption (hours)	.03	2.3	39.6
Average cost per hour of disruption	$101,600	$181,770	$99,150
Total cost of business interruption events	**$3,048**	**$418,071**	**$3,926,340**

Reduce availability lapses by 45 minutes and pay for Flash Express

Source: Aberdeen Group, February 2012

Datacenter Downtime How Much Does IT Really Cost?

Definition of Maturity Class	Mean Class Performance
Best-in-Class: Top 20% of aggregate performance scorers	▪ Recorded fewer than1 business interruption over the last 12 months ▪ Averaged only 6 minutes of downtime per each event ▪ Took less than 1 hour to restore 90% of business operational functionality after the last interruption
Industry Average: Middle 50% of aggregate performance scorers	▪ Recorded 2.3 business interruptions over the last 12 months ▪ Averaged 1 hour of downtime per each event ▪ Took 2 hours to restore 90% of business operational functionality after the last interruption
Laggard: Bottom 30% of aggregate performance scorers	▪ Recorded 4.4 business interruptions over the last 12 months ▪ Averaged 9 hours of downtime per each event ▪ Took 11 hours to restore 90% of business operational functionality after the last interruption

Average one hour of downtime per event at $181,770 per hour with two more hours to restore.

Total cost over $.5M

Redbooks

- **IBM zEnterprise EC12 Technical Introduction, SG24-8050**
  This book provides concepts, positioning, and a business value view of zEnterprise System capabilities, hardware functions/features, and associated software support. It is intended for IT Managers, consultants, IT Architects and Specialists, and anyone who wants to understand the basic elements of the zEnterprise EC12.
- **IBM System z Connectivity Handbook, SG24-5444**
  This book highlights the hardware and software components, typical uses, coexistence, and relative merits of the System z I/O features. It is intended for data center planners, IT Specialists, system engineers, technical sales staff, and network planners who are involved in planning connectivity solutions for System z servers.
- **IBM zEnterprise EC12 Technical Guide, SG24-8049**
  This book provides specific information about the zEnterprise EC12 (zEC12) and its functions, features, and associated software support. Greater detail is offered in areas relevant to technical planning. It is intended for systems engineers, system programmers (IT Specialists), planners, and anyone wanting to understand the zEC12 functions and plan for their usage.
- **http://www.redbooks.ibm.com/Redbooks.nsf/pages/zEnterprise?Open**

INDUSTRY PERSPECTIVES





Flash Express & IBM zAware for Select Industries

Financial Markets

- Financial markets cannot afford disrupted performance at their heaviest period of the day, for instance, at start of the trading day.
- Customers are demanding varied offerings and multiple channels through which to conduct business, requiring higher resiliency and performance from core financial systems.
- Insurance firms need to have highly available applications, with web-enabled applications focusing on “Know Your Customer”. Insurance firms need fast access to data –and highly available, high performance applications.
- Financial firms are limited by siloed operations, overlapping or duplicate processes and IT systems; as a result, complex problems can quickly unfold. IT staff must be able to restore service quickly.

Banking

- Banks often face inflexible, complex operations resulting from customized systems platforms, server sprawl and multiple acquisitions; banks would benefit from solutions for expeditious problem identification and highly reliable systems.
- Banks need to recover operations quickly and maintain high availability in the event of a system problem; Flash Express can help improve resiliency.
- Mobile payments systems represent a $100B a year opportunity and will place increased stress on availability for back end systems.
- Banks will centralize operational data for up-to-the-minute transactions, driving the need for flawless application performance and availability.
- Banks compete on service as a differentiator; customer service and credit card applications cannot afford service lapses

Flash Express and IBM zAware for Select Industries

Public Sector

- Public sector organizations are challenged to deliver high quality services at low cost yet must strengthen availability and support for 24 x 7 emergency preparedness.
- Many public service organizations offer self service portals, and must be available all the time to meet public needs.
- Facing economic pressures, the public sector must demonstrate sustainable cost reductions yet deliver more. Highly available systems can refocus unproductive costs.
- As public entities consolidate into Municipal Clouds, and larger service centers, implying complex workload changes, they must sustain higher availability and deliver on SLAs. Fast problem resolution is imperative for public sector.
- New Big Data capabilities allow government clients across Public Safety, Citizen Services, and other domains to integrate data. Improved performance (PLP) will be vital for these new data intensive applications.

Retail

- Retailers facing slim margins, and pressures from low cost digital competitors need superior service as a differentiator.
- Online presence requires superior availability and performance, especially during peak periods
- Convenience factor influences customer preferences; service delays can mean defections and lost revenue
- Rapid response to customer related problems is needed, retailers require excellent problem resolution
- Retailers must scale for load variability during heavy holiday periods like Black Friday or Cyber-Monday require the highest levels of response time.
- Retailers need to respond to ways that customers are buying merchandise across multiple channels, expecting consistently responsive and available systems -brick and mortar or web based.

Flash Express and IBM zAware for Select Industries

Healthcare Providers

- Hospitals and medical centers need to reduce IT operational costs, and deliver reliable service. Solutions like IBM zAware can be used to improve service restoration.
- Healthcare reform means high service levels play an integral part in helping organizations compete, in offering better patient care, and in meeting budgets- higher availability is key.
- Medical services will become digitized; claims processing and self-service will demand highly available applications and data, with superior performance of new Java and DB2 applications.
- Healthcare providers must meet regulatory standards, adopting electronic health records. Always on access to clinical, or financial data will stress current service levels, and will benefit from improved availability.

Health Insurers

- Insurers will extend coverage to the broader population; they need to absorb the under-insured. Expansion stresses the current IT performance.
- Medical loss ratio legislation and competitive forces dictate a need for administrative cost reduction (cut downtime costs).
- US Health Plans will use analytics to improve business performance and quality of care in their provider networks. Increased use of data centric applications can impact performance, areas where Flash Express & PLP can help.
- Healthcare organizations need to cost-effectively manage exponentially-growing data stores. Optimized database and application performance is achievable through pageable large pages.

SmarterAnalytics

IBM

Jaime Avaya, Business Analytics on System z Architect

Rebecca Wormleighton Sr Product Marketing Manager, Business Analytics on System z

Q4 2012 Technical Marketing Session
DB2 for z/OS Real-Time Scoring

What's in this for IBM & You?

A distinct opportunity for 'In-database scoring' with System z

- Approximately 70% of transactional data originates on System z
- Data warehousing on System z

Our primary 'focus' with the Modeler 15 release

- Real-time Scoring for DB2 for z/OS which allow us to install the scoring algorithm directly in the transactional data/application

This is different than Real-Time Scoring today

- Improves accuracy by scoring new and relevant data directly within the OLTP application
- Scales to large data volumes to improve accuracy of data models
- Delivers the performance needed to meet and exceed SLAs of OLTP applications
- Minimizes demand on network, HW, SW and resources

The impact on our business

- The Customer: Improves the accuracy, speed and performance of real-time scoring while reducing cost and complexity.
- SPSS: Provides a competitive advantage & a targeted market to pursue, a market we own
- System z: Strengths the BA & DW portfolio, opens the doors to new audiences with a targeted discussion

Provides an opportunity to differentiate your solution from other applications.

Real-Time Transactional Scoring: How to Do it Better, Faster, Cheaper

Modeler 15 for Linux on System z

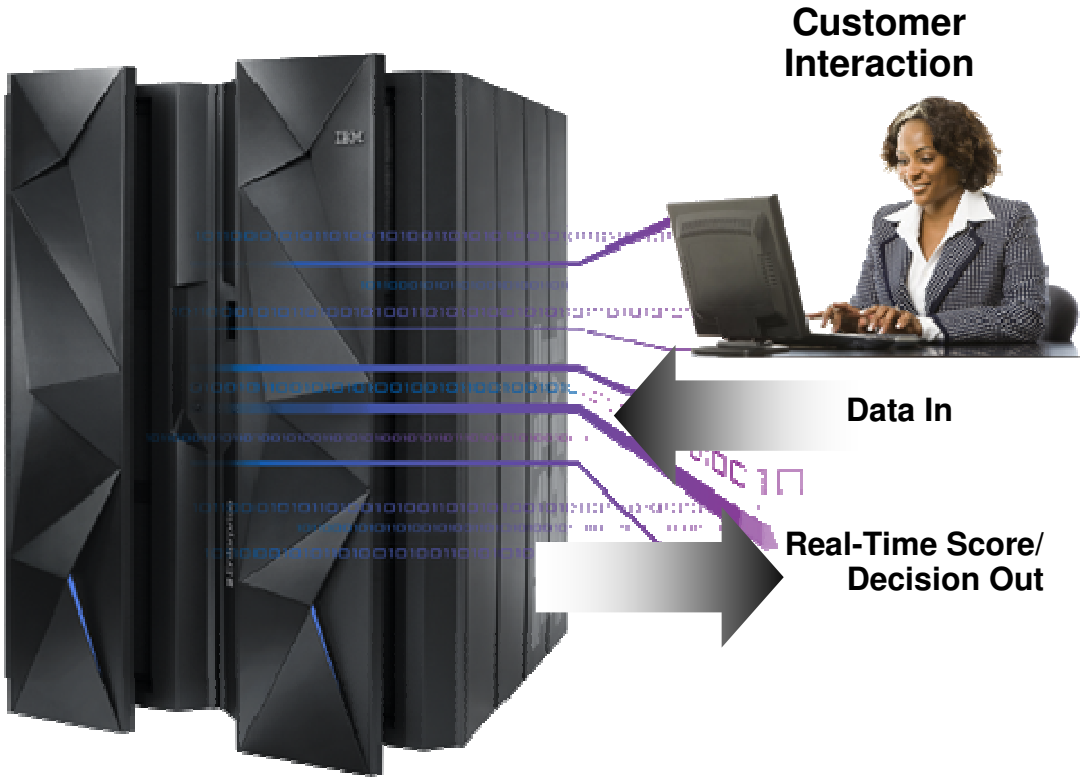
NEW

What has IBM delivered?

- **Improved speed and accuracy of scoring** in order to drive **better, more profitable decisions and business results**
  - The combination of SPSS Modeler 15 & DB2 for z/OS now enable **in-database scoring** including the **real time scoring of transactional data on System z**
- Service level agreements on par with the OLTP systems
  *general availability June 15th 2012

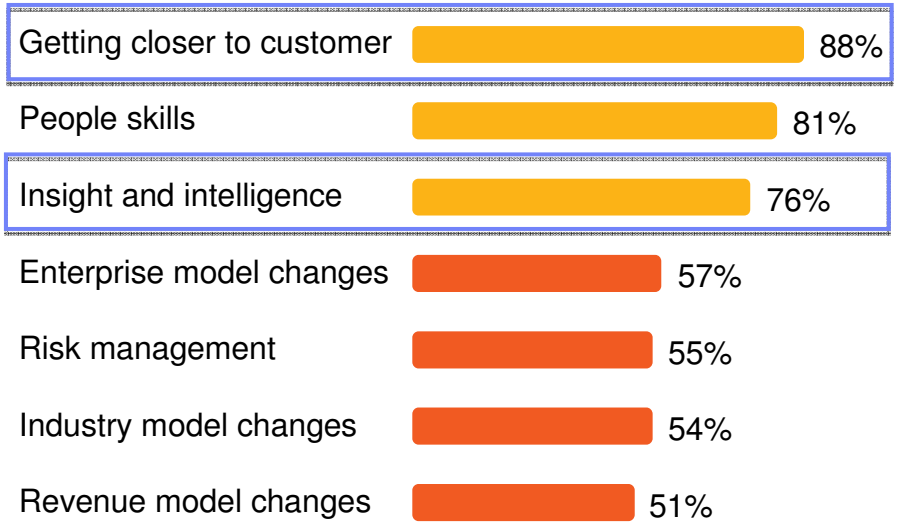
Why Modeler 15 and System z?

- **Scores the most current data** directly within your OLTP or Data Warehousing applications on System z
  - Provides sub-second response time
  - Reduces data latency
  - Minimizes data movement
  - Scales to large data volumes to improve accuracy of scores
  - Single infrastructure for reduced complexity and redundancy of HW, SW and administration resources
- Applies the same high qualities of service as the OLTP/Business systems
  - Availability, scalability, reliability and performance
- Can automate, continuous real-time updates to the model to improve the quality of the decision
  - Define new patterns faster & more frequently

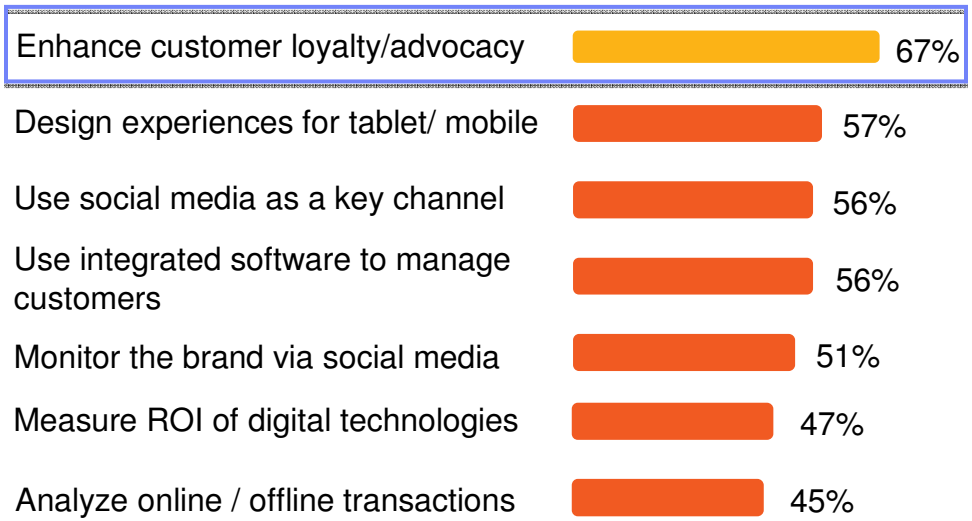


Target areas that analytics can help impact

CEO Focus Over Next 5 Years



CMO 5 Year Focus Toward Digital



Source: IBM C-Suite Studies

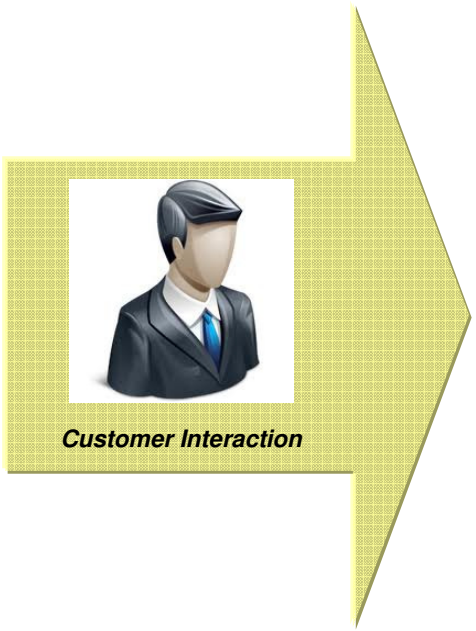
Sources: IBM's 2011 Global CMO Study: From Stretched to Strengthened (2011) & IBM's 2010 Global CEO Study – Capitalizing on Complexity

zEnterprise is the Platform that Runs the world…

Approximately 80 % of the data that is accessed for analytics originates on IBM zEnterprise!

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

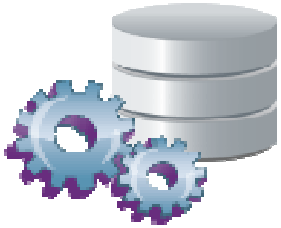
zEnterprise Represents a Unique Opportunity



Business Application

Operational/Transactional System

- OLTP System built on DB2 for z/OS
- On-line transaction processing (OLTP) systems, often referred to as transactional systems are designed to process small, quick, interactive workloads for which users expect fast response times.



Data Repository

Data moved to data warehouse for long term analysis

- Data Warehouse
- Operational Data Store
- Data Mart

Improve the Accuracy of All Business Decisions at All Points of Impact

Multiple Points of Interaction

Maximizing the Return

- Improve cross sell / up sell opportunities with customers
- Minimize risk through better fraud detection during customer interactions
- Improve customer service, loyalty, and advocacy by reducing response times and improving accuracy during customer interaction

What is Required for Real-time Scoring at the Transactional Data Level

Complete Picture

Information from yesterday and today.

The Right Tools

Predict the 'Next Best Action'

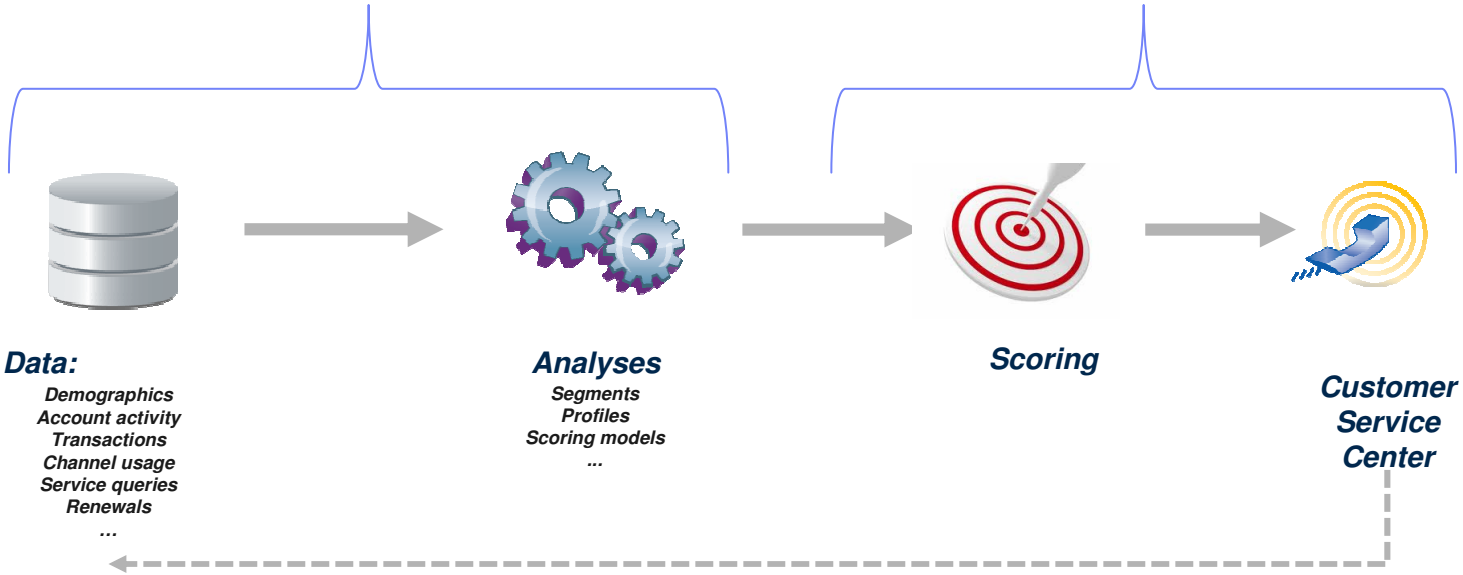
Guaranteed SLA

Without impacting service level objectives.

The Right Tool = Predictive Scoring

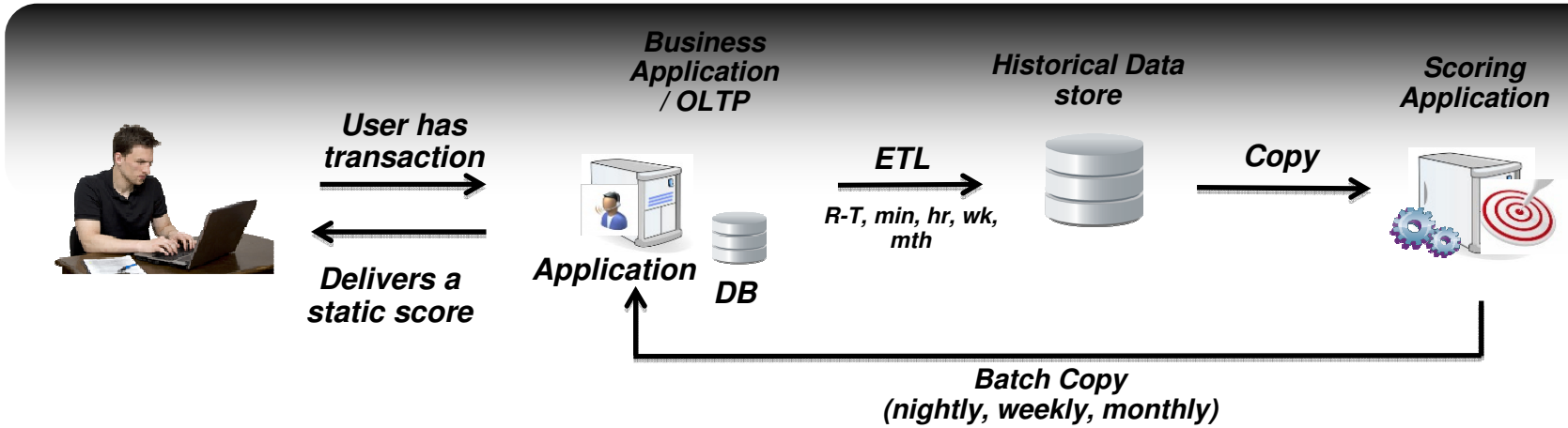
Identify predictive models/patterns found in historical data

Use those predicted variables to score data & identify the best possible future outcomes

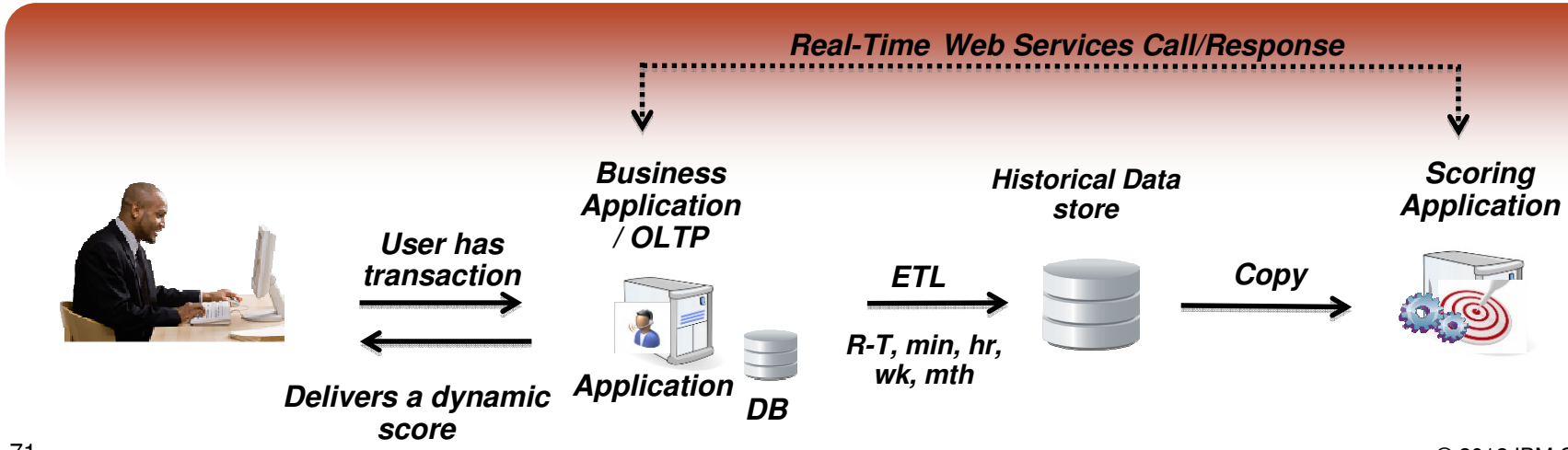


Scoring Associated with an OLTP Application

Historical Scoring



Real-time Scoring



The Impact on Real-time Scoring

Customer interaction

Delivers a dynamic score

Business Application / OLTP

Application

DB

ETL

R-T, min, hr, wk, mth

Historical Data Store

Copy

Scoring Application

Web services call

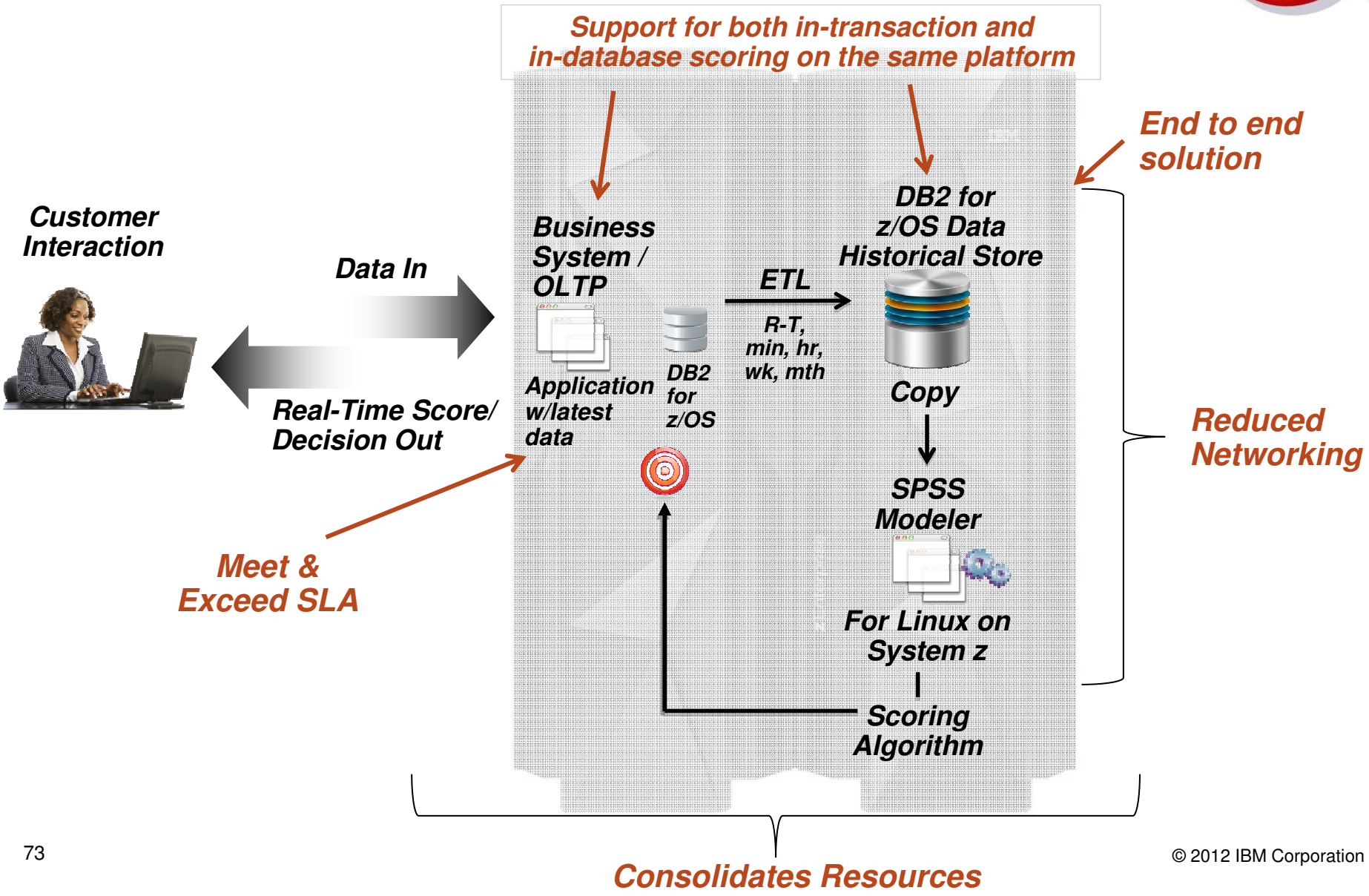
Web services call

Multiple infrastructures required

High Networking Traffic

Difficult to commit to SLA's

Modeler 15 Real-time Scoring with DB2 for z/OS



Integration Real-Time Scoring for DB2 for z/OS into an OLTP application

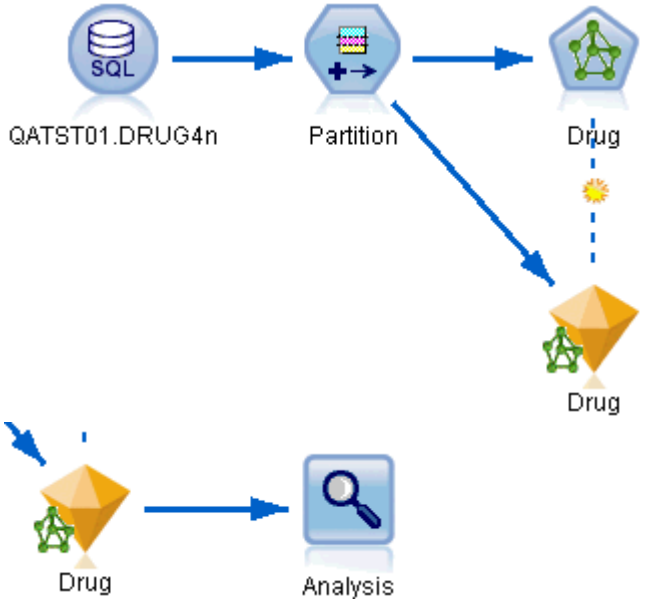
Create a stream to build a model.

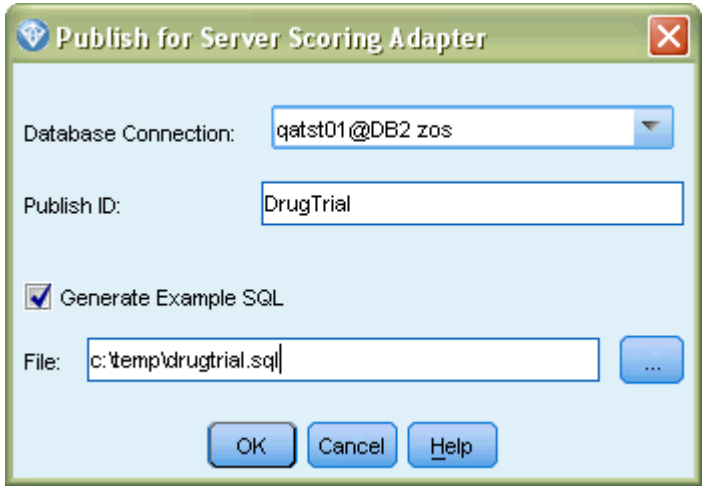
Execute the model building node to produce a model apply node.

Evaluate the model against a separate test partition of the data to test the model

Publish the model to the OLTP application

To rebuild the model, repeat steps 1..4 above.





Sample Real-time Scoring Use Cases

Use Case	Industry
Credit card fraud detection/prevention Up-selling the right product	Banking
Risk and claims fraud detection/prevention Up-selling the right product	Insurance
Risk, crime, fraud detection/prevention	Government
Cross sell, up-sell from market basket analysis	Retail
Cross sell, up-sell from market basket analysis, scheduling, inventory, irregular operations	Travel
Optimize logistics from telemetry, fuel consumption, schedule and weather patterns	Transportation
Churn management, IVR/Call Center Processing	Telco
Meter management, Asset management	Utilities

Questions???