Delivering Innovative Solutions to Meet Current and Future Market Demands

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A Journey to a Smarter Planet

zEnterprise EC12: An optimized design which delivers unique value

Comprehensive integration enabling information-centric computing

DB2 11 and zEC12/BC12 Synergy

- Faster CPU – 1.25x compared to z196
  - 5.5GHz processors, bigger/faster cache
  - 25% reduction measured with DB2 workloads
- 50% More System Capacity to help consolidation
  - Up to 3TB real memory per server
  - Excellent synergy with DB2 10 and 11 scalability
- New Features that DB2 Exploits
  - FLASH Express and pageable 1MB frames, used for:
    - Buffer pool control blocks
    - DB2 executable code
  - 2GB frame support for buffer pools
    - Performance improvement expected for extremely large memory sizes
- New zEC12 GA2 features that benefit DB2
  - zEDC Express for enhanced DB2 SMF data compression
  - RoCE Express for faster, cheaper z/OS to z/OS DRDA communication
    - Preliminary measurements show up to 2x DRDA transaction throughput increase

Improve performance of COBOL applications

Deploy business critical COBOL applications optimized for target System z servers to shorten processing time and reduce operating cost

Modern, advanced optimization

• Based on proven compilation technology shipped in Java on System z since 2006
  • Provides COBOL-specific optimizations
  • Enables COBOL users to fully exploit z/Architecture

•Provides significant performance improvements over Enterprise COBOL V4[1]
  • Many well structured, CPU-intensive batch applications have shown performance increases greater than 10%
  • Many numerically intensive programs have shown performance increases greater than 20%
  • Better exploitation of z hardware, specifically z10, z196, z114, zEC12, zBC12
  • Savings to customers in terms of CPU utilization and ability to meet Service Level Agreements.

•Provides a solid framework to enable timely delivery of z/Architecture exploitation and advanced optimizations
  • Lays groundwork for delivering release-to-release performance improvement roadmap for COBOL on System z
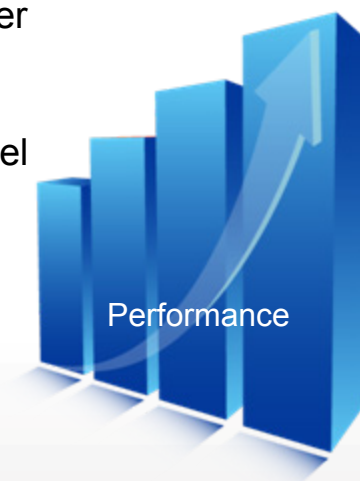
Performance

[1] Results are based on an internal compute-intensive test suite. Performance results from other applications may vary.

Operating systems focused on exploiting

z/OS Version 2.1 & z/OSMF 2.1

NEW

- Fast memory to memory data transfers with SMC-R (like HiperSockets™ between processors)
- Handle huge volumes of data with 100-way (SMP) support in a single LPAR
- Shorten batch windows with 40% shorter file recall time
- Improve SAP workload performance with 175x faster zFS V5 directory lookup
- Leverage Crypto-as-a-service for Linux® to extend IBM System z® reach as a crypto hub

z/VM® Version 6.3

openstack™
CLOUD SOFTWARE

- Supports more virtual servers than any other platform in a single footprint with support for 1TB of real memory,
- Increased performance for large VMs with a 4x increase in memory scalability while maintaining greater than 90% resource utilization
- More efficient use of CPU resources for better price performance

60%
reduction in MIPS requirement for host system size

$1.00/day
for a virtual Linux server

520
Linux virtual servers on zBC12 with 40 virtual servers per IFL.

How Customers are Leveraging System z Transactions and Data Today

Did you know, on z/Linux. we're seeing exciting growth with Worklight In 4Q13, z/Linux accounted for 45% of all IBM Worklight revenue

150M monthly mobile banking transactions with **< 30 milliseconds** end-to-end response time

FNB

System z is the Smartphones Coolest Accessory **and the foundation for a mobile enterprise**

SICOOB

- Avoids **$1.5M** per year in energy costs, while growing mobile transactions

RCBC
A YGC Member

Brings the branch to the client and enables personalized services to support **10M** new customers

New B2E mobile based inventory management system on System z keeps shelves freshly stocked with what customers want, saves over **2.4M** per year for ROI in only **16 days**

TESCO

Mobile workloads Impact Systems differently than web workloads.

- Increase in peak and off-peak transactions. Expect 10-50% growth as you add a mobile channel.

- Increased query or "read-only" transactions. As many as 50% of mobile transaction could be "read-only".

- Unanticipated spikes in workload due to popular apps, features or special offers. No traditional times for workload spikes.

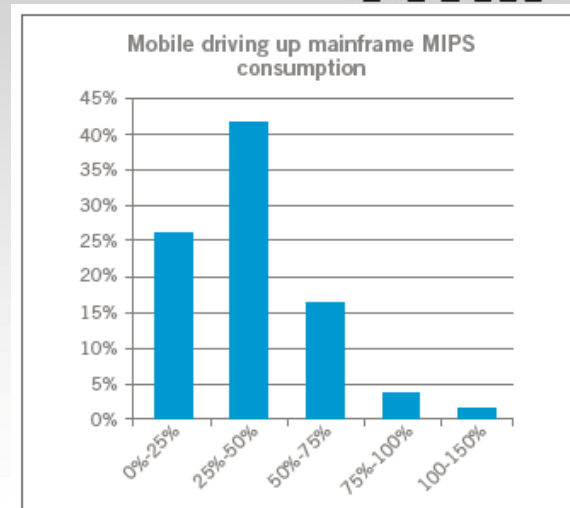- Inefficient applications written by "non-professional" coders. Drives up transaction rates.

Chart 7: The increased use of mobile applications has increased MIPS consumption by more than two-fifths (41 percent), with 2 percent saying it has more than doubled.

Chart 4: 91 percent of CIOs say now that customer-facing applications are using the mainframe and performance expectations on it have increased.

New System z Mobile Workload Pricing
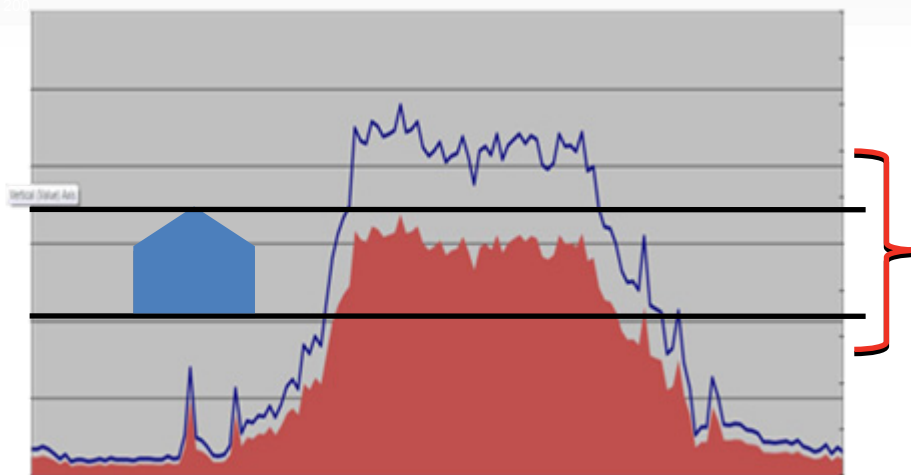
enables IT investments to scale with growth & business returns of mobile

Improving the economics of mobile computing

NEW

No Infrastructure Changes Required

Up to 60% reduction in incremental growth from mobile transactions

Build an Enterprise infrastructure for Mobile, Web, and Cloud Applications

IBM WebSphere Liberty z/OS Connect

New

Rapid and secure enablement of web, cloud and mobile access to z/OS assets

Discover z/OS assets
Simplified connection
Auditing and chargeback

Embedded in z/OS middleware:

CICS, IMS, WebSphere Application Server Batch, UNIX applications

IBM WebSphere Application Server for z/OS v8.5

New

Adopting a continuous delivery model to deliver new features and function for mobile and cloud applications

IBM CICS Transaction Server for z/OS v5.2

New

Service agility to integrate mobile capabilities and broaden the web programming model

IBM Operational Decision Manager for z/OS v8.6

New

Capture, automate and govern frequently occurring, repeatable business decisions

IBM MQ for z/OS v8.0

New

Deliver a flexible service-enabled business via integration of heterogeneous applications

System z – Surviving even the most devastating Japan earthquake!

Continuous Availability over Unlimited Distances with Active Sites Technology

Expand System z continuous availability solution that provides time to recovery in seconds with automated query workload balancing across multiple data centers.

- New automated query workload balancing across data centers through the latest release of GDPS Active-Active Continuous Availability with **IBM Multi-site Workload Lifeline v2.0**

- Improved non-relational z/OS data integration and replication of data between IMS and VSAM databases with **InfoSphere Data Replication and Federation Solutions for z/OS**

- New network automation, and network and systems management among systems with **NetView Monitoring for GDPS**

Automated multi-site continuous availability and workload distribution

GDPS Active-Active

Enhanced Resilience for zLinux/zVM

xDR

Storage CA solution

GDPS/ HyperSwap Manager

Zero dataloss Metro distance CA/DR solution

GDPS/PPRC

3-site solution

GDPS/MGM

GDPS/MzGM

GDPS/GM

GDPS/XRC

Disaster Recovery solution Unlimited distance

NEW

Best in class enterprise messaging solution for z/OS environments

IBM MQ for z/OS v8.0

- Delivering a flexible service-enabled Business via integration of heterogeneous applications

- Rapid, reliable, simple, secure exchange of data across applications, systems and services

- Simplify development via functionally rich, easy-to-use and consistent messaging layer

- Respond to peaks in transaction workloads through scaling capabilities such as clustering

New

What's new in IBM MQ for z/OS v8.0

✓ *Exploit System z capabilities to improve manageability and performance*

✓ *Improved throughput, scalability and operational tasks*

✓ *Enhanced security, increased connectivity, and support for new standards*

DB2 11: The Database for Enterprise OLTP and Analytics

Affordable for every workload with out-of-the-box savings

- – Up to10% for complex OLTP
- – Up to15% for update intensive batch
- – Up to 40% for queries

Business critical analytics

- – Expanded SQL, XML and analytics capabilities
- – Hadoop integration, NoSQL/JSON support
- – In-transaction real-time scoring
- – Advanced analytic capabilities with mobile support

Enhanced Resiliency and Continuous Availability

- – Fewer planned outages, fewer REORGs, faster recovery
- – Transparent archiving, access warm/cold data in single query

Simpler, faster upgrades for faster ROI

- – 16x faster catalog migration
- – No application changes required for DB2 upgrade
- – Product quality and stability – raised the bar

Announce Oct. 1

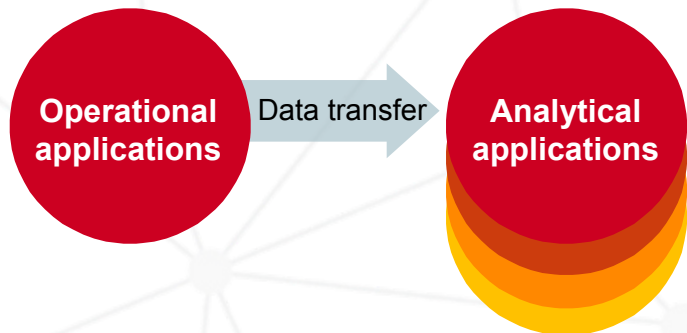**GA Oct. 25**

Day 1 SAP Certification

Bring analytics to the data rather than the data to the analytics

Extract, Transform and Load (ETL)

1TB ETL per day, Initial copy plus three derivatives costs >$8 million over 4 years

Operational applications → Data transfer → **Analytical applications**

Multiple copies of data

Transaction and analytics isolation

Significant compute power

Source: CPO internal study. Assume dist. send and load is same cost as receive and load.. Also, assume 2 switches and 2 T3 WAN connections.
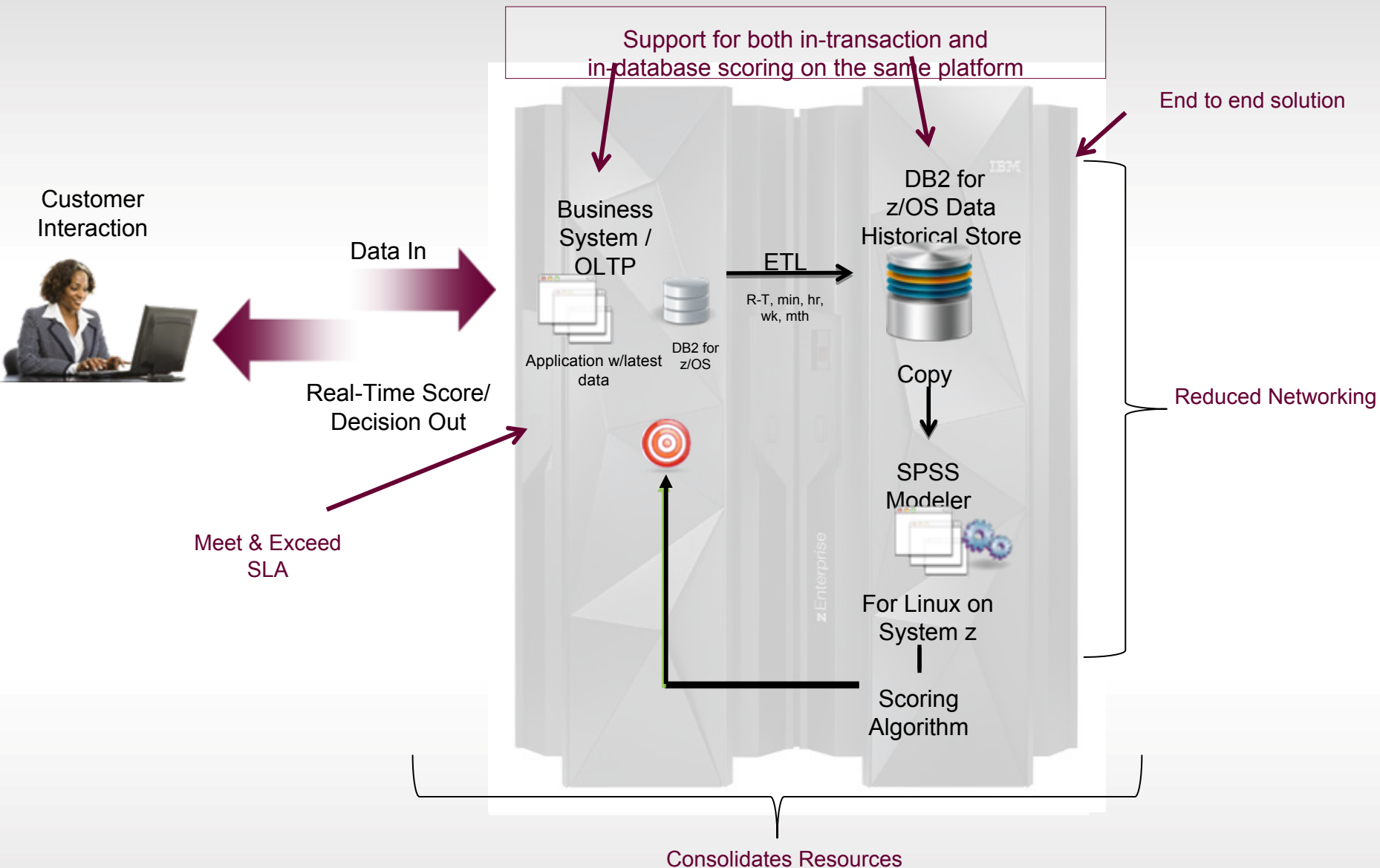
The most valuable insights occur when the analysis executes where the data originates

72%
of respondents plan to analyze transactional data from enterprise applications

80%
of world's corporate data resides or originates on mainframes

IBM
Analytics

In-database scoring for both historical data and real-time transactional data

Support for both in-transaction and in-database scoring on the same platform

End to end solution

Customer Interaction

Data In

Business System / OLTP

Application w/latest data

DB2 for z/OS

Real-Time Score/ Decision Out

ETL

R-T, min, hr, wk, mth

DB2 for z/OS Data Historical Store

Copy

SPSS Modeler

For Linux on System z

Scoring Algorithm

Reduced Networking

Meet & Exceed SLA

Consolidates Resources

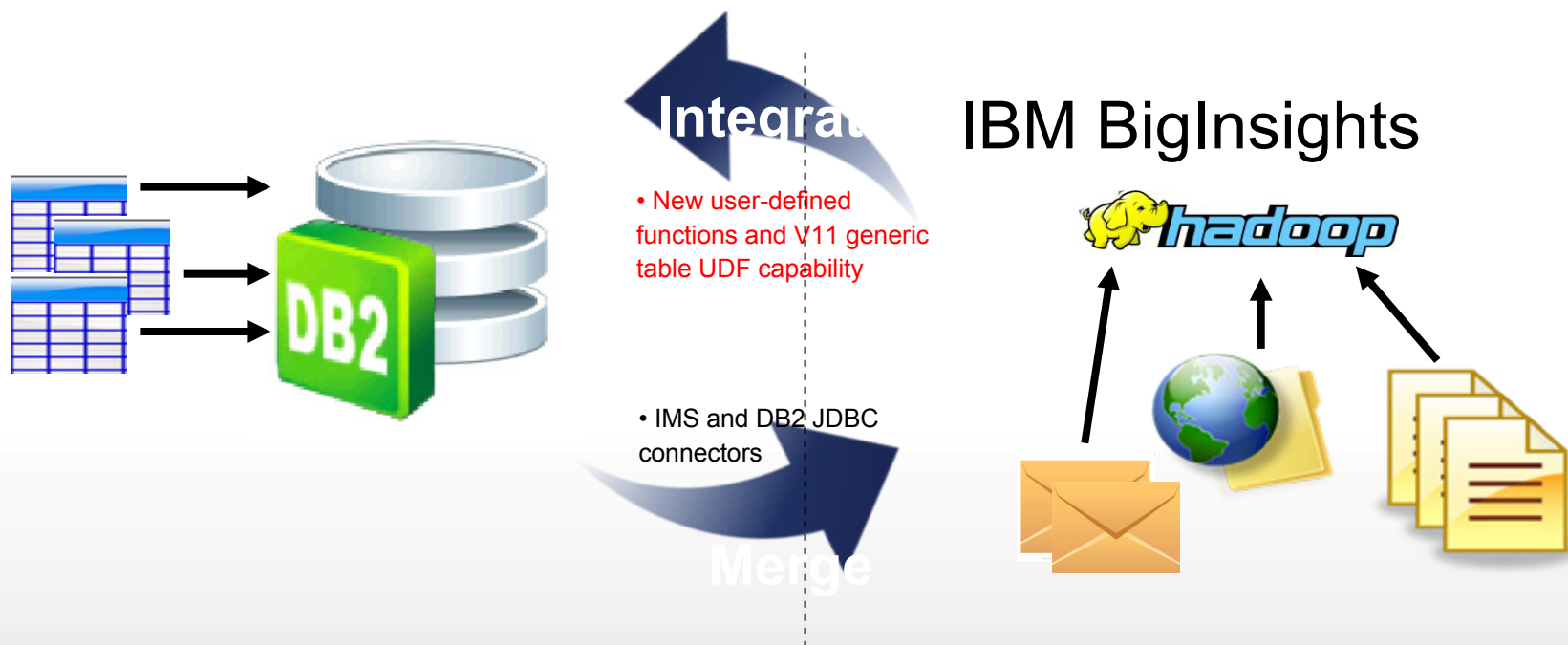# Integrating Big Data Analytics with DB2 for z/OS

• Much of the world's operational data resides on z/OS	Unstructured data sources are growing fast

- **Two significant needs:**
  1. Merge this data with trusted OLTP data from zEnterprise data sources
  2. Integrate this data so that insights from Big Data sources can drive business actions

- **Connectors to allow BigInsights to easily & efficiently access DB2 data**

- **DB2 is providing the connectors & the DB capability to allow DB2 apps to easily and efficiently access hadoop data sources**

New V11 features enable this

Integrate

IBM BigInsights

• New user-defined functions and V11 generic table UDF capability

• IMS and DB2 JDBC connectors

DB2

hadoop

Merge

Optimize and Innovate with IMS

IBM

IMS 13 delivers…

- **Speed & scalability**
  - **117,292 TPS on a single system!**
    - **800%** increase over IMS 12
  - Increased workload throughput by **130%**

- **Affordability**
  - **10%** CPU savings for traditional workload
  - **62%** CPU savings for Java workload
  - Value Unit Editions available for IMS DB and IMS TM

- **Simplicity**
  - Deliver IMS apps and data to mobile and cloud developers in a secure, governed, and optimized way with the IMS Mobile Feature Pack
  - Native SQL from COBOL
  - Dynamic database management

IMS 13 – available today! (GA 4Q2013)

Beta (QPP) experience
- *Highest quality rating (94/100) in IMS history*
- *Three IMS 13 clients in production prior to GA*

Adoption
- *The fastest adoption rate of recent releases with 75 clients and partners already on IMS 13*

IMS vNext – QPP Announce in 4Q2014

Optimize and extend the value of your IMS investment in the era of Data, Cloud & Engagement

- *Simplified, standards-based management and integration for hybrid cloud, analytics, mobile, and big data*
- *Improved IMS TCO and Qualities of Service*

IMS Global
IBM

Join us on LinkedIn

"With **IMS** as our core orchestration and business logic execution layer, we have **true 24/7 service capability** and the ability to manage growth without worrying about scalability."
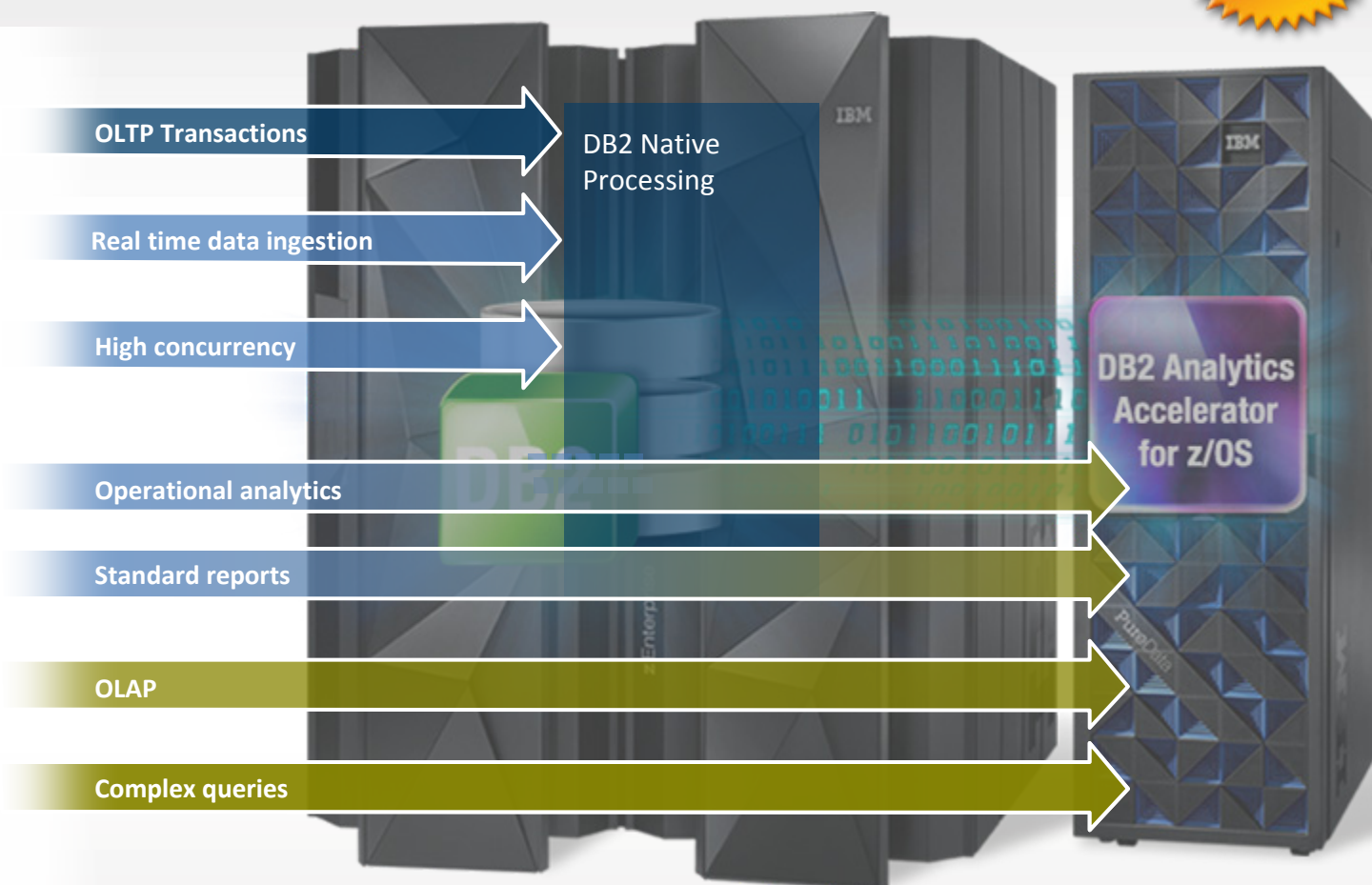
- Jay Prag, CIO Hogan Channels, FNB

FNB

An easy entry point into zEnterprise analytics
A single, workload-optimized system for both operations AND warehousing

NEW

OLTP Transactions

DB2 Native Processing

Real time data ingestion

High concurrency

Operational analytics

Standard reports

OLAP

Complex queries

DB2 Analytics Accelerator for z/OS

- **CPU savings** for DB2 query workloads including short running operational analytics and reporting **now with static SQL, multi-row FETCH, and multiple encodings on the same Accelerator**

- **DB2 analytics accelerator benefits** data warehouse, OLAP and complex queries with **improved enterprise robustness, scalability and high performance storage saver**

IDAA 2014 **Update** [1] - **Highlights**

Enterprise Security for business critical data

- Augment Security and improve Performance with new PureData Technology
  - Extend advanced security with encryption of data at rest while taking advantage of the legendary built-in security of System z
  - Up to 2X performance improvement for CPU intensive workloads and load rates

- Enhance Systems Management Capabilities
  - Faster data synchronization and data load (Incremental Update)
  - Improved serviceability with automatic „Call Home" capability

- Accelerate Multi-Step-Reporting Applications
  - Extend Accelerator scope to speed up IBM Campaign, MicroStrategy and complex custom reporting applications

[1] **delivered as V4.1 PTF 4**

IBM DB2 Analytics Accelerator V5.1 - Highlights

System z: A single workload-optimized system for accelerating decisions to the speed of business

Support full lifecycle of a real-time analytics solution on a single, integrated system combining transactional data, historical data and predictive analytics

- In-database transformation on the Accelerator enables faster and more sophisticated reporting and allows for deep application integration

- Acceleration of Predictive Analytics applications
  - Enables In-database analytics, SPSS / Netezza Analytics(INZA) data mining and in-database modeling to be pushed down to the Accelerator

- Online Schema Change provides significantly faster table updates for real-time analytics
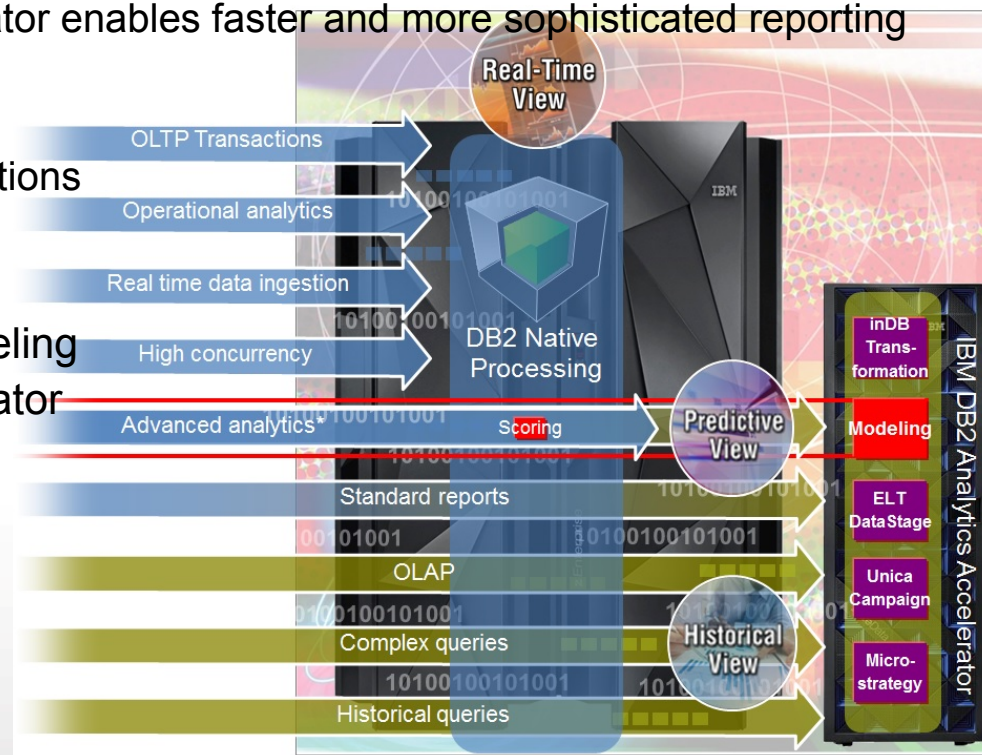
System z delivers an Open Cloud infrastructure

IBM Products & Offerings

Integrate	Automate	Orchestrate
■ IBM zEnterprise®: zEC12, z196, zBC12, z114 ■ Linux® on System z ■ CSL Wave – hypervisor manager (new acquisition) ■ xCAT – services offering to support z/VM	■ Tivoli® Provisioning Manager ■ Cloud Ready for Linux on System z ■ Tivoli Application Management for zEnterprise ■ Tivoli Asset and Financial Management for zEnterprise	■ Tivoli Application Resilience for zEnterprise ■ Tivoli Security for zEnterprise

NEW

z/VM® 6.3   SmartCloud Entry
SmartCloud Provisioning

SmartCloud Orchestrator
System z support currently in development

openstack™ CLOUD SOFTWARE

OpenStack®
■ Being enabled for z/VM first and eventually zManager
■ Being used as a code base for SCE / SCP / SCO

Simplified zEnterprise support with enhanced analytics and cloud workload management

Up to 75% savings in time to find problems

90 mins to 2 mins to fix problems on CICS transactions

zEnterprise wins Tech Innovator Award for Cloud Solutions

NEW! OMEGAMON Performance Management Suite v5
Improved visibility and management for z/OS and subsystems, including support for IBM zAware

NEW! Cloud Management Suite for System z
Easily moves cloud services to System z with standardized, open orchestration by provisioning workloads to zLinux from SmartCloud Orchestrator running on x.

NEW! Tivoli Workload Scheduler for z/OS V9.2
Enhanced automation, monitoring and control of composite workflows, including support for Cloud

Unmatched security and availability for trusted computing in the digital era

99.999%
Design point for application availability

Encryption
Of data at rest or in flight

Security

NEW! InfoSphere Guardium V9.1
Enhanced protection of high-value data and automated compliance policies

ENHANCED! IBM zEnterprise Smarter Analytics for banking
Optimized Fraud Detection and Prevention on System z with enhanced fraud detect rules, models & orchestration

Advanced encryption for new payment methods

Continuous delivery of software-driven innovation

Over 50%
of projects are over budget and often lack critical features

45%
experience delays due to troubleshooting and fine-tuning issues in production

DevOps

ENHANCED! Rational Developer for System z v9.0.1 and Rational Developer for the Enterprise *New out-of-the-box debugging capabilities with a new powerful and modern GUI-based debugger*

ENHANCED! Rational Team Concert Enterprise v4.0.6
Lifecycle automation, collaboration and traceability from conception to deployment

ENHANCED! UrbanCode Deploy v 6.0.1
Provides support for deployment of Java and WAS on z/OS, common in multi-tier applications

Nationwide®

Improved code quality by

50% over a three-year period

Create a competitive advantage in the digital era

Operational and analytics applications reside with the data in **a single fully virtualized system**
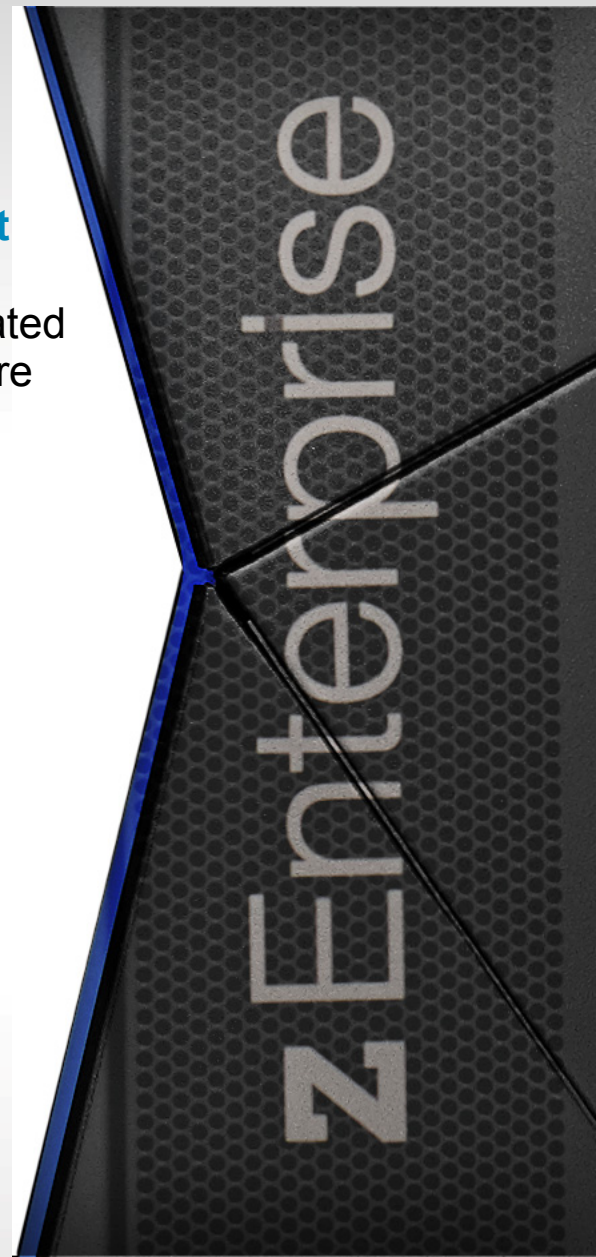
Creating **Intelligent interaction** in transactions integrated across mobile & core processes

DevOps

Analytics

Mobile

Cloud

Security

h

Infrastructure

A **flexible and robust** infrastructure for rapid delivery of high quality services

A **trusted computing** platform to support secure growth in transactions and data

…make the extraordinary possible!!!

zEnterprise

IBM

Thank You