

DB2 for z/OS

Today, Tomorrow and the Future



IBM Information
ON Demand 2009

DB2 z/OS 2009 Technical Conference

IBM INFORMATION ON DEMAND

*Rick Bowers
Director, DB2 for z/OS*

Agenda

- **Business Overview**
- **Field Update on DB2 9**
- **DB2 X**
- **Application Integration**
- **A Day at the Lab**
- **Tying it all together with a Smarter Planet**
- **Questions**

Top Challenges for



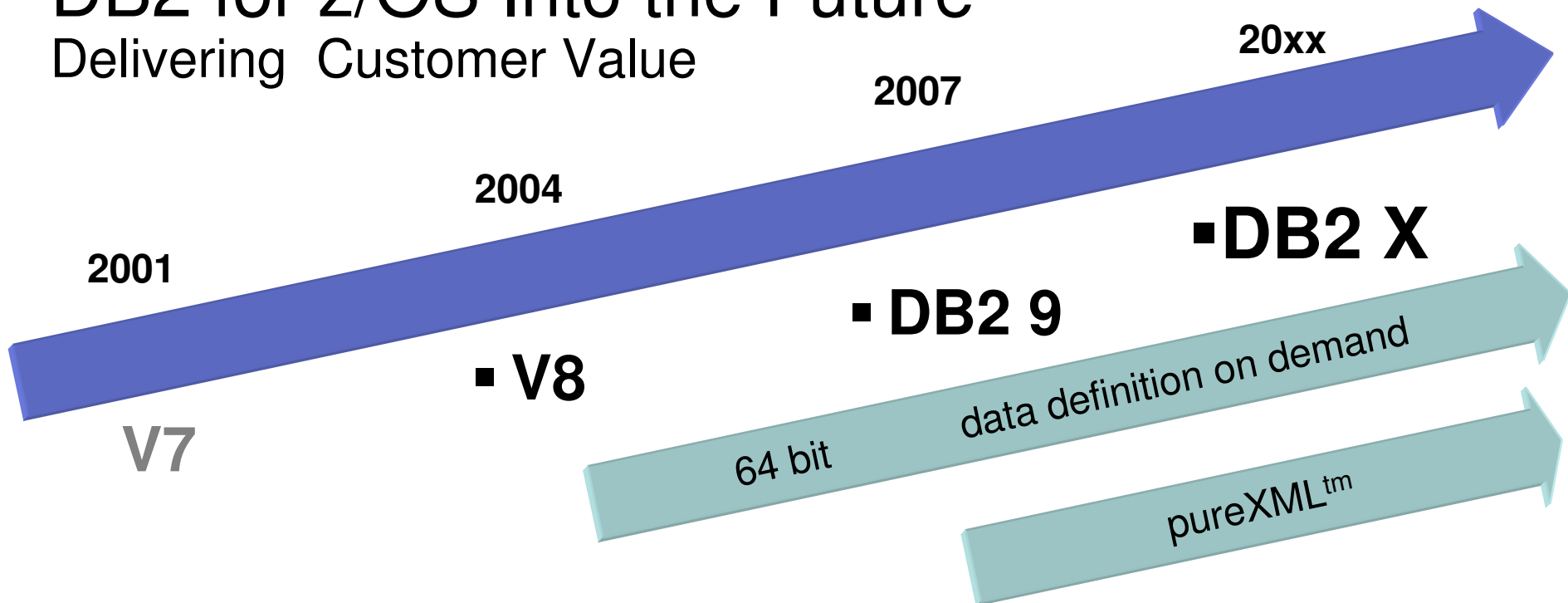
1. Reducing Costs of Information Technology
2. Continuous Service Availability
3. Boost Business Resilience and Reduce Risks
4. Deliver Differentiating Innovative Solutions
5. Security, Auditing and Regulatory Compliance
6. Accessing intelligent information on demand

DB2 for z/OS Technical Strategy

- **Extend the lead in availability, scalability and performance.**
 - Parallel Sysplex: the best scale-out solution in the industry
 - Tight integration between DB2 and the System z hardware and z/OS operating system
 - Advanced solutions for compliance with data security and privacy regulations
 - Workload consolidation: System z is the ultimate consolidation platform
 - Eliminate all causes of outages
- **Reduce cost of ownership**
 - Database technology that can handle large workloads with fewer people
 - Storage and cpu optimization, including specialty engines
 - Advanced autonomics to make the system more self-managing and self-tuning
- **Application enablement**
 - Apps can easily connect to DB2 from anywhere
 - Advanced SQL, XML capability, application portability
- **Improved data warehousing capabilities**

DB2 for z/OS Into the Future

Delivering Customer Value



Themes

Performance Scalability
Reliability Availability Serviceability
Security Productivity
Application Development
SQL XML SOA

DB2 9 Field Update

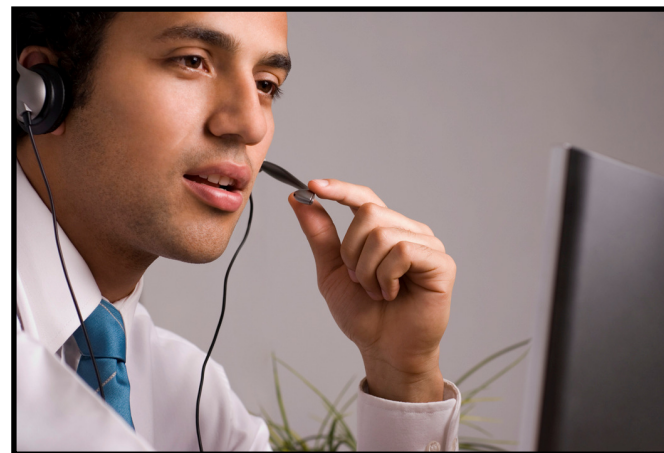


DB2 9 for z/OS field update

- **DB2 9: Climbing Sharply**
 - 39% of Top 100 31% of Top 200
 - Over 500 customers

- **DB2 V8: Migration finishing in most of world**
 - 100% of Top 100 Over 99% of Top 200
 - V7 End of Service: June 30, 2008
 - V8 Withdrawal from Marketing
 - Announced: Dec. 2, 2008
 - Effective: Sept. 8, 2009

- **How's the Quality (compared to V8)?**
 - Lower overall PMR volume
 - Less Severity 1 APARs
 - Lower PE rate



Best Practices and Recommendations when going to V9

- **John Campbell's experience presentation today**
- **Leverage CST/RSU process: Start with latest RSU + Identified Hipers**
 - Apply 2 to 3 preventative service drops annually
 - Exploit Enhanced HOLDDATA to be vigilant on HIPERs and PEs
- **Use the DB2 9 'Package Stability' function for static SQL**
 - Offers access path preserving option. Recovers to prior access path if regression is encountered
- **Minimize potential query performance issues**
 - Use Optimization Service Center to capture SQL statements
 - Run Stats Advisor to generate the recommendation for stats collection
 - Run RUNSTATS to ensure critical stats are collected as recommended by the advisor
- **Ensure an PMR is opened prior to migration start**
- **Proof point: Casas Bahia**
- **Every customer experience is different**

BALDOR

We are in great shape. DB2 9 is very solid and stable. Our reorgs are running great and performance is the best that it has ever been.

We are a very happy customer!

Thanks for all your help.

Highest Regards, Shack

Mark Shackelford, VP Infrastructure Baldor Electric

DB2 X - A Stakeholder View



Outside-In Development Approach

Definition of Stakeholders

■ Principals

- Buyers and Decision Makers
- CIOs, CTOs, & Sr. Business Mgmt

■ Insiders

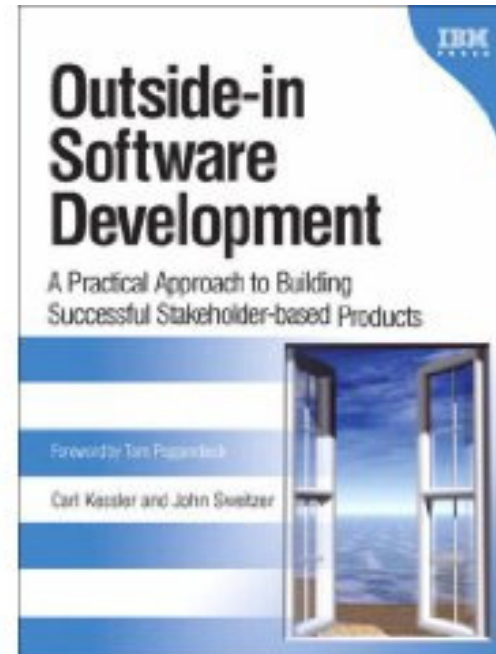
- Inside interest in product aspects
- IBM Execs; Product Managers; et.al.

■ Partners

- ISVs and Business Partners
- SAP, DB2 Tools, BMC, etc.

■ End Users

- People who use the product to get their job done
- DBAs and Application Programmers



DB2 X for z/OS At a Glance

Application Enablement	<ul style="list-style-type: none">• pureXML enhancements• Generated columns• Temporal queries• Last Committed reads• SQL improvements that simplify porting
Availability Performance, Scalability, Security	<ul style="list-style-type: none">• Wide range of performance improvements• More online schema changes• Catalog restructure for improved concurrency• Row and column access control• Hash access to data• Administrator privileges with finer granularity
Simplification, Reduced TCO	<ul style="list-style-type: none">• Full 64-bit SQL runtime• Auto statistics• Data compression on the fly• Query stability enhancements• Reduced need for REORG• Utilities enhancements
Dynamic Warehousing	<ul style="list-style-type: none">• Moving sum, moving average• Many query optimization improvements• Query parallelism improvements• Advanced query acceleration

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IBM INFORMATION ON DEMAND COMES TO YOU

INNOVATE. OPTIMIZE.
PERFORM

Principals – Business Value

- **Constant cost pressures**
 - Performance improvements in key workloads: transactions, batch, Insert, others
 - Data Compression to help reduce storage

- **Where am I going to find good skills**
 - DB2 Outreach and Academic Initiative Programs – Globally Growing University Skills
 - Universities include: Marist, San Jose State, Tonji University and in process in Brazil

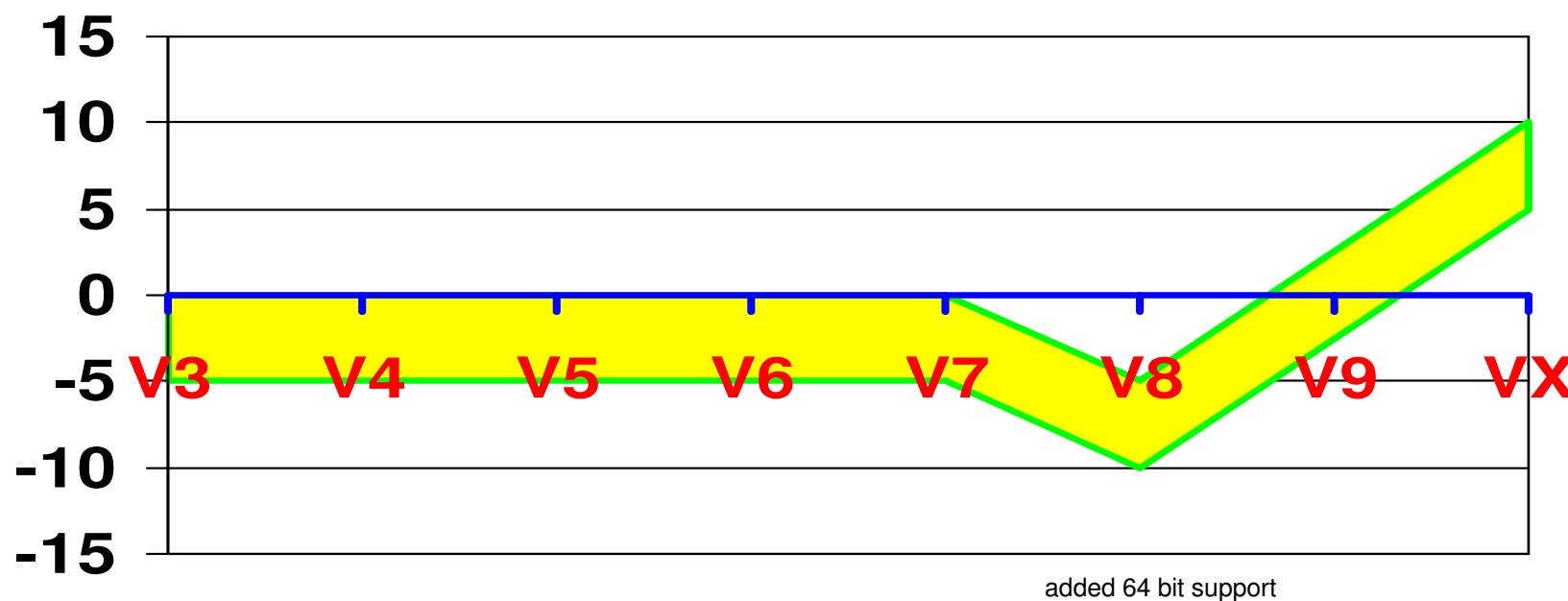
- **I need to improve the security of my data**
 - Simpler, easier privileges with finer granularity authority
 - Ability to have administrators without data access, better auditing

- **I need DB2 to be able to scale with my business**
 - 64 bit support: Many more concurrent users, simpler growth
 - Reduce DBA workload, eliminate time-consuming tasks

DB2 Version X Performance Objective

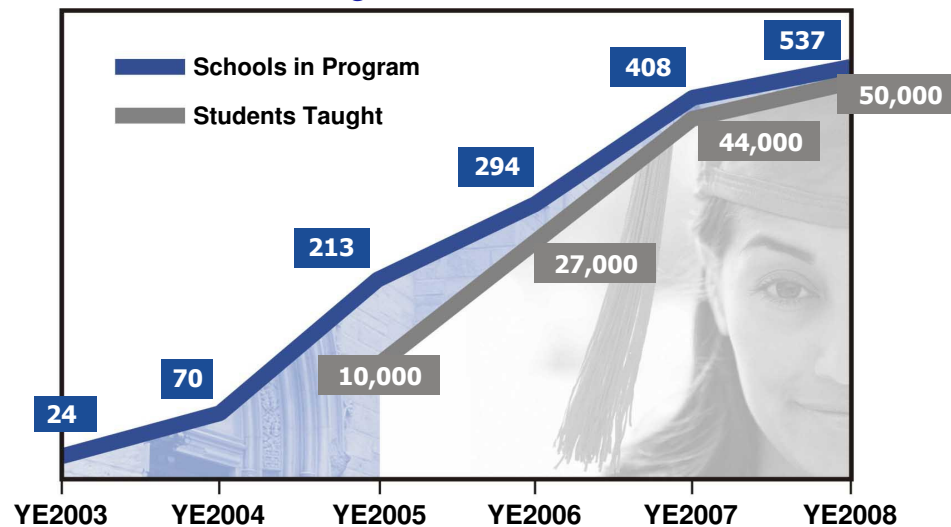
- Historical goal of <5 % version-to-version performance regression
- Goal of 10%-20% performance improvement for DB2 X

Average %CPU improvements version to version



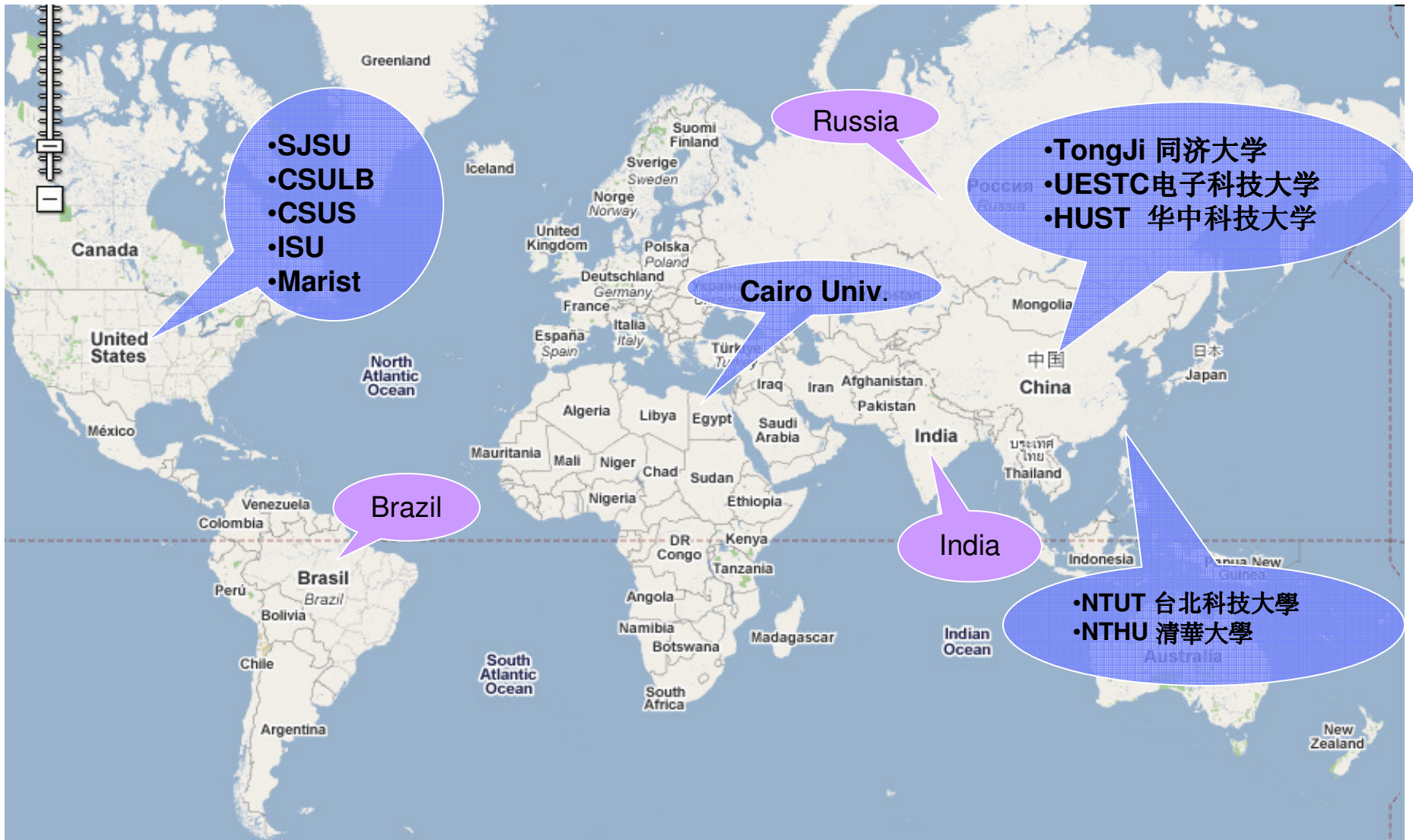
Adding mainframe skills for the community

Growing Academic Initiative



- **System z Academic Initiative by the numbers:**
 - Participation – 537 schools registered, >50,000 students attended mainframe education
 - Courses – 30 (plus more under development) & Mastery Exam Certifications
 - zCommunity – 25 z Roundtables events with Clients / Schools / ISVs / Business Partners
 - Resources – Access to Mainframes worldwide for teaching (6 Univ hubs)
 - Student MF Contests – 9 contests with 8,180 students, 1,136 schools...more planned WW
 - IBM zSkills Help Desk (zskills@us.ibm.com) + over 300 IBM Mainframe ambassadors
 - Assist Professors – Fourth annual Professor Summer Seminar, 5 Faculty awards &, education
 - More examples of clients linking with schools in the program
- **Web site - www.ibm.com/university/systemz**

Building a World-Wide DB2 User Community



Insiders – Client Satisfaction

- **We've got to deliver the product faster!**
 - Client Migration Enhancements

- **Better integration with Optim Studio / IBM Products!**
 - Data Studio, Optim and Utilities
 - InfoSphere Warehouse Support
 - Exploitation of z/OS and System z hardware functionality

- **Make it easier for application porting!**
 - SQL improvements that simplify porting (**DECIMAL FLOAT, optimistic locking, ROLE, TRUNCATE, index & XML compression, created temps**)

- **Continuous Quality Improvement**

Partners – Give Me Better Integration

- **I need better integration functionality**
 - pureXML Enhancements including
 - Performance
 - Query
 - Security

- **I need to be able to query data ‘as of’**
 - Temporal Query & Business Timestamp
 - System Time: Notes occurrence of a data base change
 - Business Time: Notes occurrence of a business event

- **Help me make my porting easier**
 - SQL improvements that simplify porting (inline LOB, administrative privileges, implicit casting, date/time changes, currently committed)

- **I need to be there on Day 1**
 - DB2 X ISV and Partner Early Program

End Users – Simpler, Easier, More Productive

- **Performance**
 - General performance enhancements
 - Hash Access
- **Workload is growing, while resources are shrinking**
 - CPU reductions without programming
- **I need to be more productive**
 - More online schema changes
 - Catalog restructure for improved concurrency
- **I need to be able to recover faster**
 - Query stability enhancements
 - Plan Stability

DB2's Deep Synergy With System z

The key is leveraging integration points throughout the system

- Data sharing (availability and scale out)
- Hardware data compression
- zIIP specialty engines
- Unicode conversion
- Encrypted TCP/IP communication (SSL), encrypted data
- Cross-memory, memory protection keys
- Sorting
- Multi-core, large N-way
- 1 MB page size (z10 – DB2 VX)
- Decimal float arithmetic (z10)
- 64-bit addressing and large memory
- z/OS Workload Manager
- z/OS Security Server (RACF)
- z/OS RRS integrated commit coordinator



DB2 for z/OS & IBM zIIP Continued Value

Portions of DB2 V8 and **DB2 9 (blue)** workloads may benefit from zIIP*:

ERP, CRM, Business Intelligence or other enterprise applications

- Via DRDA over a TCP/IP connection
- **DB2 9 for z/OS Remote native SQL procedures**
- **DB2 9 XML parsing via DRDA to fully utilize zIIP**



Data warehousing applications*: Large parallel SQL queries

DB2 9 higher percentage of parallel queries eligible for zIIP

DB2 Utilities LOAD, REORG & REBUILD maintaining index structures

IBM Smart Analytics Optimizer

Delivering Powerful Analytics to Existing Systems...Technology Preview

➔ **High Performance Extension**

- Order-of-magnitude faster, predictable analytic response times
- Less Administration & Lower Operating Costs

➔ **Application Transparency**

➔ **Extends System z Availability & Security & Skills to Smart Analytics Workloads**



Creates New Opportunities for Existing Systems By Using New Technology Approaches

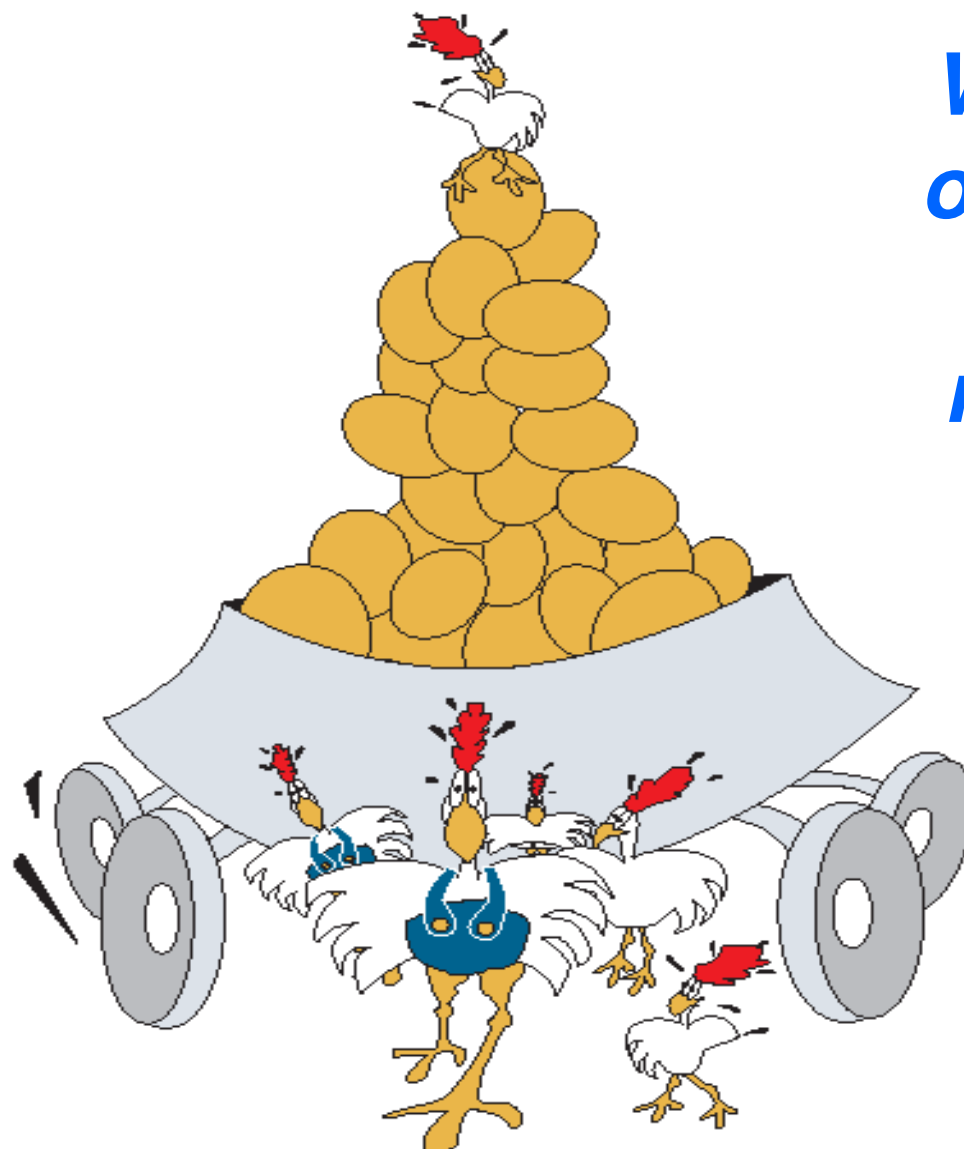
- *Exploits In-memory techniques*
- *Leverages vector processing*
- *Evaluates predicates in parallel*
- *Employs new scanning strategies*
- *Minimizes need for indexes & related administration*

* Based on IBM Laboratory Tests. Actual results may vary depending on specific environment and configuration.

Information Management Software for z/OS Solutions Information Center

- Find the latest product information for DB2® for z/OS®, IMS™, DB2 QMF™, IBM® DB2 and IMS Tools, Replication and Event Publishing, and Data Warehousing and Analytics.
- Learn how to use the information center by taking the animated tours that are available from the home page.
- Subscribe to RSS feeds for automatic notification of updates; information is frequently updated.
- Find troubleshooting information (search for Technotes, APARs, PTFs, and IBM Redbooks).
- Find product information through Google searches.

The screenshot shows the 'Information center home' page. At the top, it says 'Information Management Software for z/OS Solutions Information Center'. Below this, a welcome message states: 'Welcome to the IBM® Information Management Software for z/OS® Solutions Information Center where you can find all the information that you need to install, configure, maintain, and use IBM products for managing your information on z/OS.' There are several links and sections: 'NEW! Order an installable version of this information center', 'Tour the information center', and 'Subscribe to information center updates' with an RSS icon. The main content area is divided into two columns. The left column is titled 'In this information' and includes sections for 'Getting started' (with links like 'What's new in the information center', 'Subscribe to information center updates', 'Navigating in the information center', 'Searching in the information center', 'Searching from external sources', 'Planning for DB2® QMF™ Version 9', 'Planning for IMS™ Version 10', 'Replication and event publishing solutions', 'Data warehousing and analytics solutions') and 'Supported products' (with a link for 'DB2 Version 9.1 for z/OS'). The right column is titled 'Provide feedback' (with links for 'Send documentation feedback', 'Send product feedback (survey)', 'Help make IBM products easier to install and use.') and 'ibm.com and related resources' (with a section for 'Support and assistance' containing links like 'Search for technotes, APARs, and PTFs', 'IBM Software Support', 'IBM Information Management Software Support', 'DB2 for z/OS services', 'QMF Support', 'IMS services', 'IBM DB2 and IMS Tools services', 'WebSphere Replication Server for z/OS support', 'WebSphere Data Event Publisher for z/OS support', and 'InfoSphere Warehouse support').



*While hundreds
of chickens may
have more
muscles than a
couple of
oxen.....*

...you never see a couple of hundred chickens pulling a plow – for a good reason.



DB2 Application Integration



DB2 for z/OS enables Application Development, Drives Innovation ! Leveraging Technologies and Communities

- Use new converged SQL & Optim Studio tooling
- Key Database Technologies
 - SQL, SQL Procedures
 - XML
 - SOA, Web Services
- Developer communities
 - COBOL, PL/I, C, C++, assembler
 - REXX, APL2, Fortran
 - Java (JDBC / SQLJ)
 - .NET (C#, VB .NET)
 - Open Source
 - PHP
 - Perl
 - Python
 - Ruby on Rails
 - TOAD for DB2
 - Rational Developer for Z
 - WebSphere Developer for Z



*Design, develop, deploy,
operate, optimize and govern
enterprise data throughout its
lifecycle*



Application enablement and support for new workloads

Integrated XML support

- Declarative language, reduce complexity, dramatically improve application development
- Directly store and query XML in inherent hierarchical format
 - No decomposition/composition
 - No normalize/de-normalize
- Native processing with good XML index design = high performance
- Ideally suited
 - Versatile schemas that are diverse and evolve, and end-user customizable applications
 - Sparsely populated attribute values (null vs. absence)
- Manage XML data with ACID properties, auditing and regulatory compliance, together with relational data



A Look into Life for a Day at the DB2 Development Lab



A typical agenda for a typical day at the lab

- 8:00 Get coffee and catch up on the day's gossip!
- 8:30 – 9:00 Check in with L2 to follow up on any overnight issues
- 9:00 – 10:00 Meet with Development Operations Team
- 10:00 – 11:00 Project review with Tom Ramey, Director of DB2 Tools
- 11:00 – 11:30 Mentoring Session with team members
- 11:30 – 12:00 Lunch, at your desk of course!
- 12:00 – 1:00 Catch up on email and calls
- 1:00 – 2:30 DB2 X Release Status and Beta Update
- 2:30 – 3:30 1 – 1 Discussions with staff on current projects and issues
- 3:30 – 5:30 Service Operations Meeting
- 5:30 – 6:00 Call with leadership team at the China Software Development Lab
- 6:00 Head home, have dinner and work some more!!!!

So why am I showing this? Priorities!

1. It's all about customers, customers, customers!
2. Focus on continuous process, practice and tooling improvements
3. Growing our technical base both inside and outside the team
4. Improving on leveraging the platform beyond the database
5. Ensuring our global team is a well oiled machine

DB2 for z/OS Organization



**Jeff Josten, DE
Development**



**Gene Fuh, DE
Query Technology**



**Sara Guyer
Development**



**Curt Cotner
IBM Fellow, VP
CTO for
Database Servers**



**Rick Bowers
Director DB2 for z/OS**



**Madhu Kochar
Quality & Performance**



**Chris Akey
WW Service**



**Terrie Jacopi
Prod Mgmt**



**Nigel Slinger,
DE Service**



**Brenda Wang
CSDL**



**Jan Klockow
Boeblingen**



**Don Grossweiler
Customer
Relationships**



**Roger Miller
Technical
Evangelist**



**Maryela Weihrauch,
DE Performance**



**Jim Teng, DE
Data Mgmt.**



**John Campbell,
DE Development.**



**Namik Hrle,
DE Info. Mgmt.**



**Chris Crone,
DE Development**

Building A Smarter Planet

- To build a smarter planet,
- To gain control of the information explosion,
- To respond more quickly,
- To be more efficient,
- To have a more dynamic infrastructure,
- And DB2 is there to deliver the function and value!



Questions?

Obrigado!

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