

### Managing Database ROI with DB2

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# The World Faces Explosive Growth of Information

#### Volume

Every day, 15 petabytes of new information are being generated.

#### Variety

 80% of new data growth is unstructured content, generated largely by email, images and video

#### Velocity

 An average company with 1,000 employees spends \$5.3 million a year to find its own information.



### **Can Cost of Data be Lowered?**

- Escalating data management costs, compounded by high staffing costs and rising another vendor's Database support and maintenance costs
- Lack of scalability to meet evolving customer demands and system workloads
- Inflexible Database virtualization pricing, impacting their ability to realize cost savings from virtualization projects
- 4. Meeting Service Level Agreements (SLAs) for availability and performance
- 5. IT staff struggling with ever-increasing demands on their time

### Not all databases are created equal...



### **Difficult Choices!**



CIO/IT Manager How can I do MORE with LESS?



### The FREEDOM to CHOOSE!



IBM.

Single Vendor Strategy = Reduced BUYER POWER	Dual Vendor Strategy = Increased BUYER POWER
Non-competitive pricing	Best possible pricing
Reduced bargaining power	Increased bargaining power
Locked into one supplier's features/functions/strategy	Choice: Ability to make best decision for the business
Reduced access to innovative technologies	Most competitive technologies
Reduced service levels	Premium services levels
High risk	Low risk (customer has

alternative supplier)



### **Difficult Decision!**



IT Executive/DBA More Databases = More Administration = More Work = More Headache!

### •Is it Safe and More Economical?

# Across the globe, many customers have moved to DB2 and SAVE!

IBM understands the breadth and complexity of workloads facing enterprises today and we've understood it for 40+ years. We know that there are many pieces to the puzzle—from reliability to speed to scalability and security. We also understand that a single approach to systems can't satisfy the specific workload demands of every organization, the solution lies in optimization.



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#### Smarter Analytics

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### Reliability Proven to Many Thousands of Customers

### >10,000 migration from Oracle to DB2 including SAP customers





### **Options and Features**

Oracle Options	DB2 Features
Oracle Advanced Security	
Transparent Data Encryption	Optim Database Encryption Expert (Additional)
RMAN Secure Backup	Optim Security Solutions (Additional)
Authentication services	
Oracle Secure Backup	Optim Database Encryption Expert (Additional)
Label Security	Label Based Access Control (Additional)
Laber Security	(IBM Advanced Access Control)
Database Vault	Trusted Context (Free)
Restrict DBA Access	Restrict DATAACCESS ACCESSCONTROL (Free)
Restrict user access to specific Server	IBM Advanced AccessControl Feature (Free)
Seperation of Duties	SECADM and Role separation (Free)
Audit Mault	DB2 Audit Facility (Free)
Addit Valit	Guardium
	Part of DB2
	- Health Monitor (Free)
Diagnostic Pack	Activity Monitor (Free)
	Data studio Admin console (Free)
	Optim Performance Manager (Additional Price)
Tuning Pack	
SQL Access Advisor	Design Advisor (Free)
SQL Tuning Advisor	Ouppr Powrite (Free)
SQL Tuning Sets	Callery Rewrite (Free)
Reorganize objects	
In-Memory Database Cache (Times-Ten)	SolidDB-Universal Cache for DB2 (Additional)
Active Data Guard	High Availability Disaster Recovery (HADR) (Additional)
Real Application Clusters	DB2 pureScale (Additional)
Partitioning	
List	Table Partitioning (Free)
Range	MDC (Additional)
Hash	Database partition Featue-DPF (licensed with Intopshere
Composite	Vvarehouse)
	DB2 Look - (Free)
Change Management Pack	IBM Data Studio- (Free)
	Optim Database Administrator (Additional)
Configuration Management Pack	Configuration Advisor (Free)
Data Masking Pack	Optim Test data management (Additional)
	Optim Application Developer (Additional)
Provisioning Pack	
Total Recall	Optim DataGrowth Solutions (Archival) (Additional)
wvarenouse Builder	Infosphere Vvarenouse (Additional)
	IDM Cognos (Additional)
	IDivi intopshere Warehouse, SPSS (Additional)
	BDV Dataiviodels (BDVV,RDVV,IIVV,IDVV etc) (Additional)
Spatial	DB2 Spatial Extender (Free)
	Geodatic Extender (Additional)



### **DB2 Support Platforms** Linux

- Red Hat Enterprise Linux (RHEL) 5
- SUSE Linux Enterprise Server (SLES) 10 and 11
- Linux for System i SLES 10, SLES 11; 32 bit and 64 bit
- Linux for System i RHEL 5; 32 bit and 64 bit
- Linux for System p SLES 10, SLES 11; 64 bit
- Linux for System p RHEL 5; 64 bit
- Linux for System z SLES 10, SLES 11; 64 bit
- Linux for System z RHEL 5; 64 bit

### Windows

- 32-bit and 64-bit (x64) Windows Server 2003, Standard Server, Enterprise Server, and Datacenter Editions
- 32-bit and 64-bit (x64) Windows Server 2008, Standard Server, Enterprise Server, and Datacenter Editions
- 32-bit and 64-bit (x64) Windows XP Professional Edition
- 32-bit and 64-bit (x64) Windows Vista Business, Enterprise and Ultimate Editions

### AIX

- AIX 5L v5.3
- -AIX V6.1

### HP-UX

- HP-UX 11i v2 for HP Integrity servers (Itanium-based systems)
- HP-UX 11i v3 for HP Integrity servers (Itanium-based systems)

### Solaris

- Solaris 9 for UltraSPARC or SPARC64 servers
- Solaris 10 for UltraSPARC or SPARC64 servers
- Solaris 10 for x64 servers











### Performance





### Have you seen this on WSJ?





### Latest TPC Benchmarks 31<sup>st</sup> Jan 2012



http://www.tpc.org/tpcc/results/tpcc\_perf\_results.asp?print=true&resulttype=&version=5%&currencyID=0

#### Smarter Analytics



### Latest TPC Benchmarks 31<sup>st</sup> Jan 2012



![](_page_15_Picture_1.jpeg)

# DB2 vs. Oracle on UNIX per Core Performance

- DB2 on 3 64-core Power 780s
- Oracle on 27 64-core SPARC T3-4
  servers
- DB2 delivers 3x the per core performance
- Substitute 1 server of DB2 on Power for every 3 servers of Oracle on SPARC

![](_page_15_Figure_7.jpeg)

#### As of 12/02/2010

•DB2 on 3 64-core IBM Power 780: 10,366,254 tpmC, \$1.38/tpmC, Availability 10/13/2010

•Oracle on 27 64-core Sun SPARC T3-4; 30,249,688 tpmC, \$1.01 /tpmC, Availability 06/01/2011

•TPC-C, tpmC and TPC are registered trademarks of the Transaction Processing Performance Council. See www.tpc.org for more details.

![](_page_16_Picture_1.jpeg)

### IBM POWER7 and IBM Software Optimization Advantages

41% lower transaction cost On POWER7 than the best Oracle/Sun TPC-C result<sup>4</sup>

40% better utilization Up to 40% better system utilization with the latest compilers, exploiting POWER7 architecture<sup>3</sup>

1 IBM CPO Internal Study

- 2 As much as 40% improved throughput vs. Power6 for the identify duplicates process One example of performance improvement, TSM 6.2
- 3 CPO Study DB2 on POWER7 Delivers The Most Efficient TPC-C Result EVER!
- 4 IBM POWER7 TPC-C Result: IBM Power 780: 10,366,254 tpmC at \$1.38USD/tpmC avail 2010/10/13, (24proc/192core/768thread) Oracle Sun TPC-C Result: Sun SPARC Enterprise T5440: 7,646,486 tpmC at \$2.36USD/tpmC, avail 2010/03/19, (48proc/384core/3072thread). TPC-C results available at www.tpc.org.

5 - Solitare Study

86% lower cost for DB2 on IBM Power 780 than Oracle on Sun<sup>2</sup>

![](_page_16_Figure_11.jpeg)

2.7x faster per core On POWER7 than the best Oracle/Sun TPC-C result<sup>4</sup> 43% less staff for DB2 on Power 780 than Oracle<sup>5</sup>

73% faster JVM

using a single JVM of WebSphere on POWER7 vs. competitive application server on Nehalem<sup>1</sup>

![](_page_17_Picture_1.jpeg)

### Manageability

![](_page_17_Picture_3.jpeg)

### **IBM DB2 Compresses Data Better than Oracle**

Superior compression rates due to DB2 algorithm

- DB2 compresses data by looking at all values in the table
- Other vendors only remove duplicates at the page/block level
- Disadvantages of page level approach

Consistent repeating values throughout the entire table will be stored multiple times in each page header

There may be repeating patterns in the table but not on each page

![](_page_18_Figure_8.jpeg)

### rinfoWorld

"Row-level compression is a revolutionary development that will leave Oracle and Microsoft green with envy".

![](_page_19_Picture_1.jpeg)

# IBM DB2 - Lightning Fast & Optimized for SAP

#### **Better Performance with DB2**

Average 40% better performance World record SAP benchmark, outperforming Oracle by 18% and needing only half (only 50%) the processing power!

### Lower TCO with DB2

Average 40% Storage Savings Average 25% DBA Labor Savings

### Deep sales and development partnership leading to great results

33% Growth in SAP clients choosing DB2 since 2006 >100 Customers upgraded from Oracle to DB2 in past 12 months

"We expected an improvement of around 20% in terms of system response time, but we found that the new system was actually 40% faster. The new DB2 database is even more efficient than we anticipated." – Peter Boegler, SAP

![](_page_19_Picture_12.jpeg)

![](_page_20_Picture_1.jpeg)

### Compatibility

![](_page_20_Picture_3.jpeg)

![](_page_21_Picture_1.jpeg)

### **IBM DB2 runs Oracle Code Seamlessly**

![](_page_21_Figure_3.jpeg)

#### THIS IS WHY WE CALL IT **ENABLEMENT** AND NOT PORT !

![](_page_22_Picture_1.jpeg)

### **Gartner Report July 2011**

![](_page_22_Figure_3.jpeg)

Research G00214082

22 July 2011

### IBM DB2's Maturing Oracle Compatibility Presents Opportunities, With Some Limitations

Donald Feinberg, Merv Adrian

Oracle customers who wish to assess compatible alternatives will find that IBM's DB2 compatibility has continued to mature and add features. Understanding its strengths and weaknesses is key to making a migration decision.

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### Scalability & High Availability

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![](_page_24_Picture_1.jpeg)

### Introducing DB2 pureScale

Virtually unlimited capacity

 Buy only what you need, add capacity as your needs grow

Application transparency

 Avoid the risk and cost of application changes

Continuous availability

• Deliver uninterrupted access to your data with consistent performance

![](_page_24_Picture_9.jpeg)

#### earning from the undisputed Gold Standard... System z

![](_page_25_Picture_1.jpeg)

### Why DB2 pureScale is better than Oracle RAC

Near-linear scale-out efficiency of DB2 pureScale

![](_page_25_Figure_4.jpeg)

![](_page_26_Picture_1.jpeg)

### Why DB2 pureScale is better than Oracle RAC

Throughput efficiency declines as you add nodes to Oracle RAC

![](_page_26_Figure_4.jpeg)

![](_page_27_Picture_1.jpeg)

### Licensing

![](_page_27_Picture_3.jpeg)

29

#### Flexible licensing allows virtualization for all **DB2** editions Supports VMWare

**DB2** is Virtualization Friendly

- License ONLY the virtualized CPU
- Reduce hardware expenses through consolidation and higher utilization
- Reduce staffing costs with easy deployments
- ANY discounted licensing for development, quality assurance (QA) and user acceptance (UA) licensing?
  - DB2 offers a special Database Enterprise **Developer's Edition (DEDE) license**
  - You do not Pay Production Licenses
  - Pay 1 User not 25 Users!

![](_page_28_Picture_11.jpeg)

![](_page_28_Picture_12.jpeg)

![](_page_28_Picture_13.jpeg)

Do you need to pay 25 Named user per **Processor for Development** Licensing?

![](_page_28_Picture_15.jpeg)

![](_page_28_Picture_16.jpeg)

### **DB2 Licensing**

- DB2 is Standby Friendly
  - You need to only licenses 100PVU per server for Warm Server
  - NOT Full Licensing

"Standby – In this type of recovery, a copy of the primary database is maintained on a separate server at all times. These systems are configured for disaster recovery purposes. If the primary database fails, the standby database is activated to act as the new primary database. In this environment, both the primary and the standby databases must be fully licensed."

Edition	Cold	Warm	Hot	
Express-C	Not available	Not available	Not available	
Express (FTL, Server)	Additional server license for the standby server	Additional server license for the standby server	Additional server license for the standby server	
Express (PVU, Per User)	No charge for standby server	The standby server must be licensed for 100 PVUs if using PVU pricing. For Per User pricing, the standby server must be licensed for 5 authorized users	Standby server must be licensed in same manner as primary server	
Workgroup	No charge for standby server	The standby server must be licensed for 100 PVUs if using PVU pricing. For per socket pricing, the standby server must be licensed for 1 socket. For Per User pricing, the standby server must be licensed for 5 authorized users	Standby server must be licensed in same manner as primary server	
Enterprise	No charge for standby server	The standby server must be licensed for 100 PVUs if using PVU pricing. For Per User pricing, the standby server must be licensed for 25 authorized users	Standby server must be licensed in same manner as primary server, including any Feature Packs	
		52 0001011500 02012		
Enterprise	No charge for standby server	The standby server must be licensed for 100 PVUs if using PVU pricing. For Per User pricing, the standby server must be licensed for 35 authorized users	Standby server must be licensed in same manner as primary server, including any Feature Packs	
		authorized users		

![](_page_29_Picture_9.jpeg)

![](_page_30_Figure_1.jpeg)

![](_page_30_Figure_2.jpeg)

### SmarterAnalytics DB2 Advanced Enterprise Edition compared to Oracle

#### **For Customers**

- All-in-one, significant value, one low price
- DB2 Advanced Edition (AESE) is only 10% more than ESE (more value for customers!)
- Compare DB2 Advanced Edition to Oracle 60% Cheaper

Functionality	DB2	Price	Oracle	Price
Core Server	DB2 Enterprise	\$40,500	Oracle Enterprise	\$57,950
Compression	Storage Optimization feature	\$15,300	Advanced Compression	\$14,030
Workload Management	Performance Optimization Feature	\$15,300	Workload management	Free
Disaster Recovery	HADR	Free on primary	Active Data Guard	\$14,030
Advanced Security	Label Based Access Control	\$11,100	Label Security	\$14,030
Data Partitioning	Range Partitioning	Free	Partitioning	\$14,030
Administration	Optim Database Administrator	\$5,775	Oracle Enterprise Mgr	Free
			Change Mgmt Pack	\$4,270
Development	Optim Development Studio (10 users)	\$8,660	Internet Dev Suite	\$7,076
Performance Tuning	Optim Performance Manager (existing price Included in Perf Opt Feature)		Diagnostics Pack	\$6,100
Federation	Heterogeneous Federation Feature	\$7,353	Oracle to Oracle federation	Free
Active/Active Replication	Q-Replication with DB2	\$11,100	Golden Gate	\$21,350
Total		\$115,088		\$152,866
Advanced Enterprise \$60.320				\$152 866
Auvanceu Enterprise		-,		ψ132,000

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\*Prices are based on Oracle Global List Price publicly available, IBM price based on

![](_page_32_Picture_1.jpeg)

Course Description

### FREE for Your team of DBAs! Minimum 15 PAX to start a class or attend public class

### **IBM DB2 Workshop for Oracle Professionals**

Designed especially for Oracle practitioners, this session covers the Oracle Compatibility features in DB2 9.7 and includes a demo on the conversion process. It also compares Oracle and DB2 technologies to help you understand the similarities and differences

understand the similarities and differences compares Oracle and DB2 technologies to help you includes a demo on the conversion process. It also

DB2 Training

IBM.

### **HOW TO START?**

### 1. Start with One Application

- We will conduct a Business Value Assessment to demonstrate financial savings
- Choose a New Application or Select an Upgrade project for POC
- Migration Application Assessment
- Conduct POC to migrate application from Oracle to DB2
- POC Assessments
- Procure new licenses for New Application or Upgrade Project or enter into an AYCE for New projects

## In most cases, the COST SAVINGS already JUSTIFY the Project Costs

![](_page_33_Picture_10.jpeg)

![](_page_34_Picture_2.jpeg)

![](_page_35_Picture_1.jpeg)

### Skills?

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![](_page_36_Figure_1.jpeg)

#### Mitigate the risk of moving from Oracle to DB2/Informix

Convert with experience and trust

### What kind of support can IM Technology Ecosystem provide?

#### Skills Transfer (Bootcamps): Teach you deep product implementation skills required for real project execution

Skilled & certified Strong driver for a successful project Project Project implementation assistance to clients and ISVs to accelerate time-to-value and mitigate risk

Provide consultative support to you in real life Mentoring: Create more value by helping clients navigate the wealth of IM portfolio and apply technology in solutions

Build deep relationship with you for repeatable success

![](_page_36_Figure_9.jpeg)

#### IMTE has the breadth and depth of experience

- Successful track record in many projects
  - Proven implementation methodology
    - World class capabilities

![](_page_37_Figure_1.jpeg)

### Worldwide IMTE Team

We know that *TRUE* requires the absolute best team that we can assemble and IBM is prepared to meet your needs by leveraging our local and global resources

![](_page_37_Figure_4.jpeg)

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### **Standard Conversion Practice**

#### **Conversion assessment phase**

- Conversion assessment questionnaire
- Application conversion session
- Conversion assessment document

#### Database object conversion phase

- Conversion of database structures and objects
- Move of data from old to new system
- Enabling compression
- Configuration of autonomic functions

#### Application conversion phase

- Code adjustments to existing application per conversion assessment
- Function and system test

#### Solution deployment phase

- Additional database optimization
- Index review
- Overall solution health-check

#### Skills Transfer and DB2 ramp up (independent of above)

![](_page_38_Picture_19.jpeg)

![](_page_38_Picture_20.jpeg)

#### Smarter**Analytics**

![](_page_39_Figure_1.jpeg)

### Tools Available At Each Step of the Migration

![](_page_39_Figure_3.jpeg)

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#### Sample of a midsize migration report MEET DB2 9.7 FP2 Report 2010/09/22 (IBM Confidential)

Migration Enablement Evaluation Tool for DB2 Send comments to <u>meetdb2@torolab.ibm.com</u>

### 99.4% of statements

immediately transferable to IBM DB2

#### PL/SQL Coverage

MEET DB2 has estimated that 99.4 % of PL/SQL statements and 92.2 % of PL/SQL objects are immediately transferable to IBM DB2. The technical report below identifies possible incompatibilities in the source provided to the PL/SQL compatibility features provided by DB2 9.7.

#### Benefits

- Rapid assessment of application
- Early confirmation of compatibility
- Lists details and source code line number for exceptions

Object Type	Total Number	Number That Require Attention	Percent That Require Attention
Anonymous blocks	3	0	0 %
Procedures	4000	164	4 %
Functions	501	32	6 %
Packages	10	4	40 %
Triggers	319	176	55 %
Total Objects	4833	376	7.8 %
Statements	187451	1117	0.6 %

Feature		Description		#
NLS LIBRARY		Natural Language Library is not supported.		1
NUMBER PRECI	SION	The precision of the data type is out of range.		368
Line 247393	[package] "ADAM"	ADAM"."SP_DECLARA_CONCEPTO" i_pconcepto NUMBER(		38),
Line 247394	[package] "ADAM"	"SP_DECLARA_CONCEPTO"	i_cond_turno NUMBER	(38),

![](_page_41_Picture_1.jpeg)

### **Complete Project Methodology**

- Project management
- Configuration management and merge processes
- Re-coding of non-compliant segments from Oracle to DB2
- Performance analysis and optimization
- Solution deployment and world wide roll out

![](_page_41_Figure_8.jpeg)

### **Application Assessment**

#### **Description:**

The Conversion Assessment provides an analysis of your database and application architecture. IBM will work with TRUE to outline the scope of the assessment. Our Conversion Assessment Questionnaire allows us to gather information for evaluating the technical feasibility of a conversion to DB2 for Linux, UNIX, and Windows.

Includes: In-depth examination of your source code and database

#### **Benefits:**

This *"No Charge*" offer provides an assessment of your application and database

- ✓ Make informed decisions
- ✓ Identify potential issues early
- Understand your business risk
- Provides you with a comprehensive inventory of your current applications
- Identify candidate pilot project(s)
- ✓ Accurately scope and plan your conversion

#### **Deliverables:**

- Conversion Assessment
- High-Level Project Plan

![](_page_42_Picture_18.jpeg)

### Proof of Concept / Pilot

#### **Description:**

The Proof of Concept (POC) focuses on migrating 1-2 candidate applications. It will allow IBM and TRUE to prove that a full conversion can be completed successfully.

Includes: A DB2 technical viability exercise using your database and application(s) within your environment

#### **Benefits:**

- Provides confidence moving forward with a full conversion
- Demonstrates Oracle compatibility features in DB2 9.7
- ✓ Confirms the conversion strategy
- Reduces risk by addressing issues in a controlled environment
- Allows the project team to validate assumptions and assessment

#### **Deliverables:**

- Conversion and Compatibility Report
- Functional database(s) on DB2
- Functional application(s)
- Proof of Concept Final Report
- Lessons learnt session

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![](_page_43_Picture_19.jpeg)

![](_page_44_Picture_1.jpeg)

### **Easier Decision Now!**

![](_page_44_Picture_3.jpeg)

IT Executive/DBA More Databases = More Administration = More Work = More Headache!

### How do I start Saving?

![](_page_45_Picture_1.jpeg)

### **Applications candidates to move from Oracle**

### New applications (or refreshes)

- + no migration
- + no impact to the business
- + immediate savings on licensing
- + savings on maintenance on following years.

Move from Oracle to DB2 for packaged applications (SAP,

<u>....)</u>

- + Limited migration effort (days)
- + No application rewrites
- + Limited tests
- + Savings on maintenance on following years.

#### **ALTERNATE**

Move from Oracle for in-housedeveloped applications

- + Use the IBM database migration technology
- + Savings on maintenance on following years.
  - Assessment
  - Extended tests

![](_page_45_Picture_20.jpeg)

![](_page_46_Picture_1.jpeg)

![](_page_46_Picture_2.jpeg)