

# DB2 Optimized for SAP

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IBM Information  
ON Demand 2009



IBM

Warsaw, March 18th 2010



# Topics to be covered

➤ **DB2 for SAP Value Proposition Overview**

➤ **DB2/SAP Partnership**

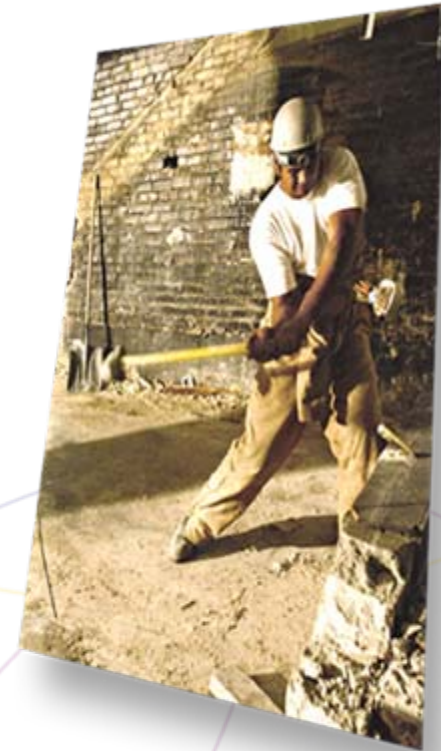
➤ **Unique DB2 Features for SAP**

➤ **DB2/SAP Customer Experiences**



# Strategic requirements for SAP customers in today's world

- **How do I better manage the current investments made in SAP applications and reduce the overall cost ?**
- **How do I lower my overall risk ?**
- **How do I optimise my current investments into the SAP infrastructure and get maximum value ?**



Many SAP customers are feeling very exposed TODAY as their SAP landscape and infrastructure is in a mess (number of instances, number of application components deployed, infrastructure ), and sorting this is their biggest priority !

# SAP Operational Challenges Impacted by the Database

- **Flexibility for SAP production and non-production systems**
  - Efficient capacity provisioning
- **System availability for end-users**
  - reduce planned down time
- **Database sizes**
  - reduce sizes to improve performance
- **Storage consumption**
  - reduce storage consumption and footprint
- **Backup/restore**
  - improved functionality and performance
- **System copies/refreshes**
  - improved functionality and performance
- **Work load management**
  - built-in functionality
- **BI scalability and performance**
  - unlimited scalability



# DB2 Value to SAP Customer – Executive Summary

## DB2 for SAP

**Optimize  
Performance**



**Operational  
Excellence**



**Reduce Costs**



## Technology Value

- DB2 leads in SAP Certified Benchmarks
- Reduced network traffic with compression
- DPF (Database Partitioning Feature) provides horizontal unlimited scalability
- Multi-Dimensional Clustering improves ad hoc query performance

- Reduce DBA efforts by 25% with integrated Data Cockpit
- Higher database availability through integrated backup and recovery and HADR
- One stop service and support via SAP OSS

- Minimize storage footprint by 50+%
- Lower server infrastructure costs
- Avoid unnecessary upgrades
- Complete out-of-the-box solution

# Topics to be covered

## ✓ DB2 for SAP Value Proposition Overview

### ➤ DB2/SAP Partnership

### ➤ Unique DB2 Features for SAP

### ➤ DB2/SAP Performance

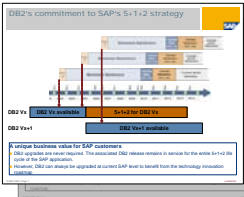
### ➤ DB2/SAP Customer Experiences

# The SAP on DB2 Roadmap



## Partnership

*Joint SAP and IBM teams working on all levels of the product*



## Product Integration

*One product, one maintenance strategy, one-stop service*



## Technology Innovation

*Joint technology roadmap with agreed deliverables*



## SAP runs DB2

*SAP is a very satisfied DB2 customer*

# SAP and IBM Partnership: SAP on DB2 is a joint project since 1993

- **Joint SAP+IBM development team at SAP Germany**
  - Development of SAP code
  - Development of DB2 code for SAP line items
  - Development support and cooperation with DB2 Service
- **Joint SAP IBM Integration Center in IBM Toronto Lab**
  - Integration of new DB2 Releases with existing GA level SAP releases
  - DB2 QA – every single DB2 Fix Pack and every new major DB2 release is tested and certified with SAP software before GA
  - Development support and cooperation with DB2 Service
  - Interface to DB2 development
- **Extremely close cooperation with DB2 Development Toronto**
  - Joint DB2 release planning
  - SAP design review of all SAP relevant DB2 items
  - Regular meetings and calls





# Technology Roadmap – High Level Planning



Next capabilities focus:

- Strong capabilities of storage and compression (e.g., MDC)
- Improved end-to-end solution support

- 3Q/09 NW 7.0 EhP 2**
- Integrated Nearline Storage
  - Top-Down, Revamped Monitoring
    - Time based analysis
    - Drill down along multiple dimension
    - Drill down into history
  - Improved End-To-End Solution Support
  - MDC Advisory Stage 2
  - LONG->LOB transition

- 2Q/08 NW 7.0 SR3**  
**3Q/08 NW 7.0 EhP 1**
- Turn-key HA solution
  - Perf & TCO differentiators (MDC)
  - Turn-key compression
  - Performance Warehouse
  - Integrated Workload Management
  - Integrated MDC advisor
  - Deferred Table Creation

- 1Q/07 NW 7.0**
- Embedded database
  - Unlimited scalability
  - Minimal admin
  - TCO (reduced storage costs, self tuning)

- 2Q/05 NW 2004**
- Streamlined install
  - Streamlined admin
  - Initial BI MDC expl.
  - Auto storage EE

**2005**

- Version 8.2.2**
- Automatic storage admin
  - Deployment optimized for SAP
  - Tailored concurrency & perf improvements

**2006**

- Version 9.1**
- Storage limits removed
  - Near-0 admin
    - Memory
    - Storage
  - Selected Autonomic / TCO features
  - Compression

**2007**

- Version 9.5**
- Integrated & automatic HADR
  - Integrated Flash Copy
  - TCO improvements
    - DPF
    - Memory Management
    - Statistics Management
    - Compression
  - Perf improvements (eg MDC)
  - Threaded Architecture
  - DPF Scaling Improvements

**2008**

- 2H/2009 „Cobra“**
- Full 360° Monitoring
  - Even Deeper Deep Compression
    - 40+% reduction in Indexes
    - 40+% reduction in Temps
    - Inlined LOBs
  - Near-0 Storage Admin
    - Sparse MDC tables for simple space reclaim
    - Easy table space reclamation
    - Ease the path to Automatic Storage
  - Extending Online Operations
    - Change schema definitions online
    - Reorganization improvements
  - Extending Integrated HA+DR OS coverage
  - Additional BI query performance boosts

**2009**

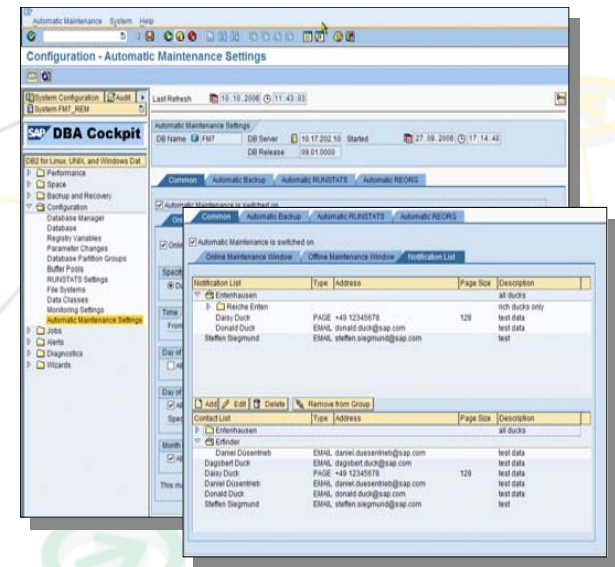
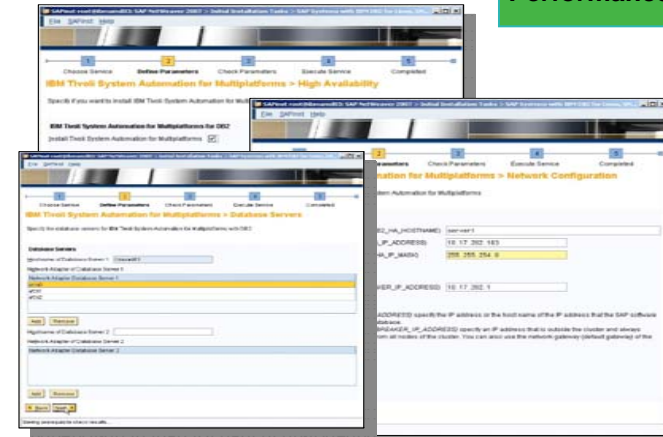
**2010**



# SAP & DB2 Product Integration

Optimize Performance

- SAP on DB2 is a fully integrated product
  - Integrated installation of DB2 software during SAP install, HA setup during SAP install \*
  - One-step SAP-tailored DB2 configuration: DB2\_WORKLOAD=SAP
  - Full DB2 administration and monitoring through SAP DBACOCKPIT
  - Near concurrent GA certification for all DB2 releases and DB2 fix-packs
- One-stop support offering
  - All customers receive one-stop service through SAP – only one single point of contact
  - Joint service and support staffed with SAP and IBM engineers
- Aligned maintenance cycles
  - IBM DB2 follows SAP's 7+2 maintenance strategy



# Strategic Technology Alignment

Database (DB)	Database GA	SAP DB GA	GA Delta	Comments
Oracle 9i	June 2001	During Q1 2003	<b>78-91 weeks</b>	Different dates for different SAP releases
Oracle 10g	Jan 2004	~ Q2 2006	<b>~125 weeks</b>	Backward comp. → 4.6D
Oracle 11g	Jul 2007	2009/2010	<b>~2.5yrs</b>	SAP will support 11.2 only
DB2 v8.2.2	April 29, 2005	June 3, 2005	<b>4 weeks</b>	1st DB2 optimized for SAP Software release
DB2 9	July 28, 2006	Aug 31, 2006	<b>4 weeks</b>	2nd DB2 optimized for SAP Software release Backward comp. →3.11
DB2 9.5	Oct 31, 2007	Dec 20, 2007	<b>7 weeks</b>	Optimized for NetWeaver 7.0 SR3
DB2 9.7	June 26, 2009	Aug, 2009	<b>~7 weeks</b>	Optimized for NetWeaver 7.0 Ehp 2



## Topics to be covered

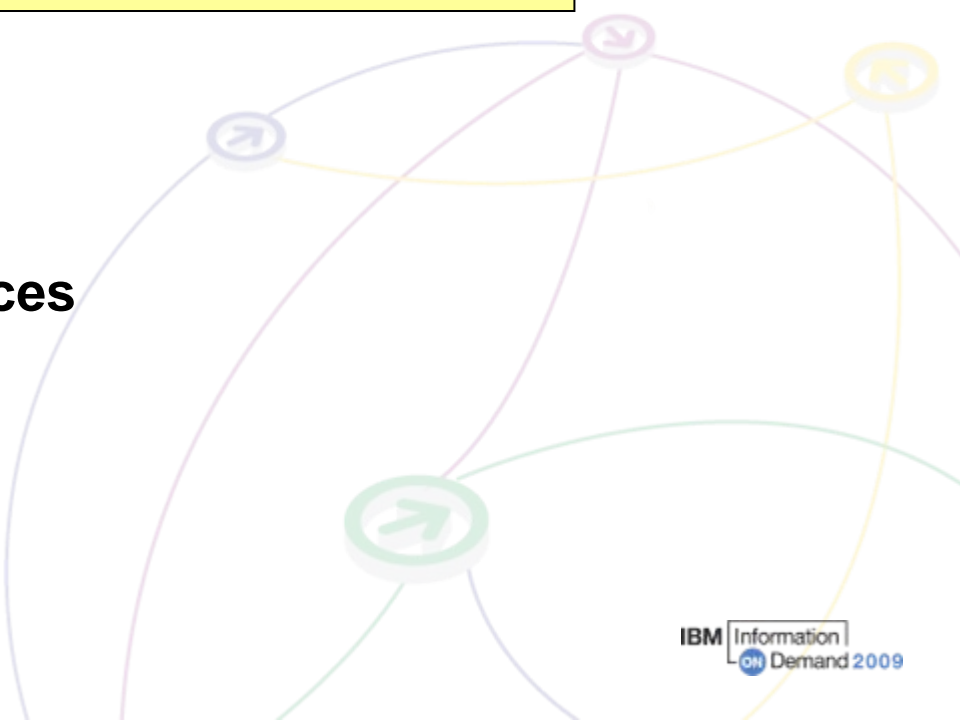
✓ **DB2 for SAP Value Proposition Overview**

✓ **DB2/SAP Partnership**

➤ **Unique DB2 Features for SAP**

➤ **DB2/SAP Performance**

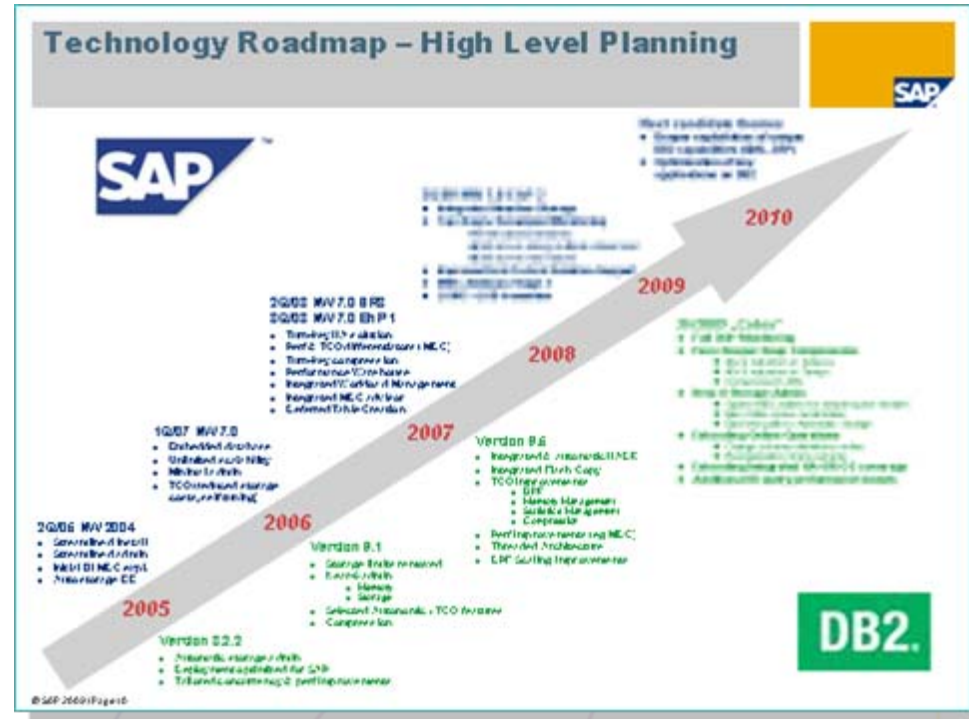
➤ **DB2/SAP Customer Experiences**



# SAP on DB2 : Key Technology Differentiators

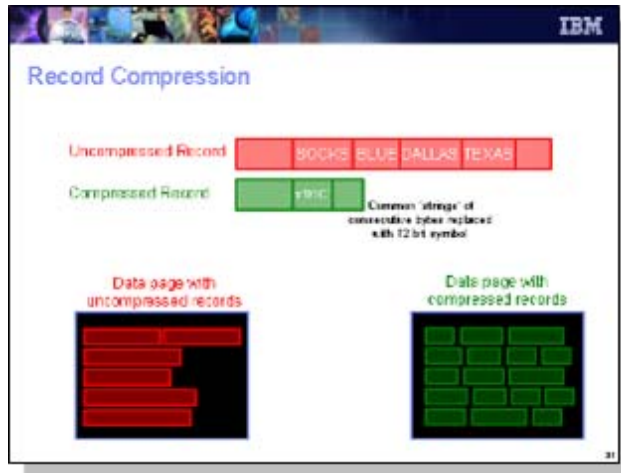
## ➤ Selected SAP on DB2 differentiators covered today :

- DB2\_WORKLOAD=SAP
- DB2 Compression
- SAP on DB2 virtual tables
- DB2 Integrated HA
- DB2 Database Partitioning Feature
- DB2 Multidimensional Clustering
- DB2 Automatic Maintenance
- Online Table Reorg
- DBACockpit
- DB2 Workload Management
- DB2 in SAP's Database Performance Warehouse
- SAP NetWeaver BW Nearline Storage on DB2



➤ **This is not an exhaustive list and only intended to provide an overview. You can find more information about SAP on DB2 in SDN.**

# DB2 9 Deep Compression reduces storage cost



## The facts:

- DB2's unique Compression technology cuts down sizes of database transparently to the SAP application
- Deep Compression is fully supported for all SAP Releases and applications, from R/3 3.11 up to the newest releases.

## Customer benefits:

- ✓ Reduced storage cost by 55%-68%, cost managed TB ~ \$ 50K / YR
- ✓ Reduced I/O requirements, better CPU utilization,
- ✓ Better RAM utilization, virtual increase of 40 %
- ✓ Better Performance, Reduced Backup/Restore time



# Customer Storage Savings with DB2 Compression

Reduce Cost

## ➤ DB2 V8 → DB2 V9 Upgrade :

- ✓ Inter Versicherungen (SAP ERP, 266 GB → 151 GB): 43%
- ✓ Stadtwerke Krefeld (SAP ERP, 1,2 TB → 380 GB): 68%
- ✓ Stadtwerke Krefeld (SAP BI, 420 GB → 230 GB): 45%
- ✓ Center Point (SAP BI 8,5 TB → 3,72 TB): 56%
- ✓ Fiat (SAP ERP, 660 GB → 372 GB): 43%
- ✓ Artsana, Deutscher Ring, Fresenius, SAP, Tellabs, T-Systems, Whirlpool, ...

## ➤ Non-DB2 → DB2 Migration :

- ✓ Schaeffler (SAP BI, 8 TB → 4,5 TB): 44%
- ✓ Coca Cola (SAP ERP, 950 GB → 575 GB): 40% \*
- ✓ Kali+Salz (SAP ERP, 2500 GB → 1375 GB): 45%
- ✓ Thyssen-Krupp (SAP BI, 176 GB → 92 GB): 48% \*
- ✓ Schwartau (SAP ERP, 651 GB → 377 GB): 42%
- ✓ Tellabs (SAP ERP, 1061 GB → 545 GB): 49%

\* Including Unicode conversion

# Operational Benefits of DB2 Compression

Operational  
excellence

## ✓ Better Storage Usage

- Database about 50% smaller
- More space for FlashCopy/Splitt-Mirror

## ✓ Better CPU Usage

- I/O traffic reduced up to 70%
- CPU workload reduced up to 60%
- Average SAP response time ~ 20% faster

## ✓ Better RAM Usage

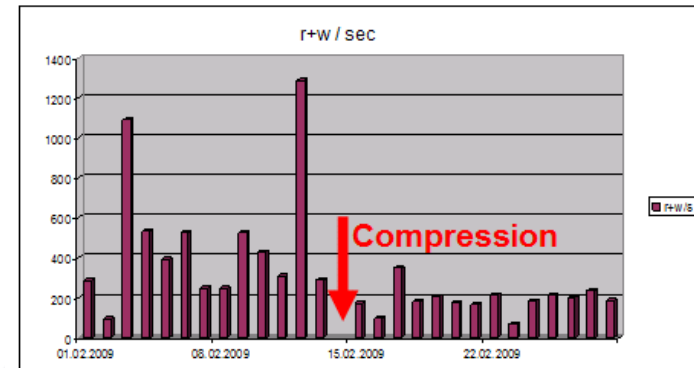
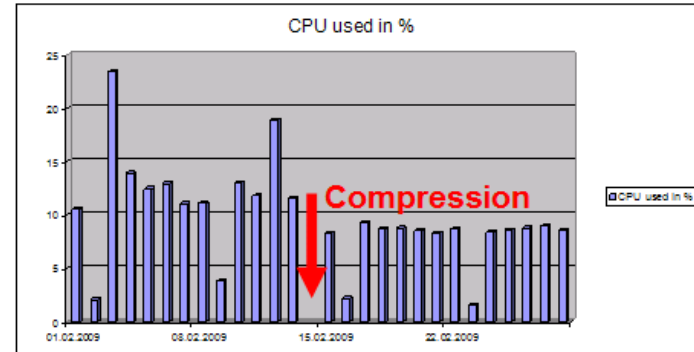
- Data on storage and in RAM is compressed
- Physical database RAM virtually ~ 40% larger

## ✓ Better Backup Usage

- Backup size up to 85% smaller
- Backup time reduced up to 65%

## ✓ Better Batch Performance

- Batch job runtime up to 10 X faster



Startdatum	Startzeit	Laufzeit	Rückgabewert
01.01.2009	19:00:03	00:56:51	0
31.12.2008		00:54:05	0
30.12.2008		01:01:37	0
29.12.2008		00:58:24	0
27.12.2008		00:51:21	0
26.12.2008		00:52:00	0
24.12.2008	19:00:02	01:43:32	0
23.12.2008		01:53:30	0
22.12.2008		01:47:07	0
20.12.2008		01:54:13	0
19.12.2008	19:00:03	02:06:10	0
18.12.2008		02:31:45	0
17.12.2008		02:12:25	0

← Compression



# DB2 9.7 Compression (Data & Index-Compression)

## Customer data-points and testing

Optimize Performance

SAP BI	DB2 uncompressed	DB2 compressed	Saving after table+index compression
Database [GB]	416	146	64,9%
Table [GB]	259	104	59,6%
Index [GB]	157	42	73,5%

SAP R/3	DB2 uncompressed	DB2 compressed	Saving after table+index compression
Database [GB]	1384	612	55,8%
Table [GB]	<b>Data Compression Rate: 57,6% to 72,1%</b>		
Index [GB]			
SAP R/3	<b>Index Compression Rate: 49,2% to 73,5%</b>		
Database			
Table [GB]			
Index [GB]	74	37	49,8%

SAP R/3	DB2 uncompressed	DB2 compressed	Saving after table+index compression
Database [GB]	666	214	67,9%
Table [GB]	541	151	72,1%
Index [GB]	125	63	49,2%

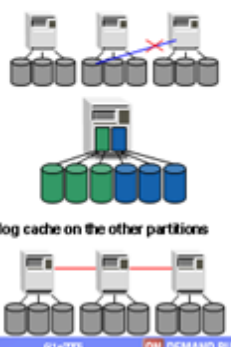
# Unique DPF scale out technology makes you do more with less

Optimize  
Performance

IBM Software Group

## DB2 DPF – Multiple Database Partitions

- One database can reside on several separate computers
- Each partition has its own Buffer Pools, Sort Areas and Logging.
- Hash function is used to distribute records on database partitions
- Shared nothing (function shipping)
  - ◆ Each Partition accesses only its local data
- Several logical partitions can be on the same machine
  - ◆ Physical or Logical Partitioning is transparent to the database.
- Database Catalog on partition 0, DB catalog cache on the other partitions
- Fast communication needed (e.g. Gigabit Ethernet Switch)



4 | SAP #non DB2LW 577 | ON DEMAND BUSINESS

## The facts:

- DB2's DPF (Database Partitioning Feature) offers a unique and proven linear scale out technology for SAP BI
- DPF is a mature technology and fully supported since SAP BW 2.0
- Almost all larger SAP BI installations use DPF

## Customer benefits:

- ✓ Best exploitation of available SMP hardware through logical partitioning with proven performance benefit compared to other databases.
- ✓ Ability to run a high-end SAP BI on lower cost hardware:
- ✓ Deployment on multiple smaller boxes instead of one big SMP machine.

# Nestle: World's largest BI BusinessWarehouse 60TB

<i>Major Key Performance Indexes</i>	<i>Requirement</i>	<i>Achieved</i>
<u>Recovery of an entire days work</u> Restore Database and roll forward 500GB of logs	<8hrs	2hr 40min Using FlashCopy
<u>Disaster Recovery</u> Complete Database restore from tape + roll forward of 2TBs of logs	<24hr	10hrs Using LTO3
<u>Daily Backup to Tape</u> Full Database backup to Tape	<12hr	6hr 10min Using LTO3
<u>Daily Backup to Disk</u> Completed processing of incremental FlashCopy of production day	<8hr	30min Using Flash Copy

## Infrastructure

- **SAP NetWeaver 7.0**
- **IBM DB2 V9**
- **Tivoli Storage Manager**
- **p595 & AIX 5.3**
- **DS8300 Turbo**
- **Tape Library 3584**

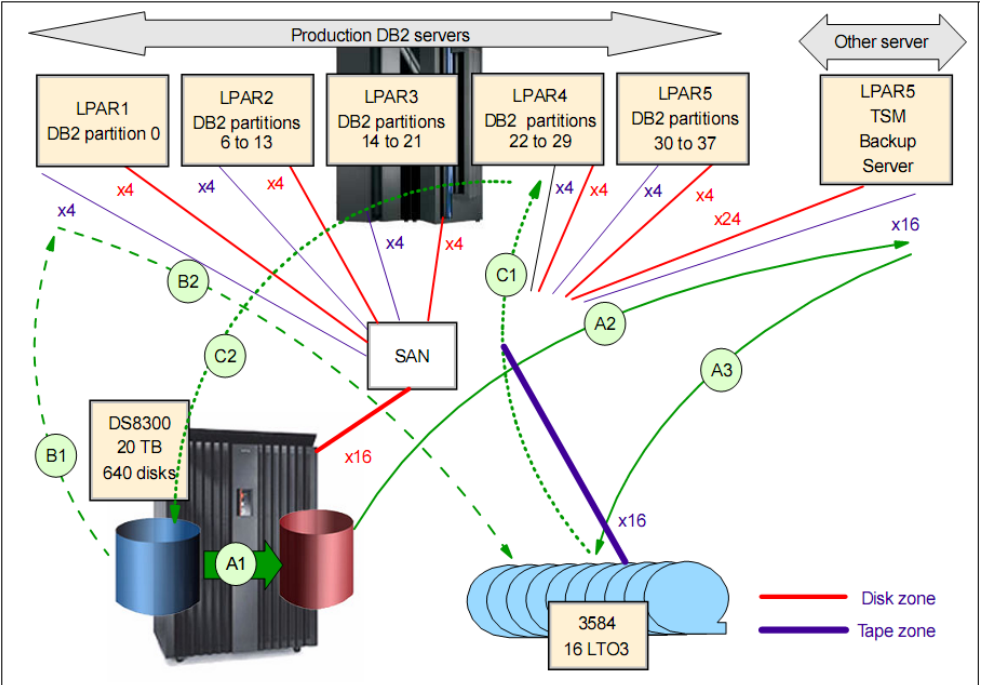
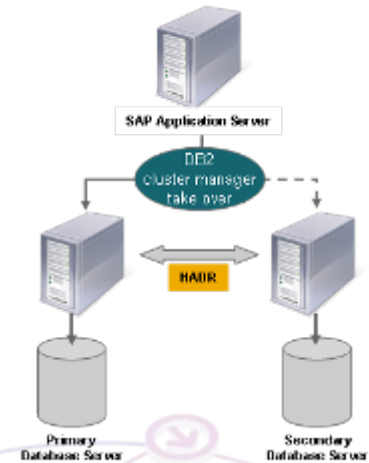


Figure 1-4 The storage infrastructure for backup and restore

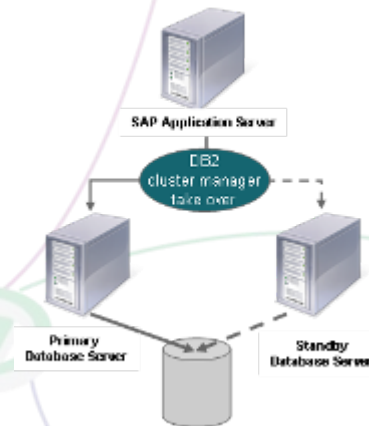
# DB2 High Availability and Disaster Recovery

- Built-in near-sync standby database with rolling update capability (DB2 HADR)
- Integrated cluster manager for fail over automation \*
- Integrated into SAP installation
- Fully supported for all SAP releases in service
- Included in SAP DB2 OEM license at no extra cost

DB2 HADR Setup



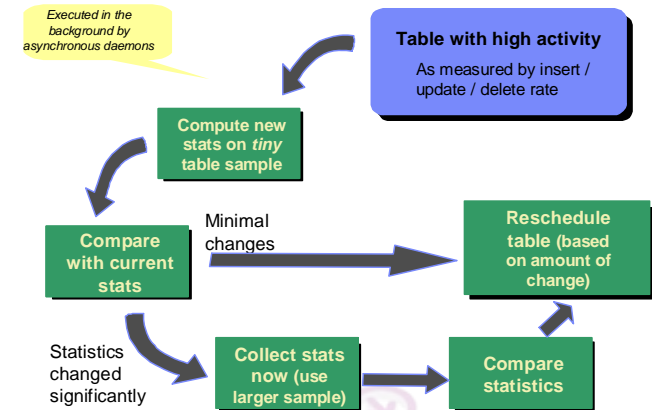
Shared Disk HA Setup



# DB2 Automatic Maintenance

- Most DBA activities are automated with DB2
  - ✓ Memory tuning and configuration
  - ✓ Storage and logfile management
  - ✓ Collection of table and index statistics
  - ✓ And many more ...
- Fully integrated into SAP DBACOCKPIT
- Included in SAP DB2 OEM license at no extra cost

## Automated Table Statistics : 1,000 ft View



The image shows several screenshots of the SAP DBACOCKPIT Automatic Maintenance Settings interface. The main window displays the configuration for automatic maintenance, including options for enabling automatic maintenance, setting the maintenance window, and configuring parameters like the maximum table size and compression dictionary. A table titled 'Tables excluded from REORG' lists various tables and their flags. Other windows show detailed settings for specific maintenance tasks, such as the 'Automatic REORG' window, which includes a table of excluded tables.

Tables excluded from REORG	Schema	Table Flagged	Index Flag
Policy Excluded Tables			
Size Excluded Tables			
AGRE_MERT	SAPFW07		

# DBA Cockpit – First built by SAP for DB2

Operational  
Excellence

- Access SAP + DB2 specific information from one GUI
- Single SAP admin interface
- Access multiple systems from one GUI (remote administration)
- Shipped as part of the SAP system
- Easy administration - all under one hood
- Enhanced usability
- More DB2 data for remote SAP support
- Multi partition support
- No external tools required

Initially implemented by  
SAP only for DB2!!

Job  
Scheduling

Performance  
Monitoring

The screenshot displays the SAP DBA Cockpit interface. The top menu bar includes 'Analysis', 'Edit', 'System', and 'Help'. The main window is titled 'db6cockpit' and shows a 'Diagnostics: System Check' window. The left sidebar contains a tree view of 'Database Administration Tasks' with categories like Performance, Space, Backup and Recovery, Configuration, Jobs, Alerts, and Diagnostics. The main content area shows the 'System Check' results for system 'OHJ' and partition '0000', with a status of 'Completed'. Below this, there are sections for 'Recovery Availability' (Last Backup, User Exit), 'Top Space Allocation' (Log Directory, Log Archive, Tablespace OHJ#SOURCE1), and 'DB & Instance Configuration'. The bottom status bar shows 'OHJ (1) (100) max OVR'. Several callout boxes highlight specific features: 'Performance Monitoring' points to the 'Performance' folder; 'Access to multiple systems / partitions' points to the 'System' and 'Partition' fields; 'Space Management' points to the 'Space' folder; 'Backup & Logging' points to the 'User Exit' status; 'DB & Instance Configuration' points to the 'DB & Instance Configuration' section; 'Job Scheduling' points to the 'Jobs' folder; and 'DB Monitoring & Diagnostics' points to the 'Diagnostics' folder.

DB Monitoring  
& Diagnostics

Access to  
multiple  
systems /  
partitions

Space  
Management

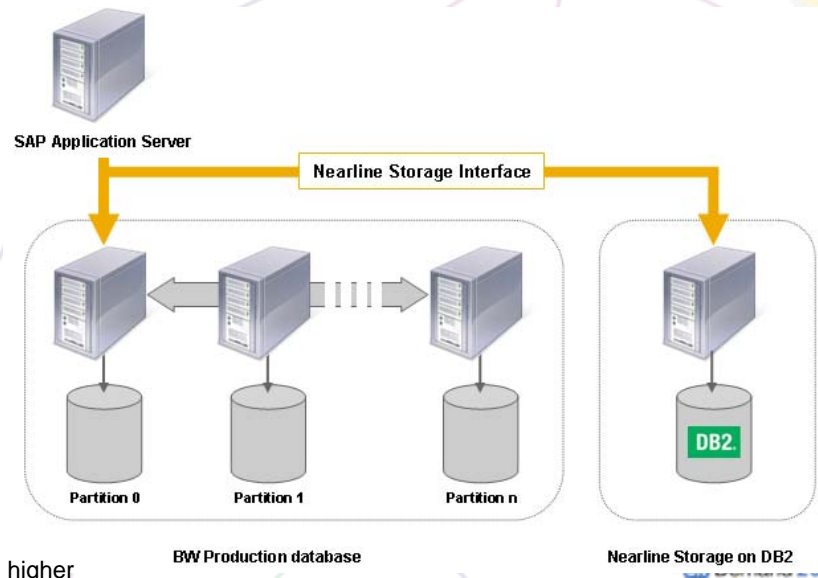
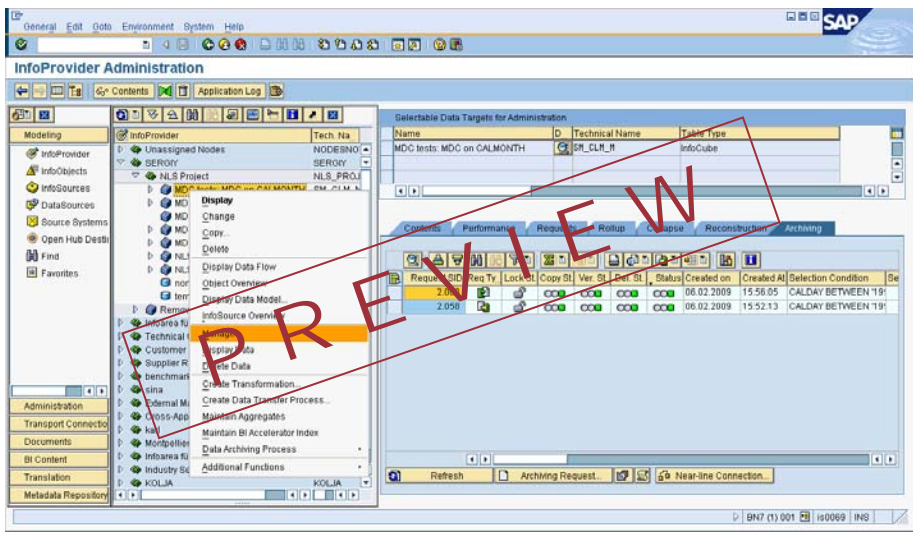
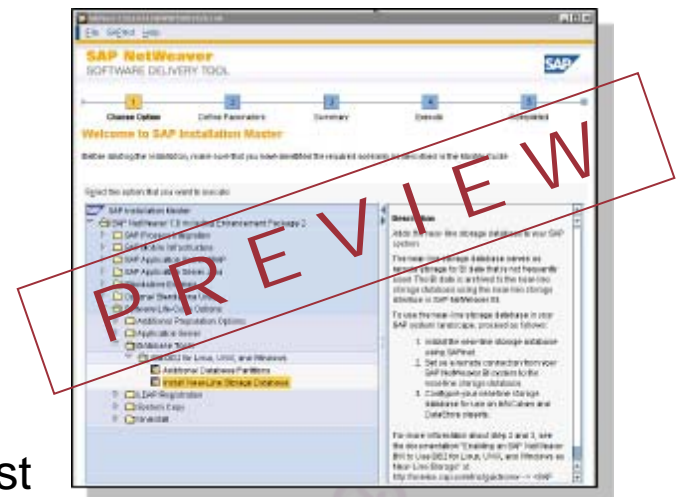
Backup &  
Logging

DB & Instance  
Configuration



# SAP NetWeaver BW Near-line Storage on DB2

- Offloads less frequently used data from SAP BW
- Reduces load and size of your production BW
- Takes full advantage of DB2 compression
- Fully exploits DB2's self managing capabilities
- Integrated into SAP's tools for installation, administration and monitoring
- Included in SAP DB2 OEM license at no extra cost



\* Planned to become available as of NetWeaver 7.0 EhP 2 and higher and DB2 V9.5 and higher

# Topics to be covered

- ✓ **DB2 for SAP Value Proposition Overview**
- ✓ **DB2/SAP Partnership**
- ✓ **Unique DB2 Features for SAP**
- ✓ **DB2/SAP Performance**
- **DB2/SAP Customer Experiences**



# SAP IT is a very satisfied DB2 customer



“This project was a great example of the benefits of combining Unicode conversion and database migration, because the data cleansing and archiving processes helped us reduce the size of the database by more than 22 percent.”

“From our own experience, and from listening to the experiences of our customers, we would definitely recommend the combination of Unicode conversion and database migration as part of an SAP software upgrade project. A reduction in database size may initially seem counter-intuitive, but many companies have experienced the same thing. Moreover, performing a database migration during the Unicode upgrade adds very little to the overheads of the project, so it is more efficient to do both at once.”

– Peter Bögl, Solution Architect, SAP IT

## SAP IT selects IBM DB2 as strategic database platform for internal business systems.

SAP AG in Walldorf, Germany, is one of the world's leading business software providers. With more than 45,000 employees serving international enterprises of every conceivable type, SAP AG has people and offices on every continent, operating in multiple languages.

### The Challenge

SAP IT (the IT department of SAP AG) wanted to be able to take advantage of new SAP software functionalities while reducing the complexity and operational costs of its IT landscape. The company also wanted to move to a new database platform to deliver optimal performance.

### The Solution

In three separate projects, SAP IT upgraded its Human Capital Management (HCM), ERP and Business Intelligence applications, simultaneously performing Unicode conversion and migrating databases from Oracle to IBM DB2.

### The Benefit

Simultaneous upgrade/conversion/migration helps reduce business disruption without significantly increasing project complexity. Response times in the HCM environment have improved by around 40 percent. Archiving and database reorganization have reduced the size of the ERP database by 22 percent – and DB2 9 Deep Compression could provide further reductions. Conversion to Unicode has helped SAP IT introduce multiple-language applications, facilitating international operations. SAP's Business Intelligence system is now positioned for nearly unlimited scalability and massive growth with DB2.



# Coca Cola Bottling

## Financial and Strategic Benefits

- Lower costs for data maintenance
- Improved ability to compress data, precluding need for additional storage space, lowering costs
- Immediate increase in performance of programs and applications, including increased dialog response times

## Operational Benefits

Key Performance Indicator	Impact
1st-year cost-avoidance savings in Oracle fees	+US\$250,000
Database size reduction	Approximately 30%
1st-year (additional) storage and maintenance cost savings	+\$100,000
Annual license, storage, and maintenance cost savings	+\$175,000
Database response time	5% to 10% faster
ROI	+205%
ROI breakeven	Approximately 8 months
5-year internal rate of return	+133%



## Key Facts:

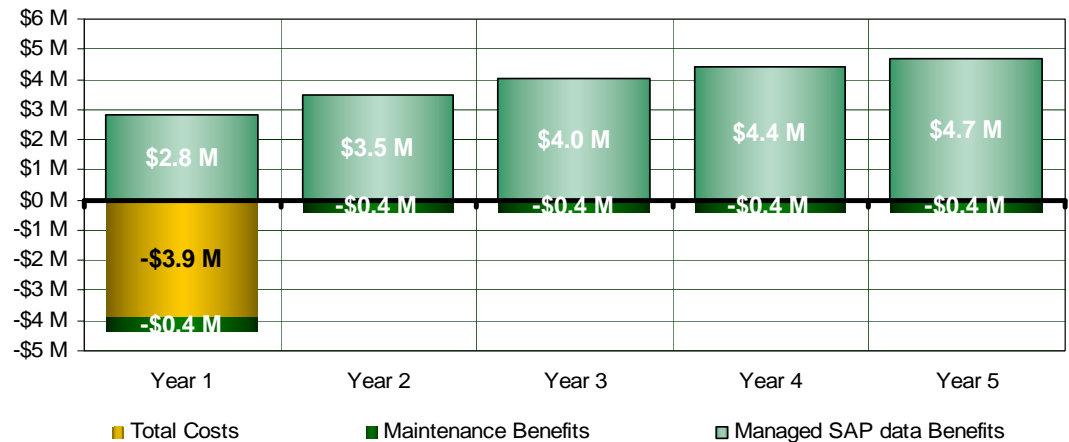
- Oracle takeout utilizing SAP OEM Agreement
- Eli Lilly is one of more than 100 companies to recently switch from Oracle to DB2.

## Summary

- > 50% savings in database storage
- 19 month payback
- \$8.5M savings over 5 years
- Significant annual cost savings for managing SAP database storage
- Improved performance
- On time / In Budget Migration

5-Year Project Economics	
NPV	\$8.5M
IRR	196%
Payback	19 Months

Investment Cost and Benefits Flows  
(\$ Millions)





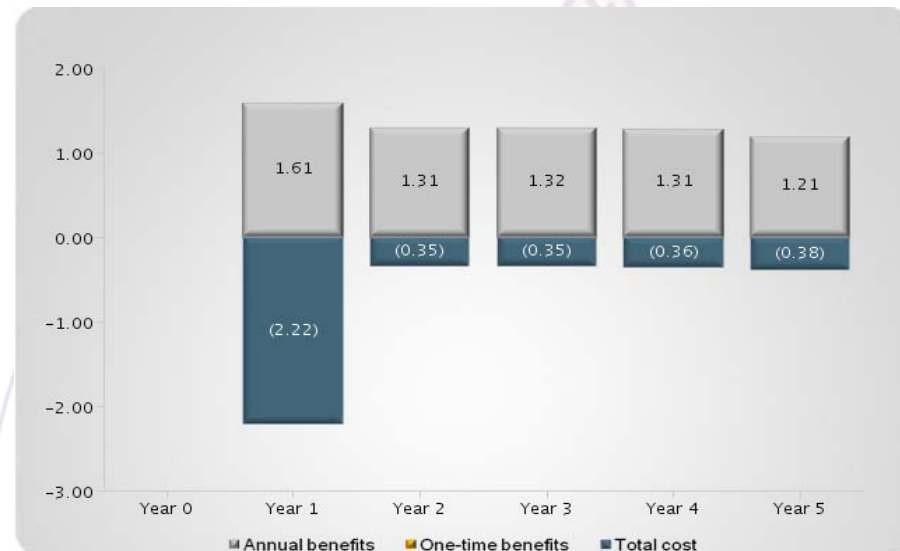
## Key Facts:

- Oracle (inside and outside of SAP) & HP take out in 90 days
- IBM addressed the Non-SAP applications as well.
- LSI had to consolidate their data centers & they were due for a HP hardware refresh
- IBM and SAP built a joint business case on the benefits of migrating to DB2 on pSeries

5-Year Project Economics	
NPV	\$2.1M
IRR	55%
Payback	18 Months

## Summary:

- IBM displaced 4 competitors for this solutions
- Oracle replaced by DB2 –
- Hewlett Packard replaced by PSeries
- Symantec replaced by Tivoli TSM –
- Quantum Storage replaced by IBM ProtecTIER Data dedup for global EDA requirements
- IBM Lab Services and Migration Factory Team





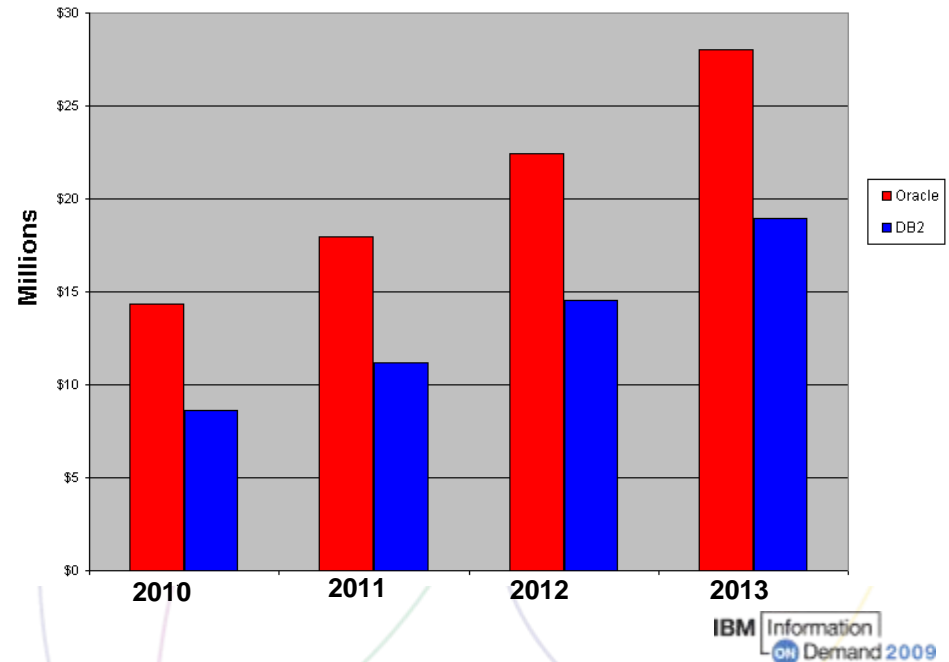
## Key Facts:

- Oracle takeout utilizing SAP OEM Agreement
- Pepsi is one of more than 100 companies to recently switch from Oracle to DB2.

## Summary

- > 50% savings in database storage
- <18 month payback
- Significant annual cost savings for managing SAP database storage
- Improved performance
- PSeries replaced HP

Financials Estimate	Through 2013
Cost of Hardware, licenses and services for Oracle Cash flow (estimate)	\$82.7 M**
Cost of Hardware and ServiceDB2 for Enterprise (estimate)	\$53.3 M**
4 year difference hardware and hardware related Services	\$29.4 M**



# Topics to be covered

✓ **DB2 for SAP Value Proposition Overview**

✓ **DB2/SAP Partnership**

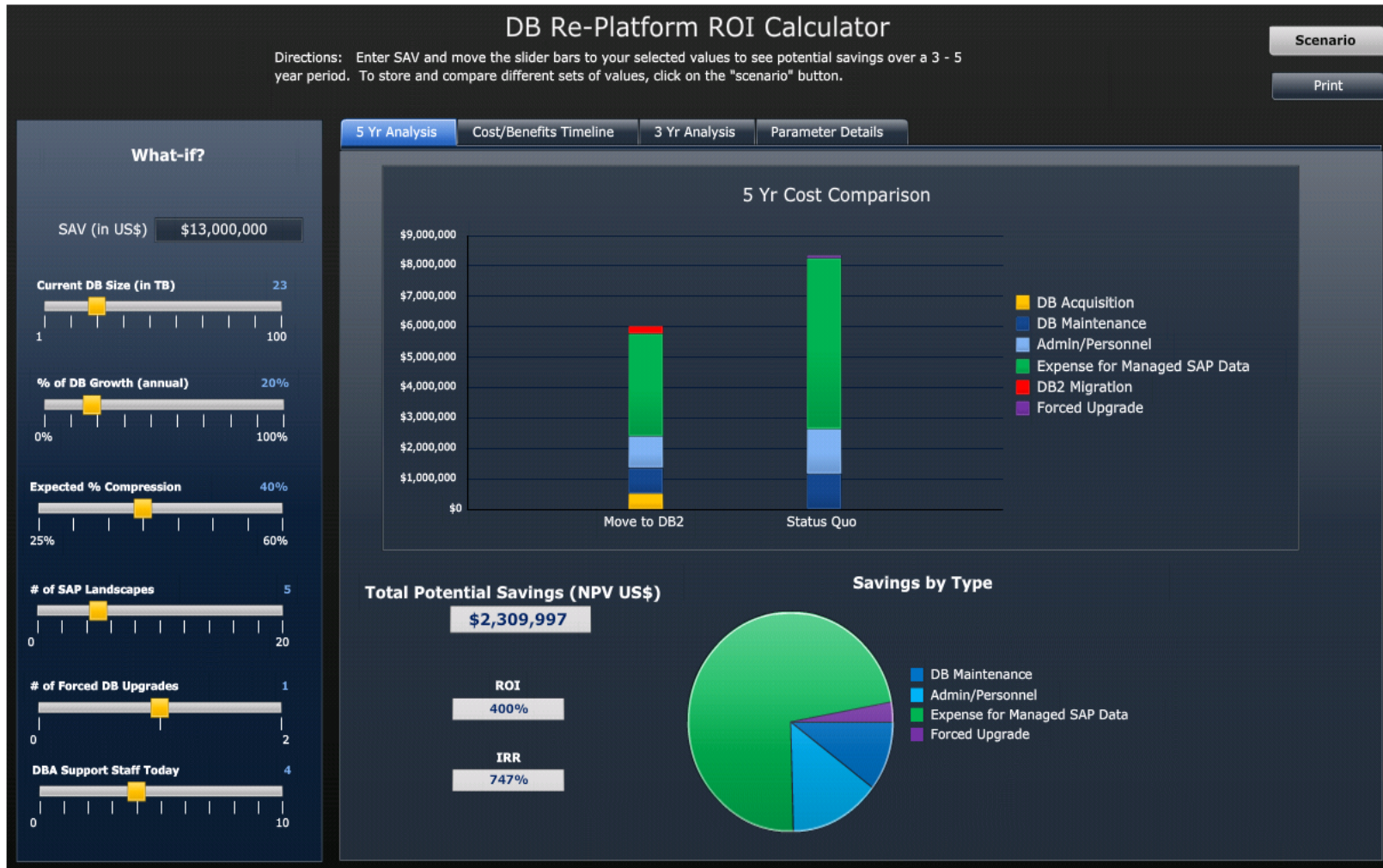
✓ **Unique DB2 Features for SAP**

✓ **DB2/SAP Customer Experiences**

➤ **Additional closing remarks (including summary)**



# Need help modelling ROI for your own environment



**IBM DB2/SAP specialists can help you create an illustration for your internal discussions to build a business case ..**



# DB2/SAP : Take-Aways from this session

- **“DB2: Only Optimized Database for SAP“**
  - Joint Development & Support & Service, Lowest TCO
- **Best Performing Database for SAP**
  - DB2 leads key SAP benchmarks
  - 20% faster than Oracle for R/3
  - 40% faster than Oracle for SAP BW
- **Only Scalable Database for SAP BW**
  - Lowest cost - unlimited scale out for SAP BI
- **38% - 74% Price Advantage over Oracle**
  - License & Maintenance via SAP OEM
- **Disc Space Savings with Compression**
  - 50% - 68 % savings vs. Oracle
  - 60 +% savings vs Microsoft and MaxDB

**DB2 is SAP's Strategic Database and SAP chooses DB2 for its own business, why shouldn't you do the same ?**





Thank  
YOU

